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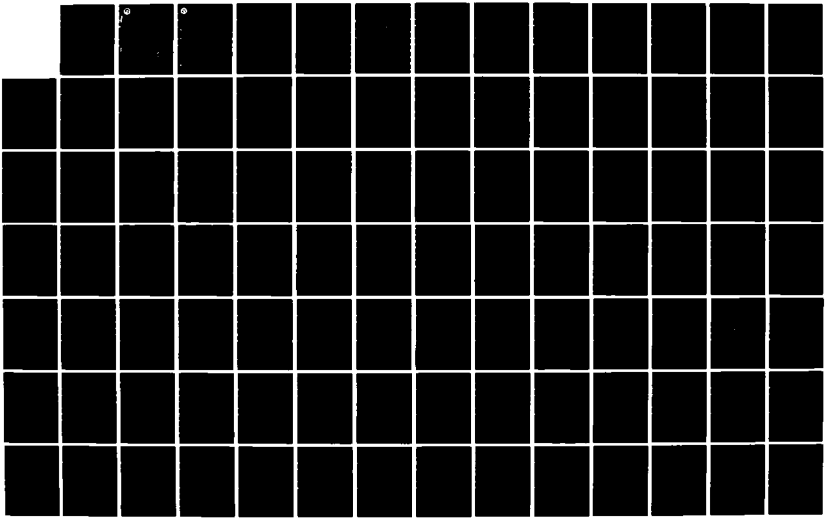

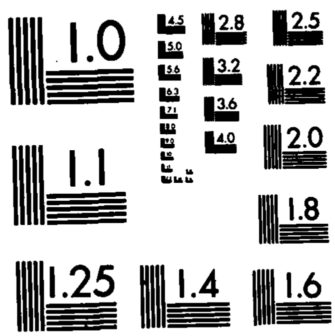

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SCN: 60-81-02

AUTOMATED INFORMATION SYSTEM (AIS) SUPPORT FOR FMF UNITS WHEN DEPLOYED OR IN COMBAT (1985-1995)

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13 APRIL 1982

FINAL REPORT

UNLIMITED DISTRIBUTION

COMMANDANT OF THE MARINE CORPS
CODE RD
HEADQUARTERS, U. S. MARINE CORPS
WASHINGTON, D. C. 20380

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

IN REPLY REFER TO
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60-81-02
19 Oct 1982

From: Commandant of the Marine Corps
To: Distribution List

Subj: Automated Information System (AIS) Support for FMF Units When Deployed or in Combat (1985-1995) (Deployed AIS-88) Study (SCN: 60-81-02)

1. The objectives of the study were:

a. To determine and document the concept of operations for each appropriate AIS for FMF organizations when deployed or in combat operations.

b. To determine and specify the requirements, if any, for additional automated data processing equipment and/or telecommunications support for the AISs.

2. The objectives of the study were met.

3. The recommendations as set forth in the study are concurred in with the exception of recommendation III. The decision concerning the development for deployment of manpower data bases is deferred pending the outcome of operational testing of the deployable Force Automated Services Center, upgrades to the ADPE-FMF device, and the fielding of REAL FAMMIS.

4. A copy of this letter will be affixed inside the front cover of each copy of the subject study report prior to its distribution.

Eugene B Russell

Eugene B. RUSSELL
DEPUTY CHIEF OF STAFF FOR RD&S

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Nine Class I AIS's have been identified and their deployed concept of operations documented. Three of the systems are aviation-oriented and will operate on hardware and software provided by the Navy. Forty percent of the deployed processing will be for Class II and III AIS's which have not been specifically identified nor their

operational concepts documented. It was generally agreed that revision to manual operations for major Marine Corps administrative functions would be difficult if not impossible making a deployed automated processing capability a necessity. The MASC concept has evolved as the means to provide the capability; the concept will be tested with the acquisition in late 1982 of an experimental FASC. The MASC must be operable in garrison, aboard ship and echeloned into the AO near the beginning of the continued operations ashore phase. The MASC concept will provide a flexible reliable means for processing deployable AIS's.

M00027-78-G-0061
DO 0099/02/0005AA

FINAL REPORT

DEPLOYED AIS-88

STUDY

Automated Information System (AIS) Support for FMF Units When Deployed or in Combat (1985-1995)

13 April 1982

PREFACE

This study was complex in its objectives and broad in its scope. The Marine Corps and Navy military and civilian personnel responding to the requests for information were open, objective and exceptionally cooperative in providing data, procedures, references, and insights for MACTF AIS operations in the 1988 deployed environment. The PGRG Study Team is profoundly thankful for the professional contributions provided by the several hundred study respondents.

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EXECUTIVE SUMMARY

1 INTRODUCTION

(Paragraphs in this Executive Summary are keyed to chapters in the main body of the report).

The Marine Corps is committed to conduct its administrative functions with automated information systems (AISs). In most cases, the manual systems have atrophied and trained personnel and manual forms are gone. Having interviewed several hundred Marine Corps personnel (and others) during the course of this study, it was abundantly clear that the respondents perceive the need for deployable processors for the purpose of operating deployed AISs. Although the time frame of the study is 1985-1995, the selected target year was chosen to be 1988.

1.1 STUDY PURPOSE AND OBJECTIVE

This is the first major study concerning deployable AISs which places realistic bounds on telecommunications support for deployed MAGTFs - this required AIS proponents to rethink the deployed concepts of operation for AISs.

1.1.1 Study Purpose

The purpose of the study is: To document the AIS concepts of operation for deployed (including combat) FMF units with a view toward justifying deployable MAGTF Automated Services Centers (MASCs). Based on the stated primary purpose of the study, several study requirements were defined which include:

- Identification of deployable AISs
- Documenting deployed concepts of operation
- Development of areas of concern
- Integration of operational concepts
- A hardware sizing estimate
- Provide the basis for justifying deployable ADP support

1.1.2 Study Objective

Utilizing an iterative interview technique, document preliminary operational concepts for deployed AISs then through additional interviews, prepare an integrated, Marine Corps-wide initial concept of operations. These documented concepts then become the basis for development of deployable AISs and the acquisition of mobile hardware for their processing support.

1.2 BACKGROUND

The Marine Corps has shown considerable interest in providing deployable automated processing support for MAGTF. The work commenced in 1972 and continues with this current study effort. A telecommunications working group was formed in HQMC in August 1972 which tasked the Navy Electronics Laboratory Center (NELC) to define combat teleprocessing requirements for each FMF command. In May 1975, Booz-Allen and Hamilton, Inc., reported in a study to HQMC, a methodology for requirements determination. An Advanced Amphibious Study Group (AASG) study in early 1975, was to identify the major problems and deficiencies of AISs in the Marine Corps and propose conceptual goals and objectives for the 1980s - this study was not carried to fruition.

Next, the emphasis for studies was shifted to smaller, battalion/squadron-level processors. Two studies, one by Stanford Research Institute (SRI) in 1977 and one by CALCULON in 1978 established the basis for acquiring source data automation (SDA)/ADPE-FMF (green machine) devices. The devices have proven to be a highly, worthwhile addition to the processing power in the FMFs.

In 1977, the GAO reported to the Congress that inadequate deployed automated processing capability existed for the Marine Corps. A lack of a long-range integrated administrative and tactical plan and a superficial determination of user requirements were cited which could utlimately impair the Corps' ability to carry out its assigned missions.

Computer Sciences Corporation (CSC) completed a study in 1979 pertaining to fixed processing requirements of the Marine Corps - deployed processing was not a study consideration.

Potomac General Research Group (PGRG) completed a study in March 1980, the MAGTF Teleprocessing Requirements Study, directly relatable to this study. The PGRG study objectives were to identify deployable AISs, determine their data transfer requirements, then determine LFICS deficiencies and provide recommendations. The study conclusions were that significant short falls existed in LFICS for telecommunications <u>external</u> to the AOA and that a mobile processor was necessary to support deployed AISs in the 1985 time period. Guidance for the MAGTF study permitted a definition of telecommunications requirements without constraints for a deployed MAGTF; as a result, manpower data transfer requirements were quite large; they have since been reduced significantly.

Two additional, recent studies have been completed by PGRG - the LFICS in the Midrange Study and the Integration of C^3 Study. Both of these studies placed emphasis upon tactical automated systems (MTACCS) but did include refinement of AIS operational concepts and the LFICS deficiencies, the need for AIS and tactical system interfaces, and recommended mobile processors for deployed MAGTFs.

This study was therefore initiated with strict, but realistic limitations on deployed telecommunications capabilities and a concerted effort to clearly document concepts of operation for deployable AISs.

1.3 STUDY ASSUMPTIONS

Seven assumptions were developed within the study framework. The key assumptions follow:

- Normal deployed data transfer will be with other than telecommunications; enhanced, deployed data transfer using telecommunications may be available for critical but limited transfers.

- Class II and III AIS processing will be 33 percent of all deployed.
- Deployed processing will be accomplished on ADPE-FMF devices and their commercial counterpart, and MASCs.
- Emerging AISs must be deployable; i.e., modular programs
- MARCORS scenarios are utilized for deployed activity rates for amphibious operational phases and MAGTF force structuring.

Software is the only unbounded component of the study thus note-able emphasis is placed upon deployable software systems.

2 SCENARIOS AND FORCE STRUCTURE

This study is not intended to be scenario-dependent, however, standard approved Marine Corps (MARCORS) scenarios were utilized to establish a combat tempo and the force structures. MARCORS 1 was utilized for a MAF force structure and MARCORS 3 for the MAB; the force structures are listed in Annexes D and E of the main report. MAUs were eliminated for detailed study in that their AIS operational concepts required only ADPE-FMF devices, smaller than the MASC.

The amphibious operational phases utilized for the study are as follows:

- Phase I - Garrison. Normal garrison operations supporting deployed preparedness - i.e., some MASCs are identified as operational in garrison, some not.
- Phase II - Preembarkation/Embarkation. A highly transitional phase with changing task organizations and ship's loading plans with significant efforts to prepare and deploy current AIS data bases.
- Phase III - Afloat. The time during which rehearsals, ships cross-loading and prepartion for an assault will occur. A deployed MAF or MAB could likely survive this phase for a few

days without a MASC processing capability, however, longer periods afloat generate the need for a MASC capability.

- Phase IV - Assault. This highly active operational phase would be supported from a MASC aboard ship with a great deal of support provided to the TACLOGs (and Navy Control Centers). Generally, the MASCs would not echelon ashore until the force beachhead line (FBHL) is established.

- Phase V - Continued Operations Ashore with a Theater Airfield Echelon (TAE). During this phase, MASCs would echelon ashore and the greatest AIS processing load is anticipated with replenishment transactions for resources consumed during the assault phase. Further, this operational phase creates a more complex processing environment since many of the aviation units are located several-hundred miles distant from the AOA.

Other operational phases (continued operations ashore with the TAE phased into the AOA, retrograde, reembarkation, etc.) were not included within the study bounds since these phases would result in an equivalent or lesser complex deployed processing requirement than those in Phases I through V above.

3 AIS OPERATIONAL CONCEPTS

3.1 INTRODUCTION

The AIS operational concepts were documented from literature research and interviews with several hundred persons from most echelons in the Marine Corps. Study references are listed in Annex A to the main report and the results of interviews are contained in Annex C. Inputs for operational concepts for each of the five major administrative functions accomplished by the Marine Corps are documented and summarized in the following subparagraphs.

3.2 MANPOWER/MILITARY PAY

The manpower and military pay functions are currently accommodated with JUMPS/MMS. JUMPS/MMS is not amenable to deployment because their system designs call for large fixed computers and a great deal of input from documents which are primarily in the form of diskettes. The planned replacement for JUMPS/MMS is REAL FAMMIS. REAL FAMMIS is nearing its design phase and provides for a limited, deployed processing capability.

3.2.1 Manpower

REAL FAMMIS is currently planned to provide processing support from the MCFC, RASCs and programmable terminals (PTs) at the battalion/squadron level in the FMF and in general, non-programmable terminals (NPTs) for the remainder of the Marine Corps. The PTs will be utilized in a method similar to the ADPE-FMF devices currently in the inventory except they will be more powerful devices due to faster processing and a limited local manpower data base. Since the local data base will contain 6-10,000 characters per Marine (20,000-plus at Kansas City) a full range of input edits may not be conducted; the local data base will be updated where feasible. Current planning provides for input transactions from the PTs on diskettes which will be forwarded to the deployable MASC where data will be merged and in turn, forwarded most likely to Kansas City. The central design and programming activity at Kansas City will perform full-range edits upon the input transactions and prepare an update tape and error listing. The update error listing will be returned to the deployed MASC for data base update; the MASC will, in turn, create update diskettes for the PTs.

One will note that a MASC operating in an AOA would contain a limited MAGTF data base which would be from 10-30 days old. The age of a deployed manpower data base was of great concern in both FMFs and does not follow the general principle that deployed data bases be both timely and accurate.

3.2.2 Military Pay

The military pay portion of REAL FAMMIS will be conducted during deployments with a bookkeeping, accrual accounting system using ADPE-FMF devices. A 256 character record will be maintained upon the ADPE-FMF devices (larger on PTs) based upon a pay-option-election system (POES) selected by each deployed Marine. He receives his pay based upon the POES with residuals submitted by diskette to Kansas City for central accrual. This bookkeeping system provides sufficient flexibility to respond to emergency situations but with all pay processing centralized at Kansas City, does not provide a interface with the deployed manpower portion of REAL FAMMIS.

3.3 POLICY, PLANS AND OPERATIONS (PPO)

HQMC, PPO is responsible for one Class I AIS-UNITREP (the replacement for FORSTAT). A monthly UNITREP report is required by the JCS/CMC from each RU of 5-card images (80 column card). Infrequent reports are required during a deployment and require a one-card image each time a unit status change occurs. Heretofore, FORSTAT was prepared on manual work sheets which were reviewed and checked as they passed through channels to the division/wing/FSSG-level where the data was key-punched. The key-punched data was transmitted by the most rapid means available with checks at intervening echelons, to the JCS/CMC.

An emerging, and most likely to be approved, concept for UNITREP is the preparation of input data at the lowest level upon ACPE-FMF devices. The transaction diskettes would follow the old FORSTAT channels and be transmitted/transported to the JCS/CMC as rapidly as possible. The input transaction data would be merged at the MASC level for deployed MAFs and MABs. Since UNITREP reports like most other combat status and readiness reports are generally classified, their processing on ADPE-FMF devices or a MASC will require appropriate security measures.

3.4 AVIATION

Today's aviation AISs are generally supported with Navy-supplied hardware and software. The Navy hardware, AN/UYK-5As (UNIVAC 1500s) are located with each MAG and are old and suffer from processing-saturation and breakdown hence FREDS, SNASS and 3M are generally processed on FASCs or RASCs; the UNIVAC 1500s generally operate only SUADPS. The Navy is currently acquiring SNAP hardware and developing NALCOMIS software for implementation in the 1983-1984 time period. The SNAP hardware configuration will perform all aviation-oriented processing at the MAG level including FREDS and other Marine aviation Class III programs.

Two significant processing capabilities are missing in support of deployed MAW operations. First is a capability to amass (blue) information from the MAGs (SNAP/NALCOMIS) for the purpose of developing wing-level, aviation-oriented management reports. The Navy's NALCOMIS has no capability to aggregate information above the MAG-level; the manual aggregation of MAG information is so cumbersome that it is frequently not accomplished. Secondly, the MAW and major elements thereof operate in remote locations such as islands or other countries. In these instances a need not only exists to aggregate 'blue' information for the MAW-level but also to provide a 'green' processing capability for the major Class I systems such as REAL FAMMIS and M3S/MIMMS. The scenario utilized for this study would strongly favor a MASC in support of the theater remote airfield.

During the development of aviation-unique deployed AIS concepts of operation, several areas of concern evolved which are briefly discussed later in this summary under "Areas of Concern".

3.5 FISCAL

The major fiscal system for FY-1984 is SABRS which will replace the currently utilized MAGFARS. SABRS will not be a deployable AIS, however two fiscal sub-functions will deploy. The CFAO function will deploy in 1988 as a manual system while DOV will operate upon ADPE-FMF devices. The deployed military pay system is included within REAL FAMMIS. The deploying disbursing office (DO) will be provided blocks of voucher numbers and will prepare transactions for all non-pay-related disbursements. For example, one block of vouchers would be for travel. Probably on a weekly basis, data diskettes would be transported to the MCFC, processed through the DOV system which will interface with SABRS and reports returned to the deployed DO. The deployed DOV AIS would not require processing support from a MASC. The deployed fiscal AIS creates a negligible processing requirement. The greatest level of DOV processing activity occurs when MAGTFs are operating in an AOA. The number of ADPE-FMF devices deploying with a MAGTF for the fiscal function would be proportional to the size of a MAGTF, the maximum being 4 to support a MAF with shared processing for a MAU.

3.6 LOGISTICS COMBAT SERVICE SUPPORT (CSS)

The significant current CSS AISs are SASSY, MUMMS, MIMMS and MEDS. In 1988, SASSY and MUMMS will be combined into the emerging M3S which will interface with MIMMS; MEDS recently operated on RASCs, is being replaced on an interim basis by SEMS which is processed upon ADPE-FMF devices and potentially on the MASCs.

The emerging M3S system is of key importance for deployed MAGTFs with user personnel trained to operate this AIS. MIMMS, which interfaces with M3S, will share an identical user environment. M3S/ MIMMS create, by far, the largest need for a deployable AIS processing capability (about 56 percent of all deployed AIS processing). The M3S/MIMMS data base and processing for deployed MAFs and MABs would reside upon a MASC; individual unit and combat service support element (CSSE) data bases, and processing including transaction edits would be accomplished upon ADPE-FMF devices. M3S/ MIMMS will experience a perturbing operational environment in preparing to deploy as the MAGTF is task-organized and deployable data bases must be prepared (either on MASCs or RASCs-dependent upon SOPs). While afloat, M3S/MIMMS processing needs will be noted for rehearsals and changes in MAGTF task organization, however, these AISs will not generate any measurable processing until the assault phase.

Since CSS is preplanned during the assault phase, the tempo of M3S/MIMMS processing will increase but will become the greatest during continued operations ashore as assault supplies are exhausted and MAGTF resupply based upon demand commences. It was further determined that when feasible supply and maintenance elements of the FSSG need hardwired data communications access to the deployed MASC.

SEMS is the AIS that provides management control for personnel, supplies and equipment for embarkation and debarkation (assault) for deployed operations. SEMS is replacing MEDS and may be operated upon ADPE-FMF devices or MASCs, or both in the 1988 time period. Embarkation operations are supported by planning functions relating to ship loading and assault operations are supported by positive controls for resource unloading. When all resources accompanying the MAGTF are unloaded into an AOA, SEMS reverts back to a status of developing and maintaining unit embarkation data bases.

While documenting the CSS deployed operational concepts, some areas of concern were identified by study team members which are discussed later in this summary under "Areas of Concern."

3.7 NAVY SUPPLIED AISs

During the afloat phase of MAGTF operations, the Navy shares shipborne, fixed hardware/software suites to support many Marine Corps deployed administrative processing requirements. This support on LHAs is provided by MIS operating on AN/UYK-7(V)s. The LHA suites are receiving additional processors to better support MIS processing. The LCCs operate ASIS (similar to MIS) on AN/USQ-20(V)s; a 1984 ship alteration for LCCs will replace the AN/USQ-20(V)s with MIS processing suites and ASIS will no longer exist.

MIS requires a great effort in data base preparation for embarkation, is limited in its processing capability, is not compatible with Marine Corps AISs and will not transition into an AOA hence MIS is of little value to deployed MAGTFs.

3.8 NON-CLASS I WORKLOAD

A detailed analysis of FMF processing was conducted at the Camp Lejeune RASC revealing that 33 percent of the FMF processing was for Class II and III systems. No effort was made within this study to identify specific Class II and III deployable AISs or their processing requirements, however, the deployed ratio is approximately equal (32.4 vs. 32.1%) that for peacetime garrison operations.

3.9 SUMMARY

The MASC supporting deployed MAFs and MABs in the 1988 time period will perform multifunctional processing. Therefore, the concepts of operation documented in this study must be aggregated in order to avoid the tendency to justify individual processors to support individually deployable automated functions. The major deployable processing requirements may be roughly summarized as follows:

- CSS at 56 percent
- REAL FAMMIS at 8.5 percent
- Total other at 33 percent

4 MASC OPERATIONAL CONCEPTS

4.1 INTRODUCTION

It is often suggested that commerical computers (slightly ruggedized frames) in a semi-trailer won't work. This philosophy or attitude has proven to be unfounded. Commercial communication switches and terminals have been in use since the 1950s. Mobile administrative, functional, commercial computers have been utilized successfully by the Marine Corps since the mid-1960s. More recently, one Service (USAF) plans to conduct its deployed personnel management function with commercial minicomputers mounted in recreational vehicles/motor homes. The Marine Corps is developing an experimental, mobile, commercial minicomputer for the purpose of testing deployed processing concepts. The MASC would be utilized to perform such generic functions as front-end edits, on-line query with a DBMS, operational processing and maintenance of current data bases, and the preparation of reports. The study team firmly believes that the questions being answered are: how many MASCs of what size should be where to perform which functions? The remainder of this subparagraph provides a direction for the answers - but not in the order asked.

4.2 MASC OPERATIONAL CONCEPTS BY PHASE

Each major, deployable AIS must be supported by a processor and a data base to accomplish functions and tasks associated with data aggregation, edit, on-line query and preparation of management reports. This automated support may be provided with MASCs - semitrailer-mounted minicomputers. The MASC-type configuration has proven a feasible means of providing automated support in a deployed, military environment; further, the Marine Corps is acquiring a mobile FASC (MASC) to test the concept in a Marine specific environment. The MASC is envisioned as mounted in two standard 35-foot vans. The sizing for a MASC is estimated in Annex F of the main report. It is imperative that the MASC be hardware and software compatible with fixed Marine Corps processors. In the following subparagraphs, the operational concept of MASC operations is addressed for a MAF and a MAB proceeding through the five phases of an amphibious operation.

4.2.1 Garrison Concept of Operations - Phase I

Three options have been identified from the interview process for garrison MASC operations; they are:

- Continuous MASC operations
- Periodic MASC training operations
- Power-up, exercise MASC

The selected option is to be determined but would probably be a matter of command SOP commensurate with any minimum operational standards and guidance established by CMC.

Continuous MASC operations would be characterized by the MASC operating as it would when deployed. A MASC operating in garrison would minimize the FMF processing load on the local RASC in that many input transaction errors would be detected and corrected at the MASC level plus many inquiries and reports could be prepared at the MASC level. Additionally, continuous MASC operations in garrison would provide the best trained personnel upon a deployment.

Periodic MASC operations could be conducted for training purposes. This option would most likely call for data base off-loading from a RASC. Loading upon the MASC would be for at least one cycle of operation for each major, deployable AIS. The output from MASC training cycles must be input to the RASC to insure continuing hardware, software and operational compatibility.

A minimum requirement will exist to power-up and exercise the MASC, a characteristic for reliability of significant ADP configurations. The manufacturer's recommendation for periodic power-up should be considered, however, the PGRG study team recommends a power-up on a weekly basis. If the operation-for-training option were selected on a monthly basis, weekly power-ups would still be required.

4.2.2 Preembarkation and Embarkation - Phase II

This is a phase during which MASC operations will be intense. As units and equipment are organized for deployment, data bases must be prepared and/or continually updated for the deploying MAGTF. When normal, garrison MASC operations are conducted, the intensity during preembarkation will be minimized since MASC data bases will be current at the start of preembarkation. The final stage of embarkation will be preparing two sets of tapes for each data base; one set for the MASC assigned primary processing responsibility and a second set of tapes for the MASC assigned responsibility for continuity of operations, and is on another deploying ship.

4.2.3 Afloat - Phase III

The afloat processing may be accomplished upon a MASC or a fixed suite of compatible equipment provided by the Navy. How the afloat processing will be accomplished is an area of concern discussed later in this summary.

The afloat processing requirement is very small and will increase somewhat as preparations for an assault commence, however, upon assault, up-to-date data bases will be of key importance. The continued use of the Navy-provided afloat systems ASIS and MIS is not recommended since they are neither compatible with nor responsive to deployed MAGTF AIS needs.

4.2.4 Assault - Phase IV

The assault phase will place significant reliance upon CSS and Manpower AISs; SEMS for debarkation, M3S for logistics and REAL FAMMIS for personnel management activities. It is envisioned that the MASC would operate aboard ship during the entire assault phase.

4.2.5 Continued Operations with TAE - Phase V

With the achievement of the FBHL, the MASCs would be echeloned ashore. For a MAF, the first ashore MASC would be placed with the FSSG where the greatest processing requirement will exist; when operational in the FSSG, current data bases would be transferred ashore. The second MASC would echelon to the division (or MAF) with an emphasis upon manpower processing. The third MASC would deploy ashore for support of the MAW. The fourth MASC, if available, would deploy with and support the TAE. It is envisioned that MABs will deploy with two MASCs. One will be in use and one for a spare. The spare also provides the capability to echelon a MASC into the BSSG and provide continuity of operations from a MASC aboard ship. When the second MASC is ashore, it would be located with the MAB headquarters.

4.3 SUMMARY - DEPLOYED MASC OPERATIONAL CONCEPTS

Deployable MASCs will support the deployed processing needs for AISs. The perceived minimum and maximum Marine Corps MASC provisioning is shown in the following table.

TABLE S.1

MINIMUM/MAXIMUM MASC PROVISIONING

Supporting	Minimum	Maximum
I MAF	2	4
II MAF	2	4
III MAF	2*	4*
1st Brigade	1	1
PWRS	0	1
TOTAL	7	14

*1st brigade subsummed by III MAF

5 AREAS OF CONCERN

5.1 GENERAL

The original study charter provided only for the documentation of AIS operational concepts for deployed MAGTFs. During the course of the study, analysis of several functional operations revealed situations which became 'areas of concern' for study team members. Upon reporting these areas of concern to the SAC, it was mutually agreed between the SAC and PGRG that the areas of concern would be included within this study report with a purpose of providing information for further consideration within the Marine Corps.

Following is a brief synopsis of the concerns.

5.2 COMMUNICATIONS

Study guidance provided that very limited telecommunications is available for deployed MAGTFs. Personnel from the field view the introduction of CONUS-oriented, interactive AISs into the AOA as further justification of the need for improved telecommunications support for deployed units. The Commanding General of the 1st Marine Brigade reiterated "that the Navy must provide communications and that communications remain a problem for deployed MAGTFs". A resolution appears necessary for this two-sided issue.

5.3 HIGH VISIBILITY AVIATION SYSTEMS

Congressional budget cutbacks have resulted in significant reductions in aviation repair parts. To counter the decreased aviation supply "pipeline," highly visible, interactive automated systems have been implemented which are dependent upon commerical telephone and remote computer systems for their interactivity. Study team members asked several aviation supply personnel what they would do when deployed. The answers were unanimous - I don't know. One person stated that if the parts are not on the carriers in combat, they won't get there. A great deal of uncertainty was expressed in both FMFs regarding the impact of losing their garrison-oriented systems.

5.4 CLASS V(W) AND V(A)

The bulk of ground ammunition and aviation ordnance is managed utilizing manual management systems. Some FMF units were observed and documented as using automated or semiautomated systems to both manage local Class V assets and also for the purpose of providing periodic ammunition/ordnance status reports to HQMC. The development and implementation of a standard ammunition/ordnance AIS may improve the management of this function for deployed operations.

5.5 SHIPBOARD MAGTF AIS PROCESSING

Afloat MAGTF AIS processing is conducted upon Navy systems - ASIS on LCCs and MIS on LHAs. The Navy systems are and will be upgraded with ship alterations, however, the upgraded systems will not be adequate due to a lack of compatibility with Marine Corps AISs and the design of ASIS and MIS - data update and retrieval with no significant processing. Also, the ASIS and MIS data bases are not deployable ashore. For the afloat and assault phases of MAGTF operations, the CLF requires either a MASC or a MASC-compatible fixed suite of equipment aboard ship upon which to process deployable AISs. Initial contact with the Navy about shipboard MASCs was satisfactory. Further, dialog is indicated with the Navy pertaining to afloat processing of AISs.

5.6 PROLIFERATION OF NONSTANDARD SOFTWARE

A detailed analysis was conducted to determine the portion of FMF processing which is devoted to Class II and III processing - it was 33 percent. One FMF studied its logistical AISs and found that 55 different local output reports were attributed to SASSY (the FMF is doing something about this situation). The 33 percent non Class I processing and the large number of nonstandard AISs indicates a great deal of resources are being expended to maintain, enhance and document these systems. The study team suggests a harder look at possible tighter controls over the proliferation of nonstandard AISs.

5.7 ADP MANAGEMENT STRUCTURE

MCOs 5230.8 and .9 and Developmental Bulletin 1-77, Command and Staff Action for ADP Systems, pertain to software control and management. Most of the software maintenance management responsibilities rest with the functional managers with implementation by the CDPAs. The addition of a change control board with C^4 membership would assist in the coordination and efficiency of planning and implementing changes to Class I AISs. A suggested combined management structure is depicted in Figure 5.7 of the main report.

5.8 MODULAR SOFTWARE

Several major, new AISs (REAL FAMMIS, M3S, SABRS, SEMS, NALCOMIS, et al.) will be implemented in the midrange time frame. Most of the systems are deployable. Therefore to provide both a fixed and a deployed processing capability, the systems must be designed and programmed to be modular. The modular software will provide an easy and inexpensive capability to provide software for each mode of operation--fixed and deployed. The study team observed and heard that some of the systems will emerge from current systems; this does not indicate modular software and hence is of concern. There is a fear that deployable software will not be readily available for deployed operations in the midrange time frame.

5.9 RETURN OF TRANSACTION ERRORS

The new AISs operated at the RASCs rely heavily upon interactive front end edits to detect input transaction errors - a principal feature of interactive systems. The deployed AISs will lose much of this capability causing the management of error return to be crucial in deployed operations.

5.10 LOCATION AND OPERATION OF MASCs

The greatest MASC requirement, support of a MAF, may be provided with up to four MASCs. One MASC each would be oriented toward logistical processing at the FSSG and manpower processing at the division (or MAF headquarters). The third MASC would provide an information aggregation capability from the MAGs for the MAW. The potential fourth MASC would be available to support a TAE or as a spare. The operation of four MASCs will require a company-sized unit in a MAF. Also, operations will be enhanced when the separation between the physical location of MASCs and their high priority users is short enough to permit a "hard wired" interactive processing capability.

5.11 DATA TRANSFER AT SEA

Data transfer while at sea will normally be accomplished by helicopter due to EMCON and other conditions. Frequently, however, helicopters are not available for this data transfer function due to weather or assignment to other missions. There is no other reliable means of transferring AIS data between ships on a timely basis - an area of concern.

5.12 FORCE STRUCTURING

Within Marine Corps AISs, difficulty may be encountered during force structuring for a deployment in aggregating complete or partial RUCs and small detachments which otherwise lose their identity. This also applies to the Rapid Deployment Force (RDF). In addition, no AIS interfaces were found to exist or planned for with other services which may be a necessary reality for RDF operations.

5.13 STRATEGIC MOBILITY, MOBILITY AND MOBILE ELECTRIC POWER (MEP)

MASCs are deployable by land, sea or air, based upon priority. Local mobility may be provided with a 5 or 10 ton tractor, however, who provides the tractor? Each MASC may require up to two 100 KW MEPs - a problem area expressed by several interviewed pesonnel. The identification of ancillary support equipment required to operate the deployed MASC is an area of concern.

5.14 CRT ACQUISITION FOR EMERGING CLASS I SYSTEMS

Planning documents for REAL FAMMIS, M3S/MIMMS and SABRS, the emerging major new Class I AISs, each identify CRT terminals/printers associated with each system. In counting CRTs for the three systems, some 2,200 terminals are involved which include several hundred for FMF applications. Several questions arise from the above observations such as:

- Have the terminal applications been considered for integration including shared printers - meaning multi-functional use of one terminal for co-located functional terminals?
- Will deployed MAGTFs be properly supported by nonprogrammable terminals when deployed?
- Where will they be located in the AOA?
- How will they be supported?

It appears that the quantity and location of terminals supporting the major emerging AISs (and probably others) would warrant additional consideration during the system development processes.

5.15 MILITARY PAY FOR NAVY PERSONNEL

Navy personnel attached to MAGTFs will be paid by the MAGTF disbursing officer in the same manner as for Marine personnel. Periodic records will be forwarded to the Navy finance center of transactions made during the deployment. No standard procedure was identified for performance of this function.

5.16 REPLACEMENT OF CASUALTIES

Marine Corps personnel entering the Navy medical evacuation system are "lost". This is crucial for low density MOSs, particularly within the MAW and the FSSG. Manpower management personnel must take extraordinary action for priority replacement of these key personnel; on the other hand, these wounded/ injured key personnel may return to duty in a few days or a week and obviate the need for extraordinary personnel replacement action. The Marine Corps may consider coordination with the Navy to develop an evacuation tracking and status system.

5.17 AIS SYSTEM INTERFACES

Several automated systems have, to date, been identified with a need for automated or semi-automated data interfaces with Marine Corps AISs. In general, the data flow passes from the AISs into other automated systems such as in the following examples:

- IDA - the Navy Integrated Disbursing and Accounting System
- MTACCS - the Marine Corps family of tactical automated systems
- ASIS/MIS - the Navy-provided shipboard systems
- SAILS - the Standard Army Intermediate Logistics System
- Other Services and allies

The interfaces are discussed in generic terms; data element contents and formats are needed in addition to the form of the interface media, i.e., electronic, magnetic or manual.

5.18 INTERACTIVE ACCESS TO MASC

Interactive access may be provided to the MASC for garrison operations and aboard ship for users which may be cabled (hardwired) to the MASC. In the AOA, however, telecommunications will not normally be available for interactive AIS processing. Interactivity may only be assured in the AOA when the priority user is sufficiently close to permit cabling. Normal cabling has an operational range of 1500 feet and with simple amplifiers, will transmit for miles. There is a practical wire-length limitation for the installation and maintenance of wire.

The physical layout of high-priority user facilities will become important for interactive processing with a MASC in the AOA. Organizational and physical considerations may need to be reviewed in light of the interactive processing supported by the MASC.

5.19 OTHER AREAS OF CONCERN

There are several areas which are more closely associated with the MASC concept and operations. Among these are the following:

- Disaster Recovery. Procedures need to be developed for recovery attributed to equipment failures and/or combat losses. Designation of alternative MASCs and frequent exchanges of tapes among the MASCs might provide a solution.

- Lift Requirements. The paucity of shipping has resulted in stringent demands as to personnel, equipment and materiel to be transported to the AOA, particularly in the assault echelon. Inclusion of one or more MASCs in the assault echelon will invariabley compete with space needed for the assault elements of the MAGTF. Consideration might be given to flying a portion of the MASC capability into the AOA.

- Timeliness of Data. For AISs to function effectively, timely provision of data is mandatory. Within the AOA, provisions must be devised for the transportation and collection of diskettes since most input data will be in this media. Also there will be differences in the data bases maintained within the AOA and those external to the AOA.

  The difference will be due primarily to the means by which tapes, data, etc. are forwarded from the AOA to CONUS and vice versa.

5.20 SUMMARY: AREAS OF CONCERN

Many of the areas of concern have no direct bearing upon deployed AIS processing as envisioned in the intended scope of the study. The study team, in cooperation with the SAC, has included this discussion of areas of concern illuminated during the normal course of data collection and documentation of deployed AIS operational concepts. Several of the areas of concern contain alternatives and/or suggested solutions. The areas of greatest concern are:

- Communications
- Aviation Supply
- Software Management
- Data Transfer at Sea
- Interactive Terminals in the FMF
- Disaster Recovery
- Lift Requirements
- Timeliness of Data

6 CONCLUSIONS

6.1 GENERAL

Throughout the conduct of the study, PGRG study team members heard a crucial need for deployed AIS processing. The MASC concept must support AIS operational concepts from garrison through continued operations in an AOA. While afloat, a capability is required to process AISs beyond the capability provided through the use of the current MIS (and ASIS) which are insufficient and need to be replaced by improved MISs that can interface with Marine AISs. The MASC is conceptualized as a van-mounted minicomputer capable of operating in a wide range of environmental conditions including shipboard environments.

Automated system justifications required by DB 1-77 are contained in Annex G to the main report - they contain more detail than is required. The system justifications required by the Federal Property Management Regulation are contained in Chapter 3 of the main report and summarized in paragraph 3 of this summary.

Deployable administrative sub-functions which were partially completed or not completed at all within the automated framework are identified as areas of concern. The areas of concern are provided for informational purposes in coordination and cooperation with the SAC.

6.2 STUDY CONCLUSIONS

The conclusions derived from this study are based upon a methodical documentation of functional concepts of operation in the 1988 deployed automated processing environment. The major study conclusions are reported in the following subparagraphs.

6.2.1 Deployed Automated Processing

Personnel from the Marine Corps at all echelons clearly recognize the need for deployed automated processing support. Much of this need stems from the atrophy of manual systems and the continual implementation of AISs. Although ADPE-FMF devices provide a small, deployed processing capability, a more robust capability is needed for the sustenance of combat power. It is concluded that deployed MABs and MAFs will need significant automated processing support.

6.2.2 Use of a MASC

The concept of a MASC to support deployed processing needs of MAGTFs is now well established. This van-mounted minicomputer is capable of supporting AIS processing for all phases of an amphibious operation. The MASC concept is a proven one as evidenced through Marine Corps and Army experience with deployable, van-mounted IBM 360, 370 and 4300 series computers. The afloat phase of deployed operations will require a MASC or a fixed MASC-like suite aboard ship for AIS processing as the use of current Navy-provided systems was found to be inadequate. It is therefore concluded that from 7 to 14 MASCs will support the deployed processing needs of the current Marine Corps active forces.

6.2.3 Functional AISs

The next seven subparagraphs contain a brief discussion of conclusions pertaining to each major administrative functional area in the Marine Corps.

6.2.3.1 Manpower. REAL FAMMIS will deploy with programmable terminals or ADPE-FMF devices upon which a limited manpower data base would reside. A MASC would support MAB and MAF operations by providing a limited MAGTF manpower data base. Update of the deployed MAGTF data base would come from Kansas City hence it could be from 10-30 days old. It is concluded that deployed manpower processing may be accomplished as documented but that a question arises as to the age of the MAGTF manpower data base. The centralized military pay portion of REAL FAMMIS when deployed will be operated on ADPE-FMF devices and will be responsive to MAGTF needs.

6.2.3.2 Policy Plans and Operations. PPO will deploy with a simple, but classified, processing requirement on ADPE-FMF devices. The edited UNITREP transactions will be reviewed and forwarded through channels to the JCS/CMC; data is telecommunicated at the earliest possible communications node.

6.2.3.3 Aviation. Aviation-unique processing will be provided by Navy SNAP configurations at the MAG-level. Since no capability exists for the aggregation of data at the MAW-level, it is concluded that a MASC capability should be provided the MAW.

6.2.3.4 Fiscal. The major fiscal AIS, SABRS, will not deploy. The deployable fiscal AIS is DOV which will be easily processed upon ADPE-FMF devices. The deployed CFAO sub-function will be conducted with a deployed team which collects and forwards paper inputs to CONUS for processing.

6.2.3.5 Logistics. The deployed combat service support AISs require the greatest deployed processing capability. The deployable systems are M3S, MIMMS and SEMS which must be operable aboard ship to provide for timely management of combat service support functions during the amphibious assault and continued operations ashore.

6.2.3.6 Other AISs. It was concluded th[illegible] non-Class I FMF processing consumes 33 percent of the total FMF pro[illegible]ssing.

6.2.3.7 Areas of Concern. Several areas of concern were identified and documented during the conduct of the study. While many of these have no direct bearing upon deployed AIS processing, they are areas that need to be addressed during the design of NEW AISs (planned and under development) and prior to the acquisition of ADPE for the MASCs.

6.3 SUMMARY

Nine Class I AISs have been identified for deployment and their concepts of operation documented. It was generally agreed that reversion to manual operations for most major Marine Corps administrative functions would be impossible making a deployed processing capability a necessity; the MASC concept has evolved as a means to provide that deployed processing capability. The MASC must be operable during all phases of an amphibious operation. Ancillary to the study effort, a number of areas of concern were isolated and are included in this summary and documented in Chapter 5 of the main report.

7 RECOMMENDATIONS

The PGRG study team recommends the following:

- That deployble AISs be processed upon deployable MASC. The MASC concept should be included in future Marine Corps doctrine. Seven to fourteen MASCs will support the deployed processing needs for current, active Marine Corps forces.

- That emerging AISs must be modularly designed and programmed so that deployable versions of the AISs may easily and inexpensively be operated in the deployed environment. The AISs identified for deployment are:

  REAL FAMMIS
  UNITREP
  NALCOMIS (Aviation)
  FREDS (Aviation)

SUADPS-RT (Aviation)
DOV
M3S
MIMMS
SEMS
33 percent Class II and III AISs.

- That the deployed manpower data base on the MASC be updated at the time transactions are processed for transmission or transport from the deployed MAF or MAB.

- That the areas of concern addressed herein be considered as a matter of priority during the design of new AISs (planned and under development, and under development during testing of the interim FASC, and prior to acquisition) and prior to acquisition of ADPE for the MASCs.

CHAPTER 1
INTRODUCTION

This study was perceived by Marine Corps personnel at all levels from HQMC, through MCDEC and from commanders and staff officers in the field. Their perceptions were that the Marine Corps had embarked upon an irreversible commitment to conduct their administrative management functions utilizing computerized, automated information systems (AISs). These administrative AISs lie in the functional areas of manpower, combat service support, policy plans and operations, fiscal and aviation.

In converting the administrative functions from manual to automated or semiautomated operations, a slow but persistent change occurs in the functional concepts of operation. The emphasis in functional training is for the operation of the AIS with little or no time devoted to manual operations for the function. Forms and procedures to operate a manual system have generally disappeared, having been replaced by AIS input formats on punched cards or from interactive computer terminals. Although manual backup systems for AISs are generally required by doctrine, they are pragmatically given "lip service" and do not exist as indicated by several Marines from the field who believe that return to a manual system would be difficult if not impossible. What is important in this matter is the belief that operating with a manual system would certainly degrade deployed functional operations to the point that support of combat power will be reduced.

The study team therefore talked with several hundred Marines at all levels with a purpose of documenting realistic concepts of operation for deployed operations of MAGTFs in the 1988 time period. As has been received from the past, the emphasis in most previous study efforts pertaining to deployed AISs has been upon hardware and telecommunications requirements vice deployed operational concepts; the emphasis of this study is upon documenting operational concepts for deployable AISs from information gained from multiple echelons in the Marine Corps (and the Navy). Once the operational concepts are documented and approved, the computer hardware and the telecommunications requirements may be derived in a straight-forward manner.

Study references are listed in Annex A by order of acquisition, not by order of appearance in this report. A glossary of acronyms and abbreviations is contained in Annex B.

1.1 STUDY PURPOSE AND OBJECTIVE

This study is the first major study wherein realistic limitations were placed upon telecommunications in support of deployed AISs. The telecommunications limitation required functional personnel and users in the field to rethink their approaches for AIS data transfer. Heretofore, telecommunications had been addressed in an unconstrained requirements mode which is not now considered a realistic mode.

1.1.1 Study Purpose

The purpose of the study is: To document the AIS concepts of operation for deployed (including combat) FMF units with a view toward justifying deployable MAGTF Automated Services Centers (MASCs). Beyond the stated purpose of the study, are several inherent, assumed or unstated purposes which include:

- Identification of deployable AISs
- Documenting deployed concepts of operation
- Development of areas of concern
- Integration of operational concepts
- A hardware sizing estimate
- Provide the basis for justifying deployable, functional AISs

1.1.2 Study Objective

The objective within this study is to apply an iterative interview methodology described in the study statement of work in order to first, document preliminary concepts of operation for deployable AISs and then utilizing iterative interview techniques, upgrade the preliminary concepts of operation into an integrated, Marine Corpe-wide initial concept of operations. The documented initial concepts of operation then become the basis for development of deployable software systems and the acquisition of hardware systems to support (approved) deployable AISs.

1.2 BACKGROUND

The Marine Corps has shown considerable interest in the development of telecommunication and processing requirements in support of the FMF. This important work commenced in 1972 and is continuing today through this study effort. The following subparagraphs present a chronological synopsis of work that has been accomplished in the development of deployed FMF telecommunication and processing requirements.

1.2.1 The need to develop teleprocessing requirements for the FMF was formally identified in August 1972 when a teleprocessing working group was formed at HQMC. This teleprocessing working group was directed to develop and identify requirements for FMF teleprocessing. The group was to review FMF garrison facilities and develop a concept for what was then called force information systems (FIS) support. Additionally, the validation of MAGTF models and local systems' teleprocessing requirements for those models was to be considered. The initial effort of the working group resulted in a draft FIS teleprocessing implementation plan. The draft plan required the development and collection of data pertaining to FIS and MAGTF model teleprocessing requirements, and message data were collected from a number of Marine Corps units to support the plan. Unfortunately, the data which were collected initially proved inadequate to support the plan because there was a misinterpretation of the questionnaire sent to the units. Since the data were questionable, a final implementation plan could not be prepared; however, the Navy Electronics Laboratory Center (NELC) was requested to perform a follow-on study. The NELC was to define combat teleprocessing requirements for each FMF command. The need for Marine Corps FISs was outlined in Marine Corps Order 5200.18.

1.2.2 The NELC conducted the Marine Corps Teleprocessing Requirements Study with a final report dated 30 September 1974 (reference bbb). The methodology for the study was to collect the average and peak teleprocessing loads for selected units in garrison and then, by estimation, extrapolate from them MAGTF loads for low-to-medium and medium-to-high level intensity combat. Two significant assumptions were made for the NELC study which were valid for 1974 but are not valid for 1985-1988. These assumptions were (1) that no consideration need be given to data transfer between computers and (2) that all FIS sub-systems are combat deployable in their present configurations. The invalidity of these assumptions will become clear within the succeeding chapters of this study report.

The principal means used to extrapolate MAGTF requirements from the detailed data that NELC collected from garrison operations was to convert a 20-day month garrison operation to a 30-day month combat operation. This has the effect of increasing the peak garrison load by 50 percent for a mid-to-high intensity deployed MAGTF. Of the 13 FIS systems considered by NELC, 11 were at 50 percent increased processing power, 1 at 25 percent increase, and 1 system was unchanged.

The NELC study was staffed and received general concurrence from HQMC staff agencies and the field. This first-time effort to collect needed information pertaining to data transfer was successful and the methodology was considered generally sound. Since key assumptions made for the study are now outdated and the linear projection of a 50 percent increase for 11 of 13 systems is no longer realistic, the results of the NELC study may not be applied to the 1988 time period of this study.

1.2.3 On 12 May 1975, Booz-Allen and Hamilton, Inc., reported the results of a study for the Telecommunications Systems Office, HQMC, entitled Communications Systems Requirements Methodology (reference ccc). This study recommended techniques for use in determining various telecommunications requirements. Chapter III of the study dealt with a requirements determination methodology which was broken into four subtasks as follows:

- Define system information transfer requirements
- Define the system architecture needed to satisfy the information transfer requirements.
- Develop overall communications system requirements and translate requirements data into needed resources.
- Investigate alternative approaches.

(The MAGTF Teleprocessing Requirement Study (reference a) follows the methodology suggested by the Booz-Allen and Hamilton Study. The MAGTF study goes beyond the suggested methodology in that it deals with deployment scenarios, force structures, phasing of operations, and ends with prioritized recommendations.)

1.2.4 In early 1975, the Advanced Amphibious Study Group (AASG) at HQMC was tasked to conduct a study with objectives to:

- Identify the major problems and deficiencies generated by the development and implementation of AISs within the Marine Corps and propose conceptual goals and objectives for the 1980s.
- Assess the overall impact on the Marine Corps of the adoption of AISs and MTACCS in terms of combat capability and resource cost.

The study, published on 15 August 1975, was entitled Automated Data Processing Systems for the Marine Corps (reference i). This study was curtailed by two months and hence forced elimination of that portion of the study which was to identify the impact upon the combat capability of the FMF. Without the impact upon combat capability, the study was of limited value.

The AASG study did, however, provide conclusions that reinforce several conditions which have been reaffirmed by this, the Deployed AIS-88 Study. The conclusions include:

- Telecommunications into an AOA will be limited only to high priority information transfers.
- A task organized ADP capability must be proportionate to the size of the deployed force.
- AIS computational requirements have grown continuously in response to increased requirements from higher headquarters, functional managers and commanders.
- AIS reporting requirements are oriented for high-level managers.
- The Marine Corps has reached the saturation point to support further, major systems development and implementation.
- The joint Navy-Marine Corps efforts to develop AISs to support the landing force during amphibious operations is marginally satisfactory.

An interesting concept within the AASG study for future develpment in the Marine Corps was extensive use of ADPE-FMF devices and three to four computer systems each mounted in two standard shelters (8' x 8' x 20') with a capability to operate aboard ship.

It is unfortunate that the AASG study was never carried to fruition however it did provide a direction and some forethought about deployed processing for AISs in the 1980s.

1.2.5 In June 1977, SRI completed a five-volume study entitled Alternative Automated Data Processing System Concepts for Support of the FMF (1980-1990) (reference ddd). Three of the four major recommendations of this study dealt with ADP planning for the FMF. They stated that the Marine Corps should develop a comprehensive plan and organize an FMF automated data system (ADS). The last recommendation proposed that FMF units from battalion/squadron up be equipped with automation devices and that a hardware prototype using processors at all levels from battalion/squadron up be evaluated.

The study reported that the availability of LFICS to support interactivity and data transfer was questionable. It favored the physical transfer (courier) of data stored on magnetic media.

1.2.6 The GAO reported, on July 11, 1977, about "Improved Management of Computer Resources Needed to Enhance Marine Corps' Efficiency and Effectiveness." The following was summarized on the report:

> Many Marine Corps administrative and tactical information processes have been automated and consequently, whether at an established base or deployed at a remote location, depend on the availability of computer support. However, the fragmented management of its computer resources, the lack of a comprehensive long-range plan integrating administrative and tactical information needs and a superficial determination of user requirements have impaired the Corps' ability to provide this type of support. The lack of computer support could ultimately impair the Corps' ability to carry out assigned missions.

1.2.7 On 30 September 1978, CALCULON (Formerly Auerbach Associates, Inc.) completed a two-part ADP study. The first part was entitled Feasibility Study for Replacement of Marine Corps ADP Equipment (reference eee). This report was aimed at the replacement of Marine Corps automated services centers and did not address deployed MAGTF requirements. The report stated that source data automation (SDA) devices will be used for data entry to Class I systems and will be the automated replacement for manual processes now used in day-to-day FMF operations. The SDA devices are also known as Automatic Data Processing Equipment, Fleet Marine Force (ADPE-FMF). The report concluded that since the ADPE-FMF processes had been neither defined nor quantified, their future workload had not been included in the report.

The second part of the study, Analysis of Feasibility for Source Data Automation in the Fleet Marine Force (reference fff) presented recommended distributions for ADPE-FMF devices within the FMF. Through interviews, the transaction requirements for each AIS were determined and manpower savings were identified for five systems operational in 1978 (which did not occur).

This study recognized that deployed MAGTFs would use the physical transfer of data on magnetic or paper tape media when telecommunications were not available.

1.2.8 Computer Sciences Corporation (CSC) completed a study in May 1979 entitled Marine Corps Automated Services Centers Requirements Study (reference ggg). This study makes no mention of requirements for deployed MAGTFs. In sizing the Kansas City computer site, the study includes one-third more processing power as a mobilization contingency.

1.2.9 The Potomac General Research Group (PGRG) completed a study in March 1980 entitled Marine Air Ground Task Force (MAGTF) Teleprocessing Requirements Study. The objectives of the study were:

- To identify deployable AISs and their associated data transfer requirements for the 1985 time frame. To determine deficiencies in the 1985 Landing Force Integrated Communication System (LFICS) methods, procedures and hardware for support of AIS data transfer requirements, by priority.
- To provide recommendations to correct identified deficiencies.

The conclusions of the study were:

- That significant shortfalls existed with the LFICS in the AOA and that there is essentially no capacity for AIS data communications external to the AOA.

- A processor is required within the AOA to provide administrative and logistical processing support in the 1985 time frame and that interactive devices are required to support manpower and logistical inputs.

The deployable processor was termed a MAGTF Automated Services Center (MASC) which has been carried into this, the Deployed AIS-88 study. Since the completion of the MAGTF study in March 1980 (approved by HQMC Codes RD/CCP on 17 September 1980) significant changes have occurred in the functional requirements, principally with the deployable manpower function. The data transfer requirements for manpower have been cut by 75 percent and in both the manpower and logistical functions, a great deal of the interactive requirements have been removed. This greatly decreased requirement upon the LFICS probably removes the intra-AOA shortfalls however, it does not change the AOA-to-external shortfall since no capacity was available for any AIS communications loading. The conclusion pertaining to a MASC for support of deployed processing requirements remains valid and is vigorously revalidated within the current study.

1.2.10 The LFICS in the Midrange Study (reference u) was completed by PGRG and forwarded to HQMC, Code RD in December 1980. The objectives of the LIFCS study were:

- To identify Marine Corps Tactical Command and Control Systems (MTACCS) and also digital communications transfer requirements for a MAF in an AOA.
- To determine the MTACCS and LFICS adequacy for their time-phased procurement.
- To identify required interfaces between LFICS and Navy communications equipments.
- To identify ADPE required to process AISs in an AOA.

The conclusions of the LFICS study were, in part:

- LFICS can support intra-AOA, AIS data transfer requirements; AOA-to-external can handle only emergency AIS traffic on a priority basis.
- Multichannel communications equipment aboard ship is not compatible with LFICS multichannel equipment for 1988. Annex C of the LFICS study contains the documented requirements for a deployable MASC along with a sizing estimate for the MASC. The MASC sizing estimate was based upon updated, deployable functional requirements from the MAGTF study.

1.2.11 A draft PGRG study report was submitted to MCDEC in September 1981 entitled, Integration of Navy/USMC Command, Control, Communications (C^3) Systems for Amphibious Operations (1985-1995) (Confidential) (Reference aaa).

One unclassified study conclusion and recommendation pertains to deployable AISs. It was concluded that:

- Tactical logistical (and manpower) information is required by the CLF for successful operation. Since deletion of MILOGS (and the uncertainty of MIPS) there is no documented concept or procedure for providing this type of information within MTACCS.
- Once interfaces between AISs and MTACCS for selected information are developed, consideration should be given to integrating MTACCS and AISs in the AOA for purposes of mutual support and for data transfer purposes.

1.3 STUDY ASSUMPTIONS

This study commenced in December 1980 with two stated assumptions. As the study progressed, additional assumptions evolved with a purpose of limiting work within a reasonable set of bounds. The assumptions for the study follow and some initial comments are then provided:

- Data will normally be transferred by means other than telecommunications - this is defined as the 'regular mode'.
- The processing capability for a deployed MAGTF will consist of ADPE-FMF devices (plus commercial IBM Series 1), MASC, and Navy-provided, aviation-oriented processors.
- Class II and III AISs will utilize 15 percent of the deployed processing power. This assumption proved to be erroneous and was subsequently documented to be 32.4 percent in garrison and assumed to be 32.1 percent in a deployed environment.
- Automated data bases must be maintained current and accurate.
- AIS concepts in accordance with doctrine.
- Positive functional management of AISs.
- MARCORS 1 scenario for 5 phases.

1.3.1 Telecommunications Availability

In addition to the regular mode the concepts could also include 'enhanced mode' AIS support when selective telecommunications support may be available for short, critical data transfers and for limited bulk data transfers. A limited capability would then exist to transmit high priority, external AIS traffic utilizing external telecommunications capabilities; however, external mass data transfers would be accomplished with the transport of data or output reports on magnetic tape or other media. Interactive data transfer may be accomplished when a user terminal may be cabled (hard-wired) to a processor (distances up to 1500 feet).

1.3.2 Processing Capability

The processing capability for a deployed MAGTF will be ADPE-FMF devices (green machines) at the battalion/squadron level and with IBM Series 1 commercial devices (white machines) with each MASC for the purpose of aggregating and disaggregating data from and to diskettes (floppy discs); Shipboard, NonTactical Automated Data Processing Systems (SNAPs) for aviation-unique processing and MASCs for aggregated functional processing within an AOA.

1.3.3 Standard System Processing

An initial assumption was made concerning FMF processing conducted at ASCs - the portion of Class II and III system processing was 15 percent. A detailed analysis was conducted at the Camp Lejeune RASC and revealed that 33.4 percent of the FMF processing was Class II and III processing. Marine Corps standard AISs are defined in DB 1-77 (reference c) and in general, encompass the following:

- Class I Centrally managed, Marine Corps-wide
- Class II Centrally managed, FMF needs
- Class III Local data bases and reports
- Class IV (Newly defined) Software for ADPE-FMF devices

1.3.4 Timely and Accurate Data Bases

The assumption pertaining to current and accurate data bases remains valid as to the accuracy of data bases however it does not hold true for the deployed manpower data base as described in the REAL FAMMIS deployed concept of operation and Chapter 3 of this study.

1.3.5 Doctrinal AIS Concepts

The assumption that AIS concepts of operation are in accordance with doctrine could not be truly validated in that some of the deployed AIS concepts of operation have not been fully defined and have been addressed in generic terms. The generic terms were in the form of the deployed processing that must be considered.

1.3.6 Functional Management

The assumption that AISs had positive functional management was not wholly true and varied from function to function. More detail pertaining to this assumption is contained in Chapter 4.

1.3.7 Force Structure

The MARCORS 1 scenario was utilized to establish a combat intensity for a MAF and to define a MAF force structure. Additionally, the MARCORS 3 scenario was utilized to establish a MAB force structure however combat intensity remained mid-to-high based upon the MARCORS 1 scenario.

1.4 STUDY MODE

From the above assumptions, the only major resource which is unbounded within the framework of this study is the software and the personnel resources that are associated with the various aspects of software. Studies may be conducted in one of two modes; the requirements mode or the capability mode. A study utilizing the requirements mode results in the functional manager stating his needs with little or no constraint upon a availability of resources to support the stated needs. On the other hand, a study executed in the capability mode provides fixed resources within which a functional manager must perform the function. The predecessor to this study was primarily the MAGTF Teleprocessing Requirements Study (reference a). The MAGTF study was conducted in the requirements mode. In the formulation of this deployed study, realistic limitations were established through the provision of very little deployed telecommunications capability and a finite set of computer hardware upon which deployed automated processing could be accomplished. The essence of the above two defined bounds by fiat places this study in a capability mode.

With software being the unbounded component of the study, it is absolutely necessary to take a hard look at deployable software systems vis-a-vis:

- Functional concepts for deployed operations for five phases of an amphibious operations with transitions.
- Modular software design and top-down programming for ease in assembling deployable AISs and ease of system maintenance, enhancement and debug.

The major emphasis for this study is to document concepts of operation for deployed MAGTF and, considering the bounds of this study executed primarily in the capability mode, the emphasis for the study is absolutely in the proper direction. As to software design and programming, this is a matter largely in the hands of the central design and programming activities (CDPAs) and functional managers at this time; this matter is developed and discussed further in Chapter 5.

The utilization of the MARCORS 1 and 3 scenarios was not intended to make this study scenario-dependent but rather they were utilized to introduce a mid-to-high intensity of combat in which the deployable AISs would function. The study participants were therefore guided with scenarios and force structures which are further discussed in Chapters 2 and 3 of this study.

The implementation of study recommendations from this study will require specific justifications such as a mission element need statement (MENS) potentially followed by a feasibility and/or economic analysis. For recommendations involving personnel or procedures, T/Os and/or T/Es may require revision and operating procedures may require origination or modification. Recall that one purpose of the study is to provide the basis for justifying deployable AISs and the MASC hardware suites upon which they would operate.

CHAPTER 2

SCENARIOS AND FORCE STRUCTURE

2.1 GENERAL

The concepts for employment/operation of automated information systems (AISs) in support of deployed Fleet Marine Force (FMF) units, as presented in this report, are intended to be scenario independent and have been developed independent of physical characteristics and operational contraints imposed by specific geographic areas. However, the development and portrayal of concepts of employment/operation are best presented within the context of scenarios and force structures that establish at least the general parameters within which the concepts will be constrained. Accordingly, generalized, notional scenarios and force structures have been identified for that purpose in accomplishing this study.

2.2 SCENARIOS

The study plan provides that the concept of employment/operations for each of the AISs considered will be documented for a Marine amphibious force (MAF), Marine amphibious brigade (MAB), and Marine amphibious unit (MAU) in each of the five phases of employment to include:

- I Garrison
- II Pre-deployment preparation including embarkation
- III During deployment while afloat
- IV Amphibious assault
- V Subsequent operations ashore with a theater airfield echelon (TAE)

2.2.1 Source

The MARCORS-1 Scenario, as contained in reference yy and as adapted for use in connection with the Marine Air-Ground Task Force (MAGTF) Teleprocessing Requirements (1980-1985) Study (reference a), has been used as a baseline for this study in analyzing requirements for phases IV and V as described above. A variant of that scenario has been utilized for phases I, II, and III. This variant of MARCORS-1 was taken from the Landing Force Amphibious Operations Planning Exercise (reference designator C(C)2112I) utilized by the Marine Corps Command and Staff College. The force structure, described in paragraph 2.3, together with these scenarios provide the framework upon which is built the concept of employment/operations for each AIS when deployed in support of FMF organizations in peacetime or combat operations. The scenarios provide a rational basis for identifying data transfer and processing nodes for the deployed AISs in each of the deployment phases.

The MARCORS-1 scenario postulates a Warsaw Pact invasion of NATO territory countered by a MAF-level amphibious assault conducted in mid-to-high intensity combat and with the intention of conducting continued operations ashore. The postulated enemy threat and configuration of the amphibious objective area (AOA) provide the environment for the phased deployment of landing force elements ashore that is suitable for the requirements of this study. The scenario also includes a requirement for the initial deployment of a theater airfield echelon (TAE) to airfields outside of the AOA and their subsequent phasing into the objective area. Since subsequent operations ashore after arrival of the assault follow-on echelon, but prior to phasing the TAE ashore in the AOA, represents the period of peak demand as far as deployed AISs requirements are concerned, there was no study requirement for a detailed examination of the final phase of the scenario with all MAGTF elements in the AOA.

Deployed MAUs will be supported solely with ADPE-FMF devices; support by a MAGTF automated service center (MASC) will not be required. Accordingly a scenario has not been identified for analysis of MAU requirements.

In order to facilitate comparison of concepts of employment of AISs with MAFs and MABs certain artificialities have been introduced into the application of the scenarios. The application of a mid-to-high intensity combat environment provides the most demanding situation in which Marine Corps forces are likely to be employed. Accordingly, the MARCORS-1 threat forces, while being kept the same in character, have been scaled commensurate with the combat capability of the MAGTF under consideration. The introduction of the artificialities of using basically the same scenario for examination of the various levels of MAGTFs does not adversely effect the analysis of requirements and concepts for the employment of AISs - combat intensity is the desired common thread. In this regard, it is emphasized that this study has used the scenarios solely as a vehicle to structure the examination of concepts and requirements for AISs and not for tactical analyses.

2.2.2 Phases

Concepts of employment/operations have been examined for each of the five phases listed in paragraph 2.2 above. These phases are described in the following paragraphs.

2.2.2.1 Phase I, Garrison. This phase examines concepts for normal garrison operations.

2.2.2.2 Phase II, Pre-deployment. This phase includes preparation for deployment, pre-embarkation, embarkation and operation at the port of embarkation prior to departure. The transition from regional automated service center (RASC) to MAGTF automated service center (MASC) data bases and changes to the MAGTF task organization and associated embarkation and loading documents will result in a great deal of AIS activity during this phase.

2.2.2.3 Phase III, Operations Afloat. This phase includes operations afloat prior to initiation of the assault. Movement to the AOA and the movement of the fixed-wing aviation component to the remote theater airfield(s) are included as well as maneuvers and any cross loading activities. In general, data must be transported from ship-to-ship.

2.2.2.4 Phase IV, Amphibious Assault. This phase comprises the ship-to-shore movement and initial operations ashore. It terminates with the seizure of the force beachhead line (FBHL) at which time all major headquarters of the assault echelon are established ashore. Rotary-wing aviation elements are fully established ashore and V/STOL aviation elements may be established ashore. Control of some or all aviation functions is normally passed ashore during this phase. Some TAE elements may begin to phase into the objective area but the preponderance of fixed-wing aviation is still located afloat or at the theater airfield(s) outside the AOA.

2.2.2.5 Phase V, Subsequent Operations Ashore. This phase considers continued operations ashore after arrival and landing of the assault follow-on echelon and fixed-wing aviation elements beginning to echelon into the AOA. This phase has been consistently identified by HQMC SAC members, the CDPAs and users from the FMFs as being very demanding for AIS operations but not as complex as those in the predeployment and assault phases.

2.3 FORCE STRUCTURE

The troop lists and task organization of the MAGTFs utilized with the scenarios described in paragraph 2.2 are those developed for and used in the Marine Air-Ground Task Force (MAGTF) Teleprocessing Requirements (1980-1985) Study. For that study, the forces were task organized from troop lists contained in the MARCORS scenarios, updated to incorporate recent and projected changes in FMF organization and to reflect personnel strengths established in current tables of manpower requirements (TMRs).

2.3.1 Forces Employed

The forces utilized for this study include a Marine amphibious force (MAF) and a Marine amphibious brigade (MAB). Since it was determined that the Marine amphibious unit (MAU) will not require deployed processing support from MAGTF automated service center (MASC), the MAU has not been analyzed in the deployed AIS MASC concept. Both FMFLANT and FMFPAC plan to provide AISs support for deployed MAUs solely with ADPE-FMF devices.

2.3.1.1 Marine Amphibious Force. The MAF was organized from the troop list provided in the MARCORS-1 scenario, updated as described above. The basic MAF troop list and the task organizations for the various phases of the operations are contained in Annex D.

2.3.1.2 Marine Amphibious Brigade. The MAB was organized from the troop list provided in the MARCORS-3 scenario, updated as described above. The MAB troop list and task organization for the various phases of the operation are contained in Annex E.

2.3.2 Task Organization Variations

The task organization of the various elements of the MAGTFs vary from phase to phase of the scenarios as explained in the following paragraphs. The variations in the task organizations are depicted in Annexes D and E. These task organizations do not necessarily coincide neatly with the phases of the scenarios described in paragraph 2.2. The phases of the scenarios and the corresponding task organization(s) are depicted in table 2.1.

2.3.2.1 Command Element. The command element of the MAF varies in size and functional components between phases IV and V, reflecting the incorporation of the assault follow-on echelon prior to the commencement of phase V. The command element of the MAU remains unchanged through the various phases.

2.3.2.2 Ground Combat Element. The ground combat element (GCE) of the MAF is a Marine division; that of the MAB is a regimental landing team (RLT). The administrative organizations reflected in the troop lists are utilized during phase I and transition to the organization for combat during phase II. Differences affecting AISs concepts of employment resulting from differences between administrative organization and

Table 2.1. Operational Phases and Corresponding Task Organizations

Scenario	Task Organization
I Garrison	Administrative organization as depicted by the troop lists.
II Predeployment including embarkation	Organization transitions from administrative to organization for combat modified as required to meet constraints of embarkation, i.e., organization for embarkation. (Note 1)
III Deployment while afloat	Organization for combat (initial assault)/organization for embarkation. (Note 1)
IV Amphibious Assault	Organization for combat (initial assault)/organization for landing. (Note 1)
V Subsequent operations ashore (initial period)	Organization for combat (subsequent operations ashore) after arrival and landing of the assault follow-on echelon but prior to arrival in the AOA ashore of the theater airfield echelon (TAE).
V Subsequent operations ashore (follow-on period)	Organization for combat after arrival of the TAE in the AOA. (Note 2)

Note 1. Only the organization for combat (initial assault) has been provided. Differences affecting AISs concepts of employment resulting from differences between organizations for combat, embarkation, and landing are considered as appropriate in addressing the individual AISs. Separate task organizations reflecting the organization for embarkation or landing have not been prepared.

Note 2. Since subsequent operations ashore after arrival of the assault follow-on echelon but prior to phasing ashore in the AOA of the TAE represents the most demanding case as far as deployed AIS requirements are concerned, there was no study requirement to examine this final step in the scenario in detail.

organization for embarkation, landing, and combat during phases II, III, and IV are considered as appropriate in addressing the individual AISs but separate task organizations have not been developed to reflect these possible variations. Examples of these differences are the accounting problems that arise from spread loading of personnel and equipment of normal administrative organizations between several ships to meet tactical and embarkation requirements and the disruption of administrative organizations by the assignment of many attachments in the process of organizing the MAGTF for combat. The essential difference between the task organization for phases II through IV and the task organization for phase V arise from the attachment of appropriate supporting elements to the infantry units during the earlier phases versus their retention in direct or general support roles during the latter phases.

2.3.2.3 Aviation Combat Element. The aviation combat element (ACE) of the MAF is a Marine aircraft wing (MAW) task organized to conduct all types of tactical air operations and that of a MAB is a task organized Marine aircraft group (MAG). The MAW and MAG are organized differently during phases II through IV and phase V. The difference between the task organizations reflect the establishment of the TAE outside the AOA during the earlier phases and its movement into the AOA during the latter part of phase V. The strength of the component aviation units also varies slightly during the earlier phases as a result of attachments to provide helicopter support, shore party support, and force or brigade combat service support during assault operations.

2.3.2.4 Combat Service Support Element. The combat service support element (CSSE) of a MAF is a force service support group (FSSG) and for the MAB it is a brigade service support group (BSSG). In this analysis, the CSSE passes through four major variations in organization --first, the administative organization in garrison; second, the organization for assault operations; third, organization following disestablishment of the landing force shore party at the end of phase IV; and finally the change that takes place with the incorporation of the TAE service support group detachment into the CSSE in the AOA. The combat service support element of a MAGTF may include naval construction units, e.g., a naval construction regiment in a MAF.

CHAPTER 3
AIS OPERATIONAL CONCEPTS

3.1 INTRODUCTION

Each major administrative function conducted within the Marine Corps was reviewed for deployed concepts of operation in the 1985 to 1995 time frame with a focus upon the 1988 time period. In many cases, large, newly emerging AISs are replacing manual and semi-automated systems to the point that automated systems will replace earlier systems thus making the Marine Corps operators dependent upon AIS both in garrison and when deployed. Marines and Marine Corps civilian personnel were interviewed at HQMC, the supporting establishment, CDPAs and both FMFs; interviews were also conducted with Navy and Defense Communications Agency personnel. The memoranda for record from the interviews are contained in Annex C to this report.

The documented concepts of operation for functions which have identified a need for deployed AIS support are contained in the following subparagraphs. The format followed for each functional concept of operation consists of a baseline concept (i.e. description of current AIS) followed by the AIS concept of operation by amphibious operational phase for the 1988 time period. Table 3.1.1 lists the deployable AIS and their proponent.

Table 3.1.1 Deployable AISs and Their Proponent

Deployable AIS	Status	Proponent
REAL FAMMIS	Development	Manpower
UNITREP	Implement	PPO
NALCOMIS	Development	Aviation-Navy
FREDS	Conversion	Aviation
SUADPS-RT	Development	Aviation-Navy
DOV	Development	Fiscal
M3S	Development	I&L
MIMMS	Conversion	I&L
SEMS	Development	I&L
CLASS II & III	Varied	Varied

3.2 MANPOWER

The manpower and pay AISs will be discussed together since both the baseline systems [Joint Uniform Military Pay System (JUMPS) and Manpower Management System (MMS)] and their potential replacement, the Real Time Financial and Manpower Management Information System (REAL FAMMIS) are integrated systems.

Throughout the course of this study, the emphasis of numerous interviews conducted with cognizant personnel at HQMC and Fleet Marine Force locations, has been on identifying the manpower and pay requirements of a MAGTF (MAU, MAB, MAF) in each of the five phases of deployment. Once requirements were defined, the discussions were directed to the existing capability of JUMPS/MMS to satisfy the requirements. Then, interviewed personnel were briefed on the applicable portions of the forthcoming REAL FAMMIS to determine their degree of satisfaction with the "solutions" currently conceptualized.

Herein, we will present an overview of the baseline system (JUMPS/MMS) and a more detailed look at the forthcoming system (REAL FAMMIS). Since it is likely that JUMPS/MMS will still be operational during the early portion of the 1985-1995 time frame, it is necessary that the reader understand the limits of the support that it will provide to a deployed MAGTF. While the conceptual REAL FAMMIS will provide significant enhancement to pay and manpower management, there are still areas wherein shortcomings are projected to exist regarding support of a MAGTF. These areas of concern will be highlighted.

It is noted that the schematic depictions of the manpower and pay AISs are in greater detail than has been possible for many of the other AISs. This has been possible because of the significant development work that has been previously completed by PGRG on the Real Time Financial and Manpower Management Information System (REAL FAMMIS).

3.2.1 Pay and Manpower Baseline Processing (JUMPS/MMS)

The existing pay and manpower management system is JUMPS/MMS. JUMPS/MMS does not include the management of Reserve and Retired Personnel. In addition, there are some 28 other systems, sub-systems, and processes whose functions are presently not an integral part of the baseline system but will be in REAL FAMMIS.

