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UNITED STATES COAST GUARD
USCG SSAMPS UPGRADE - NETWORK STUDIES
FUNCTIONAL ANALYSIS AND COST REPORT



FINAL

JULY 1988

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16. Abstract <p>The U.S. Coast Guard distributes unclassified record messages throughout each District using a wide area network called the Standard Semi Automatic Message Processing System (SSAMPS). Currently the interface between SSAMPS and AUTODIN is by paper tape. This study investigated the technical risks and cost associated with directly connecting SSAMPS to AUTODIN. The report concluded that the interface was technically possible and identified a cost of \$1.1M to prototype one district. <i>Keywords: Functional Analysis (Network and Cost Estimation)</i></p>					
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EXECUTIVE SUMMARY

This project report was prepared by FEDSIM as a deliverable item in support of Task 2, "Develop a Comparative Analysis of Functional Capabilities and Cost Evaluation of Design Alternatives" for the USCG SSAMPS Upgrade Network Studies, FEDSIM Project 83060-05-DOT.

This report was developed based in part upon data received from Astronautics Corporation of America (ACA) concerning the Standard Remote Terminal (SRT) System, and the CPT Corporation concerning the CPT Fast Accurate Simple TEMPEST (FAST) System II.

Based upon the USCG decision resulting from Decision Briefing 1, the USCG directed that FEDSIM conduct a comparative analysis of the ACA and CPT SSAMPS Upgrade solutions. The Network Study would analyze and compare the upgrade solutions based on technical operations and maintenance characteristics as well as implementation costs. FEDSIM has collected and analyzed the data and presented a comparative analysis to the USCG in the form of Decision Briefing 2.

A Generalized Functional Specification for the SSAMPS Upgrade was developed and used as a baseline in the study. This specification was presented to vendors and used as a point of departure for data collection. Data collection was accomplished through review of technical documents, informational interviews, and technical interchange meetings with ACA, CPT, and other Government agencies.

From the many informational exchange meetings, the required technical and costing information resulted in the findings documented in this report. The significant findings are that ACA can fully comply with the functional specification. CPT could become fully compliant with minor modification to firmware and hardware. The USCG selected the proposed ACA Advanced Line Control Unit (ALCU)/Automated Record Traffic System (ARTS) architecture which meets the operational requirements of the SSAMPS/AUTODIN interface upgrade while offering future growth through ACA Transitional Architecture. The USCG maintains a significant inventory of SRT System components and recognized the cost advantages of incremental upgrade of existing assets. The CPT solution is workable; however, based on USCG direction, it is not the design solution of choice.

A significant finding of the study is that removal of the manual intervention torn tape relay operation of SSAMPS requires more than the mere insertion of hardware and software to support a SSAMPS-to-AUTODIN gateway. Successful implementation of a prototype upgrade requires all elements of an ADP systems integration program. Section 5.2 provides details of the program elements and associated costs for the prototype implementation at Coast Guard District Five (CGD 5), Portsmouth, Virginia. Implementation cost evaluation resulted in a budgetary estimate of approximately \$1.1 million for execution of a SSAMPS Upgrade Prototype Implementation Program. This cost reflects the significant documentation and data development effort which must be accomplished before the Defense Communications Agency (DCA), which is the AUTODIN connect approval authority, will accept the backside SSAMPS AUTODIN interface. The USCG can now assess this cost in view of the staffing efficiencies and enhanced desktop-to-desktop communications it offers.

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1. INTRODUCTION

1.1 Background

The USCG is divided organizationally and operationally into ten districts. Each USCG district operates inter- and intra-district message networks which are interfaced by the SSAMPS. SSAMPS is installed in each District Office communications center (COMMCEN) and in several USCG Communications Stations (COMMSTAs). SSAMPS processes unclassified message traffic, both operational and administrative. Each District Office also uses AUTODIN as the primary means for sending and receiving classified and sensitive message communications among districts and other Government agencies. All AUTODIN transmissions are encrypted regardless of message classification. The USCG system for unclassified AUTODIN message traffic handling uses torn tape relay to/from SSAMPS, and requires manual intervention.

The USCG is exploring ways to upgrade SSAMPS in each district to replace torn tape with an automated, hardwired interface. FEDSIM has provided support to the USCG to accomplish network studies which would identify and evaluate feasible implementations of the SSAMPS Upgrade.

1.2 Purpose

This report will identify and evaluate the functional capabilities of selected SSAMPS Upgrade design alternatives. The subject design alternatives were selected by the USCG as a result of Decision Briefing 2. The report describes implementation requirements for a prototype SSAMPS site and identifies costs associated with requisite implementation activities.

1.3 Objectives

The objectives of this report are:

- ° delineation of the costs associated with the SSAMPS Upgrade design solution selected by the USCG;
- ° documentation of the findings of a comparative functional analysis conducted on the basis of a generalized specification and a set of stated assumptions;
- ° identification and description of the total program requirements which must comprise successful SSAMPS Upgrade implementation.

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1.4 Critical Project Tasks

FEDSIM has addressed the requirements of the SSAMPS Network Study, Task 2 through performance of the following critical project tasks:

- ° conduct a comparative functional analysis of capabilities and cost evaluation of the SSAMPS/AUTODIN interface upgrade;
- ° prepare a detailed specification of the SSAMPS/AUTODIN interface based upon USCG generalized requirements;
- ° provide a Decision Briefing enabling USCG selection of a candidate SSAMPS Upgrade design alternative for further cost evaluation;
- ° obtain cost quotations from hardware vendors for basic equipment and any required modifications;
- ° develop line item cost estimates for implementation;
- ° prepare a report detailing the cost evaluation and functional analysis findings.

1.5 Document Organization

This report is organized into six (6) sections. This section provides introductory information for reader orientation. Other sections include:

- ° Section 2, "Study Environment", describes the key environmental factors affecting the SSAMPS/AUTODIN interface upgrade implementation.
- ° Section 3, "Assumptions and Constraints, identifies factors affecting the performance of the study.
- ° Section 4, "Methodology", identifies the analysis methodology followed in the development of this report.
- ° Section 5, "Analysis and Findings", presents the findings of the data collection effort, and the analysis of that data.
- ° Section 6, "Summary", presents a summarization of data from the analysis and findings.

Appendices are provided to detail the referenced documentation and informational contacts made during the study performance

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period. A glossary of applicable acronyms used in this report is also furnished. Due to the proprietary nature of selected vendor cost data, specific implementation line items are provided associated cost data within a separate, detachable appendix. This appendix was designed for easy removal when the Report is furnished to personnel other than the initial FEDSIM and USCG distribution.

The appendices provided are as follows:

- Appendix A, "Proprietary Cost Data", identifying cost data for equipment, materials, direct labor, and other direct charges applicable to the implementation costs.
- Appendix B, "Glossary", identifying and defining the acronyms referenced within this report.
- Appendix C, "Reference Documentation", providing a bibliography of documents referenced during performance of the Network Study.
- Appendix D, "Supplemental Technical Documentation", which includes information valuable to subject matter experts.
- Appendix E, "Contact Log", which identifies points of contact who represent technical or policy expertise in telecommunications issues germane to the SSAMPS upgrade.

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2. STUDY ENVIRONMENT

The study environment section defines those environmental factors which affect the SSAMPS/AUTODIN interface upgrade implementation. These factors focus on the design solution selected by the USCG and will include specific information concerning the alternative design solutions analyzed in the study. The systems and organization active in the study environment are described below.

2.1 Task 1 Findings

At Decision Briefing 1, the findings of Task 1 of the SSAMPS Network Study were presented to the USCG. These findings are summarized as follows:

- SSAMPS electrical interface for AUTODIN access is technically feasible
- accredited hardware is required and available
- software and firmware modification will be required
- certified configuration is required with separate testing for Local Digital Message Exchange (LDMX) and AUTODIN Switching Center (ASC) configurations
- backside issue is manageable through software assessment in USCG/DCA/Naval Telecommunications Automated Systems Center (NAVTASC) working group
- configuration control is an overriding factor in minimizing scope of Category III testing required due to disciplined version control and standardized SSAMPS
- currently fielded SRT and FAST hardware may offer a design alternative to a standalone line controller.

2.2 SSAMPS Upgrade Elements

This section also describes the SSAMPS Upgrade design solution selected by the USCG for the cost report final analysis. The solution selected was the upgrade of the Standard Remote Terminal (SRT), manufactured by Astronautics Corporation of America (ACA). This upgrade will enable the SSAMPS to be integrated as a backside element of the AUTODIN circuit termination via an auxiliary port of the SRT.

This section also includes data collected pertaining to the CPT Corporation FAST System II SSAMPS Upgrade design alternative.

The FAST II CPT 9000T AT-compatible workstation was identified during Decision Briefing 1, SSAMPS Network Studies Task 1. The CPT product offering has been introduced to USCG inventory through an application of Maritime Defense Zone requirements.

2.2.1 Existing USCG SRT Configuration

The USCG employs the SRT system as an AUTODIN entry point for paper tape message traffic from/to SSAMPS. The configuration of the SRT system consists of (1) Line Control Unit (LCU); (1) Storage Module Disk Drive (SMDD); (1) Paper Tape Reader (PTR); (1) Paper Tape Punch (PTP); (2) Medium Speed Line Printers (MSLP); and (1) Optical Scanning Unit (OSU). The USCG requirements for SSAMPS Upgrade will include an SRT system provision for SSAMPS backside connectivity to Mode I AUTODIN via an auxiliary port without use of manual torn tape relay operations.

USCG directed FEDSIM to conduct this functional analysis and cost study with the target system implementation being that of a prototype at CG District Five. Based upon this directive, FEDSIM developed a "Most Capable" SRT configuration and documented this in a generalized specification. This "most capable" configuration included all the peripheral hardware units currently found in use at USCG Districts throughout the continental United States (CONUS). The configuration does not, therefore, replicate any one district configuration currently in use; however, it does represent the full-functionality requisite at any one of the districts.

2.2.2 SRT Upgrade

ACA proposes two solutions. The first of these is referred to as the Transitional Architecture. This solution is a large-scale update which is designed as an evolutionary series of incremental upgrades packaged as discrete software subsystem offerings. These offerings will provide classified and unclassified local area networks (LANs), E-mail, Defense Data Network (DDN) access, classified user stations, and dual homing to AUTODIN for more robust communications. This transitional architecture requires numerous additions to the hardware and software inventory of the USCG but would enhance the desk-to-desk communications that is a stated objective of the USCG.

The transitional architecture upgrade would begin with a hardware upgrade of the SRT system Line Control Unit (LCU) to the Advanced Line Control Unit (ALCU). To support this new hardware module, installation of the Automated Record Traffic Software (ARTS) is required. Additional incremental packaged software and hardware is available to expand the system adding classified and unclassified LANs, as desired.

The second solution offered by ACA addresses only those interface requirements set forth in the SSAMPS/AUTODIN generalized specification, the baseline document to which ACA responded with its design proposals. In this architecture, the SRT system would be furnished with the ALCU hardware module, the ARTS software, and the additional Message-Edit Preparation Software (MEPS). This solution would permit SSAMPS to backside the Mode I AUTODIN termination via the SRT system. Based upon the USCG decision subsequent to Decision Briefing 2, this minimum essential ALCU/ARTS/MEPS upgrade is the selected target architecture of this report.

2.2.3 CPT 9000T FAST System II

The USCG will receive the FAST System II in FY88 and FY89 to support MDZ operations. The FAST System II employs the CPT 9000T CPU, and with the addition of the TLC-1 line controller board, this system would allow SSAMPS equipment to backside the Mode I AUTODIN network. Presently the CPT 9000T has three (3) communications ports. Additional ports can be configured through optional hardware and software revisions. One of the three existing communications ports supports an OCR device. A second port would support SSAMPS connectivity. The third communications port would support the medium speed line printer (MSLP).

The SSAMPS interface would use the CG Standard Terminal as the multi-tasking front-end processor between the SSAMPS HP processor and the CPT 9000T. The CPT TLC-1 controller board includes two (2) communications ports. One of these TLC-1 ports would support a DCS AUTODIN mandated receive-only printer while the second port would be utilized as the auxiliary port for AUTODIN interface. More specifically, it would provide electrical connectivity to the associated encryption device (e.g., KG-84).

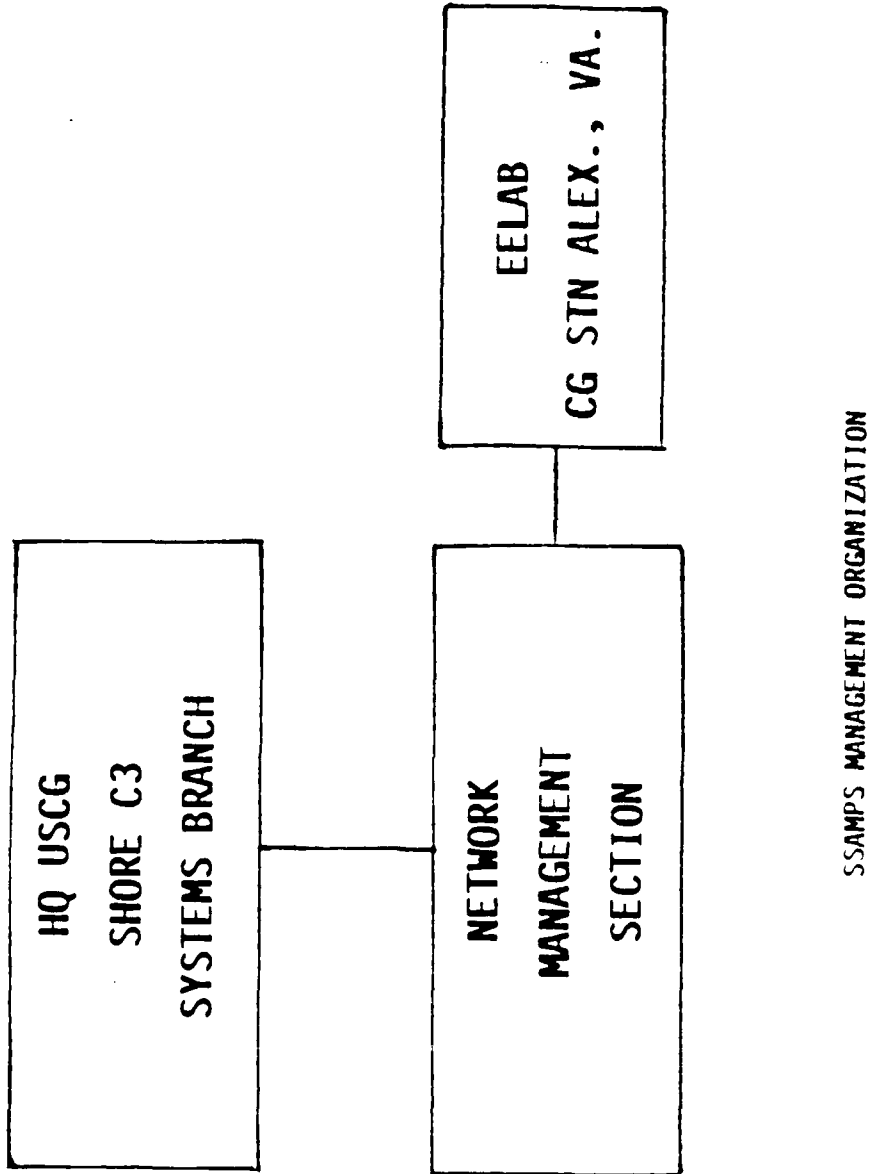
The FAST II alternative was not selected for further study subsequent to Decision Briefing 2 due to USCG recognition of the significant operations and maintenance investment in the existing Astronautics SRT system elements. FEDSIM has included in this report all pertinent design and cost data collected during analysis of the CPT Corporation systems.

2.3 Organization

Throughout the SSAMPS network studies performance period, FEDSIM coordinated all contacts with USCG through the office of the Section Chief, Network Management Section, Shore Command, Control, and Communications (C3) Systems Branch, HQ USCG. The informational and organizational relationships exercised throughout the development of this report are depicted in Exhibit 2-1.

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The Network Management Section, Shore C3 Systems Branch, HQ USCG, provided the essential programmatic and technical management guidance which was instrumental in understanding the objectives of the SSAMPS upgrade and the existing USCG communications environment. The Electronic Engineering Laboratory (EELAB), USCG Station Alexandria, Virginia, provided recurring engineering and software architecture information to FEDSIM. Technical interchange meetings were conducted with candidate equipment and software suppliers as well as Government agencies responsible for operational testing, accreditation, and certification processes germane to AUTODIN connectivity.



SSAMPS NETWORK STUDIES ORGANIZATION

EXHIBIT 2-1

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3. ASSUMPTIONS AND CONSTRAINTS

This section identifies the assumptions upon which the SSAMPS Upgrade network studies and this report have been based. The section also describes the constraints which affected either the study or the presentation of findings in this report.

3.1 Assumptions

In order to execute the study objectives, specific assumptions were required as a baseline of understanding common to FEDSIM and USCG. These assumptions are identified below.

3.1.1 SSAMPS Message Handling and Configuration

Message handling and throughput characteristics of the SSAMPS were based upon information contained in the FEDSIM Report, "U.S. Coast Guard Intra-District Message and Data Communications Requirements", dated May 1986. Within this referenced FEDSIM report, the methods upon which message traffic totals were compiled varied from district to district. In view of this, and the previously described "most capable" configuration of the prototype SSAMPS upgrade, the message traffic figures used in this report represent an average of all district totals identified in the May 1986 Report.

A second critical assumption in this network study was that SSAMPS, currently being implemented by USCG, is in fact standardized in software versions and hardware configurations across all locations. This is essential, since SSAMPS is entering the domain of AUTODIN, a National Communications System (NCS) component with extremely high integrity.

