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THESIS

AN ANALYSIS OF THE PROCUREMENT AND
MANAGEMENT OF END-USER COMPUTING
EQUIPMENT (EUCE) WITHIN THE
UNITED STATES MARINE CORPS

by

Carl Ralph Porch
June 1989

Thesis Advisor:

Raymond W. Smith

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An Analysis of the Procurement and Management of
End-User Computing Equipment (EUCE) within
the United States Marine Corps

by

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Captain, United States Marine Corps
B.S., University of Southern Illinois, 1981

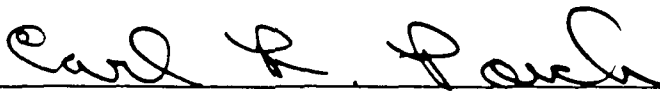
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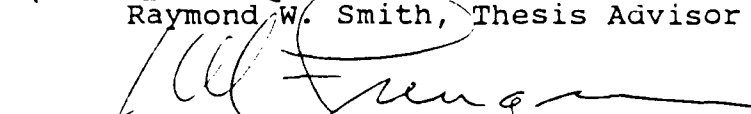


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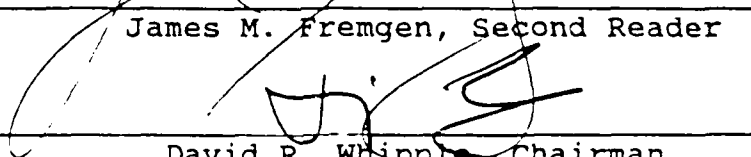
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ABSTRACT

This thesis analyzes the procurement and management of End-User Computing Equipment (EUCE) within the Marine Corps. EUCE refers to microcomputers and peripherals. The background chapter covers microcomputer acquisition in the Federal Government, Marine Corps history of EUCE acquisition, regional data processing support, information resources policy formulation within USMC, and the Mid-Range Information Systems Plan (MRISP). The second chapter covers the current environment and these topics: organizational differences in EUCE procurement, current procurement procedures, Marine Corps EUCE property control, and potential problems in procurement and management. The third chapter presents the results of a survey of 11 contracting offices and 26 ADP offices, and the final chapter gives the conclusions and recommendations. Additionally, Appendix A is a synopsis of current laws and regulations relating to the acquisition of EUCE.

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His cooperation, combined with the guidance and patience of LCDR. Ray Smith (thesis advisor), and Prof. James Fremgen (second reader) enabled this thesis to become a meaningful experience and valuable learning tool.

I. INTRODUCTION

Today the microcomputer is the office tool of choice. Recent advancements in hardware and software have endowed microcomputers with more power than was available ten years ago on large mainframe computers, and at a much reduced cost. There has been a virtual explosion in the acquisition and use of microcomputers within the Federal Government, the Department of Defense, and the Marine Corps since the early 1980's.

Information systems technology has become so embedded in the management structure of the federal establishment that vital administrative, scientific, and military functions are now almost totally dependent on the smooth functioning of hardware and software. [Ref. 1]

This thesis addresses the procurement and management of end-user computing equipment in the Marine Corps. The term "end-user computing equipment" (EUCE) specifically refers to smaller computers and peripherals (e.g., microcomputers, printers, modems) designed for the end-user and subject to his control, as opposed to the large mainframe computers found in data processing installations. It should be noted that, throughout the literature, the term "Automated Data Processing Equipment" (ADPE) is frequently encountered and has a much broader meaning than EUCE. The term ADPE refers to mainframes, microcomputers, teleprocessing equipment, and more. Several terms similar (in breadth) to ADPE are also

found in the literature, laws, and regulations on computers--terms such as Information System (IS), Information Resources (IR), and Automated Information Systems (AIS)--and these terms are often used interchangeably.

Chapter II will cover the background of EUCE procurement and management within the Federal Government and the Marine Corps; also discussed are the Marine Corps' regional data processing support concept, the automated data processing planning and policy formulation process, and the current environment in which these plans and policies are implemented. Following this chapter, the results of telephone conversations and an extensive telephone survey are presented. The telephone interviews were designed to provide information for answering the primary and secondary research questions:

- (1) How could the procurement of EUCE and software be improved within the Marine Corps? [Primary]
- (2) What guidance has been promulgated concerning the procurement of EUCE and software within the Department of Defense? [Secondary]
- (3) How is the procurement of EUCE initially justified and approved within the Marine Corps? [Secondary]
- (4) How and why do field activities differ in the procurement and management of EUCE resources? [Secondary]
- (5) What special problems are encountered in procuring and managing EUCE and software, and how might they be improved? [Secondary]

The survey was conducted with purchasing and contracting offices and automated data processing (ADP) professionals at locations around the Marine Corps.

Finally, the conclusions of the research are presented; and recommendations are made on how Marine Corps EUCE procurement and management might be improved. To orient the reader to the topic of this thesis, first is a discussion on its background and history.

II. BACKGROUND

A. THE ACQUISITION OF MICROCOMPUTERS WITHIN THE FEDERAL GOVERNMENT

The first true electronic computer (developed under government contract) was the Electronic Numerical Integrator and Calculator (ENIAC). Completed in 1946, it was used by the Army at the Aberdeen Proving Grounds to calculate ballistic tables, random number tables, and perform other mathematical computations. A monstrous machine, the ENIAC contained 18,000 vacuum tubes, occupied over 1500 square feet of floor space, and weighed over 30 tons. [Ref. 2]

The federal computer arsenal has grown from the Army's ENIAC, to over 13,000 medium and large computers and more than 600,000 microcomputers [Ref. 3]. The proportion of the federal budget spent on information resources has also dramatically risen in the past few years.

Obligations for the information technology activities of Federal agencies increased from \$9.1 billion in 1982 to \$16.1 billion in 1987 and is expected to increase to \$17 billion in 1989....Between 1982 and 1987, the Federal Information Technology budget rose sharply (on the average 12% per annum). [Ref. 4]

The Department of Defense accounts for a large portion of these expenditures. While the upsurge in computing expenditures (brought on by the development of the microcomputer and advancements in miniaturization) has been a relatively recent phenomenon, issues surrounding the

procurement and management of computing resources have been the subject of debate and legislation since the mid-1960's.

In 1964, the development of the IBM-360 family of computers ushered in a new era of computing. An operating system had been developed which would allow a computer to perform both scientific and business functions efficiently [Ref. 5]. There was a lot attention being focused on how information resources were being managed within the Federal Government. There was a proliferation of systems. Some of the systems were procured and some were leased with expensive leasing arrangements. There appeared to be a tremendous opportunity for savings by centralization of the coordination of federal information resources.

Alarmed at the proliferation of systems within the Federal Government and the lack of overall coordination and management, Congressman Jack Brooks from Texas (a former Marine) introduced a bill which became Public Law 89-306 (the Brooks Act) in 1965.¹ The purpose of the Brooks Act, as stated, was:

To provide for the economic and efficient purchase, lease, maintenance, operation, and utilization of automatic data processing equipment by Federal departments and agencies.
[Ref. 6]

¹"Brooks considers perhaps his finest hour the passage in 1965 of the Brooks Act. Even today the congressman speaks of the law that bears his name as if it were a favorite son." Casatelli, Christine, "Brooks Wields Computer Power," Federal Computer Week, 22 August 1988.

The law gave three agencies significant control over the government-wide use of computers; they were the Office of Management and Budget (OMB), the General Services Administration (GSA), and the National Bureau of Standards (NBS).² OMB has an overall policy role, GSA has authority over procurement matters, and NBS is responsible for developing federal information processing standards (FIPS).

The Brooks Act, the first in a series of laws targeting information resources, accomplished the following:

- (1) Gave GSA jurisdiction over ADP procurement in the Federal Government. However, OMB continued to be tasked with exercising policy and fiscal control over ADP purchases.
- (2) Placed limits on GSA authority.

The Administrator shall not interfere with, or attempt to control in any way, the use made of automatic data processing equipment or components thereof by any agency.
[Ref. 6]

- (3) Granted GSA authority to delegate procurement responsibilities to agencies.
- (4) Established an ADP Fund. The ADP Fund is a general purpose fund primarily to be used by agencies without the necessary programmed funds. Approval for expenditures from this fund must come jointly from GSA and OMB.³

²On Aug. 23, 1988 President Reagan signed the Omnibus Trade and Competitiveness Act into law; officially changing the name of the National Bureau of Standards to "National Institute of Standards and Technology" (NIST).

³On 1 January 1987, an "Information Technology Fund for Telecommunications and ADP" was established under Public Law 99-500 (replacing the ADP Fund of the Brooks Act).

- (5) Tasked the National Bureau of Standards with responsibility for developing standards relating to federal information processing.

The Brooks Act was actually an amendment to the 1949 Federal Property and Administrative Services Act (Public Law 81-152) which created the General Services Administration. While many other laws have had an impact on the procurement and management of computers in the federal government, the only other major amendment to the 1949 Act (P.L. 81-152) has been the Warner Amendment of 1981 (Public Law 97-86).

The Warner Amendment excluded certain systems and services (involving ADPE) from the Brooks Act. It limited GSA oversight to those procurements which do not involve:

- (1) intelligence activities.
- (2) cryptologic activities related to national security.
- (3) command and control of military forces.
- (4) equipment that is an integral part of a weapon or weapons system, or
- (5) the direct fulfillment of military or intelligence missions (excluding routine data processing functions...). [Ref. 7]

There are some problems with this amendment. When a service within the Department of Defense (i.e., a program office) has determined that a procurement falls under the Warner Amendment, while it may choose to consult with GSA, it is not required to notify GSA of the impending procurement. This applies to unclassified as well as classified procurements. According to GSA personnel, the

applicability of the Warner Amendment is sometimes interpreted rather loosely, thereby preventing GSA from providing proper procurement guidance. [Ref. 8]

In addition to the aforementioned laws, other laws have also had an impact on computer procurement. The Competition In Contracting Act of 1984 (Public Law 98-369), referred to as CICA, established criteria for full and open competition and gave contractors the choice of taking protests of an agency decision to either the General Accounting Office (GAO) or the General Services Board of Contract Appeals (GSBCA). CICA has an entire section (i.e., 2713) devoted to automated data processing dispute resolution. Disputes involving ADPE are heard before the GSBCA. Over time, it appears that the GSBCA has also acquired a reputation for being sympathetic to contractors.

Many agencies believe that the appeals board is sympathetic to contractors or at least makes it too easy for them [i.e., the contractors who failed to win the contract] to stall computer procurements. [Ref. 9]

The Paperwork Reduction Reauthorization Act of 1986 (Public Law 99-500), known as the Amended Brooks Act, expanded the scope of the original Brooks Act by redefining "ADPE." The current definition of ADPE is:

The term "automated data processing equipment" means any equipment or interconnected system or subsystems of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching interchange, transmission, or reception, of data or information by a federal agency, or under a contract with a federal agency which requires the use of such equipment, or furnishing of a product which is

performed or produced making significant use of such equipment. [Ref. 10]

The Amended Brooks Act also authorized GSBCA to determine its own jurisdiction with respect to ADP bid protests and required that a five-year management plan be submitted by OMB to meet the information technology needs of the Federal Government. [Ref. 10]

In addition to federal laws, there are numerous OMB directives, Federal Acquisition Regulations, Federal Property Management Regulations, Department of Defense (DOD) Directives, Secretary of the Navy (SECNAV) Instructions, and Marine Corps Orders (MCO) relating to the procurement of EUCE in the Marine Corps. A synopsis of these laws and regulations is contained in Appendix A.

The guiding document for the procurement of ADPE in the federal government is the Federal Information Resource Management Regulation (FIRMR) released by GSA in 1984. While it is intended to supplement the Federal Acquisition Regulation (FAR), in situations where interpretations of the FAR and FIRMR appear to contradict one another, the FIRMR takes precedence.⁴ As the guiding document, the FIRMR provides the foundation for the majority of agency regulations concerning information resources. It covers all

⁴Announced 18 May 1988, in the Federal Register and is pending a rewrite of the Federal Acquisition Regulations Part 39: Acquisition of Information Resources.

the major aspects of ADP equipment procurement and management, including such topics as:

- (1) Planning and Budgeting for Information Resource Activities (Part 201-16).
- (2) Security of Information Resources System (Part 201-7).
- (3) Implementation and Use of Federal Standards (Part 201-8).
- (4) Competition (Part 201-11).
- (5) Delegations of Authority (Part 201-23).
- (6) Acquisition Policies (Part 201-24).
- (7) Sharing of ADP Resources (Part 201-31).
- (8) Reuse of ADP Equipment (Part 201-33).

All of the aforementioned areas (and more) are examined by GSA when they inspect agencies in their triennial review process (referred to as an Information Resources Procurement and Management Review). Prior to the publication of the Federal Information Resource Management Regulation, procurement offices had to examine a confusing multitude of regulations and guidance pursuant to acquiring EUCE [Ref. 11].

The primary tool available to the General Services Administration in exercising its jurisdictional authority over the procurement of ADPE is the granting of the delegation of procurement authority (DPA). There are two types of delegations of procurement authority granted by GSA; they are (1) blanket delegations, and (2) specific

delegations. As stated in the FIRMR (par. 201-23.104-1), a blanket delegation, so that it can procure ADPE without prior GSA approval, is granted to an agency when the procurement meets the following conditions:

- (1) The requirement is to be made by placing a purchase/delivery order against an applicable GSA requirements-type contract.
- (2) The procurement is to be made by placing a purchase order against a GSA schedule⁵ contract provided that the order is within the maximum order limitation of the contract, the total purchase price (of the order) is not over \$300,000, and the requirements on the use of the GSA schedule contracts (such as competition) are met.
- (3) The procurement is to be made by solicitation procedures other than use of GSA requirements-type or schedule procurement and does not exceed \$2,500,000.⁶

When an agency's planned procurement exceeds the limitations of GSA's blanket delegation of procurement authority, the agency must request a specific delegation from GSA in writing. GSA has the option of granting the request, handling the procurement in-house, or refusing the agency's request. If an agency desires to dispute the decision of GSA concerning a procurement request, the matter is arbitrated by the Office of Management and Budget.

⁵A "GSA Schedule" is a catalog of prices from a particular vendor which has been accepted by the government (i.e., negotiated with GSA) and is established for a specified time period (the period of applicability will be printed on the schedule). GSA schedules are not unlike Sears' catalogs and can be obtained from specific vendors.

⁶The three conditions listed are paraphrased from the FIRMR (para. 201-23.104-1), and other conditions are included for special situations.

The specific delegation granted by GSA is granted to the agency's central ADP selection office. All federal agencies, as required in the Brooks Act, must have central selection and ADP management offices (known as "central selects"). It then becomes the responsibility of the central select of each agency to properly delegate procurement of ADP equipment to lower levels in the organization. The central selection office for the Marine Corps is the C4 division at Headquarters Marine Corps.⁷

B. THE MARINE CORPS BACKGROUND ON EUCE

1. Marine Corps Organization

The Marine Corps is an integral part of the Department of the Navy (DON). The mission of the Marine Corps is to provide Fleet Marine Forces of combined arms, together with supporting air components, for service with the fleet in seizing or defending advanced naval bases and in conducting such land operations essential to the prosecution of a naval campaign. The active Fleet Marine Forces are composed of three divisions, three aircraft wings, three service support groups, and supporting organizations. The Marine Corps also has a reserve combat division, air wing, and service support group. The three

⁷Other central selects are: Automated Data Processing Selection Office for the Navy, Air Force Computer Acquisition Command for the Air Force, and Information Systems Selection and Acquisition Activity for the Army.

major components of the Marine Corps are: the Operating Forces, the Supporting Establishment, and the Reserve.

[Ref. 12]

The Fleet Marine Force (FMF) is composed of operationally ready commands (i.e., transportable to an area of conflict in a short period of time) and is subject to the operational control of the respective fleet commanders (e.g., CINCPACFLT) except for individual/unit training and personnel assignment, control of which is retained by the Commandant of the Marine Corps (CMC). Some examples of FMF units are Marine Corps security forces ashore and afloat, complements aboard naval vessels, special activity forces, and other combat forces. While headquarters elements of a Marine division may exist at a particular Marine Corps base, units will rotate in and out of the field (i.e., be deployed overseas or aboard naval vessels). An FMF unit (or any component thereof) is known as a "tenant activity" when stationed aboard a Marine Corps base or station. As a "tenant activity" it has garrison property (e.g., desks, chairs, office equipment) issued to it by the base, and the equipment shall remain behind when the unit deploys.