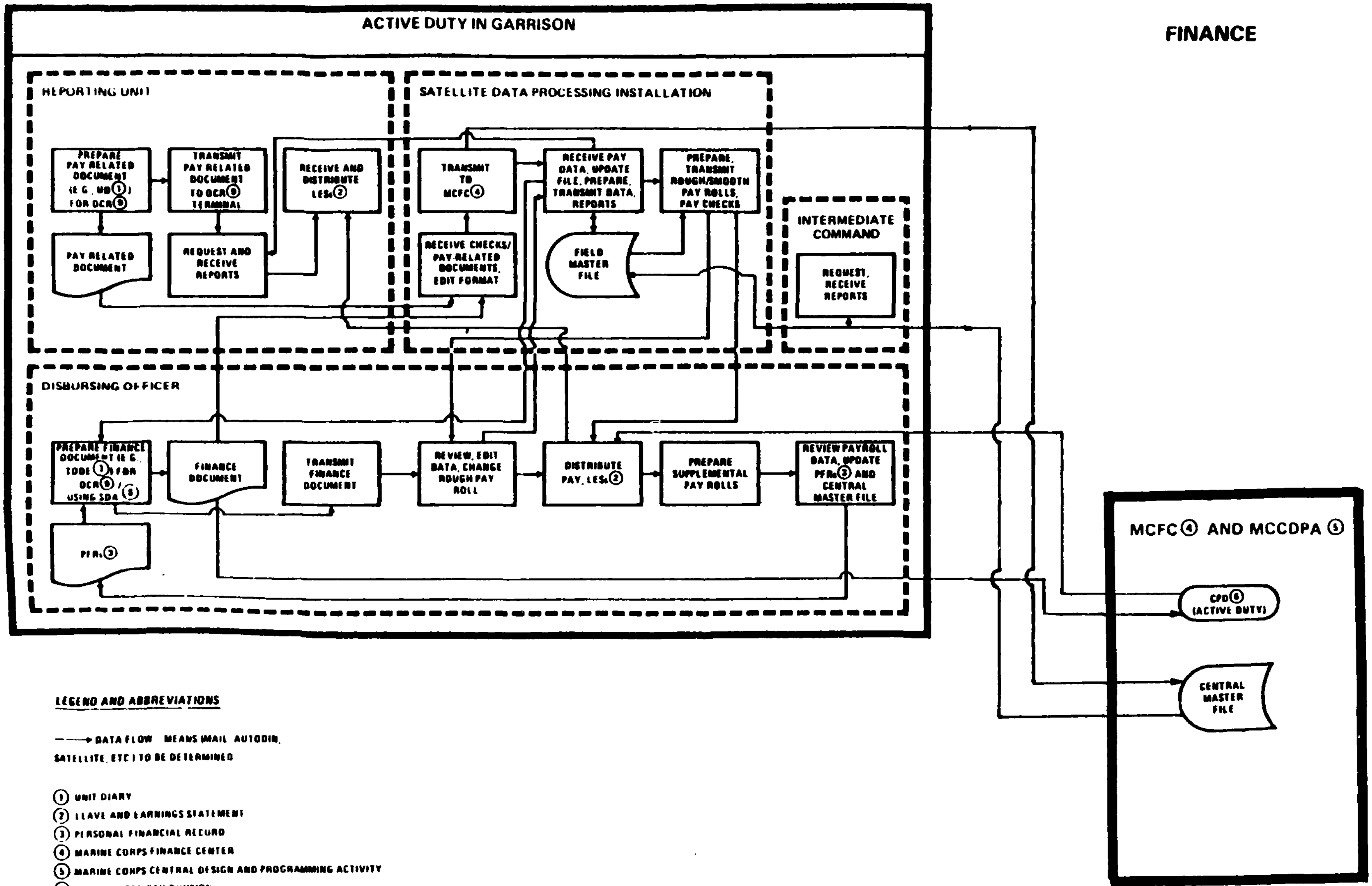
Figures 3.2.1 through 3.2.4 display the functions of the baseline system in the garrison and embarkation environments, and in the afloat, assault and continued operations ashore environments. The description of this baseline system is contained in the paragraphs that follow.

JUMPS/MMS may be characterized as a distributed data-processing system with a central facility and master data base exercising control over remote processing facilities and their data bases. The system was implemented over the period 1969-1975.

Functional control of the input and output is exercised by the Deputy Chief of Staff (Manpower) for the manpower portion of the system and the Fiscal Director of the Marine Corps for the financial portion of the system. Technical operation of the system is controlled by the Director of the Command, Control, Communications, and Computer Systems Division.

The system is event-oriented, with input occuring at the Reporting Unit/Disbursing Office (RU/DO) level. The RU/DO, any command or administrative echelon so designated, enters his input on the"green machine" or prepares an Optical Character Recognition (OCR) document in a format prescribed within the several directive and procedural documents, e.g., Personnel Reporting Instruction Manual (PRIM), JUMPS Field Procedures Manual. Depending upon the function supported by the OCR documents, it is variously titled: (1) Unit Diary, (2) Transcript of Data Extraction, (3) Accession Transcription Form, (4) Data Transcription Form (5) Allotment/Bond Authorization Form, (6) Military

FINANCE

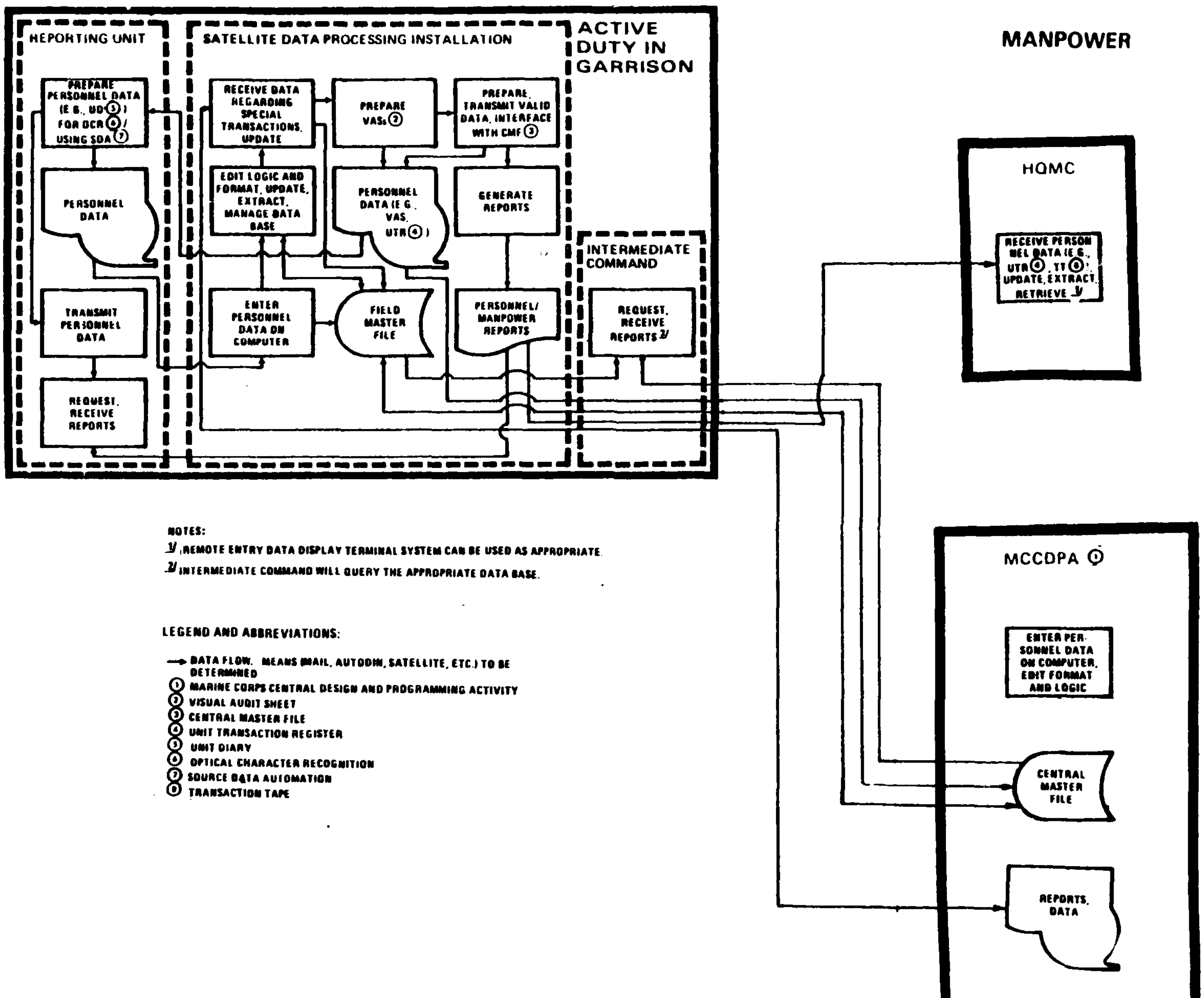


LEGEND AND ABBREVIATIONS

——→ DATA FLOW (MEANS (MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED)

1. UNIT DIARY
2. LEAVE AND EARNINGS STATEMENT
3. PERSONAL FINANCIAL RECORD
4. MARINE CORPS FINANCE CENTER
5. MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY
6. CENTRALIZED PAY DIVISION
7. TRANSCRIPT OF DATA EXTRACTION
8. SOURCE DATA AUTOMATION
9. OPTICAL CHARACTER RECOGNITION

Figure 3.2.1. JUMPS (Garrison and Embarkation Phases)



NOTES:

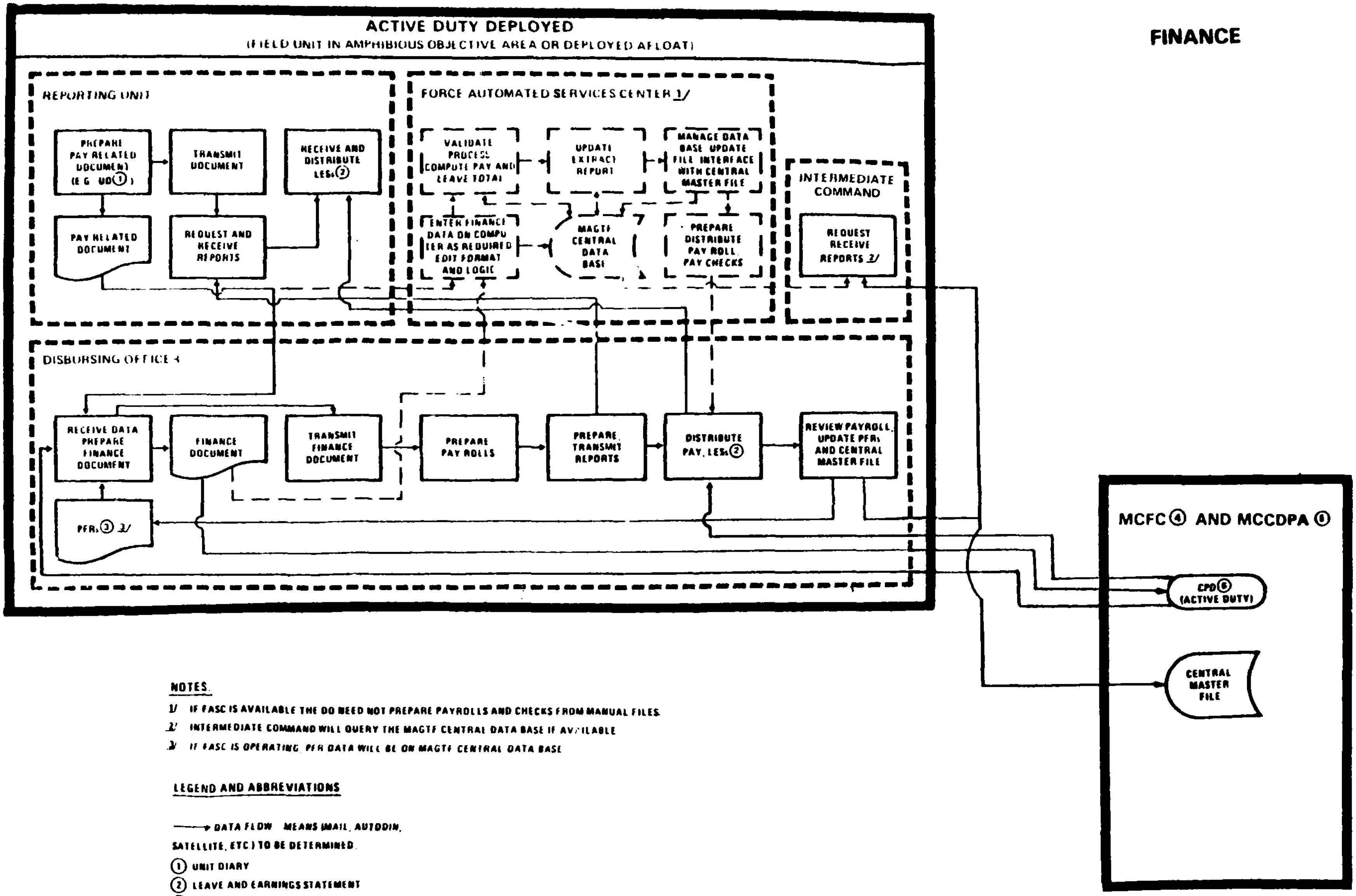
1/ REMOTE ENTRY DATA DISPLAY TERMINAL SYSTEM CAN BE USED AS APPROPRIATE.

2/ INTERMEDIATE COMMAND WILL QUERY THE APPROPRIATE DATA BASE.

LEGEND AND ABBREVIATIONS:

→ DATA FLOW. MEANS (MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED
① MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY
② VISUAL AUDIT SHEET
③ CENTRAL MASTER FILE
④ UNIT TRANSACTION REGISTER
⑤ UNIT DIARY
⑥ OPTICAL CHARACTER RECOGNITION
⑦ SOURCE DATA AUTOMATION
⑧ TRANSACTION TAPE

Figure 3.2.2. JUMPS (Afloat, Assault, and Continued Operations Phases)



NOTES

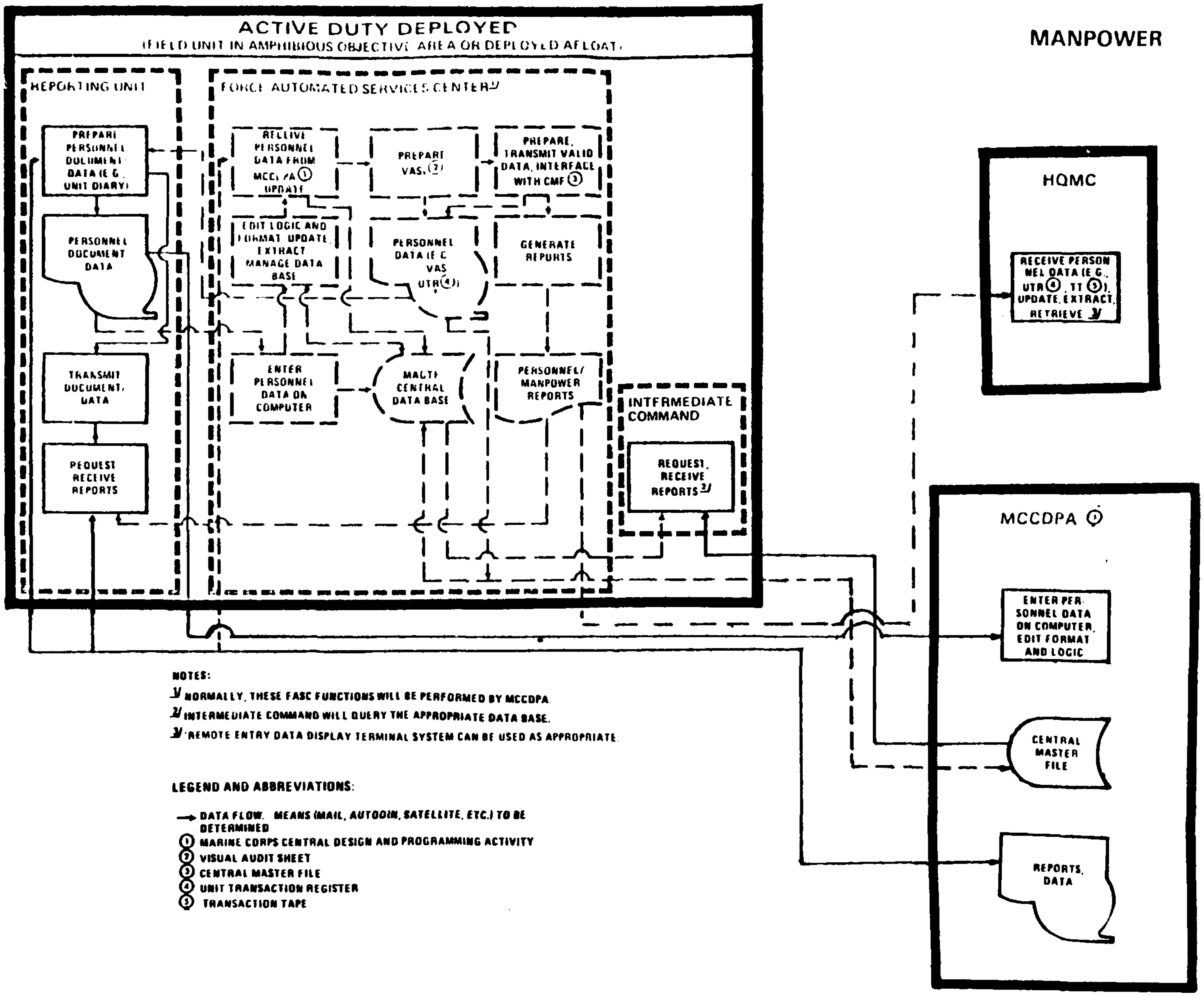
1/ IF FASC IS AVAILABLE THE DO NEED NOT PREPARE PAYROLLS AND CHECKS FROM MANUAL FILES.
2/ INTERMEDIATE COMMAND WILL QUERY THE MAGTF CENTRAL DATA BASE IF AVAILABLE
3/ IF FASC IS OPERATING PFR DATA WILL BE ON MAGTF CENTRAL DATA BASE

LEGEND AND ABBREVIATIONS

→ DATA FLOW (MEANS (MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED

① UNIT DIARY
② LEAVE AND EARNINGS STATEMENT
③ PERSONAL FINANCIAL RECORD
④ MARINE CORPS FINANCE CENTER
⑤ MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY
⑥ CENTRALIZED PAY DIVISION

Figure 3.2.3. MMS (Garrison and Embarkation Phases)



NOTES:

1/ NORMALLY, THESE FASC FUNCTIONS WILL BE PERFORMED BY MCCDPA.

2/ INTERMEDIATE COMMAND WILL QUERY THE APPROPRIATE DATA BASE.

3/ REMOTE ENTRY DATA DISPLAY TERMINAL SYSTEM CAN BE USED AS APPROPRIATE.

LEGEND AND ABBREVIATIONS:

→ DATA FLOW. MEANS (MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED

1 MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY

2 VISUAL AUDIT SHEET

3 CENTRAL MASTER FILE

4 UNIT TRANSACTION REGISTER

5 TRANSACTION TAPE

Figure 3.2.4. MMS (Afloat, Assault, and Continued Operations Phases)

Pay Voucher, (7) Schedule of Payroll Deletions, (8) Payment Option Election, (9) Military Payroll Money List and (10) Document Transmittal Letter. Unique to HQMC is the capability to enter certain event information into the system on a standard 80-column EAM card.

After the OCR document has been completed, it is forwarded by the most expeditious means to the Administrative Control Unit (ACU)/Regional Automated Services Center (RASC) and, if necessary, a copy is forwarded to the Disbursing Office which services the Reporting Unit. A copy is retained in the Reporting Unit.

Within the ACU/RASC, the document is visually edited for errors and the original is retained for the daily scan cycle at the RASC. The ACU files a copy of the document by RU/DO and, through coordination with the RASC, schedules a scan cycle. The accumulation of the daily OCR documents is forwarded to the RASC OCR scanner, where each document is scanned and converted to English statements on magnetic tape. Additional outputs from this process are hard copy management reports which are forwarded to the ACU/RASC for verification that the scanning process was correctly accomplished. When it has been confirmed that the scanning operation has correctly taken place, the original OCR document is filed for subsequent mailing to and microfiche copying at the MCASC, Kansas City, Missouri.

The continued implementation of Source Data Automation (SDA) throughout the Marine Corps is obviating much of the process described above and has facilitated data entry into the system.

Subsequent to the scanning process or input of data by SDA, the English language event statements are delivered to the Operations Section of the RASC. Following Standing Operating Procedures, the Field File Maintenance process is commenced. The first three steps involve editing of the event statements; i.e., (1) converting the English statement to machine oriented transcation code, (2) verifying logical content and proper original source of entry, and (3) checking compatibility of an event with the individual record to be changed. If the English statement cannot be converted to code or the transaction fails to pass any other edit, it is removed from the job stream and placed on the Master Error Control File/Suspense File.

After the completion of the edit operation, the transactions are uniquely identified in two categories: (1) pay-related and (2) non-pay-related. This distinction is made since pay-related transactions must not update the Field Master Record of an individual until they have first updated that record on the Central Master File (CMF). These two types of transactions are now merged with a third category of data which is representative of the transactions which had been passed to the MCCDPA, as the result of previous field cycles, for posting to the CMR. These transactions can further be subdivided into two categories, those which have not previously posted to the FMR and those which may or may not have posted, but upon entry into the Central File Process have failed one of the various edit criteria and therefore have not been posted to the CMR. Transactions received from MCCDPA, via AUTODIN, are first decoded by stripping off the basic communications information, leaving the basic JUMPS/MMS data. Those transactions which have failed at the MCASC are written on the Master Error Control File. Those which have been posted to the CMR are merged with the transactions from the output of the edit process for the current field cycle.

All transactions from the current field cycle which have passed the edit process are now encoded for AUTODIN transmission to the MCCDPA. Additionally, a duplicate set of the uncoded version of these transactions plus the decoded transactions from the MCCDPA are now posted to the FMR.

The final steps in the Field File Maintenance process are involved with the preparation of the various management and audit reports and files which support JUMPS/MMS. A Statistical Analysis Report file is updated. The Master Error Control File/Suspense File is merged with posted transactions to create the Reporting Unit Transaction Register and ACU Transaction Register. Personnel Verification Unit Transaction Register, Pending Transaction Register, and Visual Audit Sheets are prepared when directed by current policy.

These latter documents are delivered to the ACU for distribution to the Reporting Units and subsequent audit and correction of erroneous data.

Twice each month the MCCDPA generates payment data (TCC 699) and transmits these data, via AUTODIN, to the appropriate RASC for posting to the FMR. In accordance with information contained on the payroll header and payroll number cards submitted by the RASC Disbrusing Officer, the RASC will prepare a Rough Payroll which the Disbursing Officer will audit against the Personal Financial Record and Leave and Earning Statements. Addition/deletion of individuals to the Rough Payroll and correction to amounts due are accomplished by the preparation of a change card. When the audit of the Rough Roll has been completed and the requisite change card created, the change cards are submitted to the RASC.

The RASC processes the change cards and payment data to create the Military Payroll Money List (Smooth Rolls), check issue file, control total reports, and the Comeback Payment Tape which is composed of TTC 625 data (payments).

The Comback Payment Tape takes two paths back to MCCDPA/MCFC. First, it is encoded for AUTODIN transmission to the MCASC and, secondly, a copy is mailed to the MCFC.

The process by which JUMPS/MMS data are prepared for and transmitted by AUTODIN is essentially the same for a RASC and the MCCDPA. This basic process is described as follows:

- Information is generated into AUTODIN batches. Each batch is composed of between 400 and 425 line blocks. Each batch is assigned a batch control number which identifies the origin, destination, batch version and batch number. Batches are transmitted via the AUTODIN I Network. Upon receipt at the destination, the data are written to tape; as tapes fill up they are catalogued.

- As part of the cycle process the catalogued tapes are passed through a BREAKOUT program, which places the data in the correct JUMPS/MMS context and performs edits which include a check for completeness.

- Data which have been transmitted remain on a hold file at the RASC until an acknowledgement is received from the destination. If acknowledgement is not received for a transmitted batch within a specified time, the batch is automatically retransmitted.

The Central Master Record (CMR) is maintained at the Marine Corps Central Design and Programming Activity (MCCDPA) which is collocated with the Marine Corps Finance Center. The process for updating the CMR can be described at the macro-level in an anologous manner to that used for the update of the FMR. Therefore, only exceptions will be noted as follows:

- With the exception of the 625 comeback tapes that are sometimes used, there are no JUMPS/MMS data in the form of scan tapes (Bonds and Allotments is considered a separate system from JUMPS/ MMS). All input data have been obtained from AUTODIN traffic. Reports such as the UTR, PVUTR, PTR, ACU, UTR, and VAS are not produced at the central site except for those produced at the Kansas City ACU.

- Several statistical management reports are produced which are not produced in the field cycle process.

- Once weekly a magnetic tape of changes to the CMR during the past week is forwarded to HQMC for update of the Headquarters Master Record (HMR).

The purely unique operations at the MCASC/MCFC are those which are associated with the pay function. The CMR is the only magnetic record with the requisite data from which the pay of an individual Marine can be created.

Approximately 10 days prior to each monthly payday, an Update and Extract (U&E) Cycle is run at the central site. Each record is examined, including the pay history remarks, and the pay due to each Marine is computed as Type Transaction Code 699. These TTC 699s are transmitted via AUTODIN to the appropriate RASC and are the basic input for the Rough Rolls and Smooth Rolls pay process. The composite to check-to-financial organization program is entered into the Federal Reserve System by tape at Kansas City by manual delivery.

For those Marines who are on Centralized Pay, e.g., Marine Corps Base, Twenty-Nine Palms, the checks are created at the central site and delivered to Central Pay Accounts for subsequent delivery to the appropriate Disbursing Office. The Disbursing Officer audits the checks received against the Personal Financial Record. Checks which are less than the amount due are issued and the difference made up as a special amount. In those cases where the original check was in excess of the amount due, that check is cancelled and a new check in the proper amount is issued. Subsequent to payday the Comeback Pay Tapes (TTC 625) are posted, as payments are made, to the CMR.

Subsequent to the last payday of the month, receipt of the Comback Pay Tapes, and the 6th day of the next month, Leave and Earnings Statements are produced from the CMR and are distributed throughout the Marine Corps by the MCFC. This action provides for an exercise of the control, audit and correction to the pay process.

In addition to the creation of the JUMPS Management Reports, the manual audits performed as a Quality Assurance function serve to provide as audit and control post-pay processes for the detection of all forms of erroneous payments within JUMPS/MMS.

3.2.2 Development of REAL FAMMIS

As stated in the foregoing section, for the past decade the Marine Corps has utilized the Manpower Management System (MMS) and Joint Uniform Military Pay System (JUMPS) to support the manpower and pay functions of the active duty Marine Corps. During that time, JUMPS/MMS has undergone significant revision and modification to meet the ever changing procedural and information demands. Recognizing that JUMPS/MMS was approaching its life expectancy, the Marine Corps embarked upon a program to develop a system that will serve commanders and managers at all levels throughout the mid- and long-range periods. Thus, on 30 March 1978 the Chief of Staff of the Marine Corps approved the concept of the Real Time Financial and Manpower Management System (REAL FAMMIS).

As an ultimate goal, This concept provides for a single, centralized, automated manpower and pay system, which will combine service record maintenance, unit diary reporting and personal financial record maintenance into a single function. As proposed in the concept, the REAL FAMMIS would be capable of:

- Secure, on-line, real-time, interactive retrieval and update of the central data base with reporting units down to the Battalion/Squadron level.
- Supporting the Command in all environments: garrison, afloat and deployed ashore.
- Achieve data transmission through maximum use of telecommunications support available.
- Operate on standard, general purpose ADPE which will become available in the 1985-1995 time frame.

During the period 1 August 1978 through 30 September 1981, the Potomac General Research Group (PGRG) performed development work on the REAL FAMMIS as follows:

- Problem Definition (1 August 1978 to 30 March 1979)
- Requirements Determination and Validation (1 April 1979 to 29 June 1979)
- Initial System Design Considerations (1 July 1979 to 28 September 1979)
- Feasibility Study (1 October 1979 to 29 August 1980)
- Telecommunications Requirements Study (1 May 1980 to 30 September 1980)
- Economic Analysis (1 October 1980 to 7 April 1981)
- Functional Description (1 October 1980 to 7 June 1981)
  Automated Information System Development Plan (1 October 1980 to 30 September 1981)

Herein, we will highlight those features of the aforementioned development work that directly apply to manpower and pay support in a deployed environment.

During the Problem Definition, it was determined that JUMPS/MMS did not adequately support deployed units or individuals.[1] The Regional Automated Service Centers (RASCs) are in fixed locations which created the problem of transporting input/output to and from deployed units. The telecommunications are not generally available with sufficient capability in deployed units for high volume administrative traffic. Additionally, it was determined that the Disbursing Offices must support deployed units with a parallel manual pay system and that their T/Os were not adequate to support this requirement.

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[1] It should be noted that the JUMPS/MMS was not operational during the Vietman era and thus, has not been tested in a war-type of environment.

Evolving from the problems defined in the existing JUMPS/MMS system were 246 requirements validated as necessary and three that were validated as optional to meet the criteria established in the approved REAL FAMMIS System Concept Statement. Those that pertain uniquely to manpower and pay in a deployed environment are summarized herein; i.e., REAL FAMMIS must:

- Provide the means for system operation and functioning which are independent of the environment in which the system is operating.
- Provide that any required hardware in the FMF is independent of the environment in which the system is operating.
- Provide for interface with required Marine Tactical Command and Control Systems (MTACCS).
- Provide for absorbing the functions of the Marine Integrated Personnel System (MIPS).[1]
- Provide for interface with the Shipboard Manpower Management Systems (ASIS, LHA-MIS).[2]
- Provide the means by which the system can smoothly make the transition from the garrison to the afloat and then to the combat environment.
- Establish interface from Battalions/Squadrons in AOAs and other remote/afloat locations to the central pay data base.
- When available transmission means will not support direct interactions between the centralized pay data base and the deployed unit, establish a MAGTF central data base.

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[1] The MIPS is the system that is to provide the FMF with an easily deployable system capable of providing the manpower information input requirements to the MTACCS. PGRG prepared and delivered to the Marine Corps a Required Operational Capability document with supporting information regarding MIPS on 2 July 1976.

[2] This requirement was validated as "optional."

- Provide the capability to pay members of other Services when necessary.
- Provide members the option of having a portion of net pay carried forward if desired, and, at the option of the unit commander when deployed or afloat, to delay the unit payroll.
- Provide the requisite information and responsive procedures with which system users may determine the tables of organization and manning levels for units under their cognizance.
- Provide a means by which the system will interface with tactical and supporting establishment systems, models and processes which have a requirement for manpower information.

The system designs evaluated were conceptualized as alternatives that might satisfy the requirements for REAL FAMMIS. These were a centralized, decentralized, and a hybrid system that combined features of each of the other two pure alternatives. During the feasibility study, each of these alternatives and the existing JUMPS/MMS were evaluated regarding their technical and operational feasibility in meeting REAL FAMMIS requirements. The JUMPS/MMS was determined to be not technically or operationally feasible in meeting the REAL FAMMIS requirements. The centralized, distributed and hybrid systems were found to be operationally and technically feasible and would accrue approximately the same relative benefits. Importantly, each of the alternative REAL FAMMIS system designs was marginally feasible from both a technical and operational standpoint when considering a deployed environment.

Regarding technical feasibility, one of the seven evaluation criteria was, "Provision of REAL FAMMIS support to deployed MAGTFs." It was determined that a lack of data communications capability to the battalion/squadron level and from the deployed MAGTF (or AOA) caused an unresponsive component for REAL FAMMIS processing. Each alternative system configuration was, therefore, modified to accomodate the degraded communication conditions. It was hypothesized that each deployable battalion/squadron would be provided a stand-alone microcomputer terminal to conduct transaction edits, prepare a transaction disk, and query the battalion manpower convenience file. (In fact, this device can be considered to be the second generation of the "green machine" that has recently been provided at the battalion/squadron levels.) It was also hypothesized that a mobile FASC would be provided the deployed MAGTF to create consolidated MAGTF transaction tapes for transportation to a host computer and return update of files (These FASCs are analogous to the MASCs referenced throughout this report). It was envisioned that the MAGTF FASC would act as the regional MAGTF processor for the REAL FAMMIS alternative ultimately recommended, the hybrid alternative. Even with these modifications the hybrid system was still adjudged to be "marginally feasible" regarding technical considerations.

A total of 39 operational feasiblity criteria were identified for analysis and derivation of quantitative benefits. Of these, the following four were directly involved with the deployed environment:

- Ability of the system to meet the information and pay needs of the afloat commander during periods when communications may be less than optimal. (Within this criterion, such factors as: (1) what are the true information and pay needs of the afloat commander, and (2) what are the anticipated number of changes to the data base with which the commander embarked, are considered.)
- Ability of the system to meet the information and pay needs of the combat commander during periods when communications exterior to the combat area may be less than optimal. (This criterion measured the flexiblity of a system in meeting a commander's information needs under varying quality levels of communications exterior to the AOA.)

- Capability of the system to effect all payments to and collections from members, from information contained in individual pay accounts in garrison, afloat and in combat.
- Ease of handling input corrections (resubmissions of data) from afloat and deployed commands during periods when communications may be less than optimal.

While the hybrid alternative was evaluated to satisfy each of these criterion, it did so in a marginal fashion causing it to receive a rating of "marginally feasible" for operational feasibility for both the combat and afloat environments.

The portion of the REAL FAMMIS developmental efforts involving telecommunications requirements in the AOA documented the fact that there then existed insufficient data to adequately identify AIS requirements in the AOA. Accordingly, since data were not available for other data competing with REAL FAMMIS traffic, the examination of the LFICS capability considered only whether or not a particular configuration could support the REAL FAMMIS data transfer requirements. Figure 3.2.5 outlines the traffic flowlines for a MAF in the AOA and Table 3.2.1 provides an indication, by link, of the percent of total common user channel capacity required for transfer of REAL FAMMIS data. Since the greatest percentage estimated was only six percent of the total capacity, it was evaluated that the multichannel switched system (MCSS) should be capable of supporting REAL FAMMIS within the AOA. However, telecommunications exterior to the AOA were evaluated to be severely constrained due to the austere capabilities available. PGRG estimated that with a 75 bps rate approximately 200 percent of channel capacity would be required by REAL FAMMIS alone.

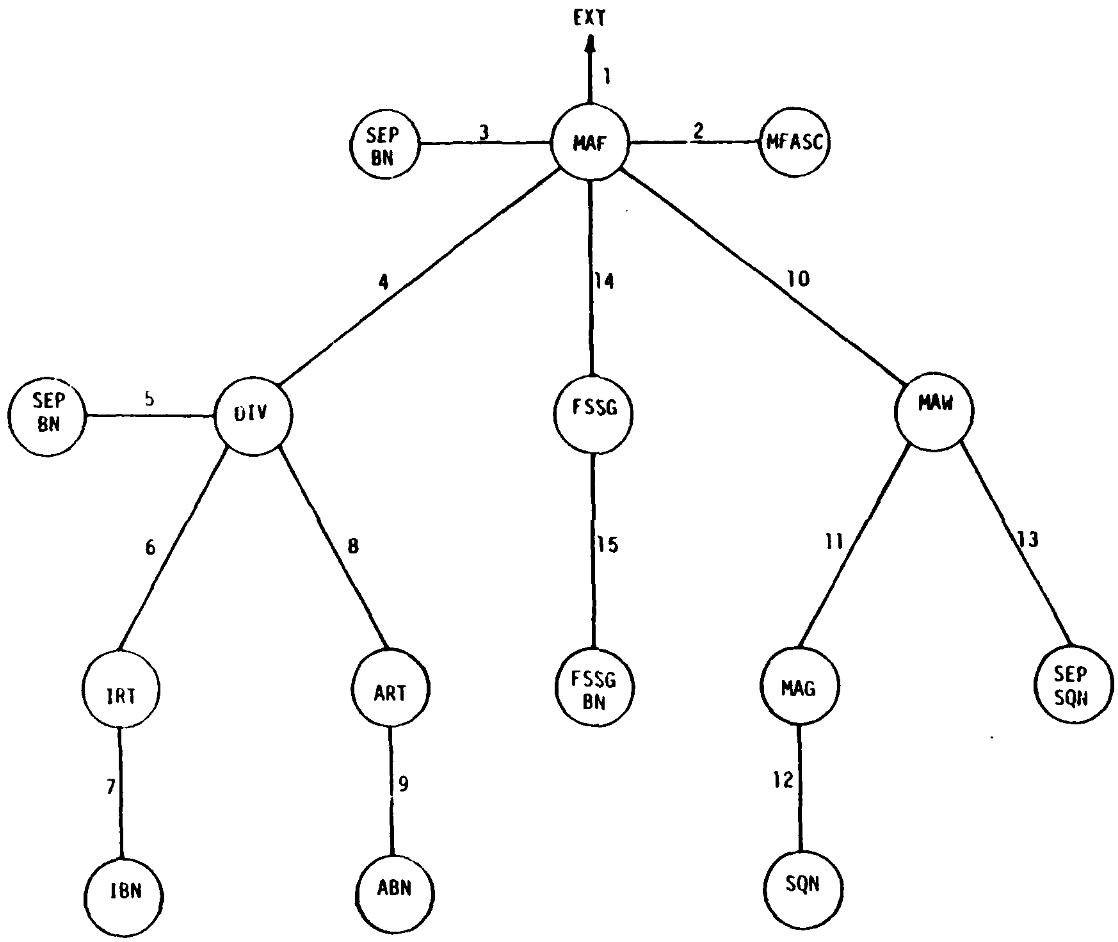

Figure 3.2.5 REAL FAMMIS Traffic Flowlines for a MAF in the AOA

TABLE 3.2.1

COMPARISON OF MCSS TRAFFIC CAPABILITY
AND REAL FAMMIS TRAFFIC REQUIREMENTS
WITHIN THE AOA

Link	Common User Channels	Common User Channel Capacity Erlangs	Call Min	REAL FAMMIS Traffic Requirement Daily	Busy Hr	% of Total
2	(*)	-	-	4244	849	-
3	(4)	2.0	120	18	4	3
4	34	33	1980	365	73	4
5	(4)	2.0	120	18	4	3
6	6	3.8	228	59	12	5
7	6	3.8	228	18	4	2
8	6	3.8	228	70	14	6
9	7	4.6	276	13	3	1
10	34	33	1980	376	75	4
11	22	19.5	1170	60	12	1
12	(4)	2.0	120	5	1	4
13	(4)	2.0	120	5	1	4
14	19	16.5	990	184	37	4
15	7	4.6	276	25	5	2

*To be determined

The information in REAL FAMMIS, contained herein, is the most current available. It is subject however, to changes resulting from certain organizational and concept decisions made by the REAL FAMMIS Executive Steering Committee on 30 November 1981. These changes have not as yet been provided to PGRG.

3.2.2.1 <u>REAL FAMMIS - Garrison and Embarkation Phases</u>. The pay and manpower operations within REAL FAMMIS for the garrison and embarkation phases of an amphibious operation are depicted in Figures 3.2.6 and 2.3.7 respectively. As can be seen, REAL FAMMIS is a crossbreed between a fully centralized approach and a distributed approach; i.e., it uses a centralized concept of pay and manpower data input and a distributed concept of manpower data retrieval, for active duty Marines.

The principal elements of this approach are a central, integrated data base that is operated at a large central processing facility (MCCDPA, Kansas City) and several regional data bases geographically located in CONUS, Hawaii and Okinawa. These data bases are accessed, the central for all updates and some retrievals, the regional sites for retrieval, by user terminals over an extensive MCDN-based telecommunications network. Generally, HQMC, disbursing offices and reporting units at the Battalion/Squadron and higher headquarters echelons (in garrison) will have query and update access to manpower and financial information. Intermediate commands that have no reporting responsibility will have direct access for query only to that portion of the data base pertaining to individuals under their purview.

Principal to this system is the sequence of data update. All data are entered to the central master file prior to being distributed to the regional data bases. Therefore the central file is truly the master file.

Primary data entry points will be the Reporting Unit (RU) and the Disbursing Office (DO)[1]. Data entry will be from the RU

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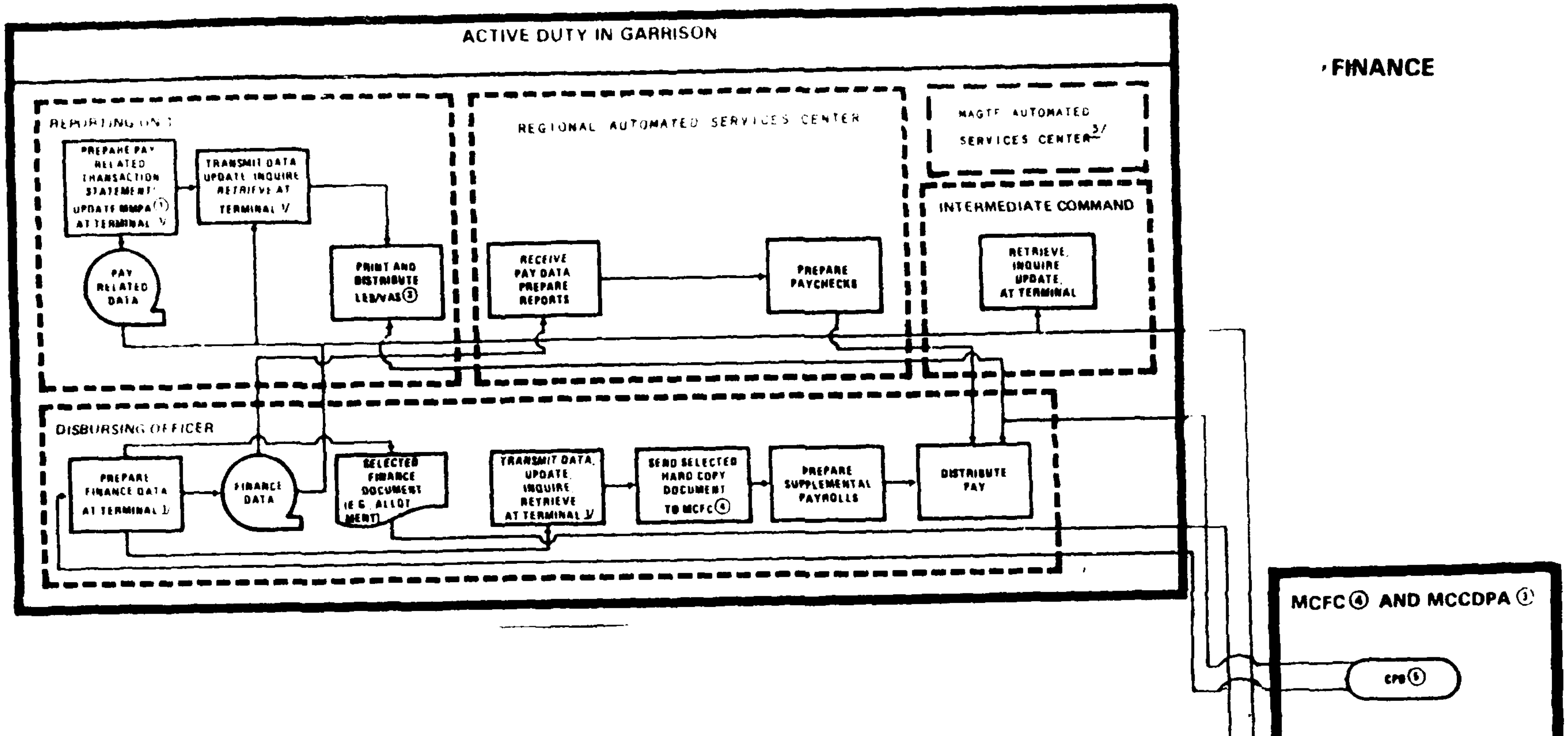
[1] Input to the system will be directly from unit reporting, as supplemented by DO, HQMC, MCRD, AFEES and other input and/or quality assurance personnel.



NOTES

1/ "TERMINAL" IS A DEVICE WITH INPUT (TELETYPE, TAPE) AND OUTPUT (CRT, DISC, HARD COPY) CAPABILITY AND SOME MEMORY. AVAILABILITY OF TERMINALS IN RESERVE UNITS HAS NOT BEEN DECIDED. IF TERMINAL IS NOT OPERABLE, HAND CARRY OR MAIL MUST BE USED.

2/ INCLUDES ACTIVE DUTY, RESERVE AND RETIREE PAY DATA

3/ THE MAGTF AUTOMATED SERVICES CENTER IS KEPT "WARM" [illegible] A MINI DATA BASE [illegible] GARRISON OPERATIONS. IT IS ACTIVATED DURING THE EMBARK[illegible]ON PHASE WITH PAY RECORDS OF THE DEPLOYING UNITS.

LEGEND AND ABBREVIATIONS

→ DATA FLOW (MEANS MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED

① MASTER MILITARY PAY ACCOUNT

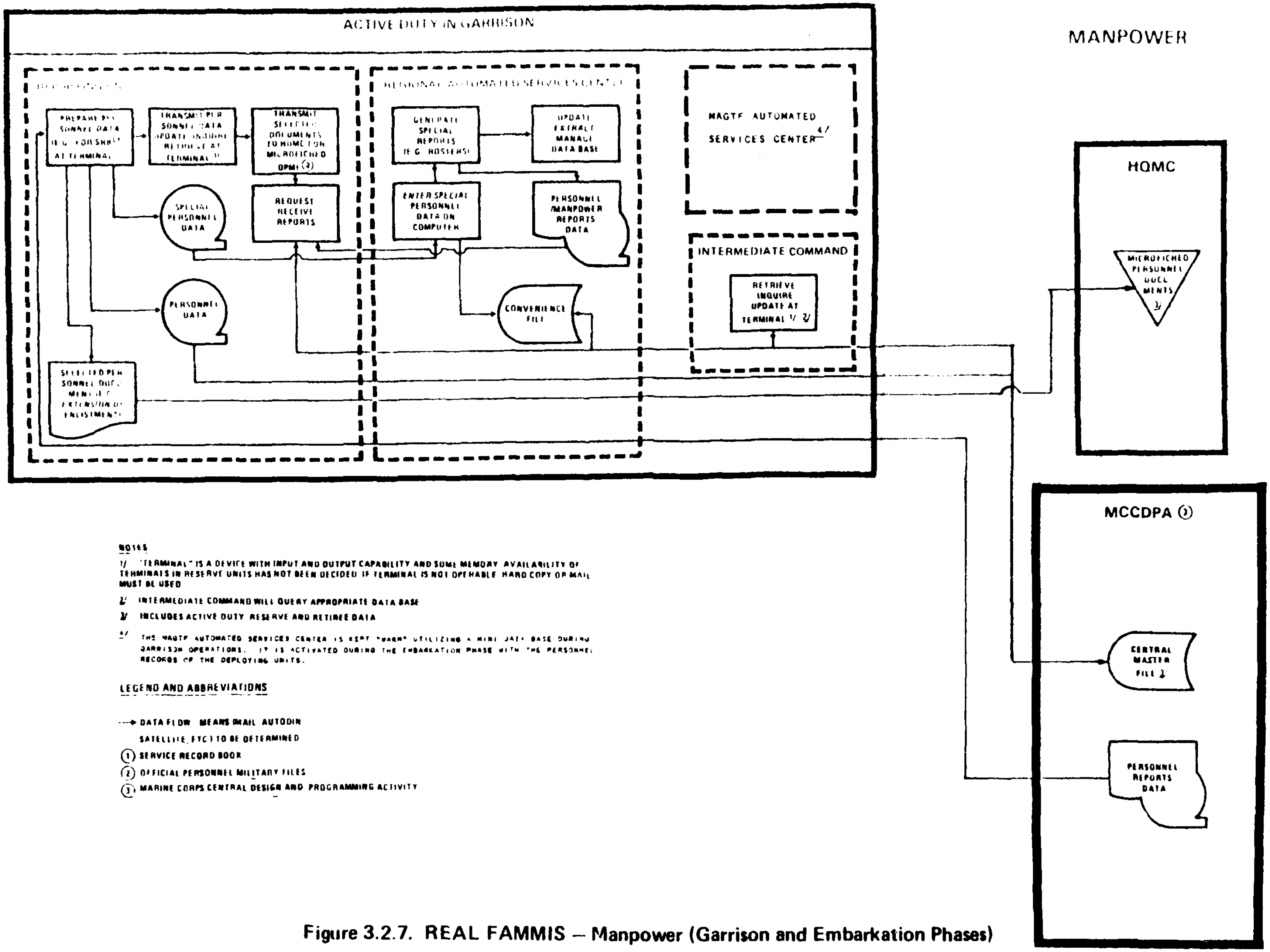
② LEAVE AND EARNINGS STATEMENT/VISUAL AUDIT SHEET

③ MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY

④ MARINE CORPS FINANCE CENTER

⑤ CENTRALIZED PAY DIVISION

Figure 3.2.6. REAL FAMMIS – Pay (Garrison and Embarkation Phases)



NOTES

1/ "TERMINAL" IS A DEVICE WITH INPUT AND OUTPUT CAPABILITY AND SOME MEMORY. AVAILABILITY OF TERMINALS IN RESERVE UNITS HAS NOT BEEN DECIDED. IF TERMINAL IS NOT OPERABLE, HARD COPY OR MAIL MUST BE USED.

2/ INTERMEDIATE COMMAND WILL QUERY APPROPRIATE DATA BASE

3/ INCLUDES ACTIVE DUTY, RESERVE AND RETIREE DATA

4/ THE MAGTF AUTOMATED SERVICES CENTER IS KEPT "WARM" UTILIZING A MINI DATA BASE DURING GARRISON OPERATIONS. IT IS ACTIVATED DURING THE EMBARKATION PHASE WITH THE PERSONNEL RECORDS OF THE DEPLOYING UNITS.

LEGEND AND ABBREVIATIONS

→ DATA FLOW (MEANS (MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED)

(1) SERVICE RECORD BOOK

(2) OFFICIAL PERSONNEL MILITARY FILES

(3) MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY

Figure 3.2.7. REAL FAMMIS — Manpower (Garrison and Embarkation Phases)

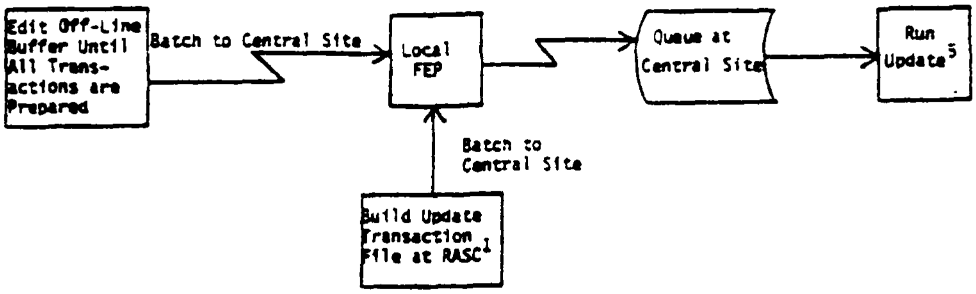
or DO terminal to the CDPA. Most RUs and DOs are to be equipped with programmable terminals (PTs) but some will have nonprogrammable terminals (NPTs). When a reserve unit has a PT, the Inspector-Instructor and Active Duty Support staffs will use the MCR unit PT; other MCRs will have separate NPTs. Some users at HQMC and MCFC/CDPA will use NPTs.

For those units/offices equipped with the PT, prompted format edit of updates is to be accomplished within the terminal (off-line). When the transactions are formatted and ready for input they will be sent on-line (or by physical transport if telecommunications are not available) to the MCDN entry point for transmission to the CDPA. Reporting Units equipped with the PT will also maintain a local manpower data base for that unit. When update transactions are generated for input to the CDPA, they will also generate updates to the unit's local file. This will provide the commander automated data support for manpower management when telecommunications are not available to the RASC or CDPA.

For those units/offices equipped with the NPT, prompted format edit will be accomplished interactively either with the RASC or the CDPA. If prompted by the RASC, a very limited amount of logic edit, e.g., data comparisons, will be accomplished. As update transactions are completed, they will be forwarded from the RASC via MCDN to the CDPA.

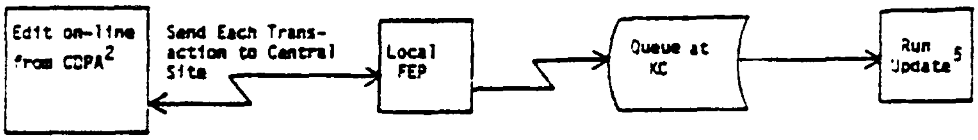
For both types of terminals, when the update data reach the CDPA, they usually will be queued up for entry during an update cycle. This is when the full edits against actual records will occur. When the update is run, a UTR type of report will be generated magnetically for the user. When the terminal signs on for the next period of activity the UTR report will appear so that the user can determine the status of the last group of update transactions. Figure 3.2.8 schematically traces possible input processes for programmable and non-programmable terminals.

PROGRAMMABLE TERMINAL

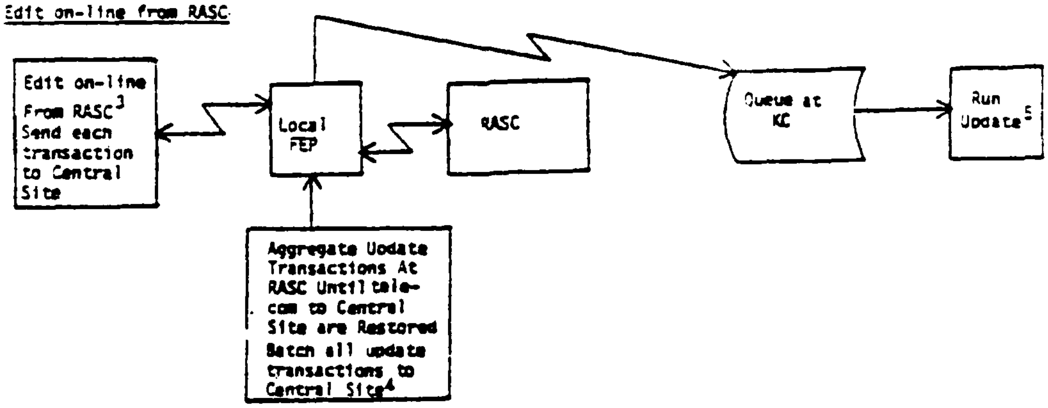


NON-PROGRAMMABLE TERMINAL

Edit on-line from CDPA



Edit on-line from RASC



[1] When telecommunications from the user terminal to the RASC are not available update transactions are built at the programmable terminal off-line and physically transported (diskette) to RASC for transmission to central site.

[2] When telecommunications from the terminal to the local FEP or from the local FEP to the central site are not available, update transactions cannot be made from the non-programmable terminal.

[3] When telecommunications between the user terminal and the RASC are not available, update transactions cannot be made from the non-programmable terminal.

[4] This condition would only occur when telecommunications between the RASC and the central site were not available, but telecomm between the RASC and the user terminal were available.

[5] Update will occur within 24 hours of receipt of update data at the Central Site

Figure 3.2.8 REAL FAMMIS Input Process

After the update has been run, an update overlay will be transmitted to the applicable regional data bases to update those records touched. The ultimate goal is to have the central and regional data bases updated within 24 hours of receipt of transaction at the central site. However, the initial goal is to update the Central Master File within 24 hours of the update data being received at the CDPA. For the units with PTs and thus an in-house data base, an update overlay will be generated periodically from the RASC to the RU to reconcile the unit's data base. The frequency of this overlay has not yet been determined.

When data are entered, an accepted transaction will result in a fully updated record since the system is to be designed so that a transaction entry automatically generates the associated transactions; e.g., a promotion generates the appropriate changes in pay, BAQ, FICA, withholding tax, etc.

Standard output is to be generated at specified times and "force-fed" to the users. Retrieval, for the majority of data, will be from the regional data bases. Ad hoc retrievals will use interactive prompting to set up the requirement, and depending on the magnitude of the request and its priority, will be provided interactively or at a later date. For instance, an alphabetical roster with different data fields from the standard roster (e.g., to support training management) might be requested one day and provided 24 hours later; whereas, a request for an individual record could be made and then satisfied in seconds. In the latter case, the user will have the option of retaining the information in magnetic storage or hard copy. There will be some output that must be printed, such as pay checks and LES/VASs. The printing of high volume output at the terminal versus using RASC facilities is a matter to be decided on the basis of local needs and the economic utilization of resources.

Ad hoc retrievals will be facilitated by conversational prompting through the data base management system. The ease with which REAL FAMMIS meets ad hoc output requirements may well cause an increased demand for this type of output.

The individual record in the unit/DO file of the programmable terminals will approximate 6-10,000 characters in order to accommodate, in the unit file, the automated SRB and applications programs to be performed at the terminal. Each terminal will have at least .256 megabytes of core memory and process at the rate of .03 million instructions per second (MIPS). The RASC and MASC record sizes will be identical and somewhat larger than the RU data base due to inclusion of LES information as well as information on unit records. The central data base individual record size will be at least 20,000 characters. While in a garrison environment, the MASC will be kept "warm" by exercising it with a mini data base. During the embarkation phase, personnel/pay records of the deploying units will be moved from the RASC to the MASC. The actual transfer in processing control must be closely coordinated between the RASC and the MASC.

Entry into the system for either update or retrieval will be safeguarded by a combination of electronic and physical security provisions. Electronic authentication/verification for certain transactions will also be incorporated. There will also be a priority system for both update and retrieval.

Pay functions are to be managed centrally. Pay functions conducted by local disbursing offices will be by interaction on-line from the DO terminal to the applicable data bases. In most cases the DO terminal will interact with the central data base. However, LES/VAS information is to be resident in regional data bases and accessible on-line so that pay service will not be interrupted when telecommunications to the CDPA are not available. Also, considerable pay information can be stored in the programmable terminals, at the DO's option. Personnel on direct central pay are to be paid by check via U.S.

mail or check-to-bank. For those that are paid locally, check images will be transmitted electronically to the RASC or disbursing office where the actual checks will be produced.

The system is to be capable of pay computations covering any period up to 31 days.[1]

The REAL FAMMIS function of the local disbursing officer is to monitor the pay system within the DO's jurisdiction and to provide pay service. Since the central data base is to be highly accurate, there will be no requirement for preliminary rough payroll data nor for the local disbursing officer to evaluate the payroll prior to payday. The local disbursing office will not maintain individual pay accounts[2] but will have immediate, on-line access to pay accounts stored magnetically at the central site. The local disbursing officer will make exceptional payments and provide pay service to individuals when required, as well as assist commanders in the area of pay. The interactive terminal at the disbursing office will not only provide the disbursing officer the capability to retrieve pay information, but also the capability to input.

Notice of payments to Marines by other services is to be conveyed to the central site where data entry will be performed to update the data base.

REAL FAMMIS intends to eliminate hard copy documentation wherever possible. This will be accomplished in the case of the Unit Diary, TODE, Data Transcription Form, SRB/OQR etc. However, there are certain input transactions that require hard copy documentation, e.g., Record of Emergency Data, Pay Option Election, Withholding Tax form W-4,

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[1]Due to the programming structure, this is not possible with JUMPS/MMS for Marines under centralized pay; hence, pay interruptions (e.g., lack of Congressional obligation authority) have been difficult to cope with.

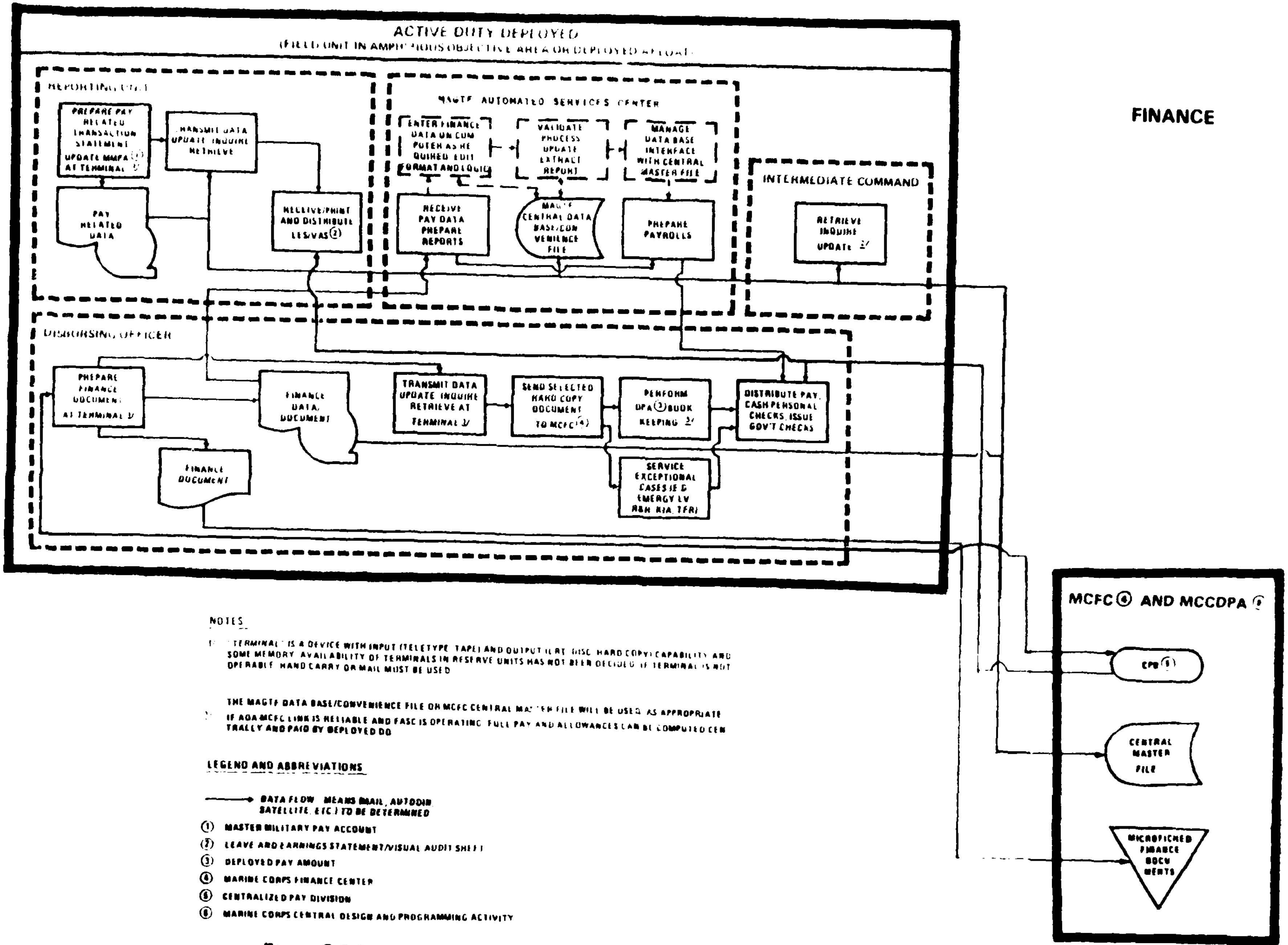
[2]I.e., personal financial records (PFRs).

etc. This will be accomplished as follows: the normal procedure for input will be followed; but when the transaction is accepted by the system, it will also be printed out at the terminal. The hard copy will then be signed by the Marine and/or the certifying officer and subsequently mailed to the central site, for (1) reduction to microform and (2) disposal of the hard copy. The on-line availability to users of documents reduced to microform remains to be determined.

3.2.2.2 REAL FAMMIS - Afloat, Assault and Continued Operations Ashore Phases. The pay and manpower operations within REAL FAMMIS for the afloat, assault and continued operations ashore phases are depicted in figures 3.2.9 and 3.2.10 respectively. Within REAL FAMMIS, all Battalion/Squadron size deployable units will be equipped with terminals that have a programmable, stand-alone capability. Some software similar to that of the central site CPU will be resident in those terminals and the reporting unit will have the capability to maintain its own limited manpower data base. When update transactions are generated for the central site, the unit data base will also be updated. Periodic reconciliations of the unit data base are to be made from the RASC. For echelons above battalion/squadron retrievals or other system output will emanate from the RASCs. Since the output will originally come from the central file, the regional files must be synchronous.

Since the responsibility of the two major FMF commands transcends more than one regional data base, direct access to the central site for retrievals and/or other output may be desirable.

Equipment and software for ADP support to units and DOs deployed ashore and afloat will provide substantial amounts of core memory in programmable terminals and a high priority of usage for manpower and pay functions. This will enable units and DOs to operate independently when telecommunications are either not available or when tactical traffic has severely reduced the capability of transmitting administrative traffic.



NOTES

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THE MAGTF DATA BASE/CONVENIENCE FILE OR MCFC CENTRAL MASTER FILE WILL BE USED AS APPROPRIATE.

IF ADA-MCFC LINK IS RELIABLE AND FASC IS OPERATING, FULL PAY AND ALLOWANCES CAN BE COMPUTED CENTRALLY AND PAID BY DEPLOYED DO.

LEGEND AND ABBREVIATIONS

⟶ DATA FLOW (MEANS MAIL, AUTODIN, SATELLITE, ETC.) TO BE DETERMINED

(1) MASTER MILITARY PAY ACCOUNT
(2) LEAVE AND EARNINGS STATEMENT/VISUAL AUDIT SHEET
(3) DEPLOYED PAY AMOUNT
(4) MARINE CORPS FINANCE CENTER
(5) CENTRALIZED PAY DIVISION
(6) MARINE CORPS CENTRAL DESIGN AND PROGRAMMING ACTIVITY

Figure 3.2.9. REAL FAMMIS – PAY (Afloat, Assault, and Continued Operations Phases)

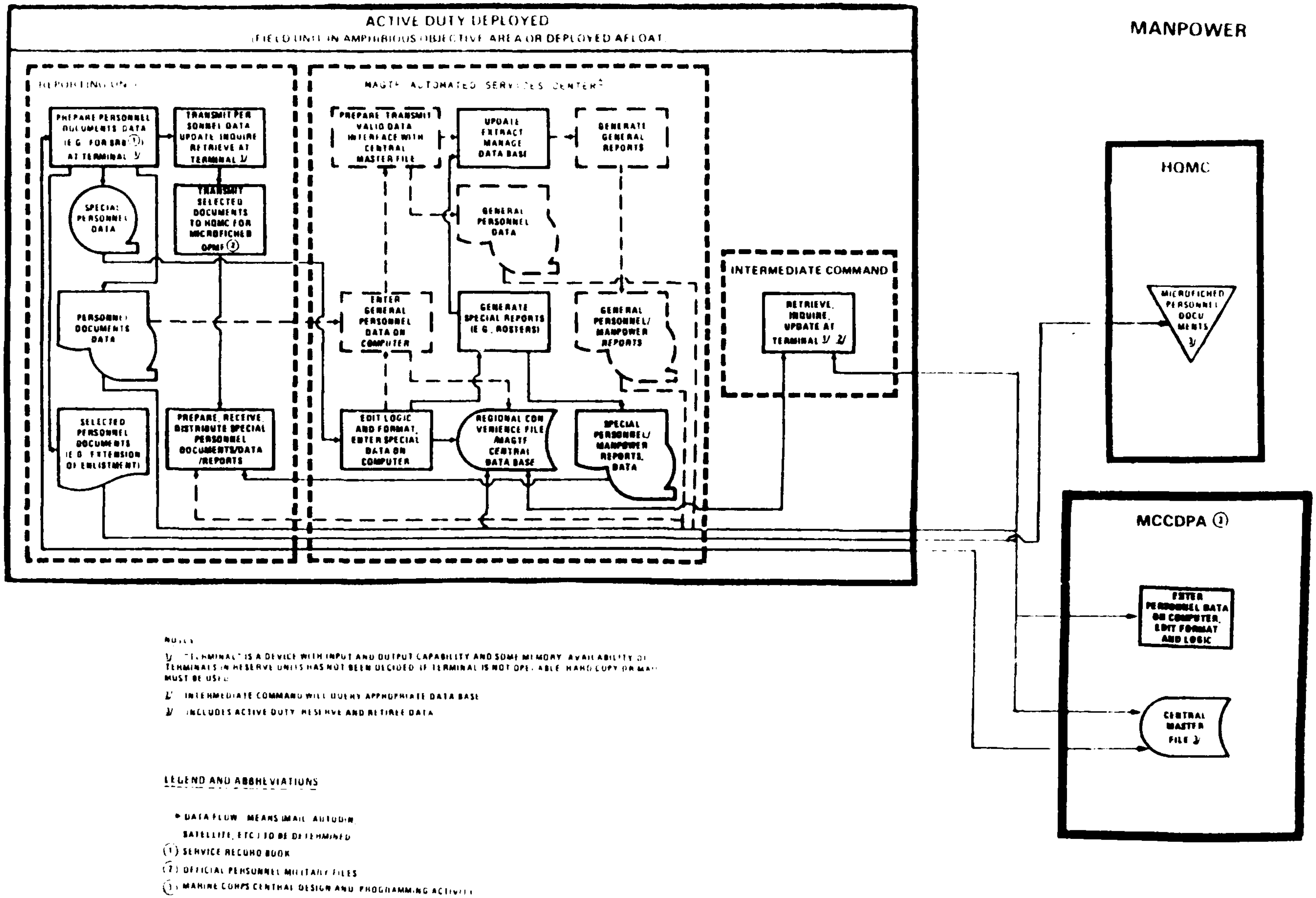


Figure 3.2.10. REAL FAMMIS – Manpower (Afloat, Assault and Continued Operations Phases)

It is intended that multichannel circuits provide AIS data transfer capability; but, the level of support that can be provided to deployed units is highly dependent on tactical telecommunications within and external to the deployed environment. Regardless of the communications resources available, the system is able to provide at least a minimum level of support.

It is not anticipated, in the foreseeable future, that there will be external, interactive telecommunications for REAL FAMMIS accessible to the deployed environment. However, over time, such telecommunications may become available. If this should happen, REAL FAMMIS will be capable of incorporating the telecommunications that become available. In that event, the system will operate in the same fashion as for the garrison environment.

It is anticipated that the majority of deployed system use would be with a combination of stand-alone mode and, when telecommunications are available, interaction with the MAGTF Automated Services Center (MASC).

Guidance concerning the LFICS architecture specifies that the multichannel communications will not be available to reporting units or DOs in a highly mobile situation. The multichannel telecommunications will only be available to the more static units/offices. This guidance indicates considerable periods of operation in the stand-alone mode. By having the stand-alone capability, the reporting unit can manage its manpower and the DO can manage pay from a limited, but substantial, convenience file (6-10K characters) per record resident in the terminal processor. Input transactions will be edited for format against this file and placed on output media for subsequent entry into the central data base. As described earlier, the unit update transactions will concurrently update the unit's local data base. Depending upon the MAGTF deployed environment, the update diskette will be transported to the MASC or to the central site by whatever means available. If it goes to the MASC, the MASC will aggregate all the updates for a given period of time and generate a consolidated update diskette (or tape cassette) for transport to the central site by available means-courier, mail, AUTODIN, etc. The MASC will maintain a MAGTF convenience file for manpower management needs of the major MAGTF elements. In accordance with present guidance, this file will not be updated at the time the input transactions are processed for input to the central site; rather, the file will be updated only after the central site processes the MAGTF update and returns the update transactions for overlay on the MAGTF convenience file. When units/DOs are aboard ship, input transactions diskettes are to be generated either for subsequent aggregation when the MASC is established or sent direct to the central site.

The foregoing procedure is one of the major areas of concern to field commanders interviewed during the course of this study. While it may be a goal of REAL FAMMIS to update the regional data base within 24 hours, this may not be possible in a deployed environment when communications out of the AOA are taxed to meet the requirements of tactical traffic. Thus, if the deployed regional data base located at the MASC is not updated until after the transaction has posted at the Central Master File, there is a high probability that the MASC data base would be two or more weeks old, which is highly unacceptable, especially when consid[illegible]ng the volatile nature of pers[illegible]nel transactions in combat. Accordingly, it is strongly recommended that the proposed design for REAL FAMMIS be modified to provide for updating the MASC data base when transactions are received and consolidated from the reporting units.

When telecommunications are available, the reporting entities will be able to generate input on the stand-alone (programmable) terminal and then transmit them interactively to the MASC where they will be aggregated for transport to the central site, as described above. On receipt of the update or output from the central file the MASC will update the MAGTF file, break down the updates or output and send them to the reporting units so those files can be reconciled. Again, depending on the availability of telecommunications, this will be done on-line or by other means of transmittal.

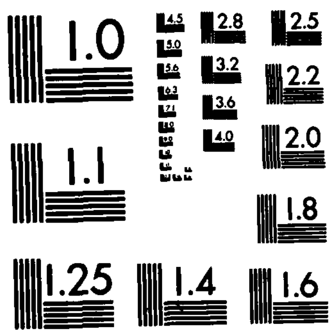
It is anticipated that a mobile MASC will accompany a MAB-or-larger deployment. The MASC will consist of a van or shelter mounted minicomputer with a reasonable complement of peripheral devices to support deployed MAGTFs as follows:

- Maintain a limited manpower data base.
- Perform retrievals from the manpower data base.
- Perform format and limited logic edits on most manpower transactions and prepare transaction tapes/discs.
- Segregate and prepare a pay related transaction tape/disc; perform only format and a few logic edits.
- Provide interactive support to RUC users when telecommunications allow.
- Disaggregate and distribute updated information returned from the central site.
- Perform automated services for UDs on request (e.g., LES storage and retrieval).

During work on the ADS Development Plan for REAL FAMMIS, PGRG analysts working with cognizant HQMC and MCCDPA personnel developed the assumption that the processing requirements placed on the MASC would be 25 percent of CONUS-type processing requirements because of the significantly reduced volume of traffic anticipated. This assumption should be validated during forthcoming phases of the REAL FAMMIS development.

In cases where the MASC might not be deployed, such as for a MAU deployment, the bulk of support is to be accomplished by users

AD-A123 283 AUTOMATED INFORMATION SYSTEM (AIS) SUPPORT FOR FMF 2/5
UNITS WHEN DEPLOYED OR IN COMBAT (1985-1995)(U) POTOMAC
GENERAL RESEARCH GROUP MCLEAN VA 13 APR 82
UNCLASSIFIED USMC-60-81-02 M00027-78-G-0061 F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

utilizing stand-alone capability. However, by equipping the MAU headquarters with a stand-alone processor, a limited convenience file could be maintained for the MAGTF, if necessary. This could be done by having the major elements of the MAU consolidate input from their reporting units and provide the consolidated input to the MAGTF mini-processor.

FMFM 4-1 specifies guidance which recommends that each MAGTF be required to submit a Personnel Status Report daily with information that is no more than two hours old. The data requirements are for strength and loss data for each unit of the MAGTF (including other service personnel and civilians) as follows:

- Strength
  - Actual
  - Authorized
- Losses
  - Battle (killed, died of wounds, wounded, captured missing)
  - Non battle
  - Administrative

Although this information is not specifically provided for in the current documentation of REAL FAMMIS, its inclusion as a standardized report is easily implementable.

The REAL FAMMIS concept calls for pay service to be fully centrally managed. If this were followed to the letter, deployed Marines would be totally dependent on central pay output that may reach the deployed area only after significant time delays and on an intermittent basis. It is apparent that commanders must have some flexibility to pay deployed Marines.

Figure 3.2.11 displays the REAL FAMMIS flexible pay method that enables commanders to provide pay service to deployed Marines.