3.1.2 USCG Programming Support

This report will provide implementation cost and labor estimates for all program activities essential to successfully implementing the SSAMPS upgrade. It was assumed that where programming support is required for SSAMPS software modification, CG Standard Terminal software modification, or other software development, the USCG will utilize contractor support. The limited programmer and system analyst resources available at EELAB are considered indicative of staff depth currently accessible to the SSAMPS Upgrade program manager. Current industry bid rates are used in the estimate of software development costs in this report.

3.1.3 USCG Prototype Site

Development of the prototype SSAMPS Upgrade configuration requires a full-complement of SSAMPS equipment and software, i.e., a "most capable" ACA SRT system, and AUTODIN circuit connectivity, at a minimum. Based upon direction provided by USCG at Decision Briefing 2, the prototype site for the SSAMPS Upgrade was targeted as CG District Five, USCG COMMSTA, Portsmouth, Virginia. The site configuration is a factor in the pre-test evaluation of SSAMPS by Defense Communications Agency (DCA), AUTODIN Test Activity personnel. Consideration of operational realism is important in the Category III Certification testing which is further described at section 5.1.5.6 of this report. FEDSIM has determined that Naval Telecommunications Systems Integration Center (NAVTELSYSIC) may be capable of providing a permanent test bed facility for the SSAMPS configuration. This is an important consideration given the major role which NAVTASC has in conducting the Navy Integration/Certification Test for LDMX AUTODIN connect approval.

The location of Category III testing will be determined through meetings between USCG and DCA in early working group technical interchanges. For the purposes of this report, implementation estimates are based upon the assumption of CGD 5 as the prototype site for the SSAMPS Upgrade activities.

3.1.4 USCG Working Group Staffing

Proper planning for the SSAMPS Upgrade program requires early interaction with DCA AUTODIN Test Activity staff to discuss the existing SSAMPS software and hardware architecture and to provide a comprehensive engineering plan for the functional and physical changes proposed as part of the upgrade. These discussions will promote consistency in later program phases, and will identify any major deficiencies in the existing or planned design which could prevent certification.

It was also assumed that the USCG will staff the working group with operationally experienced individuals (1-2) who are familiar with SSAMPS and who are also knowledgeable of SSAMPS software architecture.

3.1.5 Paper Tape Equipment (PTE) Usage

It was assumed that the USCG desires to discontinue use of the PTE through automation of all torn tape operations.

3.2 Data Limitations

This report is based upon data furnished to FEDSIM by the USCG, AUTODIN support hardware and software vendors, DCA, NAVTASC, NAVTELSYSIC, Defense Intelligence Agency (DIA), and other Government agencies. This data has been furnished either verbally or with supporting documentation. Telephonic contacts, technical interchange meetings, and informational interviews at Government facilities were conducted in the execution of this network study and preparation of this report. Personnel interviewed or queried for this report are identified in Appendix E of this Report. Reference documentation reviewed during the study is identified in Appendix C.

3.2.1 Cost Estimation Methodology

In preparing cost estimates for the SSAMPS Upgrade implementation activities, FEDSIM has approached the effort as a system engineering life-cycle program which utilizes a contract work breakdown structure (WBS). Section 5.2.3 of this report provides details of the SSAMPS Upgrade Program WBS.

The WBS enables breakout of line items by the program activity to which they are allocated. FEDSIM has used the WBS to segregate those activities that are entirely USCG-staffed from those that are staffed by support contractors. Where hardware and software vendor quotations are used for configuration items, they are included in the prototype implementation estimates. Due to the proprietary cost data furnished by vendors, and the limited restrictions upon accessing this report, a separate appendix of proprietary cost data is furnished in Appendix A.

3.2.2 Price Basis

The prototype implementation is based upon a "most capable" specification and has not been tailored to the final production quantities and site-specific requirements of each USCG District employing SSAMPS. Therefore, pricing is limited to that of unit pricing and does not reflect any quantity price breaks. Given that the SRT upgrade components may be available from a delivery order schedule based on a larger volume U.S. Navy SPAWAR procurement, it is possible that the USCG could obtain significant cost advantages during full-scale (all District) implementation.

Direct labor estimates are based upon competitive rates currently in use by professional services organizations supporting the Federal Government in the areas of ADP systems development and systems integration. These rates are identified as part of proprietary cost data in Appendix A.

3.2.3 Proprietary Cost Data

The performance period of the SSAMPS Upgrade network study and the development of this report coincided with the competitive procurement of a large delivery order contract for the General Services Administration (GSA). This contract solicitation included responses from vendors who have supported FEDSIM with cost data for this report. In recognition of the competitive sensitivity of these cost data, FEDSIM requested the USCG approval of furnishing proprietary cost data in the form of a detachable appendix to this report. This appendix has the objective of conveying total cost data to those USCG personnel who are required to review the SSAMPS Upgrade network study findings, while allowing a modicum of data protection to the source vendors in a competitive procurement process. It is anticipated that access to Appendix A will not be afforded through Defense Technical Information Center (DTIC) or National Technical Information Service (NTIS) distribution.

4. METHODOLOGY

FEDSIM structured the approach to the SSAMPS Upgrade Network Studies through the following data collection and analysis activities:

- Initial review of technical and policy information;
- Technical interchange meetings;
- Comparative analysis of functional capabilities;
- Development of functional specifications;
- Assessment of capabilities and cost evaluation;
- Providing USCG with a Functional Analysis Decision Briefing;
- Tailoring final report to USCG design selections.

The initial SSAMPS Network Study, Task 1, had the objective of determining the feasibility of implementing a SSAMPS interface to AUTODIN which would remove the manual torn tape relay operations currently in use. Findings of the Task 1 study were presented to the USCG in Decision Briefing 1. This briefing identified available standalone hardware devices which could provide the AUTODIN line controller functionality. However, a critical path of documentation and testing must be developed and successfully completed to achieve the essential accreditation and certification for AUTODIN connection approval from DCA.

The scope of the accreditation and certification processes is broad when compared with the labor and materials required for merely physically and electrically implementing the AUTODIN interface with SSAMPS. The practices and procedures of all SSAMPS functions and operations must be scrutinized; detailed documentation must be made available; and software architecture must be analyzed for any impact upon AUTODIN end-to-end system integrity. Significant time and resources must be allocated to achieve SSAMPS/AUTODIN interface objectives.

Given the policy, security, technical, and cost issues surrounding implementation, USCG directed FEDSIM to further investigate the options for upgrade beyond standalone hardware devices. The feasibility of exploiting AUTODIN hardware currently in use, or elements entering the USCG inventory, for support of the SSAMPS interface was targeted for Task 2 analysis.

4.1 Initial Review of Technical Information

Task 2 activities commenced with a comprehensive review of the following technical documentation:

- ° Task 1 products, including working notes used by the FEDSIM team in developing Decision Briefing 1;
- ° Vendor documentation existing in USCG technical library;
- ° Astronautics Corporation of America (ACA) Standard Remote Terminal (SRT) technical specifications and system description;
- ° CPT Corporation CPT 9000T technical specifications and FAST System II description;
- ° Analytics Communication Systems (ACS) Corporation TLC-1 technical specifications and functional description;
- ° USCG SSAMPS System Description and Acquisition Plan.

4.2 Technical Interchange Meetings

The FEDSIM project team conducted numerous technical interchange meetings with hardware suppliers including the following organizations:

- ° Analytics Communications Systems (ACS) Corporation
- ° Teqcom Incorporated
- ° Mark-Space, Inc.
- ° Inteq Corporation
- ° Astronautics Corporation of America (ACA)
- ° Information Management Associates, Inc.
- ° CPT Corporation.

Principally, engineering staff members were in attendance at these meetings. The focus of the FEDSIM inquiries was the technical and operational testing issues related to implementation of their AUTODIN- related hardware and software offerings. In many instances, live demonstrations of workstations utilizing the supplier's line control units were conducted. Compliance with DCA Category I AUTODIN channel

control and coordination requirements was discussed in detail. The TEMPEST requirements, which are evaluated in DCA Category II Testing, were also reviewed. FEDSIM was particularly interested in supplier willingness to support a variety of communications protocols for backside elements. Pertinent to this was experience with Category III Operational Testing for DCA AUTODIN certification. Many of the recent testing experiences of these vendors in supporting DOD sponsors of Cat III Tests were factored into the program scheduling of test phases, and are reflected in the preliminary SSAMPS Upgrade Program schedule in Section 5.2.3.1 of this report.

Other technical interchange meetings were conducted with the Defense Communications Agency (DCA), AUTODIN Test Activity, in McLean, Virginia. At the DCA interchange, the concept of early sponsor dialogue with DCA was emphasized. The need was identified for a Working Group to meet with DCA, with the objective of discussing SSAMPS ADP architecture, and the engineering changes planned. Through this interchange meeting, FEDSIM learned of the configuration control imperative. The most significant evaluation factor in readiness for Category III Operational testing is the adequacy of existing USCG operational and configuration management documentation. The emphasis upon SSAMPS architecture is on the very first word of its name -- Standard. Standardization and version control must be assured before any submitted Cat III Test Plan would meet DCA approval.

The USCG supported the SSAMPS network study by providing access to SSAMPS system developers and integrators at the Coast Guard Station Alexandria, EELAB, Alexandria, Virginia. The FEDSIM project team met with EELAB staff for multiple technical interchanges to obtain operational concept clarifications and configuration data.

4.3 Development of Functional Specifications

The nature of the Task 2 study was such that responses from multiple hardware and software suppliers were required to identify the feasibility of upgrading existing USCG inventory to meet SSAMPS/AUTODIN interface requirements. USCG and FEDSIM recognized the competitive nature of the commercial vendors who could provide design solutions for the SSAMPS interface upgrade and based upon this, a generalized functional specification was developed to document the baseline functionality of the SSAMPS/AUTODIN interface and workstation requirements. This specification was utilized as the point of departure for technical and cost responses by ACA and CPT Corp.

Details of the generalized functional specification are provided in section 5.1.5 of this report.

FEDSIM

4.4 Comparative Analysis of Functional Capabilities

Subsequent to the release of the generalized functional specification to industry, technical interchange meetings were held. At these meetings industry representatives briefed the FEDSIM project team on their proposed hardware and software products that complied with the USCG specification. FEDSIM then identified and documented those respondents complying with each of the specification elements.

4.5 Functional Analysis Decision Briefing

FEDSIM provided the USCG with the preliminary results of Task 2 findings at Decision Briefing 2. The briefing addressed the following topical areas:

- reviewed Task 2 objectives
- reviewed Task 1 findings
- described technical approach
- described findings of functional analysis
- identified implementation requirements
- reviewed design alternatives
- reviewed decision impact upon Functional Analysis & Cost Report
- outlined assumptions in cost evaluation process
- identified objectives of Functional Analysis & Cost Report.

Briefing attendees were provided with a review of Task 1 findings which supported the feasibility of procuring off-the-shelf, standalone hardware components for use as AUTODIN line controllers enabling SSAMPS electrical interface. FEDSIM noted that due to the large historical investment in the SRT system architecture, any introduction of SSAMPS as a backside element of the existing SRT or RIXT configurations would require support of Astronautics Corporation of America (ACA) because of essential proprietary software modifications. Alternatively, the use of the CPT 9000T FAST II System would bring with it an additional requirement for AUTODIN circuit termination. Approval for such a telecommunications service request appears unlikely given the low message traffic volumes indicated by the May 1986 FEDSIM analysis. The added leased

service costs would represent a cost burden unjustified solely by SSAMPS message traffic volume. This does not consider another constraint identified during the study, namely, the saturation of LDMX communications port capacity at many CONUS switch locations.

4.6 USCG Decision and Scope of Report

The USCG decision resulting from assessment of the preliminary functional analysis findings of Task 2 determined the focus and scope of this report. The USCG recognized the difficulty associated with introducing new hardware and software solutions that could not in themselves replace functions performed by existing equipment. Based upon USCG direction, this Report focuses upon the design alternative which implements upgraded transitional SRT architecture to achieve the SSAMPS AUTODIN interface. This transitional architecture is described in Section 5.1.3.1 of this report.

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5. ANALYSIS AND FINDINGS

This section presents the findings of the network study data collection effort and the analysis of that data in accordance with the Task 2 objectives.

5.1 Analysis of SSAMPS Upgrade Solutions

The USCG-approved generalized functional specification was used to elicit industry response to the SSAMPS/AUTODIN functional requirements. Candidate solutions were proposed by the Astronautics Corporation of America (ACA), the supplier of the SRT System, and by CPT Corporation, manufacturer of the CPT 9000T FAST System II, which uses the TLC-1 controller.

5.1.1 Generalized SSAMPS/AUTODIN Specifications

FEDSIM requested that the USCG assist in development of a Generalized SSAMPS/AUTODIN Hardware Specification which would be used as a baseline for the SSAMPS Upgrade Network Study for Task 2 functional analysis and cost evaluation. The USCG termed the generalized specification a "most capable" configuration, as listed in Exhibit 5-1, consisting of:

- ° (1) Line Control Unit (LCU)
- ° (1) Storage Module Disk Drive (SMDD)
- ° (1) Paper Tape Reader (PTR)
- ° (1) Paper Tape Punch (PTP)
- ° (2) Medium Speed Line Printers (MSLP)
- ° (1) Optical Scanning Unit (OSU)

Presently this configuration varies from district to district. However, the "most capable" AUTODIN terminal configuration, as illustrated at Exhibit 5-2, has been used throughout the performance of this network study.

The USCG SRT System is used to enter classified/unclassified messages into the AUTODIN. As configured, messages may be sent or received via AUTODIN through DD173 format entry or the use of paper tape equipment (PTE). The USCG desires the elimination of the use of PTE and the upgrade of SSAMPS and SRT operations so that message traffic (send and receive) will interface AUTODIN via a direct electrical interface rather than the present torn tape relay operation. The SSAMPS will

GENERALIZED SSAMPS/AUTODIN HARDWARE SPECIFICATION

"MOST CAPABLE" AUTODIN TERMINAL REQUIREMENTS:

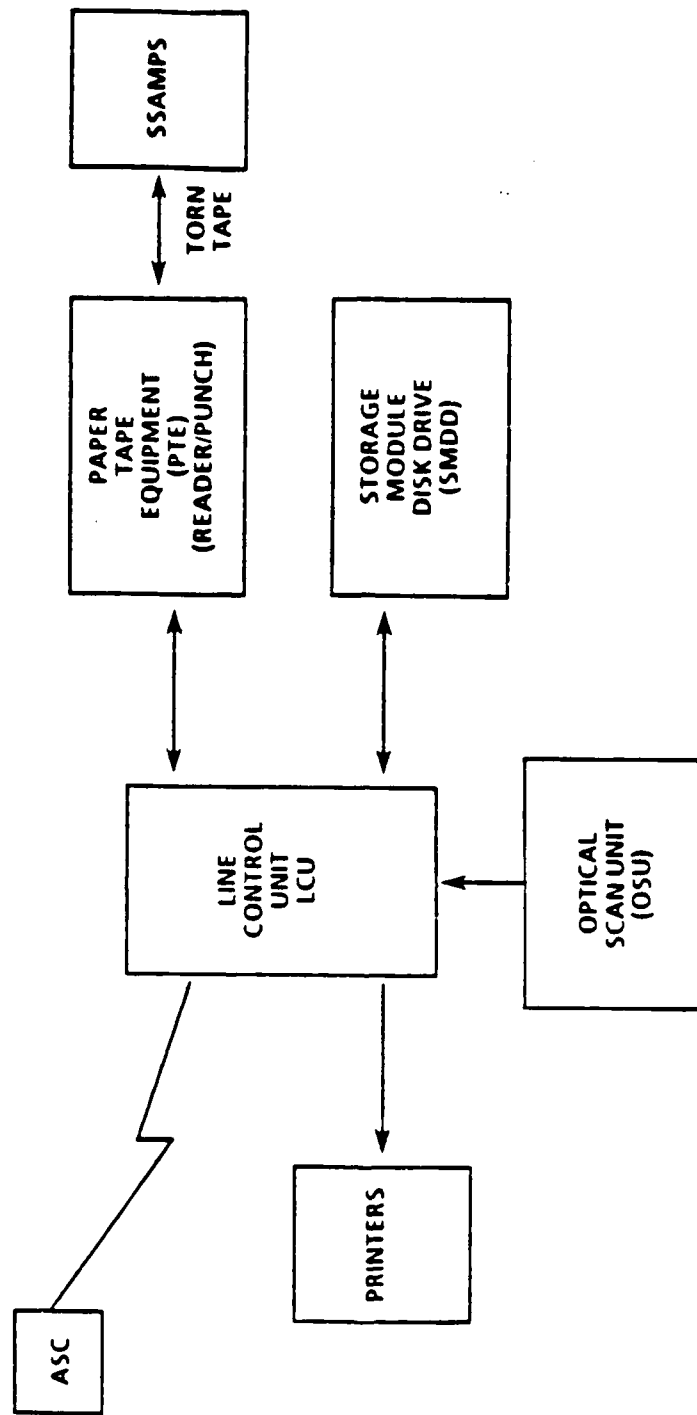
- LINE CONTROLLER UNIT (LCU)
 - PROVIDING BACKSIDE AUX PORT FOR SSAMPS H-P PROCESSOR
 - CAPABLE OF CATEGORY I, II, AND III CERTIFICATION BY DCA
- ON-LINE STORAGE
 - 40MB WITH RANDOM ACCESS
- PAPER TAPE READER (PTR)
 - READ 5-LEVEL AND 8-LEVEL CODE
 - 150 CPS
- PAPER TAPE PUNCH (PTP)
 - 120 CPM
 - PUNCHES 5-LEVEL/8-LEVEL CODE
- MEDIUM SPEED LINE PRINTER (MSLP)
 - 150 LPM - 200 CPS
 - 10 CHARACTERS PER INCH
 - 1-6 PART PAPER
- OPTICAL SCANNING UNIT (OSU)
 - READS DD173
 - 150 CPS
 - PROCESS MAXIMUM OF 24 LINES
- SPECIFICATIONS UTILIZED AS
 - POINT OF DEPARTURE FOR TECHNICAL INTERCHANGE MEETINGS
 - BASIS OF ELICITING RESPONSES INDICATIVE OF AUTODIN NEW PRODUCT OFFERINGS

GENERALIZED SSAMPS/AUTODIN HARDWARE SPECIFICATION

EXHIBIT 5-1

SYSTEM CONFIGURATION

USCG "MOST CAPABLE" AUTODIN TERMINAL



"MOST CAPABLE" SYSTEM CONFIGURATIONS

EXHIBIT 5-2

actually interface or "enter" AUTODIN via the CG Standard Terminal. The Hewlett-Packard (H-P) 9825 processor used in the SSAMPS uses a single-task CPU. Rather than delay SSAMPS message processing through addition of the SRT communications processes to the H-P workload, the H-P would pass messages directly to the CG Standard Terminal, a multi-tasking Convergent Technologies workstation. The protocol implemented between the SSAMPS H-P CPU and the CG Standard Terminal will emulate PTE.