The Supporting Establishment (SE) is not mobile and occupies a particular geographic location. Some examples of the Marine Corps supporting establishments are Marine Corps bases, camps, and unit training centers; aviation installations; logistics installations (e.g., Marine Corps

Logistics Base, Albany, Georgia); recruit depots; and reserve support activities. The SE employs large numbers of civilians (i.e., Federal Civil Servants) who work in various administrative and service type jobs. They perform such functions as security guards, clerk/typists, cooks, facilities maintenance, public works, etc. Civil servants greatly enhance the continuity of knowledge and historical perspective within an organization.

2. Marine Corps History of EUCE Acquisition

In the early 1970's when minicomputers first began being introduced in the marketplace, the Marine Corps experimented with several stand-alone processors, these were: SYCOR systems, IBM-3741's, and Entrex computers. These systems were considered especially useful and formed the basis for larger programs. [Ref. 13]

A major contract for the Supporting Establishment (SE), called "Scan Data," was awarded in 1976 for stand-alone minicomputers that had a networking capability and were considered very beneficial. This procurement paved the way for the 1979 Green Machine contract for the Fleet Marine Force (FMF).

The acquisition of EUCE in the Fleet Marine Force (FMF) got its first major thrust with the IBM-4110 (Green Machine). Also referred to as ADPE-FMF, 583 Green Machines were acquired in 1979 for \$18,000 each; and 276 more were acquired in 1984 for a unit price of \$28,000. Ruggedized

(i.e., strengthened to endure rugged treatment) for deployment with the FMF, the Green Machine was transportable in two containers with a combined weight of 220 pounds. It was designed to aid the local commander by providing an information storage and retrieval capability, and to capture input for the large automated information systems within the Marine Corps. Though the Green Machine had only 64K of memory (initially), because of its operating system and input/output capabilities, it was officially termed a minicomputer rather than a microcomputer [Ref. 14]. Its computing power, however, is essentially that of a microcomputer. The Supporting Establishment (i.e., bases and stations) began acquiring non-ruggedized versions a year later, referred to as "White Machines," as a contract modification to the Green Machine contract. Less than five hundred of these were acquired.

After the Green Machine/White Machine acquisitions, microcomputers began gaining in power and popularity, and several other contracts were awarded. A non-mandatory Zenith-120 contract was awarded in 1983 which added about 500 microcomputers to the Marine Corps inventory. The Zenith-120 suffered the disadvantage of not being fully IBM-compatible--a big disadvantage, since most business software is written to operate under PC-DOS (also known as "MS-DOS"). A mandatory requirements contract for the Zenith-150, which

was IBM compatible, was awarded in 1985 and added 700-800 computers to the inventory.

The most recent acquisition by the Marine Corps (for the FMF) has been the AN/UYK-83 microcomputer. The AN/UYK-83, called the "yuck 83," is referred to as Fleet Marine Force-End User Computing Equipment (FMF-EUCE). Originally called "the son of Green Machine," the AN/UYK-83 was procured to replace the 852 Green Machines in the Marine Corps inventory and provide an enhanced capability to perform office automation. The inside of the computer and its performance characteristics are very similar to the Zenith-248 [Ref. 15].

The contract was awarded to International Telephone and Telegraph Corporation as an indefinite quantity, indefinite delivery type-contract (IDTC) with a ceiling of 13,000 units. It was designed as a supportable, ruggedized, tempest certified⁸ computer for the Fleet Marine Force. Each unit carries a price tag of \$12,567. The AN/UYK-83, like the Green Machine (IBM-4110), is also very bulky. It's transported in two boxes weighing 100 lbs. and 106 lbs., respectively. [Ref. 16]

According to Capt. Glenn Bassett [Ref. 16], while the total requirement for the Marine Corps has been

⁸Tempest certification refers to the reduction of electronic emissions in order that activity on a computer keyboard, printer, or within the computer cannot be intercepted and interpreted by hostile forces.

identified as 5068, currently only 1447 have been procured. Fielding of the UYK-83 began in November 1988, and all 852 Green Machines have since been replaced--that is, replaced on the unit's Type-I Table-of-Equipment (to be explained later). The major administrative systems of the Marine Corps (e.g., personnel, payroll, supply) are being rewritten to run on the AN/UYK-83. However, until they are completely rewritten and tested, the Green Machine must be kept on hand. All of the Green Machines are slated to be removed from the inventory by November 1989; however, removing ADP equipment is not as easy as removing other equipment⁹ and this remains a sticky issue. [Ref. 16]

The most successful overall contract for EUCE has been the joint Air Force-Navy contract for the Zenith-248 (Z-248). The Z-248 is fast, powerful, and completely IBM-compatible. While the contract was also an IDTC contract, the computer became extremely popular and about 15,000 to 18,000 were added to the Marine Corps inventory (for both the FMF and SE) [Ref. 17]. The contract was awarded by the Air Force, and the Navy and Marine Corps became mandatory participants. The contract has recently expired (28 February 1989) and a follow-on contract (also managed by the

⁹An agency desiring to excess (i.e., remove) ADPE must submit an SF 120 to GSA at least 60 days before the anticipated release date. According to the FIRMR, if excess ADPE is allowed to deteriorate during warehousing, but is desired by another agency--the cost of returning it to serviceable condition is paid by the current owner.

Air Force) referred to as Desktop III is expected to begin fielding computers in late 1989. [Ref. 18]

It should be noted that other brands of EUCE and office products (e.g., COMPAQ, IBM, and KAYPRO) have been available on GSA schedules and in the marketplace. These make up a considerable portion of the total inventory of EUCE. Additionally, many local area networks have recently been procured, which allow the end-user access through a server (dedicated microcomputer) and telecommunications port to other microcomputers, peripheral devices, and large regionally-managed computer centers. Both the FMF and the SE are provided automated data processing (ADP) support on a regionalized basis.

3. Regional Automated Data Processing Support Concept

The concept of operation for Information Resources Management (IRM) within the Marine Corps is stated in the Mid-Range Information Systems Plan (the guiding IRM policy document) as follows:

The concept of operation for providing data processing support is structured around centralized policy formulation, technical direction, and acquisition under the Director, C4 Division. This concept also includes centralized development and maintenance of standard IS's, and decentralized processing of IS's by regional service centers while in garrison or by various deployable information resources such as the Automatic Data Processing Equipment-Fleet Marine Force (ADPE-FMF) minicomputers, the Fleet Marine Force-End User Computing Equipment (FMF-EUCE), or the Deployable Force Automated Service Centers (DFASC's) while in a deployed or combat environment. [Ref. 19:p. 3-6]

The regional service centers consist of three Central Design and Programming activities (MCCDPA's) and six Regional Automated Service Centers (RASC's). The three MCCDPA's are located at Quantico, Virginia; Albany, Georgia; and Kansas City, Missouri. The six RASC's are located at Camp Lejeune, North Carolina; Cherry Point, North Carolina; Camp Pendleton, California; El Toro, California; Camp Smith, Hawaii; and Camp Butler, Okinawa, Japan.

The MCCDPA's are distinguished from the RASC's, in that they have larger missions, and a commensurately larger size in order to accomplish these missions. In addition to providing regional data processing support for Class 1A systems (defined below), the responsibility for the programming and maintenance of the Class 1A software is handled by the cognizant MCCDPA [Ref. 19]. Class 1A systems are standardized Marine Corps-wide information systems which, for example, provide basic administration of personnel (e.g., payroll, personnel assignment, personnel records); supplies (e.g., inventory reporting, parts replenishment, mobilization requirements); and finances (e.g., budget submissions, expenditures, reconciliations).

All of the MCCDPA's and RASC's are equipped with large IBM mainframes and connected into a teleprocessing network referred to as the Marine Corps Data Network (MCDN). Data gathered from the field is processed through the RASC's and MCCDPA's. The data submitted from the field update

large, centrally-controlled files and the results (including listings of input errors) are transmitted back to the originating activity. In addition to the regional service centers, remote job entry (RJE) facilities provide access to the regional service centers at selected locations. RJE's are equipped with medium-scale computers, high speed printers, and a communications processor (for interfacing with MCDN).

Finally, for units deployed in the field, processing is handled via ADPE-FMF (Green Machine), FMF-EUCE (AN/UYK-83), or the Deployable Force Automated Service Center (DFASC). The DFASC has a large IBM computer (IBM-4341) and peripherals, mounted in two semi-trailer vans which can be shipped by sea or air. The DFASC was fielded as a test concept and whether or not it will remain in the inventory (considering the current capabilities of EUCE) remains a big question [Ref. 20].

On the personnel side, the Information Systems Management Officer (ISMO) is the primary staff officer for information resource management within both the FMF and the SE. The ISMO's functions involve: (1) advising the commander and the staff on computer related matters and (2) acting as the command focal point for all matters pertaining to the planning, installation, maintenance, training, and upgrade of EUCE resources. For matters transcending EUCE

(i.e., mainframes and teleprocessing via MCDN) the regional service centers assume full responsibility.

Figure 1 shows the support chain implemented by the regional support concept. Support and problem resolution should begin at the lowest possible level.

Level 4	Headquarters, USMC C4 Systems Division	
Level 3	RASC/CDPA	FMF ISMO MEF ISMO
Level 2	RJE	ISMO
Level 1	SE USER	FMF USER

Figure 1. Regional Support Concept

In closing the discussion on Regional Support, it should also be noted that, in the last several years, many activities have formed Information Resource Centers (IRC's) to advise and assist end-users with EUCE. These IRC's perform the functions of a large ISMO shop, that is, they approve microcomputer procurements, advise and train end-users, and handle low-level maintenance.

C. MARINE CORPS EUCE PROCUREMENT POLICY FORMULATION

1. Information Resources Management (IRM) Policy Formulation

Marine Corps policy is managed by the senior IRM official within the Marine Corps--Headquarters Marine Corps, C4 Division. This position is filled by a Marine brigadier general. As previously mentioned, the current IRM policy is one of centralized policy formulation and decentralized (i.e., regionalized) data processing support.

Central guidance and management at the Headquarters Marine Corps level is formulated by permanent committees, permanent and ad-hoc working groups, and a permanent staff. The permanent committees are the Assistant Commandant of the Marine Corps (ACMC) Committee and the Information Systems Steering Committee (ISSC). The ACMC Committee is the highest level planning, programming and budgeting forum within the Marine Corps. It determines the Marine Corps programs, including alternatives, to be submitted to CMC for approval. The ACMC Committee addresses issues presented by the Chairman of the ISSC. The ISSC is the designated arm of the ACMC Committee which oversees IRM-related issues. When warranted, the ISSC provides specific recommendations and/or alternative courses of action concerning IRM issues to the ACMC Committee. The ISSC consists of general officer representatives of each member of the ACMC Committee and representatives from FMFPac, FMFLant, and the 4th Marine

Division/Wing Team. The committee is chaired by the Director, C4 Division. [Ref. 19:p. 3-3]

A permanent working group is the Information Systems Working Group (ISWG). The ISWG performs necessary staff actions as required by the ISSC. The ISWG membership reflects the composition of the ISSC. Ad-Hoc groups are formed to address specific concerns. An example is the IRM Transition Working Group. This working group was tasked to recommend the management of information resources within the FMF. The intent was to have the Marine Corps Combat Development Center (MCCDC) and the Marine Corps Research, Development, and Acquisition Command (MCRDAC) appropriately involved with information resources used by the FMF. Both commands are located at Marine Corps Base, Quantico, Virginia. [Ref. 19]

The permanent staff is the C4 Division at Headquarters Marine Corps. Sub-elements within the division address the various management and technical areas of IRM: procurement, software development and standardization, retention and training of technical personnel, and telecommunications. The C4 Division is responsible for drafting and issuing policy guidance to the field. The guidance promulgated by HQMC usually takes the form of a Marine Corps Order (or CMC message) and is disseminated throughout the Marine Corps.

2. The Mid-Range Information Systems Plan (MRISP)

The MRISP is the guiding document within the Marine Corps for the acquisition of information resources (both large and small). With contractual assistance by the GSA Planning Support Center, HQMC developed its first MRISP, which covered Fiscal Years 1986-1992, in November 1985. Coincidentally, GSA considers the Marine Corps' MRISP process a model for Federal strategic planning. [Ref. 21] In their procurement review of the Marine Corps in 1987, GSA made the following statement about the MRISP in its final report:

The planning process has the elements necessary for success, including senior level management support in the form of the Information Systems Steering Committee (ISSC), working level management involvement, Information Systems Working Group (ISWG), and submissions by users, which allows for both top-down and bottom-up involvement. [Ref. 21:p. 6]

The MRISP planning process covers the current year, the budget year and the five year Program Objective Memorandum¹⁰ (POM), for a total of seven years. Regarding the POM process, the ISSC prioritizes each IRM initiative for funding. The POM is the final determinant of the amount of funds applied to each IRM initiative. It is the policy of the ISSC that requests for funding of IRM initiatives that have not been previously identified in the MRISP will

¹⁰The Program Objective Memorandum provides the basic input into the Five-year Defense Plan (FYDP) from which the Department of Defense budget is formulated.

be approved on an exception basis. The MRISP provides the ISSC with a meaningful tool from which to make educated and logical funding decisions. [Ref. 21]

The most recent MRISP (FY89-FY95) gave a breakdown on all of the major ADPE upgrade programs taking place in the Marine Corps, including such programs as Central Processing Unit (CPU) Augmentation, Uninterruptible Power Supply (UPS), and Systems Software Upgrade. The funding profile for the FMF-EUCE (AN/UYK-83) is shown in Figure 2.¹¹

<u>Appropriation</u>	<u>PMC</u>	<u>O&M</u>
FY 99	\$14,854,000	\$2,300,000
FY 90	\$ 7,067,000	\$2,000,000
FY 91	\$13,889,000	\$4,400,000
FY 92	- 0 -	\$1,400,000
FY 93	- 0 -	\$1,400,000
FY 94	- 0 -	\$1,400,000
FY 95	- 0 -	- 0 -
TOTAL	\$35,810,000	\$12,900,000

Figure 2. Funding Profile for the AN/UYK-83

The MRISP also noted that, in order to fully implement the program, funds will have to be reprogrammed. In light of the current emphasis on reduced spending, it is doubtful that the AN/UYK-83 program will proceed to

¹¹Appropriations are monies provided by Congress within specified limits. "PMC" stands for Procurement Marine Corps; it is obtained from HQMC, and will be used for ADP procurements over \$15,000. "O&M" stands for Operation and Maintenance and is managed by the local commander.

completion without having to make reductions. Having an indefinite quantity, indefinite delivery contract (IDTC), the adjustments are easy to make, since the quantities to be procured have not been firmly established. The current EUCE concept envisions the Zenith-248 and FMF-EUCE (AN/UYK-83) as the primary microcomputers in the Marine Corps [Ref. 19:p. 5-10].

The current MRISP (FY89-FY95) also contains a prioritized list of 26 areas of needed improvement within the Marine Corps. These include the following:

- (1) Ability of current EUCE to meet the requirements of the user.
- (2) EUCE hardware/software standards.
- (3) Policies on ADP equipment acquisition, implementation, and maintenance. [Ref. 19:p. 7-8]

We shall next examine the details of how the procurement and management of EUCE is implemented, and some of the organizational differences.

III. CURRENT ENVIRONMENT AND PROCEDURES FOR THE PROCUREMENT AND MANAGEMENT OF EUCE

A. ORGANIZATIONAL DIFFERENCES IN EUCE PROCUREMENT AND MANAGEMENT

To better understand the procurement and management of EUCE in the Marine Corps, one should appreciate the differences between (1) the Fleet Marine Force versus the Supporting Establishment, and (2) the Ground Combat Elements versus the Aviation Combat Elements.

1. The Fleet Marine Force (FMF) versus the Supporting Establishment (SE)

Since the Supporting Establishments (i.e., bases, stations, and depots) don't deploy, they can employ a large number of civilians (very stable workforce) and acquire relatively stable numbers of military personnel. This enhanced stability (relative to the FMF), caused by the large civilian component and military personnel who are generally on three-year tours of duty, makes the planning, acquisition, and installation of EUCE much easier.