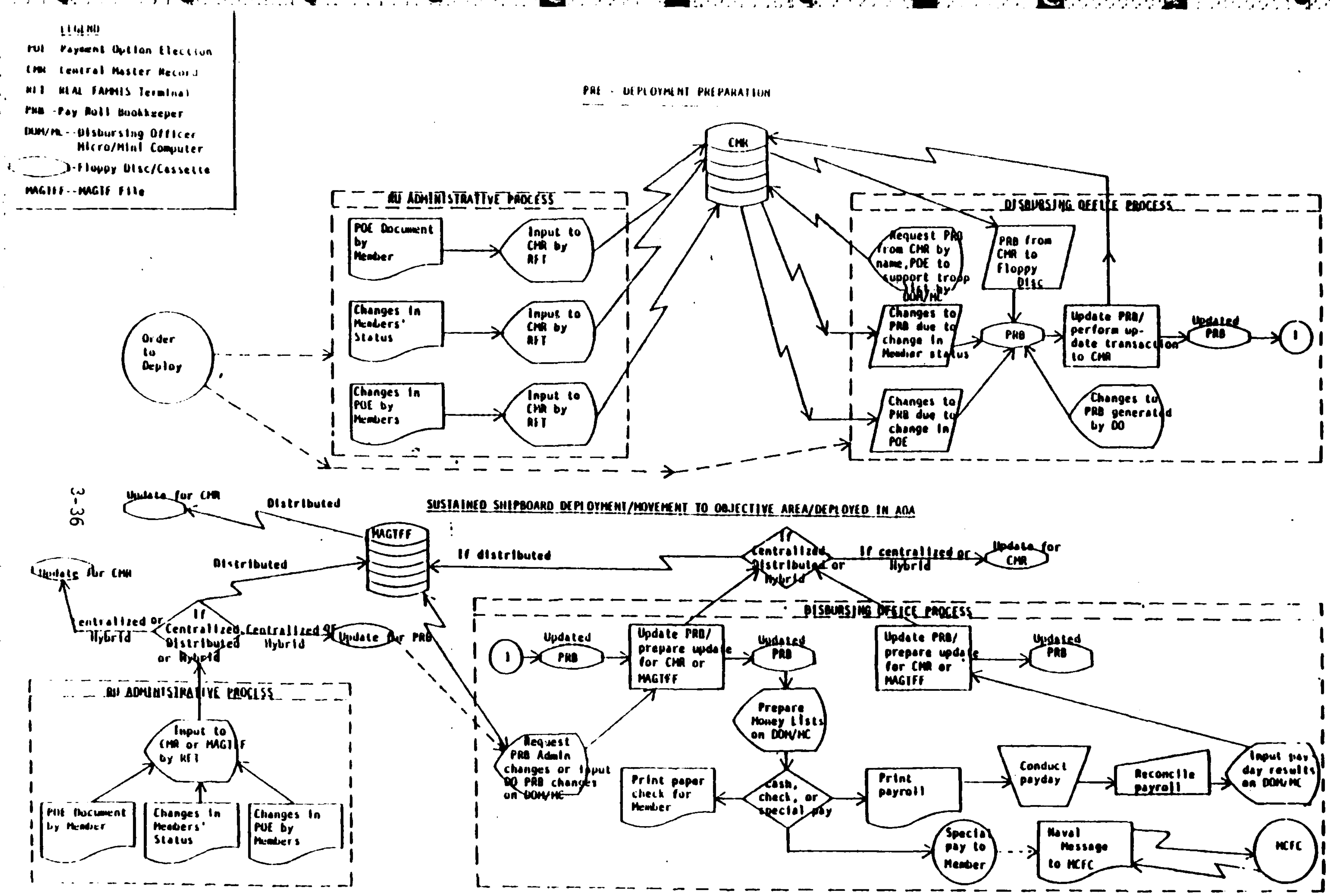


Figure 3.2.11. FMF Deployed Pay Process

Under REAL FAMMIS, an automated bookkeeping system is to be deployed. Marines will be paid a Deployed Pay Amount (DPA) specified by a Pay Option Election made by each Marine. All pay processing is still to be performed at the central site. Any monies due the Marine over and above the DPA will accrue on the central file. The Marine will also have the option to draw less than the DPA each pay day, as desired. The money "left on the books" will accrue on the local bookkeeping file, to be paid at an appropriate time such as for an R&R trip, rotation, etc. Special payments of amounts more than the locally accrued amount could be supported by centrally accrued monies as authorized by message traffic between the local disbursing office and the MCFC.

The bookkeeping system is to be operated on the disbursing office programmable terminal. Input transactions to the bookkeeper file will also generate update transactions for the central file. The latter will be produced on diskette or cassette for transport to the MASC for consolidation or direct to the central site. Changes in the Marines' status such as change of payment option election, KIA, and checkages of pay will be generated by the reporting unit administrative section and sent to the MASC, or a diskette or cassette will be provided to the disbursing office so the bookkeeper file can be updated. RUC-DO interface will be important to preclude overpayments and delays in disciplinary action (forfeitures).

Periodic automated reconciliations will be accomplished between the deployed disbursing office bookkeeping file and the central file at MCFC. For example, the current DPA and the "monthly norm" pay amounts will be reconciled; and historical data (i.e., payments) will be purged from the bookkeeping file after being picked up on the central file.

For individual Marines participating in "Direct Deposit," the local disbursing office will accept and cash the Marine's draft on a commercial bank/financial institution.

The most recent available Leave and Earnings Statement, with the updated information contained on the local deployed pay file, will be provided to the individual upon transfer or when returning to CONUS on emergency leave, to provide a means to be paid by another service while in transit.

The concept for the deployed REAL FAMMIS provides a pay and manpower management system that will adequately support the deployed MAGTF. One shortcoming stems from the lack of a sufficient telecommunications capability in the AOA to support external communication requirements for administrative traffic. This shortcoming may cause time delays of 10 to 30 days in the turnaround of administrative data processing from the MASC to the Central Master File which is unacceptable for other than audit purposes. For this reason, it is recommended that the MASC data base be updated when transactions are received from the reporting units rather than after they have posted at the Central Master File. Some may argue that the principal shortcoming of REAL FAMMIS is, in fact, the degree of centralization of manpower/pay data. This was one of the reasons that the alternative of total centralization was not recommended for REAL FAMMIS.

Numerous considerations regarding the development of REAL FAMMIS were provided the AIS study team during interviews conducted with manpower and disbursing personnel at various Fleet Marine Corps Commands. Since these considerations are involved in the details of designing REAL FAMMIS rather than in the total concept of REAL FAMMIS operation, they can readily be incorporated into the REAL FAMMIS during the work on the next milestone of the REAL FAMMIS development, the detailed system design phase. These considerations are:

- Specific provisions must be made for operations in the event of catastrophic system failure. These provisions must be detailed and planned for. It is not sufficient to merely state that units would revert to manual unit diary preparation. Even today, where automated assistance has been implemented, we find that there are few administrative personnel who still possess the skills requisite to preparing a manual unit diary.

- Specific procedures must be detailed regarding the administration of tactical units that are operating away from a site that provides automated assistance.

- While it is not anticipated that an ACU would ACU would accompany a deployed MAGTF, planning should be made to include in REAL FAMMIS support provisions, the training and assistance function provided by the administrative control unit (ACU) in garrison.

- A fail-safe procedure must be established to ensure that the Record of Emergency Data (RED) which is acted upon in the event of casualties is the most current one completed by a Marine. It is conceivable that REDs completed during the movement to objective phase of an operation would not have reached Kansas City/HQMC before priority message traffic designating casualties. Thus, unless specific procedures are instituted (e.g., a flag of some type in the casualty message such as the date of the last RED on record at the RU), it is conceivable that notifications, the death gratuity and possibly, even the remains, could be sent to the incorrect party.

- Care must be taken in developing software for the programmable terminals which will be located at the reporting units to ensure that the operator capability to override error message is carefully controlled. For example, the ACUs report they are currently experiencing problems with transactions entered on the "green-machine", wherein the clerks have entered incorrect SSNs or initials and then have overridden the machine software when it has flagged the error.

- Provision must be made to modify, during deployments, certain procedures that have been implemented to enhance garrison administration. For example, the current procedure is to terminate a Marine's pay and allotments if his EAS arrives and he has not been reported to have reenlisted or extended. In a combat environment, this could happen frequently through delays in the system; the Marine should not be made to suffer because of system inadequacies.
- There may be a necessity for disbursing officers to provide advance pay and allowances to a rapidly deployed MAGTF for up to two pay days. This would give the MAGTF disbursing officer the time he would need to initialize his distributed system.
- There must be a backup for the diskette on which basic pay data is retained.
- Some concerns were expressed with respect to pay for naval and other Service personnel associated with a MAGTF. In actuality, payment of other service personnel does not present a problem. It is envisioned that the procedures would not significantly differ form current procedures wherein a "skeleton" pay record is maintained by the Marine Corps disbursing officer charged with administering an unit. He pays the other Service personnel the same as he does Marines and periodically reconciles their "skeleton" pay records with the pay records carried by their parent Services; e.g., for the Navy, he reconciles with the Integrated Disbursing and Accounting (IDA) system. A similar system would be used for Marine Corps casualties who are in other Service Medical facilities.

3.2.2.3 Summary for Pay and Manpower. The Real Time Financial and Manpower Management System (REAL FAMMIS) will provide the pay and manpower management capability to the Marine Corps for both garrison and deployed operations during the midrange. The garrison REAL FAMMIS is a highly centralized pay and manpower management system which is accessed by user terminals over an extensive MCDN-based telecommunications network. Reporting units, down to the battalion/squadron level, will have direct access to a centralized data base for query and update of manpower and financial information as it occurs. It is anticipated that the deployed REAL FAMMIS would be a combination of operations in a stand-alone mode (Reporting Units will have programable terminals) and, when LFICS is available, interaction with the MAGTF Automated Services Center (MASC).

Conceptually, the REAL FAMMIS will provide adequate pay and manpower support to the deployed MAGTF; however, cognizant Marines in virtually every echelon of command maintain that, when a MAGTF is deployed, the MASC data base must be updated when transactions are received from reporting units under its jurisdiction rather than after the transactions have posted at the Central Master File. Otherwise, the information on the MASC could be from 10 to 30 days old, rendering it practically worthless in the turbulent atsmosphere of a combat environment.

3.3 POLICY PLANS AND OPERATIONS (PPO) - HQMC

PPO has the responsibility for the Unit Status Report (UNITREP). UNITREP is utilized to report the combat status of battalion/squadron sized units through channels to the Joint Chiefs of Staff (JCS). UNITREP is the replacement for the Marine Automated Readiness Evaluation System/Force Status and Identity Report (FORSTAT).

3.3.1 UNITREP Baseline

The UNITREP baseline operations are as depicted in the enclosure to Tab J to Annex C. The baseline system consists of manually prepared coding sheets prepared at the battalion/squadron/separate company level. The manually coded sheets are reduced to keypunched information which is transmitted through intermediate commands to Division, FSSG, and Wing. The data are transported or transmitted through AUTODIN. The data is submitted to a RASC/FASC where reports and error messages are generated and review by the MAF is accomplished. From the MAF, the consolidated data is AUTODINed to the FMF, to the CINC and then onto the JCS and CMC. As the information is reviewed at each echelon, reports and error messages are also prepared. In many cases, the UNITREP data is classified SECRET and hence special provisions must be made to accommodate the classified processing at all levels.

UNITREP inputs are prepared and submitted any time there is a unit status change (1-80 column card image) and once a month (5-80 column card images). A worst case situation occurs during the deployed operations of assault and continued operations ashore. Knowledgeable personnel estimated the worst case could cause two changes per week for combat and combat support units in the force and one change per week for other units. The monthly reporting requirement continues during deployed operations. The processing time within II MAF for FORSTAT (UNITREP) processing is .34 percent per month on an IBM 360/65 computer. In a worst case, a combat unit would submit 14 card images per month (9 changes, 5 monthly) and the equivalent processing time could increase to

14/5 x .34 or .95 percent which is considered trivial and hence overlooked as a processing requirement. What may not be overlooked however, is the classified nature of the processing. The classified processing requires special scheduling on most ASCs since classified processing may not be intermingled with unclassified processing.

3.3.2 Deployed UNITREP Processing

Initial contacts with the PPO representative to the study resulted in acquisition of a flow diagram of how UNITREP would be operated in the deployed mode. The flow diagram, obtained in April 1981, is enclosed with Tab J to Annex C. The flow was based upon manually prepared input forms which were forwarded through channels; they were reduced to data inputs on keypunch devices at the Division/FSSG/MAW-level. During a SAC meeting in October 1981, the PPO representative indicated that the procedures for preparing UNITREP input information was undergoing change so that inputs would be prepared upon ADPE-FMF devices rather than the manual forms with keypunch at the Division/FSSG/Wing-level. Verification of the alternate means of UNITREP input was conducted in December 1981 at this writing. The PPO representative indicated that the ADPE-FMF concept would operate in a manner similar to the manual system except that input data would be generated on ADPE-FMF devices. The input diskettes would be passed through channels with a conversion to the appropriate media prior to submission to the nearest AUTODIN facility; AUTODIN terminals were identified at Division, Wing and FSSG. The new concept is yet unapproved however approval is anticipated in a month or two.

3.3.2.1 UNITREP-Garrison and Preembarkation. UNITREP will undergo the trauma of changing unit makeups as the force is organized for deployment. Personnel attachments and detachments along with changes to equipment strengths will undoubtedly cause frequent changes to the unit's status which will be reportable under UNITREP. Fortunately, a change requires only one card image but unfortunately, it will most likely require a classified processing environment as discussed earlier in this subparagraph. Each month, each RUC must submit a 5-card-image report through channels.

3.3.2.2 UNITREP-Afloat. During the afloat phase of operations, UNITREP activity will be minimal. The monthly reports would continue and status changes would be based upon rehearsals and force structure changes.

3.3.2.3 UNITREP-Assault and Continued Operation. These operational phases will create the most activity for UNITREP. Tactical units are expected to generate two inputs per week and other FMF units in the AOA will create one input per week. This processing requirement is trivial, however, the classified processing could create a scheduling requirement. The monthly reporting requirement will continue. Data will be prepared upon ADPE-FMF devices and sent through channels to the nearest AUTODIN entry point. The higher command echelons (MAF, MAB, division, wing, and FSSG) will access AUTODIN via the Naval Telecommunications System (NTS) using MAGTF HF equipment. Any external telecommunication capability that is available for the AOA will be utilized, be it AUTODIN, NTS or a DCA entry point.

3.3.3 Summary

UNITREP, the replacement for FORSTAT, will be placed upon ADPE-FMF devices where unit level input images will be prepared and forwarded through channels and transmitted utilizing the closest communications which go external to the AOA. A flow diagram of the generic operating procedures for deployed UNITREP is depicted in Figure 3.3. Most UNITREP processing will be classified thus requiring special scheduling. A monthly report consisting of 5 card images is required.

3.4 AVIATION

Aviation automated processing requirements encompass not only the standard Marine Corps systems such as REAL FAMMIS and M3S, but also aviation-unique logistical systems. Three of these systems are provided by the Navy, and two are Marine Corps-unique aviation reporting systems. In effect, Marine Corps aviation units operate in two different automated processing environments. The Marine Corps standard AISs operate in the ASC/RASC environments, currently provisioned with IBM 360 series

UNITREP - ALL PHASES (NOT YET APPROVED)

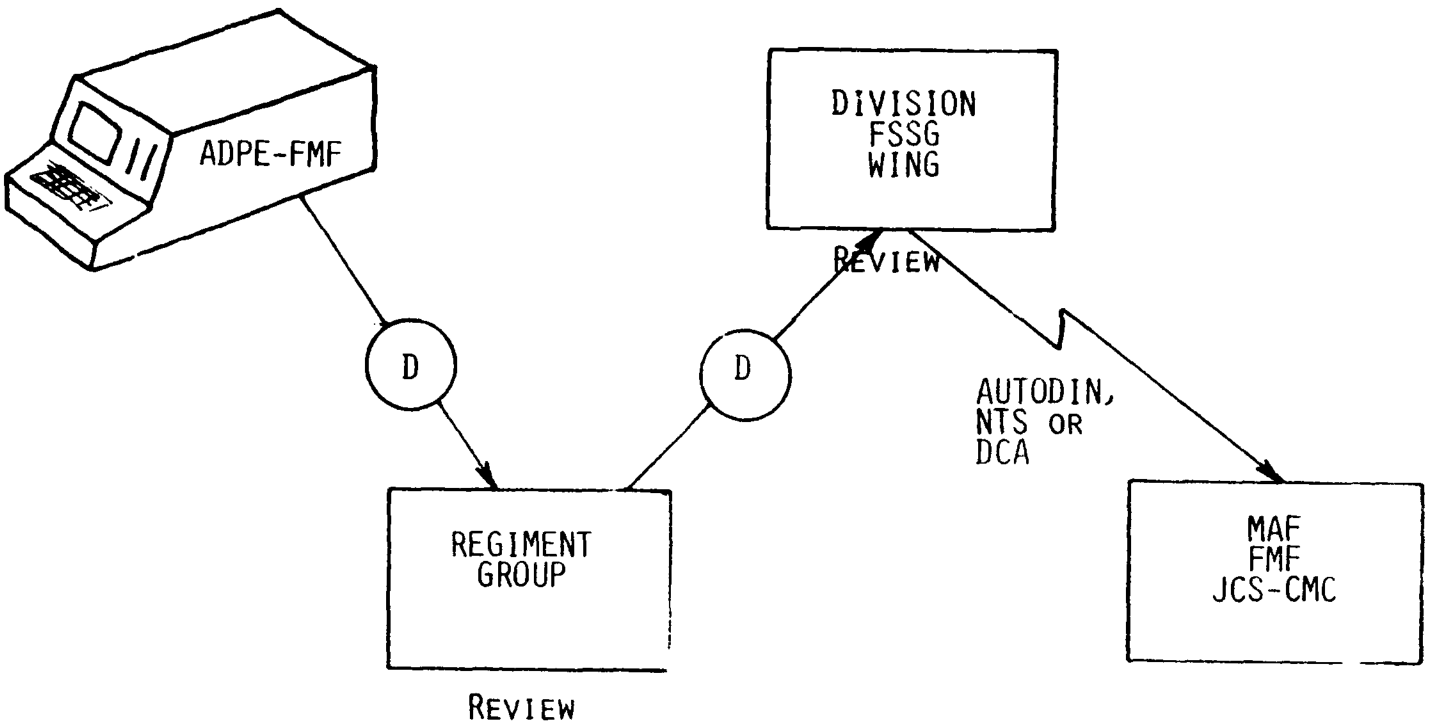


Figure 3.3

UNITREP Concept of Operation - All Phases computers. For naval aviation AISs, each Marine Air Group (MAG) is provided an AN/UYK-5(V) (UNIVAC 1500) computer by the Navy. These UNIVAC 1500s are approaching a 20 year technological age. A program is underway by the Navy to replace the UNIVAC 1500s with a system termed the Shipboard Non-Tactical Automatic Data Processing Program (SNAP). The UNIVAC 1500s are assigned to each MAG, and data flows directly from the MAG to the Navy supply/maintenance organizations. The Marine Aircraft Wing (MAW) does not have Navy-provided processors to aggregate and compile aviation unique information at the MAW level for staff use as management tools. Currently this aggregation processing is done utilizing the FASC/RASC IBM 360 series computers. The aviation unique AISs which support Marine Corps aviation functions currently and in the FY-88 time frame are as follows:

- Shipboard Uniform Automated Data Processing System (SUADPS). A Navy system which will be upgraded within the next two years to SUADPS-Real Time.

- Maintenance and Material Management System (3M). Navy system.

- Naval Aviation Logistics Command Management System (NALCOMIS). A Navy system which will replace 3M and enhance other systems with the introduction of the SNAP hardware prior to FY-1988.

- Flight Readiness Evaluation Data System (FREDS). A Marine Corps system.

- Standard Naval Aviation Supply System (SNASS). A Marine Corps system.

The UNIVAC 1500 is saturated with processing of SUADPS, therefore 3M, FREDS and SNASS are being processed on ADPE-FMF devices and/or the FASC/RASC IBM 360 series computers. All aviation unique systems are required for deployed combat operations.

3.4.1 Systems Description

3.4.1.1 Shipboard Uniform Automated Data Processing System (SUADPS). SUADPS is a straight-forward aviation repair parts requisitioning system designed to improve supply management by utilizing automatic data processing equipment. Under the SUADPS concept, all inventory control and financial records are maintained on magnetic tape. The system is run on the UNIVAC 1500 computer at MAG level and will be picked up on SNAP hardware to be acquired prior to the 1988 time frame. The system is designed to provide designated points of contact between the customer and the supply department, supply support center, stock control, system coordinator, data processing, and storage. SUADPS-RT will be an enhanced automated SUADPS that will be an on-line integrated and interactive system that uses source data entry (SDE) equipment and advanced data management techniques to provide responsive file maintenance and query capabilities. SUADPS-RT is expected to be operational in late 1982.

3.4.1.2 Maintenance and Material Management System (3M). The 3M system provides integrated aeronautical equipment maintenance management and all related support functions. The objective of 3M is to achieve the readiness and safety standards established by CNO, with optimum utilization of manpower, facilities, material, and funds. It encompasses the repair of aeronautical equipment and materiel at the level of maintenance which will ensure optimum use of resources; the protection of weapons systems from corrosive elements through the prosecution of an active corrosion control program; the application of a systematic planned maintenance program; and the collection, analysis, and use of pertinent data in order to effectively improve materiel readiness and safety, while simultaneously increasing the efficient and economical management of human, monetary, and materiel resources. The 3M system is founded on the three level maintenance concept; organizational, intermediate and depot level aviation maintenance. Currently 3M is processed on ADPE-FMF and the FASC/RASC IBM 360 series computer with all data being entered from the squadron level. In the 1988 time frame 3M will be replaced by NALCOMIS and processed on the SNAP I phase II hardware.

3.4.1.3 Naval Aviation Logistics Command, Management Information System (NALCOMIS). NALCOMIS is an automated management information system which will provide aviation maintenance and material managers with timely, accurate and comple : information on which to base day-to-day decisions. The overall objective of NALCOMIS is to implement a system that will provide assistance for the worker, supervisor and manager at the organizational maintenance activity (OMA), intermediate maintenance activity (IMA) and supply support center (SSC) leve s. each MAG will be provided with a Navy acquired computer which is designated to be the Navy SNAP hardware. The hardware configuration will normally be "hard wired" to interactive terminals throughout the MAG due to close proximity of subordinate units. NALCOMIS hardware will be dedicated to processing the data previously contained in the Navy maintenance and Material Mangement System (3M), inputing data to FREDS, and interfacing with SUADPS-RT and SNASS.

3.4.1.4 Flight Readiness Evaluation Data System (FREDS). The major purpose of this system is to construct an automated data base which will contain the data elements needed to manage Marine Corps aviation assets pertaining to utilization of aircraft and/or aircrews. It includes all scheduled flights including those flights that were not completed. The data base is derived from daily flight/flight training actions at the squadron level and recorded on a FREDS "yellow sheet." Data are entered and validated on local computers where the data base is maintained on a daily basis. FREDS input transactions are prepared on each scheduled flight not completed and for each flight crew member on completed flights. Currently FREDS is processed on the FASC/RASC IBM 360 series computers but will be converted to the SNAP computers for the 1988 time frame. FREDS interfaces with 3M intra-activity processing routines and produces reports as follows:

- Daily FREDS proof list
- Daily FREDS validation error report
- Monthly aircrew roster
- Monthly individual flight activity report
- Monthly aircraft utilization report

3.4.1.5 Standard Naval Aviation Supply System (SNASS). SNASS is a Marine Corps Class III system which compiles output from SUADPS that is processed on the UNIVAC 1500. The system uses UNIVAC 1500 output from all MAGs in all MAWs twice a month. This information is compiled/aggregated on the FASC/RASC IBM 360 series processors. Currently, output is printed on microfiche and distributed to all MAWs and MAGs in the Marine Corps. In a deployment some other media may be required as a substitute for the microfiche. Functionally, SNASS is used to locate and transfer aviation spare parts stocked within the MAG and from one MAG/MAW to another.

3.4.1.6 Other Local Systems. Visits to the 2nd and 3rd MAWs have revealed the existence of several locally generated systems which may add to the requirement for continued centralized MAW processing capabilities. Two examples of these Class III systems are listed below:

- Ordnance Expended System (OES). This class III system has been developed through the auspices of the 2nd MAW ordnance office. The system is interactive and operates from a single CRT terminal/printer on a Navy base-type UNIVAC 1140 computer. OES is utilized to manage aviation ordnance, aviation ordnance handling equipment and small arms ammunition. The system is used to make monthly inventory reports and to monitor unit use of annual ordnance allocation for possible transfer to other units. In a deployed force this system will be extremely valuable for compiling daily reports of aviation ordnance items.

- Aviation Supply Activities. Currently, the 2nd and 3rd MAW supply offices have established interactive access to two aviation supply activities; Aviation Supply Office, Philadelphia and four ICPs of the Defense Logistics Agency. No demands or transactions may be processed into these systems--they are utilized to retrieve supply status information.

From discussions with supply personnel, it is anticipated that a need exists to place a similar capability at the MAG level and a need was also expressed to place demands upon the ASO and DLA ICPs through the system.

3.4.2 Aviation Unique Systems--Garrison and Embarkation

Operations of the aviation unique systems in the garrison and embarkation phase of the amphibious operation are characterized in figure 3.4.1. For the 1988 time period aviation unique AISs will be processed on SNAP hardware in the MAG and compiled/aggregated at the FASC/MASC installation at the wing level. In garrison the MAG SNAP installation will be hard wired to interactive terminals in the squadron work areas. Data for the Navy systems will then be passed from the MAG into the Navy supply and maintenance activities. Data that is to be compiled/aggregated at the MASC will be passed from the MAG electronically or manually. In preparation for and during embarkation, data will be stored on tape at the MAG SNAP and at the MASC to be transported with the units afloat.

3.4.3 Aviation Unique Systems--Afloat

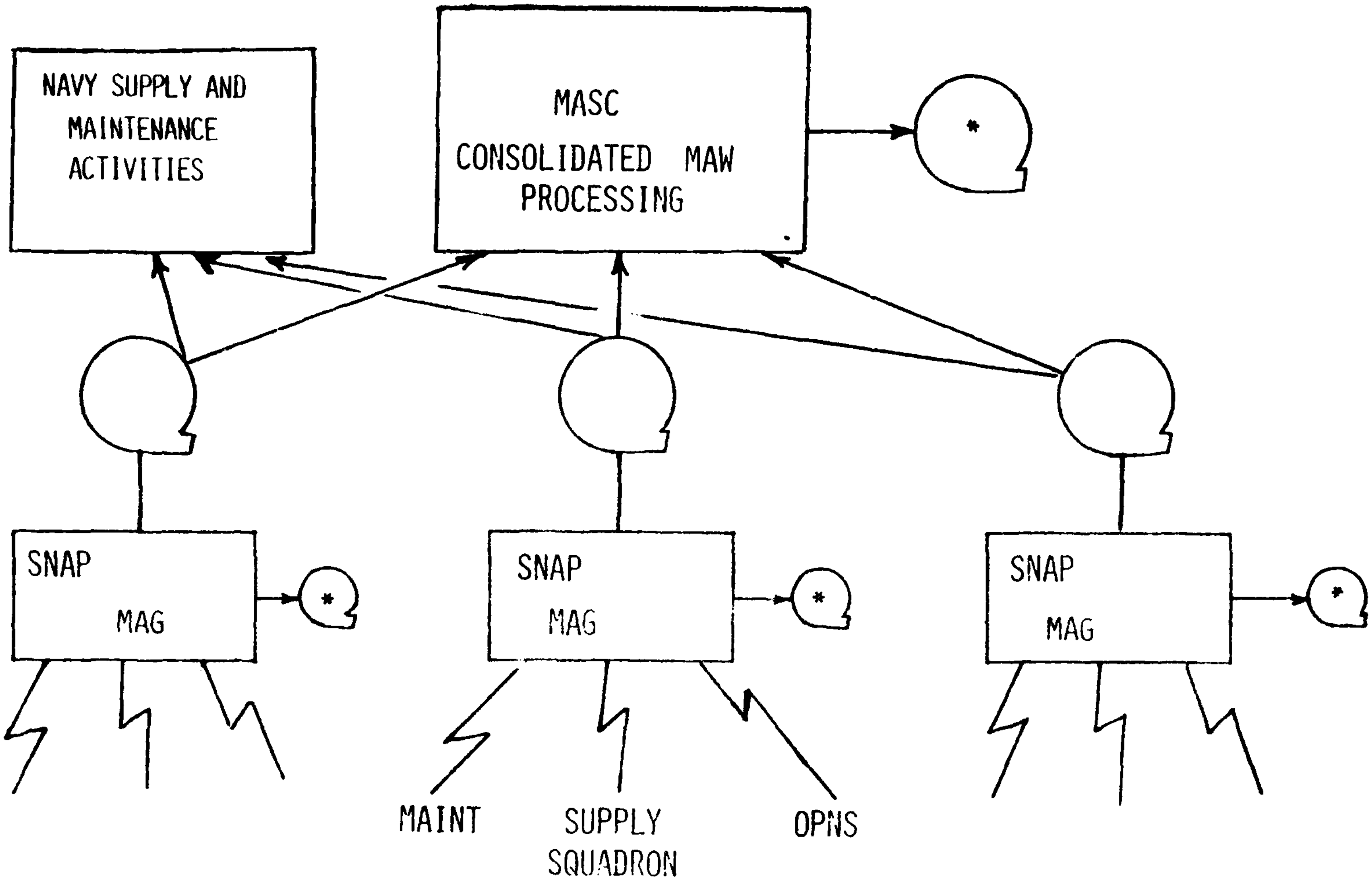
During the afloat phase of the amphibious operation very limited processing will be accomplished on the aviation unique systems. The Marine Corps SNAP hardware and the MASC will not operate until after movement and when established ashore. If processing time is available, the shipboard SNAP processors may be utilized. Courier service will be employed if it is necessary to transfer data between ships. Characteristics of the afloat phase of aviation unique systems are depicted in figure 3.4.2.

3.4.4 Aviation Unique Systems In the Assault and Continued Operations

Characteristics of the aviation unique systems in the assault and continued operations ashore are shown in figure 3.4.3. It is anticipated that the helicopter MAGs, with slow moving fixed-wing aircraft attached, would be established with the MAW Headquarters in the amphibious objective area. Squadron work centers will have interactive

AVIATION UNIQUE SYSTEMS

GARRISON AND EMBARKATION, ALL FORCE SIZES

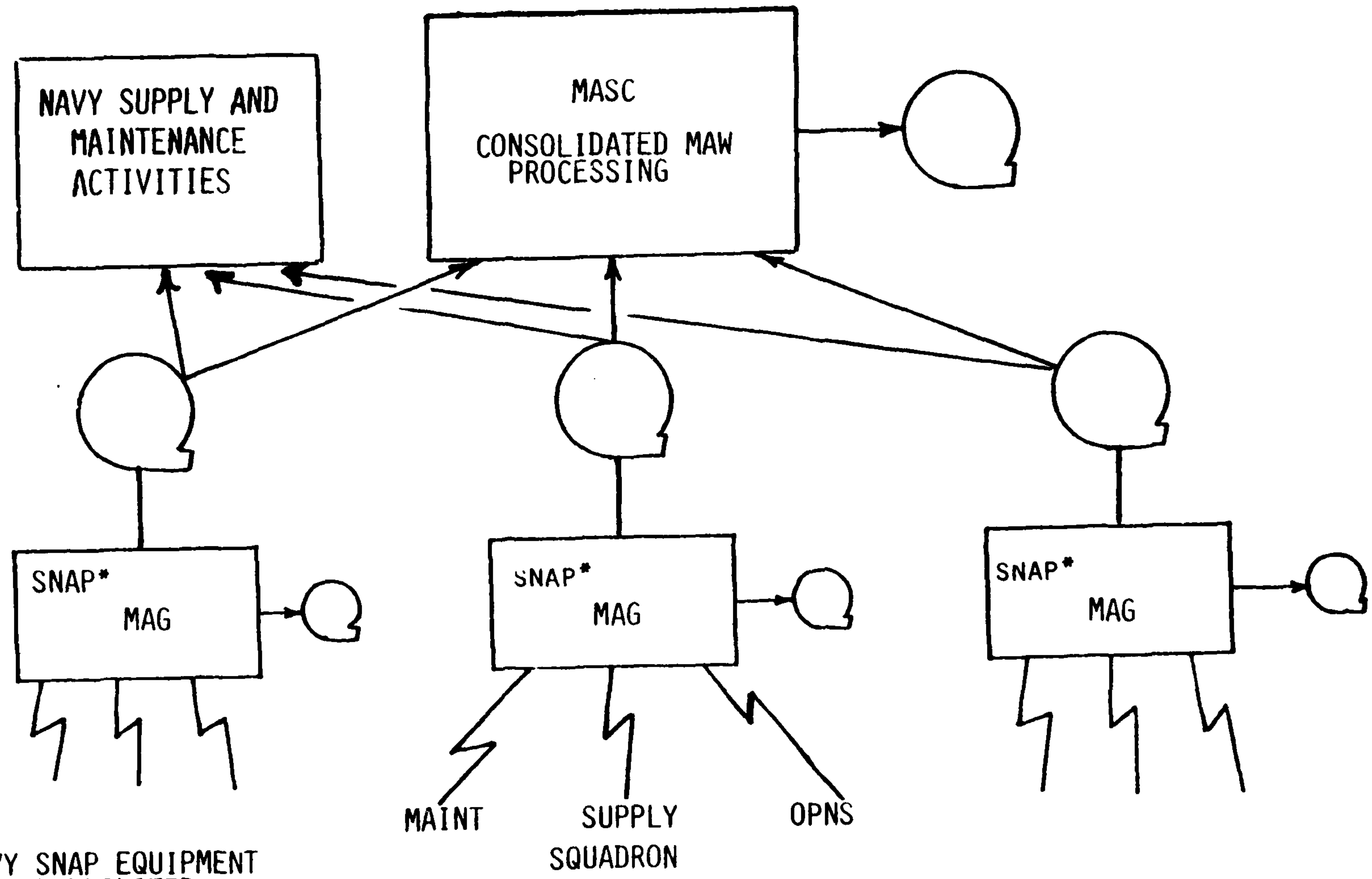


*DATA BASES FOR EMBARKATION

Figure 3.4.1
Aviation Unique Systems -- Garrison and Embarkation

AVIATION UNIQUE SYSTEMS

AFLOAT, ALL FORCE SIZES



*NAVY SNAP EQUIPMENT MAY BE UTILIZED

Figure 3.4.2

Aviation Unique Systems -- Afloat

AVIATION UNIQUE SYSTEMS

ASSAULT AND CONTINUED OPERATIONS, ALL FORCE SIZES

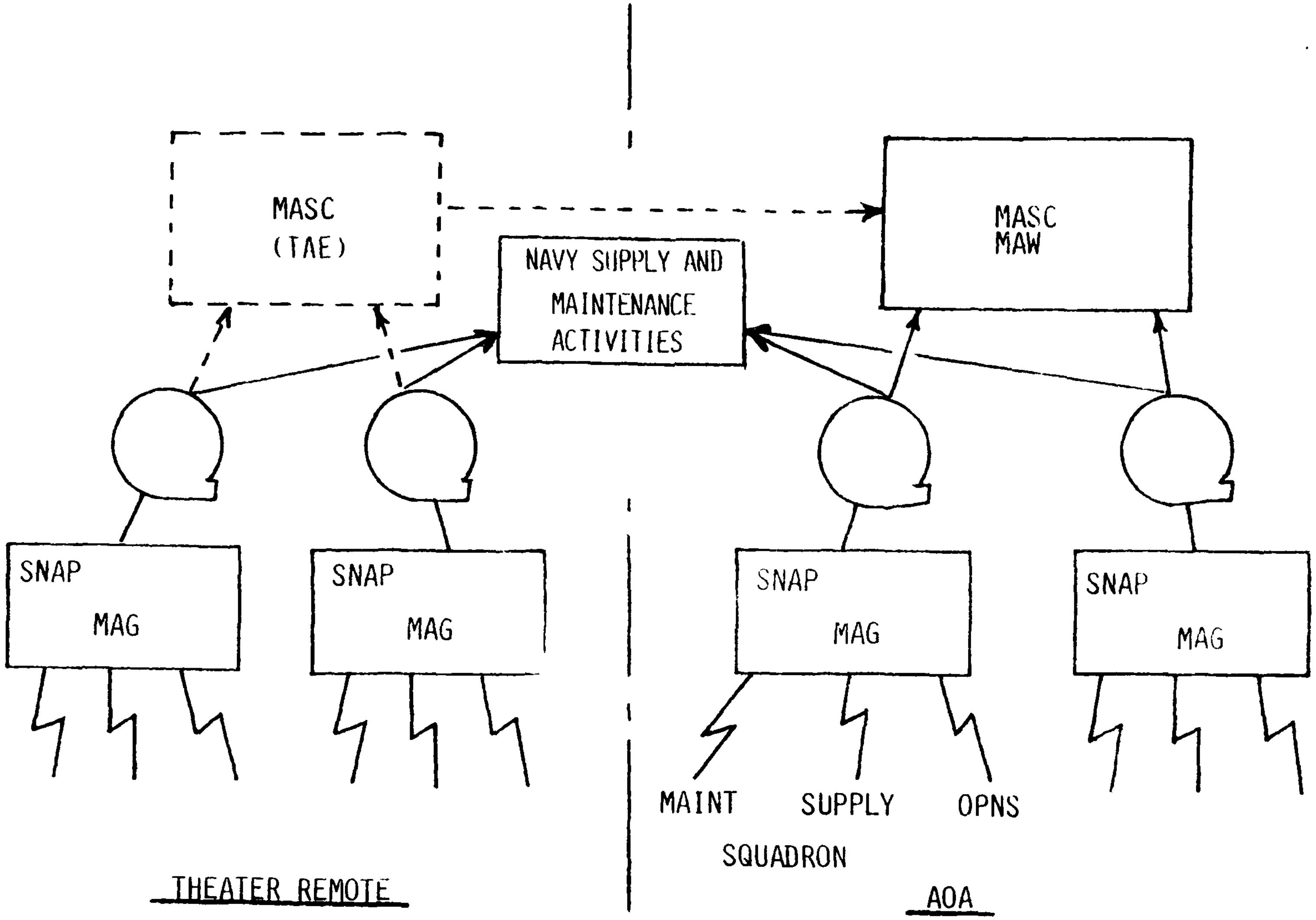


Figure 3.4.3

Aviation Unique Systems -- Assault and Continued Operations terminals hard wired to the MAG SNAP computer. Data will be processed on the SNAP computer and then passed to Navy supply and maintenance activities. Selected data will be transferred electronically or manually to the MAW aviation unique oriented MASC for compiling/aggregation. The system operations in the objective area will be a duplication of garrison operations. In this study with the high speed fixed-wing aircraft operating from a theater remote airfield a duplicate operation will be established within the theater remote MAGs. Compiling/aggregating data from the MAGs at a theater remote location may be transmitted electronically or manually to a MASC established in the theater remote area or transported on tape to the AOA for processing.

3.4.5 Aviation Systems Summary

The aviation unique systems briefly discussed in paragraph 3.4 and subsequent subparagraphs will operate on four types of computer equipment within the MAW.

Configuration "B" of the SNAP system shall support new and rewritten interactive software in aviation 3M and SUADPS-RT applications. This installation will be van mounted and located with each MAG.

A configuration "C" of the SNAP system will also be van mounted, adjacent to the configuration "B" van in each MAG. Configuration "C" provides additional ADP support for NALCOMIS and consists of added processing support, mass storage and remote peripheral subsystems designated (RPS-C), implemented as an extension of configuration "B". The combined configuration "B" and "C" will have a capability to provide up to 12-16 visual display terminals for each squadron. Installation of the first NALCOMIS operational site is programmed for FY 83 depending upon acquisition of the SNAP I Phase II computer and subsequent prototype operations at MAG-24, Cherry Point, NC.

ADPE-FMF is located in each squadron. Currently the FREDS and 3M data are entered on these machines and diskettes are transported physically or electronically to the FASC/RASC IBM 360 series computer for processing and compiling/aggregation and further transport to the mainframe computer.

Currently 3M, FREDS, and SNASS are processed on the FASC/RASC IBM 360 series computer. The ASC/RASC computer is also used to compile/-aggregate the MAG data of all aviation unique systems into useable decision making documents for MAW staff action. With introduction of SNAP as the replacement for the UNIVAC-1500, the requirement will continue for a "MASC" type computer at the MAW level for use in garrison and while deployed.

In addition to the aviation unique processing needs for a MASC, the aviation units will in most cases be located at airfields several hundred miles distant for an AOA. Due to the difficulty of data transmission, Marine AISs will most likely require processing upon an aviation-oriented MASC located within the MAW. The concept of REAL-FAMMIS and M3S data bases operated within the MAW is a newly emerging concept which will require further development and planning.

3.5 FISCAL

The Fiscal Department at HQMC is currently in the process of developing a major, new automated system with which to conduct the fiscal function within the Marine Corps. The new system, the Standard Accounting and Budget Reporting System (SABRS), is in the system development phase as of this writing; SABRS will replace the Marine Air/Ground Financial Accounting and Reporting System (MAGFARS) and the Class I Budget System, and the Priority Management Effort (PRIME), an automated system providing a means of collecting, processing and submitting financial data.

During the first round of interviews in II MAF, a preliminary deployed concept of operations was identified at the 2nd FSSG Disbursing Office for the Disbursing Office Voucher System (DOV)(MFR at Annex C, Tab B). A deployable DOV automated information system has not yet been supported by an appropriate HQMC proponent. Although there has been no formalization of a DOV AIS, the information obtained from the field will be enumerated in this study with a belief that such an enumeration will assist an appropriate HQMC proponent with the formalization of a deployable DOV justification. Endorsements for a deployable DOV were obtained within FMFPAC during the second round of interviews.

The military pay function is discussed as a subfunction of REAL FAMMIS and hence was documented in a preceding subparagraph 3.2.

The emerging, new fiscal AIS is SABRS. It is scheduled for implementation in FY-1984. HQMC Fiscal Division staff members have clearly indicated that SABRS will not be utilized with deployed MAGTFs. Input to SABRS will be accomplished at a CONUS RASC (or CDPA) which receives and processes data from M3S and probably the hard copy inputs from the deployed consolidated fiscal and accounting office (CFAO) team. Since SABRS is non-deployable, it will not become a documented system within this study. The interfaces between SABRS and other deployable AISs are identified as a SABRS interface requirement for the deployable AISs.

In general, very little deployed AIS processing has been documented in support of the fiscal function. Deployed DOV processing is tentatively planned to process on the ADPE-FMF devices with no definition of data aggregation on the IBM Series/1 commercial devices or processing on the MASC. The other fiscal functions, when deployed, will use CONUS-type inputs to RASCs (or CDPAs) from other deployable AIS or as in the case of the CFAO function, hard copy documents will be collected by deployed CFAO teams and periodically mailed to a CONUS-type RASC facility for processing.

The concept of operations for a deployed DOV include a deployed, automated AIS based upon recent changes to the disbursing office T/O. Personnel have been removed from the T/O as a result of the implementation of AISs, including DOV as pointed out by personnel in the 2d FSSG DO (Tab B to Annex C). Further, and as is characteristic with most contemporary AISs, only the automated systems are taught in schools such that manual procedures and techniques have atrophied to the point where they hardly exist or don't exist at all. The validation of manual system atrophication came from several of this study's memoranda for record. Further, current experience with transaction error rates into the MCFC show the deployed unit hard copy inputs to the MCFC for DOV vary from a 10 to 90 percent error rate across the DOs. Utilizing a skewed normal error rate distribution favoring a small error rate, the input error rate to DOV at the MCFC is presumed to be 35 percent. The introduction of a deployed front end edit device such as the ADPE-FMF may cut the aggregate error rate to the 2 to 5 percent range and minimize the numerous corrections which require research and resources which are in short supply. The error rate data was obtained informally through a telephone conversation with personnel from the the Systems Branch of the Accounting Department at the MCFC.

3.5.1 Disbursing Office Voucher System (DOV)

DOV was identified by the disbursing officer at the 2d FSSG as a system which should operate as an AIS for deployed MAGTFs (see Annex C, Tab B). 2d FSSG personnel indicated a priority requirement for a deployable AIS for DOV and military pay. They were also concerned about military pay for Navy personnel accompanying a MAGTF into an AOA (military pay is within REAL FAMMIS) and about an interface with the Navy's Integrated Disbursing and Accounting System (IDA) which occurs at Kansas City. It is planned to pay attached Navy personnel in the same manner as Marines using the Pay Option Election procedures provided for by REAL FAMMIS. Periodically a record of pay transaction would be forwarded to the Navy Finance Center for entry into IDA.

3.5.1.1 DOV Baseline. The Marine Corps possesses no standard manuals for DOV processing-they depend upon a NAVCOMP manual to define the functional processing requirements for DOV. Numbered blocks of DOVs are assigned by each DO by disbursing cost category; a cost category is, for example, travel. For deployed units in the current time period, manual records are maintained in the deployed DO or disbursing section (dependent upon force size) and periodically mailed to the Marine Corps

Finance Center (MCFC) at Kansas City. The deployed unit DO or disbursing section receives no return information from Kansas City - the response to this form of operation is--"accounting took care of it." For certain key, high visibility disbursing categories, data is transmitted electronically utilizing AUTODIN circuits. For military pay inputs to DOV, summarized inputs are provided from the military pay list (MPL) and the military pay vouchers (MPVs). The DOV inputs to Kansas City are forwarded on a weekly, bimonthly and monthly basis. The baseline processing time from the RASC at Camp Lejeune taken from the Resource and Cost Utilization Report (RESCU) shows that the monthly DOV portion of processing on an IBM 360/65 computer is .07 percent of the processing time. Out of a typical monthly availability of 613.7 processing hours, .43 hours or 26 minutes of processing time per month is required for DOV processing on an IBM 360/65 computer. This is a very small monthly processing requirement--it may nearly be overlooked.

3.5.1.2 DOV-Garrison and Embarkation Phases. Garrison DOV operations for garrison and the embarkation phases of an amphibious operation are characterized in Figure 3.5.1. Garrison operations are conducted through interactive terminals to a RASC where processing is accomplished. The RASC contains both DOV and SABRS hence the disbursing interface is automatic and internal to the RASC processor and data bases. In addition, the disbursing office also possesses an inquiry capability using the Video Inquiry System (VIS). This capability allows a disbursing terminal to call the Marine Corps Finance Center in Kansas City for a display of a single pay record by page; however, no changes or processing can be accomplished on VIS.

For the 1988 time period, ADPE-FMF devices will be utilized for deployed DOV processing. As a matter of fact, as of this writing (November 1981), plans are underway to automate a deployed version of DOV for deployed operations on the ADPE-FMF devices in the near-term. Information as to the functions processed and the elements in the data base was not available to the study team. It is therefore presumed that deployed DOV will perform front-end transaction edits, local update of a

DISBURSING OFFICE VOUCHER

GARRISON AND EMBARKATION, ALL FORCE SIZES

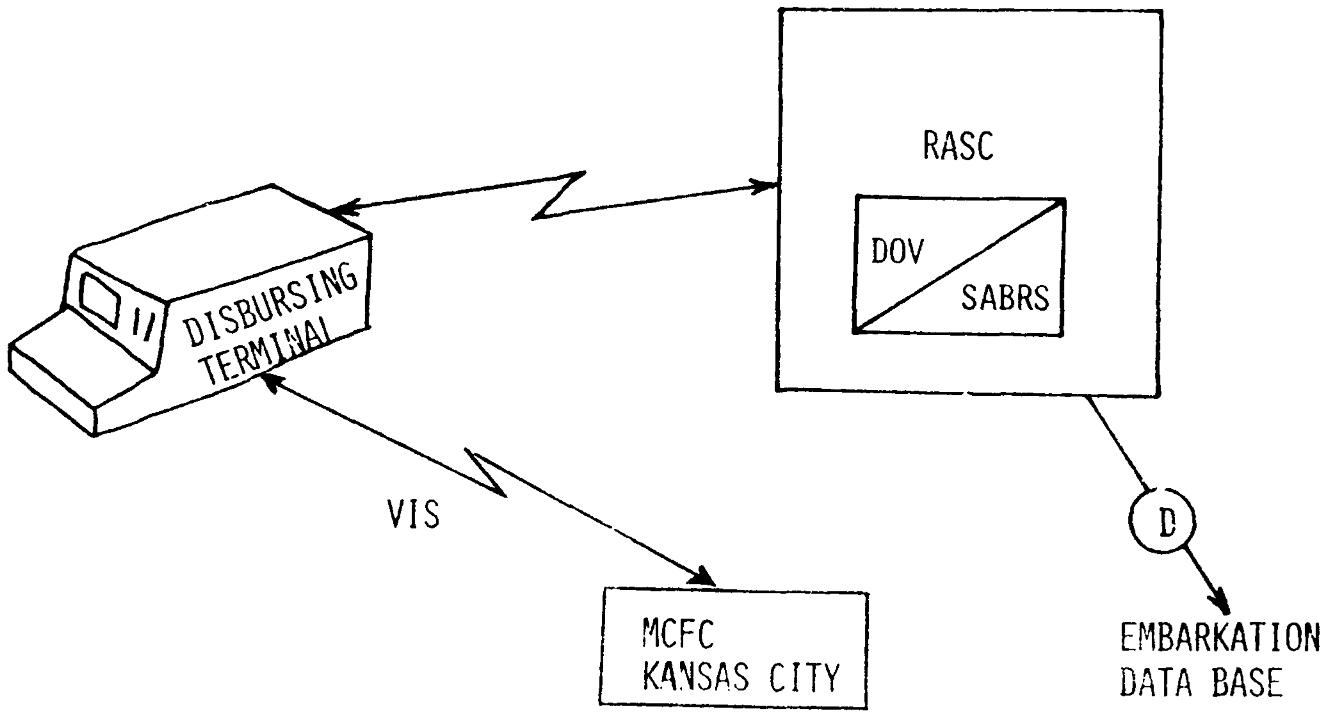


Figure 3.5.1
DOV for Garrison and Embarkation Phases

bookkeeping data base, and the preparation of a transaction diskette for transport to a CONUS-like ASC for processing. DOV transactions would be transported either to the MASC or a RASC. Should the MASC be utilized, the DOV transaction would only be consolidated at that location because SABRS has not been identified as an AIS operated upon the MASCs. A potential option would be to hardwire regular terminals to the logistically-oriented MASC should the DOV terminals in the FSSG or BSSG be located closely enough to the MASC to operate in that mode--this is considered a low-probability option.

The perceived concept of operations for an embarking MAF and MAB require a task organization and a data base. Once the task organization is defined, a deployed DOV data base may be prepared in a short period of time estimated as 15 minutes for a MAB and 45 minutes for a MAF. 2d FSSG personnel felt that a deployed MAU would be sufficiently small as to operate a manual system--this was concurred with Marine Corps-wide. MAUs are currently deploying with four to five ADPE-FMF devices. The DOV function could easily be processed on one of the deployed ADPE-FMF devices since the DOV processing requirement is very, very small. The potential delay in preparing a deployed version of DOV is identification of the deploying force structure. Task organized units are changing regularly even while ships are being loaded (this condition affects most other deployable AISs). It may be necessary to prepare the final DOV data base when the ships have sailed and the data bases, on diskette, be flown to the embarked ships with ADPE-FMF devices (or the MASC).

3.5.1.3 <u>DOV Afloat, Assault and Continued Operations Phases</u>. 2nd FSSG personnel felt that the deployed operation of DOV would require only about 1/3 of the processing time compared to garrison operation. The baseline, garrison FMF requirement was previously calculated for all DOV processing at the Camp Lejeune CASC at 26 minutes of IBM 360/65 processing time per month. Since the deployed DOV functions will most likely be fewer than those in garrison, the deployed requirement will be cut by another one-third; this load is expected to also occur during the continued operations phase. The afloat and assault phases will have even a smaller requirement. The continued operations phase will therefore have a processing need for:

> 26 minutes x 1/3 for deployed x 2/3 for functions = 5.8 minutes per month. Considering DOV growth until 1988 at 5 percent per year, the monthly processing requirement in IBM 360/65 equivalents is 7.7 minutes per month, say 10 minutes per month. Converting from IBM 360/65 processing time to ADPE-FMF processing time (a ratio of 6.5:1) the ADPE-FMF devices require 65 minutes per month for processing deployed DOV. Four ADPE-FMF devices are slatedfor each deploying MAF for DOV. Considering the requirement per month one ADPE-FMF device would be utilized at
>
> $$\frac{\text{10 min/month rqmt x 100 percent}}{\text{30 days/mon x 22 hours/day x 60 min/hr}} = \text{.03 percent.}$$
>
> One ADPE-FMF device may easily be operated for deployed DOV processing aboard ship for a MAF (and a MAB). In fact the requirement is so slight, sharing the processing with another operable ADPE-FMF device seems feasible. Should DOV unique devices deploy, a second ADPE-FMF device could deploy as a redundant, backup device. As stated earlier, deployed MAU DOV processing would be accomplished either manually by collecting and mailing hard copy documents or by forwarding a diskette containing transactions which were recorded by the ADPE-FMF device.

The assault phase of an amphibious operation would operate in a fashion similar to that of the afloat phase. The principal difference is that units ashore would transport hard copy transactions to the ADPE-FMF device aboard ship where they would be input to the ADPE-FMF devices. As the FSSG echelons into the AOA from one-to-four ADPE-FMF devices could be utilized for MAF operations. The number of DOV processors deployed ashore will be dependent upon the geographic disbursion designated by the combat service support portion of the operations plan; operations plans will vary from scenario to scenario and from unit to unit. The deployed MAB would require one ADPE-FMF device for all operational phases and potentially a second device for redundancy and backup. Also recall that the monthly processing requirement for DOV is so small, the processing may be series-shared upon another device. Figure 3.5.2 depicts the afloat, assault and continued operations ashore phases for MAF and MAB-sized forces.

3.5.1.4 DOV Data Collection Work Sheets (2). A data collection work sheet is provided for MAF and MAB DOV concepts of operations for all of the amphibious operation phases (garrison, embarkation, afloat, assault and continued operations) are contained in Annex G.

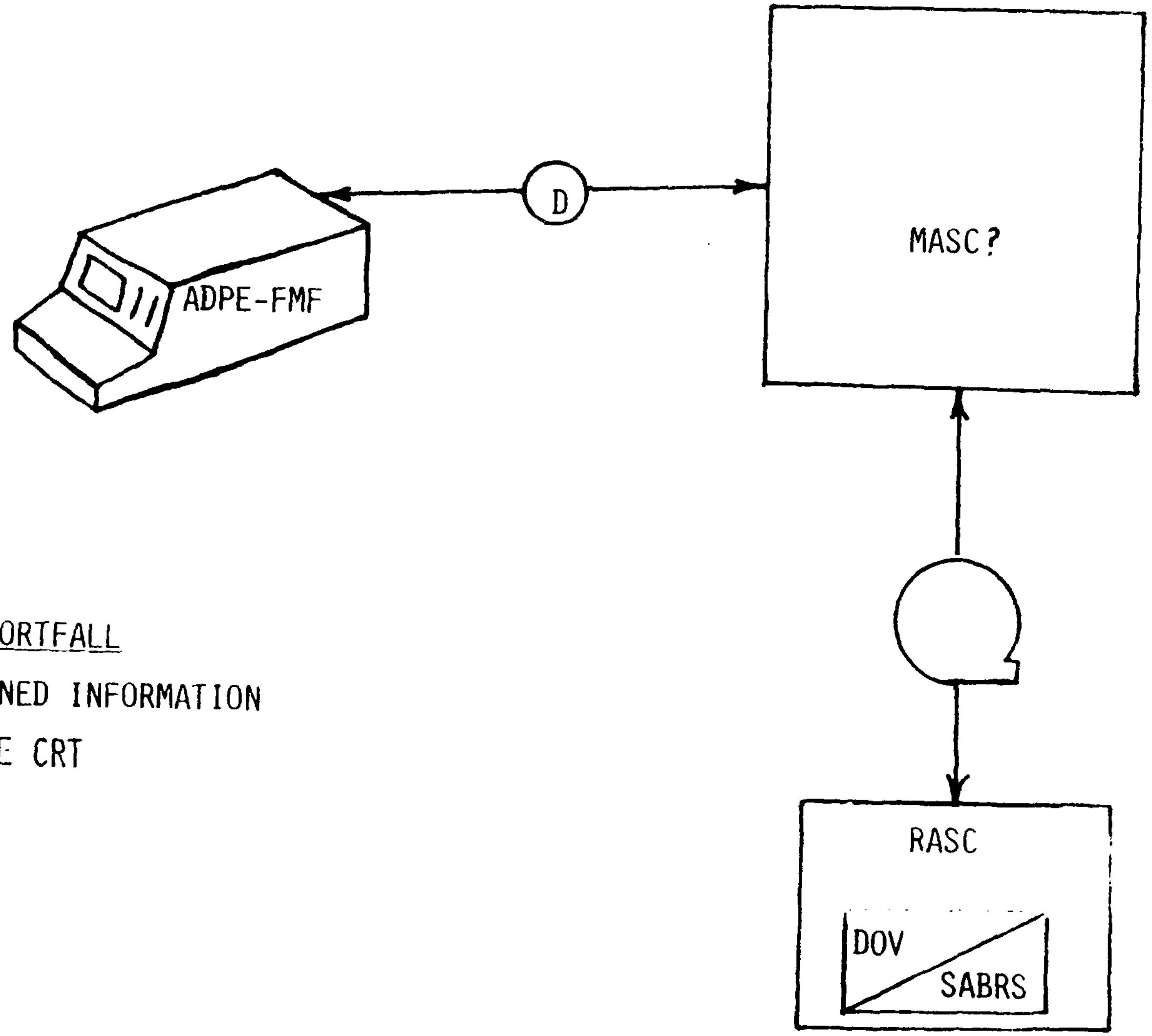
3.5.1.5 DOV Summary. DOV is a small bookkeeping system which will use ADPE-FMF devices deployed in the 1988 time period, and will create a very small processing requirement that is almost negligible but has been considered in this report. It will transition easily among the amphibious operation phases with the possible exception of the embarkation phase herein the DOV data base must be updated at the last moment with the latest task organization. DOV was initially identified as a deployable AIS during the study team's first round of interviews at Camp Lejeune in March 1981. Subsequent interviews in FMFPAC in September 1981 resulted in an endorsement for DOV deployability on ADPE-FMF devices. The deployed DOV should be approved and implemented in the near-term time frame.

3.5.2 Consolidated Fiscal and Accounting Office (CFAO)

The CFAO function will be a part of the SABRS which is currently under design under the auspices of the Fiscal Division, HQMC. The CFAO automated functions are performed from a fixed installation normally near by or colocated with the RASC. Their task is to retrieve information from paper documents and prepare input transactions to the RASC with an interactive terminal providing a front-end edit capability to the RASC. The CFAO function is not truly a deployable AIS function in that through the midrange time frame, the deployable aspects of the CFAO will be conducted with a deployed team collecting hard-copy documents

DISBURSING OFFICE VOUCHER

AFLOAT, ASSAULT AND CONTINUED OPERATIONS, ALL FORCE SIZES



SUSPECTED SHORTFALL

AGE OF RETURNED INFORMATION

ADPE-FMF VICE CRT

USE OF MASC

Figure 3.5.2

DOV for Afloat, Assault and Continued Operation Phases which will be mailed to a fixed CFAO for normal, CONUS-like input to a RASC.

3.5.2.1 CFAO Baseline Processing. The baseline processing is described in the introduction to this subparagraph. The flow of information and processing is shown generically in Figure 3.5.3 for the garrison and embarkation phases of an amphibious operation. In preparing for deployment, the diskette shown in Figure 3.5.3 is a one-time listing of the task-organized structure CFAO accounts; the diskette could be a hard copy printout which the deployed CFAO team personnel could use for a reference file.

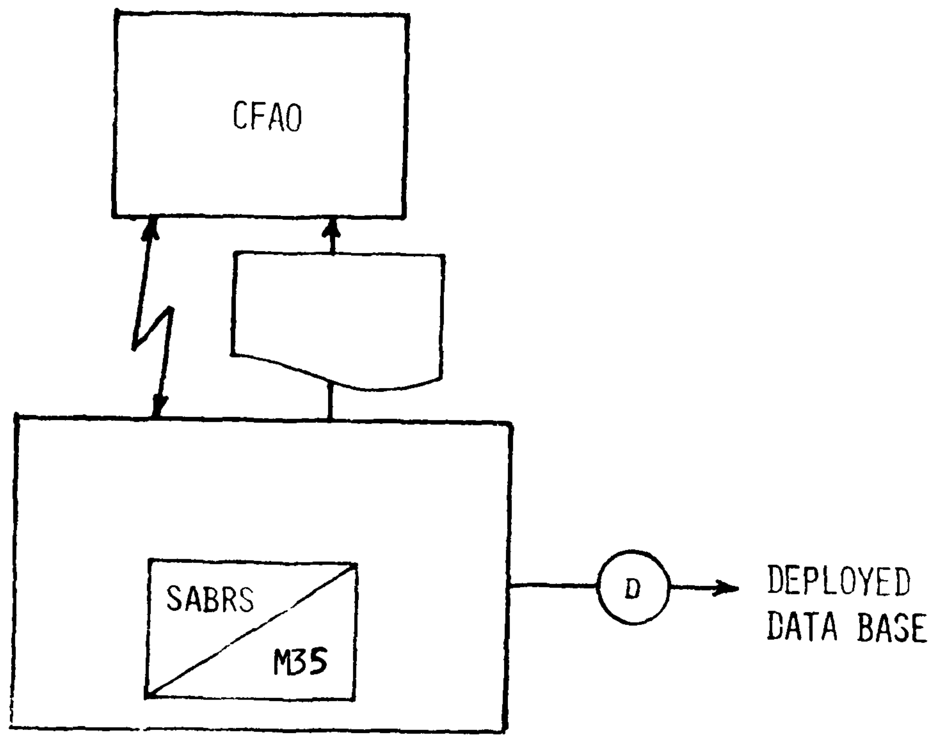
The actual processing time per month in the garrison environment was not ascertainable from the Resources and Cost Utilization (RESCU) reports obtained from HQMC Code CCIR. The RESCU reports contain a monthly summary of the various AIS resource usage at each Marine Corps ASC. Considering that Standard General Ledger and a system such as Budget in aggregate utilized 1.09 percent of the ASC capacity at the Camp Lejeune CASC, the processing requirement for FMF units would be on the order of .5 percent each month--CFAO is not specifically reported in RESCU. This processing requirement as with DOV previously described (.06 percent per month), is very small and since CFAO does not deploy, its deployed processing requirement for ADPE-FMF devices or other processors will be overlooked.

3.5.2.2 CFAO-Garrison and Embarkation Phases. As preparation for embarkation proceeds, that portion of the CFAO data base that relates to task organization, unit attachments and the like will require data base updates until such time that the organizational data base represents the deployed force. It is at this time the diskette or hard copy reference files would be output from the RASC to accompany the deployed CFAO team.

3.5.2.3 CFAO-Afloat, Assault and Continued Operations. The actual deployed phases for CFAO operations is not clear from a review of

CONSOLIDATED FISCAL AND ACCOUNTING OFFICE (CFAO)

GARRISON AND EMBARKATION, ALL FORCE SIZES



<u>SUSPECTED SHORTFALL</u>
121 REGULAR TERMINALS
FOR THE FMFs

Figure 3.5.3

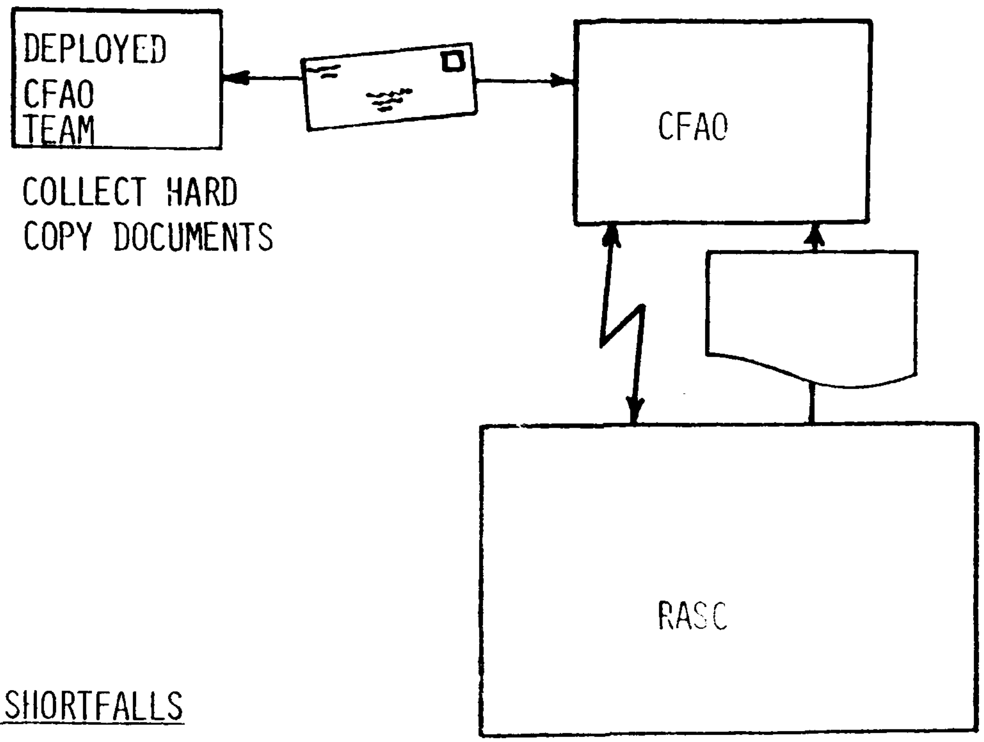
CFAO for Garrison and Embarkation Phases the SABRS ADS development plan (reference jj). In total, SABRS in conjunction with other fiscal functions and the military pay portion of REAL FAMMIS, requires approximately 872 interactive terminals for its implementation in FY-1984. Of the 872 terminals, 121 are slated for utilization by units in the FMF. Whether these assets are deployable and/or how they will support the deployed force has not yet been addressed with respect to the CFAO function. Large, interactive systems under development within the Marine Corps appear to have a generic planning difficulty with the distribution and utilization of regular interactive terminals in support of deployed MAGTFs; this topic area is further amplified in Chapter 5 of this study report--Areas of Concern.

The CFAO function will be conducted in the deployed environment as shown graphically in Figure 3.5.4. It consists of deployed personnel comprising a CFAO team whose function is to collect hard copy documents which are mailed to a RASC or the MCFC at Kansas City; the mailings are generally sent on a weekly basis. Feedback to the deployed CFAO team frequently takes two-to-three weeks, so a question is raised as to the timeliness of the feedback. The deployed CFAO team would remain aboard ship during the assault phase of the amphibious operation and would transfer ashore in accordance with the operations order--probably in the early portion of continued operations ashore phase. A CFAO team member may also be located at the TAE.

3.5.2.4 <u>CFAO Summary</u>. The information pertaining to the deployed CFAO function was obtained informally through interviews with cognizant personnel in the Fiscal Division at HQMC. The deployed CFAO function is conducted in a deployed status as it is in the garrison environment. The significant difference is that during deployments hard copy inputs are mailed where as in garrison, the inputs may be hand carried to the RASC with output available within 24-48 hours rather than the 2-3 weeks experienced by deployed MAFTFs. Since the deployed CFAO function does not create a need for deployed AIS processing, a data collection work sheet is not included in this study report for the deployed CFAO function.

CONSOLIDATED FISCAL AND ACCOUNTING OFFICE (CFAO)

AFLOAT, ASSAULT AND CONTINUED OPERATIONS, ALL FORCE SIZES



SUSPECTED SHORTFALLS

INFORMATION RETURN TO MAGTF

Figure 3.5.4
CFAO for Afloat, Assault and Continued Operation Phases

3.6 LOGISTICS/COMBAT SERVICE SUPPORT (CSS)

It is prudent at the outset to address the terms "logistics" and "combat service support" as they apply to MAGTFs. Contrary to everyday usage, the terms are not interchangeable. A fundamental difference exists between the two terms as defined and discussed in doctrinal publications (references d and e).

Logistic planning is primarily concerned with deployment planning prior to D-day and external support requirements during the entire deployment, i.e. prior to and subsequent to D-day. In contrast, combat service support planning is primarily concerned with organizations, tasks, and responsibilities internal to the MAGTF. However, the two are interrelated in that combat service support planning is part of, and dependent on, logistic planning. Thus, the difference between the two terms is essentially one of orientation. Logistics is oriented primarily to <u>external</u>, deployment-oriented support, whereas combat service support is oriented primarily to <u>internal</u>, combat-oriented support. Technically, the area addressed in this paragraph embraces combat service and extends into logistics.

Major inputs to this paragraph are based on outputs from the Combat Service Support (CSS) Automated Information System (AIS) Support Concept Development Study (references jjj and kkk). This study, with the Deputy Chief of Staff for Installations and Logistics as the functional manager, was conducted for the purpose of identifying, enriching and developing concepts of operations for CSS AISs planned for the 1985-95 period. The study had the following objectives:

- Develop a concept of operations for CSS AIS support in the 1985-95 period for deployed MAGTFs
- Define the critical/priority/essential operational or functional requirements for CSS AISs considering contemporary and future doctrine

The study was developed in concert with, and provided as input to this PGRG effort.

The initial step consisted of an analysis of combat service support functions to determine which functions and/or sub-functions required a deployable capability. The single measure of effectiveness used was the time required to provide combat essential support at the required location. The combat service support functions and sub-functions analyzed are contained in Figure 3.6.1. It was determined that the logistic/combat service support functions which require a deployable capability are supply, maintenance and embarkation. These are noted by the solid-lined boxes in Figure 3.6.1. Other CSS functions which require a deployable capability are manpower and financial management. These are indicated by the dash-lined boxes in Figure 3.6.1 and discussed in paragraphs 3.2 (Manpower) and 3.5 (Fiscal).

Each of the three functional areas (supply, maintenance and embarkation) are now supported by an AIS. New AISs are planned or under development in two of the functional areas (i.e. supply and embarkation). Additionally, two-level sysems are evolving with the use of ADPE-FMF devices. These devices, using Class IV systems, provide an ADP capability at the user level (i.e. units and selected sections and shops in the force service support group) for local management and generation of input (transactions, changes, etc.) for the Class I systems. The evolving systems are shown in Figure 3.6.2. The CSS AIS Study Group and field interviews indicate that the supply, maintenance and embarkation functions as currently performed in the FMF are not expected to undergo any significant operational or doctrinal changes between now and the 1988 time frame. There will be changes in data management with the development of M3S and the follow-on to the MEDS system and the fielding of the ADPE-FMF devices. These evolving systems will increase the commonality and standardization needed to permit the functions to be performed in the same manner during all operational postures, e.g., garrison, peacetime deployments, amphibious operations in a combat environment, etc.

CHIEF OF STAFF

*AUTOMATED DATA PROCESSING
- Data Systems Development
- I/O Control
- Administration

***FINANCIAL MANAGEMENT
- Budgeting
- Accounting
- Disbursing
- Auditing

*COMMUNICATIONS-ELECTRONICS (Non-Tactical Communications)
- Messenger
- Wire
- Radio
- Communications Center
- Communications Security
- Maintenance

*Special Staff Officers under cognaizance of chief of staff

**When civil affairs G-5 not authorized

***When comptroller not designated in MAGTF or authorized by T/O, function assigned to G-4/S-4

G-1/S-1

ADMINISTRATION
- Personnel Management
- (Manpower Management)
- Support Administration
- Civilian Personnel
- (Deployed Overseas)

POSTAL SERVICE
- Receipt
- Transmission
- Postal Services

GRAVES REGISTRATION
- Care of Deceased Personnel

POW MANAGEMENT
- Collection
- Guarding
- Evacuation

LAW ENFORCEMENT
- Regulation
- Enforcement
- Traffic Control

LEGAL SERVICES
- Military Justice
- Legal Assistance
- Civil-Military Relations

ECCLESIASTIC SERVICES
- Spiritual/Moral Guidance

BAND
- Field Music
- Security

SPECIAL SERVICE/CLUBS
- Recreation & Athletic Programs
- Facilities & Equipment
- Support Services

EXCHANGE SERVICES
- Necessity, Health & Comfort Items

G-3/S-3

CSS TRAINING
- Basic Skill Development

SECURITY
- Physical Security

**CIVIL AFFAIRS
- Civil Affairs Assistance

G-4/S-4/CSSE

SUPPLY
- Procurement
- Storage
- Distribution
- Maintenance
- Salvage

MAINTENANCE
- Management
- Operations

TRANSPORTATION
- Requirements Determination
- Resources Coordination
- Resources Assignment
- Resources Control

PASSENGER/FREIGHT TRANSPORTATION
- Transportation Coordination

ENGINEER SUPPORT
- Construction
- Facilities Maintenance
- Utilities
- Technical Engineer Support

LANDING SUPPORT OPERATIONS
- Beach Operations
- Helicopter Support Operations

MEDICAL/DENTAL
- Collection
- Evacuation
- Hospitalization
- Health Maintenance
- Technical Support

MATERIAL HANDLING

FOOD SERVICES
- Control Mess Management
- Mess Operations

EMBARKATION
- Planning, Coordination & Supervision

Figure 3.6.1. Logistics/Combat Service Support Functions and Sub-functions

FUNCTION	CURRENT SYSTEM	CLASS IV SYSTEM	FUTURE CLASS I SYSTEM
Supply	Supported Activities Supply System (SASSY)	ADPE-FMF, Phase II	Marine Corps Standard Supply System (M3S)
Maintenance	Marine Corps Integrated Maintenance Management System (MIMMS)	ADPE-FMF, Phase II	Marine Corps Integrated Maintenance Management System (MIMMS)
Embarkation	Mechanized Embarkation Data System (MEDS)	Standard Embarkation Management System (SEMS)	Planned (Name to be designated)

Figure 3.6.2. Evolving Logistics/Combat Service Support Automated Information Systems

3.6.1 Supply Function

The supply function is one of the oldest and the largest user of automation support. With ever increasing utilization, automation support has become ingrained in daily supply operations to the degree that substitution of manual techniques would cause an unacceptable degradation of support for MAGTFs except in the case of the smallest MAGTF. Even in the smallest MAGTF, i.e. Marine Amphibious Unit (MAU), automation support is rapidly becoming a requirement. The degradation is due to an insufficient number of available supply personnel and the additional training time needed for instruction and practice in using manual techniques.

The current, standard, Class I supply AIS is the Supported Activities Supply System (SASSY) which suffers from a number of deficiencies and undesirable features. It was designed for a garrison environment and therefore not readily deployable. SASSY excludes ammunition, bulk fuel, garrison property, individual clothing, lumber and subsistence. Additionally SASSY requires a complete program run to update its files no matter how few transactions or files are involved and uses excessive time to accomplish the program run. FMFPAC has identified approximately 55 Class III programs to assist and enhance SASSY processing.

The Marine Corps Standard Supply System (M3S) is presently under development as a replacement for SASSY and other supply AISs. It will be a single system encompassing both the retail and wholesale functions for FMF units and the supporting establishment. M3S will support and consolidate the functions now performed by SASSY, Marine Corps Unified Material Management System (MUMMS), Direct Support Stock Control System (DSSC) and numerous base property control systems, and remedy the deficiencies cited above for SASSY. Although much of the system is still in the process of definition and development of system specifications, the supply functions and operations as practiced currently in the FMF will undergo little change. M3S is expected to be operational about 1985.

M3S system design will emphasize modularity and permit the addition or deletion of equipment or software components without reconfiguration and redesign. Standard linkages will insure the ability to expand or reduce resources as requirements dictate. Subsystems and equipment components can be added or deleted without degradation to other subsystem processing. In garrison, the data base will be integrated with the financial base to eliminate the passing of data in a subsequent process and to provide timely financial status. There are no plans at present to deploy the financial AIS, i.e., Standard Accounting and Budget Reporting System (SABRS). Therefore, for deployed units this integration would occur upon receipt of tapes at the designated RASC. The primary functions are contained in Figure 3.6.3. The functions of primary importance for deployable forces are Functions 1.2.3 (Inventory Control) and 1.2.7 (Reporting System).