FEDSIM technical interchanges with EELAB addressed the use of CG Standard Terminal. EELAB programmers foresee no significant difficulties in the programming of SSAMPS or the CG Standard Terminal for the communications interface requirement. Their estimate for SSAMPS software modification was approximately 6-8 weeks of programming effort. Estimate of CG Standard Terminal reprogramming was approximately 4-5 weeks. The EELAB suggested the communications protocol between the CG Standard Terminal and the host (SRT) also be PTE emulation.

5.1.2 Estimated Costs of USCG "Most Capable" SRT

The USCG submitted estimated non-recurring costs for equipment, surveys, planning and training, as well as annual recurring costs for maintenance and leased communications lines. FEDSIM has included these estimated costs at Exhibit A-1, Appendix A of this report. ACA submitted estimated replacement costs for the USCG "most capable" SRT configuration. Due to the proprietary nature of this cost data, it has been furnished as Exhibit A-2 of Appendix A.

5.1.3 ACA SRT Design Alternatives

ACA was approached with a request for information (RFI) concerning the feasibility of backsideing the SSAMPS via the SRT System using the TLC-1 AUTODIN line controller manufactured by Analytics Communication Systems (ACS) Inc, of Herndon, Virginia. ACA declined to support the ACS TLC-1 product, however ACA did offer other design alternatives. ACA presented two design alternatives which FEDSIM has evaluated.

The first of the design alternatives is the Transitional Architecture which is a full-scale upgrade that supports automatic of message processing, reduced manpower, and enhanced desk-to-desk throughput. The second ACA proposed alternative is essentially the initial phase of the Transitional Architecture. This phase concentrates on the upgrade of the SRT LCU. This alternative is of narrower scope than the first offering, however it is capable of meeting the USCG SSAMPS upgrade requirements. Each of the two ACA alternatives will backside the SSAMPS to the AUTODIN Mode I network via an auxiliary port in the SRT LCU.

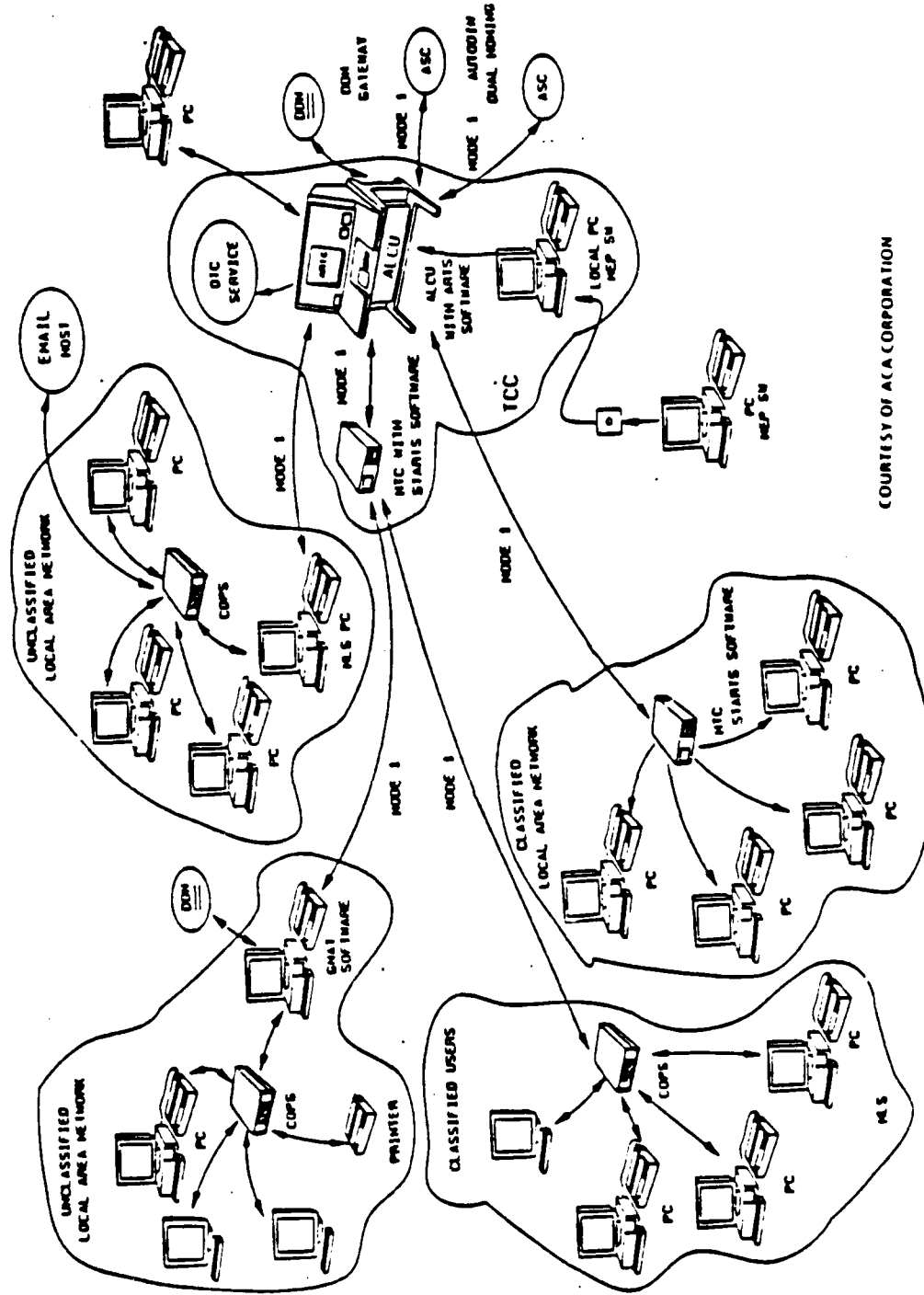
5.1.3.1 ACA Transitional Architecture

The ACA Transitional Architecture, as illustrated in Exhibit 5-3, is a large-scale upgrade of the existing SRT System design. This upgrade provides users with many options. The options target operational and administrative message processing and delivery. The architecture upgrade is best characterized as a "menu" style in that various discrete functional packages can be selected from among all of the incremental upgrade subsystems. Each is a standalone sub-system, as depicted in Exhibit 5-3.

Implementing the Transitional Architecture hardware and software can provide the following services:

- ° At the COMMCEN
 - dual homing to/from AUTODIN (ASC)
 - over-the-counter (OTC) hard copy service
 - OTC diskette service
 - multipoint AUTODIN interface
 - support of multiple remote unclassified or classified workstations on local area networks (LANs)
 - support of multi-level secure workstations
 - DDN gateway
 - control of remote station classification levels
 - backside AUTODIN access capability
- ° At the remote workstation
 - unclassified LAN Mode I access
 - DDN access
 - E-mail access
 - classified AUTODIN access
 - floppy diskette message preparation
 - JANAP 128 and DD173 message preparation
 - multi-level secure personal computer (PC) access.

ACA TRANSITIONAL ARCHITECTURE



COURTESY OF ACA CORPORATION

ACA TRANSITIONAL ARCHITECTURE

EXHIBIT 5-3

The Transitional Architecture upgrades have been fully developed and tested at the ACA test facility in Milwaukee, Wisconsin. Currently the total applications (all subsystems) package is not operational at an ACA customer location. ACA is seeking a Government client for sponsorship of DCS Category III Operational testing.

5.1.3.2 Incremental/Evolutionary Upgrades

The Transitional Architecture (TA) is designed to support the user through an evolutionary growth path which can be selectively and incrementally implemented. The initial upgrade of the SRT LCU is the initial TA upgrade increment. A probable sequence of evolution from the core SRT system is provided below:

Step 1 - the SRT LCU would undergo a hardware and software upgrade. This would entail the installation of the ALCU and associated communications ports required by the peculiar user requirements. Next, the Automated Record Traffic Software (ARTS) would be installed. ARTS is a self-contained software module designed to handle a variety of record traffic forms including JANAP 128, DD173, and ACP 126. A significant feature of this subsystem is its capability of handling multiple remote interfaces using the Mode I protocol or any other standard protocol.

Basically the ARTS program interfaces with the ALCU and associated peripherals. It provides dual homing to AUTODIN, accepts additional message processing workstations, and acts as a gateway to the DDN.

Step 2 - installation of a Zenith Z-248 workstation at the Telecommunications Center (TCC); this together with the Message Edit Preparation Software (MEPS) will support OTC diskette service.

Step 3 - in the COMMCEN, installation of a Message Terminal Controller (MTC) with Subscriber Terminal Automated Record Traffic Software (STARTS); the MTC hardware with STARTS programs is designed to support multiple remote workstations and direct interface to both AUTODIN and the DDN. This subsystem would greatly increase accessibility by the user to the DCS message systems. Additionally, the subsystem facilitates remote message preparation and direct access to AUTODIN reducing TCC staff requirements and enhancing desk-to-desk throughput performance. STARTS software is user friendly. Messages are prepared through operator selection (i.e., JANAP 128, ACP 126, DD173) of an overlay or mask which prompts the user through all fields of the format.

Step 4 - installation of an unclassified LAN to support E-mail and AUTODIN access; a Communications Oriented Processor (COP) would be installed. The COP is an intelligent communications control sub-system which adapts and directs data flow between LAN elements and the network. Up to 152 ports can be supported by the COP. A multi-level secure personal computer (MLSPC) would be installed for onward routing to/from AUTODIN via the ALCU/ARTS.

Step 5 - installation of an unclassified LAN to support AUTODIN and DDN access; one COP would also be installed in this incremental upgrade. Attached to this COP would be a PC running the ACA General Network Access Terminal Software (GNATS). GNATS provides message processing with connectivity to both AUTODIN and DDN from a single PC on the LAN. Message data destined for AUTODIN will be routed to the COMMCEN via the MTC with STARTS, and onward to the SRT ALCU/ARTS for delivery. Message data destined for the DDN will be passed directly to DDN via GNATS control and routing.

Step 6 - installation of a classified LAN; one COP would be installed and classified message data would be routed to the COMMCEN to be processed by the MTC/STARTS prior to handoff to the SRT ALCU/ARTS for routing to AUTODIN.

5.1.3.3 Transitional Architecture Estimated Costs

Due to the proprietary nature of this cost data, it has been inserted at Appendix A of this report. Refer to Exhibit A-3 for cost estimates pertaining to the ACA Transitional Architecture.

5.1.3.4 ACA ALCU/ARTS Architecture

Based on information furnished at Decision Briefing 2, the USCG decided upon the ACA ALCU/ARTS incremental upgrade for further cost evaluation. Exhibit 5-4 depicts the ALCU/ARTS upgrade. In this exhibit, the backside elements depicted are an ACA Keyboard Video Display Terminal, or KVDT and a Zenith Z-248 PC. In the SSAMPS Upgrade, the KVDT would be substituted with the CG Standard Terminal. With installation of the ALCU/ARTS upgrade, the USCG would have the optional growth path afforded by the ACA TA. Addition of a PC with the MEPS subsystem offers the additional capability of COMMCEN OTC diskette service.

5.1.3.5 ACA ALCU/ARTS Architecture Estimated Costs

Due to the proprietary nature of this cost data, it has been inserted at Appendix A of this report. Refer to Exhibit A-4 for cost estimates of the ALCU/ARTS incremental upgrade.

5.1.4 CPT Corporation Design Solution

During the informational interviews conducted in performance of Task 1, FEDSIM determined that the USCG would be receiving the FAST System II for support of MDZ operations. Additionally, it was learned that Analytics Communication Systems, Inc. produced a line controller board that is utilized in the FAST System II. This TLC-1 board functions as the interface board for support of Mode I AUTODIN communications. These findings were presented to the USCG at Decision Briefing 1. The resultant decision by USCG included guidance to FEDSIM that required further comparative analysis of the FAST System II with other candidate solutions. This analysis was conducted as part of Task 2.

FEDSIM contacted Information Management Associates (IMA) of Leesburg, Virginia, the authorized CPT Corp. representative supporting Federal clients. The FAST System II will provide the necessary auxiliary port for backside support of the SSAMPS. The FAST System II uses the CPT 9000T as the central processor (an AT-compatible CPU). The TLC-1 is installed in a card slot in the processor housing. The FAST System II is flexible with firmware for the TLC-1 being readily reprogrammable to adapt to changing network protocols.

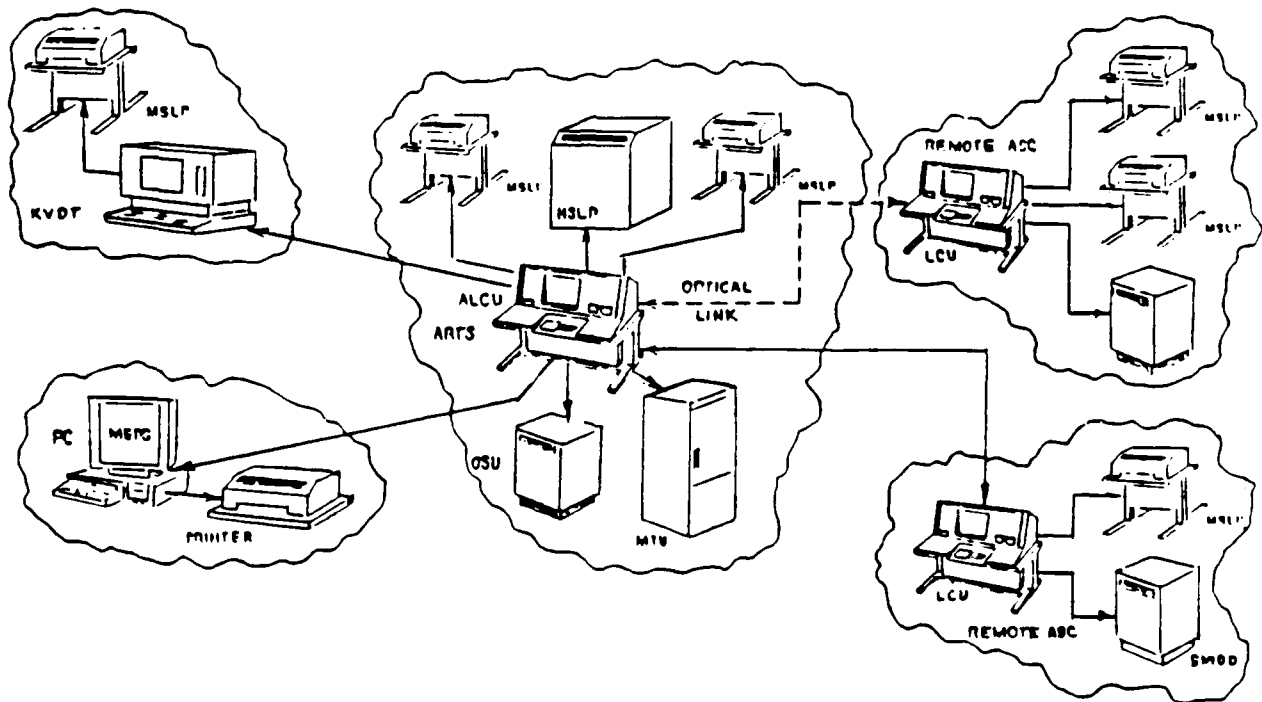
5.1.4.1 FAST System II Configuration

FAST is an acronym for fast, accurate, simple, TEMPEST. The FAST System II configuration, as illustrated at Exhibit 5-5, is comprised of the CPT 9000T with three integral communications ports. These ports can support an optical character reader (OCR) device, a letter quality printer, and an I/O port which could support the SSAMPS electrical interface. This SSAMPS communications port would accept data from the CG Standard Terminal which is analogous to a SSAMPS/AUTODIN gateway.

The FAST System II has been certified under DCA Category I. Category III (CAT III) operational testing has been scheduled for July 1988 under U.S. Navy sponsorship. The configuration to be tested for CAT III certification includes the 9000T, one medium speed printer and one TLC-1 controller. CPT Corp. will not support paper tape equipment and the existing, basic configuration requires added hardware to furnish the communications port capacity adequate to the "most capable" specification.

ACA - ALCU/ARTS UPGRADE

ADVANCED LINE CONTROL UNIT/AUTOMATED RECORD TRAFFIC SOFTWARE



ACA - ALCU/ARTS UPGRADE

EXHIBIT 5-4

5.1.4.2 CPT 9000T System Operations

The 9000T is CPT Corporation's newest and most versatile IBM-AT compatible workstation. The 9000T is designed with the following features:

- 20 or 40 MB storage - removeable disk
- two serial ports; one for OCR device, one for other I/O (SSAMPS)
- one parallel port for MSLP
- split-screen operation; message preparation and office automation in multi-tasking environment.

The 9000T processes messages by providing plain language addressing (PLAD) to Routing Indicator look up. Message processing will accept DD173, JANAP 128, and ACP 126 formats from selected media. The message processing system will not strip communications information from the headings of the final hard copy, will not perform Flag Word or standard subject ID code look up for routing purposes, and will not affix office code or PLAD routing on the final hard copy.