To begin with, because of the long lead times associated with the procurement of EUCE, seldom will the same individual (in an FMF unit) who initiated a procurement action be the one to receive the equipment when it finally arrives [Ref. 22]. Also, while a shore-based activity does not generally have to worry about the physical dimensions of

the equipment it acquires or concern itself much with how maintenance will be provided if the equipment breaks, an FMF unit does. In sharp contrast, an FMF unit must not only worry about the space the equipment will occupy (being limited aboard ship) but how the equipment will be packaged and transported. For the shore activity, the equipment will be under warranty for the first year of use, and there are many local contractors available to repair the equipment in subsequent years. Having a computer under warranty is little consolation to the FMF commander, who may be in the middle of the Mediterranean Sea when the computer malfunctions--a not uncommon occurrence when using shipboard power.

2. Ground Combat Elements versus Aviation Combat Elements

The major difference between ground combat elements and aviation elements (in EUCE procurement and management) comes in the form of funding. While ground combat elements must rely solely on funding for EUCE from Headquarters Marine Corps, aviation elements have the added advantage of receiving funds directly from the Navy (i.e., "blue dollars"). All aviation units have a Table-of-Basic-Allowance (TBA) which is funded by the Navy and managed by the Naval Supply Systems Command. EUCE for each aircraft squadron is part of these TBA's. [Ref. 23]

Another difference concerns how contracting actions are carried out in the aviation community versus the ground community. Marine Corps Air Stations (MCAS) have a limited procurement authority as compared to Marine Corps Bases. For most air stations, once a procurement exceeds the small purchase threshold of \$25,000, it is forwarded to a Naval buying activity (such as a Navy Regional Contracting Center) [Ref. 23]. Though the differences mentioned balance out across the Marine Corps, they serve to make each EUCE procurement and management situation unique.

B. CURRENT PROCUREMENT OF EUCE

Prior to 1984, HQMC conducted ADP procurements under a centralized philosophy.¹² This approach worked well until the explosion of ADP procurement requirements (i.e., terminals, micros, etc.) and the expansion of end-user involvement. In order to improve service to the user community and effectively utilize existing personnel resources, a decentralized and regionalized ADP procurement approach has been taking place. This concept involves delegating ADP approval and procurement functions to field activities and optimizing ADP administration and regulation compliance procedures. Field activities may now approve and

¹²Since February 1984, selected Marine Corps commands participating in the Information Resources Management (IRM) Delegation Program have been authorized to procure ADP resources to meet local requirements [Ref. 24].

procure their own ADP requirements within the scope of an established ADP Delegation Program.

Along with this new procurement authority comes additional responsibilities. Field activities must now accept responsibility for many of the functions previously performed at the Headquarters level. These functions include requirements validation, procurement authority, and contract administration.

In addition to decentralization of procurement functions, decentralization of technical support functions must also occur. ADP support and problem resolution should take place at the lowest possible level in the support chain. This concept requires greater involvement by the CDPAs, RASCs, and ISMOs, specifically in the areas of requirement preparation, analysis, and documentation, to include all aspects of end-user ADP support. Involvement will place greater responsibility on local and regional ADP management to ensure compliance with all applicable statutes, policies, and regulations. [Ref. 25]

A central concept in the delegation of procurement authority to the field by HQMC (Code C4), has been the separation of approval authority from contracting authority [Ref. 24]. When end-users desire to procure EUCE they submit their requests along with an abbreviated system decision paper (i.e., economic analysis of alternatives) to their respective ADP approval authorities (see Appendix B).

The ADP approval authority screens the request for feasibility, reasonableness, and conformance to Marine Corps policies on standardization, and forwards the request to the Comptroller for approval of the necessary funds. The request is then forwarded to the appropriate contracting authority (normally the Purchasing and Contracting office). The approvals are sometimes made by a local ADP Steering Committee;¹³ but, in many cases, the ADP approval authority is an ADP officer serving in a staff advisory function (i.e., an ISMO) or within a data processing facility. He provides the end-user guidance on performing the economic analysis and a list of approved hardware and software, and attempts to tailor the system to meet the end-user's particular needs. If the end-user has requirements which cannot be satisfied with the standard software packages, the ADP approval authority will normally grant a waiver for the particular acquisition. The current EUCE software standards for the Marine Corps are as follows:

- (1) wordprocessing = Multimate, Wordstar.
- (2) spreadsheet = Supercalc4.
- (3) data base = Dbase-3+, Condor.

¹³A board of officers which meet to screen requests for EUCE. The board will normally be chaired by the Chief-of-Staff, and have representatives from the major staff sections (including a data processing representative).

- (4) integrated program = Enable¹⁴.
- (5) business graphics = Graftalk.
- (7) composition graphics = CADKEY.
- (8) compilers = Microsoft series compilers. [Ref. 26]

The purchasing and contracting office should, in accordance with the applicable regulations, screen the purchase request and either reject the purchase request for regulatory non-compliance, send a purchase order to the vendor, or place a synopsis of the requirement (for open market purchases over \$25,000 and GSA schedules over \$50,000) in the Commerce Business Daily (CBD) to notify vendors of the need to submit their bids or proposals.

Figure 3 shows the sequence of events in a typical EUCE buy.

The regulations which P&C are primarily concerned with (for buys below \$50,000) are the Federal Information Resource Management Regulation (FIRMR), Federal Acquisition Regulations (FAR), and the Defense Federal Acquisition Regulation Supplement (DFARS). One of the primary things which Contracting Officers look for is whether or not the proposed procurement meets requirements for competition [Ref. 27].

The small purchase buyer must avoid the pitfall of allowing the requestor to tailor the specifications towards a sole source procurement. One particular area of

¹⁴The software for the FMF-EUCE (AN/UYK-83) included the Enable program. Enable is an integrated package which contains a spreadsheet, word processor, and data base.

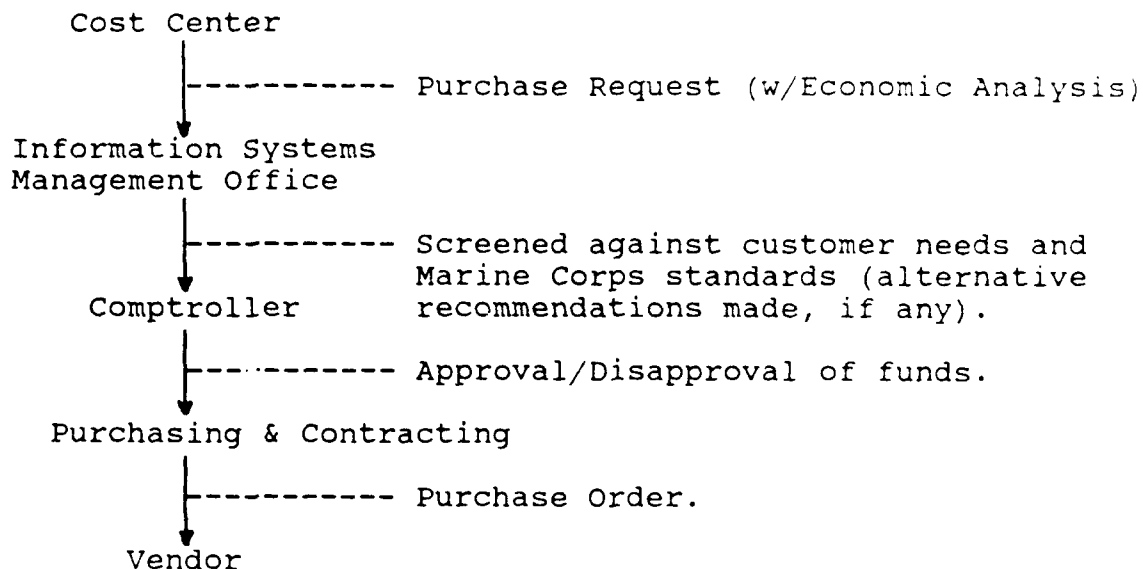


Figure 3. Typical Sequence of Events for EUCE Procurement

concern is in dealing with the statement "compatible with existing software." Even though software might already be available at the command, this is not in itself a sole source justification simply because it will avoid this particular cost. [Ref. 28:p. 180]

Since buyers are seldom as conversant as ADP personnel in the terminology of computer specifications, they rely heavily on the advice given by ADP personnel. As stated in the Federal Information Resource Management Regulation, prior to procuring computers, buying offices should screen the ADP equipment available through GSA's Excess and Reutilization program. Once this is done, alternatives should be evaluated in terms of lowest life cycle cost. To determine life cycle costs, costs such as maintenance are

calculated over the life of the equipment and discounted back to the present [Ref. 29].

Many procurement sources are available for EUCE. Until recently, the Marine Corps has been participating in the highly successful Zenith-248 contract awarded by the Air Force (covered in Chapter II). Other sources include GSA Schedule contracts and purchases on the open market. One of the more popular GSA Schedule contracts is the one offered by Government Technology Services, Incorporated (GTSI). This company has been in business for five years, specializes in offering EUCE to government buyers, and lists over 40 different vendors on their schedule. GTSI salesmen are assigned to specific federal agencies, become very knowledgeable about the agency's regulatory requirements, and offer advice to buyers on how to deal with the agency's regulations. Since GTSI carries competing products, requirements for competition can conceivably be fulfilled within a single company's schedule. The company's approach has been so successful that IBM Corporation has agreed to let GTSI market their EUCE to the Federal Government. [Ref. 30].

While the vast majority of ISMOs contacted in the survey were either waiting for the Air Force's follow-on contract for the Zenith-248 (i.e., DESKTOP III) or were buying from the GSA Schedule, one individual (Lt. E. Shaffer, ISMO, Marine Corps Recruit Depot, Parris Island, SC) insisted that

open market prices were lower than the best GSA could offer (referring to GTSI). For a recent purchase request (dated 29 April 1989), Lt. Shaffer performed the comparative cost analysis shown in Figure 4. He felt that scanning advertisements in periodicals such as PC Magazine and PC World is the best approach to take in obtaining the most economical purchase. He further stated that he did not order from mail order firms, but reputable companies (such as General Electric) and was able to obtain excellent maintenance coverage. [Ref. 31]

Currently, most EUCE is procured with Operation and Maintenance (O&M) funds.¹⁵ When the Delegation of Procurement Authority Program was first begun, all computer procurements which exceeded a \$2500 threshold had to be bought with PMC funds (which are controlled and dispensed by Headquarters Marine Corps). This dollar threshold has been raised in increments over the years and now stands at the O&M threshold of \$15,000 [Ref. 32]. While large buys (such as the AN/UYK-83) are still centrally managed by Headquarters, the high procurement threshold has further removed Headquarters from the procurement process and the ability to ensure standardization. Compounding this removal of involvement by Headquarters is the fact that there is

¹⁵O&M funds are specific monies set aside by Congressional appropriation to finance on-going operations and investment items (i.e., EUCE) below \$15,000.

ITEM TYPE	VENDOR	GSA YES/NO	PRICE
286 PC/12MH/EGA/40MB	NEC	YES	\$2,858.00
286 PC/12MH/EGA/40MB	IBM	YES	\$3,233.00
286 PC/12MH/EGA/40MB	COMPAQ	YES	\$2,904.00
286 PC/12MH/EGA/40MB	AST	YES	\$4,000.00
286 PC/12MH/EGA/40MB	NORTHGATE	NO	\$2,300.00
286 PC/12MH/EGA/40MB	PACKARD BELL	YES	\$2,611.00
286 PC/12MH/EGA/40MB	AUSTIN (GE)	NO	\$2,243.00
HP PAINT JET	GTSI	YES	\$1,014.00
HP PAINT JET	ICN	NO	\$ 998.00
HP PAINT JET	COMPUTER BS MRT	NO	\$ 795.00
HP PAINT JET	DL CONSULTING	NO	\$1,089.00
HP DESK JET	GTSI	YES	\$ 723.00
HP DESK JET	DL CONSULTING	NO	\$ 700.00
HP DESK JET	ICN	NO	\$ 599.00
HP LASER JET II	GTSI	YES	\$2,095.00
HP LASER JET II	DL CONSULTING	NO	\$2,163.00
HP LASER JET II	ARLINGTON C P	NO	\$1,998.00
386 PC/20MH/VGA/380MB	NEC	YES	\$6,974.00
386 PC/20MH/VGA/380MB	IBM	YES	\$9,352.00
386 PC/20MH/VGA/380MB	COMPAQ	YES	\$10,000.00
386 PC/20MH/VGA/380MB	AST	YES	\$10,000.00
386 PC/20MH/VGA/380MB	NORTHGATE	NO	\$6,023.00
386 PC/20MH/VGA/380MB	PACKARD BELL	YES	NOT AVAIL.
386 PC/20MH/VGA/380MB	AUSTIN (GE)	NO	\$7,034.00

Figure 4. Cost Comparison for Purchase of EUCE

very little oversight (i.e., inspection) of the procurement and management of computers in the field. Headquarters Marine Corps (Code CCIR) is itself inspected by several governmental units: General Services Administration (GSA), General Accounting Office (GAO), Department of Defense Inspector General, and the Navy Audit Team. [Ref. 13]

The GSA conducted an Information Resources Procurement and Management Review of the Marine Corps between April and June of 1987 [Ref. 21]. The Marine Corps received excellent comments in the inspection report.

The GSA review team found the Marine Corps IRM Headquarters and field organizations to be as responsive and professionally managed as any agency reviewed. Several of the IRM planning and control mechanisms established to manage ADP could serve as models for other agencies, both inside and outside of DOD. [Ref. 21:p. i]

The majority of the report and the findings were centered around the Marine Corps IRM planning structure (i.e., the MRISP), which GSA helped to develop in 1985, and were positive in nature. Several findings of the procurement review relating to EUCE were as follows: (1) the Marine Corps would benefit from further improvement of its ADPE Inventory system; (2) the Marine Corps could benefit from coordinated and centralized planning for implementation of Local Area Networks (LANS); and (3) the Marine Corps procedures for acquisition planning are insufficient. GSA's report also drew attention to the fact that the Marine Corps had documented its own "areas needing improvement" in the Mid-Range Information Systems Plan (MRISP). The ultimate goal of the MRISP is to coordinate the acquisition and introduction of information technology, so that the maximum efficiencies can be obtained at the lowest life cycle cost. The next section describes the steps which occur after EUCE has been procured and is

finally being delivered to the end-user. This area, while logistically very important, has generally received less attention than the actual procurement of the EUCE.

C. INSTALLATION AND MAINTENANCE OF EUCE

When a purchase order has been received by the vendor, the order is processed and the equipment is shipped to the government address (on the purchase order). Figure 5 demonstrates the basic sequence of events in getting equipment from the vendor to the end-user.

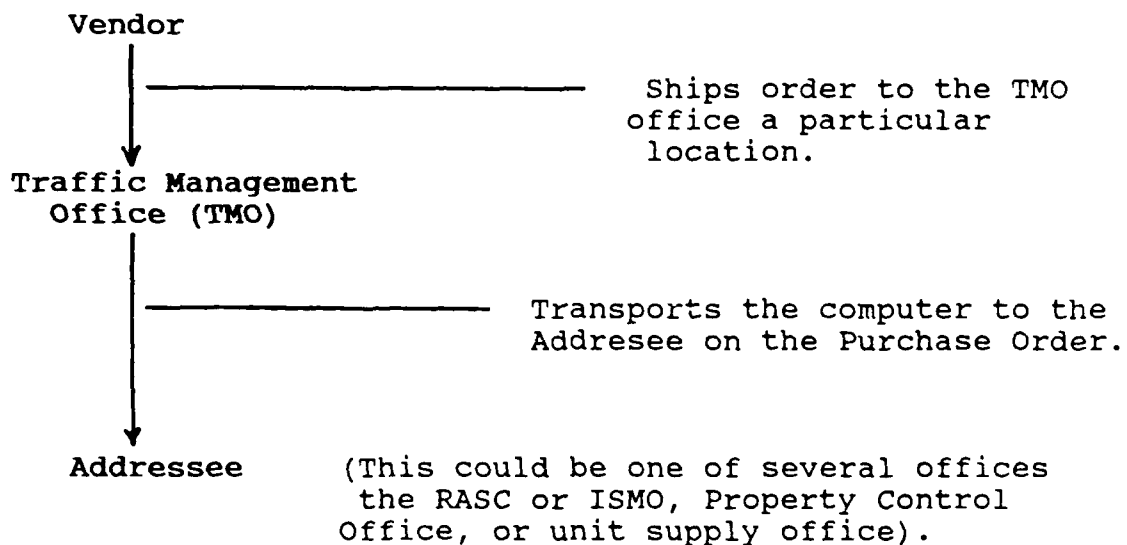


Figure 5. Basic Steps in Obtaining EUCE from a Vendor

At least two of the addressees indicated above should be involved in the installation of EUCE. The Base Property Control office (or the unit's supply office) should be notified to ensure the equipment gets properly tagged and

placed on the unit's records. The Information Systems Management Office (or other ADP representative) should be notified in order that it might inventory the hardware, make backup copies of the software, and install the security screens (per the Computer Security Act of 1987). It is also generally the ISMO's (or supply office's) responsibility to track the warranty on the equipment and to ensure that maintenance is provided for at the end of its warranty period.