The system will be capable of batch or transaction input on an exception basis through the media of source data automation, key punch documents or magnetic devices. Output will be periodic, recurring and

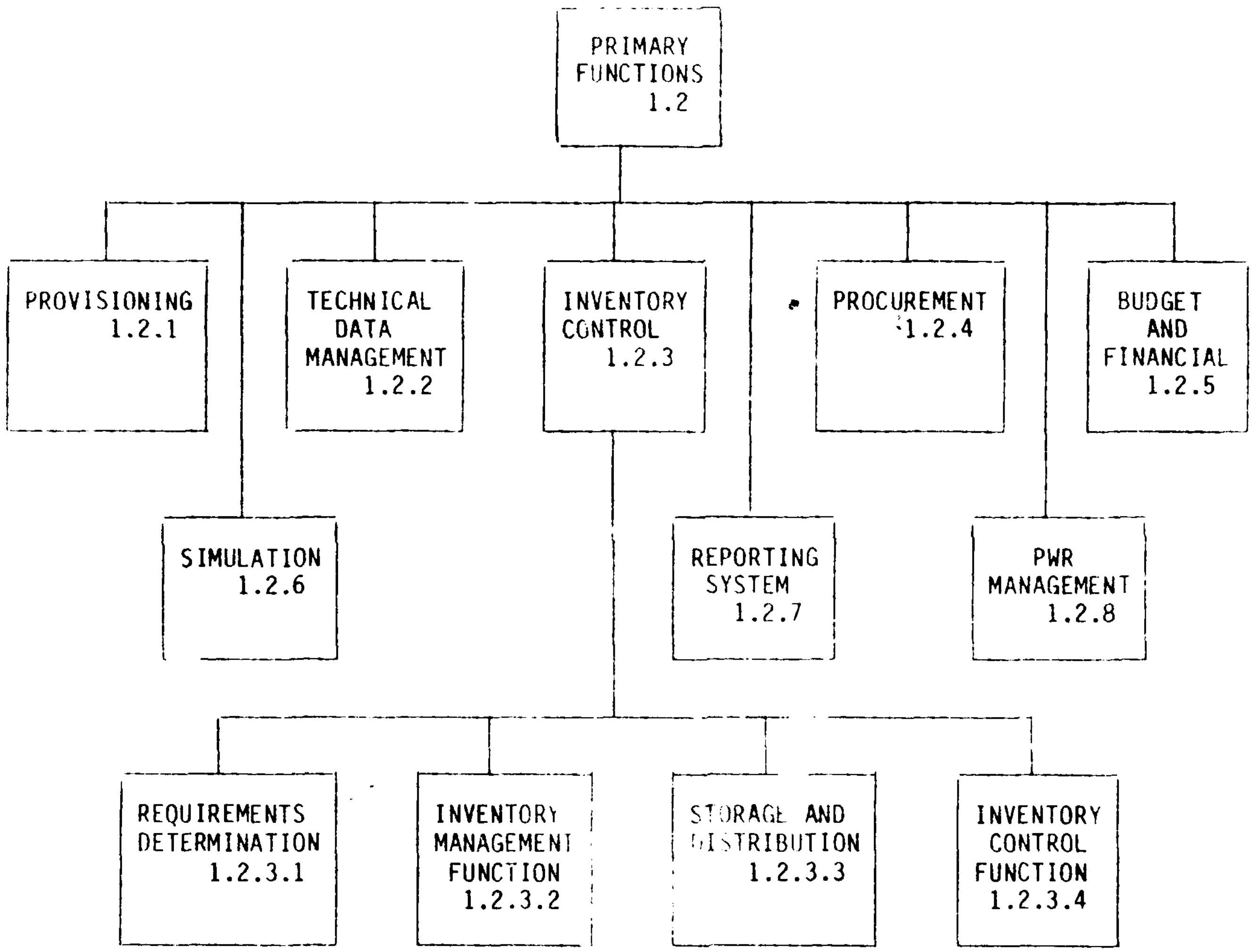


Figure 3.6.3. Marine Corps Standard Supply System (M3S)--Primary Functions

exception reports which can be readily modified in format and content. Also, ad hoc retrieval requests will be possible in a minimum turnaround time.

A M3S goal is to develop a system which will operate in deployment the same as in garrison, while providing for phased commitment of logistics elements in the objective area. Support of FMF units will be maintained by a central accounting unit configured as a Retail Issue Point (RIP). Through this central accounting unit, FMF units will be supported by Materiel Issue Points (MIPs) established geographically or task organized to support contingency plans.

3.6.1.1 M3S Baseline. The equivalent of the M3S baseline is SASSY plus the ADPE-FMF devices which constitutes a two-level system. At the lower level, ADPE-FMF devices have been issued to using units (battalions, squadrons and at selected activities in the supply and maintenance battalions of the force service support group). Using the Phase I program these devices record transactions, changes and other required input data on diskettes which are delivered to the RASC for entry into the SASSY data base. The Phase II program, nearing completion of development, provides for a local data base and a capability for generating local reports. This program also provides an interface with the local MIMMS data base. Input to SASSY is accomplished by delivery of diskettes (floppy disks) from the user level to the RASC. Diskettes are read into SASSY through the use of Commercial Series/1 system hardware ("white machine"). Reconciliation and updated transaction status data for use at the user level are obtained by a returned diskette produced by SASSY. For deployed units (i.e. MAUs), the diskette is used in conjunction with the Message Entry Processing System (MEPS) to produce a paper tape which in turn is entered into the Naval communications system for transmission to the cognizant SASSY Management Unit (SMU).

SASSY is the mechanized supply management system used at the direct support echelon and the user level of supply. It is designed to accomplish supply accounting for the battalion, squadron and separate company level. SASSY accomplishes requirements determination, materiel control, and asset visibility. A key feature of the SASSY concept is the daily or periodic transaction reporting between the using unit level employing ADPE-FMF devices and the SMU. The system also interfaces with other Marine Corps systems (MUMMS, MIMMS, MARES) in the transfer of data, and with other authorized sources of supply using military standard formats.

3.6.1.2 M3S-Garrison and Embarkation Phases. M3S operations during the garrison and embarkation phases are depicted in Figure 3.6.4. During these phases, two levels of automation will be utilized, i.e. ADPE-FMF devices at the using unit and M3S at the RASC. In garrison, using units enter transactions except for Class IX repair parts on diskettes and update local data bases using ADPE-FMF devices. Repair parts and maintenance-related supplies are entered into MIMMS using an equipment repair order shopping list (EROSL). The transaction data is passed to M3S via the M3S/MIMMS interface. The diskettes are forwarded by courier to the retail issue point (RIP) for processing. The RIP using RJE or ADPE-FMF devices reports actions taken on the transactions to M3S at the RASC. The RASC, in turn, produces a diskette containing status data which is returned to the using unit so that local data bases may be updated and reconciled with the M3S data base.

The embarkation phase consists of the assumption of M3S operations at the MASC for the MAGTF. Interviews revealed three viewpoints on this subject. One viewpoint suggested that all M3S operations should be accomplished by the RASC until embarkation. Another suggested that M3S should be operated in parallel at the MASC and RASC to provide for a high level of training and proficiency for MASC personnel, up-to-date operation of M3S programs at the MASC and as a check and balance for M3S operations performed by both centers. The third viewpoint provided for an in-between position in which the MASC would be operated at periodic intervals to achieve training and proficiency of personnel and to ensure up-to-date programs.

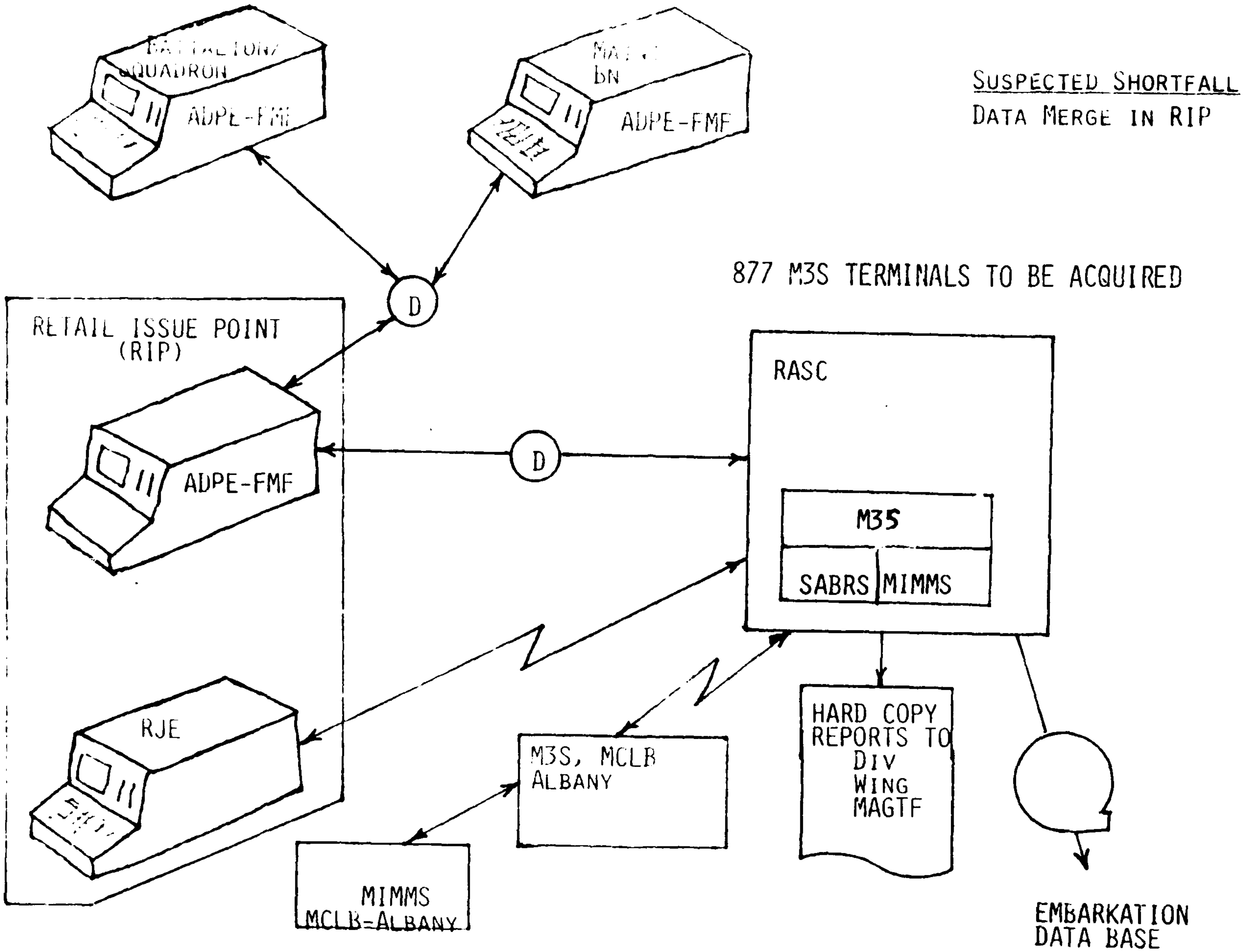


Figure 3.6.4. Marine Corps Standard Supply System-Garrison and Embarkation Phases

Regardless of the status of the MASC, upon activation of the MAGTF immediate steps are taken for the MASC to assume M3S operations for the MAGTF task organization. M3S programs and data bases for the MAGTF task organization at the RASC are duplicated at the MASC. Using units continue to record transactions on diskettes. However, initially the diskettes are processed for record purposes at the RASC with the data provided to the MASC. The parallel processing effort continues until the M3S programs and MAGTF data bases have been reconciled and are fully operational at the MASC. Thereafter, MAGTF using units submit transactions to the MASC for processing. Duplicate tapes are provided to the RASC in order to prevent any degradation in the MAGTF data bases as a result of the transfer of processing responsibility from the RASC to the MASC, and to facilitate exchange of data as the result of changes in the MAGTF task organization.

3.6.1.3 <u>M3S-Afloat, Assault and Continued Operations Ashore</u>. Upon embarkation, supply support and transaction reporting will involve some deviations from that followed during the garrison and embarkation phases. The support structure will be changed in that the combat service support element (CSSE) will be task organized to support the operation. Additionally, some of the elements of the CSSE will be task organized to provide support to designated MAGTF elements from one or more combat service support areas (CSSAs). The remainder of the CSSE will operate from a force combat service support area (FCSSA). Prepositioned emergency supplies (floating dumps and prestaged helicopter-lifted supplies) and initial supplies to establish dumps in the beach support areas (BSAs) and landing zone support areas (LZSAs) are dropped for record purposes. These supplies are issued on demand/as required during the initial assault. Upon establishment of the CSSAs and FCSSA, the remaining supplies in the BSAs and LZSAs are treated as a receipt and reentered into the supply system.

M3S operations during these phases are shown in Figure 3.6.5. During the afloat phase, transactions are recorded on diskettes in the

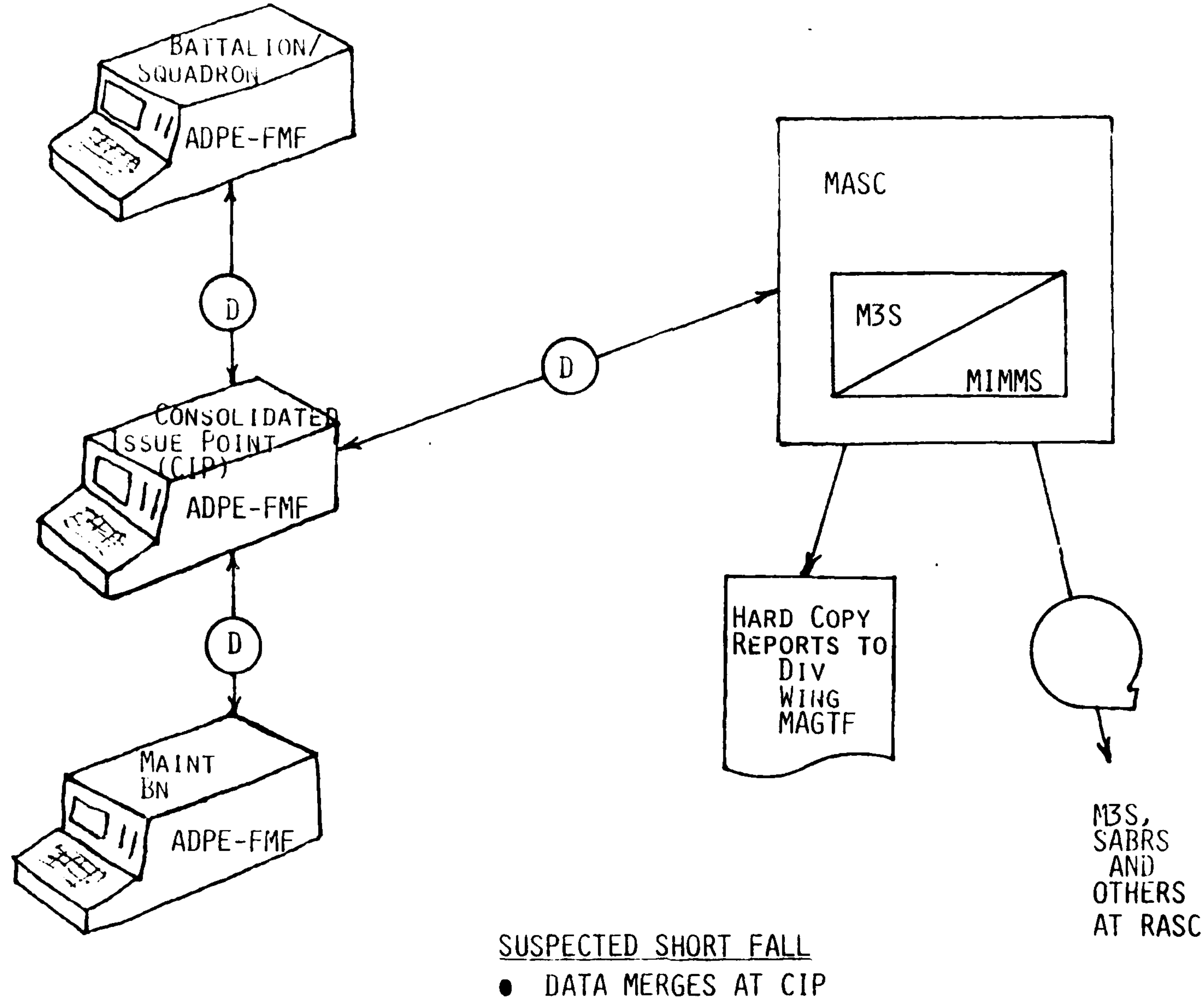


Figure 3.6.5. Marine Corps Standard Supply System (M3S)-Afloat, Assault and Continued Operations Ashore Phases

same manner as in garrison, and couriered to the supporting material issue point (MIP). The MIP reports action taken to the MASC for updating the M3S data base. The number of transactions are expected to be low and will consist primarily of supplies and materiel needed to replenish expenditures and losses during the rehearsal phase. Location of supplies during the afloat phase will be maintained in the embarkation AIS (SEMS).

During the initial assault, the number of transactions will continue to remain low. Requisitions will involve primarily Class I, III and V supplies from prepositioned emergency supplies, BSAs or LZSAs. No transactions for these supplies are entered into the M3S data base as they are pre-expended and dropped from the inventory records upon embarkation.

As the operation continues, the CSSAs and FCSSA are established ashore and general unloading commences. The CSSAs are located generally in the forward areas and are task organized to provide combat service support to designated MAGTF units. Each contains a MIP which holds a prescribed consumer-level inventory. The FCSSA is located usually near the beach or port and holds the intermediate level inventory used to replenish consumer level inventories. Transactions, except for Class IX repair parts, during this and the continued operations ashore phases are recorded on diskettes using the ADPE-FMF devices at the using unit level as stated above. Transaction data concerning repair parts are entered into MIMMS using an EROSL. The diskettes are forwarded to the MIP which takes the appropriate action relative to the transactions. The MIP in turn records the action, i.e. issue or referral to the FSCCA, using ADPE-FMF devices, and forwards the transaction data to the MASC for entry into the M3S data base. Output data from M3S is returned by diskette to the using unit for use in updating its local files. Output data is prepared also for a designated RASC and appropriate supply sources. These data are forwarded to the appropriate recipients on the basis of the priority of contents using telecommunications, courier or mail.

3.6.1.4 M3S Data Collection Worksheets. Data collection worksheets for the supply function are contained in Annex G by those sub-functions which are most susceptible to automation, i.e. procurement, storage and distribution.

3.6.1.5 M3S Summary. M3S portends to be a readily deployable system which will permit supply operations to function the same in deployment as in garrison.

3.6.2 MAINTENANCE

The current maintenance AIS is the Marine Corps Integrated Maintenance Management System (MIMMS) and will be operational through the 1988 time period. Refinements to MIMMS are expected in the form of appropriate changes/modifications in order to maintain an effective and current system. MIMMS is an integrated management system encompassing all ground equipment commodity areas, based on standard policies and procedures which are applicable to all levels of command and echelons of maintenance. It is user-oriented and designed to work with other systems, i.e. SASSY and its successor M3S, and ADPE-FMF devices through both the supply and maintenance applications.

MIMMS consists of three subsystems:

- Headquarters Maintenance Subsystem (HMSS). This subsystem is designed to support logistics managers at Headquarters Marine Corps and the Marine Corps Logistics Base (MCLB), Albany, Georgia.
- Depot Maintenance Subsystem (DMSS). This subsystem supports the depot maintenance effort at MCLBs, Albany and Barstow.
- Field Maintenance Subsystem (FMSS). This subsystem supports all ground equipment maintenance performed at the organizational and intermediate maintenance echelons in the Fleet Marine Force, supporting establishment and selected Marine Corps Reserve units.

3.6.2.1 MIMMS Baseline. With the fielding of the ADPE-FMF devices, MIMMS is a two-level system. Initial input is recorded on diskettes by using units (i.e. battalion, squadrons, separate companies, and maintenance activities in the maintenance battalion, FSSG) with the ADPE-FMF devices. This initial input consists of transactions covering the full range of the maintenance function for which the reporting unit is responsible to include maintenance resources, management and production (operations). The diskettes are forwarded by courier to the RASC for entry into the MIMMS FMSS. Equipment Repair Order Shopping/ Transaction Lists (EROSLs) are submitted to the supply issue point where the transaction is recorded and entered into SASSY.

FMSS files, through an automated interface with SASSY, are automatically updated in terms of materiel requisitions, issues, turn-ins and status information. Upon processing, FMSS produces status and equipment readiness reports for all levels of the MAGTF commands on a daily and/or periodic basis. FMSS also provides selected information (e.g., ERO history data, equipment status and readiness data) to the MIMMS HMSS for management and information purposes on a scheduled basis.

3.6.2.2 MIMMS-Garrison and Embarkation Phases. MIMMS operations during the garrison and embarkation phases are shown in Figure 3.6.6. Two levels of automated support will be employed. At the lower level, battalions, squadrons, separate companies and maintenance activities in the maintenance battalion, FSSG will maintain a local data base and record initial input on diskettes using ADPE-FMF devices. This input data consists of transactions for maintenance functions performed at the organizational level for owning units and at the intermediate level for authorized owning units and maintenance activities in the maintenance battalion, FSSG. Requisitions for repair parts and maintenance-related materiel are submitted to the designated supply issue point, e.g., RIP, where the transaction is recorded on a diskette for entry into M3S in accordance with supply procedures. Diskettes are forwarded to RASC for entry into the MIMMS FMSS. FMSS files, through an automated interface

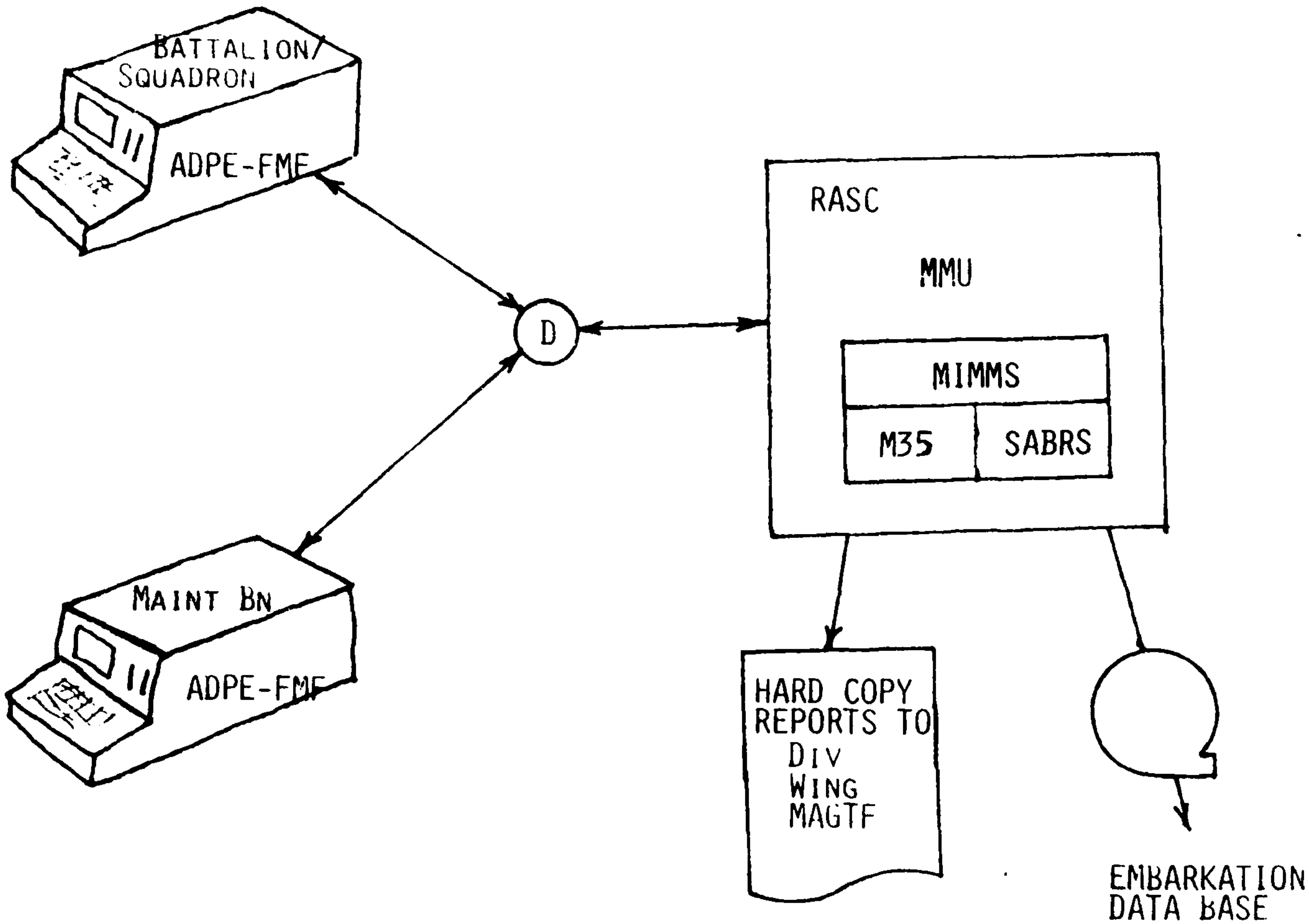


Figure 3.6.6. Marine Corps Integrated Maintenance Management System (MIMMS)-Garrison and Embarkation Phases

with M3S, are updated with materiel requisition, issue, turn-in and status information. Upon processing, MIMMS FMSS produces diskettes containing update and status data for updating and reconciling the local data bases of using units and management, status and equipment readiness reports for MAGTF, division, wing and using unit levels. Additionally selected information and data is produced and transmitted to the MIMMS HMSS for management and information purposes.

3.6.2.3 MIMMS-Afloat, Assault and Continued Operations Ashore Phases. MIMMS operations during these phases are shown in Figure 3.6.7. Operations are conducted in a manner similar to that in the garrison and embarkation phases. At the lower level, input data is recorded on diskettes using ADPE-FMF devices by the using unit for the organizational level maintenance and by authorized using units and maintenance activities in the maintenance battalion, FSSG for intermediate level maintenance. During the afloat and assault phases, contact teams, rather than evacuation of equipment, will be used to the extent possible to accomplish intermediate level maintenance requirements. EROs and EROSLs will be completed by the contact teams and recorded on diskettes by the maintenance detachment at the CSSA. During the continued operations ashore phase, a combination of contact teams and evacuation of equipment to the maintenance detachment at the CSSA will be used. Diskettes from the using units and maintenance activities of the maintenance battalion, FSSG are forwarded to the MASC for entry into MIMMS FMSS. Supply requisition and status data are provided by the automated interface between M3S and MIMMS FMSS. Upon processing, MIMMS FMSS produces management, status and readiness reports for all levels of the MAGTF and diskettes containing updates and status data for return to using units. Selected information and data is produced and forwarded to the MIMMS HMSS for management and information purposes.

3.6.2.4 MIMMS Data Collection Worksheets. Data collection worksheets for the maintenance function are contained in Annex G.

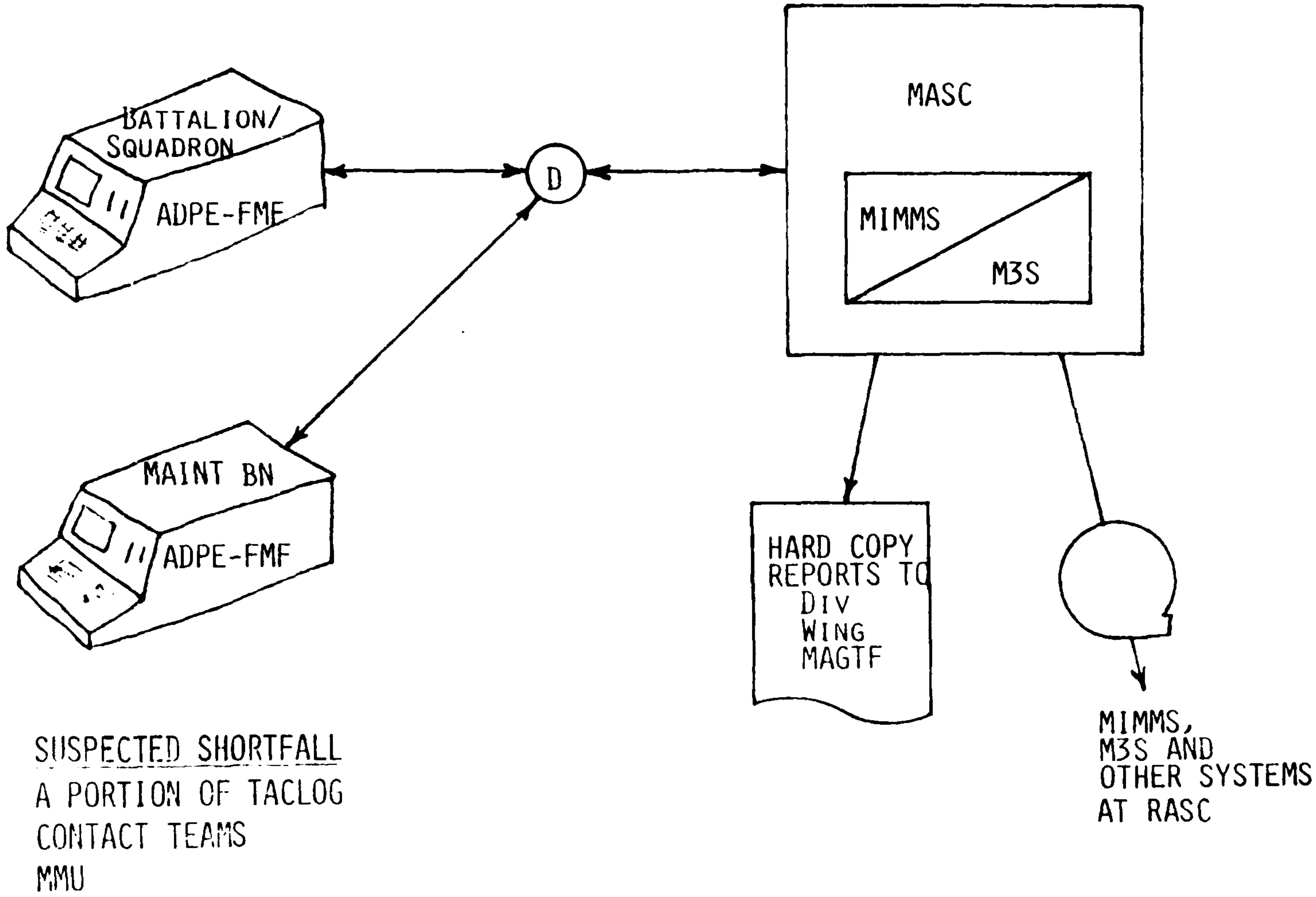


Figure 3.6.7. Marine Corps Integrated Maintenance Management System (MIMMS)- Afloat, Assault and Continued Operations Ashore Phases

3.6.2.5 MIMMS Summary. MIMMS is currently operational and will continue to be so through the 1988 time period with appropriate changes/modifications and enhancements to the system. It consists of a two-level system with ADPE-FMF devices at the lower (using unit) level which provide input to the upper level in the form of diskettes. The upper level, MIMMS FMSS, is located at the MASC and accomplishes the necessary processing required to produce output reports and status and readiness information for all levels of the MAGTF. MIMMS FMSS has an automated interface with SASSY and is capable of deployment with continuous operations throughout all phases of the amphibious operation.

3.6.3 Embarkation Function

The embarkation AIS is in a state of transition. The current system, the Mechanized Embarkation Data System (MEDS), is being replaced by the Standard Embarkation Management System (SEMS) which operates on ADPE-FMF devices. In addition, a Class I system is planned for development in the near future. The Class I system has not been defined, but basically the new system will use input developed by SEMS at the lower echelons to assist in processing and documentation of embarkation planning and execution at higher echelons, primarily at the division/wing echelons.

Based on current technology, MEDS is a primitive system utilizing five types of color-coded Electrical Accounting Machine (EAM) cards, one each for personnel, cargo, vehicles, munitions and pallets. The detailed information on the EAM cards is used to prepare ship loading plan documentation (less stowage diagrams) and consolidated information reports on the landing force for TACLOG use during amphibious operations. The system is a straight-forward bookkeeping system with no logic or data manipulation.

Field interviews and the Headquarters Marine Corps embarkation conference proceedings indicated that MEDS is cumbersome, requires excessive man-hour application using current production procedures and is inadequate in both data and format.

3.6.3.1 SEMS Baseline. The cornerstone of embarkation planning is the development of embarkation data bases at the battalion/squadron/ separate company level. These data bases are developed and maintained by each unit on ADPE-FMF devices, and consist of five basic files: unit profile, billet (personnel), cargo, vehicle and pallet. These data are provided on a periodic/as-required basis to higher headquarters for use in developing lift requirements using sea, air and surface transportation modes. When directed or alerted for a mission, the data is processed and manipulated using record linking to produce output data and reports. The various types of record linking are shown in Figure 3.6.8 and will vary depending on the transportation mode. Upon determination of the embarkation task organization, unit and detachment embarkation data is consolidated at the embarkation team, unit, element, or group levels. Output reports consist of standard embarkation reports and other reports as defined by the user.

Mobile Loading	Hazardous Cargo and Munitions Assignment
Palletizing	LFORM Assignment
Troop Space Assignment	Priority Number Assignment
Floating Dump Assignment	Landing Serial/Fuselage Station Assignment
D-1 Assignment	Hold and Level Assignment
Unitized Cargo Assignment	Transportation Mode Assignment

Figure 3.6.8. Standard Embarkation Management System (SEMS)-Types of Record Linking

3.6.3.2 SEMS-Garrison and Embarkation Phases. During these phases, embarkation data bases are developed and maintained on ADPE-FMF devices at the battalion, squadron and separate company level as indicated in paragraph 3.6.3.1 above. On a periodic or as-required basis, these data are provided to higher headquarters for planning purposes and determination of contingency lift requirements. Embarkation management and lift requirement reports are produced as required. When directed or alerted for a mission, the data in combination with other data, such as

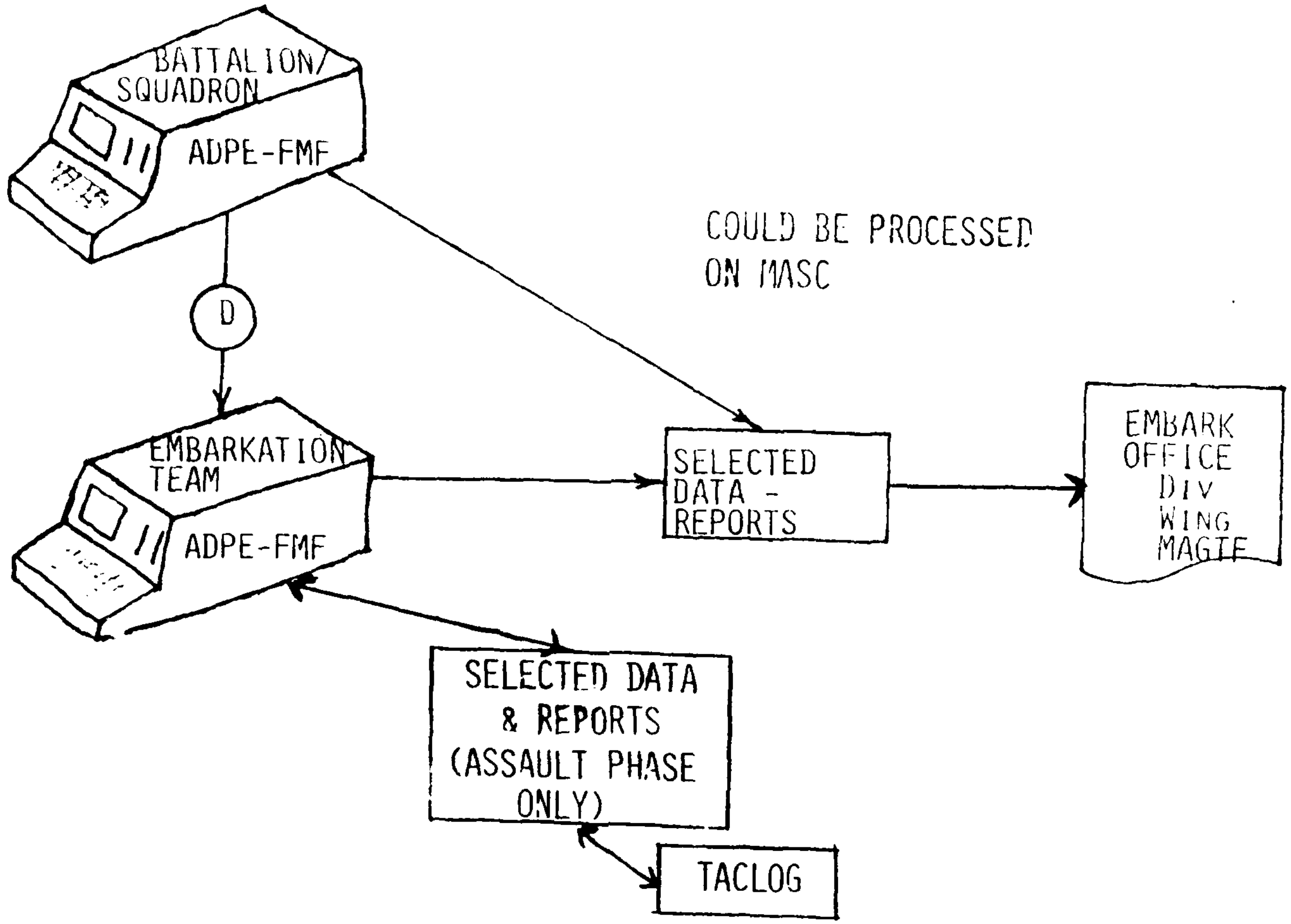


Figure 3.6.9. Standard Embarkation Management System (SEMS)-All Phases

embarkation task organization and the type and quantity of transportation, are processed and manipulated to produce embarkation and loading plan documentation. During embarkation, changes in task organization, personnel, supplies and equipment are entered into data bases with appropriate updated reports and documentation produced as output. The concept of operations for SEMS is shown in Figure 3.6.9.

3.6.3.3 SEMS-Afloat, Assault and Continued Operations Ashore Phases. During the afloat phase, changes incident to operational planning are entered to update the appropriate embarkation data bases and embarkation and loading plan documentation. This updated documentation is used by TACLOG, operational and CSS personnel in the execution of the assault. Upon completion of the assault and initiation of the continued operations ashore phase, units reestablish and maintain their embarkation data bases in the same manner as in the garrison phase.

3.6.3.4 SEMS Data Collection Worksheets. The data collection worksheets for SEMS are contained in Annex G.

3.6.3.5 SEMS Summary. SEMS, using ADPE-FMF devices, provides a standardized embarkation data system applicable to all USMC and selected USN units. It permits the establishment and maintenance of embarkation data bases at the battalion, squadron and separate company level and the capability to manipulate and consolidate data based on the embarkation task organization and transportation mode. The data bases can be updated readily in garrison, while embarkation, in a deployed area, and for all movement operations. SEMS also produces reports for embarkation management and lift requirements, loading plan documentation and selected data and reports as defined by the user. A Class I embarkation AIS is planned but has not been defined.

CHAPTER 4

MAGTF ASC (MASC) OPERATIONAL CONCEPTS BY PHASE

4.1 GENERAL

The concept of supporting deployed military forces with mobile computers in now easily within the grasp of technology. Computers continue to decrease in physical size and cost while providing more processing power. The experience of others has proven that commercial, off-the-shelf computers may be semi-trailer mounted, given a suitable operating environment and perform well under the wide range of conditions found in the field. As more and more administrative systems are automated and more systems are becoming interactive, there is an increasing awareness by functional staff members of the dependence of the military services upon automated systems. More than one high-level staff officer and commander has stated in effect, that the Marine Corps would be hard pressed or impossible to revert to manual operations in key functional areas within the Marine Corps; the AISs are taught in schools and the forms required for manual operations are no longer available in the quantities required to revert to manual operations. As time passes, the Marine Corps will develop increased dependence upon computers and hence the MASC concept must be rapidly developed so that a MAGTF doesn't end up in the Indian Ocean accomplishing its administrative management functions with a stubby pencil. The MASC would be utilized to perform such generic functions as front-end edits, on-line query with a DBMS, maintenance of data bases and preparation of reports. To provide the experience of others and to consider a current Marine Corps experiment, the next subparagraph will provide a short background about mobile, tactical processing.

4.2 BACKGROUND - MOBILE PROCESSING

Mobile commercial and military computers have existed since the late 1950s. Communications terminals have been van-mounted since the late 1950s as have mobile television broadcasting units existed from the same time period. Many of the van-mounted communications terminals contain computers which, instead of processing AISs, process messages. Conduct of the communication function with mobile processors has proven to be a feasible and a desirable technique for the performance of the function. The U.S. Army has conducted mobile business processing for nearly a decade with good results.

4.2.1 Marine Corps Experience With Mobile Computers

The Marine Corps' initial experience with mobile computers was in Vietnam. Data processing equipment and personnel were deployed to Da Nang, Vietnam in March 1965. The equipment consisted of an IBM 1401-B3 card computer and related electronic accounting machines such as sorter, collator, interpreter and key punch units. Equipment and supplies were contained in four air conditioned, M35 mounted, M109 vans and powered by two 60KW, trailer-mounted, generators. Problems were experienced in excessive downtimes due to the heat, dust, humidity and long lead time to obtain parts. These problems were eased somewhat in October, 1965 by the deployment of two additional ADPE platoons, repairmen, and procedures for expediting receipt of needed repair parts. This system performed only logistics functions.

An ADP study, conducted in August 1966, resulted in plans for an upgraded system using third generation ADPE. This equipment, an IBM S/360-30F, was installed in February, 1967 and became operational in May, 1967. At this time the IBM 1401 assumed personnel accounting processing while the IBM S/360-30 was used (to a saturation point) for supply processing. It became evident that the ADP capability needed to be further upgraded. A study was conducted in November and December, 1967 which resulted in the implementation of the automated services center concept and an upgrading of the ADPE in the form of an IBM S/360-50 in 1969. This configuration remained in operation until the withdrawal of the III MAF from Vietnam.

In recognition of the need to provide an ADP capability to deployed MAUs, the Marine Corps began field testing the concept of distributed processing and source data automation. For this purpose the Marine Corps procured SYCOR devices, a stand alone miniprocessor. The test results proved to be highly satisfactory and led to the procurement of the ADPE-FMF devices.

4.2.2 U.S. Army Experience with Mobile Computers.

The U.S. Army fielded mobile computers in the early middle 1970s with the Combat Service Support System (CS^3). The CS^3 configurations provided a 35-foot air-ride van for the central processing unit (CPU) and all peripheral devices except for the disc mass storage devices; a second 35-foot van was provided for the disc mass storage. The vans were placed 9-feet apart and were connected with a conduit housing for cabling to the disc mass storage devices. Army divisions were provisioned with an IBM 360/30 processing unit while an Army corps was provisioned with two or three IBM 360/40 configurations. The Army mobile IBM configurations could operate the same software programs as the Army fixed sites since the fixed sites were equiped with IBM 360 series computers with models ranging from model 30s to model 65s. The Army successfully processed their standard and other systems upon the mobile CS^3 configurations. The CS^3 computers were deployed by air from CONUS to Europe and were able to paticipate in REFORAGER exercises from the middle 1970s. These mobile computers processed manpower, fiscal, logistical and other Army systems. The Army experience with mobile computers is germane to Marine Corps MASC concepts of operation principally from a garrison operations point of view, transportability, and field operations.

For garrison operations some commanders utilize their CS^3s for peacetime operations--some use the fixed base operations (BASOPS) computers for their standard processing. A study was conducted by the Army Administrative Center (ADMINCEN) at Ft. Benjamin Harrison in 1975. A portion of that study determined the priority with which Army Divisions and Corps would deploy their CS^3 computers. The responses ran the gambit from first priority air shipment to they would not deploy at all. During the interview for the Deployed AIS-88 Study some variation was recorded as to the Marine Corps' use of MASCs in garrison and the priority for deployment. Once deployed, the CS^3 computers operated well in reasonable terrain and extremes in climate. A similar performance would be expected from MASC processors. The Army has 27 CS^3 configurations and is now embarked upon the acquisition of up to 324 Decentralized Automated Service Support Systems (DAS_3)(AN/MYQ-4) configurations. DAS_3 provides the Army a responsive battlefield logistics support system and postures the Army to address future requirements through its design expansion and modular capabilities. A Honeywell minicomputer provides the processing power for the DAS_3s.

4.2.3 A Recent U.S. Air Force Acquisition

The U.S. Air Force is acquiring minicomputers mounted in mobile home vehicles to provide Personnel Support for Contingency Operations (PERSCO). The 45-foot PERSCO system is comprised of a 32-foot, 15,000 pound converted mobile home and a two-ton trailer which carries a mobile electric power unit. Each unit has a self-contained mini-consolidated base personnel office capable of handling records for 36,000 personnel. The PERSCO units will be placed in strategic locations in CONUS and Europe.

4.2.4 The Marine Corps Experimental Deployable FASC (MASC)

The Joint Logistics Review Board monograph on automated data processing in Vietnam (reference ppp) affirmed the requirement and dependence upon deployed computers. The Marine Corps recognized the need for deployed AIS processing earlier in that era as they progressed from a deployed IBM 1401 in 1965 through an IBM S/360-30 to an IBM S/360-50 in 1969. In 1980, the Marine Corps embarked upon a program to acquire and test mobile minicomputers to provide automated processing support for AISs operated at the division level and above in a deployed MAF. Additionally, there exists a need for the RASCs, CDPAs and the mobile MASC to nave compatibility in hardware and software to avoid duplicate and triplicate software maintenance and enhancement with differing hardware configurations. For the purposes of this study, the mobile experimental processor will be termed an experimental FASC or MASC. The experimental FASC will be utilized to validate the concept and employment of mobile AIS computers in the Marine Corps.

The experimental FASC will be mounted in two 35-foot, semi-vans with an interconnecting walkway. The current manufacturer of these MILSTD vans is located in Orlando, Florida; the MASC will most likely be configured by a contractor. It will contain an IBM 4341 minicomputer along with a number of peripheral devices as depicted in Fig. 4.2.1. In addition, the configuration will include a commercial version IBM Series/1 (white machine) for the purpose of data aggregation and diskette duplication in support of the ADPE-FMF devices (green machines).

The current estimated cost for a configuration is on the order of $1.6M. The initial experimental FASC is slated to commence OT&E in January of 1983 with two additional configurations acquired at six month intervals. The initial OT&E is planned for completion in January 1984. Sufficient funding has been allocated in the FY 82 supplemental and FY 83 budgets to support this experimental project. Both FMFs have shown a high interest in being provisioned with a (experimental) MASC.

Additional supporting measures are required to conduct the OT&E portion of the experiment. LT. GEN. Schwenk, CG of FMFLANT, has agreed to provide two M818, 5-ton tractors to be prime movers for the 35-foot vans; he will also provide two mobile electric power units-100 KW skid-mounted generators. Each van is to be equipped with an Army standard heating/air conditioning unit with two 60,000 BTU per hour capability units (this may change because the Army doesn't list such a unit). The acquisition contract will specify that a worldwide maintenance capability must be provided by the supplying vendor.

A portion of the OT&E process will be utilized to determine T/O and T/E changes needed for the MASCs personnel to support a MASC; for a MAF, personnel will be drawn from the existing FASC T/O.

Although benchmarking is not complete as of this writing, some comparative processing times were made available by the experimental FASC acquisition project officer. It is to be noted that the IBM

EXPERIMENTAL MASC SYSTEM CONFIGURATION

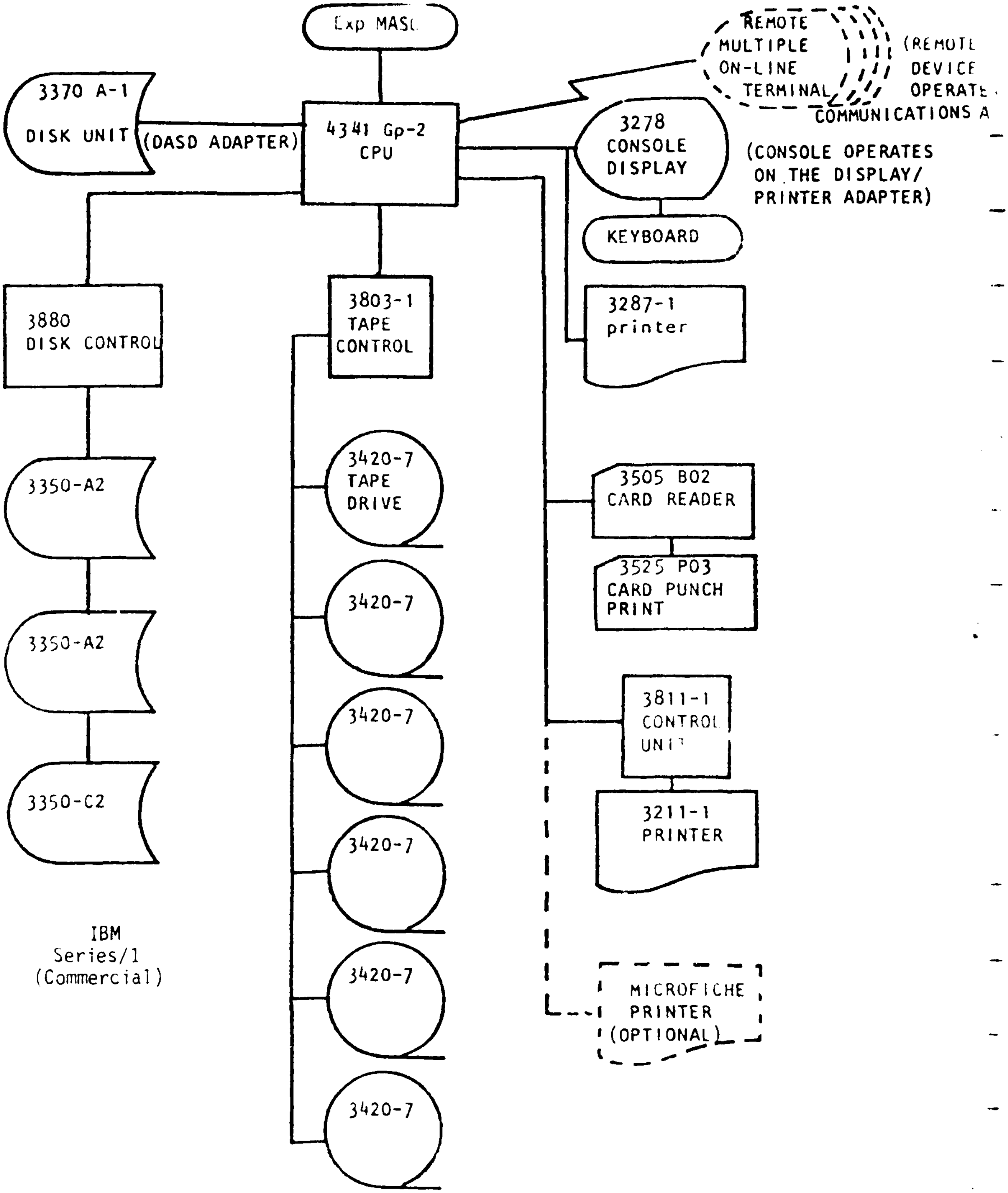


Figure 4.2.1

Experimental MASC Configuration

4341 was used for benchmarking; acquisition plans are oriented towards the selection of the IBM 4341 for the experimental FASC. This is similar to an Army situation in which the Army acquired several IBM 370/138s to replace the IBM 360/40s supporting the Corps interim upgrade. The Standard Army Intermediate Logistics System (SAILS-ABX) was benchmarked on the IBM 370/138 at 134 minutes while on the IBM 4331 it required 323 minutes or more than two-times the processing requirements. One may believe from this comparison that IBM 370/138s should be placed in the MASC, however, as the IBM 4341 or equivalent minicomputer technology advances, processing speeds for the minicomputer in 1984-85 will exceed those of the IBM 370/138, will be less costly and will be physically smaller. This experimental forerunner to test the concept of deployable MASCs is an exciting and supportable concept perceived to enhance the justification to acquire sufficient MASCs to support total Marine Corps deployed processing needs. The Army version of the MASC is shown in Figure 4.2.2.

4.3 DEPLOYED MASC OPERATIONAL CONCEPTS BY PHASE

Deployed processing concepts utilizing MASCs have not yet been established doctrinally for the Marine Corps. In the interview process, PGRG study team members found different operational perceptions at different levels of command and within the same levels of command. One resounding, unanimous response, however, was that a deployed processing capability is required for the Marine Corps. With a generic need for deployed processors and AISs as a backdrop, the succeeding subparagraphs will move the MASCs through five amphibious operational phases and four transitions from phase to phase. Controversial elements exist for the garrison and afloat phases of the amphibious operation.

4.3.1 Garrison Concept of Operations-Phase I

A realistic, operational requirement will exist when a MASC is located in garrison to keep the MASC 'warm'. 'Warm' means that it be physically turned on or powered up so that electronic components are exercised and that condensing moisture is not present. As with any piece of electronic gear, they must be used on a periodic basis or their

(Photo Courtesy of
General Electric)

Figure 4.2.2

Army Decentralized Automated Service Support System (DAS3) AN/MYQ-4 reliability to operate decreases. Responses fell into three areas: first, operate all AISs in garrison each day; second, use the MASC for training on a periodic basis and third, power up the MASC occasionally. Personnel at the CDPA in Albany felt the full M3S should be operated on the MASC each day (Tab P, Annex C) as did personnel from the 3rd MAW (Tab R, Annex C), and the 1st BSSG and SMU Commanders (Tab U, Annex C). Personnel from I MAF (Tab S, Annex C) and 1st MARDIV (Tab V to Annex C) felt that AISs should operate at the RASC when in garrison so that the MASC would be utilized when deployed or as a backup if the RASC is down. The I MAF and 1st MARDIV personnel understand the need to power up the MASC periodically; hands-on training would be conducted at that time. As may be seen, there is no mandate as to how the MASC would operate in garrison--full blown or some power up and training. It is believed that the garrison utilization of the MASC would be a commander's prerogative commensurate with standards and guidance established by CMC. This same sort of finding evolved with the Army CS^3 units discussed earlier in this report. Upon an alert to prepare for embarkation, it would certainly seem advantageous to have operational data bases on the MASC however a policy decision on garrison MASC operations is required and will be determined during the test of the experimental FASC.

4.3.2 Transition To and Embarkation-Phase II

FMF units in garrison are task organized into a typical force structure. Task organizations for combat must be developed for the MAGTF headquarters, and the ground, aviation and combat service support elements. This creates a most complex and demanding processing requirement. Data bases must be continually updated with traceability maintained in the transition of T/O and RUC units into task organized units. Upon the preparation for embarkation, a great deal of similar activity will occur with respect to task organization for embarkation and the ship loading plans. Continual changes to the task organization have significant impact upon the preparation of deployed data bases for the major deployable systems which are REAL FAMMIS, M3S/MIMMS and SEMS. These four systems reflect the condition of manpower and combat service support resources for the MAGTF. Each is dependent upon the aggregation of units into RUCs or other accountable entities within their data structure. During this phase a great deal of confusion may be anticipated and may be excerbated by an additional transition from RASC garrison data bases to MASC data bases--this may suggest a doctrine of garrison AIS operation on a MASC. At the last minute, the MASC or RASC would produce two magnetic tape copies of all the files on the MASC. One set of tapes would be used to load the MASC aboard ship; the second set of tapes would be stored in an alternative location for continuity of operations and disaster recovery purposes. One MASC could be loaded aboard ship and made operational while a second MASC could be operable on the ground to deal with the last minute changes prior to transfer of data bases to the shipborne MASC. The second MASC could then be loaded aboard ship for MAF support or in the case of a deploying MAB, be a backup or redundant MASC to support deployed MAB operations. The transition of data bases would be accomplished by the physical transfer of magnetic tapes. In the event a MAU is deploying, units will probably deploy with four to five ADPE-FMF devices along with a minimum of one paper tape reader/punch. One of the ADPE-FMF devices is a backup to the others; the paper tape reader/punch is for entry to and receipt from the Naval Telecommunications System (NTS). ADPE-FMF device support of a deployed MAU was uniformly considered adequate for that sized force. Concern was indicated by the 1st Brigade BISMO (Tab U, Annex C) pertaining to maintenance of deployed ADPE-FMF devices. His concern was attenuated with an explanation that 24-hour repair turnaround time was available for all devices used by the MAGTFs. An advanced call to the commercial maintenance facility will insure timely repair of ADPE-FMF devices.

4.3.3 Afloat-Phase III

Afloat operations are currently supported with Navy-supplied hardware and software. The Navy systems are under the systems umbrella of the Integrated Tactical Amphibious Warfare Data System (ITAWDS) which includes both tactical and administrative type data bases and processes. For this study, we are concerned with the Navy Management Information System (MIS) and Amphibious Support Information System (ASIS) which include the attributes for deployable AISs theoretically required for Marine Corps deployed operations. MIS and ASIS operate utilizing different hardware and software and their general characteristics are described in paragraph 5.5. The software gives the user a limited capability to process information and also little computer time is available for Marine administrative processing needs while afloat.

All together, MIS and ASIS are not adequate to support the deployed AIS processing needs for the Marine Corps - other deployed processing alternatives must be developed.

Two general deployed processing alternatives appear available to provide an improved functional processing capability along with the general availability of processing time for Marine needs. The two alternatives initially available are:

- Marine provided, afloat hardware/software which is fully compatible with deployable Marine Corps AIS environments and architectures.
- Navy provided, afloat hardware/software which is fully compatible with deployable Marine Corps AIS environments and architectures.

In reality, the alternatives are essentially the same; the question is - who provides these deployable processors for the afloat phase of operations? By far, the Marine Corps personnel interviewed during the study want the deployable MASC to operate while afloat and then transition to shore. This alternative, the Marine MASC afloat, seems very attractive from many points of view. The afloat MASCs must be powered up occasionally for reliability purposes. No problems are encountered when moving data bases and applications software to and from a ship. The MASCs, even on an expedient basis, could be made operable on most any ship. The Commanding General of the 1st Marine Brigade felt that command ships could be LHAs, LPHs, LSDs or LCCs. (Only LHAs and LCCs have marginal Navy-provided processors on board.)

The other alternative could be for the Navy to provide fixed processors aboard ship which are fully compatible with the MASCs. This would provide the MAGTF with a full capability until the MASCs are deployed ashore. With such a capability, consideration could be given to transportation of the MASCs in the assault follow-on echelon in which there would be less competition for shipping (lift) space or possibly to flying the MASCs into the AOA. Considering the wide range of ships in which the CLF could operate, this could require a larger number of compatible, fixed processors being installed aboard varying classes of ships. Such an alternative would provide the advantage of AIS support to any size MAGTF afloat, however, the cost of adapting this alternative and the effort required to maintain hardware and software on a large number of ships does not initially appear as a desirable alternative. It is possible but highly improbable that this capability could be provided with current Navy equipment utilizing software emulation, however emulation is extremely slow.

The emphasis for deployed AIS processing and functional support for the afloat phase is toward utilization of the van-mounted, deployable MASC. This concept is not without significant physical and attitudinal considerations. From a physical point of view, a SAC member stated - 'when you put a new radio aboard, an old radio must come off'. Personnel in NAVSEA 612, where responsibility for LCCs and LHA overhauls rests, believe that space for a MASC aboard ship may be identified and the requirement amplified to OPNAV on a priority basis in order to impact upon the LCC SHIPALT in 1984 (Tab L to Annex C). Navy personnel interviewed aboard LCC-19 (USS MT WHITNEY) at Norfolk were negative toward the concept of an operational MASC aboard ship (Tab K to Annex C).

An additional consideration by the PGRG study team stems from MAF operations aboard ship. It is unlikely that a full MAF could deploy aboard ship in the mid-range time frame; there will be insufficient ships upon which to deploy a full MAF. Also for the larger forces, the MAF and MAB, how long might they be at sea? The MARCORS I scenario used to initialize this study, does not include the seaborne aspects of the operation leading to the assault of Jutland. In moving to Jutland, would they stage in England, Norway, Northern Germany or elsewhere? The answers to such questions requires a trade-off analysis of force size versus time afloat to prepare a definitive recommendation for the afloat phase of an amphibious operation The study team believes the time afloat could impact the need for deployed afloat AIS processing. We are, however, looking for a worst-case situation hence the deployable MASC will be considered aboard ship and operational to support the deployed AIS processing needs while MABs and MAFs are afloat for a period of time beyond which automated processing support would be required.

During this afloat period, it is anticipated that AIS data interface would be necessary with other AISs, tactical systems and others in a joint or NATO-type context. Interfaces with other AISs would be from the manpower portion of REAL FAMMIS to the deployed military pay function into DOV and M3S/MIMMS for SABRS-the interface to SABRS would not occur at the MASC-level but rather at a higher echelon upon a CONUS-type processor. Detailed AIS data interface elements have not yet been specified for any of the systems. The principal tactical system interface is anticipated to be with TCO in the MTACCS. The interfaces with other services or allies have not yet been defined, however, one most likely interface would be from M3S into the Army's Standard Army Intermediate Logistics System (SAILS)--this interface has neither been specified nor functionally defined. It is anticipated that most data interfaces with a MASC would be accommodated utilizing magnetic media--tapes or diskettes.

While the MASC is operational aboard ship, the TACLOG and G-1 staff may desire hard-wired access from their functional space aboard ship to the MASC. This means that the afloat MASC must be upon the same ship with the CLF and CATF. Further, the afloat MASC would remain operational as the MAGTF transitioned from the afloat to the assault phase of an amphibious operation.

4.3.4 Assault-Phase IV

The commencement of the assault phase of the amphibious operation will place demands upon the manpower and logistical AISs operating upon the MASC. Manpower data bases will play an important role in dealing with replacements for WIAs and KIAs (under current planning the deployed manpower data base would be 10 to 30 days out of synchronization with the MCCDPA data base). Also, a need to track low density, highly skilled, evacuated personnel was identified by personnel in the G-1 office of the 2nd MAW at Cherry Point (Tab F to Annex C). Manpower functional personnel in the 2nd FSSG at Camp Lejeune had earlier indicated no need for tracking evacuees within the Navy medical system (Tab F to Annex C) even though the 2nd FSSG possesses a number of low-density, skilled personnel.

Combat service support (CSS) functions will place great demands upon the deployed AISs during the assault phase of the amphibious operation. Both routine and high priority CSS functions will be supported by M3S and SEMS. Demands upon these AISs will be placed from units on the beach, from the Navy Central Control(s) and from TACLOGs. For the first several days of the assault, information would be obtained from the MASC aboard ship by requests submitted with tactical radios. As the force beachhead line expands, there will be a point that a MASC could be moved ashore. Assuming a MAB is provisioned with two MASCs (one operational while afloat plus one spare) and a MAF with up to four MASCs, one or more of the spare MASCs could be transported ashore and brought into operation. At this point data tapes from the afloat MASC could be quickly transported to the ashore MASC(s) and placed in operation. The shipboard operational MASC could then be routinely displaced ashore and placed in reserve. For the MARCORS I, Jutland scenario, it is projected that the AIS transition ashore would occur after seven-to-ten days into the assault phase of the operation. The detailed planning for MASC operations ashore and with a TAE would have to be conducted on a case-by-case basis. This perception of MASC operations for the assault phase tracks with the Jutland scenario and the presumption that a deployed MASC will be operational aboard ship in the support of MAB and MAF operations and the ADPE-FMF devices are in wide-spread use by the deployed forces.

4.3.5 Continued Operations with TAE-Phase V

When the force beachhead line contains sufficient area, MASC(s) may be made operational on shore. From the preceding subparagraph, the MASC(s) would be 'leapfrogged' ashore to provide virtually continuous AIS support. Once ashore, the MASCs would provide normal, deployed AIS support to all deployed echelons of a MAGTF. With the scenario utilized for this study, a MASC would be used at the TAE for reasons explained in subparagraph 4.4 of this study. Interfaces with other (AISs, MTACCs, joint and allied) systems would continue as described in subparagraph 5.17 of this report.

4.4 MASC SUPPORT FOR DEPLOYED MAFs, MABs, AND MAUs

During the course of the study, a concept to support deployed MAGTFs with MASCs has evolved. Initially, one MASC was deemed necessary to support a deployed MAF. Intermediate guidance from the SAC recognized that up to three MASCs may be required for a deployed MAF. Then, after information gathering trips to California and Hawaii, it became apparent that possibly more than three MASCs per MAF would be necessary to provide automated AIS processing support to highly dispersed elements of a MAF; III MAF was recognized as a highly dispersed MAGTF in this respect.

4.4.1 MASC Support for Deployed MAFs

The MAF in mid-to-high intensity combat represents the greatest documented demand for deployed processing support. While conducting preembarkation preparation of data bases for deployed AIS operations, much activity will be observed between RASC operations and the MASCs. The degree of direct MASC involvement will be predicated upon standard operating procedures established within each MAGTF. The processing activity levels during the aboard ship operations will be minimal except during the assault. Military personnel and logistical transactions will be less than those conducted in garrison or while in combat.

The 6 MIPS requirement, developed in Annex F, may potentially be supportable with one minicomputer projected as technologically available in the 1985-1988 time frame. However, a single MASC supporting continued operations for a MAF will not provide the degree of reliability or flexibility for AIS processing. To provide the desired processing attributes in the AOA, other MASC operational concepts have been documented and endorsed by both staff officers and commanders within the Marine Corps (many of the MFRs in Annex C). Also exacerbating the size and locations of the MASCs within the AOA are the austere telecommunications made available for the purpose of transmitting AIS data - in essence, AIS data is transported by courier. A need exists within the AOA that functional personnel have interactive access to the deployed AISs and data bases. It is desirable therefore, that functional personnel in the FSSG have interactive access to a MASC for the purpose of providing responsive supply and maintenance support. Typically, interactive terminals (and printers) may be located and cabled from up to 1,500 feet to the MASC. Elements of the FSSG Headquarters, and the supply and maintenance battalions may be located within the cabled range of the MASC to perform these key CSS functions and at the same time, provide a management capability for the FSSG Headquarters. A MASC to support deployed CSS operation in an AOA is clearly indicated. There is a similar requirement for support of the manpower AIS. For continuity of operations purposes, it would be desirable to position a MASC at a location other than that of the CSS MASC. Such a MASC could be located with the division to provide cabled, interactive ASC support to the division staff including manpower support for the G-1. As an alternative the MASC could be located with the MAF. Under these alternatives, a division G-1 element could colocate with the MAF G-1 or vice versa. The location of the MASC supporting manpower processing would be as directed in a current operations order or by standard operating procedures.

Aviation AIS proponents have communicated a need for a MASC to be located with the MAW for the purpose of aggregating management reports for MAG (SNAP) processors into wing-level management reports; this is currently a manpower-intense task which is seldom completable. Also, Class I Marine Corps AIS will require supporting MASC processing from remote airfield locations.

The basic deployed and documented MASC requirement in the AOA for a MAF is for three MASCs. Although multi-programming is attractive, it seems desirable that each MASC would conduct processing oriented toward but not dedicated to manpower, CSS and aviation functions. This would avoid an aggregation task which would be required if each MASC accomplishes multi-programming. Each of these three MASCs is provided sufficient additional processing power to support the processing of two rather than one major deployable AIS. For example, if sized appropriately, should the manpower-oriented MASC processor not be operable, the manpower processing could be conducted upon the CSS processor utilizing serial processing techniques. The serial (rather that time shared) processing is necessary because only one data base may be placed upon the available direct access storage devices (disc drives).

The provision of a fourth MASC in support of deployed MAF operations arises from two conditions:

- The MARCORS 1 scenario in Jutland places two remote airfields (theater airfield echelon (TAE)) in Norway. These airfields are within range of the narrowfoot print, 12 channel AN/TSC

93A terminal supported by the Defense Satellite Communication System (DSCS) II (and DSCS III) however, this communication capability is not considered available for AIS traffic. Further, the spare AN/TSC 93A may not be committed for use with the TAE. The TAE will need a MASC to perform the information aggregation function and potentially perform limited manpower and CSS functional processing.

- The need for a fourth MASC also stems from a contingency, redundancy or back-up role. Should one of the three required MASCs be removed from operation for more than a few days or a week, a spare MASC must be available in order that functionally-oriented, interactive processing continue without significant abatement.

Four MASCs as sized are indicated for AIS support for I MAF and II MAF. Per information documented in Tab U to Annex C, III MAF may require more than four MASCs based upon their unique geographical dispersion (maybe an estimate may be made).

4.4.2 MASC Support for Deployed MABs

The deployed MAB is a subset of the MAF hence the MASCs associated with deployed MAB AIS processing is evaluated in perspective with a deployed MAF. As with the MAF, the major deployed functions for a MAB are manpower and CSS. However, because of smaller data bases, processing can be accomplished by one MASC. During the preembarkation phase of the operation, the activities associated with AIS data base preparation will be like those described for the MAF. Based on the MARCOR scenarios used in this study the MAB has a strength of about 15,000; the MAF strength is about 52,000 hence the processing ratio for manpower is assumed linear so the MAB requires about 30 percent of the processing power of a MAF. Table 4.5.1 are estimates for the deployed processing needs for AISs developed from the data collection work sheets contained in Annex G. These deployed MASC processing requirements are easily supportable with one MASC aboard ship or in the AOA. The second MASC would accompany the deployed MAB to permit smooth transition ashore and provide a backup processing capability for the deployed MAB.

TABLE 4.5.1

DEPLOYED PROCESSING NEEDS FOR AISs ON A MASC(s)[1]

(in millions of instructions per second (MIPS))

	MAF				MAB			
Phase	Log	Pers	Other	Total	Log	Pers	Other	Total
I	3.6	2.8	2.1	8.5[2]	1.1	1.0	1.0	3.1[2]
II	3.6	2.8	2.1	8.5[2]	1.1	1.0	1.0	3.1[2]
III	.4[3]	.6	.4	1.4	.1	.2	.1	.4
IV	1.8	.4	.3	2.5	.5	.1	.2	.8
V	5.5	.4	1.3	7.2	1.6	.1	.2	1.9

[1]MAU not included.

[2]Includes RASC processing.

[3]Peaking to .9 MIPS for rehearsals, etc.

4.4.3 MASC Support for Deployed MAUs

Without exception, all interview respondents felt that deployed MAUs would require only ADPE-FMF devices for all phases of amphibious operations. One person in FMFPAC indicated that it would be nice to deploy a MAU with a MASC but this was not identified as a requirement (Tab U to Annex C).

The position on automated support for a MAU is both logical and consistent with the MAU's mission. A MAU is typically utilized in a show-of-force or police-type action where combat related activities are of low-intensity--this type of deployment is envisioned as easily supportable with ADPE-FMF devices. In the event that combat intensity would increase from a low level, the MAU would require reinforcement to at least a MAB-sized force which would introduce a MASC; the MAU would then be embodied in the larger force which would have a greater capability to provide deployed AIS support. This study will, therefore, not address the deployment of a MASC with a MAU-sized MAGTF. Presuming that MASCs are provided as conceptualized in the preceding two subparagraphs a MASC could potentially be deployed from assets of a larger force--such a decision would be accommodated upon a case-by-case basis and/or unit standard operating procedures.

4.5 SUMMARY-DEPLOYED MASC OPERATIONAL CONCEPTS

The Marine Corps has, by fiat and hence irreversably, made a commitment to support their major functional management with automated, interactive, front-end editing AISs. As these emerging AISs of the mid-80s are implemented, Marines will come to depend on the AISs and will not be trained to operate with manual systems. The concepts for MASC operations espoused in this chapter of the report are responsive to the deployed needs of MAGTFs in the 1988 time period as documented from numerous staff members and commanders within the Marine Corps.

The Marine Corps may provision with MASCs to support any level of operation. Consideration may be given MASC deshelterized configuration also be given to each CDPA for the purposes of system development and maintenance. Then each MAF could be considered for provisioning at varying levels. For example, each MAF could be provided two MASCs and upon deployment, given one or two MASCs from other MAFs; or, going maximum, I MAF and II MAF could have three or four MASCs and III MAF four or five MASCs based upon III MAF dispersion (including the 1st Brigade MASC). The perceived minimum and maximum requirements are displayed in the following table.

TABLE 4.5.2

MINIMUM/MAXIMUM MASC PROVISIONING

Supporting	Minimum	Maximum
I MAF	2	4
II MAF	2	4
III MAF	2*	4*
1st Brigade	1	1
PWRS	0	1
	7	14

*1st Brigade subsumed into III MAF.

The provisioning of the Marine Corps with MASCs is variable and could easily be impacted by such restraints as budget and manpower. The study team learned that provisioning for MASCs will be studied further.

CHAPTER 5
AREAS OF CONCERN

5.1 GENERAL

The methodology for this study required the identification of AISs which should deploy with MAGTFs and the documentation of operational concepts for the deployable AISs. During the course of the study (starting in December 1980), several situations evolved which required at least cursory investigation within the framework of this type of study but not within the scope or methodology of the study. The illuminated situations have therefore been identified and form this chapter --they are called Areas of Concern. The dozen or so areas of concern herein identified are discussed only in general terms and may require more detailed documentation, description or analysis by appropriate functional managers.

5.2 COMMUNICATIONS

A predecessor study, the MAGTF Teleprocessing Requirements Study (Reference a) provided the documented AIS data transfer requirements for deployed MAGTFs in the 1985 time period. The AIS telecommunication requirements were superimposed upon voice and tactical system telecommunication requirements to determine which, if any, deployed communication circuits were overloaded. Shortfalls were identified and prioritized recommendations were provided the study sponsor. This study views communications from a different aspect; i.e., AIS data transfer for deployed operations will normally be accomplished by courier. Should enhanced communications facilities be available for AIS data transfer, this is considered an enhanced mode of operation. The normal mode was utilized for this study. Data transfer by electronic means may only be accomplished when terminal or peripheral devices are cabled (hardwired) to the AIS processor. Since the completion and approval of the MAGTF Teleprocessing Requirements Study (reference a) a decrease in data transfer requirements has occurred principally stemming from decreased, deployed manpower processing requirements.

In spite of the austere communication facilities provided as study assumptions for the Deployed AIS-88 Study, Marine Corps personnel interviewed at all echelons repeatedly stated a need for telecommunication support for deployed AIS data transfer for the 1988 time period. The most vocal group for telecommunication support for deployed MAGTFs came from within FMFPAC, although personnel from all echelons indicated the need for telecommunications to transmit AIS information. FMFPAC is most sensitive to telecommunications support due to their geographic dispersion and ports of call with limited telecommunication facilities.