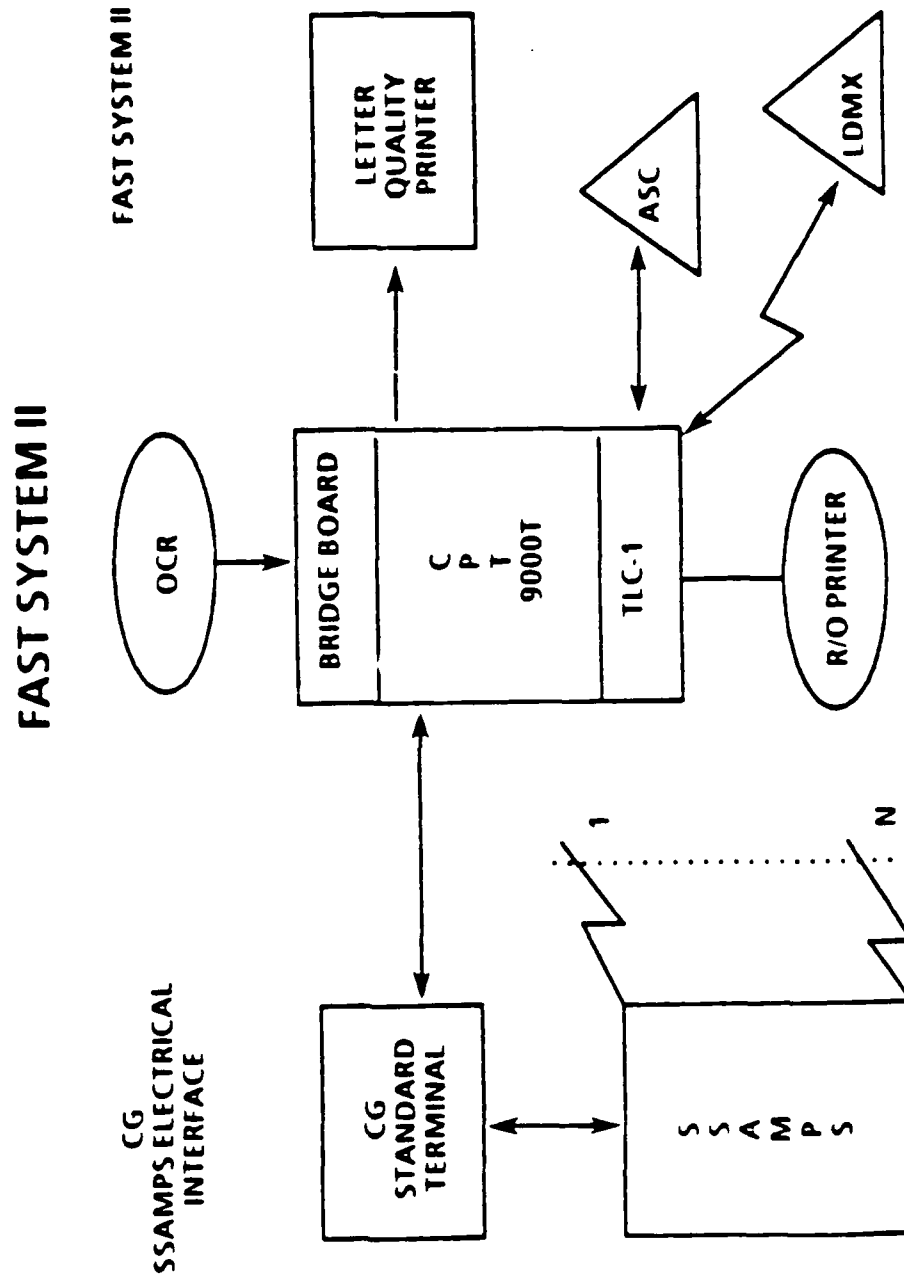
5.1.4.3 TLC-1 Line Controller Operations

The TLC-1 board, manufactured by ACS Corporation, replaces the TLC-100 standalone line controller. The TLC-1 is an intelligent communications module that is plug-compatible with the CPT 9000T in the SSAMPS application. The TLC-1 board operates transparently, with the type of messages and format controlled by the workstation. The TLC-1 is a multi-protocol communications board operating as a full-duplex, synchronous or asynchronous (as required) interface to AUTODIN at speeds up to 9.6 kbps. The use of the communications ports and site unique station identifiers (OSRI, classification level, precedence alarms) are programmed from the workstation. The TLC-1 is flexible and its firmware adaptable to changing protocols.

The TLC-1 is in use or under evaluation by other U.S. Government agencies planning to access AUTODIN from a backside workstation. Some of these TLC-1 applications are:

- World Wide Military Command and Control System (WWMCCS) Automated Message Handling System (WAMH)
- Fleet Numerical Weather Center

SYSTEM CONFIGURATION



SYSTEM CONFIGURATIONS - FAST SYSTEM II

EXHIBIT 5-5

- Fleet High Level Terminal (FHLT) - USN Anti-Submarine Warfare (ASW) community.

The TLC-1 offered by ACS as of the technical cutoff date of this report is set for AUTODIN protocol. A Remote Information Exchange Terminal (RIXT) requirement would necessitate a negotiated fee for firmware revisions.

5.1.4.4 FAST System II Estimated Costs

Due to the proprietary nature of this cost data, it has been inserted in Appendix A of this report. Refer to Exhibit A-5 for cost data pertaining to the FAST System II configuration items.

5.1.5 ACA/CPT Compliance with Specifications

The comparative analysis findings compiled as a result of Task 2, and identified in Exhibit 5-6, address compliance with the Generalized Functional Specification by both ACA and CPT offerings.

5.1.5.1 Generalized Specification Requirements

The comparative analysis found that ACA met all the specification requirements. ACA has an installed base of SRT system products at USCG facilities and its existing configuration was an influencing factor in the peripheral and performance characteristics within the USCG specification. The CPT Corporation FAST System II offering exhibited some shortfall in meeting all specification requirements. These shortfalls should not, however, disqualify it from future consideration by the USCG. Each of the shortfalls could be remedied. For example, CPT would not support PTE with its own family of readers or punches. It is the position of CPT that PTE is a vestigial media and not worthy of advanced product development. If it were apparent that PTE were an absolute requirement, PTE could be acquired from another vendor and supported by the CPT 9000T.

The Generalized Specification calls for the following peripherals, each of which requires a communications port on the CPT 9000T:

- one Paper Tape Reader
- one Paper Tape Punch
- two Medium Speed Line Printers (MSLP)
- one Optical Scanning Unit. (OSU)

COMPLIANCE WITH GENERALIZED FUNCTIONAL SPECIFICATION

HARDWARE ELEMENT	ACA	CPT	REMARKS
LINE CONTROL UNIT	1	1	
STORAGE MODULE DISK DRIVE	1	1	
PAPER TAPE READER	1	2, 3	COMM PORT CAPACITY
PAPER TAPE PUNCH	1	2, 3	COMM PORT CAPACITY
MEDIUM SPEED LINE PRINTER	1	3	55 CPS (CPT PRINTER)
OPTICAL SCANNING UNIT	1	1	

KEY: 1 MFGR SUPPLIED AND SUPPORTED
 2 MFGR SUPPORTED (NOT MFGR SUPPLIED)
 3 LIMITED SUPPORT

COMPLIANCE WITH GENERALIZED FUNCTIONAL SPECIFICATION

EXHIBIT 5-6

The FAST System II is not furnished with adequate communications ports to support all of the peripheral devices cited above. The following actions could be taken to remedy this deficiency. A hardware/software modification could be executed to increase the quantity of ports to accommodate the peripherals. An alternative to the hardware/software modification would be to alternate the use of the PTE and the OCR/OSU from the same communications port. An A/B switch could be utilized for this application. In another potential deficiency, the CPT-proposed MSLP has a slower print speed than the MSLP specification requires. However, the speed differential is not sufficient to cause message queueing backlog.

Aside from compliance with the generalized specification, candidate SSAMPS Upgrade designs must be certifiable for AUTODIN connect approval through successful completion of operational Category III testing. In the ensuing sections of this report, DCA accreditation and certification testing will be reviewed.

5.1.5.2 Category I (Interface)

Category I testing IAW DCAC 370-D195-1 is sponsored by the designer or hardware supplier. Cat I testing evaluates the interface, message processing, and software or firmware capabilities of a terminal and message processing system with regard to:

- demonstrated responsibility for the entire message
- channel coordination - delays to/from ASC
- channel controls and indicators for status and data flow
- operator interface
- accountability - message protection and handling
- code acceptance criteria
- ability to accept, process, punch, or print all American Standard Code for Information Interchange (ASCII) characters.

DCA AUTODIN Test Activity (ATA) can provide an AUTODIN Interface Simulator (AIS) which is used in developmental testing of Mode I protocol functionality.

5.1.5.3 Category II (TEMPEST)

Category II testing will be sponsored by the hardware supplier and is performed IAW DCAC 370-D195-2. Cat II certification includes the technical evaluation and approval of test results confirming that the equipment has met the required limits of:

- ° NACSIM 5100A (C), Compromising Emanations Laboratory Test Requirements, Electromagnetics (U)
- ° DCAC 370-D195-2.

5.1.5.4 Category III (Procedural)

Category III testing will be performed IAW DCAC 370-D195-3 and is sponsored by the user of the equipment to be certified. Cat III testing evaluates the adequacy of:

- ° hardware
- ° software
- ° configuration
- ° documentation.

Cat III testing also serves to verify:

- ° revalidation of Cat I compliance through transmission and reception of self-addressed test messages to and from the supporting ASC
- ° confirmation that all test messages sent and received by SSAMPS must neither lose nor add text
- ° proper response to reject and cancel control sequences
- ° self-test features
- ° response to abnormal conditions such as power failure or loss of crypto synchronization
- ° message logging capability
- ° ability to successfully transmit and receive all characters associated with the AUTODIN language media format (LMF)

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- acceptability of operations and maintenance (O&M) documentation with regard to instructions for retransmissions, misroute or missent messages, and error recovery
- operator proficiency
- messages and data cannot be lost during transmission to, or reception from, the ASC (or LDMX), I/O devices, or remote devices.

At the completion of testing, and receipt of certification, additional installations with the identical configuration may not require retesting. However, any changes in hardware or software configuration which could be construed by the test authority (DCA) as affecting message processing must be submitted to DCA for evaluation and may require Cat III retest.

The scope of Cat III testing is determined on a case-by-case basis by DCA. Herein rests the benefit of establishing a proactive DCA/SSAMPS working group early in the implementation program life. To establish this working group, USCG will require close coordination with COMNAVTELCOM. The working group would likely consist of members from:

- DCA ATA
- COMNAVTELCOM (N31)
- NAVTASC
- NAVTELSYSIC
- USCG, G-TTS
- USCG, EELAB

DCA ATA and NAVTASC would assess SSAMPS software architecture (e.g., process partitioning), coordination and control procedures between SSAMPS processor and backside CG Standard Terminals, configuration and version control practices.

The USCG would provide NAVTELSYSIC with source documentation at least 120 days prior to the desired date of test. NAVTELSYSIC and NAVTASC would then develop test plans and present these to DCA at least 60 days prior to the desired test date. The Cat III Test Plan must include:

- SSAMPS-unique test plan
- description of SSAMPS

- system block diagram and interface diagrams
- completed message processor questionnaire (Supplement 1 to DCAC 370-D195-3).

The objectives of Cat III testing for a backside configuration such as the SSAMPS include, but are not limited to the following:

- demonstrated execution of initialization IAW the SSAMPS User Manual
- detection of receipt of Y and Z precedence messages
- host preemption capability
- control and limit of maximum security level of the backside terminal host

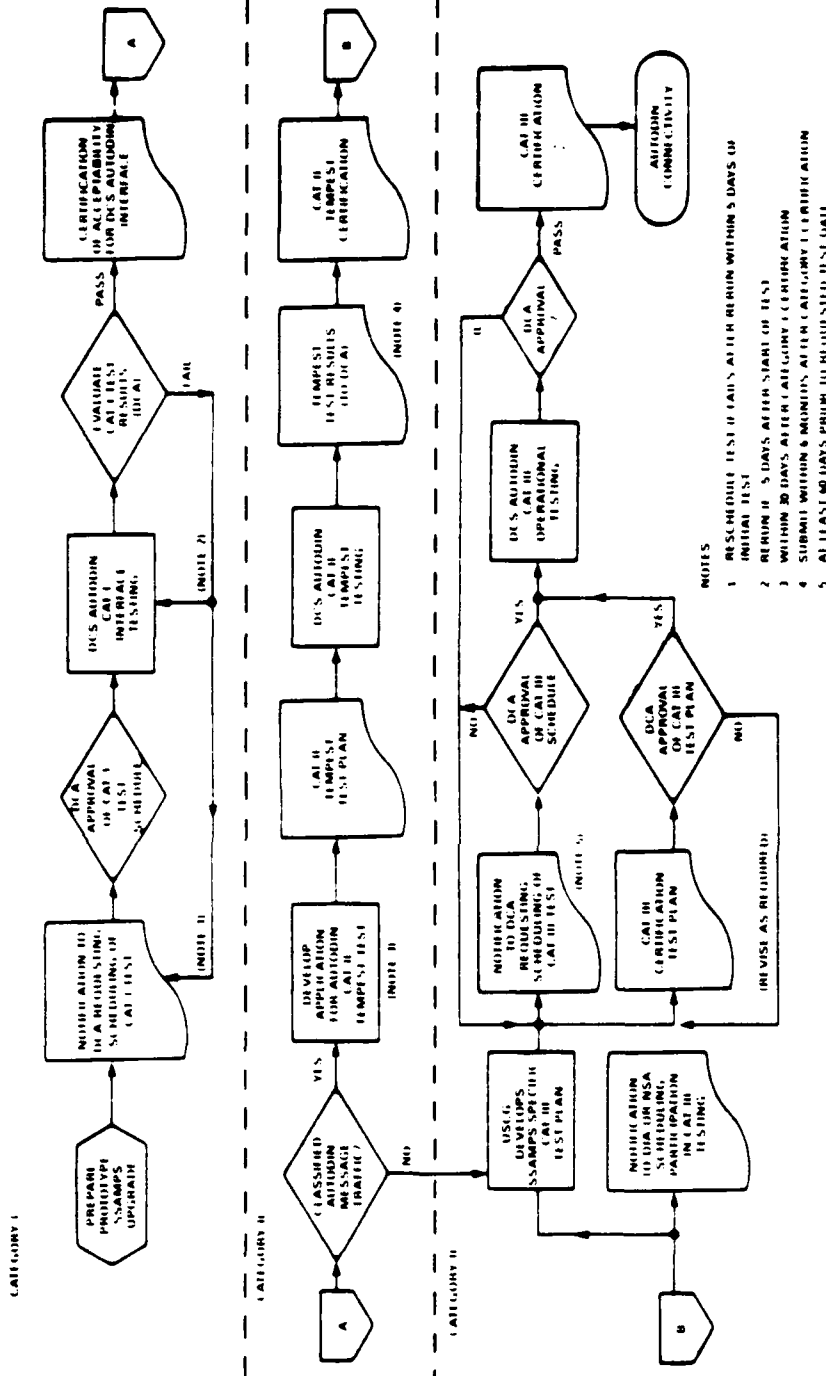
Exhibit 5-7 illustrates the accreditation and certification process of DCA Category I, II, and III testing.

5.1.5.5 Analogous Programs and Precedents

This section identifies other programs currently planning or executing DCA Category III Operational Tests.