Most EUCE is under warranty for the first year. After the warranty expires, maintenance for the equipment can be handled in a variety of ways. The equipment can be placed on a contract with a local business (which may or may not be required to come aboard the base to fix the equipment when it breaks). It may be placed on a maintenance contract with the original vendor (such as IBM) if representatives are in the area, or it may be repaired by Marine Corps personnel, and sent to a computer repair shop (or original vendor) only when absolutely necessary.

ADP personnel at Information Resource Centers (IRCs) and ISMO offices are usually trained in performing low-level maintenance. They will ensure the equipment was properly hooked up, reseal the circuit boards, and perform other rudimentary checks before contacting an official repair facility. [Ref. 33]

Within each Maintenance Battalion of a Force Service Support Group, there exists an Electronic Maintenance Company (ELMACO) tasked with repairing communications and electronic equipment to the component level. While not currently tasked with repairing computers, the Electronics Maintenance Company of the First Force Service Support Group (1st FSSG) in Camp Pendleton, California, trained its personnel in how to repair EUCE and they have been doing so for several years. ELMACO's maintenance history files indicate that the average cost per repair of computer components from commercial sources is \$550, while the average cost of repairing computer equipment by USMC maintenance personnel is \$15.00 (for components). Their records also indicate that the mean-time-to-repair (i.e., average turnaround) from commercial sources is 30 to 60 days, while the mean-time-to-repair for USMC personnel is five to ten days. [Ref. 15]

The ELMACO supports the Fleet Marine Force (FMF) only, and does not repair the computers of the Supporting Establishment. The equipment ELMACO is tasked with repairing is derived from mission essential (i.e., Type-I T/E) requirements. Since the ADPE-FMF (Green Machine) and more recently the EUCE-FMF (AN/UYK-83) are the only Type-I T/E EUCE in the inventory, ELMACO's computer maintenance efforts are targeted at them. [Ref. 34]

Since the inside of an AN/UYK-83 is very similar to the Zenith-248, a unit deploying with both computers can generally get either repaired by ELMACO. When deployed, the ELMACO relies primarily on its maintenance float¹⁶ to supply replacements for failed EUCE parts. Non-standard EUCE (such as Apple, COMPAQ, or Kaypro microcomputers) will seldom show high enough parts usage to justify inclusion in the maintenance float and, if problems occur, will remain down until the parts are received from commercial sources. Units deployed in combat areas for extended periods become extremely vulnerable to problems (such as equipment standardization) which impact logistics support.¹⁷

The successes achieved by the ELMACO of 1st FSSG (in repairing EUCE) has helped establish Computer Repair as a secondary military occupational specialty (MOS) at the Communication and Electronics (C&E) School at the Marine Corps Air Ground Combat Center, Twentynine Palms, California. The course outline is currently being staffed, and the first class for Microcomputer Repair (MOS 2822) is expected to begin in late 1989.

¹⁶A maintenance float is a stock of high usage repair items (such as transistors, integrated circuits, and circuit boards) which allows the unit to reduce its time in waiting for parts.

¹⁷Logistics support consists of the elements necessary for the accomplishment of material flow and distribution functions, as well as sustaining life-cycle maintenance support of the system throughout its period of use.

Repair of the AN/UYK-83 by Marines trained at C&E Schools, however, is a complicated issue, because C3 Corporation won the maintenance training contract for the AN/UYK-83 for nine years beginning with the first deliveries in 1988. The warranty on the AN/UYK-83 will be voided if unauthorized personnel (i.e., personnel not trained by C3 Corp.) attempt to repair the equipment. The current plan calls for a certain number of Marines to receive training by C3 Corporation (in order to work on the AN/UYK-83 during its warranty period), and for qualified Marines to care for the equipment during the remainder of the its life cycle. [Ref. 35]

D. MARINE CORPS EUCE PROPERTY CONTROL

As was previously mentioned, the Base Property Control Office or the unit's supply office should properly account for all EUCE. Property control (i.e., knowing what exists in a unit's inventory) is a key element of information in logistics and fiscal planning.

Each unit within the Marine Corps has a Table of Equipment (T/E) and a Table of Organization (T/O). These tables are line-item lists of specific equipment and personnel that the unit should have. There are two types of T/E allowances: Type-I and Type-II. The Type-I T/E allowance is a firm requirement, contrasted with the Type-II T/E allowance which is much more flexible. The status of

Type-I equipment is closely scrutinized and reported up the chain-of-command in the unit's readiness statistics. Type-I allowances are considered "mission essential." CMC controls the allowances of Type-I equipment (based on mission requirements), and the constant reporting of readiness information insures that commanders are especially vigilant in their oversight. Furthermore, a unit cannot have any more of a Type-I item than their allowance indicates--and they can't have any less. Type-I allowances must either be on-hand or on order. The IBM-4110 (Green Machine) and the AN/UYSK-83 are both Type-I T/E allowances. [Ref. 36]

Type-II allowances are more flexible. Local commanders can set their on-hand inventory levels above or below those indicated by the Type-II T/E allowance. The primary purpose of a Type-II T/E allowance is to provide a predetermined allowance which the supply system can respond to during a major mobilization (i.e., supply for the first 60 days of war). T/E allowances (both Type-I and Type-II) will be similar for like units, but not necessarily mirror images.

Garrison property is property controlled and distributed by the Property Control Office of each Supporting Establishment (SE) activity to both SE and Fleet Marine Force (FMF) units. The difference between garrison property and a Type-I or-II T/E allowance is that the Unit Commander in the FMF doesn't have to maintain garrison property. In other words, if the Commander has a choice between acquiring

a computer as a Type-II T/E allowance or as garrison property, he must weigh the pros and cons of controlling the equipment versus being tasked with its accountability and maintenance. If an FMF Commander wishes to transfer EUCE to his garrison property account, once he obtains the concurrence of the supporting base (i.e., maintenance funds are available) an Adjustment Voucher is completed and turned into the respective base property control office. [Ref. 37]

When an FMF Commander moves his equipment to the garrison property account, not only is the maintenance of the item taken care of by the Supporting Establishment but the responsibility for the item (i.e., personal accountability) is managed by the SE also. Each base has a property control office which keeps CMRs (consolidated memorandum receipts) with the signatures of all responsible officers. The office is tasked with ensuring that a chain of custody is maintained for the equipment in its inventory.

Marine Corps Order 7100.10 addresses EUCE property management [Ref. 38]. The order was originated at the request of Marine Corps field activities who desired some standardized guidance from Headquarters in accounting for EUCE and in assigning Table of Authorized Material (TAM) control numbers to the equipment. TAM numbers are needed to record the equipment as a Table of Equipment (T/E) line item. It was found, during inspections by the DOD I.G. and others, that much of the EUCE was unmarked; and FMF

commanders have discovered (on occasion) that the space requirements for deployment were much higher than projected, since much of the EUCE (which units desired to take along) had not been reported in their inventory. [Ref. 39]

In addition to providing guidance in the accounting and classification of EUCE, Marine Corps Order 7100.10 directed that inventories be taken, equipment be transferred between the Supporting Establishment and the Fleet Marine Force, and that reports (NAVCOMPT 167) be submitted to Headquarters. Since the date of the order, only one unit in the Marine Corps has complied (with the reporting requirement), though many units struggle with conducting accurate inventories. [Ref. 39]

According to Ms. Rosemary Cummings (personally involved in implementing Marine Corps Order 7100.10), restrictions on the deployment of garrison property have been recently relaxed. Previously, FMF units were forbidden to take garrison property with them when they deployed (though this sometimes occurred); but now the property control office has the authority to grant a waiver allowing the deployment of garrison property for a period not to exceed five months. This was designed to satisfy requirements during exercises and shorter deployments (as opposed to unit rotations which are normally six months in duration), while maintaining the integrity of the system and avoiding the use of garrison property to remedy equipment shortages in the FMF.

During the background data gathering and initial discussions (for this study), certain problematic issues surfaced and will be covered next.

E. POTENTIAL PROBLEMS WITH THE PROCUREMENT AND MANAGEMENT OF EUCE WITHIN THE MARINE CORPS

Some of the areas which, in the course of the preliminary research, surfaced as problem areas were these:

- (1) The lack of understanding by the ADP approval authorities and contracting authorities of the regulatory requirements for both project approval and procurement relating to EUCE.
- (2) Problems with achieving standardization in areas of EUCE hardware and software.
- (3) Poor understanding of how the GSA Schedule should be used and inadequate knowledge of sources available for obtaining a "fair and reasonable price."
- (4) Inadequate understanding and application of life cycle costing techniques in determining the lowest total overall cost.
- (5) Lack of implementation of standard guidelines for the installation, maintenance, and property control of EUCE.

1. Lack of Understanding by ADP Authorities

The problem concerning the lack of understanding of the regulatory requirements for project approval and procurement reflects the voluminous guidance which has been promulgated for the procurement of information resources (see Appendix A). This mass of regulatory oversight is partly an outgrowth of multiple agency involvement (i.e., OMB, GSA, NIST (formerly the National Bureau of Standards),

and DOD) and the political struggles which sometime take place.

Since GSA has been given cognizance of ADP procurement for the Federal Government, it has experienced struggles with other agencies and offices (such as OMB, and the Defense Acquisition Regulation (DAR) Council),¹⁸ and it was not until recently that the FIRMR was recognized as the controlling document [Ref. 40]. The Federal Acquisition Regulations contains only one small paragraph in Part 39 (Acquisition of Information Resources) and the Defense Federal Acquisition Regulation Supplement Part 70, incorrectly paraphrases guidance given in the FIRMR, and is currently being rewritten by the DAR Council. [Ref. 41]

Added to the problem of the voluminous guidance is the scarcity of feedback to the field (i.e., ADP regulatory compliance inspections) to either confirm or deny that field offices are, in fact, doing things correctly.

In the course of the research, attempts were made to address the issue of compliance (and inspection) by contacting the originators of some of the regulations, in order to discover how compliance (with their directives) was monitored and enforced.

¹⁸The DAR Council oversees the Federal Acquisition Regulations (FAR) and the Defense Federal Acquisition Regulation Supplement (DFARS).

The General Services Administration (GSA) emphasized that while it exercised oversight it was not a "policeman" for ADP procurements by agencies. Its policy was to provide agency incentives (such as the "Go For 12" program) in order to promote regulatory compliance. [Ref. 8]

Upon contacting the Office of the Secretary of the Navy (Information Resources Management Division, Code OP-945), which publishes the 5230 series Secretary of the Navy Instructions (i.e., SECNAVINST 5230.n to 5239.n) pertaining to ADPE procurements, it was discovered that no lower level inspections are performed and that only those procurements which exceed certain thresholds (e.g., \$50 million for the Marine Corps) receive the scrutiny of the office.

The "game" in ADP procurement is to keep buys below certain thresholds (per the Delegation of Procurement Authorities) so that they don't receive the scrutiny of higher level offices during the approval process...for the most part the Department of the Navy and Headquarters Marine Corps don't want SECNAV telling them how to do their business, and they're very careful to keep the dollar value below certain thresholds. [Ref. 42]

Headquarters Marine Corps has not yet made ADP compliance a part of the Inspector General process. It, like GSA, endorses the philosophy that, rather than attempting to preempt the prerogatives of lower level commands, a smoother overall implementation will result by making standards attractive (e.g., offering procurement assistance, technical support). [Ref. 26]

Lack of oversight from higher levels gives field activities a lot of flexibility in procuring EUCE, but guidance continues to be published and commands are left wondering how well they are performing with respect to regulatory compliance. The end result of no inspections (and the resultant feedback) is that commands gravitate towards the conservative approach of only acquiring EUCE from a mandatory requirements contract (e.g., Air Force Zenith-248 contract) or from the GSA Schedule, when there are many competitive commercial sources.

2. Problems with Standardization

The problem of standardization of hardware and software is well documented throughout the Marine Corps, and the Department of Defense as well. While standardization is attractive from a logistic support standpoint (e.g., standard parts and supplies being obtainable in the supply system, training programs developed for standard applications), standardization from a legal standpoint has its problems. The Congressional emphasis in recent history has been for greater competition among contractors, such as in the Brooks Act of 1965 and the Competition in Contracting Act of 1984. "Competition" means that competing manufacturers should have an equal chance at obtaining government business; and, therefore, unless the requirement for standardization can be thoroughly justified, it becomes a secondary issue.

Unfortunately, problems arising from non-standard equipment can have a tremendous impact on a unit (in the field) which may be required to exist for extended periods on the strength of its own inherent logistics capabilities (i.e., maintenance float).

Standardization problems may occur when buying off of the GSA Schedule. It may cause problems on the maintenance side of the house. ELMACO would have to stock parts for other computers, and they are already having trouble keeping up. [Ref. 43]

Problems with a lack of standardization of software are partly driven by the fact that software is hard to control. Software is highly portable (can be transported on floppy disks), it can be obtained from a variety of sources (e.g., computer clubs, public domain software distributors, and computer stores), and it is easily installed, hidden on, and removed from EUCE. There also appears to be a lack of understanding at many field activities as to exactly what the Marine Corps standards are.

3. Poor Understanding of the GSA Schedule

The problem of understanding how the GSA Schedule should be used was evident from the preliminary conversations with several contracting offices. Buyers at several locations assumed that, when buying EUCE from a GSA Schedule contract, there was no requirement to compete the buy. Also, the preponderance of business going to GSA mandatory and non-mandatory contracts demonstrates the lack of understanding--since for even small dollar value EUCE

buys, the availability of items on the GSA Schedule shall not preclude or waive the requirement to seek (through alternative contracting procedures) the lowest overall cost alternatives to meet the needs of the Government [Ref. 44]. As far as complying with the need for competition, as demonstrated in Figure 4 (p. 36) there are few advantages to be gained in using a GSA Schedule; but there is a perception (on the part of many) that by using a GSA Schedule one can avoid contractor disputes and lessen oversight.

4. Inadequate Application of Life Cycle Costing

While the directive for Economic Analysis (DODI 7041.3 Economic Analysis and Program Evaluation for Program Management) has been in effect for a long period of time (since 1969) and is widely disseminated, it is neither referenced nor incorporated into the Marine Corps Order on Life Cycle Management (MCO P5231.1). The portion of MCO P5231.1 most frequently used in microcomputer procurements, the Abbreviated System Decision Paper (see Appendix B), gives a list of costs to calculate as one-time and/or recurring costs but no guidelines (such as exists in DODI 7041.3) on what to consider in each category. What to consider and how to calculate the costs are left to the preparer's judgment, and no mention is made of either the time-value of money or the residual value of investment. [Ref. 25:p. G-2]

Unfortunately, life cycle cost directives and guidance are all written with major systems in mind, which leaves the preparer of EUCE justifications wondering how many alternatives should be explored and to what depth. For instance, the FIRMR (which is applicable to all ADP procurements regardless of dollar value) states:

A comparative cost analysis shall be performed for each identified requirement or when planning indicates the possible existence of outdated ADPE. The purpose of the analysis is to determine which alternative will meet the user's needs at the lowest overall cost over the system/item life. The alternatives to be considered shall include, but are not limited to the following:

- (1) Use of non-ADP resources to satisfy the requirement.
- (2) Use of existing ADP facilities (e.g. Federal Data Processing Centers) and resources on a shared basis.
- (3) Use of commercial ADP services.
- (4) Redesign of application programs, to the maximum practicable extent.
- (5) Revision of production schedule or job stream and matching work elements to resource systems to improve productivity.
- (6) Addition or change in working shifts to increase capacity.
- (7) Augmentation of installed ADPE by adding additional components to increase data processing capacity.
- (8) Upgrading selected system components, such as adding additional selector channels, memory, faster tape or disk units, etc., in order to improve throughput capability.
- (9) Replacing installed ADP system with a compatible system that will handle the workload.
- (10) Competitive replacement of the installed ADP system through use of functional specifications. [Ref. 44:par. 201-30.009]

If one were to attempt to conscientiously evaluate all the alternatives listed in the FIRMR for every procurement of EUCE, very little EUCE would ever be procured. It would certainly never be procured if users, uneducated in the technical aspects of computers, were tasked with performing the analysis.