5.3 HIGH VISIBILITY AVIATION SYSTEMS

Congressional budget cuts in the past decade have required all the services to cut back on repair parts in the supply pipeline. To overcome such a shortfall in the Navy, interactive aviation repair parts automated systems have been implemented. The automated systems utilize the Navy's Closed Loop Aeronautical Management Program (CLAMP) and have interactive query capability with Navy aviation rebuild facilities. Access to these high visibility systems is provided with commercial terminal and communications facilities (Tabs E and U to Annex C). FMFLANT utilizes two commercially-acquired terminals and AUTOVON for queries while FMFPAC (MAG 24) utilizes a Western Union terminal and WESTAR satellite link to enter the high visibility, CONUS aviation supply systems. The study team has three concerns pertaining to aviation supply:

- When deployed, the commercial systems, which work well in the fixed-CONUS environment, will not be available.

- With the aviation repair parts "pipeline" as dry as possible, there is a question as to whether the aviation repair parts requisitioning objectives are sufficiently high in order to support tactical operations. One Marine aviation supply officer believes that aviation repair parts not aboard ship when deployed won't be available in combat situations due to the non-deployability of aviation AISs provided by the Navy.

- The high visibility systems utilized by FMFPAC and FMFLANT are different. FMFPAC is oriented about CLAMP and the Navy aviation rebuild facilities (Tab U to Annex C) while FMFLANT is oriented toward Defense Supply Centers (Tab E to Annex C).

The probability of responsive aviation supply support diminishes upon MAGTF deployment and with a limited stockage in the "pipeline," combat availability of aviation repair parts is a significant concern. Further, it appears that each FMF is utilizing different types of AISs which may place HQMC in a position where consistent management is a concern.

Both FMFs prefer to deploy with the interactive systems and are not certain of the impact of losing their garrison-oriented systems.

5.4 CLASS V (W) AND V (A)

Multiple systems were noted for the management of ground ammunition and aviation ordnance at numerous locations where interviews were conducted. In general, Marine Corps units are maintaining fully manual records for both types of Class V supplies. Periodic management reports are produced from the manual records and forwarded to various echelons for higher-level management of these important resources.

Some units had prepared semiautomated AISs to improve the efficiency and accuracy for ground ammunition and aviation ordnance management. None of the observed systems were standard AISs but rather were Class III and with the implementation of ADPE-FMF devices, some Class IV systems. A notable and efficient system was noted at the 2nd MAW at Cherry Point. The MAW supply office had leased a terminal which was compatible with the Navy facility computer and had developed a simple AIS to maintain cognizance of Class V(A) supplies. Included within the maintained inventory were aviation ammunition-unique tools for a total management structue of about 100 line items of supply (Tab N to Annex C). Since this simple and straightforward system was available, Class V (W) supply was added. In meeting the periodic Class V reporting requirements, the AIS minimized the management reporting human resource requirement by several fold--on the order of 40 hours per month to 8 hours (and no weekends) per month. 2nd MAW personnel planned to place the system upon ADPE-FMF devices so that it could easily be deployed.

Based upon observations during the conduct of the study, it would seem desirable to establish a common doctrine and management procedure for all Class V supplies within the Marine Corps. It also appears that an established Class V management procedure could be easily supported upon deployable ADPE-FMF devices.

5.5 SHIPBOARD MARINE AIS PROCESSING

Marine Corps afloat processing capability is currently provided with Navy hardware and software operated within the umbrella of the Integrated Tactical Amphibious Warfare Data System (ITAWDS). ITWADS has both tactical and administrative subsystems. The ITAWDS hardware is vintage 1965 and the software utilized for the administrative subsystems is based upon a one-and-a-half generation data base management system (DBMS). Deployed MAGTFs must enter the administrative data into ITAWDS using punched card inputs from Marine Corps ASCs. Constructing the data bases is manpower intensive and the DBMS permits only data retrieval and data element update. No significant processing capability is available for MAGTF use. Additionally, with the current ITAWDS hardware, component failure results in processor non-availability for Marine administrative subsystem use. Availability of ASIS on the LCC has been documented at 30 percent in FMFLANT (Tab K to Annex C). MIS and ASIS are therefore of little use for the equivalent deployed processing needs of the Marine Corps in 1988. For example, the Marine Corps desires to construct a manpower transaction using front-end, interactive edits. MIS and ASIS using different software languages will permit the user to change a field in the personnel file and that's it. Aside from the limited functional capability provided by MIS and ASIS, the construction and maintenance of the DBMS-like files is manpower intensive and this is recognized in FMFLANT with a comment "that it doubles our work" (Table K to Annex C) (in the 4th MAB Planning Staff).

The characteristics of ASIS and MIS are displayed in Tables 5.5.1 and 5.5.2. It appears that not only are MIS and ASIS are generally unavailable for Marine Corps use, but also limited functionally. Considering the effort involved with preparing the MIS and ASIS data bases, the incompatibility between the systems and their general non-availability to the deployed MAGTF, other means must be provided to meet the needs of deployed MABs and MAFs--the MAUs being supported with ADPE-FMF devices.

One means of improved support for ASIS is providing for additional processors aboard the LCC-class ships. Ship Alteration (SHIPALT) 938K (reference t) obtained from NAVSEA 612 calls for a processor upgrade for ASIS on LCC-class ships in the 1984 overhaul window. Considering the manpower intensiveness of data base construction and the limited functional capability of ASIS, the LCC processor upgrades will provide only a marginal improvement in the ASIS processing capability but will not change the functional processing capability. The study team is aware of the addition of two AN/UYK-7s for each LHA class ship in the current time frame. A further and severe limitation from MIS and ASIS processing while afloat stems from the inability to transition these systems ashore. All together, MIS and ASIS are not adequate to support the deployed AIS processing needs for the Marine Corps - other deployed processing alternatives must be developed.

Study team members contacted a representative of NAVSEA 612Y in order to document any upgrades planned for processors aboard amphibious ships (Tab L to Annex C). A ship alteration (SHIPALT) is underway for LHA class ships. The SHIPALT consisted of adding 2 additional AN/UYK-7s for administrative processing using the Management Information System (MIS). The three existing AN/UYK7s on the LHA class ships will be dedicated to processing tactical information. LCC class ships will have processor upgrades with SHIPALT 938K in 1984. The SHIPALT will provide two additional AN/UYK7s dedicated to processing MIS. Currently, the LCCs operate the Amphibious Ship Information System (ASIS) upon CP652B/USQ-20(V) processors hence the LCC SHIPALT will eliminate the need for ASIS. The elimination of ASIS offers the advantage of one system for both LHA and LCC class ships.

TABLE 5.5.1
COMPARISON OF LCC ASIS AND LHA MIS HARDWARE

	Capabilities (limits)	LCC ASIS (Refs. w, x, y)	LHA MIS (Refs. 2, bb, cc)
1.	Computer 30-bit words	CP-652B/USQ-20(V)	AN/UYK-7(V)
2.	Computer-Read/Write Cycle Time	4.0 microseconds	1.1 microseconds
3.	Medium Speed Printers	None	5
4.	Code Conversions	None	Yes
5.	Geographic to Universal Transverse Mercator Conversion (& vice versa)	None	Yes
6.	Data Bases/File Sets for System	7	64
7.	Logical Files for System	63	4029
8.	Groups per Data Base/File Set	127	1024
9.	Character Constants	63	255
10.	Record Size (Words)	975	4084
11.	Logical Files Per Data Base/File Set	63	256
12.	Group Size (Words)	126	4084
13.	Digits for Numeric Fields	9	14
14.	Dynamic Core Available (Words)	20,000	91,000
15.	Saved Messages	600 statements	100 procedures
16.	Number of Input Data Formats Per Data Base/File Set	25	256
17.	Batch Jobs	None	1
18.	Data Base/File Set Definitions	CRTT	Cards or Tape
19.	Report Selection	First In/First Out	Choose From List
20.	Roll/Scroll	Line by Line	Paging
21.	Complex Programming Language	Quest	P-Language Q-Language
22.	NIPS Processing	None	Yes
23.	TDS Interface	None	Target List
24.	3M and S&A (JISDC simulator)	None	Yes

TABLE 5.5.2
MIS/ASIS SOFTWARE FUNCTIONS/FILES

MIS (Ref. q)	ASIS (Ref. r)
Personnel	Personnel
Intelligence	Intelligence
Landing Serial	Landing Serial
Target List	Target List
Ammo Status (NGF)	Ammo Status (NGF)
Air	Air
Staff Journal	Staff Journal
Logistic Planning	Logistic Planning
Supply/Accounting	Supply
Support	Support
Whole Blood	Whole Blood
Communications	Communications
	POL
	Ammo Status

The Navy has traditionally provided automation facilities aboard ship for Marine Corps use as evidenced by the processing upgrades underway on the LHA class ships and the planned upgrade to the LCC class ships in the 1984 LCC overhaul. The difficulty with the upgrade and provision of dedicated MIS processing aboard ship is that old hardware and software will continue in use. Not one respondent in the Marine Corps felt that MIS (and ASIS) were worthwhile systems. Further, the shipboard MIS data bases can not be transported into the MASC's envisioned for use in the AOA. In all cases, Marine Corps respondents preferred to operate the MASC aboard ship so that data bases may be easily transferred from phase to phase of an amphibious operation. Software operated on the MASCs will provide an interactive processing capability aboard ship plus the DBMS capability; additionally, AIS users would be familiar with deployed software during all phases of an amphibious operation. A strong argument abounds for placing a MASC aboard ship due to the lengthy time needed to provide a fixed processor that is fully compatible with the AIS hardware and software architecture aboard the appropriate ships.

This area of concern needs rather immediate attention with respect to the LCC processing upgrade in 1984. The deployed AIS processing need is thoroughly documented and makes sense from both a pragmatic and operational point-of-view. Nothing may be accomplished with the LHA, AN/UYK-7 upgrades because those overhauls are currently underway. On the other hand, there is time available to consider AIS processing aboard the LCC class ships. A significant decision is required for one of four alternatives available to support deployed AIS-type processing as follows:

- LCC upgrade with AN/UYK-7s. This is not considered a feasible alternative since the interactive AIS processing is needed aboard ship for reasons which have been previously discussed.

- Emulation of AIS software onto the UNIVAC software of the AN/UYK-7s. The emulation process is highly inefficient (generally two to two-and-one-half times the processing time) and costly to develop and maintain from a human resource point-of-view. Therefore, the emulation process is not considered a viable alternative for a deployed processing solution for the Marine Corps in the 1985-1988 time frame.

Remaining therefore are two alternatives:

- A fixed AIS processing capability aboard ship which is fully compatible with MASC hardware and software architectures.

- A MASC configured to be operable aboard ship for AIS processing.

Trade-offs must be considered for the two feasible alternatives. First, one MASC in a two-van configuration requires a large shipping cubic footage (estimated as 8,000 cubic feet and 675 square feet of contiguous deck space). Second, the CLF may be located on one of four classes of ships; fixed computers would be required on any ship housing the CLF or, the CLF may be placed on a class ship which has a fixed AIS processing capability. Third, it is anticipated that ITAWDS and MASC or fixed AIS processors will be incompatible hence a MASC could provide backup processing capability for another on-board MASC or fixed AIS processor; ITAWDS does not provide a backup processing capability for deployed AISs. The feasible alternatives must be carefully weighed prior to a decision on fixed or MASC AIS processing aboard ship using the three key parameters identified above. A clear and rapid decision is required because of the potential impact upon SHIPALT 938K for LCC class ships in 1984. The current AN/UYK-7 upgrades on the LHA class ships must be considered from a sunk cost point-cf-view. NAVSEA 612Y response to placing an operational MASC aboard was satisfactory; the NAVSEA representative said it may be too late to cause a change in

SHIPALT 938K; the afloat operational MASC would require electric power, tie downs, cabling and identification of space aboard ship as a minimum. In reality, the alternatives are essentially the same; the question is - who provides these deployable processors for the afloat phase of operations? By far, the Marine Corps personnel interviewed during the study want the deployable MASC to operate while afloat, which seems very attractive from many points of view. The afloat MASCs must be powered up occasionally for reliability purposes. No problems are encountered when moving data bases and applications software to and from a ship. The MASCs, even on an expedient basis, could be made operable on most any ship. The Commanding General of the 1st Marine Brigade felt that command ships could be LHAs, LPHs, LSDs or LCCs; only LHAs and LCCs have marginal AIS-type processors on board.

5.6 PROLIFERATION OF NONSTANDARD SOFTWARE

At the outset of this study, an assumption was included pertaining to the ratio of processing for Marine Corps-wide standard automated systems (Class I systems) and locally developed and maintained systems (Class II and III). The original assumption that Class II and III processing requirements consumed 15 percent of ASC processing time proved to be erroneous as documented from a large Marine Corps CASC. The original assumption was made based upon U.S. Army documented (Army Regulation 18-1) requirements limiting the amount of nonstandard processing which could be conducted upon Army base operations (BASOPS) computers. A detailed analysis was conducted (TAB D to Annex C) at Camp Lejeune to differentiate FMF processing from that conducted for the supporting establishment. The basic information is contained in resource and cost utilization (RESCU) reports provided with the cooperation of HQMC-CCIR. Class II and III system processing at Camp Lejeune for FMF processing was compiled and is listed in the enclosure to Tab D of Annex C. The resultant computations revealed that Marine Corps Class II and III system processing associated with the FMF in garrison consumes 32.1 percent of the aggregate FMF total processing time. For purposes of this study, the figure of 33 percent for deployed processing was used. Such a nonstandard percentage indicates a great deal of resource is being expended at multiple ASCs within the Marine Corps to develop and maintain such systems.

On the study team trip to the West Coast and Hawaii, the 33 percent nonstandard processing time was endorsed although a detailed analysis of RESCU reports was not conducted; recent RESCU reports were not available from the newly combined RASC and FASC at Camp Pendleton.

A different sort of nonstandard software proliferation was under study within FMFPAC (Tab V to Annex C). The Force Supply Officer (FSO) was conducting a study to determine how many supply systems were operated within FMFPAC and analyze the requirements for a deployed supply systems. Preliminary results of the FSO work indicated that 55 different versions of SASSY output reports had been implemented in the field using the MARK IV report generating system. It was believed that these numerous versions of SASSY output reports were not necessary and were wasteful of programmer resources in generating and maintaining the unique software. Work to determine the requirements for a deployable supply was in the embryonic stage thus no functional information was available to the study team to enhance the combat service support aspects of the study.

In reviewing the 33 percent nonstandard processing in the FMF and the 55 versions of SASSY output reports discussed just above, it would seem imperative that the proliferation of nonstandard AISs within the Marine Corps be regulated to some extent. As with any regulation, operations must be auditable and enforceable. Although cost has not been analyzed in considering the impact of nonstandard software proliferation, it is the experience of the business world that the personnel costs for the proliferation will far exceed the hardware costs of operating the proliferated software - probably three-to-one.

5.7 ADP MANAGEMENT STRUCTURE

Contemporary software management techniques include methods for control of the software configuration for an automated system. Without software configuration control, system changes can be inserted in a haphazard and random way. MCOs 5230.9 Standard Procedures for Central System Control (ref. nnn) and 5130.8, ADS Maintenance and Modification (ref. ooo) were reviewed for the software management procedures promulgated within the Marine Corps. Following is a list of key direction provided by the two MCOs:

- Priorities are established by the functional manager.
- Test evaluation criteria defined by the functional manager.
- Change releases are in object code-source programs are not permitted in the field.
- Change justifications approved only by functional manager.
- Quarterly changes to CMC-CCI for review.
- Functional manager approves interfaces with Class III systems.
- No field changes to Class I or II systems without CMC approval.
- CDPAs prepare and submit quarterly change reports to functional managers.
- Change projects must be justified, approved and prioritized by the functional manager.
- An ADS impact statement must be prepared by the CDPA.

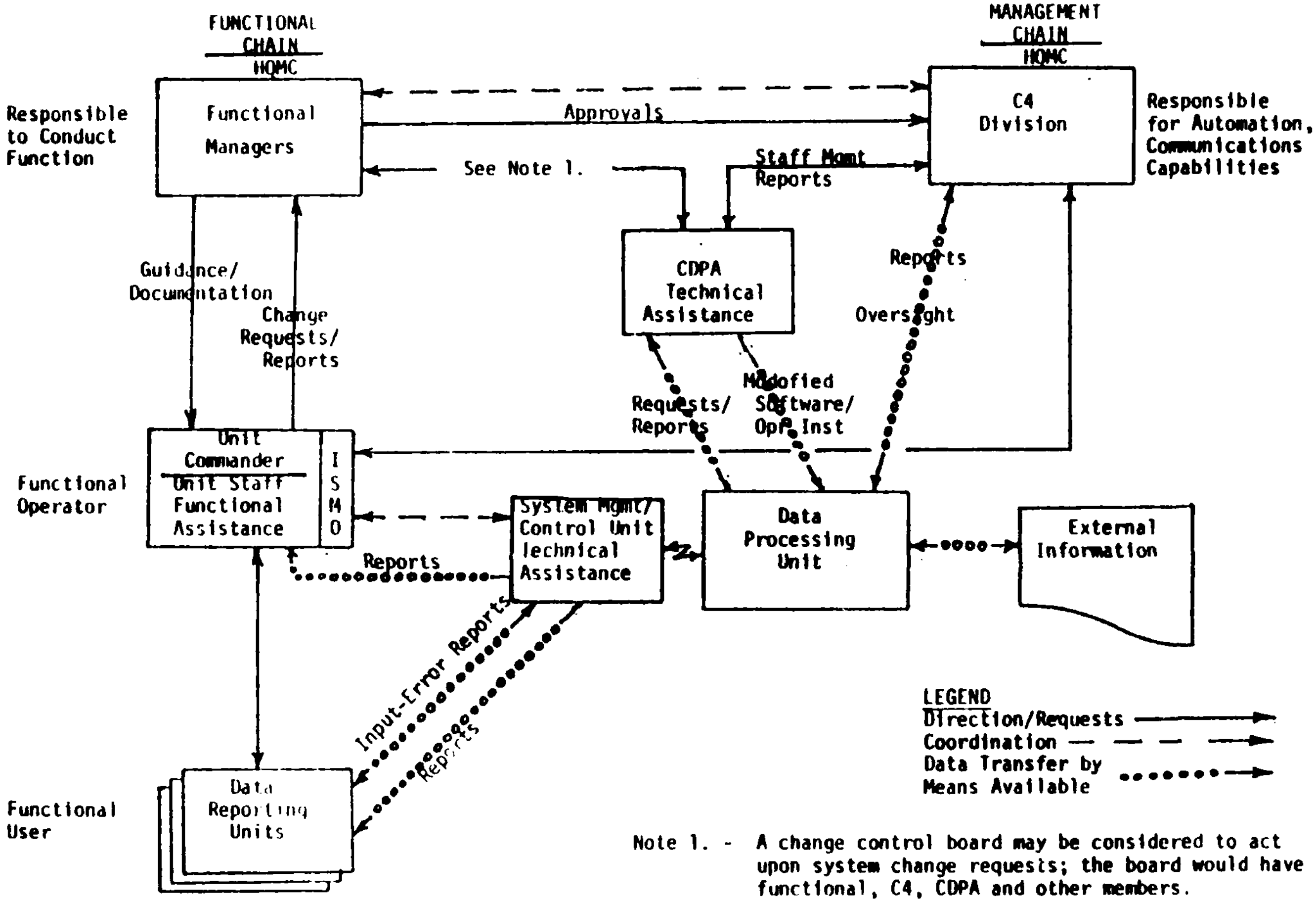
The bulk of the AIS control procedures and the responsibilities for AIS maintenance and modifications rests with the functional manager. This is promulgated in DB 1-77 (reference c.) and was observed by study team members during field trips. The personnel at the CDPAs in Kansas City and Albany experienced difficulty with prioritization for software maintenance tasks. In most cases, source programs are distributed to the field hence, field users are able to perform modifications and enhancements to Class I AISs including MARK IV. In view of the requirements specified in the MCOs and observations from field visits, the PGRG study team members reviewed DB 1-77 as it pertains to functional and management responsibilities for AISs.

Figure 1 of DB 1-77 lays out the functional chain of responsibility while Figure 2 shows the management chain - they are operated as independent functions. In order that the functions be better coordinated, Figures 1 and 2 in DB 1-77 have been combined and are shown in Figure 5.7. The combined and better coordinated functions will serve to meet the requirement of MCO 5230.8 for C^4 to coordinate and review the maintenance and modification program. Further, a systematic means of dealing with system change (project) requests is specified in MCO 5230.8 and the study teams recommend the establishment of a change review board with C^4 membership; the board would meet on a quarterly basis to deal with and prioritize requests. Note 1 on Figure 5.7 contains the provision for the integration of the change review board. As an example, the board could determine that once a software module had to be changed, all changes desired in that module would be implemented - an efficient method for approaching software maintenance.

5.8 MODULAR SOFTWARE

Throughout the study team's travel to Headquarters elements, CDPAs, units and ASCs within the Marine Corps, the idea of modular software implementation was acknowledged and has been specified for the design of new systems such as REAL FAMMIS, M3S and SABRS. Modular software developed utilizing top-down programming techniques provides software that is relatively easy to maintain and/or enhance. Modular software also provides great advantages for deployed operations in that modules may be easily added or not used for deployed processing. The implementation of REAL FAMMIS is to be accomplished by evolution from JUMPS/MMS and in so doing, may easily avoid the process of a modular design. There is a fear that the evolutionary process will result in functions being added to the existing software and will be difficult or unreasonable to operate in a deployed environment. Similarly, M3S may be an evolution from SASSY again resulting in non-modular software for deployed operation. SABRS has not been identified as a deployable AIS hence the modularity of software is not germane. The most likely way to produce modular software may be to start from scratch while continuing to operate the current systems.

Combining Figures 1 and 2 in DB 1-77
for the Interactive Environment (not Approved)



Note 1. - A change control board may be considered to act upon system change requests; the board would have functional, C4, CDPA and other members.

Figure 5.7. Combined ADPS Management Structure

5.9 RETURN OF TRANSACTION ERRORS

The return of transaction errors with a fully interactive system is essentially immediate. For the deployed environment however, limited front-end editing is planned for ADPE-FMF systems. The MASC will not have a full edit capability for REAL FAMMIS. This means that some transaction errors will not be detected until processed in a CONUS-like mainframe processing environment. Appropriately, error returns from ADPE-FMF devices will take a few seconds, from the MASC one or two days and from CONUS mainframes, a few weeks. The Marine Corps' manpower management system typically experienced an error rate in excess of 10 percent using the OCR on input transactions for batch inputs. This error rate has been reduced to less than one percent using the ADPE-FMF devices. Upon conversion to a full, front-end interactive edit, the error rate also drops to less than one percent hence the interactive systems will have less volume in error returns. A need will still exist for the management of error returns. An approach in controlling or preventing errors would be to place the same edit routines at all processing levels; this is not possible at all levels since many of the edits require checks against a data base element that is not in a deployed data base. Errors will occur at different processing levels at different rates and the system must provide a mechanism for dealing with timely error return information.

5.10 LOCATION AND OPERATION OF MASCs

At the time of this writing, four MASCs are envisioned to provision a MAF. One MASC would be operated in the vicinity of Division or MAF headquarters and would be oriented toward personnel processing; some G-1 and other headquarters personnel would be able to hardwire their terminals to the MASC (hardwiring is using cable directly from the terminal to the MASC - say a distance up to 1500 feet - thus modems and telecommunications are not required to complete the circuit). A second MASC would be placed with the FSSG (greatest processing requirement) oriented toward the processing of automated combat service support functions; terminals may be hardwired from FSSG headquarters and most probably, the supply and maintenance battalions. A third MASC would support the consolidated processing of the wing again, with certain terminals potentially hardwired to the wing headquarters. The fourth MASC is provided for two principal reasons - first, as a spare to back up the other three and second, to provide a processing capability for one or more theater remote airfields. The four MASCs per MAF would also serve to provide more than adequate processing support for any lesser deployable force. III MAF may require more than four MASCs due to its unique organization and geographic dispersion.

5.11 DATA TRANSFER WHILE THE MAGTF IS AFLOAT

Data transfer while at sea is generally accomplished in one of three ways:

- Voice by radio (or semaphore)
- Paper tape on the NTS
- Helicopter courier

Semiphore is not seriously considered. Frequently while afloat EMCON procedures are in effect hence radio and other forms of electronic communication are not available for data transfer. Further, to enter ship-to-ship electronic circuits, the input is by paper tape; one paper tape unit deploys with a MAU sized MAGTF and with the MAU being spread-load across three-to-six ships, this form of data communication is difficult at best. The remaining and frequently used method for data transfer is by helicopter courier. It was found in FMFPAC that the helicopter carriers frequently steam apart from the troop carrying ships by 1000-2000 miles; data is not transferable for these split formation situations. Also, bad weather has its impact upon the availability of helicopter couriers. One possible solution to this type situation is the establishment of ship-to-ship data communication over currently existing multichannel nets. One may therefore understand that there is no reliable means to assure data transfer among ships such that it may be input to the MASC on a timely basis.

5.12 RAPID DEPLOYMENT FORCE (RDF) AND FORCE STRUCTURING

The RDF is envisioned to be a joint task force or a RDJTF. Considering the Iranian operation (not a RDJTF per se) of two years ago, there was a need for systems integration among all the uniformed services. No AISs were observed to have developed interfaces with the other services which could be a key aspect for manpower management, combat service support, unit status reporting and aviation management.

A special concern is the aggregation of Marine Corps AIS data from complete RUCs, partial RUCs and small detachments which lose their identity with any RUC. Force structuring introduces some very complex, demanding processing requirements. In developing the task organization for the MAGTF, data bases are in a continual state of flux and must be constantly updated. Task organizations for entering combat must be maintained for the MAGTF headquarters, and the ground, aviation and combat service support elements. Traceability must be maintained in the transition from T/O and/or RUC identities to the task organization. This also applies to the organization for embarkation which varies from the task organization for combat.

5.13 STRATEGIC MOBILITY, MOBILITY AND MOBILE ELECTRIC POWER

In the era of the RDJTF, strategic air mobility must be considered vis-a-vis the priority for strategic shipment of the deployable MASC. Although not considered so far, MASCs could be placed with prepositioned assets with a drawback that electronic equipment must occasionally be exercised. It is anticipated that both the experimental MASC and the MASC in a two-van configuration may be loaded in a C-141 aircraft. For local mobility, a 5 to 10-ton tractor will be required to tow the van. Although dedicated tractors are not currently envisioned, possibly one, two or no tractors could be assigned the MASC - this will be studied during the experimental MASC operational test. For mobile electric power (MEP) while aboard ship, the MASC is assumed to operate from ship's power. Based upon experience with other deployed systems, one dedicated 45-60 or even a 100 KW, 60 cycle generator will be required to operate each van in the AOA. It may be desirable to mount such a generator on the van or as a last resort, in a small trailer towed behind the the van. The MEP source must be clearly identified and earmarked to support the MASC in an AOA. MEP for the MASC was of concern in both FMFs.

5.14 CRT ACQUISITION FOR EMERGING CLASS I SYSTEMS

In documenting the deployed concepts of operation, system design documents were reviewed for REAL FAMMIS, M3S and SABRS. Each of the three, major, new Class I systems envisions extensive use of CRT terminals for interaction by FMF units with a regional or centralized processor through a telecommunication network. Each system has varied impacts upon the supporting establishment and the FMF. REAL FAMMIS plans the use of approximately 700 intelligent terminals for the FMF and 300 regular terminals for the supporting establishment. The REAL FAMMIS implementation may not require dual training for operators since deployable FMF units may be equipped with their deployable intelligent terminals. M3S plans to provide user support with approximately 875 regular, interactive terminals. Many of the M3S terminals will be located with retail issue points (RIPs) in garrison. Upon major deployments, personnel from the RIPs may accompany a MAGTF to an AOA and become part of a consolidated issue point (CIP). In this case, the versions of M3S operated at the RIP and the CIP will most likely be different. This difference could create a problem in cross-training or may require dual training.

In summary, some 2,200 interactive terminals will be placed in use in the mid-range time frame supporting Class I AISs. What must be considered therefore is:

- May terminals provide multifunctional support?
- Must dual training of FMF users be performed?
- How will the function be performed when deployed?
- Can ADPE-FMF type devices be substituted for interactive terminals in the FMF?

5.15 MILITARY PAY FOR NAVY PERSONNEL

The MARCORS 1 scenario with a MAF in Jutland is supported by several thousand Navy personnel as identified in Annex D. For current peace time operations, Navy personnel in garrison are paid through the Navy medical facility on base; while at sea, they are paid as a part of the ship's company. When Navy personnel are attached to a MAGTF in an AOA it is planned to use the Pay Option Election provided for in REAL FAMMIS. Periodic reports of transaction would be forwarded to the Navy finance center for entry into IDA.

5.16 REPLACEMENT OF CASUALTIES

The SAC expressed concern pertaining to the return to duty of wounded personnel. Personnel from 1st and 2nd MAW and the 2nd FSSG want to track casualties because, in some MOSs, they have a few highly skilled personnel, the loss of which would impair their capabilities. It is important therefore to follow casualties within the Navy medical system to determine if the wounded person will be returned to duty in a relatively short period of time. When a wounded member is expected to return to duty within a few days or a week, no extraordinary effort would be required to requisition a replacement. During the course of this study, no capability was found that traces a wounded member in the Navy medical system. It is believed that such a capability is desired most likely as a portion of deployed REAL FAMMIS.

5.17 AIS SYSTEM INTERFACES

The emergence of Marine Corps tactical automated systems (MTACCS) has functionally defined information which is required from data bases that operate with the AISs. Some key examples of information required of the MTACCS would be personnel strengths and supply items like fuel, ammunition and other high demand/visibility items. Throughout the documentation process for this study, no specific data interfaces were identifed; a data interface requirement exists but is not documented.

In a similar vein, interfaces with automated systems of the other Services and our allies will most likely be necessary for joint and combined operations. A very likely interface would be between M3S and the Standard Army Intermediate Logistics System (SAILS). As with MTACCS, no specific data transfer needs were identified during the course of the study.

To date, data interface needs between AISs and many other automated systems have not been specified but have been generically identified. Examples of generic identification of deployable system interfaces are that MIMMS will interface with M3S; and REAL FAMMIS and M3S will interface with TCO (MTACCS). It would be desired that the actual data interface requirements be specified by data element and data format such that the design of emerging AISs include the data interfaces with other automated systems. Additionally, the interfaces must be specified as electronic, magnetic or manual. Know data interfaces are provided in Annex G for both intra- and inter-AOA data flows.

5.18 INTERACTIVE ACCESS TO MASC

This study contains guidance which, in essence, does not provide a routine means of electronically transmitting AIS data for deployed operations of a MAGTF. Functional managers have identified a need to query deployed data bases on a timely basis particularly in the areas of manpower and combat service support. The MASC configurations will have an interactive communications capability either with telecommunications or terminals wired to the MASC. With a minimum telecommunication capability for deployed AIS operations, the wired terminals will provide the only means for reliable interactivity between functional managers and the MASC. The systems impacted by this need for interactivity are REAL FAMMIS for the G-1/S-1 and M3S/MIMMS for G-4/S-4 and supply and maintenance personnel.

Wired, interactive processing may be provided for the afloat phase of an amphibious operation to provide a MASC capability aboard ship. Within an AOA for assault and continued operations ashore, the interactivity may be provided only with wired terminals. Terminal wiring may extend 1500 feet without the use of amplifiers, with inexpensive amplifiers, the wired distance may be extended to a number of miles. What must be considered is the physical location of a MASC and its interative users. The best example of this concern rests with combat service support AISs and the FSSG. FSSG Headquarters and at least the Supply and Maintenance Battalions will desire interactive access to data bases residing on the MASC. The wired distance to the MASC and the installation and maintenance of the wire may lead to differing physical locations of force elements. The philosophy of MASC locations is based upon the physical location of MASCs within a reasonable wiring distance of the most important interactive users. The concept of MASC operations enumerated in Chapter 4 of this report will require careful consideration followed by positive actions to insure the interactive processing needs of functional managers and operators are not overlooked during deployed operations in the 1988 time period.

5.19 SUMMARY: AREAS OF CONCERN

Many of the areas of concern have no direct bearing upon deployed AIS processing as envisioned in the intended scope of the study. The study team, in cooperation with the SAC, has included this dissussion of areas of concern illuminated during the normal course of data collection and documentation of deployed AIS operational concepts. Several of the areas of concern contain alternatives and/or suggested solutions. The areas of greatest concern are:

- Communications
- Aviation Supply
- Software Management
- Data Transfer at Sea
- Interactive Terminals in the FMF
- Disaster Recovery
- Lift Requirements
- Timeliness of Data

AD-A123 283 AUTOMATED INFORMATION SYSTEM (AIS) SUPPORT FOR FMF UNITS WHEN DEPLOYED OR IN COMBAT (1985-1995)(U) POTOMAC GENERAL RESEARCH GROUP MCLEAN VA 13 APR 82 3/5

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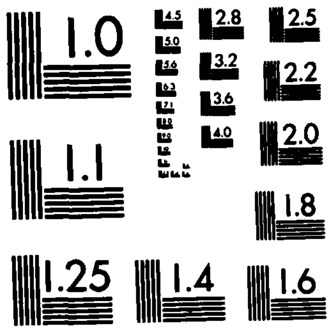

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CHAPTER 6

CONCLUSIONS

6.1 GENERAL

Throughout the conduct of this study, PGRG study team members discerned a great need for a capability to process AISs while deployed. This automated processing capability will be needed in garrison to assure that the computer systems and AISs are up, running and prepared for a deployment. While preparing for embarkation a great deal of activity will occur as cross attachments are made and deployable data bases are prepared for deployment. Once afloat, a capability to continue processing Marine Corps AISs will exist beyond that capability provided by the Navy through ASIS and MIS. Upon assault and continued operations ashore, the current, afloat data base may easily be transferred ashore for continued and essentially uninterrupted processing of Marine Corps AISs. This deployed and predeployed processing may be accomplished with what is initially defined as a MAGTF ASC or MASC. This MASC is now conceptualized as a van-mounted, super minicomputer, capable of operating in a wide range of environmental conditions. While afloat, the MASC or a similar fixed-installation aboard ship would provide processing continuity for Marine Corps standard AISs during the afloat phase of an amphibious operation.

Automated system justifications for deployable AISs required by DB 1-77 (Reference c) are contained in Annex G to this report. The justifications contain more detail than required by DB 1-77 with respect to specific data transfer requirements (nodes, needlines, volume). The system justifications required to support the requirements of 101-36.15 of the Federal Property Management Regulation (FPMR) is contained in Chapter 3 of this report.

As the study team effort progressed, many subfunctions were evaluated with respect to deployed AIS concepts of operation. Of concern was the fact that some subfunctions were not being accomplished completely while others were not being accomplished at all. These subfunctions are specified for informational purposes in the preceding chapter, but are not specifically incorporated into the conclusions or recommendations.

6.2 STUDY CONCLUSIONS

The efforts of this study were directed toward a methodical documentation of functional concepts of operation in the 1988 deployed automated processing environment. The major study conclusions are reported in the following subparagraphs.

6.2.1 Deployed Automated Processing

Marines and Marine Corps civilian personnel from all echelons in Headquarters, the supporting establishment and the FMF clearly recognize the need for AISs with deployed MAGTFs. During the recent past, the Marine Corps has increased the use of AISs and reduced their dependence on manual systems to perform the major MAGTF, administrative functions. The consensus of Marines interviewed was that the combat power from MAGTFs would be diminished without a deployable automated processing capability. It is therefore concluded that in the midrange environment, deployable automated processors are required to sustain the combat power of deployed MAGTFs. MAUs would be supported with ADPE- FMF devices; however, MABs and MAFs need a much more robust deployed processing capability. (Note: The Army is currently acquiring up to 324 van-mounted minicomputers on which to perform deployed logistical processing).

6.2.2 Use of MASC

The MASC concept espoused in this study is a van-mounted, minicomputer capable of processing deployed AISs during all phases of an amphibious operation. The MASC is needed to provide up-to-date, deployable AIS data bases for those AISs which have been identified for deployment. In conducting the phases of an amphibious operation, the MASC will provide a processing capability and current data bases to support force operations. A questionable conclusion pertaining to the deployed MASC concept is how shipboard processing will be conducted. This processing could either be conducted by a MASC or by a compatible fixed installation aboard ship. However, it is highlighted that the afloat systems now in use and provided by the Navy, are inadequate for Marine Corps needs while afloat and are not capable of being readily transferred ashore.

6.2.3 Functional AISs

Deployed AIS concepts of operation have been identified and documented for each major Marine Corps administrative function to the extent possible at this time. Specific concerns pertaining to some incomplete subfunctions in the operational concepts are discussed in Chapter 5 of this report. The following subparagraphs contain conclusions as they pertain to deployable AISs.

6.2.3.1 Manpower. A deployed REAL FAMMIS will be required. The operational concept calls for a limited manpower data base of about 10,000 characters per Marine and limited processing capability at the deployed MASC. Partially edited input transactions, prepared on intelligent terminals found at the battalion/squadron level, would be consolidated at the MASC, forwarded to Kansas City for processing and returned to the MASC for a local data base update. This creates a situation wherein manpower data with the deployed force would be aged from 10 to 30 days. The technique for updating the deployed manpower data base will not be responsive to the management needs of commanders and staff officers above the battalion/squadron level. The military pay will be accomplished from Kansas City with a deployed bookkeeping, accrual system operating upon ADPE-FMF devices.

6.2.3.2 Policy Plans and Operations (PPO). PPO has an identified need to deploy with UNITREP. Planning is underway to place the very small UNITREP processing requirements on ADPE-FMF devices with transactions telecommunicated from the deployed force, through channels to the JCS and CMC. The UNITREP input transactions and output reports will, in most cases, be classified and hence will require special scheduling on ADPE-FMF devices or MASCs.

6.2.3.3 Aviation. Aside from Marine AISs utilized within a MAW, Marine Corps aviation assets receive their aviation-unique supply support from the Navy and Navy-provided hardware and software. Missing within the MAW concept of operations, is a processor which may aggregate reports from their subordinate MAGs (from Navy-provided processors) into MAW level reports. Each MAW requires the support of a MASC.

6.2.3.4 Fiscal. The emerging new primary fiscal AIS, SABRS, will not deploy with a MAGTF. Fiscal subfunctions which will deploy are DOV and CFAO. DOV creates a small processing requirement which will be accommodated on ADPE-FMF devices; CFAO will operate with small deployed teams which collect paper documents and forward them to a CONUS-type facility for processing - CFAO does not create a deployed processing requirement.

6.2.3.5 Logistics. The deployed combat service support AISs present the key basis for deployed processing. The deployment of M3S, MIMMS and SEMS will provide the automated support necessary to provide supply, maintenance and embarkation support to the deployed force. The combat service support AISs create the largest processing requirement for deployed processing. This requirement is about 4 1/2 times that of the deployed manpower processing requirement. It is imperative that the combat service support AISs be operational aboard ship to support the assault phase of an amphibious operation.

6.2.3.6 Other AISs. In addition to the standard, Class I AISs identified for deployment, many Class II-III AISs will deploy. These other deployable AISs have not been specifically identified but rather are considered to be a percentage of the total FMF deployed processing requirement. Cognizant personnel at Camp Lejeune have documented this Class II-III AIS requirement to be 33 percent of the total requirement.

6.2.3.7 Areas of Concern. Several areas of concern were identified and documented during the conduct of the study. While many have no direct bearing upon deployed AIS processing and the MASC concept, they are areas that need to be addressed during the design of new AISs (planned and under development) and resolved prior to the acquisition of ADPE for the MASCs.

6.3 SUMMARY

Nine Class I AISs have been identified and their deployed concept of operations documented. Three of the systems are aviation-oriented and will operate on hardware and software provided by the Navy. Forty percent of the deployed processing will be for Class II and III AISs which have not been specifically identified nor their operational concepts documented. It was generally agreed that reversion to manual operations for major Marine Corps administrative functions would be difficult if not impossible making a deployed automated processing capability a necessity. The MASC concept has evolved as the means to provide the capability; the concept will be tested with the acquisition in late 1982 of an experimental FASC. The MASC must be operable in garrison, aboard ship and echeloned into the AOA near the beginning of the continued operations ashore phase. The MASC concept will provide a flexible, reliable means for processing deployable AISs.

Ancillary to the study effort, a number of areas of concern were isolated and are documented in Chapter 5 of this report.

CHAPTER 7
RECOMMENDATIONS

The PGRG study team recommends the following:

- That deployble AISs be processed upon deployable MASC. The MASC concept should be included in future Marine Corps doctrine. Seven to fourteen MASCs will support the deployed processing needs for current, active Marine Corps forces.

- That emerging AISs must be modularly designed and programmed so that deployable versions of the AISs may easily and inexpensively be operated in the deployed environment. The AISs identified for deployment are:

  REAL FAMMIS
  UNITREP
  NALCOMIS (Aviation)
  FREDS (Aviation)
  SUADPS-RT (Aviation)
  DOV
  M3S
  MIMMS
  SEMS
  33 percent Class II and III AISs.

- That the deployed manpower data base on the MASC be updated at the time transactions are processed for transmission or transport from the deployed MAF or MAB.

- That the areas of concern addressed herein be considered as a matter of priority during the design of new AISs (planned and under development, and under development during testing of the interim FASC, and prior to acquisition) and prior to acquisition of ADPE for the MASCs.

ANNEX A

DEPLOYED AIS-88 STUDY REFERENCES

Annex A

Deployed AIS-88

Study References

References are listed in the order of acquisition, not by order of date.

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aa. NAVSHIPS 0905-486-1010, Preliminary Operational Stations Book for LPD Class Ships (Flag) Communication Systems, undated, NAVSEA

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ANNEX B

GLOSSARY

ANNEX B

GLOSSA

AASG	Advanced Amphibious Study Group
ACE	Aviation Combat Element
ACU	Administration Control Unit
ADP	Automatic Data Processor(ing)
ADPE	Automated Data Processing Equipment
ADPE-FMF	Automatic Data Processing Equipment-Fleet Marine Force
ADS	Automated Data System
AFOE	Assault Follow-on Echelon
AIS	Automated Information System
AOA	Amphibious Objective Area
ASC	Automated Services Center
ASIS	Amphibious Support Information System (Navy)
ASO	Aviation Supply Office/Officer
AUTODIN	Automatic Digital Network
BAQ	Basic Allowance for Quarters
BSA	Beach Support Area
BSSG	Brigade Service Support Group
CATF	Commander Amphibious Task Force
CDPA	Central Design and Programming Activity
CFAO	Consolidated Fiscal and Accounting Office
CIP	Consolidated Issue Point
CLAMP	Closed Loop Aeronautical Management Program
CLF	Commander Landing Force
CMC	Commandant of the Marine Corps
CMF	Central Master File
CMR	Central Master Record
CNO	Chief of Naval Operations
CONUS	Continental U.S.

ANNEX B (Continued)

COOP	Continuity of Operations Plan
CPU	Central Processing Unit
CSC	Computer Science Corporation
CSS	Combat Service Support
CSSA	Combat Service Support Area
CSSE	Combat Service Support Element
CS^3	Combat Service Support System (U.S. Army)
DAS_3	Decentralized Automated Service Support System (U.S. Army)
DBMS	Data Base Management System
DCA	Defense Communications Agency
DLA	Defense Logistics Agency
DMSS	Depot Maintenance Subsystem
DO	Disbursing Office
DOD	Department of Defense
DOV	Disbursing Office Voucher
DPA	Deployed Pay Account
DSCS	Defense Satellite Communication System
DSSC	Direct Support Stock Control System
EAS	Expiration of Active Service
EMCON	(Electronics) Emission Control
ERO	Equipment Repair Order
ERSOL	Equipment Repair Order Shopping/Transaction List
FASC	Force Automated Services Center
FBHL	Force Beachhead Line
FCSSA	Force Combat Service Support Area
FIS	Force Information System
FMF	Fleet Marine Force
FMFLANT	Fleet Marine Force Atlantic
FMFPAC	Fleet Marine Force Pacific

FMR	Field Master Record
FMSS	Field Maintenance Subsystem
FORSTAT	Force Status and Identity Report
FREDS	Flight Readiness Evaluation System
FSO	Force Supply Officer
FSSG	Force Service Support Group
GCE	Ground Combat Element
HMR	Headquarters Master Record
HMSS	Headquarters Maintenance Subsystem
HQMC	Headquarters Marine Corps
ICP	Inventory Control Point
IDA	Integrated Disbursing and Accounting
IMA	Intermediate Maintenance Activity
ISMO	Information System Management Office/Officer
ITAWDS	Integrated Tactical Amphibious Warfare Data System (Navy)
JCS	Joint Chiefs of Staff
JUMPS	Joint Uniform Military Pay System
KIA	Killed in Action
LCC	Amphibious Command Ship
LES	Leave and Earnings Statement
LFICS	Landing Force Integrated Communications System
LHA	Amphibious Assault Ship System (General Purpose)
LPH	Amphibious Assault Ship
LSD	Dock, Landing Ship
LZSA	Landing Zone Support Area

MAB	Marine Amphibious Brigade
MAF	Marine Amphibious Force
MAG	Marine Aircraft Group
MAGFARS	Marine Air/Ground Financial Accounting and Reporting System
MARES	Marine Corps Automated Readiness Evaluation System
MASC	MAGTF Automated Services Center
MAU	Marine Amphibious Unit
MAW	Marine Aircraft Wing
MCASC	Marine Corps Automated Services Center
MCDEC	Marine Corps Development and Education Command
MCDN	Marine Corps Digital Network
MCFC	Marine Corps Finance Center
MCLB	Marine Corps Logistics Base
MEDS	Mechanized Embarkation Data System
MENS	Mission Element Need Statement
MEP	Mobile Electric Power
MEPS	Message Entry Processing System
MIMMS	Marine Corps Integrated Maintenance Management System
MILOGS	Marine Corps Integrated Logistics System
MIP	Material Issue Point
MIPS	Marine Integrated Personnel System
MIS	Management Information System (Navy)
MMS	Manpower Management System
MPL	Military Pay List
MPV	Military Pay Voucher Marine Corps Unified Materiel
MUMMS	Management System
M3S	Marine Corps Standard Supply System
3M	Maintenance and Materiel Management System
NALCOMIS	Naval Aviation Logistics Command Management System
NATO	North Atlantic Treaty Organization
NELC	Navy Electronics Laboratory Center
NPT	Nonprogrammable Terminal
NTS	Navy Telecommunications System

ANNEX B (Continued)

OCR	Optical Character Recognition/Reader
OMA	Organizational Maintenance Activity
OQR	Officer Qualification Record
PGRG	Potomac General Research Group
PRESCO	Personnel Support for Contingency Operations (US Air Force)
PRIM	Personnel Reporting Instruction Manual
PRIME	Priority Management Effort
PPO	Policy, Plans and Operations Department - HQMC
PT	Programmable Terminal
RASC	Regional Automated Services Center
RDF	Rapid Deployment Force
RED	Record of Emergency Data
REAL FAMMIS	Real Time Financial and Manpower Information System
RESCU	Resource and Cost Utilization Report
RIP	Retail Issue Point
RJE	Remote Job Entry
RLT	Regimental Landing Team
RU	Reporting Unit
RUC	Reporting Unit Code
RU/DO	Reporting Unit/Disbursing Office
SABRS	Standard Accounting and Budget Reporting System
SAC	Study Advisory Committee
SAILS	Standard Army Integrated Logistic System
SASSY	Supported Activities Supply System
SDA	Source Data Automation
SDD	Systems Description Document
SDPI	Satellite Data Processing Installation
SE	Supporting Establishment
SEMS	Standard Embarkation Management System

ANNEX B (Continued)

SMU	SASSY Management Unit
SNAP	Shipboard Nontactical Automated Data Processing System
SNASS	Standard Naval Aviation Supply System
SRB	Service Record Book
SSC	Supply Support Center
SSN	Social Security Number
SUADPS	Shipboard Uniform Automated Data Processing System
SUADPS-RT	Shipboard Uniform Automated Data Processing System-Real Time
TACLOG	Tactical-Logistical Group
TAE	Theater Airfield Echelon
TCO	Tactical Combat Operations System
T/E	Table of Equipment
TMR	Table of Manpower Requirements
TRA	Theatre Remote Airfield
T/O	Table of Organization
TODE	Transcript of Data Extraction
UNITREP	Unit Status and Identity Report System
UTR	Unit Transaction Report
U&E	Update and Extraction Cycle
VAS	Visual Audit Sheet
VIS	Video Inquiry System
WIA	Wounded in Action

ANNEX C

MEMORANDUMS FOR RECORD

DEPLOYED AIS-88 STUDY

INDEX
MEMORANDUMS FOR RECORD
DEPLOYED AIS-88 STUDY

TAB	DATE	SUBJECT
A	24 March 1981	Interview with Manpower Personnel from 2nd Marine Division and 2nd FSSG - Deployed AIS-88 Study.
B	24 March 1981	Interview with 2nd FSSG Disbursing Officer - Deployed AIS-88 Study.
C	26 March 1981	Field Visit to Camp Lejeune, N.C. Concerning Deployed Automated Information Systems (AISs).
D	1 April 1981	Interview with Mr. Don Perkins from the Systems Office, Camp Lejeune Consolidated ASC - Deployed AIS-88 Study.
E	9 April 1981	Interview with 2d MAW Supply Personnel, Cherry Point MCAS - Deployed AIS-88 Study.
F	13 April 1981	Interview with G-1 Staff Personnel, 2d MAW, Cherry Point MCAS - Deployed AIS-88 Study.
G	15 April 1981	Interview with Personnel from the MIMMS/MMO Office, Headquarters 2nd MAW - Deployed AIS-88 Study.
H	15 April 1981	Interview with Personnel from the Aviation Maintenance Office, Headquarters 2nd MAW - Deployed AIS-88 Study.
I	17 April 1981	Interview with Personnel from the 2nd MAW Aviation Ordnance Office - Deployed AIS-88 Study.
J	29 April 1981	Interview with a Representative of HQMC-PPO - Deployed AIS-88 Study.
K	1 June 1981	Trip to Norfolk, Va. to Determine the Functions Performed by the Integrated Tactical Amphibious Warfare Data System (ITAWDS) - Deployed AIS-88 Study.
L	17 June 1981	Visits with Personnel from NAVSEA 612 Pertaining to Shipboard Deployed Automated Processing - Deployed AIS-88 Study.

TAB	DATE	SUBJECT
M	23 June 1981	SAC Comments Regarding Phase I and Guidance Concerning Phase II of the Deployed AIS-88 Study.
N	Orig. 17 Apr 81 Rev. 2 Jul 1981	Interview with Personnel from the 2nd MAW Aviation Ordnance Office - Deployed AIS-88 Study.
O	28 July 1981	Utilization of the Defense Automated Addressing System (DAAS) to Support Deployed Marine Air-Ground Task Forces (MAGTFs) - Deployed AIS-88 Study.
P	28 August 1981	Interview with Personnel from the Marine Corps Logistics Base, Albany - Deployed AIS-88 Study.
Q	18 September 81	Interview with Personnel from 3rd MAW Aviation Logistics Management Office - Deployed AIS-88 Study.
R	18 September 81	Interview with 3rd MAW ISMO Personnel, MCAS El Toro - Deployed AIS-88 Study.
S	30 September 81	Interview with Cognizant Personnel in the Functional Areas of Manpower and Military Pay - Deployed AIS Study.
T	30 September 81	1st Marine Brigade Deployed AIS Processing Concepts - BGen McClintock.
U	30 September 81	Liaison Trip to FMFPAC and 1st Marine Brigade - Deployed AIS-88 Study.
V	1 October 1981	Interviews with FMFPAC Personnel Concerning the Functional Areas of Supply, Maintenance and Embarkation for the Deployed AIS-88 Study.

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24 March 1981

MEMORANDUM FOR RECORD

Subject: Interview with Manpower Personnel from 2d Marine Division and 2d FSSG - Deployed AIS-88 Study

1. An interview was conducted with LtCol Tuttern from the 2d FSSG-Manpower and Captain Yantorn the Assistant Adjutant from the 2d Marine Division at Camp Lejeune on 19 March 1981. The purpose of the interview was to consider the concept of operations for deployed manpower AISs in the 1988 time period.

2. The manpower personnel foresee two modes for the deployment of a MAF. FIrst, an operation could commence with the commitment of a MAU which may be overlaid with a MAB and subsequently overlaid with a MAF. The second mode could involve the commitment of a MAF as portrayed in the MARCORS-I scenario. The commitment of a MAF creates the largest requirement for deployed manpower processing.

3. The manpower information desired by the commander is who does he have and what can they do? Very limited and basic data is desired such as name, rank, MOS, combat restrictions and the record of emergency data. The deployed AIS requirements for manpower may be more modest than those identified for the deployed version of REAL FAMMIS (10,000 characters per individual record). FMFM 4-1 requires a personnel status report (cy attached) no more than two hours old once a day. The G-1 sorely needs this report automated for deployed operations. Deployed units need a small manpower data base from which information may be quickly extracted.

TAB A

4. The remaining significant point pertains to Marines that enter the Navy medical system. The Marine Corps manpower personnel interviewed indicated that they are not concerned about Marine Corps personnel that enter the Navy medical system. The evacuees are reported as losses which creates a replacement requisition.

5. II MAF manpower personnel have indicated a need for a small, deployed manpower data base with quick retrievals from that data base. They further feel that the MAF will create the largest requirement for manpower AISs. Additionally, there was no concern expressed for tracking Marine Corps personnel that enter the Navy medical evacuation system.

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Deployed AIS-88
Study Team Leader

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LtCol Tutteron - 2d FSSG - Manpower
Capt Lundeen - MCDEC
Mr. Dondero - PGRG
Mr. Lanigan - PGRG

EXAMPLE 15

PERSONNEL STATUS REPORT

1st Marines (Rein), 1st Marine Division
Personnel Status Report No. 4 as of 1700, 15 July 19-

Unit (A)		Strength: Actual (B)	Strength: Authorized (C)	Daily Losses, Battle: Killed (D)	Daily Losses, Battle: Died of Wounds (E)	Daily Losses, Battle: Wounded (F)	Daily Losses, Battle: Captured (G)	Daily Losses, Battle: Missing (H)	Daily Losses, Battle: Total (I)	Daily Losses: Nonbattle (J)	Daily Losses: Administrative (K)	Cumulative Losses, Battle: Killed (L)	Cumulative Losses, Battle: Wounded (M)	Cumulative Losses, Battle: Missing (N)	Cumulative Losses, Battle: Captured (O)	Cumulative Losses, Battle: Total (P)	Cumulative Losses: Nonbattle (Q)	Cumulative Losses: Administrative (R)	Days in Combat (S)	Gains: Replacements (T)	Gains: Returned to Duty (U)	Prisoners of War: Captured (V)	Prisoners of War: Evacuated (W)	Prisoners of War: On Hand (X)	Prisoners of War: Total Taken (Y)	Prisoners of War: Detainees (Z)
1st Bn	Off																									
	Enl																									
2d Bn	Off																									
	Enl																									
3d Bn	Off																									
	Enl																									
H&S Co	Off																									
	Enl																									
Total Regt	Off																									
	Enl																									
Co C, 1st Med Bn	Off																									
	Enl																									
Co C, 1st MT Bn	Off																									
	Enl																									
Total Attached	Off																									
	Enl																									
Total	Off																									
	Enl																									
Aggregate Off & Enl																										
Army																										
Navy																										
DOD Civilians																										

EXPLANATION OF INDIVIDUAL COLUMNS

(A) Include all units assigned and attached. List officers and enlisted.

(B) Show actual strength at end of reporting period. Total minus (I+J+K) plus (T+U).

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24 March 1981

MEMORANDUM FOR RECORD

Subject: Interview with 2d FSSG Disbursing Officer - Deployed AIS-88 Study

1. An interview was conducted with LtCol Mertes, the 2d FSSG Disbursing Officer and Capt Hawkins from the Disbursing Office at Camp Lejeune on 19 March 1981. The purpose of the interview was to consider the concept of operations for deployed financial AISs in the 1988 time period.

2. For the 1988 time period, the disbursing personnel identified a priority requirement to conduct some automated form of military pay and to handle disbursing office vouchers (DOVs). Concern was expressed with respect to pay for naval personnel associated with a MAGTF (approximately 2,500 with a MAF) and an interface with the Navy's Integrated Disbursing and Accounting (IDA) system.

a. HQMC-FD has an approved concept of operations for conducting the deployed military pay function - a copy of the approved concept was provided the FSSG personnel for their detailed review and appropriate coordination directly with HQMC-FD. Deployed pay data turn-around time is desired on a 96-hour basis.

b. A method of conducting automated deployed DOV processing will be required based upon recent changes to the disbursing office T/O wherein personnel had been removed from the T/O as a result of the implementation of AISs, including DOV. DOV-type support for a deployed MAU is quite small and could be processed manually however,

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26 March 1981

MEMORANDUM FOR THE RECORD:

SUBJ: Field Visit to Camp Lejeune, N.C. Concerning Deployed Automated Information Systems (AISs)

1. A field visit was made to Camp Lejeune, N.C. on 19 and 20 March 1981 concerning deployed AISs requirements. Discussions during the two day period were held with representatives from the 2d Force Service Support Group (2d FSSG) and 2d Marine Division (2d MarDiv) on logistic AISs in a deployed environment in the 1988 time frame.

2. The primary discussions were oriented towards supply, maintenance and embarkation areas which are currently the primary users of automated systems. The purpose of the discussions were to identify logistic functions and subfunctions for which a requirement exists or may exist for deployed AIS support in the 1988 time frame.

3. Supply

a. Requirements for deployed AIS support are essentially equivalent to that which SASSY provides at the present time plus about 50% for class III systems-type processing. These requirements were provided but conditioned by the impact of ADPE-FMF and M3S. Until the new systems are better defined, developed and placed into operation, the impact on class III type processing cannot be determined but could be reduced as much as 80%.

b. Much of the discussions addressed current SASSY operations system deficiencies and supply operations utilizing ADPE-FMF by deployed MAUs. The major observation gained is that automation implemented to date has reduced the authorized personnel strength to the point that manual methods could be employed only with a severe degredation in support for MAB and MAF size MAGTFs. Automation support is rapidly becoming a "must" requirement in a deployed environment.

c. Supply classes I, III and V (i.e. rations, POL and ammunition) are managed externally to SASSY, and do not utilize any class III type processing. Present plans provide for these classes to be incorporated into M3S . Until M3S is available, it is highly probable that ADPE-FMF will be used in the management of these supply classes.

d. Currently, the major problem area is telecommunications for deployed units. The extensive time for receipt of supply data from deployed MAGTFs, which when added to the time required to process and forward requested materiel to the deployed MAGTF, has reduced the period of support to approximately the first three of a five or six month deployment.

4. Maintenance

a. Automation support for the maintenance function will be equivalent to the current MIMMS plus about 10% for class III systems type processing. As in the supply function, the impact of ADPE-FMF cannot be assessed until it has been placed in operational use. However, it is anticipated that most of the class III processing will be accomplished at the organizational level on ADPE-FMF.

b. Minimal demands are being placed at the class I level for additional data to supplement the present MIMMS reports. However, an opinion was expressed that the reports are voluminous and need to be reduced in number and the type of data to be provided.

5. Embarkation

a. Currently, the division embarkation office is developing parameters and recommended guidelines for the forthcoming class I embarkation system. No estimate could be provided concerning the size of the system, however it would be needed in a deployed environment. Re-embarkation, for example, could require a significant amount of processing time.

b. The current MEDS is straight-forward bookkeeping system with no logic or data manipulation. A more sophisticated system is needed to cope with the several potential points of embarkation, the different modes of transportation and the various types of surface shipping.

c. Currently, MEDS uses about 1 1/2 hours of 360-65 processing time per month. This might be reduced when programs are designed for ADPE-FMF since the preponderance of effort is required at the organizational level.

C.R. MUNN JR
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1 April 1981
Rev: 12 March 1982

MEMORANDUM FOR RECORD

Subject: Interview with Mr. Don Perkins from the Systems Office, Camp Lejeune Consolidated ASC - Deployed AIS-88 Study

1. An interview was conducted with Mr. Don Perkins from the systems office of the Consolidated ASC (CASC) at Camp Lejeune on 19 March 1981. The purpose of the interview was to determine the relationship between standard, Class I AIS processing and other than Class I AIS processing conducted at the CASC.

2. The CASC had been operational since October 1980 thus processing time information was available for the months of November 1980 through January 1981. The processing time information was provided from the resource cost and utilization (RESCU) reports which are prepared monthly and sent to HQMC-CCIR. Of the 37 operational software systems reported by the CASC, Mr. Perkins explained which systems were used for base operations processing requirements, which were used for FMF requirements and which systems were utilized for both base and FMF requirements. Further, and from interviews with other functional personnel, estimates of deployed processing compared to CONUS type processing have been developed. For example, deployed logistical systems will require 50 percent more processing after the assault phase of a tactical operation; MAGFARS (to be replaced by SABRS) will not deploy, however the disbursing voucher system (DOV) would deploy with about one-third of the CONUS processing requirement; deployed manpower and pay systems would require about 25 percent of the CONUS requirement.

The RESCU report data was averaged for the months of November 1980 through January 1981 and the systems segregated as deployable and the deployed processing factors applied to the system processing utilization. All data retrievals were placed in the Class II system category.

The tabulation for this analysis is attached. For peace time CONUS operations, 32.4 percent of the total Camp Lejeune processing is non-Class I while the deployed non-standard rate is 32.1 percent. Of the 26.05 percent Class II and III deployed utilization, 14.93 percent results from data retrievals of 57.3 percent of the total deployed utilization.

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ANALYSIS OF CLASS II AND III AIS

PROCESSING TIME - CAMP LEJEUNE CASC

RESCU [1] SYSTEM NO	SYSTEM NAME	CLASS	MONTHLY AVG. % UTILIZATION [2]	CONUS CLASS I DEPLOYABLE	CONUS CLASS II & III DEPLOYABLE [3]	PROCESSING MULTIPLIER FOR DEPLOYED OPERATIONS [4] Class I	PROCESSING MULTIPLIER FOR DEPLOYED OPERATIONS [4] Class II & III	DEPLOYED PROCESSING REQUIREMENT Class I	DEPLOYED PROCESSING REQUIREMENT Class II & III
1500	Local Manpower[5]	I	.48	.48	--	.25	--	.12	--
3000	FORSTAT (UNITREP)	I	.34	.34	--	2.3	--	.78	--
3500	Local OPNS (Sys Maint)	I,II	13.83	3.45	3.45	1.0	1.0	3.45	3.45
40R1	War Res Retrievals	I	.21	--	--	--	--	--	--
40R2	LIS Retrievals	II	.01	--	--	--	--	--	--
40R7	DSSC Retrievals	II	2.97	--	--	--	--	--	--
4007	DSSC	I	4.75	--	--	--	--	--	--
4011	War Reserves	I	.06	--	--	--	--	--	--
410R	SASSY Retrievals	II	3.28	--	3.28	--	2.5	--	8.2
4100	SASSY	I	17.40	17.40	--	2.5	--	43.50	--
415R	MIMMS Retrievals	II	2.39	--	2.39	--	2.5	--	5.98
4150	MIMMS Field	I	10.24	10.24	--	2.5	--	25.60	--
440R	MEDS FLD RET	II	.09	--	.09	--	4.0	--	.36
4500	Local Log	II	1.76	--	.88	--	2.5	--	2.20
50R1	RESCU Retrieval	II	.06	--	.06	--	1.0	--	.06
50R2	FLD TMR RET	II	.07	--	.03	--	1.0	--	.03
5001	RESCU	I	.63	.63	--	1.0	--	.63	--
5002	Field TMR	I	.29	.15	--	1.0	--	.15	--
5004	RCS	I	.02	.01	--	1.0	--	.01	--
5500	System Maint	II	4.87	--	4.87	--	1.0	--	4.87
5600	Proj Mgt	II	.03	--	.03	--	1.0	--	.03
70R2	Net Pay Retrieval	II	.32	--	.16	--	.25	--	.04
70R4	MAGFARS Retrieval	II	3.19	--	--	--	--	--	--
7002	Net Pay	I	1.76	.88	--	.25	--	.22	--
7004	MAGFARS	I	8.27	--	--	--	--	--	--
7006	Std Gen Ledger	I	.18	--	--	--	--	--	--
7007	Budget	I	.53	--	--	--	--	--	--
7031	B&A Field	I	.56	.28	--	.25	--	.07	--
704R	JUMPS/MMS Ret	II	3.54	--	1.17	--	.25	--	.29
7040	JUMPS/MMS Field	I	9.82	3.24	--	.25	--	8.1	--
723R	ALPS Retrieval	II	.12	--	--	--	--	--	--
7230	ALPS	I	1.19	-	--	--	--	--	--
7250	Disbursing Voucher	I	.46	.46	--	.33	--	.15	--
730R	Prime Retrieval	II	1.21	--	--	--	--	--	--
7300	Prime	I	2.97	--	--	--	--	--	--
7500	Local Financial	II	3.83	--	1.26	--	.33	--	.42
9999	Local Other	III	1.07	--	.35	--	.33	--	.12
	TOTAL UTILIZATION		102.78	37.56	18.02			55.14	26.05
					48.0% of Class I				47.2% of Class I
				32.4% of Total				32.1% of Total	

[1] RESCU - Resource Cost and utilization.

[2] Average for Nov 80-Jan 81 from RESCU reports at CASC.

[3] Determined through interview w/CASC and functional personnel Camp LeJeune - 19-20 Mar 81.

[4] Compared to CONUS normal requirement.

[5] MMS Data Base.

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9 April 1981

MEMORANDUM FOR RECORD

Subject: Interview with 2D MAW Supply Personnel, Cherry Point MCAS - Deployed AIS-88 Study

1. In an interview at the wing supply office at the 2nd Marine Aircraft Wing, Marine Corps Air Station, Cherry Point, NC, the study team leader and the aviation team leader discussed with members of the wing supply office, Marine Corps supply and Marine Corps aviation peculiar supply concepts of operation and automated information support for deployed forces in the 1988 time period. Those in attendance were:

Col J. G. Foti	2nd MAW Supply Office
Maj C. A. Dankmeyer	" " " "
CWO-2 G. E. Krewson	" " " "
MgySgt P. W. Writer	" " " "
J. M. Daugherty	Potomac General Research Group
J. W. Detroy	" " " "

2. The wing supply office currently has interactive access to two aviation supply activities.

a. Aviation Supply Office, Philadelphia, via 300 bps TTY.

b. Defense Logistics Agency, four ICPs, via an intelligent terminal at 1200 bps:

- DISC, Defense Industrial Supply Center
- DCSC, Defense Construction Supply Center
- DESC, Defense Electronics Supply Center
- DGSC, Defense General Supply Center

The utilization of the logistical data bases maintained at the logistical facilities is to retrieve supply status information--no demands or transactions may be processed into these systems. The systems are queried from terminals located within the MAW supply office. Col Foti felt it desirable to provide a similar capability at the MAG level; further, he expressed a need too for the MAW and MAGs to place demands upon the ASO and ICP facilities. The terminals currently in use at the MAW supply office are off-the-shelf, commercial equipments.

3. Current Navy planning documents for NALCOMIS (from 3M), SUADPS-RT and IMMS-RT indicate the processing will be accomplished with two

shipboard nontactical automated data processing systems (SNAP) located with each MAG. One of the SNAP configurations will be dedicated to the operation of NALCOMIS. Since the automated aviation supply and maintenance concept of operations centers about the MAG, it is desired that other Marine Corps standard AISs also be operated from a shared, multifunctional processor located with the MAG. Such a concept avoids the fragmentation of data bases and in most cases, input to/ouptut from the MAG processor would be conducted utilizing terminals hard-wired from the squadrons to the MAG processor. The aviation unique AISs must be operable while afloat and during land based operations supporting an AOA. For standard Marine Corps logistical processing, it is desirous for M3S system users to have direct access to the MASC located with the FSSG.

4. Col Foti expressed concern pertaining to the adequate visibility of aviation supply and maintenance conditions at the MAW-level. As envisioned, 17 sets of SNAP are being procured for the Marine Corps. Each of the SNAP configurations is shelter-mounted and two SNAP configurations would be provided to each MAG. MAW Hq has neither SNAP or other significant automated processing capability with which to aggregate MAG information into MAW-level reports; rather, MAGs submit hardcopy reports to MAF which seldom may be properly reviewed. The tabulation of a MAW statistic from the numerous MAG hardcopy reports is a manpower-intensive task and thus, seldom accomplished. To properly manage the aviation assets of the MAW, a processor is required to provide an aggregated data base from magnetic media provided from the MAGs.

5. Currently supply status and requisitions from a deployed MAU hardly exists. Naval messages are used on a sporadic basis augmented by phone calls while the MAU is in port. There is a requirement for rapid transmission of supply requisitions and status from deployed MAUs over the limited communications means available. Also, a requirement was identified for a dedicated terminal to provide supply data from the remote MAG at Beaufort, SC, approximately 350 miles distance from the MAW supply office.

6. To provide an example of the large volume of supply items required in Marine aviation, the wing supply personnel interviewed indicated that 1100 aviation supply items were required for two deployed harrier squadrons.

J W Detroy
J. W. Detroy
Aviation Team,
Deployed AIS-88 Study

Col J. G. Foti, 2nd MAW Supply Officer
LtCol Balthis, HQMC-CCIB
LtCol Miles, FMFLANT-FISMS
LtCol Costello, HQMC ASA
Maj Glover, 2nd MAW WISMO
Capt Lundeen, MCDEC
Mr. Dondero, PGRG
Mr. Detroy, PGRG
Mr. Munn, PGRG

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13 April 1981

MEMORANDUM FOR RECORD

Subject: Interview with G-1 Staff Personnel, 2d MAW, Cherry Point MCAS - Deployed AIS-88 Study

1. PGRG personnel met with and interviewed Major P. R. Smith and 2d Lt. J. L. Rickman from the G-1 staff of the 2d MAW pertaining to the deployed, automated systems for the MAW in the 1988 time period. The interview was conducted on 9 April 1981 in the G-1 office at Cherry Point.

2. The G-1 personnel generally endorsed the information gained from interview with G-1 personnel at Camp LeJeune on 19 March 1981. The Camp LeJeune personnel indicated the medical evacuees need not be tracked within the Navy medical system. Cherry Point personnel took exception to such a condition for those cases where injury and evacuation occurred to personnel with low density, key MOSs within the MAW. A specific example was cited with the MOS 6061-67 series covering aircraft specialties in which as few as two personnel with an MOS are assigned within a squadron. The 2d MAW personnel feel a need exists to determine if key, evacuated personnel will be quickly returned to duty or to commence extraordinary actions to obtain a trained replacement.

3. Study team personnel believe that the return or nonreturn of key, low density personnel is significant and should be included as information required from the Navy. The type or method of such an interface will require further clarification; the interface will be addressed by PGRG study team members in subsequent interviews and conceptual documentation.

JOHN M. DAUGHERTY
Study Team Leader
Deployed AIS-88

CF:
Lt. Col. Bathis HQMC-CC1E
Lt. Col. Costello HQMC - ASA
Lt. Col.Miles FMFLANT
Maj. Smith 2d MAW-G1 Office
Maj. Glover 2d MAW - WISMO
Maj. Hughey - HQMC - LPS
Capt.Lundeen - MCDEC
Mr. Dondero - PGRG
Study Team Members - PGRG

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15 April 1981

MEMORANDUM FOR RECORD

Subject: Interview with Personnel from the MIMMS/MMO Office, Headquarters 2nd MAW - Deployed AIS-88 Study

1. PGRG personnel met with Colonel Moore, the 2D MAW G-4, Major Riggs the Logistical Officer, Capt Lundy, the Maintenance Management Officer and Captain Workman the Supply Officer (Ground Equipment) at the Marine Corps Air Station, Cherry Point on 10 April 1981 to discuss their needs for deployed automated processing in the 1988 time period.

2. Currently, supply personnel with a deployed MAU requisition repair parts for Marine Corps common equipment by sending a message to the CONUS automated service center. The status of the requisition is returned by mail. The turnaround time for a transaction is almost a month and frequently, the part arrives before a response is received from the supply system. The current system is not responsive to the deployed supply requirements of a MAGTF nor does the deployed MAGTF have an automated system for supply management.

3. The 2D MAW personnel interviewed indicated a need for deployed automated supply support as in CONUS for all deployed phases of operation. The requirement for deployed automated supply support would be minimal while afloat, would be crucial during the assault phase when expenditures must be managed and for continuing operations ashore, the automated supply support would be as in CONUS.

4. The study scenario calls for a MAF assault into Jutland and continued operations ashore with two theater remote airfields (TRAs) in Norway. The TRAs would be provided supply support from combat service support areas (CSSAs) located in Norway. The CSSAs in Norway would require communications into the amphibious operations area (AOA) to conduct supply operations. The timing for priority 01 and 02 supply transactions was stated that it should take no longer than 24 hours to enter the supply system and that a supply status should be returned within an additional 24 hours.

5. In discussing a deployable MAGTF automated service center (MASC) with Colonel Moore, he expressed concern about providing any more equipment that required mobile electrical power; Colonel Moore said that providing mobile electric power for the MAW was a significant problem.

John M. Daugherty
Study Leader
Deployed AIS-88 Study

CF: Colonel Moore, 2D MAW G-4
LtCol Balthis, HQMC-CCIB
LtCol Miles, FMFLANT-FISMS
LtCol Costello, HQMC-ASA
Maj Hughey, HQMC-LPS 4
Maj Riggs, 2D MAW Log Office
Capt Lundeen, MCDEC
Mr. Dondero, PGRG
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Mr. Detroy, PGRG
Maj Glover, 2d MAW - WISMO

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15 April 1981

Memorandum for Record

Subject: Interview with Personnel from the Aviation Maintenance Office, Headquarters 2nd MAW - Deployed AIS-88 Study.

1. Study team personnel met with Major Snooks, the 2nd MAW Aviation Maintenance Officer, at the Marine Corps Air Station, Cherry Point, N.C., on 10 April 1981 to discuss problems in current automation and needs for deployed automated processing in the 1988 time period.

2. Major Snooks expressed concern about automation in that only the "old timers" have the experience to back up the automated systems with manual records in case of equipment failure or damage. Also, there is a problem of reconstructing records if data is lost. Training of operator personnel is critical in order to eliminate input errors and thus maintaining valid data. Currently management data is not available until about 10 days after the end of the month. Also, when extracting data for maintenance actions on a specific aircraft, those performed within the last 30 days are not available.

3. Maintenance personnel stated the requirement for an interactive system with terminals at both wing and the user level. The automated information for aviation maintenance and supply will be required to operate in all phases of the amphibious operation. During the movement to the objective area, there would be periods when the systems could be inoperative depending upon the intensity of flight operations and maintenance activity. Use of the shipboard SNAP system may be possible during the movement to the objective area depending upon availability of computer time.