- USAF Phase IV Program
 - operational and Cat III certified at Charleston AFB and MacDill AFB
 - separate Cat III test for every installation
 - failed first Cat III test; pins shorted on RS-232 interface did not produce Mode I failure
- U.S. Army AUTODIN Mail Server (AMS) Program
 - goal is an AUTODIN gateway to E-mail
 - based on Army Materiel Command (AMC) Multiple Message Distribution Facility (MMDF)
 - MMDF developed by University of Delaware as extension of NSF-funded CS NET
 - matured to H-P E-mail product
 - now part of Berkeley UNIX: "Sendmail"

ACCREDITATION & CERTIFICATION



- NOTES
1. RESCHEDULE TEST IF FAILS AFTER RETURN WITHIN 5 DAYS OF INITIAL TEST
 2. RETURN II - 5 DAYS AFTER START OF TEST
 3. WITHIN 30 DAYS AFTER CATEGORY I CERTIFICATION
 4. SUBMIT WITHIN 6 MONTHS AFTER CATEGORY CERTIFICATION
 5. AT LEAST 60 DAYS PRIOR TO REQUESTED TEST DATE

ACCREDITATION AND CERTIFICATION
EXHIBIT 5-7

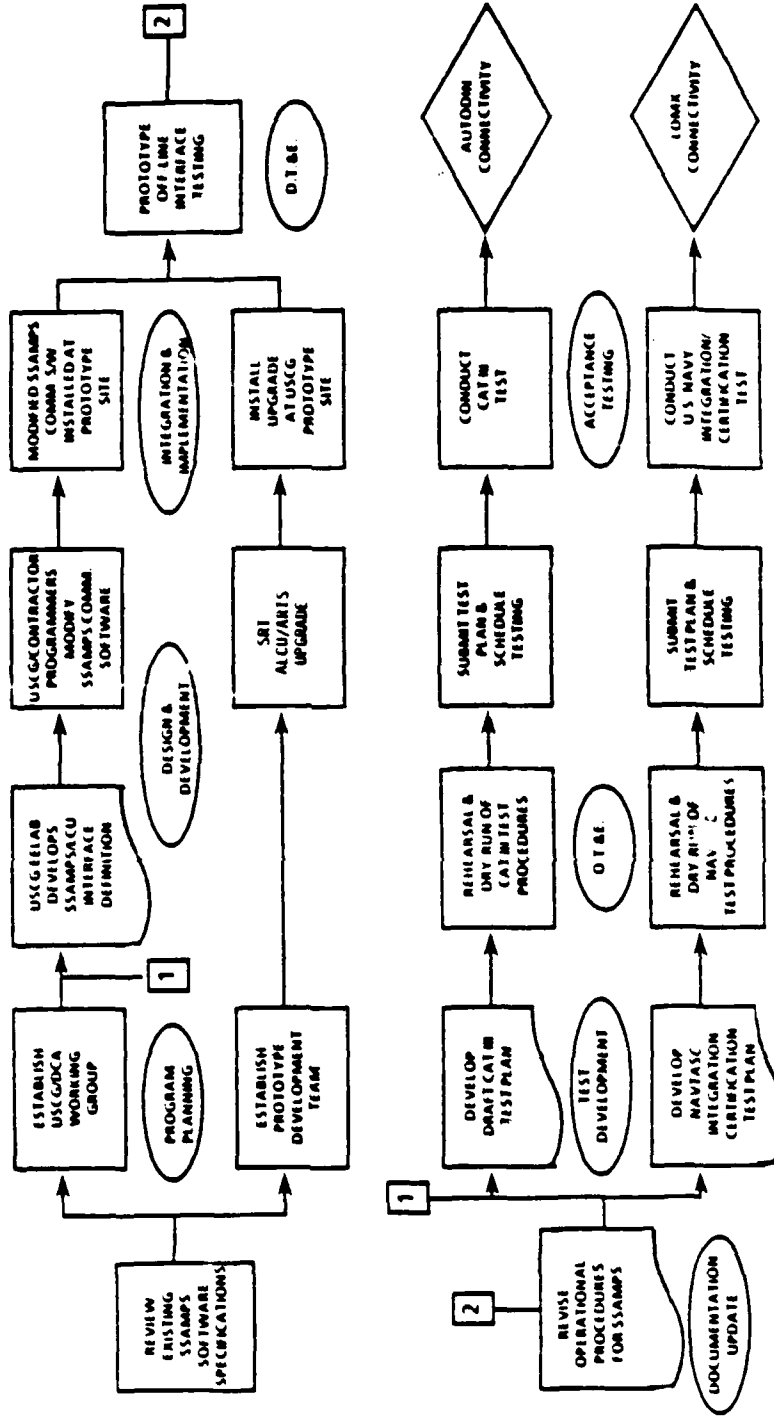
- will not run on H-P 9000 series processors
- uses Tegcom Inc. line controller
- backside is unclassified LAN with E-mail facility
- beta testing at Ft. Ritchie, MD., April 1988
- ° SARAH (Standard Automated Remote to AUTODIN Host)
 - backside terminals hosted by Z-248
- ° FAST Program
 - use of auxiliary port to support backside elements
 - Cat III testing for Y-community, June 1988
- ° U.S. Navy RIXT/Joint Intelligence Automated Command and Control System (JINTACCS)/RAINFORM Translator Unit
- ° (JTU)/Shore Targeting Terminal (STT)
 - JTU designed to interface between the RIXT and the STT

5.2 Implementation of the Upgrade

SSAMPS Network Study, Task 1, identified the significant technical, policy, security, cost, and staffing issues associated with the USCG objective of upgrading the SSAMPS. The removal of manual intervention in the torn tape relay process is much more than merely the insertion of a hardware module or SSAMPS gateway. Task 2 isolated the essential activities and configuration items that must be managed and procured to achieve AUTODIN connect approval. Exhibit 5-8 identifies key phases of the implementation process. In this section, the activities which would comprise successful prototype implementation are described. A work breakdown structure (WBS), developed in accordance with the Defense Systems Management College Systems Engineering Management Guide and MIL-STD-881A, is also provided.

The WBS is a product-oriented family tree, composed of hardware, software, services, and data, which completely defines the SSAMPS Upgrade Prototype Implementation Program. The WBS is essential to providing the USCG program management with capability to exercise technical, schedule, and financial control of the implementation program. FEDSIM has constructed the SSAMPS WBS on the premise that the USCG would manage the

SUMMARY OF IMPLEMENTATION PROCESS



SUMMARY OF IMPLEMENTATION PROCESS

EXHIBIT 5-8

effort as a systems development/systems integration contractor-supported program. Based on this premise, FEDSIM has developed a program schedule which reflects the activities and milestones that prudent systems integration methods would dictate.

Activities within the program schedule were evaluated for identification and estimation of staffing requirements. Appropriate professional labor categories were attributed to each of the activities and rough order of magnitude (ROM) costs for each WBS area have been estimated.

5.2.1 SSAMPS Upgrade Program Planning

FEDSIM has followed the initial USCG approach to the SSAMPS Upgrade problem. In this approach the interface upgrade is implemented and tested at a prototype site. This is in consonance with traditional prototype/production development programs, minimizing cost and technical risks for the USCG. The prototype site selected by the USCG for the purpose of this cost evaluation is U.S. Coast Guard District Five, Portsmouth, Virginia.

There is a significant documentation requirement in preparation for Category III Operational Testing. Because the SAMPS is currently undergoing an evolutionary upgrade to SSAMPS, the documentation data and configuration controls are dynamic. A significant proportion of engineering labor hours will be required to develop the documentation adequate to meet the criteria of DCA Circular 370-D195-3. Section 3.1.1 describes the importance placed upon configuration management in meeting the requirements of NAVTELCOM INST 2010.4B which must be adhered to in preparation for the Navy Integration and certification Test.

While hardware and software suppliers are prepared and willing to assist the USCG with on-site support throughout testing, it is not expected that they will staff and fund the preparation of engineering and installation plans, correct deficiencies in existing software and hardware configuration data, accommodate software modification of the SSAMPS communications software, or participate regularly in DCA Working Group meetings. It is the task of the SSAMPS systems integration contractor to comprehensively support these life-cycle activities.

5.2.2 Upgrade Activities

The seven ensuing sections describe the major WBS areas of SSAMPS Upgrade Prototype Implementation.

5.2.2.1 Program Management

Program Management encompasses the following activities:

- Planning and scheduling
- Budgeting each of the WBS work packages
- Configuration management
- Product quality assurance
- Contract and subcontract management
- Safety and security.

All of these program elements must be coordinated in the planning and execution function. Schedule takes on added importance in the SSAMPS implementation effort because of the needed coordination of multiple Government agencies in preparing and conducting accreditation and certification tests. Personnel from DCA and NAVTASC will be required at the prototype site for the duration of operational testing; this will require advance planning of Temporary Additional Duty (TAD). A second area of schedule impact is the request for telecommunications service from DCA for AUTODIN termination at the prototype site. Requests for such service are required at least 180 days prior to required activation date.

5.2.2.2 Engineering and Design

This WBS area encompasses both hardware engineering and software engineering activities. As indicated in section 5.1 of this report, the candidate ACA ALCU/ARTS upgrade includes both additional hardware modules, the Advanced Line Control Unit, and new software known as the Automated Record Traffic Software. Implementation of these configuration items will affect the configuration control documentation of existing SRTs. Operations and maintenance documentation, as well as version control and system description documents will require updates.

The LDMX configuration of most CG District AUTODIN circuits introduces significant U.S. Navy responsibility into the test and acceptance of any modification of existing connectivity. Task 1 of the SSAMPS Network Studies identified the role and responsibilities of NAVTASC in supporting USCG during the Navy Integration/ Certification Test and DCA Category III Test. For its part in this joint test activity, the USCG must provide NAVTELSYSIC with engineering data which conforms with the

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configuration management requirements of NAVTELCOM INST 2010.4B. FEDSIM has reviewed the status of existing SSAMPS system documentation and has determined that significant additional documentation will be required to comply with NAVTELCOM INST 2010.4B requirements.

NAVTELSYSIC requires a Basic Electronic System Engineering Plan (BESEP) which includes engineering drawings and associated lists detailing the functional, physical, and electrical connectivity of the SSAMPS and SRT Upgrade architecture. This BESEP must detail operations such that NAVTELSYSIC is able to develop forced-failure, hardware-oriented operator procedures. BESEP development must be in conformance with SPAWAR INST 2804.1 Series. The BESEP should be the basic engineering document upon which the System Installation Plan (SIP) is developed. The SIP will provide all requisite installation procedures, assembly drawings, cable routes and types, grounding, bonding, shielding, RED/BLACK separation criteria, power requirements, and floor plans and equipment layouts.

Although the prototype will require a dedicated AUTODIN termination apart from the existing circuits servicing CGD 5, there does exist a need for a Cutover Plan which identifies when the test circuit(s) will be activated, for what periods, what the Technical Control Facility (TCF) support requirements should be, and any operations or maintenance support required from the COMMSTA Portsmouth.

The SSAMPS prototype implementation software engineering and design activities center on three areas:

- integration of the ARTS software modules
- integration of the MEPS software modules
- modification of SSAMPS H-P software to support the communications interface with the SRT.

The first two of these integration tasks will be principally staffed by the software supplier technical staff. However, the documentation of these engineering changes must be completed for the reasons stated above -- configuration control and readiness for operational testing. The third software change will be executed by the USCG (integration support contractor). Modification of the SSAMPS software to provide for an RS-232C (or MIL-188-114) communications interface with the SRT must be completed to enable 9600 bit-per-second (bps) transmission of JANAP 128 message format data. Consideration must be given to the standardization of this change order. Documentation provided NAVTELSYSIC and DCA will be evaluated for uniformity of software version across all SSAMPS installations. Any discrepancy between documentation and prototype installed versions jeopardizes network integrity.

Throughout the engineering and design phase, technical staff will be required to support a DCA Working Group that will review the SSAMPS architecture to assess system security and operational integrity. The working group may identify changes to the basic SSAMPS architecture to enhance the partitioning of processes (e.g., AUTODIN vs. office automation capabilities). Engineering design changes may result from implementation of the Working Group's recommendations. For the purposes of this report, estimating labor hours for the engineering and design activity includes conservative provision for such software design changes to enhance SSAMPS software security.

5.2.2.3 Furnish Equipment

Equipment, software, and installation materials will be required to implement the SSAMPS prototype. Equipment includes the following:

- one SRT
- one SSAMPS with minimum; two USCG Standard Terminals
- one ALCU hardware upgrade kit.

Software includes the previously described ARTS, the MEPS, and the developmental H-P SSAMPS communications modules.

Materials will be required to successfully execute the installation and test activities. During the design and engineering phase, expendable items, cables, connectors, and mounting hardware will be identified and documented on an Installation Bill of Materials (IBOM). These items will be acquired through subcontractor or direct purchase order and will be delivered to CGD 5 for use by the installation team.

Required test, maintenance, and diagnostic equipment (TMDE) which is essential to execution of installation or test activities will also be identified. These items may be obtained through lateral transfer from other USCG or Navy activities, or leased from third parties.

5.2.2.4 Installation

Installation activities will follow a sequence of three stages:

- Prototype site preparation
- Prototype site installation
- Prototype checkout.

Site preparation begins with a site survey which is conducted jointly by USCG, its support contractor, and optionally, the principal hardware supplier(s) who may benefit from a better understanding of environmental or physical constraints on their proposed equipment. Findings of the site survey will be included in the BESEP. Findings which represent deficiencies or impediments to installation will be documented in separate written correspondence directed to the USCG SSAMPS Program Office.

Installation will be conducted in accordance with the BESEP and System Installation Plan (SIP), and will begin when equipment is removed from storage areas and placed in a staging area at CGD 5. As the target prototype floor space is available, subsequent to any facilities or power system modifications, equipment will be assembled and mounted in the equipment layout approved by USCG. Physical inspection will follow assembly to ensure all configuration items have been completely and correctly installed, without damage.

Prototype checkout follows inspection. At this stage, initial equipment power-up sequences are executed. Hardware and software diagnostics are run to establish serviceability of all configuration items. Next, subsystem checkout is performed. In this stage, manufacturer or sponsor provided system checks are performed with separate and discrete steps for ACA SRT equipment and software, and unrelated steps for SSAMPS system checkout. These are conducted as if each subsystem were independent, standalone entities, as they currently exist.

5.2.2.5 Test

The test phase of SSAMPS Upgrade Implementation includes three (3) stages of activities:

- ° test plans
- ° test execution
- ° test reports.

Plans required for testing include the Installation and Checkout Procedures, the Navy Integration/Certification Test, and the DCA Category III Operational Certification Test.

Execution of test requirements encompasses the following activities, not all of which require formalized plans for USCG or DCA approval:

- inspections
- installation and checkout tests
- developmental test and evaluation (DT&E)
- operational test and evaluation (OT&E)
- Navy Integration/Certification Test
- DCA Category III Certification Test.

Selected test activities will be required to submit reports that summarize test results. These include initial inspection, OT&E, the Navy Integration/Certification Test, and the DCA Category III Certification Test. The requirements for the latter two of these tests are identified at section 5.1.5.4 of this report.

5.2.2.6 Data

Data deliverables for the implementation of the SSAMPS Upgrade prototype are categorized in six (6) top-level applications areas:

- technical publications
- engineering configuration data
- engineering test data
- administrative management data
- financial management data
- logistics support data.

Technical publications include the vendor-provided operations and maintenance manuals, system functional descriptions, and parts lists. Engineering configuration data includes the BESEP, SIP, Certificates of Compliance, drawings and associated lists, and software documentation. Software documentation, with tailoring, should be modeled after the data requirements set forth in DOD-STD-2167. The following data items should be considered for development:

- System/Segment Specification (SSS)
- Software Requirements Specification (SRS)
- Interface Requirements Specification (IRS)

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- Software Top Level Design Document (STLDD)
- Software Detailed Design Document (SDDD)
- Interface Design Document (IDD)
- Software Product Specification (SPS)
- Version Description Document (VDD)

The SSS defines the requirements for the entire SSAMPS system, with emphasis upon the upgrade segment. The SRS specifies the requirements for each computer system configuration item (CSCI). The interfaces between CSCIs is specified in the IRS. The STLDD defines the top-level design and the SDDD defines the detailed design for an individual CSCI, such as the SRT ARTS.

The IDD defines the external interfaces required, such as the SSAMPS to SRT communications interface. The SPS specifies the "as built" description of an individual CSCI, such as the SSAMPS or SRT. Finally, the VDD identifies the exact version of the software installed in the SSAMPS and the SRT.

Engineering test data is comprised of the previously identified test plans, procedures, and reports. In addition, thirty (30) days prior to the performance of any formal test, the SSAMPS program manager will issue a written Notification of Test to appropriate participating, observer, or approval activities.

Administrative management data includes the following activities and documentation:

- Hotline telephone calls to USCG SSAMPS Program Office or Contract Office
- Operations Security (OPSEC) Plan
- Contract Work Breakdown Structure (CWBS)
- Management Plan
- Monthly Program Status Reports
- Cutover Plan.

The SSAMPS Upgrade Implementation program manager is also responsible for the development, documentation, and distribution of financial data conveyed within Monthly Status Reports and Cost/Schedule Status Reports (C/SSR).

Management support data includes the maintenance of a current equipment and materials list as well as a recommended spare parts list (RSPL).

5.2.2.7 Logistics

Logistics requirements for SSAMPS Upgrade implementation must include provisions for training of operations and maintenance personnel on the modified hardware and software configurations. It is appropriate to consider documenting these O&M responsibilities within a succinct user's guide. Maintenance requirements analysis and planning will also be necessary to ensure maintenance readiness for the new configurations.

5.2.3 SSAMPS Upgrade Work Breakdown Structure (WBS)

The activities described in the preceding section are illustrated in a top-level WBS "system tree" provided in Exhibit 5-9.

5.2.3.1 Preliminary Program Schedule

FEDSIM has developed a preliminary program schedule for the SSAMPS Upgrade Implementation Program. This schedule is based on contractor support of activities and is structured upon labor estimates which conservatively assess the risk areas of software modification and test development. An eighteen (18) month period of performance is depicted in the schedule. The two most critical factors in this duration are:

- ° design documentation activities essential in generating adequate configuration control documentation
- ° mandatory requirement that BESEP and other configuration data be furnished NAVTELSYSIC not less than 180 days prior to projected test dates.

Exhibit 5-10 depicts the preliminary program schedule through which SSAMPS Upgrade Prototype Implementation can be accomplished.

5.2.3.2 Labor Requirement Estimates

FEDSIM has developed estimated labor hour requirements by specific labor categories for each of the top-level WBS areas in the SSAMPS Upgrade Prototype Implementation Program. These estimates are identified in Exhibit 5-11.

In assessing the implementation requirements of the SSAMPS Upgrade, FEDSIM identified the requisite labor categories required to support the technical, managerial, and administrative tasks. This assessment resulted in the identification of the following labor categories:

- Program Manager/Engineering Manager
- Senior Systems Engineer
- Senior Programmer/System Analyst
- Programmer/Analyst
- System Engineer
- Administrative Support Specialist.

5.2.4 Critical Dependencies and Assumptions

The execution of the program schedule set forth at section 5.2.3.1 is influenced by a set of critical dependencies and assumptions pertaining to those dependencies. If one were to define a critical path within the implementation program, it would be derived from the following critical milestones:

- DCA concurrence with a Working Group architecture as to feasibility and adequacy of security provisions
- DCA approval of Telecommunications Service Request (TSR) for AUTODIN test circuit termination at CGD 5
- USCG and USN NAVTELSYSIC approval of the SSAMPS BESEP and other configuration control documentation
- DCA approval of the SSAMPS Category III Certification Test Plan.

The second milestone identified above as a critical schedule factor is the TSR approval and issuance of a Telecommunications Service Order (TSO) for test circuit activation. Currently, NAVTELSYSIC reports a 180-day elapsed time from a Request for Service (RFS) until circuit activation. Clearly, this is consistent with the scheduled installation window of months seven through eight of the performance period.