Much of the problem in the application of life cycle costing to the procurement of EUCE is the absence of meaningful guidelines on how to apply the concepts at the small purchase level. The Marine Corps Order on Life Cycle Management (MCO P5231.1) is, likewise, centered around the milestone approval process of large system procurements.

5. Inadequate Guidelines for Installation and Control

Lastly, the problem of guidelines for the installation, maintenance, and property control of EUCE is aggravated by the fact that each command handles these aspects of EUCE a little bit differently. EUCE procurement at Marine Corps Base Camp Pendleton, California, is handled by the Regional Automated Services Center, which (being concurrently the Base ISMO) both approves end-user procurements and initially receives the equipment from the vendor. In a similar situation on the East Coast (i.e., Marine Corps Base Camp Lejeune, North Carolina), the Regional Automated Services Center does not get involved in end-user computing.

At some locations, the equipment goes straight to the unit supply office (which should then notify both the end-user and the ISMO); at other locations the equipment may get delivered first to the property control office, which will then issue it to the end-user; and, at still other locations, the equipment may be delivered to the ADP approval authority who issues it to the end-user and helps install the system. Having equipment "turn up on my doorstep" is an often heard complaint.

It is the need for standardization of property accountability and control which helped get Marine Corps Order 7100.10 released to the field. To date, however, very few commands have complied with the order (at least as far as the reporting requirement is concerned). [Ref. 39]

In an attempt to address these problems and to answer the primary and secondary research questions, the research described in the following chapter was conducted.

IV. RESEARCH METHODOLOGY

A. RESEARCH STRATEGIES

Three strategies were employed in researching the procurement and management of microcomputers in the Marine Corps. These strategies were: (1) archival research of laws, regulations, audit reports, statistics, and policy guidance, (2) telephone interviews to obtain background information on policy and current operations, and (3) a telephone survey of contracting offices and ADP approval authorities.

First, the archival research involved reviewing applicable laws, directives, and regulations (synopsized in Appendix A), as well as obtaining audit reports from the General Accounting Office, the General Services Administration, and policy drafts from Headquarters Marine Corps on microcomputer procurement and management. Other research efforts and studies, as well as current books and periodicals, were also reviewed for pertinent information.

The procurement of microcomputers is tightly controlled and regulated, and the advantage of using archival research was being able to access the vast quantity of laws and regulations governing the process. The research questions involving the procurement of microcomputers and the effectiveness and efficiency with which microcomputers are

managed (throughout the life-cycle) are primarily management-type questions. These questions do not lend themselves to empirical research (i.e., isolating and manipulating variables in a specified way) or analytic research (i.e., research based on formal logic and philosophical inquiry).

Secondly, numerous interviews were conducted with personnel at Headquarters Marine Corps, the General Services Administration, and other offices and field activities in order to clarify regulations, directives, and current practices and policy issues. The information and insights gained from the archival research and the telephone interviews were presented in the previous two chapters.

Lastly, a telephone survey was conducted with two groups of individuals: (1) purchasing and contracting specialists (i.e., EUCF buying offices), and (2) automated data processing (ADP) specialists (i.e., ADP approval authorities). Within the Marine Corps the procurement of a microcomputer is approved by a cognizant ADP specialist within the command (or at a higher level command), and the actual procurement is then carried out by the appropriate buying activity.

The advantage in using opinion research was its ability to capture individual impressions about microcomputer procurement, determine the level of understanding of the laws and regulations governing the procurement and

management process, and to obtain current information on procedures being followed. Telephone interviewing was used for the opinion research in order to ensure that sufficient participation was achieved, response turnaround time was reduced, and survey participants were encouraged to add any other information or opinions they felt were important.

Since the number of contracting offices and ADP specialists is not large, it was possible to obtain a very high level of participation in the survey. Eleven contracting offices and 26 ADP offices were interviewed. For a complete list of survey respondents see Appendix C.

Responses obtained from telephone surveys, however, suffer certain inherent weaknesses. The following limitations in using telephone surveys are noted:

- (1) Responses given over the telephone are not an official expression of a command's policy.
- (2) While most respondents could provide answers to the survey questions, the personnel participating were sometimes below the highest supervisory positions within their respective offices (generally because of the supervisors' absence or the respondent being the "duty expert" on the topic of microcomputers).

Despite the disadvantages of using a telephone survey, the responses are informative and, when considered in the aggregate, provide an insightful look at how microcomputers are being procured and managed.

B. RESEARCH SURVEY

The survey questions directed at contracting personnel are grouped as follows.

1. The Pre-Award Phase (Preparing to Buy EUCE)

- (1) Have any contracting personnel received formal training in ADP procurement?
- (2) Who is the approval authority for ADP procurement at your command?
- (3) Does the contracting office consider life cycle costs when buying EUCE? If so, how is this accomplished?
- (4) How well do you feel the ADP community understands the procurement process?

2. The Contract Award Phase (Making the EUCE Buy)

- (1) What ADP regulations are followed in the procurement of EUCE?
- (2) Are you buying EUCE off of the GSA Schedule? If so, what are your procedures/guidelines for using the Schedule?

3. The Post-Award Phase (Following EUCE Receipt)

- (1) How are maintenance costs handled? Who takes care of the accountability and tracks warranties of newly acquired computers?

The following questions were directed at ADP specialists (i.e., persons in the approval chain for microcomputer procurements).

4. The Pre-Award Phase (Preparing to Buy EUCE)

- (1) What studies/justifications are the end-users required to provide in order to obtain procurement approval?
- (2) Have ADP personnel received any training in procurement?
- (3) Do you have procurement approval authority for EUCE?

(4) Is there an ADP Steering Committee within the command? If so, what is their role?

5. The Contract Award Phase (Taking Part in the EUCE Buy)

(1) What contracting sources do you seek when procuring EUCE?

(2) What happens when new software becomes available in the marketplace? Do you obtain copies for evaluation?

(3) What are the Marine Corps software standards?

(4) Have you ever heard of the Federal Information Resource Management Regulation?

6. The Post-Award Phase (Following EUCE Receipt)

(1) Approximately how many computers do you support?

(2) Who is responsible for tracking serial numbers and expiring warranties on computer equipment?

(3) How much and what type of training is provided to end-users of EUCE?

(4) How is the maintenance of EUCE handled?

(5) How is EUCE property controlled? (What steps occur in getting the EUCE from the vendor to the End-user?)

Responses from the ADP specialists proved very informative and provided the bulk of the following material. This resulted from the fact that ADP personnel are involved in the microcomputer procurements at their inception, as well as in the follow-on life cycle management of the equipment once it is received. ADP specialists (e.g., ISMOs, RASC personnel) are viewed as focal points for all matters relating to microcomputers within a command and, other than performing the actual buying of the equipment,

are the most intimately involved. Contracting personnel, while familiar with the standard procurement regulations (e.g., FAR, DFARS), are much less familiar with the FIRMR and the issues surrounding the selection and evaluation of microcomputers.

1. Questions for ADP Professionals

- a. What Studies/justifications are the End-users Required to Provide in Order to Obtain Procurement Approval?

Six of the commands questioned followed the requirements of Marine Corps Order P5231.1 (Life Cycle Management) which requires for all ADP procurements less than \$100,000 that an abbreviated system decision paper be submitted (see Appendix B). Thirteen of the respondents gave a liberal interpretation to MCO P5231.1; that is, only a narrative justification (showing savings in man-hours or clerical assistance) was required. Alternatives were not evaluated (per MCO P5231.1), the life cycle analysis was regarded simply as an administrative requirement, and the availability/approval of funds was considered to be the primary requirement for buying equipment. Four of the ISMOs questioned replied that they would construct the economic analysis from the information provided by the end-user's narrative request.

MCAS Cherry Point, North Carolina, was one respondent which took a different approach. Several years ago it conducted a study which identified a need for 600-700 microcomputers. It is referencing the study in procurement justifications and will continue to do so until the identified deficiencies are satisfied.

Lastly, two of the ADP respondents required no formal justification from end-users, but merely a memorandum

from the requestor and the approval for the expenditure of funds. The results are shown in Figure 6.

Response	No. of Respondents
End-user is required to submit an abbreviated decision paper (per MCO P5231.1).	6
End-user required to submit a narrative justification and to quantify benefits.	13
ADP office drafts required justifications from the narrative description provided by the end-user	5
No justification required (memorandum only)	2

Figure 6. Justification Required from End-User

b. Have ADP Personnel Received Any Training in Procurement?

Of the 26 respondents only three had received formal ADP procurement training. MCCDPA Albany, Georgia, and RASC Cherry Point, North Carolina, had personnel who had been trained at DSMC, Fort Lee, Virginia; and RASC Camp Pendleton, California, had taken advantage of the week long ADP procurement course offered there. Nineteen of the respondents had received no training, and five of the respondents had received limited training by their respective contracting offices.

- c. Do You Have Procurement Approval Authority for EUCE?

All respondents answered "yes" to this question. This question was somewhat redundant, since ADP professionals who were approval authorities (under the delegation of procurement authority) were the ones chosen for the survey. The responses merely confirmed that there was no deviation.

- d. Is There an ADP Steering Committee Within the Command? If So, What is its Role?

Eleven respondents replied that there was not a Steering Committee (or one that they knew of). Two respondents replied that, while there was currently was not a Steering Committee, one was in the process of being formed (i.e., input was being gathered from commands, a charter was being drafted, etc.). Twelve of the respondents answered that a Steering Committee exists, but only to set standards and policy. Only one steering committee (i.e., MCLB Albany, Georgia) approves individual EUCE procurements. The results are shown in Figure 7.

Response	No. of Respondents
There is no Steering Committee.	11
No Steering Committee currently exists, but one is in the process of being formed.	2
A Steering Committee exists to establish local policies and standards.	12
A Steering Committee sets policy and approves all requests for EUCE.	1

Figure 7. Steering Committee Involvement in EUCE

B. THE CONTRACT AWARD PHASE (MAKING THE EUCE BUY)

1. Questions for Contracting Officers

a. What ADP Regulations are Followed in ADP Procurement?

While the answer to this question by respondents was consistent, the accompanying remarks varied. The uniform response was: Federal Information Resource Management Regulation (FIRMR), the Federal Acquisition Regulation (FAR), and the Defense Federal Acquisition Regulation Supplement (DFARS). Two of the accompanying remarks were as follows:

The FIRMR is followed; however, you don't really need any regulations outside of the DFARS Part 70. The FIRMR has been incorporated into DFARS Part 70. [Ref. 45]

The FIRMR, FAR, and DFARS are adhered to, but there's very little in those regulations which applies to small dollar

value EUCE buys. The regulations were written for large ADP systems. [Ref. 46]

- b. Are You Buying ADP from GSA Schedules? If So, What are Your Procedures/guidelines for Using Schedules?

Seven of the 11 respondents replied that they compared the prices listed in different GSA schedules (to satisfy the requirement for competition), as well as making purchases on the open market. Four of the respondents made purchases only from GSA schedules, and two of these four were under the impression that GSA's negotiated contracts (i.e., GSA schedules) did not have to be competed.

2. Questions for ADP Professionals

- a. What Contracting Sources do You Seek When Procuring EUCE?

Fifteen of the respondents looked strictly towards GSA schedule EUCE to fill their requirements. Four respondents are currently waiting for the follow-on buy to the mandatory Air Force Zenith-248 contract (i.e., Desktop III). Six of the respondents sought sources from both the GSA schedule and the open market, and one respondent, while occasionally procuring from the GSA schedule, relied primarily on the open market. The results are shown in Figure 8.

Response	No. of Respondents
Procured solely from the GSA schedule.	15
Currently waiting for the follow-on buy to the Air Force Zenith-248 contract.	4
Sought sources from both GSA schedules and open market.	6
Relied primarily on the open market.	1

Figure 8. Procurement Sources for EUCE

- b. What Happens When New Software Becomes Available in the Marketplace? Do You Obtain Copies for Evaluation?

The responses to this question were evenly divided. Half of the respondents tried to keep ahead of their customers by reading computer magazines and obtaining the latest software releases for evaluation.²⁰ The other half of the respondents did not pursue new software and instead sought guidance from Headquarters Marine Corps and only supported the standard software products. Many of the ISMOs questioned cited customer interest as a driving force behind software purchases (i.e., their customers would learn about a software product and request the software product be procured).

²⁰Several vendors (such as Egghead Software and Government Technology Services, Inc.) loan evaluation copies of software to government users for 30 to 90 days.

c. What are the Marine Corps Software Standards?

Of the 20 offices which responded to this question, only three respondents were aware that the software on the Zenith-248 contract was considered the Marine Corps standard (by Headquarters Marine Corps; Code CCIS).²¹ The remaining responses varied (tabulation would be meaningless), with most people citing a few of the more popular packages (e.g., Wordstar, Dbase-3, Lotus 1-2-3, and Supercalc).

d. Have You Ever Heard of the Federal Information Resource Management Regulation?

Those personnel which had received formal training in ADP procurement both had heard of the FIRMR and had a copy. Four respondents had heard of the FIRMR, but none of these individuals knew anything about it or had a copy of it. None of the other respondents had heard of the FIRMR.

C. THE POST-AWARD PHASE (FOLLOWING EUCE RECEIPT)

1. Questions for Contracting Officers

a. How are Maintenance Costs Handled? Who Takes Care of the Accountability and Tracks Warranties of Newly Acquired Computers?

Eight of the respondents replied that the cognizant ADP office (i.e., ISMO, ASC, RASC, etc.) was responsible for tracking warranties on EUCE and coming to

²¹The Marine Corps software standards are shown on pg. 25.

them with any requirements for outside contract maintenance support. Two offices answered that it was the responsibility of the individual units or the Property Control office to track warranties and to forward requirements for maintenance contracts. One office replied that no one was tracking warranties (and the associated maintenance requirements) and this had caused them some problems, because equipment with expired warranties suddenly turn up needing repairs.

2. Questions for ADP Professionals

a. Approximately How Many Computers do You Support?

The range of numbers cited was 50-3000. RASC Camp Pendleton, California, stated that the number of microcomputers (aboard their base) was growing at a rate of about 500 per year. The results are in Figure 9.

Response	No. of Respondents
No. of computers supported = 50 - 100	3
No. of computers supported = 100 - 250	2
No. of computers supported = 250 - 500	10
No. of computers supported = 500 - 750	3
No. of computers supported = 750 - 1000	0
No. of computers supported = 1000- 2000	4
No. of computers supported = 2000+	4

Figure 9. Inventory of EUCE

b. Who is Responsible for Tracking Serial Numbers and Expiring Warranties on Computer Equipment?

Twenty-three of the ADP professionals replied that they were tracking serial numbers and warranties of EUCE equipment. The reasons cited were these: (1) Since they were involved in the maintenance of the equipment, they needed to monitor the inventory of EUCE and the status of equipment warranties; and (2) since supply offices had not been able to keep up with the heavy influx of equipment, they were forced to implement their own tracking system (e.g., a Dbase file). Three respondents stated that the cognizant supply office was tracking both the serial numbers and warranties.

c. How Much and What Type of Software Training is Provided to End-users of EUCE?

The software packages being taught and the number of locations they are taught at are indicated in Figure 10.

Some of the respondents do not give end-users training, and two of the respondents refer end-users to courses at local community colleges for training in specific software packages. Personnel attending were reimbursed for the costs of the course by their respective commands.

d. How is the Maintenance of EUCE Handled?