J W Detroy
J. W. Detroy
Aviation Team,
Deployed AIS-88 Study

C.F.
Lt. Col. Balthis, HQMC, CCIE
Lt. Col. Miles, FMFLANT, FISMO
Lt. Col. Costello, HQMC, ASA
Maj. Snooks, 2nd MAW, AMO
Maj. Glover, 2nd MAW, WISMO
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17 April 1981

MEMORANDUM FOR RECORD

Subject: Interview with Personnel from the 2D MAW Aviation Ordnance Office - Deployed AIS-88 Study

1. Deployed AIS-88 study team personnel met with Major Belcher and Mgy Sgt Elliott from the 2D MAW aviation ordnance office at Cherry Point on 10 April 1981 to discuss the desired concept of operations for their function as it pertains to deployed AISs in the 1988 time period.

2. A class III AIS called Ordnance Expended System (OES) has been developed through the auspices of the aviation ordnance office. The system is an interactive one operating from a single CRT terminal/ printer on a Navy base-type UNIVAC 1140 computer. The telecommunications requirements are based upon local dial-up within Cherry Point.

3. OES is utilized to manage approximately 71 line items of aviation ordnance and accessories and approximately 50 line items of ordnance handling accessories associated with aviation ordnance. The system is based upon updates; i.e., expenditures and receipts are entered into the system each day by unit. By maintaining unit supply status, aviation ordnance items may be transferred among units with little difficulty. OES is also used to manage small arms ammunition within the MAW and in the near future, an aviation ordnance personnel management is planned for implementation within OES. Further, up-to-date status reports may be printed at any time or determined through interactive query of the data base.

4. For CONUS operations, a monthly status report on aviation ordnance is forwarded to HQMC. The class III AIS saves approximately 100 man hours per month compared to the operation of the previous CONUS manual system. Upon tactical deployments, a daily message is required for everything that happens with respect to aviation ordnance. For tactical operations, it would require more personnel to administer the manual preparation of daily aviation ordnance reports; with a deployed OES, such administration and reporting could be accomplished with currently assigned personnel. Tactically deployed reporting is performed using messages into the Navy Telecommunications System (NTS).

5. An interesting insight gained through discussions with Major Belcher and Mgy Sgt Elliot is that the tactically deployed reporting

requirement calls for all aviation ordnance line items each day. Their perception was that only changed line item quantities need be reported on a daily basis with a periodic transmission of all line item quantities for the purpose of reconciliation. By transmitting only daily changes, message traffic through the NTS, a very taxed system, could be reduced. Also when deployed, the OES could be utilized to manage any ammunition received and expended by a MAGTF.

John M. Daugherty
Deployed AIS-88
Study Team Leader

C.F.
LtCol Balthis, CCIE
LtCol Miles, FMFLANT-FISMS
LtCol Costello, ASA
Maj Glover, 2D MAW-WISMO
Maj Belcher, 2D MAW-AOO
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29 April 1981

MEMORANDUM FOR RECORD

Subject: Interview with a Representative of HQMC-PPO - Deployed AIS-88 Study

1. A PGRG representative met with a representative of DC/S, Plans, Policy and Operations (PPO), HQMC Code POR on 28 April 1981 to consider the concept of operations for deployed PPO AISs in the 1988 time period.

2. PPO is responsible for the Unit Status and Identity Report (UNITREP) which has replaced the Marine Automated Readiness Evaluation System/Force Status and Identity Report (FORSTAT). The UNITREP and FORSTAT reporting requirements are essentially the same in both data format and reporting frequency. UNITREPs will be submitted by battalion/squadron or separate company/battery level organizations to reflect unit status changes, and will follow the operational chain of command to the JCS. The volume of reports will vary among the various deployment phases with the heaviest requirement occurring during tactical operations. In addition to reports submitted to reflect changes in organizational status, each reporting unit submits a regular monthly report to update personnel status information.

3. UNITREP AIS data requirements and transfer volumes have been estimated by knowledgeable personnel for tactically committed MAGTFs during the 1988 time period. These AIS requirements would be minimal during pre-assault phases, climb during the unit assault phase and then stabilize during continued operations ashore. It is estimated that UNITREP data report volumes will average one card (80 columns) image twice a week for each engaged combat and combat support unit, and one card image per week for other MAGTF reporting units. In addition, the monthly report, equating to five card images, would be submitted for each reporting organization.

4. PPO is currently in the process of developing a procedural concept for processing UNITREP which is depicted in the enclosure to this MFR. PPO currently plans to utilize ADPE-FMF devices for editing or processing UNITREP transactions and will utilize a MASC at the division/wing/FSSG level to process UNITREP input transactions (see enclosure).

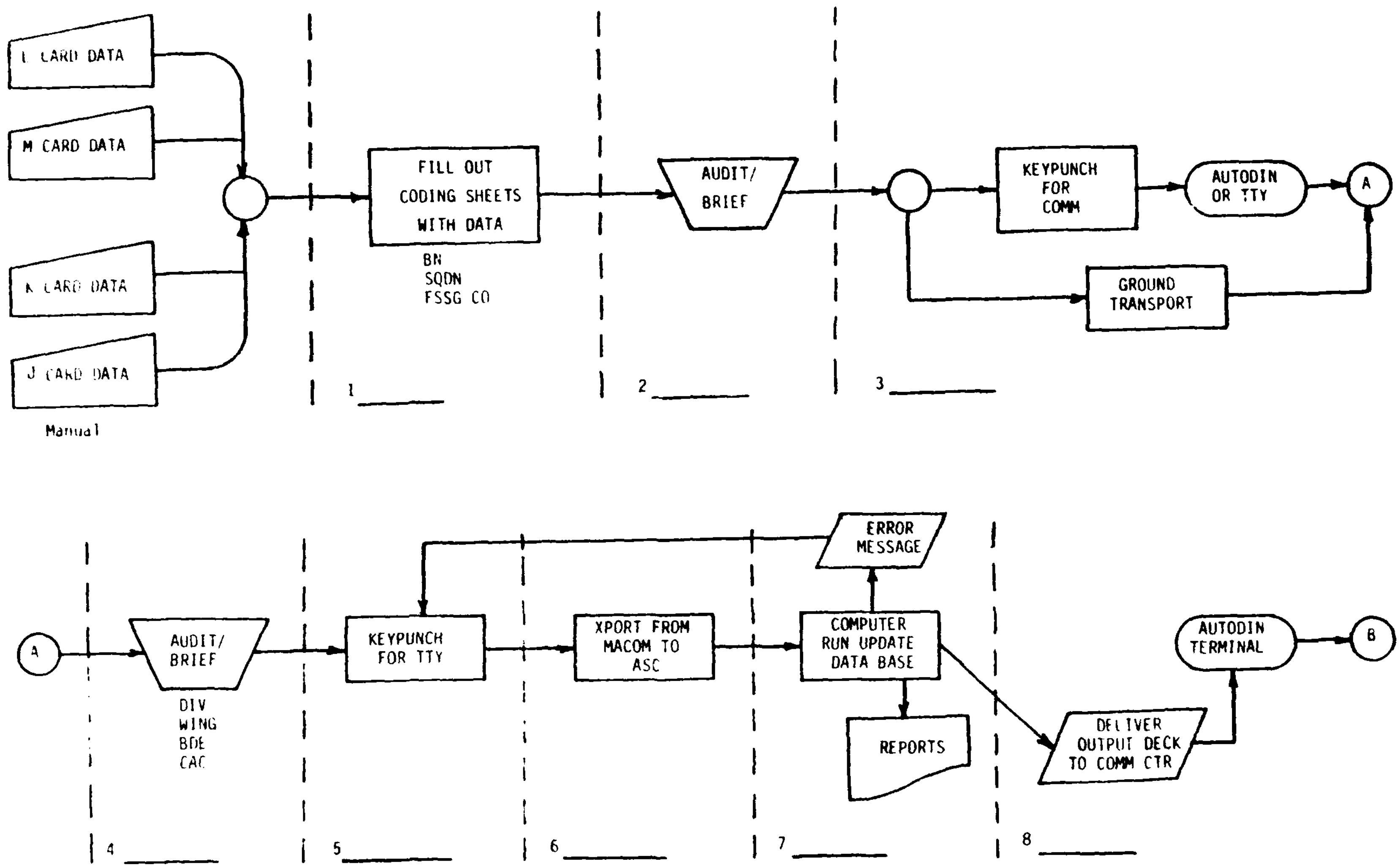
5. UNITREP is the only AIS falling under the purview of PPO that would impact processing or telecommunications requirements for deployed MAGTFs in the 1988 time period.

JOHN M. DAUGHERTY
Deployed AIS-88
Study Team Leader

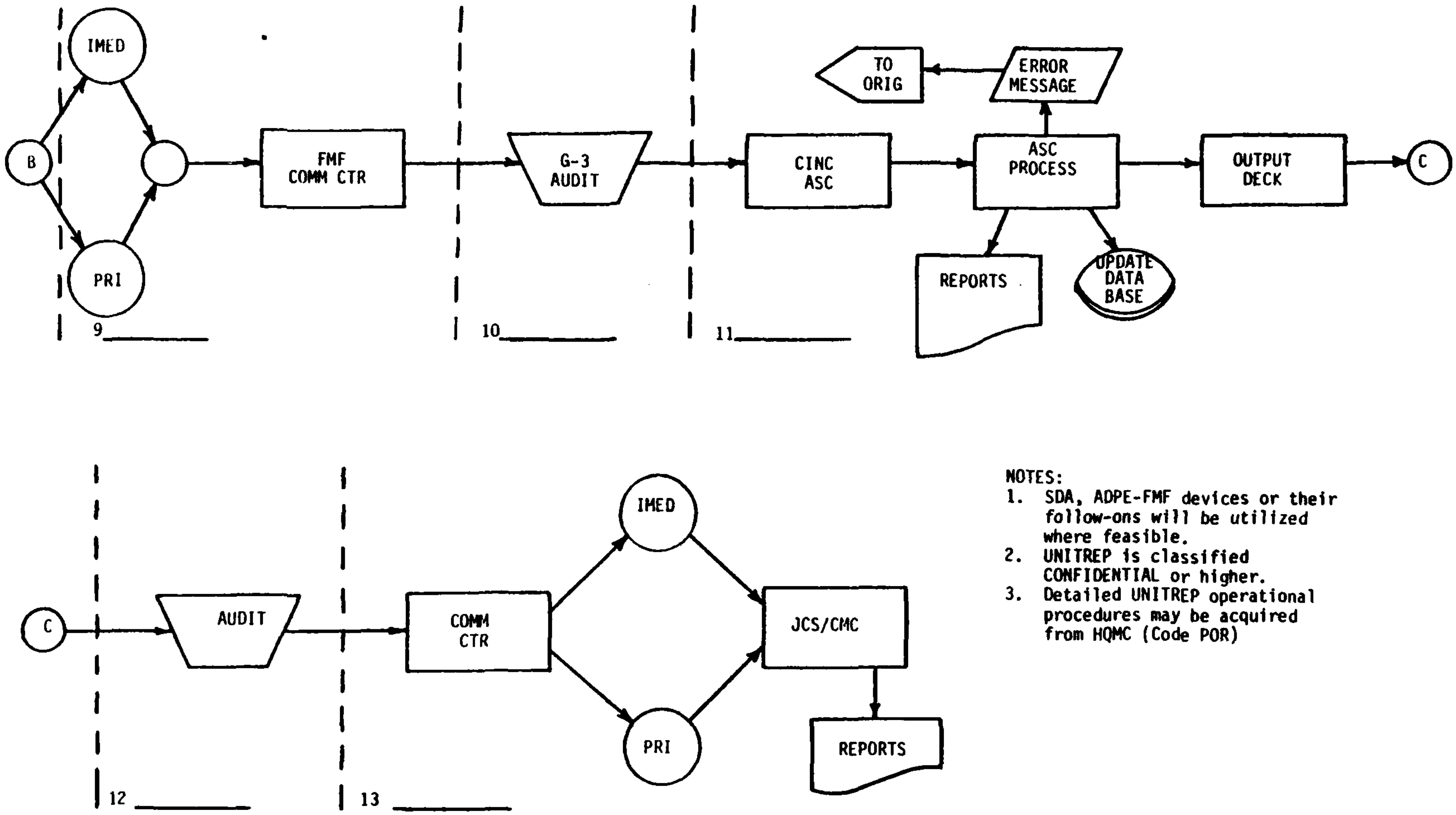
1 Encl a/s
cc: LtCol Balthis - CCIE
Capt Lundeen - MCDEC
Capt Dublin - POR
Mr. Dondero - PGRG

TAB J

Approved Operating Procedures for UNITREP (Apr 81)



Approved Operating Procedures for UNITREP (Apr 81) (Cont'd)



NOTES:

1. SDA, ADPE-FMF devices or their follow-ons will be utilized where feasible.
2. UNITREP is classified CONFIDENTIAL or higher.
3. Detailed UNITREP operational procedures may be acquired from HQMC (Code POR)

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1 June 1981

MEMORANDUM FOR RECORD

Subject: Trip to Norfolk, Va. to Determine the Functions Performed by the Integrated Tactical Amphibious Warfare Data System (ITAWDS)-Deployed AIS 88 Study

1. The trip was made by John Daugherty of PGRG to Norfolk, Va. from 27-29 May 1981 for the purpose of gathering information pertaining to ITAWDS hardware, software, and operational environment from a Marine Corps AIS point of view. Discussions were conducted with several Marine Corps and Navy personnel; a list of the personnel is attached as Enclosure 1.

2. ITAWDS is a composite data system designed for LHA class ships to improve the CATF's capability to exercise control over a coordinated airborne/seaborne amphibious assault. The two major components of ITAWDS are the Tactical Data System (TDS) and the Management Information System (MIS). A subset of the MIS is the Amphibious Support Information System (ASIS) which is operated aboard LCC class ships. The military functional activities served by ASIS are:

- Personnel
- Intelligence
- Operations and Plans
- Supporting Arms Coordination
- Air Support
- Communications
- Logistics
- Special Files

The approved standard files to support the above functions are as follows, along with CLF responsibility for creation, manipulation, and execution:

indicated that Marine Corps requirements for a shipboard MASC (space and power) must be amplified to OPNAV on a priority basis to impact LCC Shipalt at 938K; the impact could be a hold, change, or modification to Shipalt 938K. The impact of shipboard MASCs must be weighed against the industrial availability of the LCCs for overhaul in 1984 realizing that the next window for industrial availability to overhaul is 1989.

5. Further thought has been given to the potential duplication of processing capability provided by MIS (ASIS) and the deployed AIS and MTACCS processing (the consideration of MTACCS processing is beyond the scope of the AIS-88 study but is shown below due to its duplication with MIS (ASIS) processing). Potentially, the deployed AISs processed upon a deployed MASC could be fielded in the 1984-85 time frame. The MTACC systems that would duplicate MIS (ASIS) functions are the tactical combat operations (TCO) (with an initial operational capability (IOC) planned for FY 1988) and the Marine Integrated Fire and Air Support System (MIFASS) (with an IOC planned for FY 1986). The following matrix gives an initial indication of the current perceptions of where the various deployable Marine Corps functions will be processed in the 1988 time period.

	CLF* Responsibility	MIS (ASIS)	MASC	MTACCS	NIPS
Personnel File (PERS)	Primary		X		
Intelligence File (INTEL)	Primary			X	X
Astronomical/Tidal Data	Secondary	X		X	
Landing Serial File (LDSER)	Primary	X		X	
Air Files	Secondary	X		X	
Target List File (TGTLIST)	Secondary	X		X	
Communication File (COMM)	Primary			X	
Logistics Files	Primary		X		
Staff Journal (Journal)	Primary			X	
Logistics Support (Support)	Primary		X		
Ammunition Status (AMMOSTAT) (NGF)	Secondary	X			

*From ASIS Users Guide

The IOCs contemplated for the MASCs (1984-85) and involved MTACCS (1986-88) bear directly upon the timing for LCC overhaul windows. From a deployed AIS point-of-view, there would be no requirement to upgrade the LCC ASIS (MIS) processing capability during the 1984 overhaul window. Should the 1984 LCC processing upgrade occur, the MTACCS equivalent ASIS (MIS) systems could operate for a year or so prior to the planned TCO and MIFASS IOCs. This then points out a

6. The following references have been added for the study:

(q) DB4-76, LHA-1 Class Ship Integrated Tactical Amphibious Warfare Data System, dated 22 March 1976

(r) Amphibious Support Information System (ASIS) User's Guide, Volume 1, dated 1 June 1979

JOHN M. DAUGHERTY
Deployed AIS-88 Study
Team Leader

Encl. a/s

cc: Lt Col Balthis - CCIE
Lt Col Miles - FMFLANT
Capt Lundeen - MCDEC
PGRG Study Team Members
Mr. L. Dondero

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June 17, 1981

MEMORANDUM FOR RECORD

SUBJECT: Visits with Personnel from NAVSEA 612 Pertaining to Shipboard Deployed Automated Processing - Deployed AIS-88 Study

1. Visits were made by Mr. Munn and Mr. Daugherty of PGRG to Mr. Tom DeLuca of NAVSEA 612 on 8 and 17 June 1981 respectively for the purpose of determining computer improvements planned for the Navy's amphibious ship overhaul program.

2. Underway, is a Shipalt for LHA class ships which adds a 2-bay AN/UYK-7 processor and associated peripherals for MIS processing. The 3-bay AN/UYK-7 currently installed in the LHA class ships will be utilized for ITAWDS-NTDS processing. The overhaul of LHA-3 is completed; LHAs 4 and 5 are in the process of overhaul at this time; LHA-1 is due in for overhaul in August 1981 while LHA-2 is due in July 1982. These overhauls will provide the existing 3-bays oriented toward processing NTDS functions with the MIS functions processed upon the added 2-bay AN/UYK-7. These processing systems would operate in an essentially independent mode and would avoid the conditions currently experienced in ASIS operations on LCC class ships, i.e., when an NTDS processor fails, that processing is relegated to the ASIS (MIS) processor causing processor non availability for ASIS (MIS) processing for significant periods of time (last LCC exercise, 30 percent availability for ASIS processing).

3. A Shipalt No 938K, "Proposal for LCC 19 Class Ships" dated July 22, 1980 is currently with OPNAV for action but is in an unprogrammed status. This Shipalt includes the installation of a 2-bay AN/UYK-7 for LCCs 19 and 20 upon which MIS would process in lieu of ASIS. The advantages of operating a system common to LHAs and LCCs is obvious and will not be further discussed. The Shipalt would require priority approval and funding in order to meet the 1984 overhauls scheduled for LCCs. Without 1984 funding, the ASIS upgrade to MIS on AN/UYK-7s would not be considered again until 1989, the next scheduled overhaul period for the LCCs.

4. One major objective of the Deployed AIS-88 Study is to determine the deployed processing requirements for Marine Corps AISs. Within this framework, space and power will most likely be required for the seaborne operation of a MAGTF Automated Service Center (MASC) for processing Marine Corps Class I, II and III AISs. Many of the Marine Corps AISs supplant those now processed by ASIS (and MIS). The thrust of Marine Corps deployed AIS processing is that the system which operates in garrison will operate aboard ship and will operate in an AOA utilizing the deployable, mobile MASC. The Navy representative

indicated that Marine Corps requirements for a shipboard MASC (space and power) must be amplified to OPNAV on a priority basis to impact LCC Shipalt at 938K; the impact could be a hold, change, or modification to Shipalt 938K. The impact of shipboard MASCs must be weighed against the industrial availability of the LCCs for overhaul in 1984 realizing that the next window for industrial availability to overhaul is 1989.

5. Further thought has been given to the potential duplication of processing capability provided by MIS (ASIS) and the deployed AIS and MTACCS processing (the consideration of MTACCS processing is beyond the scope of the AIS-88 study but is shown below due to its duplication with MIS (ASIS) processing). Potentially, the deployed AISs processed upon a deployed MASC could be fielded in the 1984-85 time frame. The MTACC systems that would duplicate MIS (ASIS) functions are the tactical combat operations (TCO) (with an initial operational capability (IOC) planned for FY 1988) and the Marine Integrated Fire and Air Support System (MIFASS) (with an IOC planned for FY 1986). The following matrix gives an initial indication of the current perceptions of where the various deployable Marine Corps functions will be processed in the 1988 time period.

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Air Files	Secondary	X		X	
Target List File (TGTLIST)	Secondary	X		X	
Communication File (COMM)	Primary			X	
Logistics Files	Primary		X		
Staff Journal (Journal)	Primary			X	
Logistics Support (Support)	Primary		X		
Ammunition Status (AMMOSTAT) (NGF)	Secondary	X			

*From ASIS Users Guide

The IOCs contemplated for the MASCs (1984-85) and involved MTACCS (1986-88) bear directly upon the timing for LCC overhaul windows. From a deployed AIS point-of-view, there would be no requirement to upgrade the LCC ASIS (MIS) processing capability during the 1984 overhaul window. Should the 1984 LCC processing upgrade occur, the MTACCS equivalent ASIS (MIS) systems could operate for a year or so prior to the planned TCO and MIFASS IOCs. This then points out a potential dilemma - if TCO, MIFASS and the MASC (with deployable AISs) are deployed as planned and if Shipalt 938K is not accomplished during the 1984 LCC overhaul window, is Shipalt 938K still a requirement for the 1989 overhaul window? Taking this dilemma a step further, if the Marine Corps systems are deployed as planned, should the priority be placed on the Shipalt for completion in the 1984 window to provide two-to-four years of MIS support pending the deployment of TCO and MIFASS. Resolution of the dilemmas described above is beyond the scope of the current study (as stated earlier) however they have significant implications which may be of concern to some element of HQMC, possibly PPO.

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Deployed AIS-88
Study Leader

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June 23, 1981

MEMORANDUM FOR RECORD

Subject: SAC Comments Regarding Phase I and Guidance Concerning Phase II of the Deployed AIS-88 Study

1. A meeting was called by LtCol Balthis, subject study SAC chairman, in his office at 1330 hours on 19 June 1981 to identify and discuss concerns expressed by the SAC pertaining to the information documented from Phase I of the study and to indicate where additional emphasis should be placed in the documentation effort for Phase II of the study. Mr. Daugherty, the PGRG Study Leader, Major Foster (the incoming MCDEC Project Officer) and Capt Lundeen (the outgoing MCDEC Project Officer) attended.

2. LtCol Balthis prepared and submitted to SAC members, a draft informal letter in which he spelled out his concerns and elicited comments and/or concurrence from the SAC about the concerns. Four SAC members responded with additional concerns, each of which was discussed in detail during the 19 June 1981 meeting. Mr. Daugherty assured LtCol Balthis that the concerns, which amount to additional guidance for Phase II of the study, would be considered and acted upon during all subsequent interviews and documentation of final AIS operational concepts. Paragraph 2 of the aforementioned letter indicated that the deliverable (the SAC presentation) was incomplete. However, after reviewing the statement of work, it was agreed by all in attendance at the 19 June 1981 meeting that the deliverable did in fact meet contractural specifications.

3. In the subparagraphs below, we will address the concerns evinced in the draft information letter. Unless otherwise directed, no further action is contemplated with the issuance of the informal letter in a formal form.

a. A major concern is the documentation for AIS operational concepts as the amphibious operation moves through the five specified phases - garrison, preembarkation, deployed afloat, amphibious assault and combat ashore with a theater remote airfield (TRA). The key aspects for the amphibious phases and AIS operational concepts are how garrison operations will be conducted, how they will move through (transition) preembarkation to operations afloat and then through the assault to continued operations ashore with a TRA. Some of the implications which will be addressed by PGRG study team members during interviews and the documentation process will be:

- Use of the MASC in garrison
- Preparation of a deployable data base.
- AIS operations aboard ship - use of ITAWDS-ASIS/MIS
- Data base maintenance while afloat
- TACLOG support with MEDS and M3S
- AIS transition into the AOA
- Processing that may become classified upon deployment or in the AOA - the need for TEMPEST
- The impact of EMCON while afloat

Each of the above items will be a topic of discussion on all subsequent interviews, the results of which will be documented by PGRG.

b. The Fiscal Division (FD) has indicated that SABRS will not deploy but rather will receive its input from the M3S with the deployed MAGTFs which will be developed and processed in a CONUS-like environment. PGRG personnel will interview cognizant FD personnel to determine specifics as to the method in which this interface will operate.

c. A system design document for M3S is desired that specifies the inclusion of a requirement to manage Class I, III and V resources within M3S; PGRG personnel will seek this requirement in writing.

d. An issue derived from the manpower initial concepts for AIS operations is that the MAGTF data base resident upon the deployed MASC will be a week or two out-of-date since the MASC depends upon data update from the central data base rather than update the limited manpower data base on the MASC as manpower transactions pass through the MASC initially. Personnel from field units want a current data base when deployed and it is suspected that HQMC principals would expect the same; HQMC principals will review and approve the final study report.

e. A verbal concern was expressed that one administrative control unit (ACU) is needed for control of manpower input. Such an ACU would probably be an element of the MASC organization and located with the FSSG. Research will be conducted to identify any documentation containing policy/doctrine/organization for an ACU; otherwise, additional action will be required to support deployed manpower processing.

f. Each deployable AIS must have a continuity of operations plan (COOP). Such plans normally include provisions for a duplicate data base and system software to be prepared periodically (weekly in garrison - maybe daily in combat) and stored at an alternate site. Further, the COOP must include identification of an alternate processing site in the event the host hardware is inoperable due to either manual malfunctions or combat action. The COOP for each deployable function will be identified.

g. The regular mode for telecommunications, will place heavy reliance on couriers to transfer input/output to and from numerous processing sites both while afloat and in the AOA. During PGRG trips, we will determine what plans have been made to courier computer products to support deployed AISs. Also, PGRG will investigate the impact of reliance on couriers.

h. The operation of a MASC aboard ship and the physical configuration of a MASC has been identified as an issue. (A side issue to this study is whether with deployable MTACCS and MASCs, how much ITAWDS-ASIS/MIS support will still be required from the Navy?) For the MASCs to be operable aboard ship, a Navy Shipalteration may be required to provide the following resources:

- Identification of space on what ship (i.e., collocation with TACLOG which normally operates aboard the LCC and/or LHA)
- Power
- Wiring to OPFACs for interactive processing
- Tiedowns, etc.

The physical MASC configuration could vary from an 8'x8'x20' shelter and a 8'x8'x10' shelter for supplies up to a maximum configuration suggested by the SAC of five, 35' vans.

i. The "tailoring" of AISs is of concern to the SAC members. The super minicomputers envisioned for use with the MASC are physically small and many times more powerful than the IBM 360/65s in use today. One approach considered by the study team contemplates that the CONUS AISs would load and operate upon the deployed MASCs as in the CONUS-like environment. In those cases where limited data bases are deployed, minor changes to the software would be required to eliminate the use of software modules not required for limited data bases and limited types of transactions. The modification of software for deployed processing of AISs will be a topic for discussion as PGRG study team personnel visit with members of the CDPAs.

j. The SAC feels it may be desirable to place a MASC with the NTPS/MPS to avoid the need to fly the MASC in with the troops.

6. The PGRG study team is keenly in tune with the concerns of the SAC at the completion of Phase I of the study and understands that the study final report must be reviewed and approved by HQMC principals. The study is pivotal in nature in that it will provide the basis for a deployed Marine Corps AIS processing capability. The concerns and

issues developed during the meeting on 19 June 1981, will be highlighted in all subsequent work. Where complete answers are not yet known or available, we will clearly indicate both the available information and the information voids.

7. The PGRG study team understands the guidance provided by the SAC and is now prepared to commence work on Phase II of the study.

John M. Daugherty
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cc:
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Orig. 17 April 1981
Rev. 2 July 1981

MEMORANDUM FOR RECORD

Subject: Interview with Personnel from the 2D MAW Aviation Ordnance Office - Deployed AIS-88 Study

1. Deployed AIS-88 study team personnel met with Major Belcher and MSgt Elliott from the 2D MAW aviation ordnance office at Cherry Point on 10 April 1981 to discuss the desired concept of operations for their function as it pertains to deployed AISs in the 1988 time period.

2. A class III AIS called Ordnance Expended System (OES) has been developed through the auspices of the aviation ordnance office. The system is an interactive one operating from a single CRT terminal/printer on a Navy base-type UNIVAC 1140 computer. The telecommunications requirements are based upon local dial-up within Cherry Point.

3. OES is utilized to manage approximately 71 line items of aviation ordnance and accessories and approximately 50 line items of ordnance handling accessories associated with aviation ordnance. The system is based upon updates; i.e., expenditures and allocations are entered into the system at intervals by unit. By maintaining unit expenditure rates, aviation ordnance allowances may be transferred among units with little difficulty. OES is also used to manage small arms ammunition within the MAW and in the near future, an aviation ordnance personnel management is planned for implementation within OES. Further, up-to-date status reports may be printed at any time or determined through interactive query of the data base.

4. For CONUS operations, a monthly status report on aviation ordnance is forwarded to FMFLANT. The class III AIS saves approximately 100 man hours per month compared to the operation of the previous CONUS manual system. Upon commitment of a MAGTF into combat operations, a daily message is required (Daily Ammunitions Transaction Report) that reports daily receipts and expenditures of aviation ordnance. Parameters of the Daily Ammunitions Transaction Report are specified in SPCC INST P8010.12C, Policy, Procedures, and Responsibilities for Supply Management of Conventional Ammunition, Naval Ships

Parts Control Center, Mechanicsburg, Pennsylvania. For combat operations, it would require more personnel to administer the manual preparation of daily aviation ordnance reports; with a deployed OES, such administration and reporting could be accomplished with currently assigned personnel. Tactically deployed reporting is performed using messages into the Navy Telecommunications System (NTS).

5. It is anticipated that OES will be modified as required to be compatible with ADPE-FMF when that system is distributed and fully operational.

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28 July 1981

MEMORANDUM FOR RECORD

SUBJECT: Utilization of the Defense Automated Addressing System (DAAS) to Support Deployed Marine Air-Ground Task Forces (MAGTFs) - Deployed AIS-88 Study

1. A most cordial meeting was held between the undersigned and members of the DOD Military Standard Logistics Systems Office (MILSO) at 1300 hours on 16 July 1981 at Headquarters DLA. The purpose of the meeting was to determine the type of support that may be expected from the Defense Automated Addressing System (DAAS) for deployed Marine Corps Air-Ground Task Forces (MAGTFs). The information was requested by Marine Corps personnel under the auspices of the Automated Information Systems (AISs) Support of FMF Units When Deployed or in Combat (1985-1995) Study (Short Title: Deployed AIS-88), being conducted by PGRG under contract M00027-78-G-0061, DO 99. The DLA personnel in attendance were:

Mr. Hendrix, Chief of MILSO

Mr. Lewis, DAAS Administrator

Mr. Allen, MILSTRIP Administration

Mr. Lyden, DAAS Staff

2. The DAAS processes logistics transactions from a receiving AUTODIN (or possibly NTS) terminal and routes them to the proper inventory control point (ICP) for supply action. During peacetime operations, the logistics transactions flow through the system with little difficulty or delay. About 40 percent of the peacetime transactions from all services are high priority transactions. For deployed and tactical operations, it is assumed that AUTODIN operations will be conducted under MINIMIZE precedence procedures. DLA personnel indicate that their operational procedures provide that logistical transactions will be processed into AUTODIN within ten minutes. Once available to AUTODIN under MINIMIZE procedures, the transmission of DAAS information is unsure based upon originator-defined precedence and the loading of AUTODIN. Ideally, logistical transactions having priorities of 1 to 8 would pass through the AUTODIN/DAAS as priority transmissions; transactions with priorities greater than 8 would be mailed in those cases when AUTODIN/DAAS circuit time was not available.

The DAAS/AUTODIN system performance was measured in the most recent Army REFORAGER exercise and found to operate within the standard specified. It was also found that during the exercise (and as expected, during combat) that the number of high priority transactions almost doubles.

3. Aside from the performance of the DAAS/AUTODIN system, deployed MAGTFs may continue to have difficulty in establishing an entry point to an AUTODIN terminal.

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28 August 1981

MEMORANDUM FOR RECORD

Subject: Interview with Personnel from the Marine Corps Logistics Base, Albany-Deployed AIS-88 Study

1. Marine Corps and contractor personnel traveled to Albany, Georgia to discuss the aspects of supporting deployed MAGTFs with logistical AISs such as the Marine Corps Standard Supply System (M3S - incorporating SASSY, MUMMS, DSSC, DMA and PCO functions) and the Marine Integrated Maintenance System (MIMMS). Personnel traveling to Albany for meetings on 18 - 20 August 1981 were:

Major Joel Foster - MCDEC Project Officer
Major Gary Hughey - HQMC, Code LPS-4 Study Representative
Mr. John Daugherty - PGRG Study Leader
Mr. Charles Munn - PGRG Logistics Team Leader

Personnel from Albany participating in the meetings were:

Mr. Ney, Director, Logistics Systems Support Division (LSSD)
Lt. Col. Vaserberg, Deputy Director, LSSD
Mr. McLean, Head, Financial/Material Management Branch (LSSD)
Mr. Cavalcanto, Director, M3S Development Office
Mr. Tawney, Head, Test Conversion and Implementation Branch, M3S
Mr. Snook, Head, Data Base Administration Branch, M3S
Mr. Best, Deputy Directory, CDPA, Albany
Maj. Lehr, ADPE-FMF Systems, CDPA, Albany

2. The discussions and documentation of operational concepts for deployable logistical systems fell into two generic categories -those of functional concepts and technical concepts. Thus MFR will record both generic categories in subsequent paragraphs; paragraph 3 responds to technical considerations while paragraph 4 responds to functional considerations.

3. The technical considerations for deployed concepts of operation for logistical AISs centers around the major attributes of a computer system - those of processing speed, core memory and mass storage for a MAGTF ASC (MASC). Detailed discussions were conducted in each of the technical areas and are recorded in the following subparagraphs.

a. The initial technical consideration was the number of transactions processed each day while in sustained combat in an AOA (the sustained combat phase of operation creates the maximum demand upon the logistical systems in that the tempo of combat will increase the consumption rate of all classes of supply). The established base line processing time for CONUS average operations was established in the Landing Force Integrated Communications System (LFICS) in the MidRange Study. This base line was established by reviewing logistical processing at both Camp LeJeune and the logistics base at Albany. Within the LFICS study, the daily, average transaction rate for tactical sustained operations was identified as three times the average CONUS peacetime transaction rate. After due consideration of recent SMU transaction rates, a number of personnel from Albany believed that the tactical transaction rate for the MARCORS I scenario would be two-and-one-half times the average CONUS transaction rate. This will create a direct and linear decrease from the logistics processing speed identified in the LFICS study.

An additional technical consideration validated during the visit was the annual growth rate anticipated for logistical processing. Utilizing data acquired from HQMC-CCIR, logistical processing was found to historically grow at a rate of 4.9 percent per year. This growth rate, rounded to 5 percent was acceptable to the personnel at Albany.

b. Core storage to operate a number of time shared overlays, a DBMS et. al., was originally estimated to require about 2.5 Mbytes in the LFICS study. More recent requirements for larger overlays, and a more sophisticated DBMS will require the following core storage capacity:

4 overlays @ .5 Mbytes	=	1.0 Mbytes
Operating System	=	.6
Telecommunications Interface	=	.5
DBMS	=	1.4
Reentrant Processor	=	.4
Subtotal	=	4.9 Mbytes
Core Allocation + 15%	=	.6
		5.5 Mbytes

The core storage requirement for the fixed processor at Albany identified in a 1978 Computer Science Corporation Study was 8 Mbytes with a growth potential to 12 Mbytes of core storage in the 1988 time period. Using 5.5 to 6 Mbytes for the deployable MASC core seems reasonable and prudent compared to the fixed Albany requirement considering that program development occurs at the Albany site.

c. The remaining key hardware consideration is that of mass storage (DASD). The mass storage capability is impacted by the number of NSNs with which a MAF would deploy, the record length per NSN and the means or efficiency of the DBMS's procedure for compressing blank data fields. The quantity of NSNs had been estimated by HQMC-I&L Department at 61,000 NSNs. The 61,000 NSNs was validated by Albany personnel based upon 32,841 NSNs in war reserve Class IX items plus 20 percent for error or 39,300 NSNs. The addition of thousands of Class I through VIII items adds closely to 61,000 deployable NSNs and thus remains a viable basis for the identification of mass storage capability for deployed logistical processing.

Another component of the deployed mass storage capability is the number of characters (or bytes) per NSN record. The initial estimate from the LFICS study was 6,000 characters per record. A good deal of time and effort was expended in consideration of the record length; mixed responses of more or less than 6,000 characters per record resulted in a concensus that the 6,000 was a suitable estimate for this, the 1981 time period. A tempering effect impacting the data base size on mass storage comes from the characteristics of the DBMS utilized with deployed logistical systems. One example cited was an automated logistics file operated with ADABASE that saved 88 percent of the theoretical mass storage capacity by compression of blank filled data elements in a revised file. The 88 percent saving cited is perceived as an exceptional example however, the implementation of a modern DBMS into the deployed processing environment, could provide a mass storage savings of from 20 to 60 percent. Should a total system, implemented with a compressed DBMS, result in an overall 88 percent mass storage savings, the data record would be reviewed to consider the elimination of seldom used elements. For unique data records, requiring extensive record lengths, other software techniques may be utilized to reduce the length of a typical record while still containing a proviso for handling unusually long, unique records. To provide a modification to mass storage capacities from the utilization of a DBMS, an average data base compression of 40 percent will be applied to future deployed hardware sizing estimates.

Since the LFICS study, which had an assumption that Class II and III systems used 15 percent of processing assets, it has been determined from detailed analysis of FMF processing at Camp Lejeune that, in fact, Class II and III processing comprises 40 percent of Marine Corps automated AIS-type processing. Therefore, the increase in Class II and III mass storage will almost offset the decrease in mass storage, which may result from the implementation of a compression-type DBMS.

d. Technically, the personnel at Albany were keenly aware of the processing requirements in support of the deployed MAGTFs. The visit with Logistics Base personnel, the M3S development team and personnel from the CDPA was most informative, provided fresh insights for deployed logistical processing and most importantly, provided a rapport for the continued and coordinated development and documentation of deployed logistical AISs.

4. Logistic/Combat Service Support (CSS) Functional Concepts

a. Logistic/CSS functions for supply, maintenance and embarkation were discussed in terms of deployable AIS support. Overall, the discussions indicated that none of the functions, as currently performed in the FMF, are expected to undergo any significant operational or doctrinal changes between now and the 1988 time frame. However, the implementation of ADPE-FMF and the development of M3S and the follow-on to MEDS will introduce some changes in data management. A major objective in these improved systems/hardware is to attain commonality and standardization wherein the functions are performed in the same manner for all operational postures, e.g. garrison, peacetime deployments, amphibious operations in a combat environment, etc. While ADPE-FMF is not a primary subject in the Deployed AIS-88 Study, its role in source data automation does impact on MASC operations. The results of the discussions by functions, including the impact of ADPE-FMF on MASC operations, are stated in the succeeding subparagraphs.

b. In the supply function, the implementation of ADPE-FMF will provide added capabilities in the data management and processing areas. However, it will also introduce some problem areas in need of resolution as the result of the hardware configuration that is being acquired. Conceptually, users will use ADPE-FMF to record transactions on a courier floppy diskette, which will be transported to consolidated issue points, (CIPS) located in combat service support areas (CSSAs). CIPs will aggregate user diskettes onto tape, together with unfilled requisitions and other data, which is forwarded to the retail issue point (RIP) level (SASSY Management Unit (SMU)) in the force combat service support area (FCSSA). At the RIP, action is taken on stock replenishment of the CIPs and unfilled requisitions, the data base and files are updated and reports (e.g. consumption, resupply requirement, unfilled requisitions, etc.) are generated for external addresses. In addition, status, reports and other data are returned to the CIP and user levels. The AIS for this concept will be SASSY until replaced by M3S.

At the present time, SASSY Phase 1 application programs for ADPE-FMF have been developed and implemented at Camp Pendleton, California. These programs are concerned primarily with transaction reporting. Transactions are entered at the user level, partially edited and read onto a courier floppy diskette which is forwarded to the RASC. The courier diskettes are aggregated and read into the RASC main frame using the faster speed and greater capabilities of the "White Machine" (Commerical Series/1 system hardware). In comparison, the conversion of a full floppy diskette to tape could take up to 25 minutes on ADPE-FMF as presently configured. When considering up to 89 RUCs in a MAF with each RUC submitting diskettes for each of several AISs, it is obvious that aggregation using ADPE-FMF at the CIP, maintenance and supply activities in the FCSSA and MASC will be unacceptable. An improved capability, equivalent to the "White Machine" now being used in testing at Camp Pendleton, will be needed.

System specifications for SASSY Phase 2 application programs for ADPE-FMF are still under development. However, on the basis of interim specifications developed to date, application programs have been developed and are undergoing tests at Camp Pendleton. When completed, the impetus of supply support will be at the user level viz a viz the SMU. The commander will have a data base for supply matters which will be updated by local inputs as well as status and other data from the SMU or its successor. Additionally, he will be able to display his unit supply status and other reports similar to those currently defined in SASSY. This portends at least two problem areas. The first is that only two diskette slots are availabe on ADPE-FMF. With one slot occupied by a diskette containing the operating system (OS) and application programs, only one diskette slot is available for data manipulation. While this may be adequate for some organizations which are authorized a minimal number of line items, e.g. infantry battalion, it has been determined that a maintenance-intensified organization, e.g. tank or assault amphibian battalion, will need at least four diskettes. This will require frequent manipulation of diskettes in the one available slot, an accurate record of data on each diskette and a more highly trained operator. The second problem area envisioned is that involved in forwarding data from the MASC to ADPE-FMF. This will require a conversion of data from tape at the MASC to a diskette which can be read into ADPE-FMF, a reverse process to that described above for entering data at the MASC.

In regard to the MASC during operational phases and transitions between phases, it was stated that the supply AIS at the MASC should be functioning during all phases. In garrison, the MASC should be operated with only the MAF data from the RASC supply AIS to ensure a high state of readiness for deployments. This would ensure that the equipment is maintained in a high state of operability, programs are functionable and have incorporated the latest changes, the data base is current, and personnel are trained and familiar with the supply AIS. An increased level of activity is expected during movement to the objective phase stemming from use of this phase to catch-up on deferred maintenance.

M3S is still in an early stage of definition and development of system specifications; however, it is expected to be operational about 1985. Although specifics are not available at this time, the overall supply support structure and modus operandi of the supply AIS within the MAF will not change significantly from the current SASSY.

c. The maintenance function is being developed in a two-phase approach for ADPE-FMF similar to that for supply. Phase 1 is essentially transaction reporting using MIMMS. Phase 2 will provide the commander with a MIMMS data base and report capability for his organization. The problem areas involved in the maintenance application are the same as those in Supply, i.e aggregation and multiple diskettes. No significant changes are foreseen in MIMMS for the Deployed AIS-88 Study time period.

d. No tasking has been made for the embarkation function. CDPA personnel are aware of the interim embarkation system effort underway at Camp Pendleton and are expecting to be tasked with the developing of a Class 1 system to replace MEDS.

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18 September 1981

Memorandum for Record

Subject: Interview with Personnel from 3rd MAW Aviation Logistics Management Office - Deployed AIS-88 Study

Deployed AIS-88 study team personnel met with Colonel J. A. Jaross, 3rd MAW AC/S for Aviation Logistics Management, on 15 September 1981, to discuss concepts of operation and automated information support for deployed forces in the 1988 time period. Subsequently other personnel in this functional area were interviewed as follows:

LtCol H. J. Tobin	3rd MAW Aviation Supply Office
LtCol H. A. Franz	3rd MAW Aviation Ordnance Office
Maj Michael W. Murphy	3rd MAW Aviation Maintenance Office
Maj M. J. Kennedy	MAG-13 Supply Office
GySgt Donald E. Brown	3rd MAW Aviation Maintenance Office (3M)
SSgt Carl Woodson	3rd MAW G-3 (FREDS)

The 4th FASC is currently located at MCAS, El Toro under operational control of the 3rd MAW. SUADPS is being processed on the MAG's U-1500 while 3M, FREDS and local unique systems are processed by the 4th FASC computer. The MAG's U-1500 have never processed FREDS or 3M in the 3rd MAW and SUADPS has not utilized the full computer capacity. The 4th FASC has generated several programs for compiling aviation unique information for 3rd MAW use.

Colonel Jaross, and all MAW staff personnel interviewed, indicated a need for compiling 3M, SUADPS, and FREDS data at the MAW level for use as a management vehicle by the staff. Since Navy procured hardware does not provide for aggregating MAG information into MAW reports, a processor is required at the MAW to compile the information from the MAGs, which will provide for proper wing management of aviation assets. The Standard Naval Aviation Supply System (SNASS) would not be available without the FASC or a similar processor. The 3rd MAW principal staff officers have been briefed on NALCOMIS, however, are somewhat skeptical of dates that it will be delivered to the MAGs.

The 3rd MAW supply has interactive access to four ICPs in the Defense Logistics Agency and each MAG has a terminal connected to the Aviation Supply Office, Philadelphia. This access is used to retrieve supply status information from the logistical facilities' data base. No demands may be processed into these systems.

J. W. Detroy

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Aviation Team,
Deployed AIS-88 Study

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18 September 1981

MEMORANDUM FOR RECORD

Subject: Interview with 3rd MAW ISMO Personnel, MCAS El Toro - Deployed AIS-88 Study

PGRG personnel met with and interviewed Major T. Morris and Capt W. E. Whittaker from the Information Systems Management Office, and Capt W. Thompson, Director 4th FASC, 3rd Marine Aircraft Wing, Marine Corps Air Station, El Toro, California. The discussions on 17 September 1981, pertained to deployed automated systems for the MAW in the 1988 time period.

For several years I MAF operated under the concept of two FASCs for the MAF. The two FASCs for I MAF were located at Camp Pendleton and MCAS El Toro. The 4th FASC at El Toro is under operational control of 3rd MAW. The concept changed to MAF level rather than composite support and in 1977 the 1st FASC at Camp Pendleton consolidated with MCB ASC-03 to form RASC-03 at Camp Pendleton. Now the concept of deployment is composite in nature and there is only one FASC per MAF; in I MAF this is the 4th FASC at MCAS El Toro. Operational control and location of the 4th FASC is currently under debate. Recommendations have been made that 4th FASC should be relocated to I MAF HQ and become totally dedicated to support the MAGTF contingencies.

Currently 4th FASC serves as a remote job entry to the RASC for Class-I Marine Corps information systems. 3M, FREDS, UNITREP, and local unique systems are processed by the 4th FASC computer. If the 4th FASC is relocated to I MAF HQ all processing for the 3rd MAW would be done at the Camp Pendleton RASC with only a Remote Job Entry at MCAS El Toro.

In order to support aviation unique requirements, it appears that each MAW needs its own stand-alone computer and data processing staff (MASC), both in garrison and when deployed.

During current operations, at times when the 4th FASC is "down", a critical problem evolves in transportation of taped data to the RASC. This results in non-response of processed data on aviation unique systems.

for J. W. Detroy
Aviation Team,
Deployed AIS-88 Study

cc

LtCol Balthis (CCIE)
LtCol Costello (ASA)
Maj Foster (MCDEC)
ISMO 3rd MAW

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30 September 1981

MEMORANDUM FOR RECORD

Subject: Interviews with Cognizant Personnel in the Functional Areas of Manpower and Military Pay - Deployed AIS Study

1. During the period 15-17 September, 1980, the following personnel were interviewed regarding the concept of operations for manpower and military pay support in the five potential FMF Scenarios (garrison; predeployment preparation, including embarkation; during deployment/ while afloat, including EMCON; amphibious assault; combat ashore.)

Col. E.M. Bair	Director, RASC, Camp Pendleton
Lt. Col. J.M. Ray	Asst. Director, RASC, Camp Pendleton
Lt. Col. L.R. Fresquez	ISMO, I MAF
Lt. Col. P. Dobon Jr.	Disbursing Officer, I MAF
Lt. Col. L Hagener	Asst. G-1, 1st Mar Division
Major A.B. Marshall	MWHS-3 (G-1)
Major M.K. Chetkovich	Disbursing Officer, MCB, Camp Pendleton
Major R.L. Lovelace	HQMC (FDD) Audit Team
Capt. T.L. Lopez	HQMC (FDD) Audit Team
Capt. T.L. Tootle	Disbursing Officer, 7th MAB
Capt. G.O. Thompson	Customer Services Branch, RASC
Capt. L.L. Kacmarynski	ISMO, 1st Mar Division
1st Lt. C.R. Sampson	OIC JUMPS, Disbursing, MCB, Camp Pendleton
1st Lt. M.L. Pane	OCU, MCB, Camp Pendleton
MGySgt. E.L. Julkowski	RASC, Camp Pendleton
Ms. M.B. Bratton	RASC, Camp Pendleton
Mr. A.F. Phillips	RASC, Camp Pendleton

The comments and recommendations provided by the interviewees are herein organized into three general groupings: General Considerations Regarding Deployed AIS Processing; Manpower Management for Deployed Fleet Marine Forces; Military Pay for Deployed Fleet Marine Forces.

2. General Considerations Regarding Deployed AIS Processing

a. The combination of the current RASC establishment together with the forthcoming Marine Corps Data Network (MCDN) will result in effective but hard wired communications among major, fixed, Marine Corps installations. An FMF (regardless of MAGTF configuration) organization that is configured for deploymment will find itself without a deployed AIS capability unless the MASCs are operated in garrison and utilized in CPXs and other training exercises (e.g., 4th FASC is currently hard-wired in).

TAB S

b. The transfer of data from a MASC to an AUTODIN or MCDN entry point is a weak link that is virtually assured to degrade transmission and turnaround times in all but the garrison environment. Telecommunications for all but critical administrative traffic will seldom exist and courier will most likely be the primary rather than the backup mode of communications both within and outside the AOA.

c. The capability of current generators to maintain the constancy of power required by the MASC computer was questioned.

d. The data bases in most of the systems intended for deployment are unnecessarily large and should be truncated so that only requisite data to maintain combat effectiveness is maintained in combat. This implies that each system and data base must be built in modular form so that they can be readily "unplugged" at the time of deployment.

e. Interface with other Service AISs will be a necessity for any joint operations.

f. None of the AISs should depend on having an interactive capability which is external to the AIS site.

g. Every AIS must be developed using structured programming and modular development so that those programs that are not required in a combat environment can be "unplugged" without system modification and, conversely, those programs that are combat specific must be capable of being readily plugged in.

h. Each AIS must have a multiple, load-and-go capability.

i. Some major systems (e.g., SASSY) do not lend themselves to being run under distributed processing; that is, the system as currently configured must be run on one MASC computer.

j. MASC structure and sizing appear to be in consonance with projected requirements.

k. Intra-MAGTF communications between the MASCs must be carefully planned to provide requisite transfer of information and backup capability.

l. In garrison, the RASC should continue to do all processing without using the added capability provided by the MASC computers.

3. <u>Manpower Management for Deployed FMF</u>

a. JUMPS/MMS has never been tested in a combat environment and before it is, we may well have implemented its successor, REAL FAMMIS.

b. The reporting unit and the MAGTF commander must both have current and timely manpower data bases. The current concept wherein the MAGTF data base is not updated until the information has posted at Kansas City to the central file and been returned to the MAGTF, may work in garrison where the communications allows rapid turnaround. However, in a combat environment there could be delays of 10-30 days depending on how information is transferred from the AOA to Kansas City. Accordingly, if the manpower data is not posted at the MASC when it is first transmitted from each RUC, the senior echelons will not use the MASC data base. They will query the individual RUCs or cause class III programs to be written to aggregate the individual RUC data.

c. Provision must be made for operation in the case of catastrophic system failure. Even today, there are very few clerks that are capable of preparing a diary.

d. Provision must be made for units that are operating away from a site that provides automated assistance in manpower management.

e. FMF commanders are currently provided a 240 character record extract from the FMR on each individual in their unit on the ADPE-FMF devices. Acceptance and reported utilization of this record has been outstanding; however, there have been difficulties in reconciling data bases with the FMR.

f. The Administrative Control Unit (ACU) need not be deployed but provision should be made to have JUMPS/MMS or REAL FAMMIS contact teams operating from the G-1 or MASC to provide both training and assistance to the RUCs within their jurisdiction.

g. In combat, a flag must be set to insure that the Record of Emergency Data (RED) possessed by Kansas City is the most current in the event of casualties. Marines tend to have a proclivity for getting married just shortly before embarkation and may become KIAs, WIAs or MIAs prior to an updated RED reaching Kansas City. Accordingly, notifications, the death gratuity and possibly even the remains could be sent to the incorrect party if a fail-safe procedure is not established.

h. There is a problem with administrative personnel over-riding the current automated assistance given by the "green-machine" in creating diaries. Specifically, some clerks are entering wrong SSNs and/or initials and overriding the machine when it flags the error.

i. There is a need to institute a procedure to validate diskettes for serviceability. Bad diskettes are currently causing problems at the ACU; however, there are significantly fewer problems now than there were with the old OCR diaries.

4. <u>Military Pay for the Deployed FMF</u>

a. Provision must be made to modify certain procedures (flags) in the event of deployments. For example, currently, if a Marine's EAS arrives and the Marine has not been reported to have reenlisted or extended, his pay and allotments are terminated. In a combat environment this could happen frequently through delays in the system; the Marine should not be made to suffer because of the system inadequacy.

b. Centralized allotments will work but centralized pay will not work in a combat environment. Even now, in garrison, unit disbursing officers are needing to run what amounts to a duplicate pay system in the field. Records received from Kansas City have errors in up to 50 percent of the records.

c. For deployed West Pac forces it takes two/three months to reconciles pay accounts after a unit has been deployed and at least two cycles of the Leave and Earnings Statement (LES) are required to get payments to post. The complexity of the 3rd FSSG disbursing at a point in time in which it had units at Fugi and others deployed is displayed in the attached schematic.

d. All disbursing officers interviewed considered that a distributed (mini JUMPS) system was the only system that would work in a deployed environment. They envision Kansas City handling bonds and allotments, a locally produced LES and a monthly credit/debit of pay similar to how the system was effected in Viet Nam; i.e., each Marine elected how much of his accumulated pay he wanted in cash, in check, in the Savings Program (if estabished) or to just ride on the books.

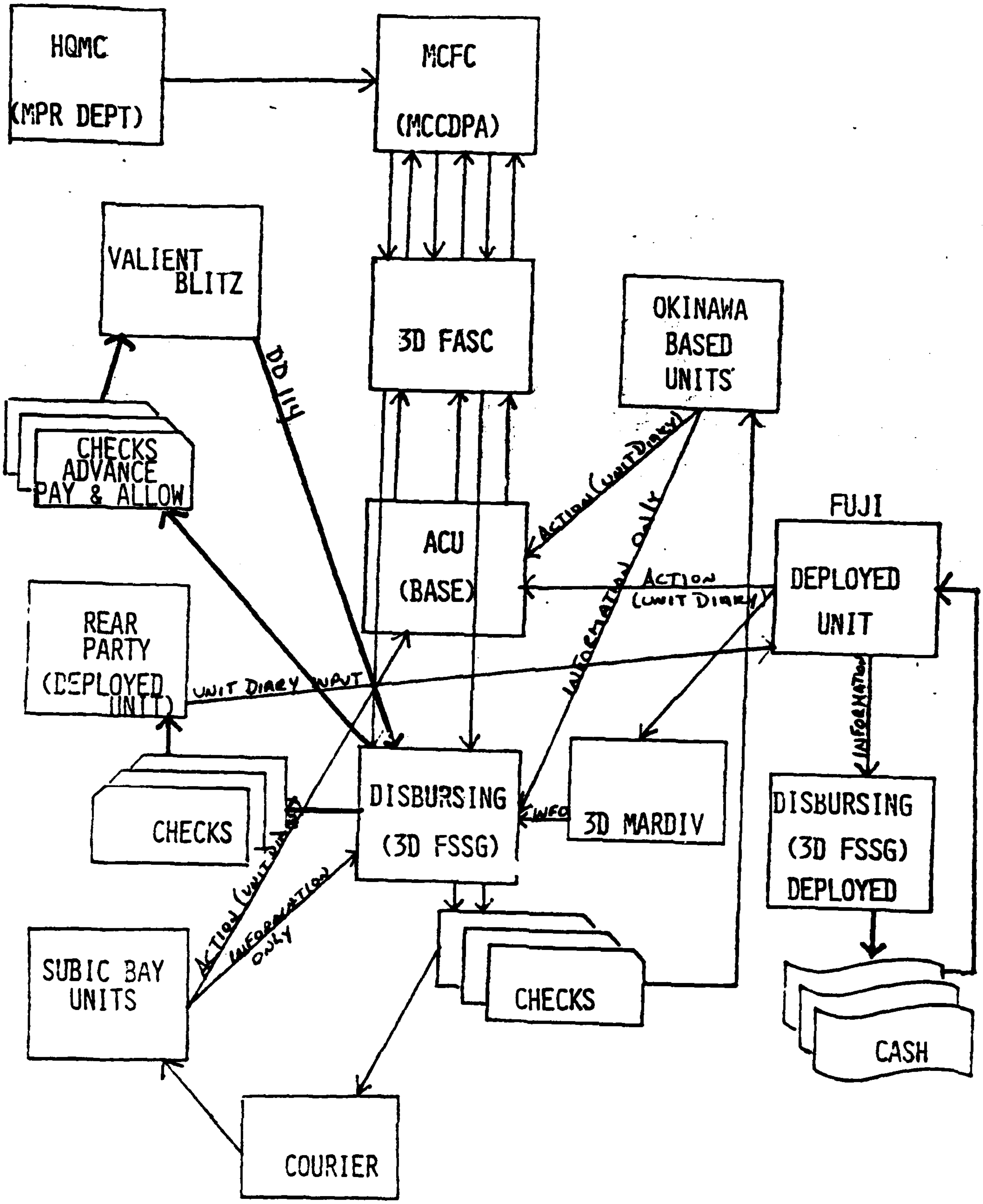
e. At the commencement of a deployment it is envisioned that advanced pay and allowances would be given for two pay days, during which time the unit disbursing officer would initialize his distributed system.

f. There must be a backup for the diskette on which basic pay data is retained.

g. The Video Inquiry System (VIS), that is useful for reconciling individual records in garrison, would not be available in a deployed environment. However, the complaint was made that even in the garrison environment the VIS is down too often (up to 50 percent of the time) and the one terminal available at the FSSG is insufficient for the potential number of users.

John D. Lanigan
Leader, Manpower Team
Deployed AIS-88 Study

cc: Lt. Col Balthis - HQMC (CCIE)
Lt. Col. DeWoolfson - HQMC (MPI)
1st Lt. Diab - HQMC (FDD)
Major Foster - MCDEC
Interviewees
Mr. Dondero - PGRG
Study Team Members - PGRG



Current Posture of 3d FSSG Disbursing 21 November 1980

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30 September 1981

MEMORANDUM FOR RECORD

Subject: 1st Marine Brigade Deployed AIS Processing Concepts - BGen McClintock

The undersigned and Major Joel Foster from MCDEC met with BGen McClintock, the Commanding General of the 1st Marine Brigade at 1000 hours on 17 September 1981 to discuss deployed AIS processing concepts of operation.

An immediate operational concern expressed by BGen McClintock was the imminent loss of the SYCOR computers which provide a deployed processing capability for logistical and manpower functions. He stated that if we lose the SYCORs, we go back to the 1950s. BGen McClintock's desires are to retain the SYCOR processors until the ADPE-FMF devices have deployed SASSY, Phase II and operate one deployed cycle in parallel with the SYCOR processors. His understanding was that HQMC would not approve an extension to the SYCOR contract beyond October 1981 and further, he has no ADPE-FMF programs that will perform a similar processing function. BGen McClintock said he was deploying a MAU in November 1981 and is afraid we are going to end up in the Indian Ocean with a stubby pencil--this is unacceptable. We must be able to cover deployed Class I system processing and have shipboard communications. He reiterated that the Navy must provide communications and that communications remains as a problem for deployed MAGTFs. Further, BGen McClintock recognized that Navy-provided processing support through ASIS and MIS is not dependable.

BGen McClintock stated that he has 3000 men, and 100 air frames in MAG-24 and that they required a MAGTF ASC (MASC) to provide an interface with the Navy.

BGen McClintock then suggested that we talk with Colonel Mockler, the commanding officer of his BSSG, and with personnel from MAG-24 to solve "blue" supply problems.

I asked BGen McClintock what class of ship would be used as the MAGTF command ship. He said it could be LHA, LPH or LSD, or in the event a larger deployed force, an LCC.

BGen McClintock was deeply concerned about deployed processing support in the near term and was fully supportive of the MASC concept for deployed operations in the mid-range time frame.

John M. Daugherty
Deployed AIS-88
Study Team Leader

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CG, FMFPAC - CEO
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30 September 1981

Rev. 4 December 1981

Memorandum for Record

Subject: Liaison Trip to FMFPAC and 1st Marine Brigade - Deployed AIS-88 Study

The deployed AIS-88 study team leader and MCDEC project officer, Major Joel Foster traveled to FMFPAC and the 1st Marine Brigade during the week of 14 September 1981. The purpose of the visit was to document the deployed administrative processing needs of MAGTFs. Study status briefings were presented to staff officers from both FMFPAC and the 1st Marine Brigade. The memorandum for record for an interview with BGen McClintock, Commanding General of the 1st Marine Brigade, is under separate cover.

The underlying message from commanders and staff officers in FMFPAC was a need for a deployed processing capability and communications. FMFPAC operational conditions vary significantly from those documented in FMFLANT. The significant differences are:

- Deployed aviation assets in FMFPAC are frequently separated from deployed ground assets resulting in no helicopters being available to transfer information from ship-to-ship.

- A deployed MAU in FMFPAC is loaded on three ships whereas an FMFLANT MAU is normally loaded on five/six ships - the result is that deployed FMFPAC units have difficulty or are unable to perform maintenance upon equipment when deployed.

- Deployed FMFPAC units have infrequent ports-of-call and when in port, have difficulty "phoning in" requisition information. FMFLANT units depend upon frequent ports-of-call and telephones to transfer requisition information.

The above differences serve to intensify PAC's dependence upon computers and communications. Another significant finding realized from the trip to FMFPAC is that several interactive, high-visibility aviation supply systems are utilized in the garrison environment which, without a deployed telephone capability, may not be utilized by deployed aviation units. The high-visibility supply systems are Navy and are the Closed Loop Aeronautical Management Program (CLAMP) and individual systems for F4, CH53 and TA4 aircraft.

Colonel Peterson, the FMFPAC CEO and responsible for AISs, is totally supportive of the MASC concept. He had some issues with specific items and was most cooperative in providing access to members of the FMFPAC staff. Major Hayden from the CEO office was the point-of-contact for our visit and was most helpful. Major Hayden provided a number of reference documents such as:

- Marine Corps Automated Data Processing Capabilities Plan FY82-88 dated 1 September 1981
- User's Manual for the Closed Loop Aeronautical Management Program (CLAMP), FASC INST 4440.92D dated 25 September 1980
- Regional Automated Service Centers (RASCs); designation of - draft MCO 5230
- Management Information System (MIS) User's Guide, Volume 1.
- Two messages pertaining to CLAMP
- Marine Corps draft comments on the Defense Audit Service Draft Report on the Review of the Readiness of Automatic Data Processing Support in the Pacific Theater (Project #OFF-113A), undated
- Communications/ADP Support for Logistics - a point paper for the RDJTF Supply Committee Meeting dated 24 June 1981
- Shipboard ADP Support for Embarked Landing Forces - a point paper dated 13 April 1981.

Captain Bailey, the outgoing 1st Marine Brigade ISMO, stated that each deploying MAU will take two 'green machines' (ADPE-FMF); one will be operated and one will be a spare. Information must be couriered to the MAU command ship for updates upon the 'green machine.' Data communication is a problem as experienced by the 31st MAU when ships split (aviation assets) due to changes in mission. One paper tape punch deploys with the MAU SSG (MSSG) for input to the Naval Telecommunication System (NTS), hence when the helicopters are not available, data transfer between ships is poor. The MAUs now have SYCOR mini computers and the Message Editing and Processing System (MEPS) which outputs paper tape for the NTS. The contract for the SYCOR processors terminates in October 1981. The Navy Management Information System (MIS) requires one 80-column card per MAU member which is input to an AN/UYK-7 on the LHA. When a composite MAU was deployed on the LHA, there was no processing time available for Marine use of MIS.

A joint interview was conducted with three past commanding officers of deployed MSSGs; they were LtCol Bailey and Majors Gooding and Carter. The MSSG deploys with about 2,500 line items of supply. While afloat, those line items are managed on the SYCOR processor with split files. One of the main problems when deployed is receiving supply status from the FSSG. Requisition information is transmitted via NTS however supply status information is received by computer printout through the U.S. mail, taking an average of about 20 days. About one-third of the time when deployed, satellite communications through the NTS are available otherwise about half of the supply messages are transmitted using HF contingency transmissions. "We must have a 2-way flow of information - the capability is there, we don't know why we don't get support." The SYCOR processor is adequate for local use and operates from 10-14 hours per day. The task organization of III MAF varies from the other MAFs and is more geographically dispersed and hence may need more than four MASCs. "For an identified deployable MSSG (MSSG 31 or 37) we would probably not want to deploy with a MASC but would be appropriate for larger-sized MAGTFs. The independent 1st Marine Brigade is forgotten in many equipment acquisitions. The MSSG deploys with one paper tape punch and that impedes data communications when the MAU is loaded aboard four ships." The past BSSG commanders were not aware of Class III(A) supply management, management of potable water or blood plasma and for Class V(A), operate with 10 days of LFORM from San Diego. Each commander would operate their MASC in garrison, would deploy with the MASC and would operate the MASC in an AOA.

Colonel Fisher, the Force Supply Officer, has identified within FMFPAC approximately 55 Class III programs in use by the SASSY Management Units (SMUs) to assist and enhance SASSY processing. He is working toward the definition of a 'core' supply system which would be employed in combat. Colonel Fisher had reviewed the Deployed AIS-88 study material and felt it is an essential project compatible with his study regarding a combat supply system; the deployed study is pertinent to the real needs of the Marine Corps. An alternate means of teleprocessing support is required for an effective automated supply system. Simply increasing personnel requirements to support ADP development will only continue our existing "out-of-hide" syndrome. The only solution is to increase the T/Os so ADPE-FMF and FASCs/MASCs are adequately manned. Colonel Fisher recommended a MASC communications link utilizing the Ashore Mobile Communications Contingency (AMCC) and the Data Communications Terminal (AN/TYC-5A). He further recommended that MCDEC initiate studies in areas of concern. Finally, Colonel Fisher indicated that it would be very difficult to operate a manual supply system at this time.

Colonel Harms, the FMFPAC G-4, believes that ASIS (and MIS) are useless for deployed processing support for the Marine Corps. "We haven't identified the functions we must take to combat (one purpose of the deployed study). Our automated systems are too complex and require too much manpower to prepare system inputs." For example, MIMMS input for an AMTRAC Battalion takes 12 mechanics. Colonel Harms would like to see the MIMMS driven with 'bar codes' (like the universal pricing codes found on supermarket items). We need a simple system that may be read by a Marine reading at the sixth or seventh grade level. One of the most useful MIMMS reports is the shop daily progress report. Ideally, this report should be available to the shop foreman at 1600 hours as of 1530 hours however, this report has been scrapped because of the extensive reporting requirements to HQMC - headquarters requires too much. The Third Amphibious Assault Battalion has a simple Class III Daily Progress report done in clear english, run at the ASC and is back to the shop foreman by 1600 hours on the day of the run.

Colonel Mockler, the commanding officer of the BSSG, was concerned about the continued deployability of the SYCOR processors until such time as SASSY Phase II programs are avaiable for the 'green machines.' He is currently working with messages to solve the deployed SASSY problem. Colonel Mockler would utilize a MASC for all phases of an amphibious operation - from garrison to embarkation, while afloat and then into an AOA. He believes that good ADPE-FMF programs will solve most of our deployed problems. When a MAU deploys, the administrative tail staff goes into the MSSG.

Major Aldridge, the commander of the SASSY Management Unit (SMU), works closely with the NCOIC of the Maintenance Management Office (MMO). The degree of cooperation observed in the 1st Marine Brigade operation prompts the question--should SMUs and MMOs be a combined operation? Major Aldridge was concerned with data and transmission security. He had experienced situations where untrained personnel had attempted to manipulate a current automated file and in so doing, had made those files irretrievable. Major Aldridge has instituted rigorous procedures to insure that only qualified personnel operate SASSY. SASSY is operated from remote job entry (RJE) at ASC-6. Currently, requisition return status is poor due to communications. Major Aldridge believes that status returns could be improved within the NTS by using a truncated message format. Also, he believes way too many Class III systems are used for retrievals with MARK IV. He is currently making three-to-four SASSY runs each week--he would prefer to make five runs a week. Major Aldridge would prefer a MASC which would operate in garrison and would not tie into another mainframe computer although he understands that AUTODIN II will provide direct access to other mainframes (not necessary when deployed). He would then operate the MASC aboard ship, when deployed, and when in an AOA, he would have as many terminals as possible hardwired to the MASC operated in the FSSG or BSSG. Major Aldridge's biggest concern is how to get supply transactions into the DLA system (DAAS) when deployed; when transactions don't enter the system, a resupply base is not established. A MSSG deploys with about 2,500 line items of supply and the BSSG would deploy with about 12,000 lines. Integration of war reserve stocks would about double the BSSG lines to about 24,000. He believes that when employed in combat, the transactions for SASSY will be about two-and-one-half times those in normal garrison operations. Further, Major Aldridge feels that the implementation of an interactive Marine Standard Supply System (M3S) will dry up a portion of the SMU. The combined operation of the SMU and MMO functions seemed very efficient and the close cooperation between the two functional managers was clearly evident.

The remaining significant discussions were held with personnel from MAG-24 which is understood to be the largest MAG in the Marine Corps. Captain Hayne from aviation supply experienced a one-third availability of the AN/UYK-5A (UNIVAC-1500) within the group. SUADPS is the only system operated on the AN/UYK even through 3M is also supposed to operate on the AN/UYKs; 3M and FREDS are operated on IBM 360s through the RJE at ASC-6. Also, four additional high visibility aviation supply systems are operated by the MAG. Each of the high visibility systems is operated on Navy hardware and software. The first system, operated at Philadelphia, is the Closed Loop Aeronautical Management Program (CLAMP). CLAMP and its follow-on system, Updated CLAMP (UCLAMP) is operated on a commercial interactive network with a Western Union Telex terminal. The remaining three systems are oriented toward specific aircraft--the F4, CH53 and TA4. Each system is interactive and entry to each is with commercial terminals and telephones. Captain Hayne would like to deploy with the high visibility aviation supply systems but their deployability is dependent upon the availability of commercial telephones which are not available to the deployed force. When deployed, the Navy seems to communicate on the high visibility items with high priority messages; for SUADPS, it takes a few days to receive aviation supplies.

The remaining discussions in MAG 24 were held with Captain Snyder, the Maintenance Officer and Master Sergeant Bauermann, the Maintenance Analyst. Reports received from 3M inputs to the Naval Maintenance Support Office (NMSO) in Mechanicsburg, PA are of little use since they are one-and-one-half to two-months out-of-date when received. MAG-24 does not operate terminals into their AN/UYK-5A nor do they operate 3M on the AN/UYK; 3M is run on an IBM 360/50. SUADPS runs on the AN/UYK require about 23 hours per day. "Aviation supply needs automated data--the computers are invaluable and we must have communications to operate." The Navy uses a front loading aviation supply theory and 'blue' air supply enjoys a high priority for data transmission. The numerous aviation supply systems do not interface the way they should. NASO produces a quarterly degradation report which is very useful--MAG-24 personnel would like to receive the degradation report on a monthly basis.

Throughout the interviews, there was little awareness of the management of Class III(A) and V(A) supplies from a Marine Corps point of view; these are normally 'blue' items of supply and Marine Corps involvement in the management of these supplies is uncertain.

John M. Daugherty
Deployed AIS-88
Study Team Leader

cc

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CG, 1st Marine Brigade - BISMO
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1 October 1981

MEMORANDUM FOR RECORD

Subject: Interviews with FMFPAC Personnel Concerning the Functional Areas of Supply, Maintenance and Embarkation for the Deployed AIS-88 Study

1. During the week of 14-17 September 1981, the following personnel were interviewed regarding the concept of operations for supply, maintenance and embarkation support for deployed forces and during all phases of amphibious operations.

Col Benstead	CO, 1st FSSG
Col E.M. Bain	Director, RASC, Camp Pendleton
LtCol L.R. Frequez	ISMO, IMAF
LtCol G. T. Kalt	Asst G-4 (Supply), IMAF
LtCol L. E. Reed	MMO, 1st Mar Division
LtCol P. J. Prinster	OIC, SMU, 1st FSSG
Maj J. S. Mays	TCO Proj Off, MCTSSA
Maj R. J. Popps	Asst OIC, SMU, 1st FSSG
Capt R. Holmes	Div Supply Office, 1st Mar Division
Capt W. E. Whittaker	ISMO, 3d MAW
CWO-2 L. A. Ferrara	MWHS-3 (G-4 Embarkation)
MGySgt E. S. Mitchell	Div Supply Office, 1st Mar Division
MSgt C. A. Vanderschans	Div Supply Office, 1st Mar Division
Mr. R. Gulath	RASC, Camp Pendleton

2. <u>MASC Concept</u>.

a. All personnel interviewed strongly endorsed the need for an AIS capability for deployed forces. The combination of the MASC and ADPE-FMF will satisfy the ADP requirements for support of the supply, maintenance and embarkation functional areas.

b. There were varied opinions regarding operation of the MASC during all phases of an amphibious operation. The widest variance was in the garrison phase. Most views supported operation of the MASC in garrison primarily for readiness and as a backup capability for the RASC. The MASC needs to be operated to ensure operability of equipment and software programs and to ensure a "hands-on" proficiency level by MASC personnel. The other strong viewpoint was that in garrison primary reliance should be on the RASC with the MASC becoming operational upon embarkation.

c. Generally, software programs are CONUS oriented and are too large and impractical for deployed forces. Tailored programs are needed for deployment. This can only be accomplished through a system by system decomposition to determine what functions and procedures should or should not be deployed. Modular developed programs would permit deployed forces to carry with them the essential elements and leave the "nice-to-have" elements behind without disrupting continuity of operations.

d. Telecommunications is a critical factor in deployed situations. With the advent of the Marine Corps Data Network (MCDN), transfer of data within CONUS will be improved. However, this improvement will lead to greater use of ADP and create serious problems when forces deploy without this telecommunication capability. Provisions must be made for telecommunications between deployed forces and CONUS.

e. An additional requirement exists for operation of the MASC in garrison now for contingency planning. A capability is required for forging varying elements of all three MAFs into a new composite MAF. This involves a large data base which must consider forces with equipment and forces without equipment but subsequently matched with prepositioned equipment.

f. The sizing of the MAFSC appears to be adequate if funding and personnel are available.

g. There is a need for the MASC to interface with ITWADS-MIS. A problem of incompatibility exists at present primarily in a seven versus nine track tape situation.

h. Too much data is being provided to the commander. A hard look needs to be taken to scale down reports to actually what is needed, particularly for forces in combat.

i. Extreme care must be taken not to clutter the main-frame with non-essential programs.