Assumptions used in developing the schedule and labor estimates pertaining to the milestones and dependencies identified above include the following:

- DCA will approve the SSAMPS software architecture which emerges from working group meetings
- the program activities are representative of the CGD 5 prototype configuration only and do not account for the geographic or site specific nuances of all districts
 - example: Automated Multi-Media Exchange (AMME) connectivity differs in test requirements from LDMX or direct ASC connectivity; this impacts the software configuration for some districts, thereby affecting operational test procedures
- in the instance of SRT prototype, the USCG will procure the system with ALCU, ARTS, and MEPS options
- USCG approves the development of the previously described DOD-STD-2167 software documentation to minimize risk of configuration control documentation deficiencies.

5.2.5 All-District Implementation Requirements

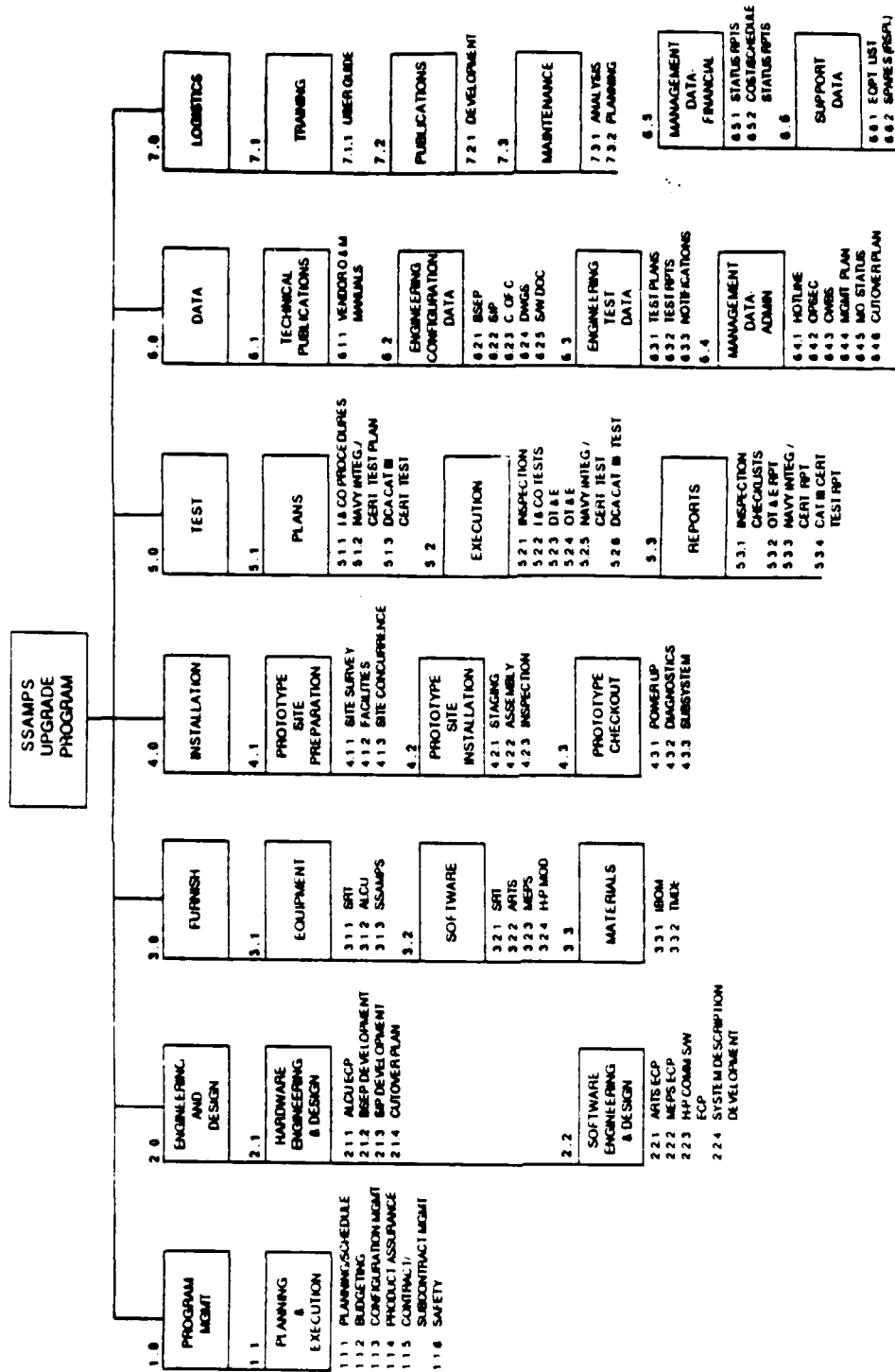
The objective of this report is to identify implementation costs associated with the prototype SSAMPS Upgrade at CGD 5. FEDSIM recognizes the USCG would benefit from estimation of costs associated with USCG-wide implementation of the SSAMPS Upgrade (at all Districts, COMMSTAs, and the EELAB). Based upon USCG guidance at Decision Briefing 2, this study has not investigated the site-specific requirements which would affect implementation beyond CGD 5. However, there are clearly distinguishable developmental (non-recurring) and recurring activities and costs which would occur. In this section, exhibit 5-9, the top-level WBS, references the developmental and recurring activities identified below.

5.2.5.1 Isolating Developmental Activities

Activities unique to the initial prototype development are the following WBS areas:

- 2.0 - all elements
- 5.1.1 - I & CO procedures may be reused
- 5.2.3 - DT & E will not occur at all sites
- 6.1 - vendor manuals unchanged
- 7.1, 7.2 - user guide unchanged.

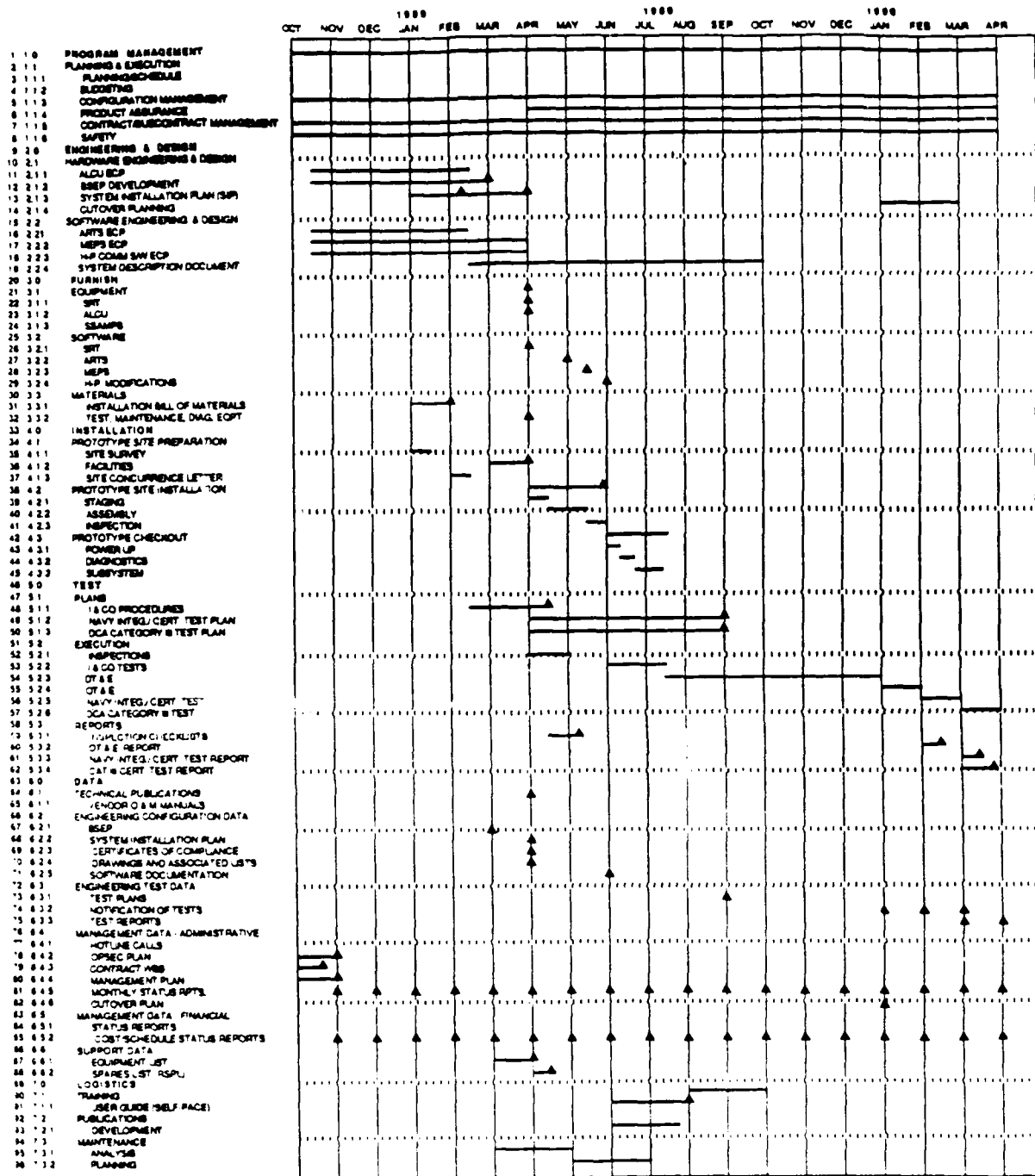
These activities can be considered non-recurring beyond prototype implementation.



WORK BREAKDOWN STRUCTURE (WBS)

EXHIBIT 5-9

SSAMPS Work Breakdown Structure (WBS)



SSAMPS UPGRADE PROGRAM
PROTOTYPE IMPLEMENTATION
Preliminary Schedule

PRELIMINARY SCHEDULE

EXHIBIT 5-10

SSAMPS UPGRADE PROGRAM DIRECT LABOR ALLOCATIONS BY WBS AREA		HOURS							SUBTOTAL HOURS BY WBS AREA
WBS AREA	DESCRIPTION	PROGRAM MANAGER	ENGINEERING MANAGER	SENIOR SYSTEMS ENGINEER	SENIOR PROGRAMMER	SYSTEM ANALYST	PROGRAMMER ANALYST	SYSTEM ENGINEER	ADMINISTRATIVE SUPPORT
10	PROGRAM MANAGEMENT	1152							2304
20	ENGINEERING & DESIGN	320	512	1664	832				384
30	FURNISH	120	576						96
40	INSTALLATION	120	832						96
50	TEST	240	832	640	320				64
60	DATA	240	48	144					256
70	LOGISTICS	40	120						96
SUBTOTAL HOURS BY LABOR CATEGORY		2232	2920	2448	1152	3040	3296	15088	

Labor Requirement Estimates

LABOR REQUIREMENTS ESTIMATES

EXHIBIT 5-11

5.2.5.2 Recurring Activities

Implementing production versions of SSAMPS Upgrade configuration items requires sustaining program management support, furnishing hardware and software items and installation materials, installing and checking out the items, and the successful completion of operational certification tests. Note that site-specific BESEP and SIP data will be required. All WBS areas in Exhibit 5-9 not explicitly cited as Developmental Activities in section 5.2.5.1 are to be considered recurring activities that must be executed for each production site implementation.

The degree of labor hour and cost efficiency which can be achieved in test commonality and certificates of compliance cannot be predicted in this study. The SSAMPS system integrity and configuration control exercised by USCG are the primary controlling factors in obtaining DCA certification by association.

5.3 Implementation Costs

In this section, FEDSIM identifies the allocated costs by WBS area and describes the method of handling proprietary cost data furnished by candidate hardware and software suppliers.

5.3.1 Cost Allocation by WBS Activities

Exhibit 5-12 identifies the estimated costs associated with each of the top-level WBS areas by labor category. These cost estimates are rough order of magnitude (ROM) estimates utilizing the bid rates identified in Appendix A.

5.3.2 Proprietary Cost Data

Budgetary estimates based upon vendor price quotations are considered proprietary and in recognition of competitive sensitivities have been detailed in a separate, detachable appendix to this report. Reference Appendix A for the following cost data:

- ° line item cost data for upgrade hardware and software configuration items (rolled up in value of WBS area 3.0)
- ° hourly labor rates for each of the labor categories designated in Exhibit A-7.

SSAMPS UPGRADE PROGRAM
 COST ALLOCATIONS
 BY WBS AREA

WBS AREA	DESCRIPTION	COST (\$)
1.0	PROGRAM MANAGEMENT	142,848
2.0	ENGINEERING & DESIGN	251,700
3.0	FURNISH	262,764
4.0	INSTALLATION	135,790
5.0	TEST	200,130
6.0	DATA	53,860
7.0	LOGISTICS	44,400
SUBTOTAL		\$1,091,492

COST ALLOCATIONS BY WBS AREA

EXHIBIT 5-12

6. SUMMARY

FEDSIM has conducted a comparative analysis and cost evaluation of the ACA and CPT SSAMPS design solutions. The findings of this Network Study which represent the most significant factors affecting the successful implementation of a prototype SSAMPS upgrade are as follows:

- ACA is fully compliant with the Generalized Functional Specification
- CPT is not fully compliant, however it can meet all Specification requirements through minor firmware and hardware modification
- all design solutions require the modification of SSAMPS software to support interface requirements
- ACA can be configured for backside support of SSAMPS with the integration of the ACA ALCU/ARTS upgrade
- the ACA upgrade will require sponsorship for DCA Category III Testing and U.S. Navy Integration/Certification Testing
- the rigorous operational test requirements mandate a major review of USCG SSAMPS configuration data items and will require development of additional documentation
- proper preparation for the certification process requires all the major elements of an ADP systems integration program; this prototype implementation is by no means a mere remove and replace hardware revision
- the implementation program will require a coordinated working relationship between technical and managerial staff of USCG, DCA, NAVTELCOM, NAVTASC, NAVTELSYSIC, and a systems integration support contractor
- the objective of relieving the burden of manual intervention in SSAMPS torn tape relay operations is achievable, however preliminary budgetary estimates approach \$1.1 million for execution of the SSAMPS prototype implementation at CCD 5
- the success of implementation is critically dependent upon two decision points in the program life:

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- DCA approval of the proposed SSAMPS backside configuration, indicating concurrence with SSAMPS system security and operational integrity
- DCA approval of the Category III Procedural Test Plan, which is developed jointly by NAVTELSYSIC and USCG

APPENDIX A

PROPRIETARY COST DATA

NOTE: Appendix A composed entirely of graphic exhibits.

APPENDIX B

GLOSSARY

GLOSSARY

ACA	Astronautics Corporation of America (SRT supplier)
ACS	Analytics Communications System Inc. (TLC-1 supplier)
AIS	AUTODIN Interface Simulator
ALCU	Advanced Line Control Unit
ARTS	Automated Record Traffic Software
ASC	AUTODIN Switching Center
ATA	AUTODIN Test Activity, DCSO B613, DCA
AUTODIN	Automatic Digital Network
BESEP	Basic Electronic System Engineering Plan
CM	Configuration Management
COP	Communications Oriented Processor
COTS	Commercial Off the Shelf
CPT	CPT Corporation (FAST System II supplier)
DCA	Defense Communications Agency
DCS	Defense Communications System
DCSO	Defense Communications System Organization
DDN	Defense Data Network
DT&E	Developmental Test and Evaluation
EELAB	USCG Electronics Engineering Lab
FAST	Fast Accurate Simple TEMPEST
FEDSIM	Federal Systems Integration and Management Center
FHLT	Fleet High Level Terminal

GLOSSARY (Cont'd)

GNATS	General Network Access Terminal Software
HSLP	High Speed Line Printer
IMA	Information Management Associates (CPT representative)
KVDT	Keyboard Visual Display Terminal
LAN	Local Area Network
LCU	Line Control Unit
LDMX	Local Digital Message Exchange
MDZ	Maritime Defense Zone
MEPS	Message Edit - Preparation Software
MLSPC	Multi Level Secure Personal Computer
MTC	Message Terminal Controller
MTU	Magnetic Tape Unit
NAVTASC	Naval Telecommunications Automated Systems Center
NAVTELSYSIC	Naval Telecommunications Systems Integration Center
OSRI	Originating Station Routing Indicator
OSU	Optical Scanning Unit
OT&E	Operational Test and Evaluation
OTC	Over the Counter service
PLAD	Plain Language Address Directory
PTE	Paper Tape Equipment
PTP	Paper Tape Punch
PTR	Paper Tape Reader
RIXT	Remote Information Exchange Terminal

GLOSSARY (Cont'd)

SMDD	Storage Module Disk Drive
SRT	Standard Remote Terminal
SSAMPS	Standard Semi-Automated Message Processing System
SSIC	Standard Subject Identification Code
START	Subscriber Terminal Automated Record Traffic Software
TCC	Telecommunications Center
TLC-1	Terminal Line Controller for the FAST System II.
WBS	Work Breakdown Structure
WWMCCS	World Wide Military Command and Control System

APPENDIX C
REFERENCE DOCUMENTATION

REFERENCE DOCUMENTATION

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Defense Communications Agency, "AUTODIN Defense Communications System Routing Doctrine General Purpose Networks," DCAC 310-D70-67, 20 August 1984.

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- . "Acquisition and Support Plan for SSAMPS," G-TTS-2 Branch, 18 December 1987.
- . "Draft 8A1 Protocol Description and Requirements," Systems Management and Engineering Facility (SMEF), EELAB, CG Station, Alexandria, Virginia, February 1988.
- . "Draft SSAMPS Operator's Guide," SMEF, EELAB, CG Station, Alexandria, Virginia, 16 July 1987.
- U.S. Navy Telecommunications Command, "Telecommunications Users Manual," NTP 3(F), August 1983.
- . "Interfacing into NCS," TELCOM INST 2010.4B., 3 August 1984.

APPENDIX D

SUPPLEMENTAL TECHNICAL DOCUMENTATION

NOTE: Appendix D data is vendor provided and not compatible
with MultiMate word processing software.

**Advanced Line Control Unit/
Automated Record Traffic
System (ARTS)**

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Revision C
10/06/87

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1. System Description

This section presents a brief description of the capabilities and security features of Astronautics Corporation of America Automated Record Traffic System (ARTS) software program.