The answer to this question varies considerably. The only area of agreement (among respondents) is that, while EUCE is under warranty, it will be repaired by the

Response	No. of Respondents
ENABLE	11
LOTUS 1-2-3	7
WORDSTAR	6
MULTIMATE	3
PEACHTEXT	1
WORD PERFECT	2
DBASE3/DBASE3+	13
SUPERCALC-3/SUPERCALC-4	3
TIMELINE	1
HARVARD GRAPHICS	1
AUTOCAD	1
MCAIMS	1

Figure 10. Software Instruction Offered by ADP Offices

manufacturer. Once the warranty expires, the method of repair depends on the following:

- (1) What brand of EUCE is it (i.e., does a local repair capability exist)? Obtaining local repair is a problem at some of the more remote locations (such as Albany, Georgia, and Twentynine Palms, California).
- (2) Does an in-house repair capability exist? In the larger ISMO shops, personnel are frequently trained in how to repair EUCE to the component level (e.g., Third Force Service Support Group ISMO in Okinawa, Japan, and the Fourth Marine Division ISMO in New Orleans, Louisiana).
- (3) Assuming that the end-user's command is part of the Fleet Marine Force, can the Electronic Maintenance Company (ELMACO) repair the computer? The ELMACOs,

however, are not identically staffed and do not provide the same support capabilities. The ELMACO at MCB Camp Pendleton, California, is the only ELMACO repairing a wide variety of computers.²²

- (4) Is the gear a Type-I T/E item (i.e., an AN/UYK-83)? The AN/UYK-83's are repaired by either C3 Corporation or the Electronic Maintenance Companies found in the Force Service Support Groups.

The method used in maintaining EUCE varies with each situation as determined by the factors listed above. In general, the Fleet Marine Force depends more on ELMACO and in-house repair capabilities, while the Supporting Establishment depends more on local contractors for repairing computers (i.e., those beyond in-house repair capabilities). No statistics were gathered on the proportion of trouble calls from end-users which result in outside maintenance.

- e. How is EUCE Property Controlled? What Steps Occur in Getting the EUCE from the Vendor to the End-user?

There are four parties involved in the receipt and installation of EUCE. They are: (1) the Traffic Management Office (TMO), (2) the unit supply office or Base Property Control office, (3) the ADP office which approved the procurement, and (4) the end-user's location (where the equipment eventually resides). While all should be notified of EUCE receipt, they do not always participate in the

²²While some respondents had the option of using ELMACO for maintenance, they chose not to do so, for reasons of unsatisfactory past experiences or delays encountered obtaining parts within the supply system.

physical custody of the equipment upon its arrival from the vendor.

After EUCE is shipped by the vendor (responding to an authorized purchase order), the EUCE is initially received by the Traffic Management Office (TMO) aboard the base where the buying activity resides. The path EUCE takes from TMO to the end-user (made apparent during the survey) has several variations, which are as follows:

- (1) The EUCE equipment moves from TMO to the unit supply office, to the ADP office, to the end-user.
- (2) The EUCE equipment moves from TMO to the unit supply office, to the end-user. The end-user should then notify the ADP office of the equipment's arrival.
- (3) The EUCE equipment moves from TMO to the ADP office, to the end-user. The ADP office will forward the equipment custody record (ECR) to the unit supply office (designating the end-user as the custodian).
- (4) The EUCE equipment moves from TMO to the ADP office, to the end-user. It becomes the end-user's responsibility to contact the appropriate supply office to ensure that the equipment is added to the proper inventory.

The survey results are shown in Figure 11.

Several ADP professionals complained about a mismatch between their records and the records of the supply activity and the necessity to take independent inventories of equipment. Two of the respondents replied that the path from TMO to the end-user depended on the source of funds for the procurement (i.e., the equipment was received by whomever had provided the funds).

Response	No. of Respondents
TMO --> Supply --> ADP --> End-User	3
TMO --> Supply --> End-User	6
TMO --> ADP --> Supply --> End-User	1
TMO --> ADP --> End-User.	5

Figure 11. Path of EUCE to the End-User

D. UNSOLICITED COMMENTS BY SURVEY RESPONDENTS

1. Comments by Contracting Officers

Users do not understand what to do with the equipment when they get it. The RASC is on the ball--but others not so much so. Simple accountability is lacking. They should keep a log which has: receipt of equipment, what contract it came from, when the warranty expires, and the serial numbers. They do not properly account for the gear, and they fail to submit for maintenance requirements. [Ref. 47]

The ADP community doesn't understand the need for competition. [Ref. 48]

ADP folks are hard to work with. They don't want to listen, and feel that they're special. [Ref. 49]

2. Comments by ADP Professionals

Once colonels, who otherwise dislike computers, see a Local Area Network in action, they like the idea. [Ref. 50]

Base Property Control is tasked with tracking the serial numbers and warranties of EUCE; however, so much of the equipment has been arriving that they've lost control of the situation. We now maintain our own database to track the equipment. [Ref. 51]

Inventory control is a big mess when it comes to software. We've treated software like hardware in placing it on CMR's, but this is a very doubtful measure. [Ref. 52]

A real world incident occurred demonstrating the problem of standardization. An administrative task force was assembled to handle the paperwork which resulted from an international incident, and administrative clerks had to be borrowed from multiple commands. We (the ISMO) had to install three different word processors on each computer, so that everyone could be productive. The proliferation of word processors is becoming a "tower of babel." [Ref. 52]

It's true that everyone has their favorite software packages; but the basic requirement in the Marine Corps is to be able to support the Marine Air Ground Task Force (MAGTF) Commander. Standardizing on ENABLE (an integrated software package) throughout the Marine Corps will enhance communication and productivity when it's needed most; that is, in time of crisis when people are transferred around and placed into different jobs, and MAGTF's are task organized from a variety of units--in order to accomplish a particular mission. [Ref. 52]

I think tempest certification (and especially maintenance requirements) is a farce! I have to send Zenith-150's and Zenith-200's (tempest certified) to Hawaii for maintenance; with a six to eight month turnaround time. The maintenance contract cost me \$13,760 last year, and only three machines were repaired. It would have been much simpler to throw them away and buy new ones. [Ref. 53]

The office of Staff Judge Advocate needs a powerful word processor such as Word Perfect. The word processor which comes with ENABLE, would not fulfill their requirement. [Ref. 50]

E. ANALYSIS OF SURVEY RESULTS

The survey responses (of the previous section) support the following findings:

- (1) Few contracting personnel have received formal training in ADP procurement. [pp. 65-66]
- (2) Few ADP personnel have received any training (formal or informal) in ADP procurement. [p. 69]
- (3) The contracting community does not regard the ADP community as being very knowledgeable in procurement. [p. 67]

- (4) Contracting offices rely primarily on the Federal Acquisition Regulation (FAR) and Defense Federal Acquisition Regulation Supplement (DFARS) to guide them in procuring EUCE. [pp. 71-72]
- (5) Very few ADP offices are familiar with the Federal Information Resource Management Regulation. [p. 74]
- (6) Life cycle costs are not considered, by contracting offices, to be an essential part of small dollar value EUCE buys. [pp. 66-67]
- (7) There is a wide variation in the requirements placed on end-users to justify their EUCE purchase requests. [pp. 67-68]
- (8) Abbreviated System Decision Papers (per Marine Corps Order P5231.1) are required for only approximately 25% of the EUCE procurements. [p. 68]
- (9) Steering Committees exist to establish local policies and standards at approximately 50% of the Marine Corps commands. [pp. 70-71]
- (10) GSA schedules are used as the primary source for the procurement of EUCE. [pp. 72-73]
- (11) ADP offices are evenly split in their approach towards researching and acquiring newly available software (i.e., half of them seek to acquire new software and half of them obtain only officially endorsed programs). [pp. 73-74]
- (12) Very few ADP offices know what the Marine Corps software standards are. [p. 74]
- (13) There is a wide variation in the types of end-user training provided by the various ADP offices. [p. 77]
- (14) The software acknowledged and supported by the end-user training offered by ADP offices differs considerably from Marine Corps software standards. [pp. 34, 77]
- (15) Having personnel trained on different word processors can create problems when the personnel are gathered together to provide a high level of administrative support. [p. 82]

- (16) Certain administrative offices require more powerful word processors than that available with products such as ENABLE. [p. 83]
- (17) There is a wide variation in the numbers of EUCE supported by different ADP offices (i.e., 50-3000). [pp. 75-76]
- (18) There is a wide variation in how maintenance is provided for EUCE. [pp. 78-79]
- (19) No Marine Corps-wide policy exists on which office shall track EUCE serial numbers and warranties (for maintenance purposes). [p. 76]
- (20) The EUCE repair capabilities of the various Electronic Maintenance Companies (ELMACOs) throughout the Marine Corps are significantly different. [p. 78]
- (21) Maintenance of tempest-certified equipment can prove extremely costly and time-consuming. [p. 83]
- (22) No Marine Corps-wide standards are followed in the process of introducing EUCE into the inventory (i.e., the steps of property control). [pp. 79-81]

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The following conclusions are supported by the background studies and telephone interviews which were conducted during the research effort.

To adequately implement the multitude of laws and regulations pertaining to the procurement of EUCE (identified in Appendix A), both contracting personnel and ADP professionals need at least some training in ADP procurement. Related to this problem are poorly conducted life cycle analyses and an over-reliance on GSA schedules (for sources of EUCE). A properly conducted life cycle analysis (per DODI 7041.3) should significantly increase the probability of achieving the lowest life cycle cost, and procuring from open market sources can often result in the greatest savings to the government.

There is a lack of software standardization throughout the Marine Corps and little understanding as to what the official (i.e., Headquarters approved) software standards are. The software product called "ENABLE" appears to hold the most promise in becoming an all-in-one Marine Corps-wide standard. It contains a word processor, spreadsheet, and data base, and has been mandated as the standard within many Fleet Marine Force commands. It has the additional

advantages of being provided with the FMF-EUCE (AN/UYK-83) and being relatively inexpensive (i.e., \$87 per copy, compared with several hundred dollars for other software products such as Wordstar and Dbase-3+). However, as one survey respondent mentioned, certain customers have special needs which can only be satisfied by powerful programs, such as Word Perfect and Dbase3+, which contain functions that ENABLE does not.

Insufficient emphasis is placed on the post-award considerations of EUCE. Since no clear guidelines exist as to the responsibilities of different offices for the tracking of EUCE for maintenance and inventory reporting purposes, there is the need for duplicate record-keeping and reconciliation of records of different offices with the actual on-hand inventory. Since no maintenance plan is required prior to the procurement of EUCE, once the equipment arrives, its follow-on logistical support is sometimes complicated and costly. Additionally, EUCE property receipt and distribution is handled in a variety of ways, depending on the particular command and source of procurement funding. While the ADP offices and supply offices need to stay informed concerning the arrival and distribution of EUCE, the number of hands through which the equipment sometimes passes creates delays in getting the equipment to the end-user.

B. RECOMMENDATIONS

Headquarters Marine Corps should ensure that training in ADP procurement is made available on a consistent basis to contracting offices throughout the Marine Corps. Options such as video-cassette training tapes and course materials, should exist for those contracting activities which cannot afford to send personnel to the formal courses.

Headquarters Marine Corps should ensure that ADP personnel who are involved in approving EUCE procurements are acquainted with and have copies of DODI 7041.3 "Economic Analysis and Program Evaluation for Resources Management" and the Federal Information Resource Management Regulation (FIRMR). These documents will greatly assist in the planning, procurement, and management of information resources.

Headquarters Marine Corps should establish ENABLE as the software standard for word processing, spreadsheet, and data base management. ENABLE is powerful and inexpensive, and its establishment as the standard will result in substantial gains in economy, efficiency, and combat readiness Marine Corps-wide. Marine Corps schools (e.g., Admin, Disbursing, Supply) will be able to train their students in using ENABLE. Those students then will enter the Fleet Marine Force more highly productive, and the training and support requirements of the ADP offices will be greatly reduced. Combat readiness refers to logistical support (i.e.,

mobilizing administrative support functions quickly), as well as specific troop exercises; having ENABLE as the standard will ensure that, whatever administrative position or office a person is required to adapt to, he will be able to do so quickly.

The standard can be enforced by making ADP inspections part of the Inspector General (I.G.) checklist or placing restrictions on the Delegation of Procurement Authority granted to the field.

Deviations from the software standard (ENABLE) should require the approval of Headquarters and the endorsement of specific occupational fields (e.g., legal, aviation maintenance, etc.). This will ensure the standardization of alternative software products in specific occupational specialties, when ENABLE does not meet the end-user's requirements.

Headquarters Marine Corps should publish a Marine Corps Order concerning how EUCE will be received, distributed, and installed. The order should make it clear which offices are responsible for: (1) the inventory of hardware and software, (2) the installation of security screens on the EUCE (required by the Computer Security Act of 1987), (3) the coordination of EUCE maintenance upon expiration of the warranty period, and (4) the overall coordination of all steps in the process.

C. RECOMMENDATIONS FOR FURTHER STUDY

The following topics are recommended for further study:

- (1) An analysis of the negotiation and award of GSA schedule contracts, comparing their prices with the open market.
- (2) An analysis of the cost and performance of the AN/UYK-83 in comparison to lightweight laptop computers (such as the Zenith-184).
- (3) A study of the Life Cycle Management guidelines, with a view towards revising them for more effective use by personnel when making small dollar value procurements.
- (4) A study of how software should be controlled in the inventory. Software is easily copied and there is no concise definition of what constitutes the physical inventory. If a person lost the original diskette but had a backup copy, should he be charged with the loss of government property?

APPENDIX A

SYNOPSIS OF LAWS AND REGULATIONS GOVERNING EUCE

Public Law 81-152: Federal Property and Administrative Services Act of 1949.

The General Services Administration (GSA) was created in order to provide supplies and services common among federal agencies. GSA (previously known as the Bureau of Federal Supply) was separated from the Department of the Treasury and given specific authority.

Public Law 89-306: Amended Federal Property and Administrative Services Act of 1949 (Brooks Act); October 30, 1965.

The Brooks Act amended Public Law 81-152, adding a new section titled "Automated Data Processing Equipment." It gave GSA jurisdiction over the procurement of ADPE for the Federal Government (previously handled by OMB). In so doing, however, certain limits were placed on GSA's authority:

"The Administrator shall not interfere with, or attempt to control in any way, the use made of automatic data processing equipment or components thereof by any agency."

The Brooks Act:

1. Granted GSA authority to delegate procurement responsibilities to agencies.
2. Established an ADP Fund (which can be used by any agency of the federal government).
3. Tasked Dept. of Commerce (National Bureau of Standards) responsibility for standards (i.e., Federal Information Processing Standards).
4. Tasked OMB with exercising policy and fiscal control over ADP purchases.

Public Law 96-511: Paperwork Reduction Act of 1980 (New Brooks Act).

Required agencies to designate a senior official responsible for carrying out the management activities of complying with the information policies, principles, standards, and guidelines. These include a systematic inventory of the major information systems and periodical review of its information management activities, including planning, budgeting, etc.

The law also established within OMB an Office of Information and Regulatory Affairs. It is here that the first mention was made of items which should not be subjected to GSA's authority (as defined in the Brooks Act). These exceptions were later codified in the Warner Amendment.

Public Law 97-86: Warner Amendment of 1981 (FY82 Authorization Act).

This amended the 1949 Act establishing GSA, for the purpose of excluding certain systems and services from the oversight mandated by the Brooks Act. The exceptions to the Brooks Act applied to ADPE or services when they involved:

- (1) Intelligence activities;
- (2) Cryptologic activities related to national security;
- (3) Command and control of military forces;
- (4) Equipment that is an integral part of a weapon or weapons system; or
- (5) Is critical to the direct fulfillment of military or intelligence missions (excluding routine data processing functions).

Public Law 98-369: Competition In Contracting Act of 1984 (CICA).

CICA established criteria for full and open competition and gave contractors the choice of taking protests (of an agency decision) to either GAO or the GSBCA. The law has section 2713 titled: "Automated Data Processing Dispute Resolution." The following is an excerpt:

"If the board determines that a challenged agency action violates a statute or regulation or the conditions of any delegation of procurement authority issued pursuant to this section, the board may suspend, revoke or revise the procurement

authority applicable to the challenged procurement."

The law defines "protest" as a written objection by an interested party to a solicitation by a Federal agency for bids or proposals.

Public Law 98-577: Small Business and Federal Procurement Competition Enhancement Act of 1984.