3. Diskette Operations

An IBM System 1 commercial version (white machine) is utilized at the RASC for the purpose of reading diskettes from the ADPE-FMF devices (green machines) and writing output diskettes. The diskette are processed through two, 10 diskette magazine peripheral devices. Each diskette is read into the IBM 360/65 and the JCL prepares a run from each diskette. The input from each diskette is maintained as a separate so that when a bad diskette is encountered, a single job is killed and other processing proceeds. The data is transmitted thorugh a 38.4 kbs (kilobits per second) bisynchoneous circuit into the COMTEM 3670 communications front-end processor associated with the IBM 360/65. It takes 20-30 minutes to read 40 diskettes and about 4 hours to write output to 40 diskettes.

4. Supply Support

a. A capability must exist to interface with other Services. Some support in a deployed situation will come from the Army, therefore it is essential that requisitions and other data be entered into and received from Army supply systems.

b. There is a need to load medical supplies and Class V(W) to SASSY.

c. SASSY as currently developed is unrealistic for deployments. It is too large and requires too much machine time. A tailored, modular version is needed for deployments.

d. Use of ADPE-FMF as input for MASC appears to be satisfactory but is troublesome in collecting diskettes from units. Also the diskettes are transported unprotected; some problems are foreseen in that dust, dirt and humidity may cause some deterioration in the diskette quality.

5. <u>Maintenance Support</u>

a. MIMMS is too slow and involves too many cards for input. It needs to be streamlined for combat.

b. There is a need for faster input and processing.

c. The Division/MAF staff need a query terminal capability with the MASC to rapidly ascertain maintenance status and materiel readiness data. In combat, this data is needed the night before rather than in the morning-after reports. Follow-up data returned the next day by diskette to the user is satisfactory.

6. <u>Embarkation Support</u>

A "Standard Embarkation Management System" (SEMS)" is under development to replace the "Mechanized Embarkation Data System" (MEDS). The program will be used on ADPE-FMF and will not require any MASC support. Upon successful testing it will satisfy the embarkation data requirements for the user (battalion/squadrons) and embarkation team levels.

C. R. Munn, Jr.
Logistics Team
Deployed AIS-88 Study

ANNEX D

MARINE AMPHIBIOUS FORCE (MAF) ORGANIZATION

Note: The study team has been advised of changes to T/Os subsequent to the preparation of this Annex and its appendices. Where these changes do not influence the results of the study, no effort has been made to make changes after the fact.

APPENDIX 1

MARINE AMPHIBIOUS FORCE TROOP LIST

Multiple	Unit	USMC	USN
	COMMAND ELEMENT		
1	Hq, MAF/H&S Co, MAF	354	16
1	Radio Bn	473	8
1	Comm Bn	738	13
1	Force Recon Co	154	7
1	CAG	97	4
4	CI Team	16	0
2	SSC Team	8	0
1	Topo Plat	53	0
	Command Element Total:	1,949	48
	GROUND COMBAT ELEMENT		
	Marine Division (Rein)		
1	Hq, Mar Div/Hq Bn	1,457	32
3	Infantry Regt		
3	Hq Co	170	5
9	Inf Bn	1,192	68
1	Artillery Regt		
1	Hq Btry	256	6
3	DS Arty Bn	737	16
1	GS Arty Bn, 155 How (SP)	416	8
1	GS Arty Bn, 8" How (SP)	565	10
1	Tgt Acquisition Battery	167	2
1	Searchlight Battery	117	3
1	Recon Bn	411	33
2	Tank Bn	990	19
1	Aslt Amphib Bn	1,141	21
1	Combat Engr Bn	910	16
	Ground Combat Element Total:	20,869	844

MARINE AMPHIBIOUS FORCE TROOP LIST

Multiple	Unit	USMC	USN
	AVIATION COMBAT ELEMENT		
	Marine Aircraft Wing		
1	Hq, MAW/MWHS	623	25
1	MWWU	49	0
1	Marine Air Control Group		
1	H&HS	142	7
1	MWCS	369	0
2	MACS	256	3
1	MASS	240	2
1	LAAM Bn	766	12
1	MATCS	288	2
1	FAAD Btry	271	7
3	Marine Aircraft Group (VA/VF)		
3	H&MS	405	0
3	MABS	276	16
2	VMA (AW)	333	4
3	VMFA (F4)	383	4
2	VMFA (F18)	366	4
3	VMA	358	4
1	Det, VMFP	321	4
1	Det, VMAQ	487	4
2	Marine Aircraft Group (VH)		
2	H&MS	351	0
2	MABS	223	16
4	HMH (CH-53D)	255	4
1	HMH (CH-53E)	294	4
9	HMM	188	4
1	HML	321	4
2	HMA	382	4
1	VMO	213	4

MARINE AMPHIBIOUS FORCE TROOP LIST

Multiple	Unit	USMC	USN
	AVIATION COMBAT ELEMENT (Cont'd)		
	Marine Aircraft Wing (Cont'd)		
1	Marine Wing Support Group		
1	H&GMS	483	22
1	Wg Engr Sqdn	576	0
1	Wg Trans Sqdn	503	0
1	Marine Aerial Refueler Transport Squadron	568	4
	Aviation Combat Element Total:	17,314	287
	COMBAT SERVICE SUPPORT ELEMENT		
	Force Service Support Group		
1	Hq, FSSG/H&S Bn	1,696	111
1	Engr Spt Bn	1,641	20
1	Lndg Spt Bn	903	1
1	Maint Bn	1,623	0
1	Supply Bn	1,496	51
1	MT Bn	848	0
1	Med Bn	341	759
4	Dental Co	0	66
	Combat Service Support Element Total:	8,548	1,206
	Marine Amphibious Force Total	48,680	2,385

APPENDIX 2

MAF TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Marine Amphibious Force	42,436	1,796
Hq, MAF	153	8
Comm Bn (-)	172	3
CI Team	16	0
Marine Division (-) (Rein)	21,025	884
Mar Div (-)	19,575	882
Det, Comm Bn	30	0
SSC Team	8	0
Tk Bn	990	19
SP Group	345	30
HS Group (2)	67	10
HS Team	10	3
Marine Aircraft Wing	19,000	534
MAW	17,228	287
Det, Comm Bn	60	0
CI Team	16	0
SSC Team	8	0
Det, FSSG	1,688	247
Force Recon Co	154	7

MAF TASK ORGANIZATION

INITIAL ASSAULT

	USMC	USN
Force Service Support Group (-) (Rein)	1,808	358
FSSG (-)	1,531	358
Det, Comm Bn	30	0
Cbt Engr Co (Rein)	157	0
Force Service Support Group (-) (Rein)	1,808	358
Det, MAG (VH)	30	0
Det, MWSG	30	0
Det, MP Co, Hq Bn, Mar Div	30	0
Radio Bn (-)	108	2

APPENDIX 3

DIVISION TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Marine Division (-) (Rein)	21,025	884
Hq Bn (-)	1,333	32
Det, Comm Bn	30	0
SSC Team	8	0
Infantry Regt (Rein)	5,040	230
Inf Regt	3,746	209
Det, Hq Bn	25	0
DS Arty Bn	737	16
AT Co (Rein)	246	0
Cbt Engr Co (Rein)	157	0
Recon Co	79	0
HSG	50	5
Infantry Regt (Rein)	5,559	260
Inf Regt	3,746	209
Det, Hq Bn	19	0
Aslt Amphib Bn	1,141	21
Cbt Engr Co (Rein)	157	0
Tk Co (Rein)	151	0
SPG (Attchd for embark and lndg)	345	30
Infantry Regt (-) (Rein)	2,996	146
Inf Regt (-)	2,554	141
Det, Hq Bn	25	0

DIVISION TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Infantry Regt (-) (Rein) (Continued)		
AT Co (-)	164	0
Cbt Engr Co (Rein)	157	0
Recon Co	79	0
HSG	17	5
Artillery Regt (-)	2,878	58
Combat Engr Bn (-)	246	16
Recon Bn (-)	228	33
Tank Bn (-)	744	19
Tank Bn (-)	675	19
Div Res: Infantry Bn (Rein)	1,288	71
Inf Bn	1,192	68
Det, Hq Bn	25	0
Cbt Engr Bn	36	0
Recon Plat	25	0
HST	10	3

APPENDIX 4

WING TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Marine Aircraft Wing	19,000	534
Hq, MAW/MWHS (-)	423	15
Det, Comm Bn	30	0
Marine Air Control Group	2,023	30
H&HS (-)	98	5
MWCS (-)	296	0
MACS	256	3
MASS	240	2
LAAM Bn	766	12
MATCS (-)	96	1
FAAD Btry	271	7
Marine Wing Support Group	1,026	11
H&GMS (-)	295	11
Wg Engr Sqdn (-)	373	0
Wg Trans Sqdn (-)	358	0
Marine Aircraft Group (VH) (2)	5,541	104
H&MS (2)	702	0
MABS (-) (2)	446	32
HMH (5)	1,314	20
HMM (9)	1,692	36
HML	321	4
HMA (2)	764	8
VMA	358	4

WING TASK ORGANIZATION

INITIAL ASSAULT

	USMC	USN
Marine Aircraft Wing (Rear)	9,957	374
Det, MWHS	200	10
Det, Comm Bn	30	0
CI Team	16	0
SSC Team	8	0
MWWU	49	0
Det, Marine Air Control Group	565	6
Det, H&HS	44	2
Det, MWCS	73	0
MACS	256	3
Det, MATCS	192	1
Marine Aircraft Group (VA/VF) (3)	6,327	96
H&MS (3)	1,215	0
MABS (3)	828	48
VMA (AW) (2)	666	8
VMFA (5)	1,881	20
VMA (2)	716	8
VMO	213	4
Det, VMFP	321	4
Det, VMAQ	487	4
Combat Service Support Group	2,194	258
Det, H&S Bn, FSSG	50	4

WING TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Combat Service Support Group (Cont'd)		
Det, Force Service Support Group	1,638	243
Det, H&S Bn	254	0
Det, Engr Spt Bn	308	0
Det, Lndg Spt Bn	283	0
Det, Maint Bn	371	0
Det, Supply Bn	341	0
Det, Med Bn	81	177
Dental Bn	0	66
Det, Marine Wing Support Group	506	11
Det, H&GMS	158	11
Det, Wg Engr Sqdn	203	0
Det, Wg Trans Sqdn	145	0
Marine Aerial Refueler Transport Squadron	568	4

APPENDIX 5

FSSG TASK ORGANIZATION
INITIAL ASSAULT

Force Service Support Group (-) (Rein)	1,808	358
Det, H&S Bn	254	4
Det, Comm Bn	30	0
Det, Engr Spt Bn	145	3
Det, Lndg Spt Bn	175	0
Det, Maint Bn	325	0
Det, Supply Bn	305	0
Det, MT Bn	196	0
Det, Med Bn	131	285
Dental Co	0	66
Cbt Engr Co (Rein)	157	0
Det, MAG (VH)	30	0
Det, MWSG	30	0
Det, MP Co, Hq Bn, Mar Div	30	0

APPENDIX 6

MAF TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Marine Amphibious Force	48,680	2,385
Hq, MAF/H&S Co, MAF	354	16
Comm Bn (-)	558	13
CAG	97	4
CI Team (2)	32	0
Topo Plat	53	0
Marine Division (Rein)	20,953	844
Mar Div	19,879	825
Det, Comm Bn	60	0
CI Team	16	0
SSC Team	8	0
Tk Bn	990	19
Marine Aircraft Wing		
Phase 3	19,086	534
MAW	17,314	287
Det, Comm Bn	60	0
CI Team	16	0
SSC Team	8	0
Det, FSSG	1,688	247

MAF TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Phase 4	17,398	287
MAW	17,314	287
Det, Comm Bn	60	0
CI Team	16	0
SSC Team	8	0
Force Recon Co	154	7
Force Service Support Group (Rein)		
Phase 3	6,920	959
FSSG (-)	6,860	959
Det, Comm Bn	60	0
Phase 4	8,608	1,206
FSSG	8,548	1,206
Det, Comm Bn	60	0
Radio Bn	473	8

APPENDIX 7

DIVISION TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Marine Division (Rein)	20,953	844
Hq Bn (-)	1,382	32
Det, Comm Bn	60	0
CI Team	16	0
SSC Team	8	0
Infantry Regt (Rein) (2)	7,542	418
Inf Regt	7,492	418
Det, Hq Bn	50	0
Other elements as appropriate		
Artillery Regt	3,732	77
Assault Amphibian Bn	1,141	21
Combat Engr Bn	910	16
Recon Bn	411	33
Tank Bn (2)	1,980	38
Div Res: Infantry Regt (Rein)	3,771	209
Inf Regt	3,746	209
Det, Hq Bn	25	
Other elements as appropriate		

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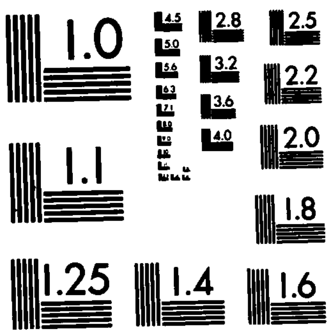

MICROCOPY RESOLUTION TEST CHART
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APPENDIX 8

WING TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Marine Aircraft Wing	19,086	534
Hq, MAW/MWHS (-)	423	15
Det, Comm Bn	30	0
Marine Air Control Group	2,023	30
H&HS (-)	98	5
MWCS (-)	296	0
MACS	256	3
MASS	240	2
LAAM Bn	766	12
MATCS (-)	96	1
FAAD Btry	271	7
Marine Wing Support Group	1,056	11
H&GMS (-)	325	11
Wg Engr Sqdn (-)	373	0
Wg Trans Sqdn (-)	358	0
Marine Aircraft Group (VH) (2)	5,597	104
H&MS (2)	702	0
MABS (-) (2)	446	32
HMH (5)	1,314	20
HMM (9)	1,692	36

WING TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Marine Aircraft Group (VH) (2) (Continued)		
HML	321	4
HMA (2)	764	8
VMA (2)	358	4
Marine Aircraft Wing (Rear)	9,957	374
Det, MWHS	200	10
Det, Comm Bn	30	0
CI Team	16	0
SSC Team	8	0
MWWU	49	0
Det, Marine Air Control Group	565	6
Det, H&HS	44	2
Det, MWCS	73	0
MACS	256	3
Det, MATCS	192	1
Marine Aircraft Group (VA/VF) (3)	6,327	96
H&MS (3)	1,215	0
MABS (3)	828	48
VMA (AW) (2)	666	8
VMFA (5)	1,881	20
VMA (2)	716	8
VMO	213	4
Det, VMFP	321	4
Det, VMAQ	487	4

WING TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION

AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Combat Service Support Group	2,194	258
Det, H&S Bn, FSSG	50	4
Det, Force Service Support Group	1,638	243
Det, H&S Bn	254	0
Det, Engr Spt Bn	308	0
Det, Lndg Spt Bn	283	0
Det, Maint Bn	371	0
Det, Supply Bn	341	0
Det, Med Bn	81	177
Dental Co	0	66
Det, Marine Wing Support Group	506	11
Det, H&GMS	158	11
Det, Wg Engr Sqdn	203	0
Det, Wg Trans Sqdn	145	0
Marine Aerial Refueler Transport Squadron	568	4

APPENDIX 9

FSSG TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELD OUTSIDE THE AOA

	USMC	USN
Force Service Support Group (-) (Rein)	6,920	959
H&S Bn (-)	1,392	107
Det, Comm Bn	60	0
Engr Spt Bn (-)	1,333	20
Lndg Spt Bn (-)	620	1
Maint Bn (-)	1,252	0
Supply Bn (-)	1,155	51
MT Bn	848	0
Med Bn (-)	260	582
Dental Co (3)	0	198

APPENDIX 10

WING TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE, AFTER ARRIVAL OF THEATER AIR ECHELON IN THE AOA

	USMC	USN
Marine Aircraft Wing	17,398	287
Hq, MAW/MWHS	623	25
Det, Comm Bn	60	0
CI Team	16	0
SSC Team	8	0
MWWU	49	0
Marine Air Control Group	2,588	36
H&HS	142	7
MWCS	369	0
MACS (2)	512	6
MASS	240	2
LAAM Bn	766	12
MATCS	288	2
FAAD Btry	271	7
Marine Wing Support Group	1,562	22
H&GMS	483	22
Wg Engr Sqdn	576	0
Wg Trans Sqdn	503	0

WING TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE, AFTER ARRIVAL OF THEATER AIR ECHELON IN THE AOA

	USMC	USN
Marine Aircraft Group (VA/VF) (3)	6,472	96
H&MS (3)	1,215	0
MABS (3)	828	48
VMA (AW) (2)	666	8
VMFA (5)	1,881	20
VMA (3)	1,074	12
Det, VMFP	321	4
Det, VMAQ	487	4
Marine Aircraft Group (VH) (2)	5,452	104
H&MS (2)	702	0
MABS (2)	446	32
HMH (5)	1,314	20
HMM (9)	1,692	36
HML	321	4
HMA (2)	764	8
VMO	213	4
Marine Aerial Refueler Transport Squadron	568	4

APPENDIX 11

FSSG TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE, AFTER ARRIVAL
OF THEATER AIR ECHELON IN THE AOA

	USMC	USN
Force Service Support Group (-) (Rein)	8,608	1,206
H&S Bn	1,696	111
Det, Comm Bn	60	0
Engr Spt Bn	1,641	0
Lndg Spt Bn	903	1
Maint Bn	1,623	0
Supply Bn	1,496	51
MT Bn	848	0
Med Bn	341	759
Dental Co (4)	0	264

ANNEX E

MARINE AMPHIBIOUS BRIGADE (MAB) ORGANIZATION

Note: The study team has been advised of changes to T/Os subsequent to the preparation of this Annex and its appendices. Where these changes do not influence the results of the study, no effort has been made to make changes after the fact.

APPENDIX 1

MARINE AMPHIBIOUS BRIGADE TROOP LIST

Multiple	Unit	USMC	USN
	COMMAND ELEMENT		
1	Hq, MAB/Det, Hq Bn, Mar Div	292	9
1	Det, Comm Bn	231	0
1	Det, Radio Bn	46	8
1	Det, MWHS	67	0
1	Det, Force Recon Co	15	0
1	Det, CAG	30	4
1	CI Team	16	0
	Command Element Total:	697	13
	GROUND COMBAT ELEMENT		
	Regimental Landing Team		
1	Infantry Regt		
1	Hq Co	170	5
3	Inf Bn	1,192	68
1	Artillery Bn (Rein)		
1	Det, Hq Btry, Arty Regt	15	0
1	DS Arty Bn	737	16
1	8" How Plat	51	1
1	Recon Co (Rein)	83	2
1	Tank Co (Rein)	168	1
1	Aslt Amphib Co (Rein)	253	4
1	Det, Cbt Engr Bn	390	6
	Ground Combat Element Total:	5,443	239

MARINE AMPHIBIOUS BRIGADE TROOP LIST

AVIATION COMBAT ELEMENT

Marine Aircraft Group

Multiple	Unit	USMC	USN
1	Marine Aircraft Group (VH)		
1	H&MS	351	0
1	MABS	223	16
3	HMM	188	4
1	HMH (Rein)	328	4
1	HMA	382	4
1	Det, VMO	91	1
1	Det, HML	79	3
1	Det, Marine Aircraft Group (VA/VF)		
1	H&MS	405	0
1	MABS	276	16
2	VMFA	366	4
1	VMA (AW)	333	4
1	VMA	358	4
1	Det, VMAQ	224	2
1	Det, VMFP	163	2
1	Marine Air Control Group		
1	Det, H&HS	49	2
1	Det, MWCS	123	0
1	MACS	256	3
1	Det, MASS	80	0
1	Det, MATCS	146	0
1	Det, LAAM Bn	294	4
1	FAAD Btry	45	0
1	Det, Marine Wing Support Group		
1	Det, H&GMS	173	7
1	Det, Wg Engr Sqdn	118	0
1	Det, Wg Trans Sqdn	116	0
	Aviation Combat Element Total:	5,909	92

MARINE AMPHIBIOUS BRIGADE TROOP LIST

Multiple	Unit	USMC	USN
	COMBAT SERVICE SUPPORT ELEMENT		
	Brigade Service Support Group		
1	Det, Hq H&S Bn	522	30
1	Det, Engr Spt Bn	367	6
1	Det, Maint Bn	6[illegible]	0
1	Det, Supply Bn	4[illegible]	17
1	Det, Lndg Spt Bn	3[illegible]	1
1	Det, MT Bn	2[illegible]	0
1	Det, Med Bn	[illegible]	163
1	Dental Co	0	66
	Combat Service Support Element Total:	2,628	283
	Marine Amphibious Brigade Total	14,677	627

APPENDIX 2

MAB TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Marine Amphibious Brigade	14,677	627
Hq, MAB	216	9
Det, Hq Bn, Mar Div	36	0
Det, Comm Bn	131	0
Det, MWHS	37	0
Det, CAG	30	4
CI, Team	16	0
Infantry Regt (Rein)	5,632	259
Inf Regt	3,746	209
Det, Hq Bn	25	0
Det, Comm Bn	30	0
Arty Bn (Rein)	803	17
Det, Cbt Engr Bn	354	6
Tk Co (Rein)	168	1
Aslt Amphib Co (Rein)	253	4
Recon Co (Rein)	98	2
HS Group	40	10
SP Team	115	10
Marine Aircraft Group	6,473	130
Det, MAG (VH)	2,300	43
Det, Comm Bn	40	0
Det, MAG (VA/VF)	2,297	33
Det, MACG	920	9
Det, MWSG	392	7
Det, BSSG	534	38

MAB TASK ORGANIZATION

INITIAL ASSAULT

	USMC	USN
Brigade Service Support Group	2,060	255
Det, H&S Bn	408	30
Det, Comm Bn	30	0
Det, Engr Spt Bn	273	6
Det, Maint Bn	445	0
Det, Supply Bn	303	17
Det, Lndg Spt Bn	220	1
Det, MT Bn	247	0
Det, Med Bn	53	105
Dental Co	0	66
Det, Hq Bn, Mar Div	15	0
Cbt Engr Plat	36	0
Det, MWSG	15	0
Det, MAG (VH)	15	0
Det, Radio Bn	46	0

APPENDIX 3

RLT TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Infantry Regt (Rein)	5,632	259
Hq Co	170	5
Det, Hq Bn	10	0
Det, Comm Bn	30	0
Infantry Bn (Rein)	1,273	73
Inf Bn	1,192	68
Cbt Engr Plat	36	0
Recon Plat	25	0
HST	20	5
Infantry Bn (Rein	1,885	83
Inf Bn	1,192	68
Tk Co (Rein)	168	1
Aslt Amphib Co (Rein)	253	4
Cbt Engr Co (Rein)	157	0
SPT (Attachd for embark and lndg)	115	10
Artillery Bn (Rein)	803	17
Det, Cbt Engr Bn	125	6
Recon Co (-) (Rein)	73	2

RLT TASK ORGANIZATION

INITIAL ASSAULT

	USMC	USN
Regt Res: Infantry Bn (Rein)	1,263	73
Inf Bn	1,192	68
Det, Hq Bn	15	0
Cbt Engr Plat	36	0
HST	20	5

APPENDIX 4

MAG TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Marine Aircraft Group	6,473	130
Det, H&MS (-) (Rein)	100	0
Det, Comm Bn	20	0
Det, Marine Aircraft Group (VH)	2,190	43
H&MS (-) (Rein)	281	0
MABS (-)	198	16
HMM (3)	564	12
HMH (Rein)	328	4
HMA	382	4
VMA	358	4
Det, HML	79	3
Det, Marine Air Control Group	920	9
Det, H&HS	49	2
Det, MWCS	123	0
MACS	256	3
Det, MASS	80	0
Det, MATCS	73	0
Det, LAAM Bn	294	4
Det, FAAD Btry	45	0
Det, Marine Wing Support Group	256	5
Det, H&GMS	100	5
Det, Wg Engr Sqdn	76	0
Det, Wg Trans Sqdn	80	0

MAG TASK ORGANIZATION

INITIAL ASSAULT

	USMC	USN
Marine Aircraft Group (Cont'd)		
Marine Aircraft Group (Rear)	2,987	73
Det, H&MS	50	0
Det, Comm Bn	20	0
Det, Marine Aircraft Group (VA/VF)	2,247	33
H&MS (-)	355	0
MABS	276	16
VMFA (2)	732	8
VMA (AW)	333	4
Det, VMAQ	224	2
Det, VMFP	163	2
Det, VMO	91	1
Det, MATCS	73	0
Combat Service Support Group	670	40
Det, H&S Bn, FSSG	30	0
Det, Brigade Service Support Group	504	38
Det, H&S Bn	64	0
Det, Engr Spt Bn	69	0
Det, Maint Bn	140	0
Det, Supply Bn	95	0
Det, Lndg Spt Bn	119	0
Det, Med Bn	17	38

MAG TASK ORGANIZATION

INITIAL ASSAULT

	USMC	USN
Marine Aircraft Group (Cont'd)		
Det, Marine Wing Support Group	136	2
Det, H&GMS	58	2
Det, Wg Engr Sqdn	42	0
Det, Wg Trans Sqdn	36	0

APPENDIX 5

BSSG TASK ORGANIZATION
INITIAL ASSAULT

	USMC	USN
Brigade Service Support Group	2,060	225
Det, H&S Bn	408	30
Det, Comm Bn	30	0
Det, Engr Spt Bn	273	6
Det, Lndg Spt Bn	220	1
Det, Maint Bn	445	0
Det, Supply Bn	303	17
Det, MT Bn	247	0
Det, Med Bn	53	105
Dental Co	0	66
Cbt Engr Plat	36	0
Det, MAG (VH)	15	0
Det, MWSG	15	0
Det, Hq Bn, Mar Div	15	0

APPENDIX 6

MAB TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Marine Amphibious Brigade	14,677	627
Hq, MAB	216	9
Det, Hq Bn, Mar Div	36	0
Det, Comm Bn	131	0
Det, MWHS	37	0
Det, CAG	30	4
CI Team	16	0
Infantry Regt (Rein)	5,528	239
Inf Regt	3,746	209
Det, Hq Bn	40	0
Det, Comm Bn	30	0
Arty Bn (Rein)	803	17
Det, Cbt Engr Bn	390	6
Tk Co (Rein)	168	1
Aslt Amphib Co (Rein)	253	4
Recon Co (Rein)	98	2
Marine Aircraft Group		
Phase 3	6,513	130
Det, MAG (VH)	2,048	40
Det, Comm Bn	40	0
Det, MAG (VA/VF)	2,491	36
Det, MACG	993	9
Det, MWSG	407	7
Det, BSSG	534	38

MAB TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Marine Aircraft Group (Cont'd)		
Phase 4	5,979	92
Det, MAG (VH)	2,048	40
Det, Comm Bn	40	0
Det, MAG (VA/VF)	2,491	36
Det, MACG	993	9
Det, MWSG	407	7
Brigade Service Support Group		
Phase 3	2,124	245
Det, H&S Bn	428	30
Det, Comm Bn	30	0
Det, Engr Spt Bn	298	6
Det, Maint Bn	470	0
Det, Supply Bn	323	17
Det, Lndg Spt Bn	260	1
Det, MT Bn	262	0
Det, Med Bn	53	125
Dental Co	0	66
Phase 4	2,658	283
Det, H&S Bn	522	30
Det, Comm Bn	30	0
Det, Engr Spt Bn	367	6
Det, Maint Bn	610	0
Det, Supply Bn	418	17
Det, Lndg Spt Bn	379	1

MAB TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Brigade Service Support Group (Cont'd)		
Det, MT Bn	262	0
Det, Med Bn	70	163
Dental Co	0	66
Det, Radio Bn	46	0

APPENDIX 7

RLT TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE

	USMC	USN
Infantry Regt (Rein)	5,528	239
Hq Co	170	5
Det, Hq Bn	10	0
Det, Comm Bn	30	0
Infantry Bn (Rein) (2)	2,404	136
Inf Bn	1,192	68
Det, Hq Bn	10	0
Other elements as appropriate		
Artillery Bn (Rein)	803	17
Assault Amphibian Bn	253	4
Det, Cbt Engr Bn	390	6
Recon Co (Rein)	98	2
Tank Co (Rein)	168	1
Regt Res: Infantry Bn (Rein)	1,202	68
Inf Bn	1,192	68
Det, Hq Bn	10	0
Other elements as appropriate		

APPENDIX 8

MAG TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Marine Aircraft Group	6,513	130
Det, H&MS (-) (Rein)	100	0
Det, Comm Bn	20	0
Det, Marine Aircraft Group (VH)	2,215	43
H&MS (-) (Rein)	281	0
MABS	223	16
HMM (3)	564	12
HMH (Rein)	328	4
HMA	382	4
VMA	358	4
Det, HML	79	3
Det, Marine Air Control Group	920	9
Det, H&HS	49	2
Det, MWCS	123	0
MACS	256	3
Det, MASS	80	0
Det, MATCS	73	0
Det, LAAM Bn	294	4
Det, FAAD Btry	45	0

MAG TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Det, Marine Wing Support Group	271	5
Det, H&GMS	115	5
Det, Wg Engr Sqdn	76	0
Det, Wg Trans Sqdn	80	0
Marine Aircraft Group (Rear)	2,987	73
Det, H&MS	50	0
Det, Comm Bn	20	0
Det, Marine Aircraft Group (VA/VF)	2,247	33
H&MS (-)	355	0
MABS	276	16
VMFA (2)	732	8
VMA (AW)	333	4
Det, VMAQ	224	2
Det, VMFP	163	2
Det, VMO	91	1
Det, MATCS	73	0
Combat Service Support Group	670	40
Det, H&S Bn, FSSG	30	0

MAG TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Det, Brigade Service Support Group	504	38
Det, H&S Bn	64	0
Det, Engr Spt Bn	69	0
Det, Maint Bn	140	0
Det, Supply Bn	95	0
Det, Lndg Spt Bn	119	0
Det, Med Bn	17	38
Det, Marine Wing Support Group	136	2
Det, H&GMS	58	2
Det, Wg Engr Sqdn	42	0
Det, Wg Trans Sqdn	36	0

APPENDIX 9

BSSG TASK ORGANIZATION

SUBSEQUENT OPERATIONS ASHORE, PREPONDERANCE OF FIXED-WING AVIATION AFLOAT OR LOCATED AT THEATER AIRFIELDS OUTSIDE THE AOA

	USMC	USN
Brigade Service Support Group	2,124	245
Det, H&S Bn	428	30
Det, Comm Bn	30	0
Det, Engr Spt Bn	298	6
Det, Lndg Spt Bn	260	1
Det, Maint Bn	470	0
Det, Supply Bn	323	17
Det, MT Bn	262	0
Det, Med Bn	53	125
Dental Co	0	66

APPENDIX 10

MAG TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE AFTER ARRIVAL OF
THEATER AIR ECHELON IN THE AOA

	USMC	USN
Marine Aircraft Group	5,979	92
Det, H&MS (-) (Rein)	100	0
Det, Comm Bn	40	0
Det, Marine Aircraft Group (VH)	1,948	40
H&MS (-) (Rein)	281	0
MABS	223	16
HMM (3)	564	12
HMH (Rein)	328	4
HMA	382	4
Det, VMO	91	1
Det, HML	79	3
Det, Marine Aircraft Group (VA/VF)	2,491	36
H&MS	405	0
MABS	276	16
VMFA (2)	732	8
VMA (AW)	333	4
VMA	358	4
Det, VMAQ	224	2
Det, VMFP	163	2
Det, Marine Air Control Group	993	9
Det, H&HS	49	2
Det, MWCS	123	0

MAG TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE AFTER ARRIVAL OF THEATER AIR ECHELON IN THE AOA

	USMC	USN
Det, Marine Air Contrôup Group (Cont'd)		
MACS	256	3
Det, MASS	80	0
Det, MATCS	146	0
Det, LAAM Bn	294	4
Det, FAAD Btry	45	0
Det, Marine Wing Support Group	407	7
Det, H&GMS	173	7
Det, Engr Sqdn	118	0
Det, Wg Trans Sqdn	116	0

APPENDIX 11

BSSG TASK ORGANIZATION
SUBSEQUENT OPERATIONS ASHORE AFTER ARRIVAL OF
THEATER AIR ECHELON IN THE AOA

	USMC	USN
Brigade Service Support Group	2,658	283
Det, H&S Bn	522	30
Det, Comm Bn	30	0
Det, Engr Spt Bn	367	6
Det, Lndg Spt Bn	379	1
Det, Maint Bn	610	0
Det, Supply Bn	418	17
Det, MT Bn	262	0
Det, Med Bn	70	163
Dental Co	0	66

ANNEX F

HARDWARE AND SOFTWARE SIZING

FOR DEPLOYED AIS-88 PROCESSING

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ANNEX F

HARDWARE AND SOFTWARE SIZING FOR DEPLOYED AIS-88 PROCESSING

F.1 INTRODUCTION

F.1.1 Concepts of Operation

The main body of this report contains the concepts of operation for each deployable functional area. Annex G of this report contains data collection worksheets for each deployable AIS; the worksheets contain three major sections. They are a narrative justification for the deployed AIS and its concept of deployed operation, the character (byte) data transfer and processing requirement, and an administrative section specifying deployed parameters and Marine Corps points-of-contact. The following have been identified as deployable systems by major Marine Corps functional area:

Manpower	REAL FAMMIS
PPO	UNITREP
Aviation-Navy	NALCOMIS
	SUADPS-RT
Aviation-Marine Corps	FREDS
Fiscal	DOV
I&L	M3S
	MIMMS
	SEMS
Varied	Class II and III

The basic concept of operations for each deployable AIS in the 1988 time period calls for data base preparations while in garrison, a transition to an afloat MASC, MASC support during an assault and finally, the echelonment of MASC(s) ashore to support continued operations.

The MASC is a extension of administrative-type processing to alfoat and ashore operations in an AOA. The MASC is not a tactical computer as defined within the MCTACCS world, however, a MASC will provide a capability to prepare data upon magnetic media on a periodic (probably daily) basis for transfer to the required MCTACCS systems but principally TCO. Unit input to, and output from the MASC would be provided based upon ADPE-FMF devices.

Following in this annex therefore are the computations to support the sizing for processing by functional area. In the later part of this annex, the individual AIS processing requirements are aggregated into those for a MAF with the MAB being a subset of a MAF - the MAU is totally supported by ADPE-FMF devices.

In all cases under consideration, the continued operations ashore phase of an amphibious operation creates the greatest processing load and hence, the sizing computations are based upon projected processing requirements during continued operations ashore with a theater airfield echelon (TAE).

F.1.2 Sizing Parameters/Adjustments

F.1.2.1 Thirty-day month. CONUS-like processing is accomplished in the 22 working days available each calendar month. Since administrative processing is an AOA will be accomplished on a 7 day-per week basis, the computed monthly processing requirement must be factored by 30 ÷ 22 or 1.364. This is an assumed linear relationship.

F.1.2.2 Reliability. Todays processing is accomplished on processors having more than one central processing unit (CPU). Should one of two or more CPUs become inoperable, the remaining CPU(s) must be capable of providing a continuing processing capability without a significant degredation in processing response time. An analysis of the reliability of multiple CPU configurations was conducted in the REAL FAMMIS feasibility study by PGRG and completed and reported in August 1980.

For a 2-CPU configuration assumed for a MASC, a 50 percent greater processing capability must be provided in each CPU in order to provide an acceptable level of degraded processing. The 50 percent greater capability provides a redundant processing capability for normal operations which is consistent with the commercial sector's approach to sizing multiple CPU configurations. The degree of degredation would be reflected in a worst case situation to about a 12 second response compared to normal response times not exceeding about 2 seconds.

F.1.2.3 Peak Loading. Analysis of a number of computer operational logs reveals that during certain periods of time during the day, the processing demands increase, particularly in the interactive processing environment where users demand processing time in other than a purely random fashion. In some ways, the demand upon processing time is similar to that of a phone system where calls place demands upon the system with a poisson (random) distribution. The peak loading for commerical telephone system calls occurs around noon and becomes a part of what is defined as the busy hour. Telephone companies design their circuit requirements so that for busy hour, twenty percent of the 24 hour total requirement may be completed with a 98 percent rate of call completion. From a statistical point-of-view, the users of a computer system are far fewer than telephone subscribers, hence to provide high assurances of computer processing in an interactive environment, a 30 percent additional processing capability is provided to account for the busy hour-type processing which occurs at three different times during the time prime computer work day. The first busy-type hour occurs between 8-9 AM where reruns and new jobs are input. Then at noon, another busy-type hour occurs because many users will place a run into the system so that output from the processing will (hopefully) be available upon the user's return from lunch. A third busy hour potentially occurs near the end of the normal work day as user's input work for overnight turnaround. This third busy-type hour is normally alleviated since one-to-two shifts are available for overnight processing. To provide a processing capability for peak or busy-hour-type processing, an additional 30 percent processing capability will be added to the identified processing needs.

F.1.2.4 Interactive System. The last decade and one-half has seen the rapid implementation of interactive systems. Two significant capabilities are being added to existing or redesigned software to support this interactive processing environment.

First, many of today's Marine Corps Class I AISs are operated in the batch mode; i.e., punched cards are provided the computer operators who place the jobs on the computer as time is available and processing priorities are met. As system software is placed in the interactive processing mode, a conversion is required so that the batch-editing functions are portrayed on the interactive CRT screen. Further, and with the advent of significantly faster computers, the edit routines and DBMS's perform more complex functions which places an additional processing requirements on the MASCs. Although not well documented at this time, technical personnel have made knowledgable estimates that the additional processing power required from interactive software will be about 30 percent of the baseline, batch processing requirement. This estimate was validated with the U.S. Army's similar experience through Lieutenant Colonel Joseph H. Shine from the Advanced Technology Directorate of the U.S. Army's Computer Systems Command by telephone on 19 July 1979. Included within the interactive processing factor is a five percent overhead attributable to system sign on/off and the processing requirement for conversational prompting in contemporary software packages.

F.1.2.5 System Growth. A previous study pertaining to future Marine Corps processing requirements (reference ggg) showed CDPA and RASC annual growth rates in excess of 20 percent with HQMC CDPA at 44 percent. These growth rates are discussed in a PGRG study (reference u). A 12 percent annual growth rate was based upon CONUS-type AIS operations, however, it is believed that only about half of the 12 percent rate will apply to deployable software hence a six percent annual growth rate will be applied to deployable software where software growth is indicated as a factor.

F.1.2.6 AIS-Unique Processing Adjustments. The bulk of the major systems under development in the Marine Corps today are interactive systems which are one-for-one replacements for today's batch processing systems. The major, new Class I AISs and their projected impact are listed in Table F.1 below.

TABLE F.1

MAJOR AIS PROCESSING IMPLICATIONS

Old Batch	New Interactive	Implications
JUMPS/MMS	REAL FAMMIS	More functions in CONUS, less deployed system growth
FORSTAT	UNITREP	Insignificant - small system
3M	NALCOMIS	
SUADPS-EU	SUADPS-RT	Navy provided hardware/software
FREDS	FREDS	
DOV	DOV	ADPE-FMF only
SASSY	M3S	System growth
MIMMS	MIMMS	System growth
MEDS	SEMS	Insignificant - small system
Varied	Varied	Assumed constant percentage of 33%

F.1.2.7 Baseline Processing Requirements. The baseline processing requirements, i.e., the monthly processing time for currently operating AISs had been extracted from res[illegible]ce cost and utilization (RESCU) reports. The RESCU reports were prov[illegible]ded HQMC each month by the 17 ASCs, however, these reports were discontinued in 1981 because there were questions pertaining to their accuracy and utlization. Another utilization system is being considered for implementation at this time.

Data from RESCU reports was collected and analyzed in 1980 and is the best data available for the establishment of baseline processing requirements. For this reason, the 1980 RESCU data will be used as discussed with a representative in HQMC-CCIR on 2 March 1982.

The RESCU reports provide the processing time requirements for standard and local automated systems operated at the Marine Corps ASCs. RESCU reports were not available for the IBM 360/50 at Camp Pendleton or the IBM 360/40 at MCDEC. Some adjustments and assumptions pertaining to reported Class I-III AISs were required in extracting and developing the data from the RESCU reports. First, data values were assumed for the two ASCs for which RESCU reports were not available. Second, due to software changes made to RESCU in 1978, not all ASCs were transmitting up-to-date RESCU reports to HQMC (CCIR); therefore, about half of the reports were out-of-date. The up-to-date reports were as of February 1980, therefore, the out-of-date reports were updated to February 1980 by applying a one percent per month growth rate to the reported processing requirements. The last adjustment required to determine the baseline processing requirements was to convert the processing requirements from the various-size IBM 360 series computers into a common denominator of IBM 360/65 equivalent processing time.

Each deployable system will be briefly discussed and the computations shown for the development of a MASC sizing estimate.

F.2 DEPLOYABLE AISs AND THEIR SIZING ESTIMATES

Following in each sub paragraph, is a brief discussion of each deployable administrative function and the computations associated with a sizing estimate.

F.2.1 Manpower and Military Pay

REAL FAMMIS is under development by the Marine Corps as the replacement for the current JUMPS/MMS. The chosen alternative for the implementation of REAL FAMMIS is the hybrid alternative wherein a Marine Corps-wide central data base is maintained in Kansas City and manpower regional data bases are provided each RASC for the purpose of regional data base inquiry (all pay data would only be located in Kansas City). For deployed MASC operations, the regional concept for manpower data base update from Kansas City was envisioned by HQMC personnel, however, this meant that the deployed data base would be days or weeks old since the bulk data transfer would be accomplished by courier upon magnetic media. Interviews with personnel in the FMFs revealed that an outdated, deployed manpower data base would be useless to them and hence not utilized. HQMC and CDPA-Kansas City personnel envisioned a limited deployed manpower data base of about 10,000 characters (bytes) per record and the FMF users were avid about the limited data base being updated upon the initiation of manpower transactions to the MASC. For this reason, the manpower sizing is conducted assuming a limited update of the manpower data base on the deployed MASC. A further and significant impact upon deployed manpower processing stems from HQMC guidance that the deployed processing requirement for the manpower portion of REAL FAMMIS will be 25 percent of the normal CONUS-type processing requirement.

At this time, the concept for deployed pay-related processing is to utilize the ADPE-FMF devices for this purpose. The sizing of standalone reporting unit processors and the pay-related processing is not considered within this study, however, insights into the sizing of the standalone processors may be acquired from the REAL FAMMIS feasiblity study.

F.2.1.1 Manpower Baseline Processing. The methodology utilized to develop the manpower processing requirements for a deployed MAF in the 1988 time period is to establish a baseline manpower processing requirement from the 1980 time frame. The baseline processing requirement developed from MMS processing will then be extrapolated to the 1988 processing requirement utilizing such factors as the processing requirement growth rate, peak interactive processing demands, etc.

The baseline MMS processing requirements were defined utilizing Resource Cost and Utilization System (RESCU) reports provided by HQMC-Code CCIR and are listed in Table F.2.

TABLE F.2

MANPOWER SYSTEM PROCESSING REQUIREMENTS - BASELINE

ASC NO.		IBM 360 MODEL	RESCU REPORT DATE	TOTAL PRODUC-TION	MANPOWER SYSTEMS	FEB 1980	360/65 EQUIV.
2	MCB, Camp Lejeune	50	Feb 80	278.9	17.7	17.7	4.8
3	MCB, Camp Pendleton	65	Apr 78	491.5	38.1	46.5	46.5
		50	Not Av.	Assumed	30.0	30.0	8.1
5	MCAS, El Toro	30	May 78	238.3	14.4	17.4	.4
6	HQ FMFPAC	50	Sep 79	368.2	23.8	25.0	6.7
7	MCDEC, Quantico	40	Not Av.	Assumed	20.0	20.0	2.4
9	HQMC, Washington	65	Aug 79	417.2	76.8	81.4	81.4
		65	Aug 79	463.6	94.7	100.4	100.4
11	MCRD, Parris Island	40	Feb 80	349.8	28.9	28.9	3.5
12	MCLSBLANT, Albany	65	Feb 80	394.3	5.4	5.4	5.4
		50	Feb 80	503.5	.3	.3	.1
13	MCLSBPAC, Barstow	40	Dec 79	447.4	2.3	2.4	.3
15	MCRD, San Diego	40	Oct 79	631.4	86.6	90.1	10.4
17	MCASC, Kansas City	65	Feb 80	356.3	44.7	44.7	44.7
		65	Feb 80	301.1	43.6	43.6	43.6
24	HQ, FMFLANT	40	Sep 79	193.2	4.5	4.7	.5
28	6th FASC, IWAKUNI	50	Apr 79	473.9	30.0	33.0	8.1
29	4th FASC, El Toro	50	Feb 80	531.8	87.4	87.4	23.6
30	5th FASC, Cherry Point	50	Feb 80	303.7	147.2	147.2	39.8
33	2nd FASC, Lejeune	65	Feb 80	427.0	5.9	5.9	5.9
55	3rd FASC, Okinawa	65	Feb 80	613.7	21.3	21.3	21.3
	Total - 360/65 hours per month in 1980 - baseline						457.9

Notes: ASC 43, CSS, Quantico - No Manpower Processing

360/65 Equivalence: 360/50 = .27; 360/40 = .12; 360/30 = .03

Note that, as of 1980, the Marine Corps was providing 457.9 hours supporting IBM 360/65 equivalent processing requirements. The 457.9 processing hours per month becomes the baseline requirement from which deployed REAL FAMMIS processing requirements are developed for the 1988 time period.

The growth rate for deployed REAL FAMMIS processing has been established at an annual rate of six percent as discussed earlier. The processing growth rate was applied as a constant monthly growth rate of one-half percent of the baseline processing time. It is assumed that the six percent annual growth rate would apply to current MMS operations and to REAL FAMMIS during its implementation and operating phases. The growth rate was applied only to the CPUs and core memory elements of the equipment suite. The growth rate was not applied to direct access storage devices (DASDs) and other peripheral devices since the sizes and system output should remain about constant.

Table F.3 portrays the estimated input and output characters from the current MMS (1980) and those expected for REAL FAMMIS implementation in 1985 - the REAL FAMMIS character inputs and outputs are expected to be the percent of the current JUMPS/MMS character inputs and outputs. Processing requirements are assumed to be linear with the number of input and output characters. System growth from the JUMPS/MMS baseline to the implementation of REAL FAMMIS, a period expected to be four years and seven months (Feb 80 - Oct 85), will be:

$$\frac{\text{1,433,690K char/mo (1985)}}{\text{692,106k char/mo (1980)}} = \text{207 percent}$$

increase in processing time upon the implementation of REAL FAMMIS in 1985.

TABLE F.3

MANPOWER CHARACTER INPUT AND OUTPUT ESTIMATES

(1000 CHARACTERS PER MONTH - FROM REAL FAMMIS STUDY)

	Manpower		
	Input	Output	Total Input/Output
JUMPS/MMS (1980)	114,483	557,623	692,106
REAL FAMMIS (1985)	168,677	1,265,013	1,433,690

F.2.1.2 1988 Manpower Processing. The system growth from 1985 to 1988 is assumed to occur at a six percent annual rate.

A number to terminals may be hardwired to the MASC so that a portion of the processing load will result from interactivity. It is estimated that 60-odd terminals in an AOA will be accepting REAL FAMMIS input, however, only about ten will be hardwired and hence interactive to the MASC therefore the equivalent load will be:

$$\frac{10 \text{ interactive terminals}}{50 \text{ total terminals}} \times \underset{\text{(interactive factor)}}{.30} = \underset{\text{interactive increase}}{.05 \text{ or } 5 \text{ percent}}$$

Following in Table F.4 is a summary of REAL FAMMIS modified processing requirements as developed in this subsection, as they pertain to the central site.

First, the processing requirement will be computed based upon millions of instructions per Marine per day in 1980 (MIMD) as follows.

$$\frac{457.9 \text{ hrs/mo X .6 MIPS}^{1} \text{ X 3600 sec/hr}}{22 \text{ days/mo X 390,000 Marines}^{2}} = \text{million instructions per Marine Day (MIMD (1985)}$$

[1]MIPS-Million instructions per second; .6 equals the processing power of an IBM 360.65.

[2]Includes active duty plus reserves.

TABLE F.4

SUMMARY OF REAL FAMMIS PROCESSING FACTORS

(MASC FOR MAF)

Factor	Adjustment
REAL FAMMIS Implementation	207% Additional
Growth	6% Annual 1985 to 1988
30-Day Month	30/22 Additional
Reliability	50% Additional
Peak Loading	30% Additional
Interactive	5% Additional
Deployed Processing Requirement	25% of Total

Conversion of the base line to a deployed processing requirement is computed as follows:

$$.12 \text{ MIMD} \times \underset{\text{(REAL FAMMIS Implementation)}}{2.07} \times \underset{\text{(Growth 80-88)}}{1.18} \times \underset{\text{(30-Day Month)}}{\frac{30}{22}}$$

$$\times \underset{\text{(Reliability)}}{1.5} \times \underset{\text{(Peak Loading)}}{1.3} \times \underset{\text{(Interactive)}}{1.05} \times \underset{\text{(Deployed Rqmt)}}{.25}$$

x 52,000 MAF = 10,639 MIPD (Millions of Instructions per day per MASC)
(Marines/MAF)

Assuming processing will occur in a 12 hours period, the hourly processing requirement for manpower on a MAF MASC will be:

$$\frac{10{,}639 \text{ MIPD}}{12 \text{ Hours/D} \times 3{,}600 \text{ sec/hr}} = .25 \text{ MIPS processing power for MASC Manpower - MAF}$$

This 1988 deployed requirement for MASC processing of manpower software includes Class II and III processing along with Class I AIS manpower processing - Class II and III were computed to be 33 percent of the total processing for manpower AISs.

The MASC would be operating a limited number of REAL FAMMIS software packages, including some aggregation and distribution software and a DBMS for retrievals. The DBMS may actually be supplied by the vendor in the form of an editor that interfaces with the operating system. An editor supplied by the vendor is assumed by the study team. An estimated core map for the MASC memory follows in Table F.5.

TABLE F.5

MASC CORE MAP - DEPLOYABLE REAL FAMMIS

Automated Software	Estimated Size in Corp, (MBytes)
Operating System (with editor)	.30
Reentrant Control	.10
Monitor	.30
Application Programs (3 @ .25 MBytes) or DBMS	.75
SUB TOTAL	1.45
Plus 207% implementation (1985)	3.00
Plus 18% for growth (1985-88)	.26
SUB TOTAL	4.71
Plus 15% spare (core allocation)	.71
TOTAL MASC CORE REQUIREMENT	5.42 MBytes

The direct access storage discs (DASDs) for a manpower processing on a MASC is based upon a 10,000 character (byte) record for each individual Marine within the MAF. In addition to the basic storage requirement, other mass storage factors must be included as follows:

- An additional percent of the storage space is provided for the utilization of Class II and III automated systems.

- The editor or DBMS requires twice the basic storage space to both maintain old versions of the data base and the file structure (inverted files or direct access addresses) for the data base.

- Not all of a DASD storage space is usable - record block are seldom completely filled and up to five percent of the storage space may be faulty and thus unusable; hence, 33 percent additional file space is required to compensate for unused portions of the mass storage media.

- Finally, operating system files are maintained upon the mass storage media which require about ten percent of the storge space.

Computation of the DASD requirements is based upon the following:

10,000 bytes/Marine X 52,000 Marines/MAF *
(Basic Storage Requirement)

1.47	X	2.00	X	1.33	X	1.10
(Class II and III Systems)		(Usable Storage)		(Operating System)		(Editor or DBMS)

= 2,237 MBytes of DASD for REAL FAMMIS data storage.

This is a relatively large data storage requirement which may be accommodated with seven triple density DASD utilizing current technology at 317 MBytes per DASD. An eighth triple density drive is required for the operating system, Eight of the current triple density DASDs may require an excessive amount of floor space (approximately 42 sq ft plus maintenance space) in the MASC. Future technology using further miniaturization and "Winchester" disc technology will provide more compact, higher speed data accesses for the 1988 time period DASDs.

F.2.1.3 Other Manpower Peripheral Devices. Diskettes from ADPE-FMF devices will be input to and output from the MASC from some 60 terminals in a MAF. The management and I/O operations to and from the MASC will require diskette I/O magazines. Such units are in use with the fixed IBM Series/1s, located with each CDPA and RASC. The fixed IBM Series/1s are highly programmable versions of the ADPE-FMF devices with much greater capabilities. This capability must be provided with each MASC. Currently, each RASC and CDPA utilizes an IBM Series/1 with 2, 10 diskette magazines and a high speed channel (38.4 kbs) into the RASC processor. This capability was also required for the MASC manpower processing.

Two tape drives will support the needs of the MASC; the two drives would provide redundancy plus a capability to perform tape-to-tape copies for the purpose of providing system and data backup.

One high speed printer would support the printing requirements within the MASC since printing from the interactive or bulk data transfer environment will be minimal (but at this time not defined). The utilization of a computer output to microform (COM) device is not envisioned for the tactical environment. Temperature extremes, humidity and dirt/dust would make a deployed COM device infeasible for use with the current state-of-the-practice. The utilization of a COM device in the deployed environment will require periodic review to determine if the COM state-of-the-art significantly improves such that use in the deployed environment is practical.

The remote terminal and printer requirements for the deployed REAL FAMMIS are based upon the requirements developed within the REAL FAMMIS feasibility study which are 87 terminals and 93 printers per MAF; 60 were assumed used for manpower purposes.

F.2.1.4 Summary for MASC - Manpower Processing. A summary of the manpower-oriented MASC requirements follows in Table F.6.

TABLE F.6

SUMMARY OF MANPOWER MASC SIZING

Number of cycles per week in combat - 7

Transactions per Marine per day - 2 (100 char each)

CPU processing speed - .37 MIPS, more than one CPU

Core Memory - 5.42 MBytes, say 6

DASDs - 8 triple density standard drives (7 data, 1 System)

Tape Drives - 2, 9 track, 1600 BPI or 5650 BPI

Diskette I/O magazines

High Speed Printer - 1

Terminals per MAF - 60

Terminal printers per MAF - 60

F.2.2 Policy, Plans and Operations (PPO) - HQMC

HQMC-PPO is responsible for conducting the UNITREP function - that of unit status reporting from battalion/squadron level to the JCS. This function for both CONUS and deployed operations will, as currently planned, be conducted soley upon ADPE-FMF devices and hence does not impact the sizing for a deployable MASC.

In the event a MASC were used for UNITREP processing, its processing time would be trivial, however, it would require processing in a classified environment; this would create a need to schedule UNITREP processing for consonance with unclassified processing.

F.2.3 Aviation

A replacement system for all aviation-related functions is in the acquisition process. It is the Shipboard Non-Tactical Automated Data

Processing System (SNAP). The acquisition includes the hardware and software necessary to perform the functions previously performed by 3M, FREDS, SUADPS-EU, and SNASS. This aviation oriented system acquisition and implementation is planned for the near term time frame, is being totally conducted by NAVAIR (with Marine Corps input), and includes 17 mobile configurations for Marine Corps MAGs. The new system is termed NALCOMIS.

The preliminary concept of operation for aviation processing included a MASC at the MAW for the purpose of preparing aggregated management reports for the MAW from the NALCOMIS configuration outputs; the NALCOMIS system design does not incorporte such an aggregation capability nor was HQMC-aviation able to provide estimated processing needs for the data aggregation function at the MAW-level.

Normal Marine Corps ground-associated AIS processing would be prepared with organic ADPE-FMF devices within the MAW and transferred to a MASC and processing in a normal fashion within the concept for deployed AIS processing.

F.2.4 Fiscal

The fiscal functions which are planned for deployed operation are the DOV and CFAO functions. The DOV impacts deployed automated processing while the CFAO function will be performed manually.

F.2.4.1 DOV. DOV will be processed upon ADPE-FMF devices in support of all phases of an amphibious operations for all MAGTFs. It is not known at this time whether any processing for MAB and MAF operations will be conducted upon MASCs. The current monthly baseline processing requirement upon 360/65s for a MAF is 13 minutes and is overlooked as a specific processing time requirement for the deployed MASC; the MAB time is 6 minutes per month (see pages G18-19 of Annex G).

F.2.4.2 CFAO. The deployed CFAO function will be performed by a team of personnel which will collect hard copy fiscal and accounting documents and periodically mail them to a CONUS-type CFAO office; personnel in the CONUS-type CFAO office will enter the documents as in normal CONUS operations. Information turn-around time to the deployed MAGTF could take a few weeks. There are no demands placed upon the deployed MASC due to CFAO operations.

F.2.5 Logistics/Combat Service Support (CSS)

The identified, deployable CSS functions are M3S, MIMMS and SEMS. M3S creates the largest deployed processing need by several-fold compared to the number two contender - the manpower portion of REAL FAMMIS. MIMMS and SEMS, for this analysis, are considered integral to M3S for processing, hence the sizing estimate will include the needs for M3S, MIMMS and SEMS deployed processing upon a MASC.

F.2.5.1 M3S/MIMMS/SEMS Baseline Processing. The baseline processing requirements for M3S/MIMMS/SEMS are taken to be today's processing requirements for the AISs which will be supplanted by M3S/MIMMS/SEMS; this includes class II and III logistical AIS processing which is documented as 33 percent of the total logistical processing

The baseline logistical processing requirements were extracted from the Resource Cost and Utilization (RESCU) reports provided by HQMC-CCIR as discussed earlier.

In preparing the sizing estimate for a deployed MAGTF, it was originally desired to extract data from a RASC or FASC that represented the logistical processing requirements of a MAF. Two options were available for a representative MAF - Camp Lejeune and Camp Pendleton; a visual review of the Camp Pendleton data revealed the turmoil experienced at that facility caused by consolidation of the RASC and FASC. Due to the consolidation of activities at Camp Pendleton, and the obvious visual nuances in the data, Camp Pendleton was eliminated as a source of data in establishing a MAF baseline processing requirement for deployed logistical functions.

Camp Lejeune, on the other hand, had more consistent data and is thereby utilized to develop the baseline processing requirement for M3S/MIMMS/SEMS functions. The raw data from Camp Lejeune as extracted from the RESCU report is displayed in Table F.7. Figure F.1 contains a pictorial display of the monthly data along with a single linear regression of the monthly logistical processing requirement at Camp Lejeune for a one, and a two-year period. Two interesting observations may be drawn by reviewing Figure F.1. First, one may see the sizable increase in logistics processing from October 1979 to February 1980 undoubtedly occasioned by operations in the Persian Gulf in that time period. Secondly, the Camp Lejeune logistical processing shows a decrease in processing requirements as shown graphically and as expressed as a negative slope in the regression equations. The negative growth factor was not anticipated since AISs normally grow at a rate of five to six percent annually as explained in the previous subsection. Investigation of the negative growth trend for Camp Lejeune logistical processing revealed that operating system and utility packages were installed during the period that performed more efficiently than the originally provided and operated IBM software. For example, the IBM system sort package was replaced with a vendor package called CA sort. CA sort puportedly operated 40 percent more efficiently than the IBM-provided sort package.

The negative growth for Camp Lejeune logistical processing was expected to terminate and return to a normal anticipated growth rate of five to six percent per year commencing in 1981. To validate this expectation, Albany processing was analyzed from data listed in Table F.8 and dipicted in Figure F.2. The growth rate of Albany, not impacted by more efficient software implementations, was 4.9 percent on an annual basis thus an annual growth rate of five percent will be utilized for logistical processing vice the six percent discussed in subparagraph F.1.2.5 of this annex.

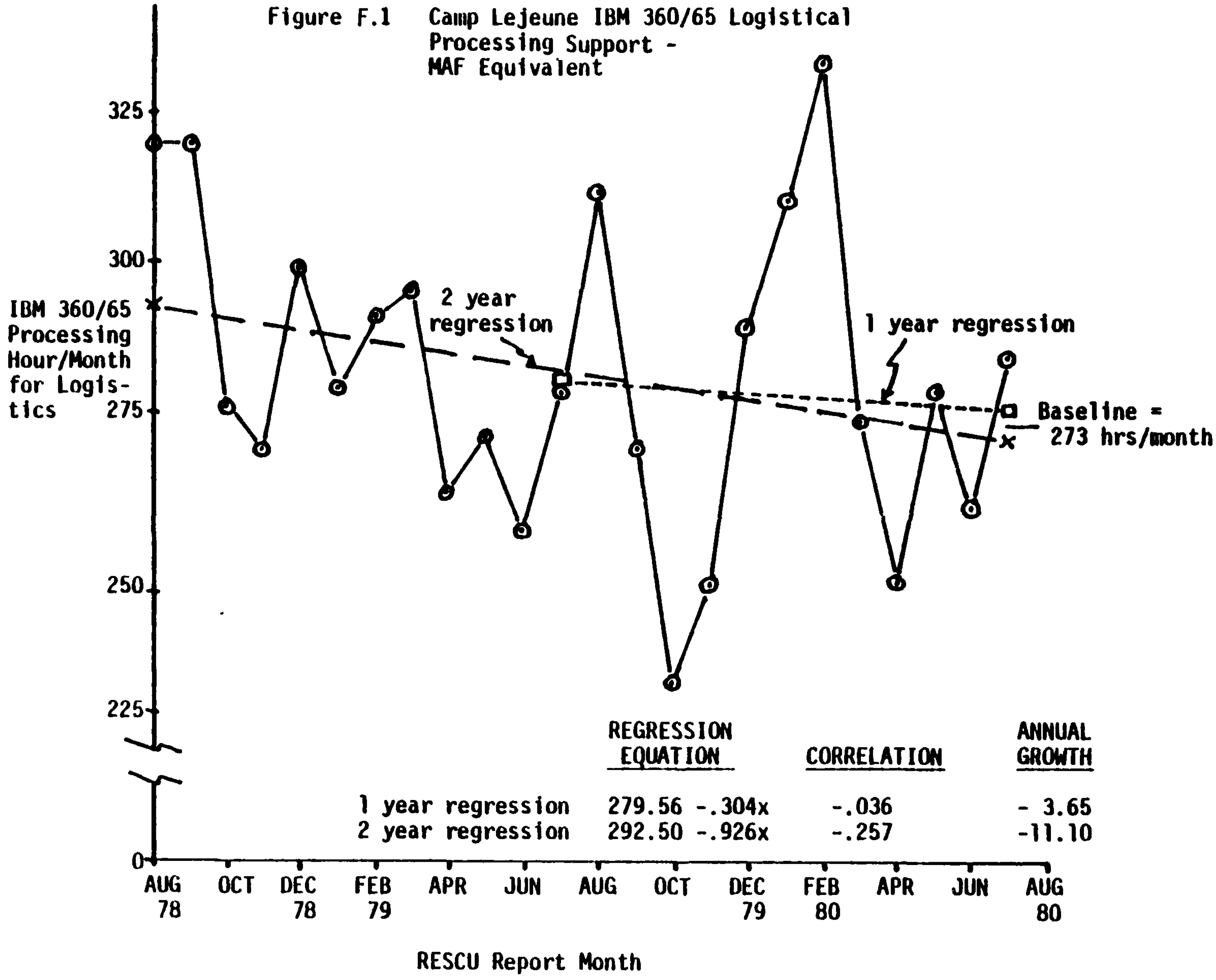
An additional and significant impact upon deployed logistical processing stems from the anticipated increased logistical consumption during the contunued operations ashore phase of an

TABLE F.7. LOGISTICAL PROCESSING AT CAMP LEJEUNE IBM 360/65 - 2ND FASC, ACTIVITY NO. 53

RESCU REPORT MONTH	PARTITION PRODUCTION	HOURS EXECUTE	SYSTEM AVAIL	WALL CLOCK HRS TOTAL PROCESSING	WALL CLOCK HRS LOGISTICS PROCESSING	40R7 DSSC RET	4007 DSSC	401R PROVIS RET	40R1 WAR RES RET	4011 WAR RESERVES	410R SASSY RET	4100 SASSY	415R MIMMS RET	4150 MIMMS FIELD	440R MEDS FLD RET	4500 LOCAL LOG	TOTAL PERCENT LOGISTICS PROCESSING
						RESCU REPORT NO. AND TITLE/PERCENT OF PROCESSING TIME											
JUL 80	1017	1123	504	456	284				.01	.05	8.46	28.04	5.52	19.77	.23	.24	62.32
JUN 80	865	965	478	432	259					.07	6.96	26.70	6.30	18.53	.12	.22	59.90
MAY 80	985	1112	507	449	278	.13		.26			7.94	29.70	5.01	18.41	.26	.24	61.95
APR 80	813	984	473	391	247						9.10	27.52	5.79	19.02	.52	.99	62.94
MAR 80	759	899	458	387	273					.09	8.28	35.77	5.61	20.13	.10	.68	70.66
FEB 80	802	1016	541	427	333				.04	.26	10.64	32.49	7.28	22.35	.25	.10	73.41
JAN 80	827	1008	526	432	310				.01	.57	9.42	29.28	7.37	24.81	.19	.17	71.82
DEC 79	675	833	504	408	289					1.38	10.13	28.30	8.03	21.60	.02	1.29	70.75
NOV 79	780	941	441	366	247				.12	.02	8.71	29.98	6.70	20.55	.09	.67	66.84
OCT 79	719	872	434	358	230		.01		.01	.94	7.78	29.70	4.26	20.83	.05	.76	64.34
SEP 79	864	956	508	459	269			.05			7.86	27.08	3.73	19.76	.06	.14	58.68
AUG 79	866	978	529	468	312	.37	.49			.03	7.01	32.17	5.26	20.85	.05	.47	66.70
JUL 79	786	897	478	419	278		.01				7.82	29.51	5.50	23.15	.01	.25	66.25
JUN 79	768	923	490	408	255			.08		.74	6.32	27.33	5.45	22.18	.10	.27	62.47
MAY 79	795	966	490	422	271		.03				4.81	31.47	3.48	23.94	.28	.16	64.27
APR 79	670	783	470	402	262						4.20	27.84	5.82	26.87	.35	.20	65.28
MAR 79	642	759	517	437	295						4.51	31.95	5.53	25.27	.15	.08	67.49
FEB 79	610	736	494	409	291						15.78	29.77	6.22	19.13	.17	.13	71.20
JAN 79	692	803	476	410	279						8.89	30.51	5.07	22.63	.55	.46	68.11
DEC 78	693	783	491	435	298						5.04	33.54	6.18	23.19	.43	.19	68.57
NOV 78	626	685	461	421	268		.06				6.96	32.23	4.62	19.15	.14	.51	63.67
OCT 78	708	793	475	424	277	.06	.31				8.22	31.85	5.97	17.85	.43	.53	65.22
SEP 78	832	920	581	529	319						4.94	31.10	7.32	16.55	.15	.29	60.35
AUG 78	880	985	569	508	318						7.19	29.56	7.31	17.16	1.23	.10	62.55

Data Obtained from HQMC-CCIR

Figure F.1 Camp Lejeune IBM 360/65 Logistical Processing Support - MAF Equivalent



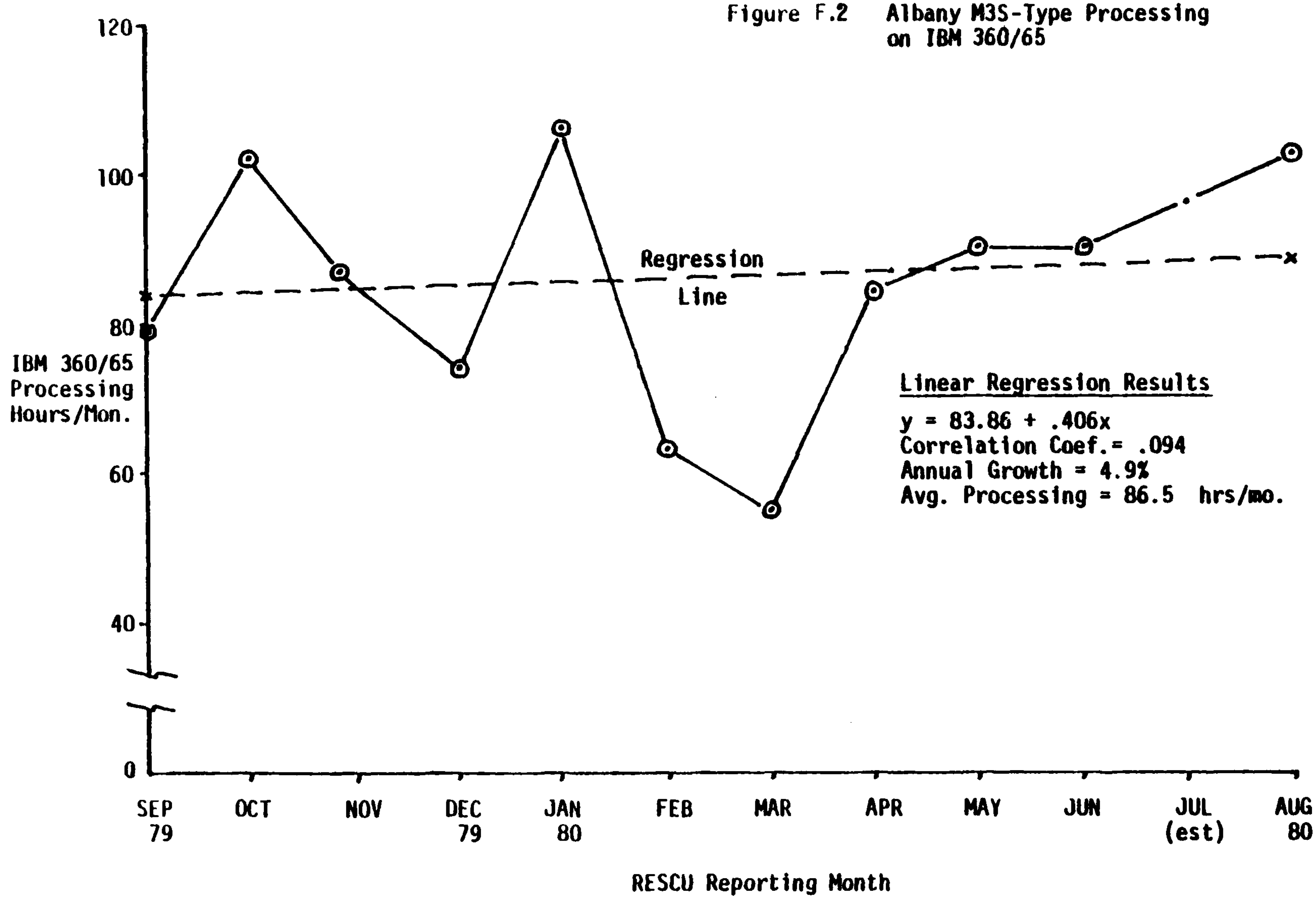
	REGRESSION EQUATION	CORRELATION	ANNUAL GROWTH
1 year regression	279.56 -.304x	-.036	- 3.65
2 year regression	292.50 -.926x	-.257	-11.10

TABLE F.8. ALBANY LOGISTICS SYSTEMS BASELINE DATA

ALBANY SYSTEM 360/65	PARTITION HOURS CPU PRODUCTION	PARTITION HOURS CPU EXECUTION	HOURS SYSTEM AVAIL	PRODUCTION HOURS	PERCENT OF PRODUCTION TIME SASSY	PERCENT OF PRODUCTION TIME MIMMS DEPOT	PERCENT OF PRODUCTION TIME DIDS	TOTAL PERCENT	PROCESSING TIME SASSY, MIMMS, DIDS
AUG 80	1708	2120	619	499	6.38	6.87	7.15	20.4	102
*									
JUN 80	2114	2401	615	541	5.27	6.08	6.22	16.6	90
MAY 80	2033	2740	655	486	7.60	5.38	5.65	18.6	90
APR 80	2654	3505	672	509	4.59	5.76	6.16	16.5	84
MAR 80	2176	2892	501	377	2.85	5.41	6.40	14.7	55
FEB 80	1972	2646	529	394	4.48	4.91	6.64	16.0	63
JAN 80	1988	2746	634	459	9.78	5.17	8.07	23.0	106
DEC 79	1631	2011	569	461	4.26	5.57	6.15	16.0	74
NOV 79	1616	2259	568	406	8.51	6.30	6.59	21.4	87
OCT 79	1991	2472	602	485	8.38	6.44	6.11	21.0	102
SEP 79	2077	2567	608	492	5.36	7.14	5.53	18.0	89

*July 80 Data NVAL Linearity Assumed

Figure F.2 Albany M3S-Type Processing on IBM 360/65



amphibious operation. Experienced personnel within HQMC, at Albany and from field visits concur that the tactically deployed logistical transactions and hence the processing time will be 150 percent greater than the baseline processing time. Additionally, the interactive load is expected to come from six terminals of 60 which will be preparing input to M3S/MIMMS/SEMS. The interactive load would therefore be:

$$\frac{6 \text{ interactive termals}}{60 \text{ total terminals}} \times 30 \text{ percent} = 3 \text{ percent additional}$$

The summary of M3S/MIMMS/SEMS processing factors applicable to the deployed processing environment is displayed in Table F.9.

TABLE F.9

SUMMARY OF M3S/MIMMS/SEMS PROCESSING FACTORS

Factor	Adjustment
Growth	5% Annual
30-Day Month	30/22 Additional
Reliability	50% Additional
Peak Loading	30% Additional
Interactive System	3% Additional
Deployed Processing	150% Additional

Utilizing the Camp Lejeune baseline processing time of 273 hours per months for M3S/MIMMS and the Class II and III AISs (33 percent of total, the following 1988 daily processing rate is computed:

$$\frac{273 \text{ hrs/mo } (360/65)}{22 \text{ days/mo}} \times .6 \text{ MIPS (Million inst per sec)} \times 3600 \text{ sec/hr} = 26.804 \text{ MIPD}^{1}$$

[1]MIPD - million instructions per day

Assuming that logistical processing occurs for 12 hours during a typical day, the processing speed over seconds is computed as follows:

$$\frac{26{,}804 \text{ MIPD}}{12 \text{ hr/day} \times 3{,}600 \text{ sec/hr}} = .62 \text{ MIPS - baseline}$$

The baseline processing needs for M3S/MIMMS/SEMS in 1981 must be adjusted for the 1988 deployed processing environment.

F.2.5.2 1988 M3S/MIMMS Processing. The 1981 baseline processing need for 1988 is adjusted and computed as follows:

$$.62 \text{ MIPS} \times \underset{\text{(Reliability)}}{1.5} \times \underset{\text{(Peak Loading)}}{1.3} \times \underset{\text{(Interactive System)}}{1.03}$$

$$\times \underset{\text{(Deployed)}}{2.5} \times \underset{\text{(Growth 1981-88)}}{(1 + (7 \times .05))} \times \underset{\text{(Work Month)}}{\frac{30}{22}} = 5.73 \text{ MIPS}$$

This processing need includes processing for M3S, MIMMS, SEMS and Class II and III AISs - the Class II and III AISs are up to 33 percent of the total logistical processing.