ARTS is modular in design. All requirements are allocated to modules based on systems and data flow analysis to assure functional completeness and ease of operation.

1.1 Overall Capability

ARTS has been developed by Astronautics Corporation of America to handle the formal record traffic normally encountered and transmitted across the military Automatic Digital Network (AUTODIN).

ARTS is a real-time communications software program designed to satisfy a wide range of user requirements in support of the Government's automated communications centers. The program may be used to perform all the functions required to receive, process, store, transmit and retrieve both narrative and data pattern messages. Messages may be of various lengths, formats, and transmission rates. ARTS has been designed to handle a variety of record traffic forms including:

- a. DD 173 forms, from Optical Character Recognition (OCR) equipment or manual entry.
- b. JANAP 128 Protocol, both narrative and data pattern.
- c. ACP 126 Protocol.

ARTS is based on a Master Data Base (MDB) Store and Forward architecture in which message security, integrity and accountability are maximized at all processing levels. The System Operator has been provided complete capability to manage the traffic and system queues at all times without fear of message loss.

Support functions available include logging of system activities, communication statistics accumulation, local file maintenance utilities, magnetic tape support utility and a local device-to-device transfer utility.

The software uses a self-contained, modular architecture designed for flexibility and configurability. This architecture is capable of adding peripheral devices easily through modification of its data bases and the inclusion of the appropriate device drivers.

A significant feature of this system is its capability of handling multiple remote interfaces using MODE I protocol or any other standard protocol. When connected to AUTODIN, the ARTS system can support single or multiple AUTODIN Switching Center (ASC) line connections as required to satisfy traffic requirements.

1.2 Security Consideration

The ARTS program is designed to be operated in a "System High" environment and is capable of providing absolute logical separation between traffic transmission and receipt.

Significant work has been performed to ensure labeling and tagging integrity. Message security, integrity and accountability are stressed during all phases of message transfer and processing. The system includes automatic detection and correction of recoverable errors and automatic message protection during unrecoverable errors or error/fault conditions.

The software program allows an equipment configuration that eliminates any single point-of-failure in the MDB Store and Forward system. Thus, no single hardware failure point can cause the loss of a message received from the AUTODIN line prior to transmission to the designated destination. ARTS provides a complete audit trail of all significant operator actions and messages processed by the system. System logs and statistical reports can be generated by the operator at all times.

2. General

ARTS is a single Computer Software Configuration Item (CSCI) designed to function with the Astronautics Advanced Line Control Unit (ALCU).

ARTS is a self-contained computer program and does not directly interface with any other computer program to perform its required functions.

2.1 Major Functions

Major functions implemented by ARTS are as follows:

2.1.1 System Initialization.

This function loads the application software from storage, performs hardware initial setup, initializes all system data bases, and passes control to the executable tasks.

2.1.2 System Executive.

The System Executive acts as the operating system for ARTS and allows control of system resources.

2.1.3 Audit Trail.

This function provides System Log and Message Statistics capabilities. ARTS provides a complete Audit Trail of all significant operator actions and messages processed by the system.

2.1.4 Built In Test (BIT).

BIT is a firmware resident package designed to perform tests on the system central processing unit (CPU) and other configured resources.

2.1.5 Message Receive.

The ARTS Message Receive function provides the capability to receive narrative and data pattern messages via AUTODIN in JANAP 128 and ACP 126 formats.

2.1.6 Message Transmit.

The ARTS Message Transmit function provides the capability to transmit messages to AUTODIN in JANAP 128 and ACP 126 formats.

2.1.7 Message Preparation.

The ARTS Message Preparation function is used to prepare messages for transmission to AUTODIN. The capability is provided to input messages of the following format types:

- Fully formatted narrative and data pattern messages transferred from peripherals, like paper tape, punched card or magnetic tape for transmission.
- DD 173 formatted messages from either an Optical Scan Unit (OSU), the ALCU Keyboard or a Keyboard Visual Display Terminal (KVDT) with review, edit and validation capabilities.
- Partially formatted narrative messages retrieved from a Storage Module Disk Drive (SMDD) or Paper Tape Reader (PTR) for readdressal.
- Partially formatted narrative and data pattern messages from SMDD, magnetic tape, paper tape or card reader for retransmission.

2.1.8 Routing File Maintenance (RFM).

The RFM function is used to maintain a routing file on storage. Present design capability is a minimum of 2500 Plain Language Addresses (PLAs) with associated Routing Indicators (RIs) and Multiple Routing Indicator Designators (MRIDs).

2.1.9 Narrative Message Storage and Retrieval.

The Narrative Message Storage and Retrieval function is responsible for message storage and retrieval of transmitted and received narrative messages.

2.1.10 Device-To-Device Transfer (DTDT).

DTDT is used to transfer data from one storage medium to another (e.g., magnetic tape to paper tape). The operator can select the source and destination peripheral from those available as system resources.

2.1.11 Magnetic Tape Utility.

This set of utility functions provide the operator selectable commands to control a Magnetic Tape Unit (MTU).

3. General

The ARTS program interfaces with Astronautics Advanced Line Control Unit (ALCU) and associated peripherals. ARTS also interfaces with AUTODIN via a separate intelligent hardware interface contained within the ALCU implementing a MODE I protocol handler.

ARTS is currently hosted on a Multibus I subsystem using an iSBC 286/10 Single Board Computer. In addition, the iSBC 88/45 Advanced Communications Processor is used as a card level front-end processor to implement the MODE I protocol interface to the ASC line.

3.1 Advanced Line Control Unit (ALCU)

The ALCU includes an Intel iAPX 286-based processor circuit card assembly (CCA), an intelligent Storage Module Disk (SMD) controller CCA, intelligent communication controllers CCA and an intelligent peripheral(s) controller CCA.

In addition, the standard configuration includes 2 megabytes of Random Access Memory (RAM). Peripheral interface CCAs are added as the system is configured on an installation by installation basis.

3.2 Microprocessor

The iAPX 286-based processor is one of the most advanced CPUs presently in production. It incorporates hardware features that enable it to implement memory management and segmentation protection, multi-level security, invalid operation code detection and pre-emptive scheduling to insure proper sharing of the CPU.

The processor is capable of:

- 14 Megabytes of physical memory
- 1 Gigabyte of virtual memory per task, and the
- High performance associated with its 1 MIPS processing capability.

3.3 Storage Module Disk Controller

The intelligent SMD controller has its own dedicated processor. The SMD controller is designed to read disk sectors independently. Since the controller uses an independent processor, it is capable of doing read and write operations independently of the master 80286 processor.

The SMDD is capable of transferring an entire track of up to 32 sectors every two revolutions of the disk. This very high performance is used to achieve the throughput efficiency of ARTS.

3.4 Communication Controller

A major ARTS feature is the method of implementation of the MODE I protocol required to interface to the ASC line. A separate processor is used to implement this protocol. This intelligent hardware interface is used as a front-end processor communicating to the ASC.

This intelligent interface feature provides the ability to modularly increase MODE I connectivity through the addition of communication controllers.

The intelligent communication controller has its own 8088 microprocessor. The communication controller is responsible for all link level MODE I protocol between ARTS and AUTODIN.

The interface is made possible through the sharing of Dual Port RAM which resides on the communication controller board.

The Dual Port RAM is structured to contain two (2) line block buffers, one used for message reception and one used for message transmission. These buffers are used by the MODE I and the 80286 processor to access message information to be received/transmitted from/to AUTODIN.

3.5 Intelligent Peripheral Interface Controller

ARTS is designed to use a separate iSBC 286/10 single board computer as a dedicated Intelligent Peripheral Interface Controller.

This permits the use of high level commands from the main system processor while retaining existing Standard Remote Terminal (SRT) Peripheral Interfaces.

The Intelligent Peripheral Interface Controller looks to the master processor as a series of intelligent peripheral interfaces. The controller translates the information it receives from the master processor into a format that it can provide to the existing SRT peripheral interfaces.

Each device driver in the Intelligent Peripheral Interface Controller is controlled by an independent task. The address space and all the objects used by each driver are protected from one another by the protection mechanisms provided by the iAPX-80286 CPU architecture. Each device driver task runs at a privilege level of one. The Intelligent Peripheral Interface Controller executive runs at a privilege level of zero. The executive handles functions like exceptions, interrupts and system initialization while providing an environment for each of the device driver tasks.

In order to achieve the highest possible system performance, ARTS is configured in such a way that the Intelligent Peripheral Interface Controller is responsible for all system input/output except for the SMDD and the MODE I port(s) to AUTODIN.

The master 80286 processor controls the SMDD and executes all the application programs.

This allocation of functions, established by a data flow analysis, provides an implementation that takes advantage of existing SRT I/O interfaces while meeting all throughput requirements.

4. Implementation Features

The ARTS software program was designed using modern software design techniques and is implemented using PLM-286, a popular High Order Language (HOL), for efficiency and maintainability.

The system is hosted on a Multibus I set of Single Board Computers (SBC) utilizing the industry standard Intel 80286 processor. Memory and other peripheral cards are off-the-shelf products widely supported and very cost effective.

The entire application software is designed to be resident in the Random Access Memory (RAM).

The program is designed to be loaded from hard disk after an initial load from distribution floppy diskettes.

4.1 Expandability

The ARTS software program offers significant expansion capabilities. The system configuration provides for virtual addressing capability for increased memory utilization. Peripheral expansion and configurability permits updates to system data bases without costly software reworks.

4.2 Maintainability

The Applications Software accesses the system resources through well defined interfaces. Changes in specific hardware components are handled at the software driver level and are resolved locally, without impacting the upper layers of the Applications Software.

4.3 Increased Efficiency

The ARTS software program uses a real time, multi-processor architecture, effectively distributing the input/output (I/O) handling and the processing of messages. Overall efficiency is achieved in message throughput, AUTODIN line utilization and operator response times.

4.4 Portability

The ARTS program can be ported to other processors and operating systems. The engineering effort required will involve implementation of a new HOL and the new operating system. Since these operations can be automated, Astronautics can implement them quickly and efficiently.

Potential operating systems include:

- iRMX-86
- iRMX-286
- CP/M
- MP/M
- MS/DOS
- UNIX
- CUSTOM OPERATING SYSTEM FOR MULTI-LEVEL (B3/A1) SECURE REAL-TIME APPLICATIONS

Potential programming languages are:

- PL/M
- ASSEMBLY
- PASCAL
- C
- ADA

4.5 Supportability

To allow user programmers cost effective software maintenance capabilities, software supportability in the form of a self-hosting environment can be provided.

5. Peripheral Devices

Astronautics Corporation of America offers a complete line of dependable, high capacity storage and input/output devices.

Because of the varied installation requirements and traffic volume, ARTS provides a modular approach to hardware configuration.

ARTS is designed to support a broad selection of peripheral devices in the exact configurations needed. Device configuration is achieved through simple system data base changes, without the need for major software configuration changes.

In this manner ARTS supports the ability to upgrade to new peripheral devices (state-of-the-art product improvement) through the addition of modular drivers without major architecture redesign.

The following are examples of the types and number of devices that can be supported:

a. Medium Speed Line Printer (MSLP)

Up to three (3) MSLPs can be configured in the system. This type of printer is normally used for Audit Trail and logs printout as well as report generation. The ARTS program allows the operator to designate any given printer to specific purposes like Operator Console, Log and Reports generator, etc.

b. High Speed Line Printer (HSLP)

Up to three (3) HSLPs can be configured in the system. This type of printer is normally used for message hardcopy generation. The ARTS system automatically generates all required security banners according to the message security and precedence levels. Any device can be specially designated for special purposes.

c. Card Reader and Card Punch (CR/CP)

ARTS supports one each of the Card Reader and Card Punch. Standard 80 column cards with Binary or Hollerith code are supported.

d. Paper Tape Reader and Paper Tape Punch (PTR/PTP)

ARTS supports one each of the Paper Tape Reader and Paper Tape Punch. Standard 11/16-inch, 7/8-inch, or 1-inch wide paper tape with five-level ITA-2 (BAUDOT) code and eight-level ITA-5 (ASCII) code are supported.

e. Magnetic Tape Unit (MTU)

Up to six (6) individual magnetic tape drives can be configured in the system. Any MTU device can be specially designated for special purposes, like Narrative Storage and Retrieval, Log, etc.

f. Storage Module Disk Drive (SMDD)

ARTS uses the SMDD for storage of information to be used by the system. One or more SMDDs can be configured in the system. The Master Data Base (MDB) subsystem can use a single SMDD with battery protected CMOS RAM or a dual SMDD configuration for message storage as part of a system configuration to ensure no single-point-of-failure exists.

g. Optical Scan Unit (OSU)

ARTS supports one OSU to provide scanning of printed DD 173 forms. The forms are read, validated, and transmitted as required. If errors are detected, the Operator is able to do on-line editing of the page read and correct any errors.

h. Keyboard Visual Display Terminal (KVDT)

In order to provide greater flexibility for the system integrator, the ARTS software program supports the configuration of multiple intelligent work stations using Astronautics MODE I KVDTs or any other MODE I terminal. The intelligent stations can be used for remote message preparation in DD 173 format, stand alone word processing, and remote reception of AUTODIN JANAP messages.

i. Automated Message Handling Systems

ARTS supports a XEROX® Message Processor (XMP) System to allow efficient message printing, sorting, and distribution. The XMP system offers improved message accountability and reduces significantly the number of manual tasks required of the Telecommunications Center personnel.

j. Remote Message Terminal

As part of its Remote Terminal capability, ARTS supports multiple Remote Message Terminals. Based on a TEMPEST PC workstation, the terminals allow message preparation tasks both manually through operator editing of preconfigured masks or by use of desk top TEMPEST OCR equipment. A printer is used for local Audit Trail and message printout.

k. Paper Tape and Card Emulation Peripherals

ARTS supports emulation peripherals designed to replace paper tape and card equipment. This is achieved utilizing specially formatted 5-1/4 inch floppy disks compatible with standard fielded PC systems.

6. Uses

This section briefly describes potential uses for ARTS.

6.1 AUTODIN Terminal

ARTS can be used to implement systems that operate directly into an AUTODIN Switching Center (ASC) with no intervening or supporting Automated Message Processing Equipment (AMPE). In this capacity, the system is capable of supporting the required ASC connections while offering over-the-counter and message record traffic services.

6.2 AMPE Remote Terminal

In this type of system, ARTS is connected to an AMPE to perform certain remote functions. In this configuration ARTS is capable of message storage and retrieval, message sequencing, audit trail generation, and interfacing to dedicated backside networks.

6.3 Defense Data Network (DDN) Terminal

The ARTS software can be used to implement a Formal Message Terminal for use in the DDN based Integrated AUTODIN System (IAS) architecture. These terminals can be interfaced to a Terminal Access Controller (TAC) or function as backside terminals to the I-S/A AMPE system.

6.4 AUTODIN - DDN Gateway

In this capacity, ARTS can be configured to operate as a translator between the AUTODIN dedicated environment and a DDN network. The system can validate data formats and provide addressing capabilities between the separate set of subscribers. ARTS will provide the required filtering of Message Record Traffic and enforce the segregation of traffic by community and classification as required.

6.5 E-Mail Terminal Capability

With the addition of commercially available interface hardware, ARTS can support standard E-Mail traffic. As in the DDN implementation, ARTS will provide the required filtering of Message Record Traffic and enforce the segregation of traffic by community and classification as required.

6.6 Multi-Level Secure (MLS) Message System

Through an extension of the security requirements and the constraints imposed by the AUTODIN Message Record Traffic handling, the ARTS system can be rehosted, documented and formally validated to meet the National Computer Security Center (NCSC) Orange Book (DOD 5200.28-STD) requirements for B3/A1 Multilevel Secure Systems.

6.7 Host DPI Connectivity

Using commercially available hardware, Host DPI connectivity can be implemented concurrent with regular Record Traffic functions. Connection to most popular protocols, like IBM's SNA, Hyperchannel based LAN's, etc. are supported.

OPERATIONAL CONCEPT DOCUMENT
FOR THE
ASTRONAUTICS
REMOTE MESSAGE EDITING PREPARATION SYSTEM

SCOPE

This document provides an overview and technical description of an Astronautics Corporation of America (ACA) initiative to upgrade the operational capabilities and extend the service life of the Standard Remote Terminal (SRT) system.

This ACA initiative was undertaken in recognition of the fact that the DOD is continuing to study and analyze more efficient and cost effective methods of handling record telecommunications traffic and the stated DOD objective of moving toward a subscriber operated, distributed, multi-level secure network.

The proposed upgrades developed by ACA will enable the DOD to retain and fully utilize the fielded SRT systems and provide the capability for an evolutionary transition toward the DOD's objective architecture including the following features:

- o Multiport Autodin Interface
- o Autodin To E-Mail Host Gateway
- o Support Multiple Remote Classified Workstation
- o Direct interface to Autodin and DDN
- o Multi-level Secure Workstations

The proposed ACA upgrade includes both hardware and software.

Identification

This Operational Concept Document describes the mission of the ACA MEP System and its operational and support environments. It also describes the functionals and characteristics of the workstation within the overall system.

Purpose

a. The primary purpose of the workstation is to Modernize data entry methods for Formal Record Traffic.

b. The MEPS workstations provide the following message handling benefits:

(1) The Base Communications Centers (BCCs/TCC's) will provide over the counter service for messages on diskettes.

(2) The workstation provides quick and easy message preparation capabilities for office personnel via the MEPS provided text editor or selected word processors.

(3) Outdated equipment at communications centers and remote sites can be replaced by state-of-the-art terminal equipment.

c. MEPS functions are to enable the preparation, transmission, reception, and storage of Record Traffic messages on a Multi-level Secure workstation.

Introduction

a. This concept provides an operational method to utilize Zenith Z-248 and Z-200 with 5 1/4" diskettes for message communication and/or message preparation.

b. The MEPS Workstation includes both message communication and message preparation. It can be located within or external to a BCC/TCC. It will be connected to a host processor and will be a full duplex workstation capable of simultaneous transmission and reception of messages. It will require a Z-248 or a Z-200.