The law addressed the following four areas:

- (1) Definition of "major system";
- (2) Rights in technical data;
- (3) Certificate of Competency (issued by SBA); and
- (4) Small business subcontracting policy statements.

Public Law 99-500: Paperwork Reduction Reauthorization Act of 1986 (Amended Brooks Act).

This law expanded the scope of the act by redefining "ADPE" as follows:

The term "automatic data processing equipment" means any equipment or interconnected system or subsystems of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching interchange, transmission, or reception, of data or information by a Federal agency, or under a contract with a Federal agency which requires the use of such equipment, or furnishing of a product which is performed or produced making significant use of such equipment.

The law also:

- (1) Defined "information resources management";
- (2) Required a 5-year management plan to meet the information technology needs for the Federal Government; and
- (3) Authorized GSBICA to determine its own jurisdiction with respect to ADP bid protests.

Office of Management and Budget (OMB) Circulars

Note: An OMB Circular is a government-wide policy directive that tells executive branch agencies how they shall implement laws or presidential policies. Interim guidance is sometimes published in the form of OMB Bulletins.

OMB Circular A-76: Policies for Acquiring Commercial or Industrial projects or services (such as maintenance) for Government Use. Circular No. A-76 (revised); 4 Aug 1983. Originally published 29 March 1979.

The stated purpose of OMB A-76 is as follows:

This circular establishes Federal policy regarding the performance of commercial activities. The Supplement to the circular sets forth procedures for determining whether commercial activities should be performed under contract with commercial sources or in-house using Government facilities and personnel.

Behind the circular is the principle that in the process of governing, the Government should not compete with its citizens. When an A-76 study is performed a Statement of Work is drafted by the government entity (currently performing the work); and the cost of contracting the work out and the cost of in-house performance are compared in order to determine who should perform the work (government or private enterprise).

The government is cautioned that the circular shall not be used to justify conversion to contract solely to avoid personnel ceilings or salary limitations.

The following were listed as examples of commercial activities under Automatic Data Processing:

- (1) ADP Services--batch processing, time-sharing, facility management;
- (2) Programming and systems analysis, design, development, and simulation;
- (3) Key punching, data entry, transmission, and teleprocessing services;
- (4) Systems engineering and installation; and
- (5) Equipment installation, operation, and maintenance.

OMB Circular A-109: Major Systems Acquisition, 5 Apr 79

The stated purpose of OMB Circular A-109 is:

This Circular establishes policies, to be followed by executive branch agencies in the acquisition of major systems.

The report of the Commission on Government Procurement recommended basic changes to improve the process of acquiring major systems. This Circular is based on executive branch consideration of the Commission's recommendations.

Major system acquisition programs are those programs that:

- (1) Are directed at and critical to fulfilling an agency mission;
- (2) Entail the allocation of relatively large resources; and
- (3) Warrant special management attention.

OMB Circular A-11: Preparation and submission of Budget Estimates, June 1981.

This circular provides guidance on submitting budget data for inclusion in the Program Objective Memorandum (POM).

OMB Circular A-130: Management of Federal IRM, 24 Dec 85.

This circular sets basic guidelines for the collection, processing, and dissemination of information by Federal agencies, and for the management of Federal information systems and technology, as well as revising existing directives on privacy, computer security, and cost accounting for Federal computer and telecommunications facilities.

The OMB Circular prescribes a general policy framework, as required by the paperwork Reduction Act of 1980, for "developing and implementing uniform and consistent information resources management policies." It assigns no new reporting requirements, but rather uses existing oversight mechanisms.

It requires Agencies to:

- (1) Establish appropriate security for AIS;
- (2) Designate senior officials for information resources management as required by the Paperwork Reduction Act;
- (3) Disseminate information about their information holdings and how to gain access to such holdings, as required by law; and
- (4) Establish procedures for placing their publications in some of the 1400 Federal Depository libraries (in locations around the country).

The Circular directed GSA, under OMB oversight, to conduct a triennial review of information resources management as called for in the Paperwork Reduction Act.

This Circular combined four previous circulars:

- (1) Maintenance of Records about Individuals -- Privacy Act--OMB Circular A-108;
- (2) Computer Security--OMB Circular A-71, Transmittal Memorandum No. 1;
- (3) Cost Accounting, Cost Recovery, and Interagency Sharing of ADP Facilities--OMB Circular A-121; and
- (4) Cooperating with State and Local Governments to Coordinate and Improve Information Systems-- OMB Circular A-90.

OMB Circular A-123: Internal Control Systems; Aug. 16, 1983.

The stated purpose of this circular is:

This Circular prescribes policies and standards to be followed by executive departments and agencies in establishing, maintaining, evaluating, improving, and reporting on internal controls in their program and administrative activities.

Federal Information Resources Management Regulation (FIRMR)

The guiding document for ADP procurement within the Federal Government. It covers: management of information resources; use of federal standards; computer security; acquisition policies; delegation of procurement authority; competition requirements; contracting for ADP resources; and more. In the Code of Federal Regulations (CFR) the FIRMR is Chapter 201. The FIRMR is also supplemented with FIRMR Bulletins which are published as needed.

Federal Acquisition Regulations

FAR Part 39: Acquisition of Information Resources.

Currently being rewritten, it consists of one small paragraph pertaining to ADP. Pending the rewrite, the Federal Information Resource Management Regulation (FIRMR) is the guiding document for federal procurement of ADPE (see Federal Register of May 18, 1988).

DFARS (Defense FAR Supplement)

DFARS Part 270: Acquisition of Computer Resources.

This regulation paraphrases much of the guidance contained in the FIRMR. There are acknowledged differences; however, and the rewrite of the FAR PART 39 (to incorporate the FIRMR) is expected to alleviate these. As with the FAR, the FIRMR takes precedence over the DFARS.

Department of Defense Directives (DODD) and Instructions (DODI)

DODD 4105.62: Selection of Contractual Sources

The prime objectives of the process are stated as:

- (1) Select the source whose proposal has the highest degree of realism and credibility and whose performance is expected to best meet Government objectives at an affordable cost;
- (2) Assure impartial, equitable, and comprehensive evaluation of competitor's proposals, and related capabilities; and
- (3) Maximize efficiency and minimize complexity of solicitation, evaluation and the selection decision.

This DOD Directive covers:

- (1) Source Selection Plan;
- (2) Preparation of the Solicitation;
- (3) Evaluation and Discussion of Technical Proposals;
- (4) Evaluation and Discussion of Cost/Price Proposals; and
- (5) Selection of a Contractor for Final Contract Negotiations.

DODD 4160.19: DOD ADPE Reutilization Program, 5 APR 73.

This directive implements GSA's Reutilization Program which is mandated in the FIRMR and managed by GSA.

DODD 5200.28: Security Requirements for ADP; 18 DEC 72. (Under revision).

This directive established uniform policy for protecting classified data in the ADP environment.

DODD 5400.11: DOD Privacy Program; 9 JUN 1982.

The directive implements the Privacy Act of 1974, and its stated policy is:

It is the policy of the Department of Defense to safeguard personal information contained in any system of records maintained by DOD Components and to make that information available to the individual to whom it pertains to the maximum extent possible.

DODI 7041.3: Economic Analysis and Program Evaluation for Resources Management; OCT 72 (updated 1975).

This directive is the definitive document (still current in 1988) on how to perform an economic analysis (required on all ADP procurements). It outlined policy guidance and established a framework for consistent application of:

- (1) Economic analysis on proposed programs, projects, and activities; and
- (2) Program evaluation of ongoing activities.

DODD 7740.1: DOD Information Resource Management (IRM) Program; 20 JUN 83.

This directive established the DOD IRM Program to promote coordinated and integrated information management functions. Its policy was stated as:

It is the policy of the Department of Defense to implement IRM aggressively in ways that enhance mission performance through the effective, economic acquisition and use of information.

Several of the stated objectives were as follows:

- (1) Provide for the economic and effective acquisition of information resources emphasizing maximum practicable competition and lowest total overall cost consistent with mission requirements; and
- (2) Ensure that information planning becomes an integral part of the management process at all levels.

DODD 7920.1: Life Cycle Management of Automated Information Systems (AIS); 17 OCT 78.

This directive established joint technical and functional policy governing the life cycle management of all automated information systems and the acquisition of major AIS.

DODI 7920.2: Major AIS Approval Process, 20 OCT 78.

This instruction established the review and decision process and procedures for major automated information systems (AIS).

DODI 7930.1: ADP Users Groups; 25 MAR 86.

This instruction established the Information Technology Users Group Program to exchange ideas and information regarding ADP software associated with designated ADPE.

DODI 7930.2: ADP Software Exchange and Release; 31 DEC 79.

This instruction established uniform policies for exchange and release of ADP software to other government agencies and to domestic and foreign requestors.

DODD 7935.1-S: AIS Documentation Standards, 13 Sep 77.

This directive specifies certain minimum acceptable documentation standards which should be applied when creating a new AIS.

DODI 7939.2: ADP Software Exchange; DEC 79.

This instruction mandated the following policy and procedures:

DOD Components shall participate in the GSA Software Exchange Program by contributing common-use software to Federal Software Exchange Center (FSEC) and by using existing software obtained through that program, when such use is cost effective.

DODD 7950.1: ADP Resources Management, September 29, 1980.

A very broad directive which is only a couple of pages in length. It directs agency heads to manage ADP in a cost-effective manner, validate requirements, and report information into the Automated Resource Management System (ARMS) data base.

Department of the Navy (DON) Directives and Instructions

SECNAVINST 4200.23A: Correspondence and Oral Communication with contractors concerning DON contractual matters.

This instruction covers correspondence and oral communication with contractors concerning Dept. of Navy contractual matters; dtd 23 May 72 (still current in 1988).

NAVMATINST 4200.50C: Contractor Support Services; Feb. 1, 1982.

This instruction provides procedural guidance to the Department of the Navy; and applies to all consulting services, studies and analyses, and management and professional support services, as described in the instruction's enclosure.

ADPSO INST 4235.1: Guide to preparation of Requirements Packages in Procuring ADP Resources; 14 MAY 87.

Note: While this instruction covers procurements submitted to ADPSO for values of at least \$10M, it contains the following information:

- (1) The factors to be considered in determining the government system/item life are listed in FIRMR 201-30.008. Used to determine the LIOC (lowest total overall cost);

- (2) The specification is the foundation upon which the total procurement action is built. The specifications becomes Section C of the solicitation document and serves to communicate the user's needs to potential contractors.
- (3) Their example of a functional specification is a statement of the system's objective, including:
 - (a) Throughput requirements;
 - (b) File description, record size, and content;
 - (c) Transaction volume and description;
 - (d) Printer output volume;
 - (e) Terminal input/output volume;
 - (f) Sequence requirements;
 - (g) Timing or turnaround restrictions;
 - (h) Processing frequencies; and
 - (i) Software functionality.

NAVSUP INST 4235.6: Navy Supply Systems Command: Contract Request Preparation Guide; 1980

An indepth guide written for end-users who prepare requisitions for ADP resources. Provides sample forms and step by step procedures in how to fill them out. Contains lengthy explanations on the process and helpful checklists which can be used in drafting specifications.

SECNAV NOTICE 5230: Automatic Data Processing (ADP) Acquisition Authority; 15 MAR 84.

The purpose of this notice was to obtain economic benefit by increasing competitive acquisition of ADP resources and by reducing the lease of ADP equipment. Specific requirements and approvals were mandated for instances of non-competitive procurements and ADP equipment leasing.

SECNAVINST 5230.6A: ADP Approval Thresholds; Delegation of the Dept. of the Navy; 31 AUG 81.

The purpose of this instruction was to establish policy, identify approval thresholds and authorities, and assign responsibilities with regard to automatic data processing (ADP) acquisition and system development actions. COMNAVDAC was one of the key players in this instructions implementation.

SECNAVINST 5231.1(series): Life Cycle Management (LCM) Policy and Approval Requirements for Information System (IS) Projects.

This instruction provides a standard discipline for managing IS projects. It identifies the delegations of authority for approval of IS actions and their thresholds in the Department of the Navy. Contracting officers are precluded from processing any IS resource acquisitions lacking an approval required by this instruction.

SECNAVINST 5233.1B: ADP Documentation Standards

This is the Navy's Implementation of DODI 7935.1-S (Documentation Standards).

ADPSO INST 5236.1: ADP Proposal Evaluation and Selection Guidance; 20 JUL 82 (still current in 1988)

This is titled: "ADPE Requisition Preparation Guide" and it covers:

- (1) Purchase Request information;
- (2) Check off sheet for ADPE Acquisition;
- (3) Milestone listing which gives projected elapsed times between CBD announcement to award; and
- (4) User's guide to the development of specifications.

SECNAVINST 5236.1(series): Contracting for Automatic Data Processing (ADP) Resources.

This instruction is the Navy implementation of the direction provided by the Office of Management and Budget (OMB), GSA, and DOD as they relate to the acquisition of ADP equipment within the Navy.

SECNAVINST 5236.1B: Contracting for ADP Resources;
15 OCT 80.

Some policy excerpts from this instruction are:

- (1) ADP resources contracting will be performed at the local level to the maximum practicable extent;
- (2) To the maximum extent practicable, contracting for ADP resources shall be based on functional or data system specifications;

- (3) Specifications should contain provisions to satisfy estimated expansion requirements during expected use of the system;
- (4) The technical validation and evaluation of offers will be in accordance with the approved selection plan; and
- (5) Competition is the preferred method of contracting.

Note: For all contracts which it awards for the Commandant of the Marine Corps (CMC), ADPSO will transfer responsibility for contract administration to CMC.

SECNAVINST 5236.2(series): Automatic Data Processing Services Contracts.

This instruction promulgates policies and procedures governing the acquisition of ADP services, including definitive statement concerning reliance on private commercial sources, approval requirements for management studies and analyses, and accountability and responsibility requirements of SECNAVINST 5231.1(series).

SECNAVINST 5237.1(series): Automatic Data Processing Equipment (ADPE) Reutilization Program.

This series of instructions establishes policies and procedures pertinent to the Dept. of the Navy's participation in DOD's ADPE Reutilization Program.

SECNAVINST 5237.3(series): Automatic Data Processing (ADP) Resource Sharing.

This series of instructions establishes policies and procedures for DON participation in ADP resource sharing among government agencies.

**Marine Corps Orders (MCO), Directives, and Policy Statements
Delegation of Procurement Message (CMC 130941Z FEB 84).**

This message delegated ADPE procurement below the headquarters level. This message separated approval from contracting authority, established dollar thresholds, required commands to report their ADP inventories, and announced that future ADP procurement training sessions would be given.

MCO 5236: Acquisition of Information Resources (Draft)

This orders purpose is:

To formally delegate authority to approve and conduct procurements for certain Information Resources (IR) and to establish approval and contracting thresholds.

The following are excerpts from the order:

"Since February 1984, selected Marine Corps commands participating in the Information Resources Management (IRM) Delegation Program have been authorized to approve and procure information resources to meet local requirements."

"Requirements for IR's are subject to the life cycle management procedures contained in MCO P5231.1A."

"The approval authority for IR's is separate and distinct from contracting authority."

"CMC is the only one which can grant an exception to the DPA."

"Future technical publications are intended to be published under MCO 5271.1."

"Marine Corps requirements for IR's shall be met by Regional Automated Services Centers, except when it can be demonstrated that these service centers cannot provide the required resources in a timely and cost-effective manner. A RASC shall issue a Statement of Nonavailability of Information Resources when in-house resources are not available to meet the requirement in a timely and cost effective manner."

The order specifies that reutilization and sharing shall be considered as alternatives for achieving the LTOC (lowest total overall cost) objective.

The following approval and contracting thresholds were given:

Approval Thresholds

- (1) Competitive Acquisition (limit of \$150,000 per requirement)
- (2) Sole Source Acquisition (limit of \$50,000 per rqmt.)
- (3) Hardware Maintenance (\$300,000 competitive or \$50,000 sole source per requirement).

Contracting Thresholds

- (4) Field Contracting Offices (limited to \$150,000 and/or \$300,000 for maintenance).
- (5) Marine Corps Air Stations (Under cognizance of Naval Supply Systems Command).

"PMC funds or O&M funds should not be obligated for procurement of IR's unless O&M funds are available to support follow-on maintenance or support requirements."

It should also be noted that this order directs everyone to make plans and to submit these plans up the chain (for inclusion in the Mid-Range Information Systems Plan).