F.2.5.3 SEMS Processing. MEDS was the predecessor for SEMS, and is included in the CSS AISs included in calculations conducted in the preceeding subparagraph. For 1988, SEMS is anticipated to require more processing time on a MASC than MEDS but only a minor increase in that time. Per Table F.7, MEDS for a MAF averaged only .24 hours (or 15 minuted) per month. Hence, the processing requirement for the deployed SEMS will not be specifically included as a processing requirement due to its trivial need for processor time.

F.2.6 CSS Core Memory

The core memory necessary to support deployed CSS processing was derived in conjunction with the M3S Development Team at the Marine Corps Logistical Base, Albany. Prior to discussions with the development team, overlay sizes of .25 MBytes had been contemplated, however, it was their desire to use .5 MBytes overlays to take advantage of the larger (up to 16 MBytes in the 1981 time period), inexpensive core memories now available with contemporary computers. The agreed-upon size is given in Table F.10.

TABLE F.10

CSS CORE MEMORY MAP

4 overlays @ .5 Mbytes	=	2.0 Mbytes
Operating System	=	.6
Telecommunications Interface	=	.5
DBMS	=	1.4
Reentrant Processor	=	.4
SUB TOTAL	=	4.9 Mbytes
Core Allocation + 15%	=	.6
TOTAL	=	5.5 Mbytes

The identified 5.5 Mbyte core memory for deployed CSS processing is rounded to 6.0 Mbytes, the next logical increment of core.

F.2.6.1 CSS Mass Storage. The major mass storage necessary to support a fully committed MAF is based upon 61,000 line items of supply which was origionally documented by HQMC-Code LPS and was indorsed by the M3S Development Team at Albany. Further, the number of characters per line item record was established at 6,000 for M3S processing and provided by the data base managers of the M3S Development Team. The remaining significant mass storage results from MIMMS, a data base which must be on-line concurrently with M3S. No deployed data base information was made available hence the PGRG study team has made a preliminary estimate based up discussions with several MMDs, Albany and HQMC. The estimated size is based upon 16,000 maintenance line items with 2,000 characters per line item. The mass storage requirement for M3S/MIMMS and other requirements is computed as follows:

((61,000 line items X 6,000 bytes) + (16,000 line items X 2,000 bytes))
(M3S) (MIMMS)

X	2.0	X	1.33	X	1.10	X	1.47
	(DBMS)		(Usable Storage)		(Operating System)		(Class II & III)

= 1,711 Mbytes of DASD for deployed CSS operations

At 317 Mbytes per triple density DASD (equivalent to IBM 3330s), six units would be necessary plus a seventh unit for system storage. Improved DASD devices, i.e., greater capacity, are becoming available in the current time frame which are expected to provide the mass storage with less space in the MASC. This topic will be addressed in the aggregated MASC processing in the latter part of this annex.

F.2.6.2 Other CSS Peripheral Devices

As with the manpower system, a diskette I/O system will be required for input from and output to ADPE-FMF devices.

Two tape drives for the logistical MASC will provide redundancy plus a capability to perform tape-to-tape copies for the purpose of producing back-up tapes for remote storage which may be utilized for system recovery.

As with the manpower MASC, one high speed printer would operate in the logistical MASC, however, no COM device would be operated due to excessive environmental ranges during deployed operations.

The number of remote terminals and printers for deployed M3S processing has not yet been defined in detail. Initial estimates are based upon MAF units that perform logistical functions plus the remote processing needs of concolidated issue points (CIPs) and the needs within the FSSG. The terminal and printer needs are estimated at 60 each.

F.2.6.3 Summary of the MASC - CSS. A summary of the logistically-oriented MASC requirements follows in Table F.11.

TABLE F.11

SUMMARY OF LOGISTICAL MASC SIZING

Number of cycles per week in combat - 7
Number of M3S transactions per week in combat - 52,000
CPU processing speed - 5.73 MIPS
Core Memory - 5.5, day 6 Mbytes
DASDs - 7 triple density standard drives
Tape Drives - 2, 9track, 1600 or 5650 bpi
Diskette - I/O magazines
High Speed Printer - 1
Terminals per MAF - 60
Terminal printers per MAF - 60

As with the ADPE-FMF device to support the manpower processing when deployed, the device would provide trivial support for logistical processing in the context of M3S processing and the MASC requirement.

F.2.7 Class II and III Deployed AIS Processing

At the inception of this study, a ratio of Class I and Class II and III was assumed at 85/15 percent. During the interview process at Camp Lejeune, it was found (Tab D to Annex C) that the ratio was 67/33 percent. The greater proportion of Class II and III processing has been included as a part of each independent functional sizing accomplished in preceding subparagraphs. The processing ratio established for CONUS-type processing is assumed linear for deployed operations hence the Class II and III deployed processing on a MASC represents 33 percent of the Class I processing load. The 33 percent is included in the baseline CPU and core estimte but not in the DASD calculations; the DASD computations are based upon raw Class I data needs so the additional DASD storage is .47 times the Class I basic requirement.

(Other concerns surfaced from informal information obtained by PGRG study team members as they relate to early use of ADPE-FMF devices. It is understood that Class IV or other nonstandard systems are being implemented at lower processing echelons that are performing tactical functions such as target list files. Such files are currently in ASIS or MIS for aboard ship operations and are planned for inclusion in MTACCS. Of concern to the PGRG study team is the early saturation of the ADPE-FMF device from systems not intended for implementation on the devices and also the unit level programming resources consummed by everybody doing their own thing outside of the MTACCS umbrella.)

F.3 DEPLOYABLE MASC SIZING SUMMARY

The Marine Corps (HQMC-CCIR) is currently in the process of acquiring three experimental MASCs for the purpose of testing deployed AIS support with each MAF. Chapter 4 of this basic report espouses up to three MASCs for deployed MAF operations; each of the three MASCs per MAF is oriented toward the major functional processes of manpower management, combat service support and aviation. To provide a spectrum of supporting MASC alternatives, Table F.12 summarizes the major components for a MASC oriented toward each of the major functions plus a summarization of the total, estimated deployed MAF MASC requirement.

TABLE F.12

SUMMARY OF DEPLOYED MAF, MASC SIZING ESTIMATES

(INCLUDES DEPLOYED CLASS II AND III PROCESSING)

	Manpower Management	Aviation[1]	Combat Service Support
CPU Processing Speed[2] (Million instructions per second - MIP)	.37 MIPS	(.4 MIPS)	5.73 MIPS
Core Memory (Million Bytes MBytes)	5.42, say 6 Mbytes	(3 Mbytes)	5.5, say 6 Mbytes
DASD No/Capacity[3]	8/2,237 MBytes	(4/1,268 Bytes)	7/1,7// MBytes
Tape Drives [4]	2	(2)	2
Diskette I/O Device	1	(1)	1
High Speed Printer	1	(1)	1

[1]Aviation-oriented processing needs are not specified in sufficient detail - PGRG study team estimates are provided in brackets.

[2]Includes mulitple CPU configuration and redundancy for degraded operations.

[3]Newer technologies will compress chs equivalent space requirement. One DASD is for software in each function.

[4]1600 or 5650 bytes per inch, 9 track.

The actual configuration for each MASC will be partially dependent upon rework results of testing conducted with the experimental FASC currently planned for 1982-1984. It is envisioned that the final MASC would reside in towed, 35 foot semi-trailers with three configurations per MAF; or, some personnel have estimated up to five semi-trailers per configuration. An alternative would be to provide a single MASC for all deployed MAF operations which could require five or even six semi-trailers. The concepts for each configuration are shown pictorially in Figure F.3. In reviewing a conceived configuration for one MASC per MAF, note the capability of the modularity of the processing components to be split into two independent configurations. Should aviation-unique processing not be validated, the later configuration could easily provide for split processing needs for manpower and combat service support. A detailed discussion pertaining to deployed concepts for MASC operations is contained in Chapter 4 of the main report.

F.4 CHARACTERIZATION OF ADPE IN THE MID RANGE

The emerging ADPE configurations for the mid-1980s take advantage of continued technological advances in the industry. The anticipated major improvements lie in the area of multiple CPUs, larger capacity but more compact core memories, communications front end processors and mass storage devices with greater storage densities and quick access times. Most of these improved capabilities may be utilized with the MASC, however, to achieve the most promising configuration, the Federal acquisition process must be more responsive in the procurement of advanced technology devices. This subparagraph will relate mid range technology advances to their potential impact upon the MASC(s).

F.4.1 Flexibility

A combination of hardware and software will provide a degree of flexibility heretofore unknown for data processing. Computer internal flexibility will permit the shifting of processing from CPU to CPU in the event one CPU is disabled or operating in a degraded mode. Also,

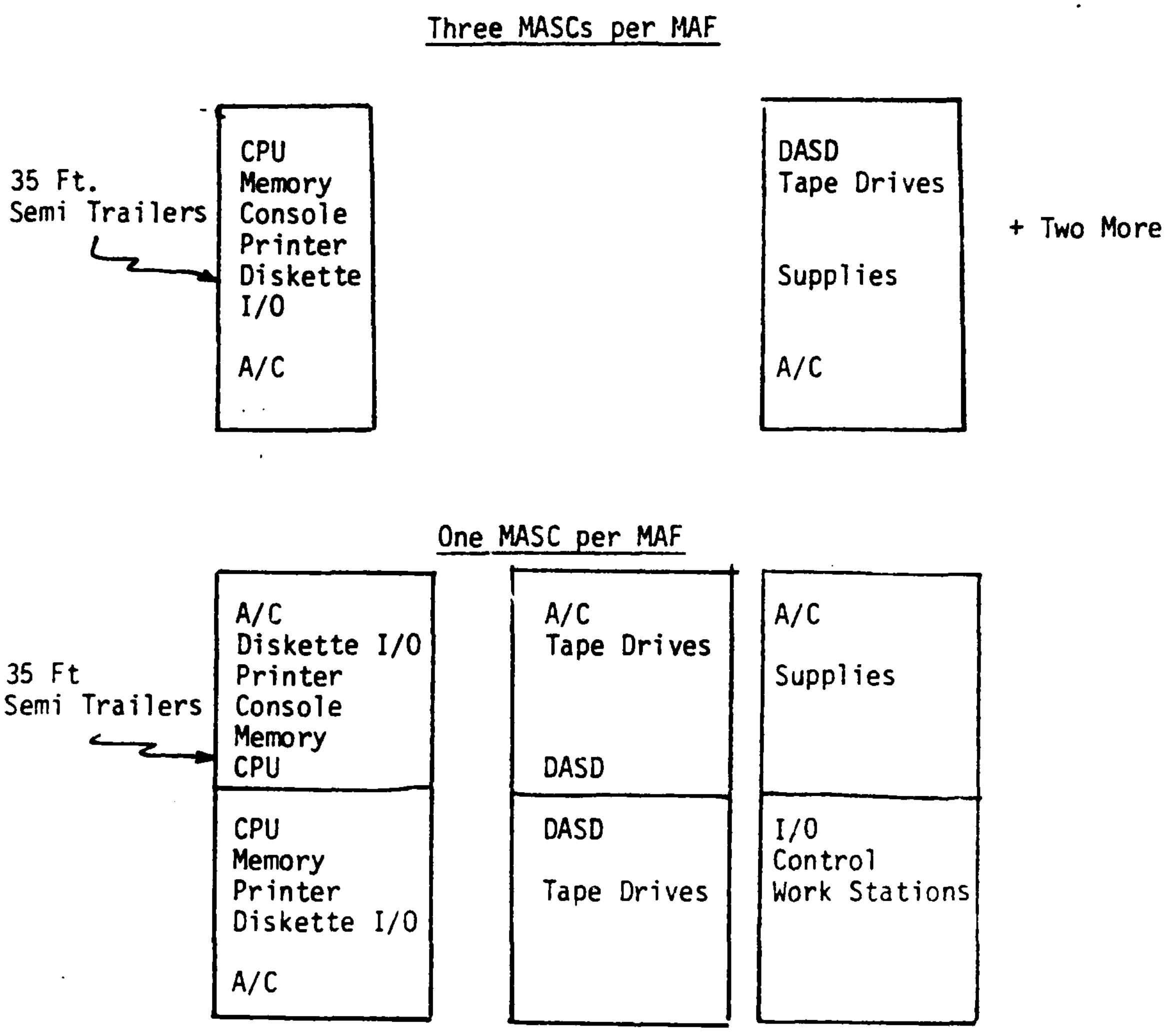


Figure F.3. Conceptual MASC Configurations as portions of a computer configuration become degraded or inoperable, self-diagnostic software and improved hardware monitors will provide information to computer operations personnel which will permit their changing the internal configuration to continue with some form of processing. This form of flexibility stems from systems used with direct customer interfaces at banks, retail sales outlets, telephone inquiries, etc; how many times have you heard, the computer is down?

The configurations of the future will also contain a great deal of flexibility with input and output (I/O) devices including supporting telecommunications networks. Input may be received from virtually any type of terminal at varying data transfer rates. The ability to accept varying types of inputs is provided by both communications front end processors (FEPs) and computer-resident telecommunications software. Computer outputs may similarly be directed to a great number and type of output devices including remote terminals/printers, various magnetic media and to intermediate magnetic media for the ultimate purpose of producing computer output to microforms (COM), graphic plotting, electronic mail, word processors, meteor-burst transmissions, et al.

Processing flexibility is enhanced not only by hardware technology improvements but also by advanced software packages; the advanced software packages are made possible because improved hardware capacity and capability is available so that the enhancements to both are inseparable.

F.4.2 Modularity

System modularity is a by product of improved technology in hardware and more sophisticated software. Improved hardware channelization and interface controlling software have made it possible to assemble and dynamically change computer system architectures to provide several configuration modification procedures. This modularity provides ADPS capabilities to amend configurations to:

- Respond to degraded hardware conditions
- Split processing capabilities
- Provide a hierarchial or distributed processing capability
- Provide major changes to hardware I/O devices
- Accommodate major changes for telecommunications methods; i.e., ground microwave at 1,200 bits per second (bps) to a nominal sattelite capability of 56 kbps utilizing wideband transmission facilities.

A specific concept for modularization appears in Figure F.3 wherein a six, semi-trailer MASC configuration is modularized to provide a split processing capability for multiple processing support for a deployed MAF or a combination of deployed MABs.

The modularity for ADPS has heretofore not been available as evidenced with the third generation systems, which when system generated, were rigid in their configuration without a basic change to the operating system peripheral parameters. Todays systems and those of the mid range time frame permit dynamic parametric change and hence a rapid capability to provide true and dynamic ADPS modularity. (Another area of modularity presented in the basic report is that of Class I AIS software modularity - the modularity discussed here is modular architecture, not application program modularity.)

F.4.3 Reliability

System reliability is provided with mid-range ADPS in three primary ways - first, is through hardware redundancy; second, is fail-soft software and thirdly, with self-diagnostic systems.

Hardware reliability is provided in two ways. Hardware components continue to decrease in size with a consequent reduction in power resulting in less heat; this phenomenum results in a vastly improved MTBF of computer components. Secondly, with ever decreasing hardware component costs, it is economically feasible to place two like but critical components in a system (like CPUs) such that when one fails, the processing is automatically shifted to the other component (CPU).

The third and one-half generation operating systems do not cause system hard stops from a single error as did their ancestors. Today's operating systems are multiple level and will continue in their refinement on into the mid-range time frame. This multiple-level operating system design permits the fail safe capabilty wherein an error at the detailed level cause reversion to a less discrete operating level. The less discrete operating level permits assessment of a correction for a more discrete error. This occurs at several levels within an operating system so that error recovery may be accomplished without "blowing" the system - this is fail soft, reliable software.

Today's and tomorrow's more contemporary software packages not only have fail-soft capabilities, but also have self diagnostic routines that will point operators to a specific inoperable component. Typically, the system can operate in a degraded mode which operations personnel may rapidly replace the self-identified, failed component.

Hardware redundancy, fail-soft software and self-diagnostic capabilities will add immeasurable reliability to MASCs envisioned for implementation in the mid-range time frame.

F.4.4 Security/Privacy

Computer system security (with Federal direction from OMB Circular A-71) and the Privacy Act of 1974 place unique and necessary requirements upon the hardware/software configurations supporting automated processes as well as the data bases and stored data. We are therefore looking at issues in electronic system security and physical security.

Electronic security is relatively easy to secure using isolation devices such as computer rooms in "cans", shielded conduit to remote peripherals, isolators and tempest requirements for stand-alone terminal devices. A dubious problem area arises with the electronic systems as it pertains to mechanical devices driven by electronically controlled servo-mechanisms, to wit, tape drives and movable head disc drives. The mechanical portion of an electronic system is subject to error such that mass storage files may be inadvertently read and privacy or classified information easily compromised unless there is a positive control on user access and physical control to a remote user area. Access control is the only means of controlling the inadvertent output situation. The mid-term time frame does not offer a solution to the servo-mechanical problem without the addition of extensive, intermediately controlled buffered output. The buffered output could be verified for validity prior to output operations.

Another aspect of electronic security is the means by which users enter an automated system. At a remote terminal location, physical access to the terminal must be controlled by locks upon the door or terminal or a cypher-type lock. Also, each user must sign into the automated system utilizing combinations of user numbers, system numbers, and read/write keys placed upon mass storage files. Access control through various codes and look-up tables are not 100 percent satisfactory when one hears of 13-year olds able to break into and disable major automated systems from simple terminals at home. Access control is hence extremely important and personnel permitted to access an automated system must be sufficiently cleared so that upon receipt of an inappropriate output, the output would be responsibly treated (reported and destroyed).

Access control also falls into the category of physical security. Physical security of some appropriate form and type must be provided computer rooms, data storage areas, peripheral and remote devices and communications lines and circuits.

Further complicating the classified processing situation is the belief that all deployed AIS data must be treated as classified information, even up to the SECRET level. This is beyond the scope of this study but may warrant a separate classification determination.

Although privacy information is not permitted a DoD classification level such as FOUO or CONFIDENTIAL, it must be treated in the same manner as the lower-level classified information. This condition has and continues to be a dichotomous situation.

F.4.5 Redundancy/Backup

Processing system redundancy as it pertains to hardware redundancy was discussed in subparagraph F.4.3 above. The redundancy/backup discussed in this subparagraph pertains to the catastrophic loss of a processor or data base. This type of loss must be covered by a continuity of operations plan (COOP). A federal COOP typically includes the identification of an alternate processing site which is fully compatible hardware and software-wise with the host configuration. In the case of a MASC, an alternate or reserve or float MASC would be identified for the alternate or redundant processing site. Also, all software and data bases must be preserved at an alternate location so that a backup system may be loaded and run. In general, software and data base backup tapes are prepared by copying to tapes on a weekly basis-normally saturday morning; the tapes are then stored at an alternate location for COOP backup purposes. For tactically deployed MASCs, local SOPs may direct data base copies each 8 hours and software backups each 24 hours.

The key to redundancy/backup for any computer is a planned and tested COOP - the alternate site or sites must actually be operated with host software and data bases on a periodic basis.

F.4.6 Mobility

Mobility highly impacts the utilization of MASCs in the deployed environments. Mobility impacts the following postures:

- Movement on land
- Movement aboard ship (stowage and use)
- Amphibious landings
- Air transport

Movement on land of the semi-trailer mounted MASC is accomplished with 5 or 10-ton tractors or may be towed with any 5 ton or greater vehicle using a dolly. A question at this time, is whether MASC prime movers will be found in the MASC T/E or supplied from other MACTF assets? The planned experiential FASC test will have tractors provided from II MAF assets; the evaluation of the test may result in a decision pertaining to the use of organic or non-organic tractors for land movement of the MASC either in the CONUS or AOA tactical environments. Each MASC van will weigh between 7-10 tons and hence is more of a volume rather than a weight consideration.

Movement onto or from a ship may be by ramps or crane. For ships configured for operation of the MASC, power, space and communications capabilities must be provided. For MASCs stored and transported aboard ship, the MASC must be "powered up" on a periodic basis.

For amphibious landings, the MASC may be moved ashore or recalled from shore to ship as would any other semi-trailer. This could be by landing craft or helicopter.

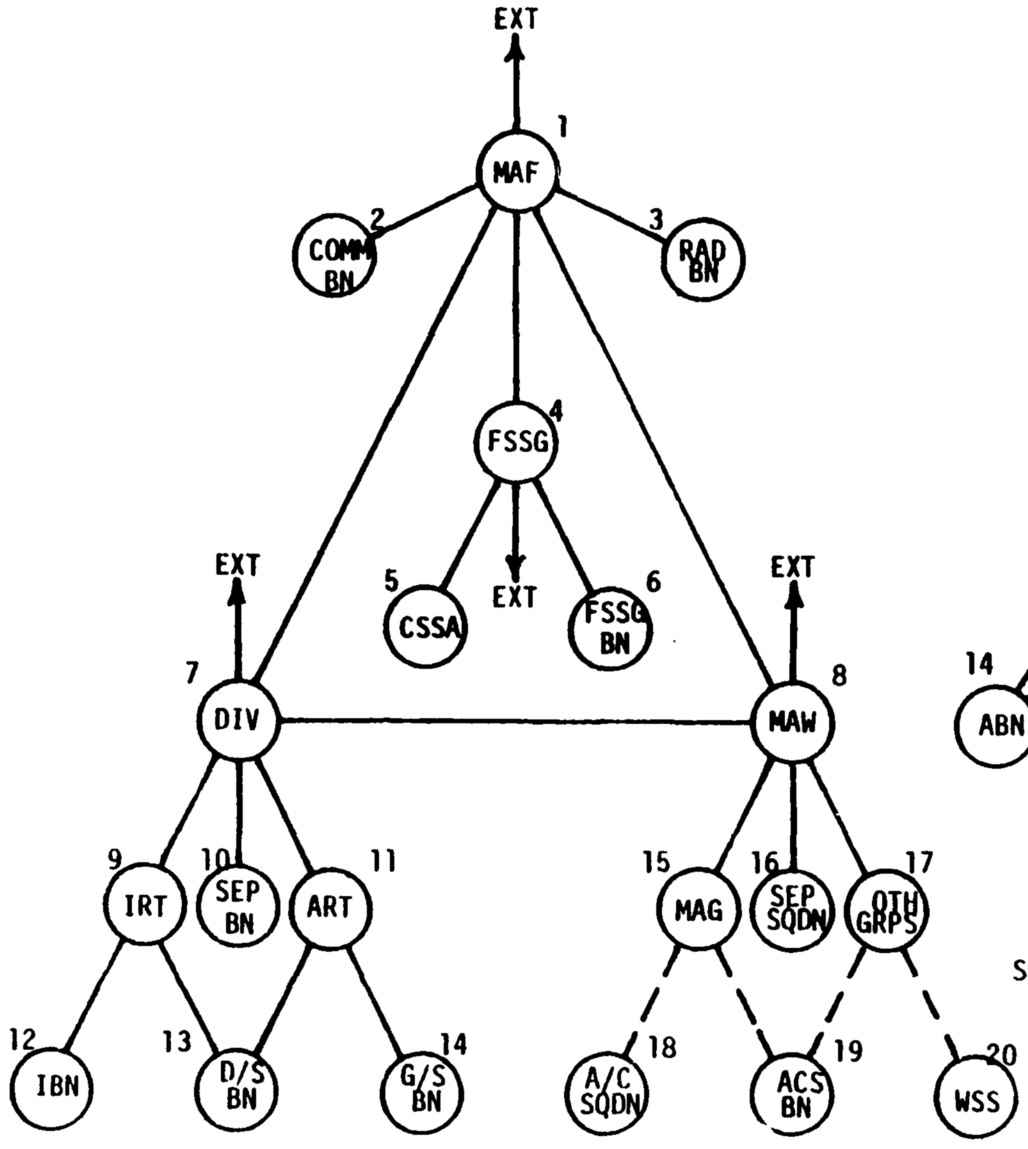
Finally, the MASC is air transportable in a variety of military and commercial cargo aircraft. With the tandem wheels removed from the semi-trailer, the van is transportable in C-130 type aircraft. The approximate dimensions of the MASC would be 37 feet long, 9.5 feet wide, 13.5 feet high w/tandem or 10.5 feet high w/o tandem axles.

The Army has moved MASC-equivalent configurations both strategically and on intratheater moves with notable success. Mobility for MASCs is more a question of movement priority than the physical ability to move a MASC.

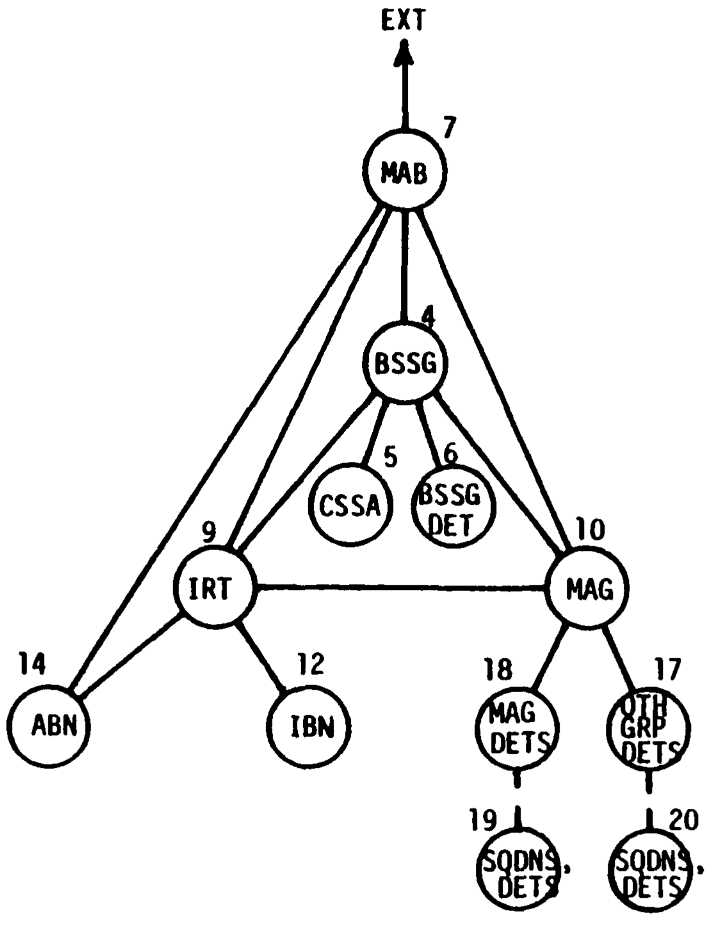
ANNEX G

DATA COLLECTION WORKSHEETS

PART II - Simplified Information System Needlines for a MAF and MAB



Simplified MAF Information System Needlines



Simplified MAB Information Needlines

Notes:

- - As Required

Nodes may be subscripted as required, ie, FSSG BN_1

DEPLOYED ADP 88 STUDY - DATA COLLECTION WORK SHEET

(Copied from Appendix B, DH 1-77. For completion instructions, refer to data collection handbook.)

15. I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practices. (Continue on reverse or additional sheet.)

DESCRIPTION: Manpower management is the function of providing timely and accurate collection, storage and processing of relevant data to provide the manpower information needed for planning, development, control and audit of policies, procedures, models, processes, and information files essential to manpower management at all levels of command.

CONCEPT OF OPERATIONS: For deployed operations, the manpower management system will operate in a stand-alone mode, and when LFICS is available, will interact with the MAGTF Automated Service Center (MASC). By having the stand-alone (i.e., programmable terminal) capability, the Reporting Unit would manage its manpower from a limited, but substantial convenience file (6-10K characters per Marine) resident in its own processor. Input transactions would be edited for format against this file and placed on output media for subsequent entry into the central data base. Concurrently, these update transactions would update the unit's local data base. Depending upon the MAGTF deployed environment, the update diskette would be transported to the MASC or to the central site by whatever means available. If it goes to the MASC, the MASC would aggregate all the reporting unit updates for a given period of time and generate a consolidated update diskette (or tape cassette) for transport back to the central site by whatever means available-courier, mail, courier to the nearest AUTODIN entry point, etc. The MASC would maintain a MAGTF file (similar to the RASC file) for manpower management of needs by the major MAGTF elements. This file would not be updated at the time the Reporting Unit input transactions were processed for input to the central site and would be updated only after the central site had processed the MAGTF update and returned the update transactions for overlay on the MAGTF file. When units are aboard ship, input transaction diskettes would be generated either for subsequent aggregation when the MASC is established or sent direct to the central site.

If LFICS is available, the Reporting Units would be able to generate input on the programmable terminal and then transmit them interactively to the MASC where they would be aggregated for transport to the central site, as described above. Upon receipt of the update or output back from the central file the MASC would update the MAGTF file, break down the updates or output and send them to the Reporting Units so those files could be reconciled. Again depending on LFICS, this would be done on-line or by other means of transport. In cases where the MASC might not be deployed, such as for a MAU deployment, the bulk of support would be accomplished by Reporting Units utilizing stand-alone capability. However, by equipping the MAU headquarters with a stand-alone processor, a limited convenience file could be maintained for the MAGTF, if necessary. This could be done by having the major elements of the MAU consolidate input from the reporting units and provide the consolidated input to the MAGTF microprocessor.

OBJECTIVES/JUSTIFICATION: A capability is required to maintain both personal data and reporting unit aggregations by various demographic parameters in a deployed environment. The advent of REAL FAMMIS and provisioning the FMF with ADPE-FMF devices provides an automated environment in which to conduct the manpower management functions. The limited front-end edit of transactions on the ADPE-FMF (or their follow on) devices will minimize transaction errors upon entry to the central manpower management data base. Further, the implementation of REAL FAMMIS will provide commanders in the field with requisite manpower management information that is both more timely and more accurate than information currently processed in MMS.

9

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie,etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
MAF	89RUs To 1 or 7	24 hours 80	SRB, RF, 10,000 char/person, Unclassified 133 transactions per day	Integration - Node 1 or 7; MASC	RUs ! 29.3 Mbytes Mass 2.29 Mytes Core	Data extracted from REAL FAMMIS Feasibility Study, Vol IV, Annex C, 20 Aug 80
MAF	1 or 7 to Ext	24 hours 80 or ST	Limited manpower data base, 6656 Transactions per day MASC - Unclassified		1.52 MIPS 1.522 Mbytes Mass, 2.47 Mbytes Core @ MASC	
MAF	Ext to 1 or 7	48 hours 80 or ST	49,920 print lines Unclassified - MASC	Disaggregation at MASC	1.52 MIPS 1.522 Mbytes Mass, 2.47 Mbytes Core @ MASC	
MAF	1 or 7 to 89 RUs	24 hours 80	10,000 print lines Unclassified		As first entry	

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

Functional Area/Staff Officer:
HQMC - MPI - Lt. Col. DeWoolfsen 694415

Functional Subsystem:
JUMPS/MMS - REAL FAMMIS - Delayed

Function System:
Manpower

Size/Type of Force:
MAF Worst Case
MAB Less than MAF
MAU Less than MAF
RDF Maybe as MAF
Reserve Unit Normal

Mission Phases:
Garrison Normal Operations
Preembark Normal Operations
Afloat Less than Normal
Assault 25% of Normal
Combat w/TRA 25% of Normal

Special Cases:
Cbt Svc Spt N/A
Transport N/A
Rehearsal N/A
Other N/A

Date: 15 MAY 81

Page of .

Signature :

DEPLOYED AIS 88 STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice. (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: JUMPS MMS (REAL FAMMIS)/DEPLOYED MILITARY/PAY INCLUDING BONDS AND ALLOTMENTS (B&A), PAY OPTION ELECTION SYSTEM (POES), TRANSCRIPT OF DATA EXTRACTION SYSTEM (TODES), MILITARY PAY LIST (MPL) AND MILITARY PAY VOUCHER (MPV)

DESCRIPTION: Military pay is the function of providing timely, adequate military pay service to guarantee the welfare for and morale of individual Marines.

CONCEPT OF OPERATIONS: For deployed operations, a simplified bookkeeping military pay system would be utilized under the auspices of REAL FAMMIS. The basis of the bookkeeping system will be the individual Marine's deployed pay option election system (POES) in which the member would specify the desired level of military pay while deployed and termed the "deployed pay amount." Pay amounts in excess of that specified by the POE would "accrue central" or at the MCFC where excess pay would hopefully be transferred to a commercial financial institution through the use of electronic fund transfer (EFT) for a "direct deposit program." The simplified bookkeeping (debit/credit) pay system will be supported by a minimal automated data base utilizing ADPE-FMF devices. The deployed bookkeeping pay system will produce an automated preliminary payroll (MPL) for member annotation and verification for normal pay periods and would provide the status of deployed pay for members that incur normal reassignments and R&R or exceptional conditions such as emergency leave, MIA, etc. Pay transactions would be transferred to the MCFC for pay processing and update of the accural portion of the members financial central data base; also, periodic reconciliations will be conducted between the central data base and the deployed bookkeeping pay system. The ADPE-FMF device would print the individuals MPV. The military pay function for a MAF is conducted from the disbursing office in the FSSG where four ADPE-FMF devices are assigned; a deployed MAB will be supported using one ADPE-FMF device from a deployed element of the disbursing office. A deployed MAU would be similarly supported. In all cases, members may change POES when deployed by an annotation on the preliminary payroll produced by the deployed ADPE-FMF devices from the bookkeeping data base. The deployed booking system provides a limited edit capability and interface for near "real time" controls for personnel actions. Prior to the implementation of REAL FAMMIS, four additional data elements will be required on both 699s and the JUMPS/MMS data base to support this deployed concept of operations. A detailed description of the deployed pay concept of operations is available from HQMC-FDD/MPI.

OBJECTIVES/JUSTIFICATION: A capability is required to pay deployed Marines. The advent of REAL FAMMIS and provisioning the FMF with ADPE-FMF devices provides an automated environment in which to conduct the military pay function. The limited front-end edit of transactions on the ADPE-FMF (or their follow-on) devices will minimize transaction errors upon entry to the central financial data base. Further, the implementation of REAL FAMMIS will result in a reallocation of financial processing personnel such that the operation of the current manual system would create a degradation in the pay function with its resultant impact upon a members morale and welfare. Finally, preliminary payrolls and pay change requests may be accommodated from the deployed environment.

PART III - Data Base Locations/Processing Requirements by Force Node (continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Hot Tactically Required, Interfaces, Transitions, etc.)
MAF	6C/ RUCs*	24 hr, PD	Deployed LES, 1 PC per member, 1 per pay period, U	Print per RUC	10 hr ADPE-FMF, 40 MB, 6C	Preliminary Payroll
	RUCs/ 6C	24 hr, PD	Annotated LES 1 PC per member 1 per pay period, U	Data Entry from annotated payroll	40hr, ADPE-FMF, 40MB, 6C	Annotated Payroll-entry
	6C/6	48 hr, 8D	Updated LES, 50,000 PC 1 per pay period, U	Consolidation, 6 (FSSG MASC)	2hr, 40MB, 6	
	6/Ext	1w, ST	LES, 50,000 PC, 1 per pay period, U	-	-	To MCFC
	Ext/6	1w, ST	LES, 50,000 PC, 1 per pay period, U	-	-	From MCFC

* 6C Disbursing Office - FSSG
89 RUCs per notional MAF

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

Lt Diab, HQMC-FDD AV 224-4115

Functional Area/Staff Officer:

Military Pay/Lt Diab

Functional Subsystems: Deployed Military Pay, B&A, POES, TODES, MPL, MPV

Function System: JUMPS/MMS (REAL FAMMIS)

Size/Type of Force:
MAF Considered
MAB Included
MAU Included
RDF Included
Reserve Unit Included

Mission Phases:
Garrison Normal CONUS
Preembark Prepare deployed DB
Afloat Considered
Assault Considered
Combat w/TRA Considered

Special Cases:
Cbt Svc Spt N/A
Transport Considered
Rehearsal Considered
Other N/A

Date: 2 April 81
Signature : 1stLt Diab

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DEPLOYED AIS DB STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice. (Continue on reverse or additional sheet.)

DESCRIPTION: UNITREP Performs the function of reporting the status of units to the JCS.

FUNCTIONS/SUBFUNCTIONS: Unit Status and Identity Report (UNITREP) (formerly FORSTAT)

CONCEPT OF OPERATIONS: UNITREP is a directed report required by JCS Pub 6. The report is forwarded each month or any time there is a change in the four status categories which are reportable; the categories are personnel, supplies and equipment, material readiness and training - an overall unit status is reported along with a reason for the status. The unit status data is initially prepared manually and is input to ADPE-FMF devices at the lowest possible level. The reported information is reviewed at each command up to and including the MAF. The consolided MAF UNITREP data for which a data base is maintained on a MASC, is transmitted directly to the JCS and CMC. The monthly report from each RUC is the equivalent of five punched card (80 columns) images. A change in unit status within the month is reported on a single 80 column card image. For deployed operations, combat and combat service support units are estimated to submit two status changes each week while other deployed units are estimated to submit one status change each week. The processing time for UNITREP is very small and hence is overlooked as a deployed processing requirement. However, UNITREP is classified CONFIDENTIAL or higher. Thus, the processing of UNITREP must be scheduled so as to not interfere with other unclassified processing.

OBJECTIVES/JUSTIFICATION: The UNITREP reports will be implemented upon ADPE-FMF devices at the lowest possible level (battalion/squadron/separate company) and aggregated at each command echelon upon ADPE-FMF devices. Preparation of the unit and aggregated reports at the command echelons by hand would be inefficient and labor intensive compared to the automated reporting on the ADPE-FMF devic . UNITREP reports are required by JSC Pub 6. A PPO-approved UNITREP concept of operations is available from HQMC-P .

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie,etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)

Part III - Data Base Locations

The data base and processing needs for UNITREP processing are trivial and hence overlooked. UNITREP processing is classified CONFIDENTIAL as a minimum thus the small amount of processing time must be specially scheduled.

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

Functional Area/Staff Officer:
Cpt. Dublin - HQMC-POR - 694-5030

Functional Subsystem:
UNITREP

Function System:
PPO

Size/Type of Force:
MAF Worst Case
MAB Included
MAU Included
RDF Included
Reserve Unit Included

Mission Phases:
Garrison Included
Preembark Included
Afloat Included
Assault Included
Combat w/TRA Worst Case

Special Cases:
Cbt Svc Spt N/A
Transport N/A
Rehearsal N/A
Other N/A

Date: 4 May 1980
Signature :

Page of

(Adapted from ... For completion instructions, refer to data collection handbook.)

PART - Brief description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice, (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Naval Aviation Logistics Command Management Information System (NALCOMIS)

DESCRIPTION: NALCOMIS is a management information system (MIS) for the Organizational Maintenance Activity (OMA), the Intermediate Maintenance Activity (IMA) and the Supply Support Center (SSC) that will support the Naval Aviation Maintenance Program (NAMP) of the 80s. The system is an on-line, near real time, integrated and interactive MIS, utilizing source data automation techniques and a data base management system that provides an aviation OMA or IMA with the capability to carry out its assigned mission.

CONCEPT OF OPERATIONS: Each MAG will be provided with a Navy acquired SNAP ADPE equipment as a replacement for the UNIVAC 1500. This computer will normally be "hard wired" to interactive terminals throughout the MAGs subordinate units work centers. Configuration "C" of the SNAP hardware provides the ADP support for NALCOMIS. NALCOMIS will encompass the functions currently provided by 3M, provide input to FREDS, and interface with SUADPS-RT. The system will contribute to aircraft material readiness by providing local maintenance and material managers at the OMA, IMA and SSC levels with modern responsive management capabilities.

The NALCOMIS objective for maintenance is to achieve the readiness and safety standards established by CNO, optimizing manpower, facilities, materials and funds. It encompasses the repair of aeronautical equipment and material at the level of maintenance which will ensure optimum use of resources and the application of a systematic planned maintenance program. It also insures the collection, analysis, and use of pertinent data in order to effectively improve material readiness and safety, while increasing the efficient and economical management of human, monetary, and material resources.

NALCOMIS is designed to produce data at the MAG level only prior to input to the Naval Aviation Organizations. MAW Headquarters will not have the SNAP processors. Tabulation of statistics from numerous MAG hardcopy reports is a manpower-intensive task. To properly manage the aviation assets of the MAW, a processor (MASC) is required to compile an aggregated data base for magnetic media provided from the MAGs.

OBJECTIVE/JUSTIFICATION: Existing procedures which are manual/semi-automated and laboriously time-consuming are not adequate to provide responsive management capabilities to local aviation maintenance and material managers at the OMA, IMA, and SSC with modern responsive management procedures. NALCOMIS hardware and software will provide aviation maintenance and material managers with timely, accurate, and complete information on which to base day-to-day decisions.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet).

MAF/ MAB/ MAU	Node From	Node To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie, etc.)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard), Not Tactically Required, Interfaces, Transitions, etc.)
MAF	18	15	Detailed data not available	Detailed data not available			15 - SUADPS
	15	8					Electronically or manually passed to Navy from node 15

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

LtCol Costello,
HQMC, ASA
694-1077
Functional Area/Staff Officer:

Maj Gillespie
NAVAIR Sys Cmd PMA-270
692-7966
Functional Subsystem: NALCOMIS

Function System: Aviation Logistics

Size/Type of Force:
MAF Considered
MAB Less than MAF
MAU Less than MAF
RDF Same as MAF
Reserve
Unit N/A

Date:
Signature:

Mission Phases:
Garrison Normal
Preembark Normal
Afloat Less than combat
Assault Less than combat
Combat w/TRA Considered

Special Cases:
Cbt Svc Spt
Transport
Rehearsal
Other None

DATA

... from Appendix ... refer to ... handbook.

... Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification ... Local Practice. (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Aviation Shipboard Uniform Automated Data Processing System - Real Time (SUADPS-RT)

DESCRIPTION: SUADPS-RT will be the supply logistics system utilized by the Navy and Marine Corps mobile aviation IMA, operational units, and ... fleet units in support of their primary functions. SUADPS will be subsumed within NALCOMIS as NALCOMIS is implemented. The system will be an on-line real-time, integrated and interactive system that utilizes source data entry equipment for data entry and advanced data management techniques to provide responsive file maintenance and query capabilities.

CONCEPT OF OPERATIONS: SUADPS is a straight-forward aviation repair parts requisitioning system designed to improve supply management by utilizing automatic data processing equipment. Under the SUADPS concept, all inventory control and financial records are maintained on magnetic tape. The system is run on the UNIVAC 1500 computer at MAG level. The system is designed to provide designated points of contact between the customer and the supply department, supply support center, stock control, system coordinator, data processing, and storage.

SUADPS-RT will be a combination of the currently operating SUADPS and SUADPS EU. It will be processed on the SNAP configuration "B" and will be a interactive real time integrated system "hard wired" to terminals throughout squadron work areas. The terminals will provide data entry, responsive file maintenance and query capability.

OBJECTIVES/JUSTIFICATIONS: SUADPS-RT gives the work center in the operating unit the capability to enter requisitions into the system by an interactive terminal. Query capability or requisitions will provide immediate response on requisition status. This interactive capability will be added to the straight-forward aviation repair parts requisitioning system. The computer will perform on an immediate basis the basic clerical functions of supply; such as, posting issues and receipts, recording demand and frequency, and accumulating financial data.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet).

MAF/ MAB/ MAU	Node From	Node To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie, etc.)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard), Not Tactically Required, Interfaces, Transitions, etc.)
MAF	18	15	Function will become a portional NALCOMIS - detailed data not available	Function will become a portional NALCOMIS - detailed data not available			Electronically or manually passed to Navy from node 15.
	15	8					

PART IV - Administrative/Type of Force/Mission Phase

(List References on the Reverse)

Points of Contact:

LtCol Costello
HQMC ASA
694-0177

Functional Area/Staff Officer:

Maj Marsteller
HQMC ASL
694-1133

Functional Subsystem: SUADPS-RT

Function System: Aviation Logistics

Size/Type of Force:
- MAF Considered
- MAB Less than MAF
- MAU Less than MAF
- RDF Same as MAF

Reserve
- Unit N/A

Date:

Signature:

Mission Phases:
- Garrison Normal
- Preembark Normal
- Afloat Less than combat
- Assault Less than combat
- Combat w/TRA Considered

Special Cases:
- Cbt Svc Spt
- Transport
- Rehearsal
- Other None

[illegible] WORK SHEET

[illegible] Appendix [illegible] 1-77. For complete instructions, refer to [illegible] collection handbook.)

[illegible] Brief description of function [illegible] concept of operations, objectives and justification - Directed or Local tasking. (Continue on reverse or additional sheet.)

FUNCTIONS/SUBFUNCTIONS: *Aviation/Flight Readiness Evaluation Data System (FREDS)*

DESCRIPTION: FREDS is the management information system that processes flight and readiness data of aircraft, aircrew, and training devices.

CONCEPT OF OPERATIONS: The major purpose of this system is to construct an automated data base which will contain the data elements needed [illegible] Marine Corps aviation assets pertaining to utilization of aircraft and/or aircrews. It includes all scheduled flights including those flights that were not completed. The data base is derived from daily flight/flight training actions at the squadron level and [illegible] on a FREDS "yellowsheet." Those data are entered and validated on local computers where the data base is maintained on a daily basis. [illegible] input transactions are prepared on each scheduled flight not completed and for each flight crew member of completed flights. [illegible] be integrated in SNAPs for the 1988 time period.

OBJECTIVES/JUSTIFICATION: Reports produced by FREDS are daily FREDS proof list, daily FREDS validation error report, monthly aircrew roster, monthly individual flight activity report and the monthly aircraft utilization report. FREDS is designed to provide management tools for all levels of command, and more accurately measure progress toward accomplishment of those goals.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet).

MAF/ MAB/ MAU	Node From	Node To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie, etc.)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard), Not Tactically Required, Interfaces, Transitions, etc.)
MAF	18	15	To become a portion of NALCOMIS - detailed data not available	To become a portion of NALCOMIS - detailed data not available	15	8	Data passed manually from node 8 to HQMC
	15	8					

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

LtCol Costello
HQMC, ASA
694-1077

Functional Area/Staff Officer:

Maj Costello

Functional Subsystem: FREDS

Function System: Aviation Operations

Size/Type of Force:
- MAF: Considered
- MAB: Less than MAF
- MAU: Less than MAF
- RDF: Same as MAF
- Reserve Unit: N/A

Date:
Signature:

Mission Phases:
- Garrison: Normal
- Preembark: Normal
- Afloat: Less than combat
- Assault: Less than combat
- Combat w/TRA: Considered

Special Cases:
- Cbt Svc Spt: ______
- Transport: ______
- Rehearsal: ______
- Other: None

(Adapted from Appendix B, DB 1-7... For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice. (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: FISCAL/DISBURSING OFFICE VOUCHER (DOV) - Garrison, Preembarkation

DESCRIPTION: DOV performs the function which provides a record of (Federal) fund expenditures by accounting classification to the Marine Corps Finance Center (MCFC) where the information is input to MAGFARS (SABRS in the future).

CURRENT OPERATIONS: The current method of operation is undergoing a change as a portion of the DOV system is being implemented on ADPE-FMF devices. It is envisioned that the ADPE-FMF device will provide a front-end edit capability and transaction construct for transmission to the MCFC on AUTODIN in CONUS and mailed when deployed. DOV transactions mailed from deployed MAGTFs are hard copy, manual records which must be reduced for automated input to MAGFARS by personnel at the MCFC. The error rate in input transactions at the MCFC from the paper documents varies between 10 and 90 percent across the DOs. Using a skewed normal error distribution favoring a smaller error rate, the input error rate is presumed to be 35 percent. Current operating procedures are defined in a NAVCOMP manual.

CONCEPT OF OPERATIONS: As the Real Time Financial and Manpower Management Information System (REAL FAMMIS) is implemented in the mid-range time period (1985-1988), DOV will be placed upon the hardware that supports REAL FAMMIS. The REAL FAMMIS feasibility study (RFFS) has identified 4 deployable, programmable terminals within each FSSG on which to conduct military pay unique functions and DOV functions. Of key importance for deployed DOV functions is the front-end edit capability which, in the interim, will be provided with the ADPE-FMF devices. Monthly receipt and expenditure reports are provided the Navy through HQMC and directly to the Department of the Treasury for disbursements made with Treasury ("green") checks. There will be little difficulty transitioning DOV from CONUS to deployed operations in the 1988 time period since the CONUS and deployed configurations would be identical. The front-end edited DOV transactions when submitted to the MCFC, will have a minimum input error rate and thus measurably reduce the input error corrections now accomplished by the MCFC accounting personnel.

DOV inputs to MAGFARS (SABRS) may be mailed from the deployed DO or, when available, telecommunicationed to the MCFC. Monthly disbursing summaries to the Department of the Treasury are hard copy, typed reports at this time; by 1988, input for Treasury purposes will most likely be on some form of magnetic media. As a MAGTF is alerted to embark, the task organization must be input the RASC which in turn would prepare a deployable data base for each deployable ADPE-FMF device(s). Two or four devices could deploy with a MAF; two would deploy with a MAB and the MAU DOV would be accomplished manually as it is conducted today (or possibly series-shared).

OBJECTIVES/JUSTIFICATION: Regardless of whether DOV is implemented on ADPE-FMF devices, REAL FAMMIS programmable terminals or even a deployed MAGTF automated service center (MASC), it will be necessary to deploy with DOV in order to minimize input errors, avoid labor-intensive transaction preparation, and also avoid the trama and errors that would be incurred with a deployed DOV system that differs from the CONUS DOV system. DO I/Os have been reduced due to the implementation of AISs, including DOV.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet).

MAF/ MAB/ MAU	Node From	Node To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie, etc.)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard), Not Tactically Required, Interfaces, Transitions, etc.)
MAF	4	Ext	Routine, 8D	4,500 PC 500 pages print, month, Uncl for CONUS x 30 percent interactive hardwired	Cons 4 if MASC utilized else courrier	.67 hrs/month .6 Mbytes, Node 4 & 1,451/MIPS	Interfaces required with Navy IDA (done through MAGFARS-SABRS and Dept. of Treasury probably on magnetic media)
MAB	4	Ext	Routine, 8D	1,150 PC, 175 pages print, month, Uncl for CONUS X 30 percent interactive hardwired	Cons 4 if MASC utilized else courrier	.23 hrs/month .20 Mbytes, Node 4, 502 MIPS	Interfaces required with Navy IDA (done through MAGFARS-SABRS and Dept. of Treasury probably on magnetic media)
MAF/ MAB	Terminal to Node 4		Routine, 8D		Data Transportation		

Total CONUS-type DOV processing at Camp Lejuene is small at 2.46 hrs/month of which about half is for 2D FSSG or 1.23 hrs per month. Add 30% for interactive, and 5% annual growth rate requires 2.24 hrs/month. Mass storage is $\frac{\text{9.500 PC @ 100}}{\text{.5 mass storage availability}}$ = 1.9 Mbytes. For deployed operations at 30 percent of CONUS use .67 hrs/month and .6 Mbytes of core storge

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

LtCol L. Mertes
DO, 2D FSSG
Av 484-3755
Functional Area/Staff Officer:

Maj R. Muza
HQMC-FDD
694-4982
Functional Subsystem: DOV

Function System: FISCAL

Size/Type of Force:
MAF Considered
MAB Considered
MAU Manual
RDF
Reserve
Unit N/A

Date:
Signature:

Mission Phases:
Garrison Normal Mode-RESCU Reports
Preembark As Garrison-data base may be required
Afloat
Assault
Combat w/TRA

Special Cases:
Cbt Svc Spt
Transport
Rehearsal
Other None

DEPLOYED AIS 88 STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-7. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice. (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: FISCAL/DISBURSING OFFICE VOUCHER (DOV) - Afloat, Assault and Continued Operations

DESCRIPTION: See Part I of Garrison/Preembarkation Worksheet

CURRENT OPERATIONS: Deployed MAGTF, of all sizes mail transactions to the MCFC where they are reduced to input transactions for MAGFARS. Input transaction rates are great as described on the previous worksheet, averaging about 35 percent. Error correction requires a great many resources in personnel and processing time at the MCFC and in physical time.

CONCEPT OF OPERATIONS: ADPE-FMF devices will be utilized through the midrange time period to prepare input transactions to DOV. These inputs will be front-end edited thereby decreasing the input error rate to the 2 to 5 percent range from 35 percent. The most demanding phase for DOV input processing occurs during the continued operations phase of the amphibious operation hence Part III of this form is completed for continued operations with TAE.

While afloat with a very small DOV deployed processing need, a series- shared ADPE-FMF device may be utilized. Input transactions, on 8-inch diskettes would be forwarded to a MASC for consolidation or to a RASC for processing. During the assault phase of an amphibious operation, paper documents would be forwarded or transmitted by voice to ship(s) where ADPE-FMF devices were located. For the continued operations phase the processing load would be the greatest yet is estimated at one-third that of the garrison load. ADPE-FMF devices would deploy alone during the latter protion of the FSSG's move to shore. The MAF could employ up to 4 ADPE-FMF devices, the MAB would employ 2 devices and the MAU would not deploy with a DOV dedicated device but may well series-share the ADPE-FMF devices that deploy with a MAU. The MAU devices are provisioned for one operational and one in back-up mode.

OBJECTIVES/JUSTIFICATION: See Part I of Garrison/Preembarkation Worksheet.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet).

MAF/ MAB/ MAU	Node From	To	Priority/ Criticality/ Essentiality, Planned Media	Data Elements/Size/ Frequency/Security Class (Per Person, Item, Sortie, etc.)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard), Not Tactically Required, Interfaces, Transitions, etc.)
MAF	4	Ext	Routine, 8D	1,500 PC, 170 pages print, month, Uncl CONUS x 30 percent interactive hardwired	Cons at Node 4 if MASC utilized else courrier	.22 hrs/month .20 Mbytes, Node 4, 490 MIPS	Interface: Navy IDA (through SABRS) and Dept. of Treasury on magnetic media.)
MAB	4	Ext	Routine, 8D	520 PC, 60 pages print, month, Uncl. CONUS x 30 percent interactive hardwired	Cons at Node 4 if MASC utilized else courrier	.1 hrs/month .1 Mbytes, Node 4, 170 MIPS	Interface: Navy IDA (through SABRS and Dept. of Treasury on magnetic media.)
MAF/ MAG	Terminal to Node 4		Routine, 8D		Data Transportation		

(See Part I of Garrison/Preembarkation Worksheet for data development)

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

LtCol L. Mertes
DO, 2D FSSG
Av 484-3755
Functional Area/Staff Officer:

Maj R. Muza
HQMC-FDD
694-4982
Functional Subsystem: DOV

Function System: FISCAL

Size/Type of Force:
MAF Considered
MAB Considered
MAU Manual or Serial
RDF
Reserve
Unit N/A

Date:
Signature:

Mission Phases:
Garrison
Preembark
Afloat Worst Case - Combat
Assault Worst Case - Combat
Combat w/TRA 33% of garrison

Special Cases:
Cbt Svc Spt
Transport
Rehearsal
Other None

DEPLOYED AIS 88 STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice. (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Supply/Storage

DESCRIPTION: Supply storage is the process of material receipt, warehousing, inventory, security, PP&P, and the preparation for issue of supplies in support of a MAGTF.

CONCEPT OF OPERATIONS: In a deployment, the initial task of the storage subfunction involves the warehousing, location control and preparation for issue of operational deployment stocks and LFORM. This task is accomplished by the FSSG utilizing preassembled and packed containers supported by an automted locator file in the supply AIS. Receipts and issues of retail and intermediate level stocks by the CSSAs and the FCSSA are entered as transactions utilizing source data automation (e.g., ADPE-FMF) and forwarded to the MASC for processing and updating the inventory balance and locator files. Based on the duration of the operation and/or the percentage of warehouse stock denials, location verifications and/or physical inventories may be required. These are conducted using the inventory balance file and the locator file of the supply AIS.

OBJECTIVES/JUSTIFICATION: A capability is required to process and update retail and intermediate level stock locations as the result of issues, receipts, and inventory gains and losses. For a MAF, the storage process could involve the multiple location of 68,500 line items. The size of the inventory and the number of stock locations are too numerous to accomplish manually and require automation support.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
		2200 as of 1800 2A, 8D	RECEIPTS			
MAF	5A/4		2175	4	4	
	5B/4		4575	4	4	
	5C/4		1425	4	4	
	5D/4		960	4	4	
	6/4		4900	4	4	
			LOCATIONS			
	5A/4		220	4	4	
	5B/4		450	4	4	
	5C/4		150	4	4	
	5D/4		100	4	4	
	6/4		500	4	4	
			INV (STOCK DENIAL)			
	5A/4		110	4	4	
	5B/4		225	4	4	
	5C/4		75	4	4	
	5D/4		50	4	4	
	6/4		250	4	4	

PART IV - Administrative/Type of Force/Mission Phase (List References on the Reverse)

Points of Contact:
Maj G. Hughey, Code LPS, Autovon 224-1763
Maj W. Arbacus, Code LMM, Autovon 224-1600

Functional Area/Staff Officer:
I&L Dept/Maj G. Hughey

Functional Subsystem: Supply/Storage

Function System: SASSY

Size/Type of Force:
MAF Considered
MAB Less than MAF
MAU Less than MAF
RDF ~~As above~~
Reserve Unit ______

Mission Phases:
Garrison Less than combat
Preembark Less than combat
Afloat Less than combat
Assault Less than combat
Combat w/TRA Considered
Cbt Svc Spt Considered
Transport ______
Rehearsal ______
Other ______

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DEPLOYED AIS 89 STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice. (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Supply/Distribution

DESCRIPTION: Supply distribution is the process of issuing supplies to units and maintenance activities required in the support of the MAGTF.

CONCEPT OF OPERATIONS: In a deployment, supplies are stored in ATF transportation resources and will be located in several elements, e.g., assault echelon, assault follow-on ecehlon, follow-up shipping, and fly-in echelon. Distribution between the embarkation and assault phases of an amphibious operation is generally limited to Class I, III and V items and a small range of Class IX items needed in the maintenance of combat essential equipment. During the assault phase, distribution is made from beach support areas/landing zone support areas (BSA/LZSA) established ashore by the landing force support party. On order and upon general unloading the BSAs/LZSAs are replaced by a combination of combat service support areas (CSSAs) and force combat support area (FCSSA) which then serve as the distribution activities for retail and intermediate level stocks respectively. Demands are placed upon the designated FCSSA or CSSA for either supply point or unit distribution. The supply distribution operations will require daily, periodic and as-required transaction reporting using source data automation (e.g., ADPE-FMF). These data are forwarded to the MASC for processing and updating the data base and files of the supply AIS.

OBJECTIONS/JUSTIFICATION: A capability is required to process and update retail and intermediate stock status and location as the result of issue and redistribution transactions in MAF. For a MAF, the distribution process could involve 68,500 line items, 89 reporting unit codes and several points of distribution.

The number of transactions required and the composition of reports generated are too numerous to accomplish manually and requires automation support.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
MAF	5A/4	2200 as of 1800, 2H, 8D	2175, 80C	4	4	
	5B/4		4571, 80C	4	4	
	5C/4		1428, 80C	4	4	
	5D/4		958, 80C	4	4	

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:
Maj G. Hughey, Code LPS, Autovon 224-1763
Maj W. Arbacus, Code LMM, Autovon 224-1600

Functional Area/Staff Officer:
I&L Dept/Maj G. Hughey

Functional Subsystem: Supply Distribution

Function System: SASSY

Size/Type of Force:
MAF Considered
MAB Less than MAF
MAU Less than MAF
RDF As above
Reserve Unit ______

Mission Phases:
Garrison Less than combat
Preembark Less than combat
Afloat Less than combat
Assault Less than combat
Combat w/TRA Considered
Cbt Svc Spt ~~Considered~~
Transport ______
Rehearsal ______
Other ______

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(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice, (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Supply/Procurement

DESCRIPTION: Supply procurement is the process consisting of stock review, requirements determination, requisitioning, and the control of receipts and issues of supply requirements for retail and intermediate level stocks in support of a MAGTF.

CONCEPT OF OPERATIONS: In a deployment, operational stocks will initially be provided from the operational deployment stocks and the Landing Force Operational Reserve Material (LFORM) and will be managed by the FSSG utilizing a supply AIS. The supply AIS will be at the MASC located at the FCSSA. It will contain the data base and files for all supply subfunctions including procurement, and will rely on transaction and data reporting from the CSSAs and using units. The FSSG will normally establish a FCSSA to hold the intermediate level stocks. The FCSSA performs the procurement subfunction of supply for the intermediate level stocks held by the FSSG General Account as well as the procurement subfunction for the retail level of stocks held by each CSSA. The number of CSSAs required is dependent upon the size, configuration, and dispersion of the MAF. Requisitions that cannot be satisfied by the General Account Intermediate level stocks and requisitions to replenish the General Account stocks are passed to the next source of supply (e.g., Theatre Army Depot, CONUS item manager, etc.) by the FSSG. The supply AIS will monitor supply activity and as retail and intermediate level stocks are drawn down to a predesignated reorder point, it will trigger requisitioning action to the next source of supply to bring stock levels up to the authorized objective. Receipts from sources of supply are entered as transactions in the data base. Units including maintenance activities within the MAF will use source data automation (e.g., ADPE-FMF) to enter requirements which are sent to a CSSA where they are issued from retail level stocks or passed to the FCSSA. Additionally, the CSSAs will use similar source data automation to report transactions which are forwarded to the MASC for processing and updating the supply AIS data base.

OBJECTIVES/JUSTIFICATION: A capability is required to determine supply requirements, requisition, control receipts and issues, and account for inventory to ensure that the proper level of retail and intermediate level stocks are maintained within the MAF. Within a MAF, this will involve approximately 68,500 line items stocked and an additional 110,000 records of line items not stocked which must be managed. The size of the inventory management will require automation support.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
MAF	1/5B	2200 as of 1800, 2N,8D	REQUISITIONS 56, 80C	CONSOLIDATION 5B	4	
	2/5B		305, 80C	5B	4	
	3/5B		165, 80C	5B	4	
	10/5B		1930, 80C	5B	4	
	9/5B		114, 80C	5B	4	
	11/5B		105, 80C	5B	4	
	12/5B		585, 80C	5B	4	
	13/5B		450, 80C	5B	4	
	14/5B		382, 80C	5B	4	

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:
Maj G. Hughey, Code LPS, Autovon 224-1763
Maj W. Arbacus, Code LMM, Autovon 224-1600

Functional Area/Staff Officer:
I&L Dept/Maj G. Hughey

Functional Subsystem: Supply Procurement

Function System: SASSY

Size/Type of Force:
MAF Considered
MAB Less than MAF
MAU Less than MAF
RDF As above
Reserve Unit ______

Mission Phases:
Garrison Less than combat
Preembark Less than combat
Afloat Less than combat
Assault Less than combat
Combat w/TRA Considered
Cbt Svc Spt Considered
Transport ______
Rehearsal ______
Other ______

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, [illegible].)
MAF	8 5A	2200 as of 1800, [illegible]A,8D	REQUISITIONS 7, 80C	CONSOLIDATION 5A	4	
	8 5C		4, 80C	5C	4	
	10 5A		385, 80C	5A	4	
	10/5C		192, 80C	5C	4	
	15 5A		300, 80C	5A	4	
	15 5C		150, 80C	5C	4	
	18 5A		205, 80C	5A	4	
	18 5C		205, 80C	5C	4	
	14 5A		267, 80C	5A	4	
	14 5C		133, 80C	5C	4	
	20/5A		532, 80C	5A	4	
	20/5C		265 80C	5C	4	

[illegible]trative/Type of Force/Mission Phase
[illegible] References on the Reverse)

[illegible] Officer:

Size/Type of Force:

MAF ________

MAB ________

MAU ________

R.F ________

Reserve Unit ________

Mission Phases:

Garrison ________

Preembark ________

Afloat ________

Assault ________

Combat w/TRA ________

Cbt Svc Spt ________

Transport ________

Rehearsal ________

Other ________

AD-A123 283 AUTOMATED INFORMATION SYSTEM (AIS) SUPPORT FOR FMF UNITS WHEN DEPLOYED OR IN COMBAT (1985-1995)(U) POTOMAC GENERAL RESEARCH GROUP MCLEAN VA 13 APR 82 5/5

UNCLASSIFIED USMC-60-81-02 M00027-78-G-0061 F/G 9/2 NL

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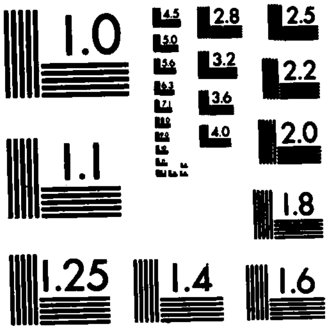

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
	6A/5A	2200 as of 1800 2A,8D	479, 80C	5A	4	
	6B/5B		479, 80C	5B	4	
	6C/5C		479, 80C	5C	4	
	6D/5D		958, 80C	5D	4	
	5A/4		2175, 80C	4	4	
	5B/4		4571, 80C	4	4	
	5C/4		1428, 80C	4	4	
	5D/4		958, 80C	4	4	
	4/EXT	0600 as Of 24A, ST	2200/4750, 80C	4	4	
	EXT/4	2200 as of 1800 24H, ST	STATUS 73, 750 80C	4	4	

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:

Functional Area/Staff Officer:

Functional Subsystem: Supply/Procurement

Function System:

Size/Type of Force:

MAF ________

MAB ________

MAU ________

RDF ________

Reserve Unit ________

Mission Phases:

Garrison ________

Preembark ________

Afloat ________

Assault ________

Combat w/TRA ________

Cbt Svc Spt ________

Transport ________

Rehearsal ________

Other ________

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PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
MAF	12-5B	1600 as of 1200, 2h, 8D	900, 80C	CONSOLIDATION 5B	4	
	13-5B		900, 80C	5B	4	
	14-5B		1000, 80C	5B	4	
	9-5B		300, 80C	5B	4	
	10-5B		2150, 80C	5B	4	
	3-5B		400, 80C	5B	4	
	2-5B		550, 80C	5B	4	
	7-5B		325, 80C	5B	4	
	11-5B		200, 80C	5B	4	
	1-5B		150, 80C	5B	4	
	6-5D		4950, 80C	5D	4	
	8-5A		66, 80C	5A	4	
	8-5C		33, 80C	5C	4	
	16-5A		700, 80C	5A	4	
	16-5C		350, 80C	5C	4	
	19-5A		432, 80C	5A	4	
	19-5C		216, 80C	5C	4	
	15-5A		300, 80C	5A	4	
	15-5C		150, 80C	5C	4	
	15-5A		400, 80C	5A	4	

PART IV - Administrative/Type of Force/Mission Phase
(List References on the Reverse)

Points of Contact:
Maj G. Hughey, Code LPS, Autovon 224-1763
Capt G. Durand, Code LMM, Autovon 225-0044

Functional Area/Staff Officer:
I&L Dept/Maj G. Hughey

Functional Subsystem: Maintenance Operations

Function System: MIMMS

Size/Type of Force:
MAF Considered
MAB Less than MAF
MAU Less than MAF
RDF As above
Reserve Unit UNK

DATE: 29May81

Mission Phases:
Garrison Less than combat
Preembark Less than combat
Afloat Less than combat
Assault Less than combat
Combat w/TRA ~~Considered~~
Cbt Svc Spt Considered
Transport Less than CSS
Rehearsal Less than CSS
Other N/A

DEPLOYED AIS 88 STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice, (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Maintenance/Maintenance Operations

DESCRIPTION: That activity of equipment maintenance which involves the physical performance of those actions and tasks attendant to the equipment maintenance function for servicing, repairing, testing, overhaul, modification, calibration, modernization, conversion, and inspection.

CONCEPT OF OPERATIONS: During the deployment only the MIMMS AIS/FMSS will be deployed with the MAGTF. Field maintenance will continue to be conducted at the organizational and intermediate levels. At the organizational maintenance level, a report of maintenance conducted and repair parts required or used will be forwarded to the MASC and entered in MIMMS AIS using source data automation (e.g., ADPE-FMF). Maintenance above the organizational level will normally be conducted in designated combat service support areas (CSSA). Equipment belonging to assault elements, and CSS organic assets requiring maintenance will be aggregated, inspected, scheduled and inducted for maintenance within the CSSA. For equipment inducted for maintenance, continual monitoring of maintenance and repair part status will be maintained until work actions have been completed and quality control procedures affected. Transactions concerning maintenance actions and status will be reported to the MASC using source data automation (e.g., ADPE-FMF). Additionally, on a periodic or as-required basis, reports will be prepared by the MIMMS AIS/FMSS for organizations and the MAGTF staff.

OBJECTIVES/JUSTIFICATION: A capability is required to process and update end item maintenance and repair part requirements, availability, and application. A high volume of items requiring repair commitments with rapidly changing maintenance status and repair part requirements are predicted.

The number and composition of transactions and reports will parallel those currently produced by the MIMMS AIS. They are too numberous to accomplish manually and require automated support.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
		1600 as of 1200, 2h, 8D				
MAF	15-5C		200, 80C	5C	4	
	5A-4		2183, 80C	4	4	
	5B-4		7906, 80C	4	4	
	5C-4		1091, 80C	4	4	
	5D-4		5700, 80C	4	4	

PART IV - Administrative/Type of Force/Mission Phase (List References on the Reverse)

Points of Contact:

Functional Area/Staff Officer:

Functional Subsystem: MIMMS

Function System:

Size/Type of Force:

MAF ________

MAB ________

MAU ________

RDF ________

Reserve Unit ________

Mission Phases:

Garrison ________

Preembark ________

Afloat ________

Assault ________

Combat w/TRA ________

Cbt Svc Spt ________

Transport ________

Rehearsal ________

Other ________

DEPLOYED AIS 88 STUDY - DATA COLLECTION WORK SHEET

(Adapted from Appendix B, DB 1-77. For completion instructions, refer to data collection handbook.)

PART I - Brief Description of Function/Subfunction, Concept of Operations, Objectives and Justification - Directed or Local Practice, (Continue on reverse or additional sheet.)

FUNCTION/SUBFUNCTION: Embarkation/Planning, Coordination, and Supervision

DESCRIPTION: Embarkation is the process of loading troops with their supplies and equipment into ships and/or aircraft.

CONCEPT OF OPERATIONS: Lower echelon units in garrison will use source data automation (e.g., ADPE-FMF) to maintain accurate embarkation data on all unit supplies, equipment and personnel to facilitate rapid planning and embarkation under compressed time frames. Selected data will be forwarded to the MASC for entry in the data base of the embarkation AIS and used by embarkation organizations and higher echelons in deployment planning. During deployment planning, the embarkation AIS at the MASC will be used to rapidly determine the lift requirements of units in any task organization and provide a means of rapidly compiling loading plans and other embarkation documentation required during the execution of amphibious/airlift operations. During the movement and rehearsal phase of an amphibious operation, the embarkation AIS will update/modify loading plans due to changes in the landing plans based upon rehearsal/contingency changes. During the assault phase, accurate status and shipboard location of troops, equipment and supplies to be landed will be available from the data base for the Tactical-Logistical Group (TACLOG) to assist in the rapid and effective establishment of supplies. Once the supplies and equipment have been delivered ashore to beach support areas/landing zone support areas, their status and location by dumps will be entered and maintained as a supply function in the supply AIS. Upon completion of general off loading, all echelons will reestablish embarkation data bases, using ADPE-FMF or the embarkation AIS as appropriate, in prepartion for back-loading or other contingencies.

OBJECTIVES/JUSTIFICATION: A capability is required to maintain and update the unit embarkation data, rapidly compile/change loading plans, and maintain a status of equipment/supplies throughout all phases of an amphibious operation.

The numbers of supplies, equipment, and personnel to be embarked, the computation of lift data for varying task organizations, the requirement to update loading plans rapidly, and the capability to plan for re-embarkation and other contingencies in the Amphibious Objective Area (AOA) precludes manual manipulation of data and requires automation support.

PART III - Data Base Locations/Processing Requirements by Force Node (Continue on reverse or additional sheet)

MAF/ MAB/ MAU	Node From To	Priority/ Criticality/ Essentiality	Data Elements/Size/ Frequency (Per Person, Supply Item, Sortie, etc)	Data Consolid'tn/ Conversion/ Integration at Node No.	Processing & Mass Storage Requirement at Node No.	Miscellaneous (Shipboard, Not Tactically Required, Interfaces, Transitions, etc.)
MAF		2000 as of 1600 2[illegible],8D	Lift Requirements and Assignment to Shipping Trans	Consolidation		- One time requirement. All transactions edited with ADPE-FMF Device
	1/4		650, 80C	1	4	
	2/4		2500, 80C	2	4	
	3/4		2500, 80C	3	4	
	6/4		30,000, 80C	4	4	
	12/4		22,500, 80C	4	4	
	9/4		1,500, 80C	4	4	
	13/4		7,500 80C	4	4	
	14/4		5,000, 80C	4	4	
	11/4		750, 80C	11	4	
	10/4		15,750, 80C	4	4	
	8/4		1,625, 80C	8	4	
	15/4		32,500, 80C	4	4	
	17/4		10,500, 80C	4	4	

PART IV - Administrative/Type of Force/Mission Phase (List References on the Reverse)

Points of Contact:

Maj G. Hughey, Code LPS, Autovon 224-1763
Maj W. Sandberg, Code LPP, Autovon 224-1917

Functional Area/Staff Officer:

I&L Dept/Maj G. Hughey

Functional Subsystem: Embarkation/Planning, Coordination, and Supervision

Function System: MEDS, Class I

Size/Type of Force:

MAF Considered
MAB Less than MAF
MAU Less than MAF
RDF As above
Reserve Unit As above

Mission Phases:

Garrison Less than preembark
Preembark Considered
Afloat Less than preembark
Assault ~~Less than preem~~bark
Combat w/TRA ~~Less than~~ preembark
Cbt Svc Spt ~~Considered~~
Transport
Rehearsal
Other

ANNEX H

STUDY PARTICIPANTS

ANNEX H

Deployed AIS-88 Study

Study Participants

HQMC - CCIE Study Sponsorship

Lt Col Balthis
Major Sims
Major Roesch
Mr. Hirai
Major Lindholm - CCIP

HQMC - RD

Lt Col Schumacher
Major Shuttleworth
Major Parrish

HQMC - MPI

Major Carter
Lt Diab

HQMC - ASA

Lt Col Costello

FMFPAC - CEO

Colonel Peterson

I MAF - ISMO

Lt Col Fresquez

MCDEC - Project Officers

Major Foster
Major Dunn
Captain Lundeen

HQMC - LPS

Major Hughey

HQMC - FDA

Major Gomez

HQMC - PPO

Captain Dublin

FMFLANT - ISMO

Lt Col Miles

II MAF - ISMO

Lt Col Dempsey

PGRG Study Team

Mr. Daugherty - Study Team Leader
Mr. Munn - Logistics Team Leader
Mr. Krueger - Logistics Team Member
Mr. Lanigan - Manpower Team Leader
Mr. Detroy - Aviation Team Leader
Mr. Peabody - Scenario and Force Structure
Mr. Cahaskie - Scenario and Force Structure
Ms Lese - Administrative Asst.
Mrs. Lauch - Administrative Asst.
Mrs. Haase - Administrative Asst.
Mrs. Treadway - Administrative Asst.

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