MCO 7100.10: Budgeting, Accounting, Maintenance, and Control of ADPE and OISE; 25 Jun 87.

The stated purpose of the order is:

"To establish policy and procedures, assign responsibilities, and implement such policy for budgeting, accounting, and controlling ADPE... for FMF units.. and for the Supporting Establishment (SE)..."

The order goes into great detail into how ADPE will be accounted for (e.g. Class 3 or 4 Plant Property; identification labeling; DD Form 1342; etc.) and disposed of.

The order directs FMF commanders and Reserve commanders to conduct an inventory of all ADPE/WPE/OISE; and assign TAMCNs (in accordance with the order).

The order directs commanders to establish allowances based on need; and load these allowances to the LUAF. (or the Mechanized Allowance List; MAL).

The order specifies the following responsibilities:

- (1) CMC (CCIR) will consolidate reports of receipted ADPE/WPE/OISE equipment which all units must submit to manage the inventory; have cognizance of disposition actions; budget and fund PMC requirements; and track replacement of equipment through the serial number.
- (2) CMC (FDA) will receive NAVCOMPT 167 reports and account for all plant property in accordance with NAVCOMPT Manual vol 3, Chap 6.
- (3) FMF Commanders shall inventory and designate all ADPE/WPE/OISE (plant or minor property) as local allowance (local TAMCNs or local NSNs) items. Assign local TAMCNs, local NSNs, and establish local allowances. FMF equipment to be used only in the SE will be reported as plant property to the command plant account office. Identify funds designated for maintenance and procurement (minor property) in the current budget, for all equipment redesignated SE equipment, for transition to the appropriate SE budget. Load allowances, on hand quantities, and serial numbers to the Reporting Unit Allowance File (RUAF).
- (4) The SE shall ensure an annual physical inventory. Identify funds for equipment redesignated FMF equipment, for transition to the appropriate FMF budget. Directs the maintenance of Equipment History Files in accordance with TM-4700-15/1.

APPENDIX B

ABBREVIATED SYSTEM DECISION PAPER (ASDP)

SECTION 1 MISSION NEED

1.1 Need. Outline the need for automation as related to specific elements of the organization's mission. Clearly identify and describe their relationship to the mission of the organization for which the system will be developed.

1.2 Priority. Describe the relative priority of the need to other mission needs of the organization.

SECTION 2 REQUIRED CAPABILITIES

2.1 User Requirements. Describe user requirements in functional terms.

2.2 Performance Requirements. Identify the standards by which the performance of the IS (Information System) is to be measured and the minimum standard of acceptable performance. These standards should be quantifiable and demonstrably measurable.

2.3 Interface Requirements. Describe the proposed IS's relationship with existing or proposed systems. Include the purpose of the requirement for the interface and the manner the interface is to be achieved.

2.4 Communication Requirements. Describe all potential communication support requirements to include projected volumes and types of data to be exchanged and the frequency of data exchange.

2.5 Classification Requirements. Describe the requirements for classified processing.

2.6 Operating Environment. Identify the operating environment in which the IS must operate. Address the requirements for the IS to operate in a deployed environment.

SECTION 3 PROPOSED ALTERNATIVE

3.1 General. Provide a summary of the preferred alternative to meet the need. Identify any assumptions or constraints considered in the selection.

SECTION 4 OTHER ALTERNATIVES

4.1 Current System. Summarize the current system.

4.2 Other Alternatives Considered. Summarize all other alternatives considered and explain why each was not selected as a proposed solution. This discussion should center on the technical and operational aspects of each alternative.

SECTION 5 COST ANALYSIS

5.1 Statement of Costs

a. Total costs for each year will be identified by appropriation (i.e., RDT&E, PMC, O&MN, MCON, etc.) for each alternative using the following guidelines:

	<u>One-Time Costs</u>		<u>Recurring Costs</u>	
	<u>ADP</u>	<u>NON-ADP</u>	<u>ADP</u>	<u>NON-ADP</u>
Personnel:				
Organizational				
Contractor				
Training				
TAD				
Equipment:				
Procurement				
Lease				
Maintenance				
Installation				
Site Preparation				
Telecommunications				
Software:				
Development				
Procurement				
Lease				
Maintenance				
Telecommunications				
Other				
TOTAL				

b. Costs will be summarized for each alternative in the following manner:

Period	<u>One-Time Costs</u>		<u>Recurring Costs</u>	
	<u>ADP</u>	<u>NON-ADP</u>	<u>ADP</u>	<u>NON-ADP</u>
1				
2				
3				
N				
TOTAL				

SECTION 6 BENEFIT ANALYSIS

6.1 General. Benefits, for this purpose, are beneficial effects on the mission effectiveness of the proposed IS. All benefits that can be identified should be listed and discussed for the proposed alternative.

SECTION 7 FUNDING

7.1 General. A statement regarding the availability of funding to support the life cycle costs of the proposed IS should be included. Identify the source and type of funding.

SECTION 8 PLANNING DATA

8.1 General. A discussion, if any, of the equipment considered in the analysis should be included. Indicate a milestone schedule to include dates for contract award, delivery of equipment, and implementation of the IS. [Ref. 25:p. G-1]

APPENDIX C

SURVEY PARTICIPANTS

I. Contracting Offices

- A. Contracting Office, Marine Corps Air Ground Combat Center, Twentynine Palms, California.
- B. Contracting Office, Marine Corps Base Camp Butler, Okinawa, Japan.
- C. Contracting Office, Marine Corps Base Camp Lejeune, North Carolina.
- D. Contracting Office, Marine Corps Base Camp Pendleton, California.
- E. Contracting Office, Marine Corps Base Quantico, Virginia.
- F. Contracting Office, Marine Corps Logistics Base Albany, Georgia.
- G. Contracting Office, Marine Corps Logistics Base Barstow, California.
- H. Contracting Office, Marine Corps Recruit Depot Parris Island, South Carolina.
- I. Contracting Office, Marine Corps Recruit Depot San Diego, California.
- J. Contracting Office, Marine Corps Air Station Cherry Point, North Carolina.
- K. Contracting Office, Marine Corps Air Station Yuma, Arizona.

II. ADP Professionals:

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- B. Information Systems Management Office, 2nd Marine Division, Marine Corps Base Camp Lejeune, North Carolina.
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- S. Information Systems Management Office, Marine Corps Base Butler, Okinawa, Japan.
- T. Information Systems Management Office, Marine Corps Base Camp Lejeune, North Carolina.
- U. Information Resources Center, Marine Corps Air Station El Toro, California.
- V. Information Resources Center, Marine Corps Air Station Yuma, Arizona.
- W. Information Resources Center, Marine Corps Air Station Kaneohe Bay, Hawaii.
- X. Regional Automated Services Center, Marine Corps Air Station Cherry Point, North Carolina.
- Y. Marine Corps Central Design and Programming Activity, Albany, Georgia.
- Z. Regional Automated Services Center, Marine Corps Base Camp Pendleton, California.

APPENDIX D

ADP GLOSSARY OF TERMS

Acquisition Plan: A document which records program decisions, contains the requirement, provides appropriate analysis of technical options and the life cycle plans for development, production, training and support of material items.

ADPE-FMF (Automated Data Processing Equipment-Fleet Marine Force): USMC program designed to provide an organic data processing capability to the unit commander. The ADPE-FMF refers to the IBM-4110 (Green Machine) suite of equipment.

ADP Support Services: Services, except maintenance services, that are adjunct and essential to agency ADP activities but do not involve the actual computation or manipulation of data by a computer. This term includes source data entry, computer output microfilming, conversion, training, studies facilities management of Government furnished ADP equipment, systems analysis and design, programming, equipment operations, and computer performance evaluation.

ADP Systems Security: The degree of protection of ADP equipment and data that is established through the application of technological safeguards, physical security measures, and administrative procedures applied to a sensitive application system, its component facilities and equipment, its software, and its data to ensure protection of a computer system and its telecommunications.

Class I System: An AIS that operates on a mainframe computer that is developed and managed by a functional manager for which the Director, C4 Systems Division provides technical support.

Data Base Management System (DBMS): A software system designed to allow the design, definition, manipulation, and storage of data within a centralized database. The major purpose of a DBMS is to allow multiple users to view the same data in different ways via relationships between data items. The benefit of a DBMS is to reduce or eliminate duplication of data for users who may view data relationships in different ways.

Deployable Force Automated Services Center (DFASC): The DFASC provides the MAGTF commander with essential data processing support for MEB size or larger units which are on extended deployment or in combat. The DFASC consists of a computer and associated peripheral equipment mounted in two semitrailer vans and is deployable to the combat service support (CSS) area.

Economic Analysis: A systematic approach to a given program, designed to assist the manager in solving a problem of choice. The full problem is investigated. Objectives and alternatives are searched out and compared in the light of their benefits and costs through the use of an appropriate analytical framework.

End User Computing (EUC): EUC encompasses source data automation, office automation, personal computers, local area networks, automated workstations, word processing equipment, and information center services.

End-User Computing Equipment--Fleet Marine Force (EUCE-FMF): The AN/UYK-83 microcomputer which has replaced the IBM-4110's (Green Machine) in the Marine Corps inventory.

Evaluation Criteria: Those factors used in determining which offer will be selected for award appear in Section M of the solicitation. The relative importance of those factors are within the broad discretion of agency acquisition officials. However, price or cost to the Government shall be included as an evaluation factor in every source selection. Quality also shall be addressed in every source selection. It may be expressed in terms of technical excellence, management capability, personnel qualifications, prior experience, past performance, and schedule compliance. Other relevant factors, such as cost realism, may also be included.

Five Year Defense Program (FYDP): The FYDP summarizes all programs of the entire Department of Defense. Resources or inputs required for five years are combined with military outputs or programs for the same period. The FYDP is expressed in terms of programs, program elements, and resource categories: (a) mission operations; (b) administration; (c) supply operations; (d) maintenance of material; (e) property disposal; (f) medical operations; (g) base services; (h) maintenance of real property; (i) utility operations; (j) other engineering support; (k) minor construction; and (l) personnel support.

General Accounting Office (GAO): An agency of the legislative branch, responsible solely to the Congress, which functions to audit all negotiated government contracts and investigate all matters relating to the receipt, disbursement, and application of public funds. Determines whether public funds are expended in accordance with appropriations.

Information: Any communication or reception of knowledge such as facts, data, or opinions, including numerical, graphic, or narrative forms, whether oral or maintained in any medium, including computerized data bases, paper, microform, or magnetic tape.

Information Management (IM): IM refers to the overall management and control of the investment in information, including identification and sharing of management information needs.

Information Resource (IR): Information itself and all resources related to its management; including personnel, equipment, funds, and technology.

Information Resources Management (IRM): The planning, budgeting, organizing, directing, and control associated with the creation, collection, processing, transmission, dissemination, use, storage, and disposition of information, both automated and nonautomated. It addresses the management of information itself as well as its related resources, including personnel, equipment, funds and the technologies of data processing, telecommunications, office system, and information management.

Information Resources Management Plan: The primary program management document that describes the development, acquisition, test, and support plans for computer resources, integral to, or used in, direct support of systems.

IRM System Security: The management constraints, physical structures, devices, personnel, and communications controls needed to provide an acceptable level of protection for classified material to be contained in an information system. (DOD Directive 5200.28, SECURITY REQUIREMENTS FOR AUTOMATIC DATA PROCESSING (ADP) SYSTEMS, December 18, 1972).

Information System (IS): An IS is the organized collection, processing, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual. (OMB CIRCULAR A-130, December 12, 1985).

Information Systems Steering Committee (ISSC): The ISSC is established as the designated arm of the ACMC Committee to oversee IRM related issues. The ISSC coordinates the application and use of AIS's consistent with overall Marine Corps objectives and resolves conflicts that exist among competing requirements. The ISSC also provides specific recommendations and/or alternative courses of action concerning IRM issues to the ACMC Committee.

Information Technology: The hardware and software used in connection with government information, regardless of the technology involved, whether computers, telecommunications, micrographics, or others. (OMB CIRCULAR A-130, December 12, 1985).

Life Cycle: The life cycle of an AIS covers that period from the mission analysis/project initiation phase until the system is replaced or terminated.

Life Cycle Cost: The total cost to the government of acquisition and ownership of a system over its useful life. It includes the cost of development, acquisition, support, and, where applicable, disposal.

Life Cycle Management (LCM): The process for managing and administering an IS over its life cycle with emphasis on strengthening early decisions which influence AIS costs and utility. These decisions must be based on full consideration of functional, ADP, and telecommunications requirements to produce an effective IS. (MCO P5231.1).

Lowest Total Overall Cost: The least expenditure of funds over the system/item life, price and other factors considered. Lowest total overall cost shall include purchase price, lease or rental prices, or service prices of the contract actions involved, other factors, and other identifiable and quantifiable costs that are directly related to the acquisition and use of the system/item; e.g., personnel, maintenance and operation, site preparation, energy consumption, installation, conversion, system start-up, contractor support, and the present value discount factor.

Marine Corps Central Design and Programming Activity (MCCDPA): MCCDPA's are under the operational control of the Director, C4 Systems Division, and are responsible for the design, programming, testing, implementation, distribution, documentation, enhancement, configuration management and maintenance of Marine Corps standard application software.

Marine Corps Data Network (MCDN): MCDN is a common user data communications network which provides terminal-to-computer and computer-to-computer communications to supporting establishment and FMF units in garrison. The MCDN architecture is based on the use of front end processors as the major nodal elements in the network.

Mid-Range Information System Plan (MRISP): The MRISP is a plan that provides information on the current status and future direction of the use of information resources and data communications technology within the Marine Corps. The MRISP provides a seven-year look ahead based on input from the functional managers and the Command, Control, Communications, and Computer (C4) Systems Division, HQMC.

Modem: Modems are used in data communications to transform digital data from a computer terminal to analog form for data transmission, and for transformation of analog data to digital for use by the computer system.

Operating System (OS): Software designed to control the components of a computer system (to include hardware and software) to achieve a system capable of processing data.

Purchase Request: Document which describes the required supplies or services so that a procurement can be initiated. Some procuring activities use other titles, such as Procurement Request.

Program Objectives Memorandum (POM): An annual memorandum in prescribed format submitted to SECDEF in May by the Secretary of a Military Department or the Director of a Defense Agency which recommends the total resource requirements and programs within the parameters of SECDEF's fiscal guidance.

Regional Automated Services Center (RASC); The RASC's are tasked with providing data processing support to both supporting establishment and Fleet Marine Force organizations within their designated or geographical areas. The primary responsibilities of the RASC is to provide day-to-day production support for all AIS's for designated activities, monitor telecommunication support their users, provide local programming support, and

perform trouble shooting services to supported activities. The RASC is under operational control of the commanding general of the base or station where they are located.

Remote Job Entry (RJE): RJE sites provide day-to-day production support for the AIS's used by supported activities. An RJE facility is equipped with a mini-or-medium scale computer, a communications processor, line printers and other peripheral equipment. RJE's serve to augment RASC data processing support, and to provide nodes to MCDN.

Software: Components of a computer comprised of programs designed to control hardware or perform tasks.

Source Selection: The process wherein the requirements, facts, recommendations and government policy relevant to an award decision in a competitive procurement of a system/project are examined and the decision made.

Specification: A document intended primarily for use in procurement, which clearly and accurately describes the essential technical requirements for items, materials or services including the procedures by which it will be determined that the requirements have been met. Specifications may be prepared to cover a group of products, services, or materials, or a single product, service or material, and may be general or detailed.

Tactical Data System: An interacting assembly of procedures, system processes, and methods which includes equipment specifically designed to collect, display, evaluate, and disseminate data for the purpose of supporting the command and control of military forms. The term specifically includes, but is not limited to:

- A. Tactical command and control systems
- B. Tactical computer systems and equipment
- C. Intelligence systems
- D. Sensor systems and equipment
- E. Communications systems and equipment

Teleprocessing: The combination of telecommunications, ADP systems, and machine interface equipment for the purpose of interacting and functioning as an integrated whole.

User: An organizational or programmatic entity that receives service from an information technology facility. A user may be either internal or external to the agency organization responsible for the facility, but normally does not report either to the manager or director of the facility or to the same immediate supervisor. (OMB CIRCULAR A-130, December 12, 1985).

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