MISSION

Mission Need Requirements

BCC/TCC customers need to transmit and receive Record Traffic messages via AUTODIN. Astronautics has taken action to develop and implement a plan to modernize current communications systems.

Primary Mission

The primary mission of the MEPS Workstation is to provide a method of preparing Record Traffic at user locations without requiring a "System High Environment".

Operational Environment

The MEPS software will be deployed in BCCs, command posts, secure controlled-environment office areas, and unclassified offices throughout the DOD. MEPS Workstations will have message preparation, AUTODIN transmission, and AUTODIN reception capabilities.

BCC/Remote Environment

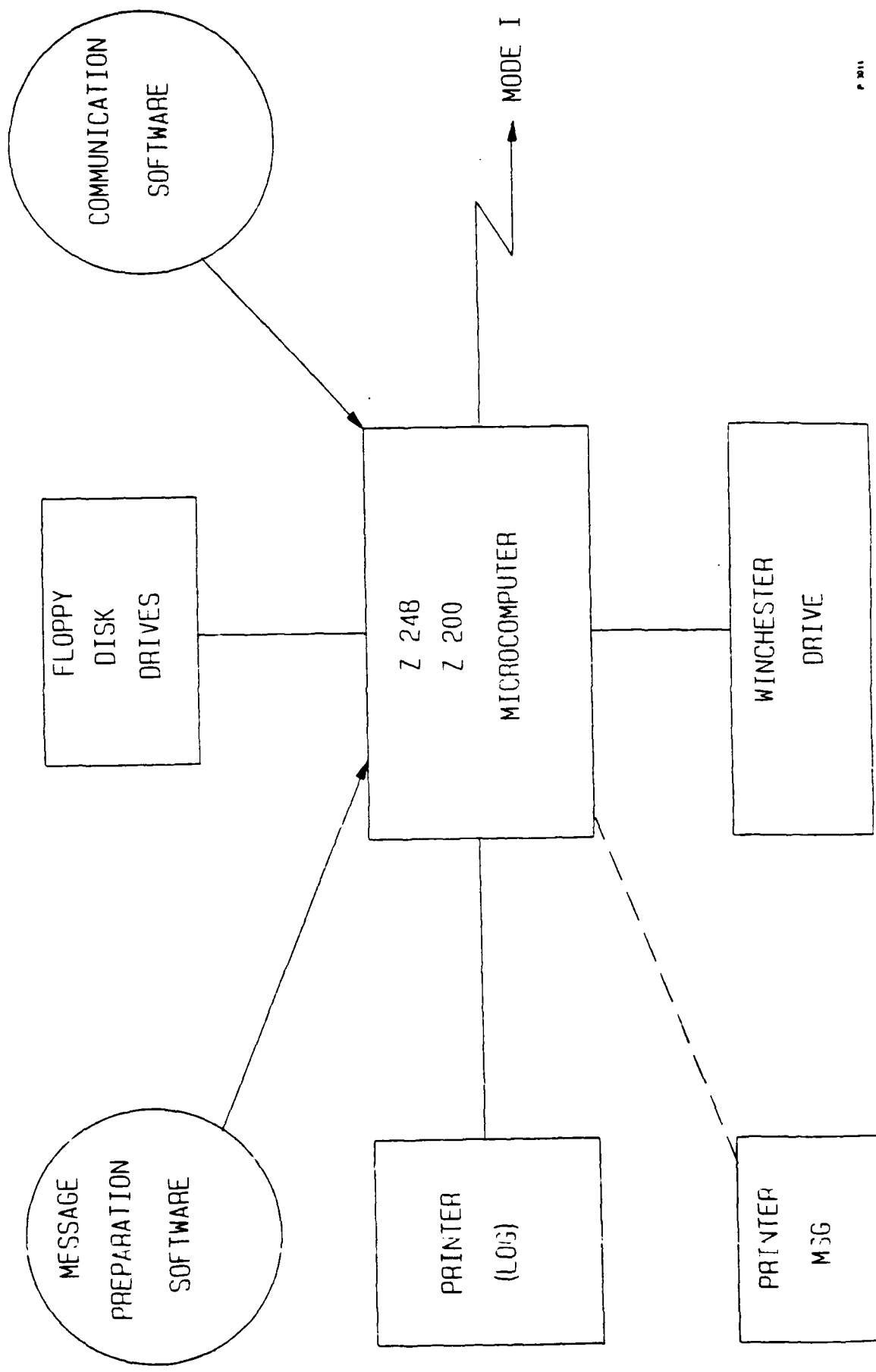
The MEPS Communications Workstation can be located within or external to the BCC. It is connected to a Standard Remote Terminal by a synchronous block-by-block or continuous Mode I Software. TEMPEST certified equipment will be used to process classified material.

Stand Alone Environment

Any number of authorized customers may use the MEPS Workstation message preparation function to prepare/read/print messages on/from 5 1/4" floppy disks. Customer are responsible for providing adequate security measures if they process classified messages or text.

Support Environment

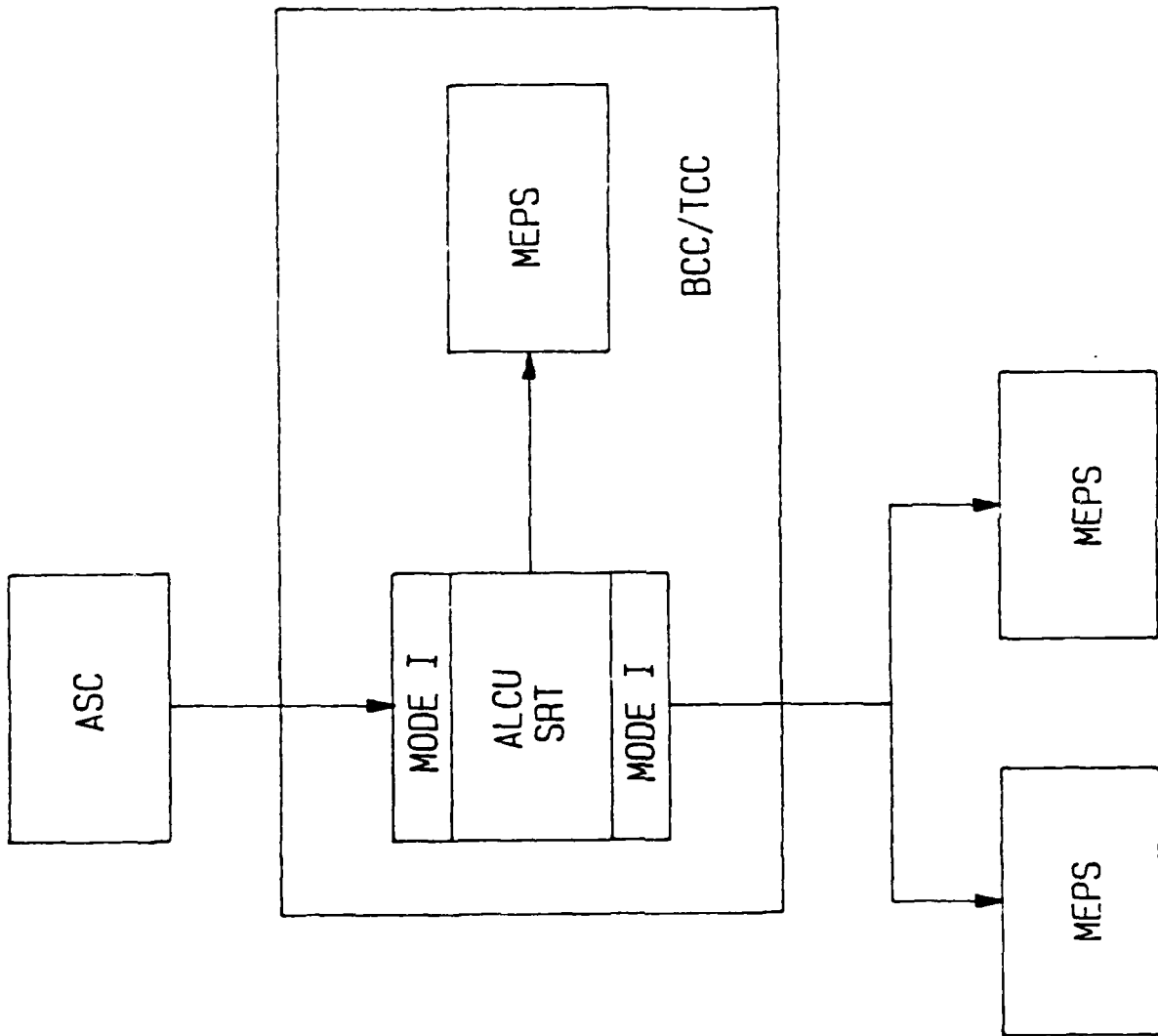
The support environment for the MEPS project involves the use of three computer systems: the Zenith Z-248, the Zenith Z-200, and the IBM PC AT. Source code has to be developed for both the Z-248 and the PC AT systems. The MEPS are targeted to the Z-248 and Z-200 microcomputers.



SYSTEM FUNCTIONS AND CHARACTERISTICS

System Functions

MEPS provides an automated "user-friendly" communications workstation which is intended to be used to prepare, transmit, and receive messages via AUTODIN. Messages prepared by the MEPS workstation may be electronically transmitted/received through AUTODIN via a communications center host. Workstations directly connected to a host use a software continuous or block-by-block Mode I. Support routines which enable the user to manipulate and control data located on diskettes (such as disk-to-disk copy and disk-to printer routines) are provided by the MEPS software.



Computer System Functions

Message Preparation Functions

The MEPS workstation shall permit the user to create, modify, delete, store, display, review, print, and prepare messages for release and transmission. The message preparation function shall provide features to permit the workstation user to display and "fill-in" message preparation masks. The user shall have the option of selecting a message mask for JANAP 128 messages with CC, SC, CT, or CA Language Media Formats (LMF), DD173 Joint Message Form, or a DD 1392 Form for transmitting card image text. MEPS shall provide a message editing capability to permit the user to selectively insert, delete, move, or copy character(s), word(s), line(s), paragraph (s) and page(s) from a message being prepared. A user of a MEPS workstation may scroll through a message or text on a line-by-line or a page-by-page basis. The MEPS workstation user may display selected messages, text or portions of a message or text on a MEPS terminal screen or print a hardcopy on a MEPS printer. The user may use MEPS to generate a hardcopy release document for all messages.

Communications Functions

The MEPS Workstation is a full duplex system capable of simultaneously receiving and transmitting messages or having a user prepare a message. Message validation for header information down to the subject line is performed on all messages prior to their introduction to DCS. Plain Language Address (PLA) to routing indicator conversion can be provided. An audible alarm is provided at the Workstation to indicate high precedence traffic (priority or above) or classified traffic is to be received. The Communications Workstation is able to interpret peripheral busy or interrupt conditions, e.g., printer device out of paper or communications device not on line. The interrupts are handled in a manner to insure no loss of data occurs. The Workstation operator will select the method for outputting message traffic. Output options available are the printer only, floppy disk only, or if the selected option is not available, messages will be held until an acceptable option is available. Required paging for all locally printed message traffic provided by the Workstation. MEPS shall provide the user with a queue of messages on the hard disk awaiting delivery. The queue will segregate messages by precedence and by classification. The workstation shall provide the BCC and remotely connected users cumulative statistics on message traffic through the workstation.

Failure Recovery Functions

A historical journal of all transactions for both transmit and receive traffic will be printed on the MEPS Workstation journal printer. This journal provides the information for a manual recovery process. When the floppy diskette or hard disk are not damaged at the time of system failure, a recovery can be accomplished using the table of contents file and the receive message file and the receive message file table of contents. In the worst case situation when the floppy or hard disk are not usable, the historical journal shall be used to request re-entry of the lost messages by the originator.

Operator and User Interaction

Stand Alone Terminal User

The user of a MEPS Workstation can create classified and unclassified messages at his/her terminal. These messages can be stored on a floppy disk. Software will not allow classified traffic to be mixed on the same floppy disk. Once a floppy disk has been used to store classified information, it will be plainly marked and not used for unclassified traffic. The workstation user shall be able to import text files created by selected word processing software running on an IBM compatible microcomputer operation under MS-DOS 2.0 or higher. Message diskettes created on other computers must contain a directory file and go through MEPS workstation conversion process before they can be accepted by the workstation for communication processing.

BCC/Remote Terminal User

a. BCC and remotely connected MEPS users shall transmit messages to AUTODIN and receive messages from AUTODIN via the ALCU SRT host. Messages transmitted to AUTODIN may be created at the BCC terminal or input electronically or from a floppy disk created on another microprocessor using MEPS software. Any floppy disk containing messages shall be validated as being created by MEPS software before messages will be introduced to AUTODIN. Plain language address (PLA) to routing indicator conversion can be provided.

b. Messages received from AUTODIN shall be output electronically to remote users or to floppy disk for delivery to the various BCC customers. Messages be segregated by customer and classification. Classified and unclassified messages are output to separate appropriately marked disks.

Computer System Characteristics

c. The following additional hardware is required to interface the workstation to the ALCU SRT Host AUTODIN system:

(1) Additional 2MB extended memory (even though only 512KB is actually needed, Zenith only permits the next increment to be 2MB)

(2) A second printer (recommend fast dot matrix printer. Required for AUTODIN logging function.)

(3) A second floppy disk drive is required for concurrent operations such as transmitting from one floppy disk at the same time as distributing received messages to another floppy disk.

(4) Modems, if needed.

(5) Cryptographic equipment, if needed.

d. With MEPS, the user may input DD 173 format messages with the normal message preparation facility. An optimal optical character reader capability can be provided.

Software

a. The software required for a multi-level Secure MEPS Workstation will include the software and GEMSOS operating system.

Hardware/Firmware

a. The minimum hardware requirement for the MEPS Workstation includes the following:

(1) Zenith Z-248, TEMPEST Z-200, or IBM PC AT compatible microcomputer.

(2) Monitor (monochrome or color; color recommended).

(3) 1.1 Megabyte (MB) minimum internal memory (512 KB real, 512 KB extended minimum).

(4) Minimum 10 (MB) Winchester hard disk drive.

(5) Minimum of one 5 1/4" floppy disk drive (IBM PC format), two are recommended for easier diskette copying.

(6) One printer (letter quality or dot matrix).

GENERAL DESCRIPTION
OF
MESSAGE TERMINAL CONTROLLER (MTC)
AND
SUBSCRIBER TERMINAL AUTOMATED RECORD TRAFFIC
SYSTEM-VERSION 2 (STARTS2) SOFTWARE

This document provides an overview and technical description of an Astronautics Corporation of America (ACA) initiative to up-grade the operational capabilities of the Government's record telecommunications system(s).

This ACA initiative was undertaken in recognition of the fact that the Government is continuing to study and analyze more efficient and cost effective methods of handling record telecommunications traffic and the stated Government objective of moving toward a subscriber operated, electronically distributed, multi-level secure network. The proposed Message Terminal Controller (MTC) along with the Subscriber Terminal Automated Record Traffic System-Version 2 software, henceforth referred to as STARTS2, will considerably increase the direct accessibility by the user to the DoD military message systems. This will provide greater direct message "writer" to message "reader(s)" communication. This will also result in the reduction of the TCC man-power requirements and support the migration to fully automated TCCs. The proposed system developed by ACA will enable the Government to provide the capability for an evolutionary transition toward the Government's objective architecture including the following features:

- * Support Multiple Remote Work-Stations
- * Direct Interface to AUTODIN and DDN

This proposed ACA up-grade includes both hardware and software. The hardware up-grade involves a system referred to as the Message Terminal Controller (MTC) with the following features:

- * Homed to ASC or DDN
- * Remote Back-Side Local Area Network (LAN)
 - Classified Record Traffic
- * Open Architecture (MULTIBUS I)
- * Current Technology Processing Power (Intel 80286 Microprocessor)
- * Smart/Intelligent Communications Interface
- * High-Order Programming Language

The hardware design is complete and the MTC has been designed to meet NACSIM 5100A (TEMPEST).

The MTC hardware up-grade can be procured under Paragraph 3.1.5.8, i and j, of the existing SRT contract DAEA18-35-D-0057, Statement of Work ASM-84033; Part II, Rev 27 March 1985. Government procurement under this paragraph will be part of "Non-Development Items" (NDI).

A detailed technical discussion of the MTC hardware is contained in Section A.

The companion software package for the MTC is the STARTS2 software which contains the following major features:

- * Self Contained Software Program to Handle Formal Record Traffic
- * Perform all Required Functions for ICC Operation:
 - AUTODIN Terminal
 - AUTODIN to Multiple Back-Side Work-Stations

The STARTS2 software package is a recent and on-going product

improvement effort being done in-house by Astronautics.

A detailed technical discussion of the STARTS2 software is contained in Section B.

SECTION A
TECHNICAL DESCRIPTION
OF
MESSAGE TERMINAL CONTROLLER (MTC)

1.0 SCOPE

This section describes Astronautics Corporation of America's (ACA's) up-grade of the Standard Remote Terminal (SRT) to provide additional functionality through the addition of a Message Terminal Controller (MTC) system with multiple back-side ports.

2.0 GENERAL

The proposed MTC would optimize the Government's investment in small user terminals (Z-248 PCs). This would be accomplished by connecting individual user terminals (Z-200 or Z-248 PCs) or a cluster of office user terminals to the back-side ports of the MTC. The MTC would in turn be connected to AUTODIN or the DDN using an intelligent communications interface(s).

Supervisory control capabilities are obtained through the connection of a portable personal computer (PC) or a VT-100 terminal, with a printer connected to the serial port on the Intel i386 286/10 Processor circuit card assembly (CCA) within the MTC. Alternatively, user control could be achieved from a designated remote location by connecting the PC to one (1) of the back-side ports.

Some of the outstanding features of the MTC include the following:

- * Open Architecture
- * High Order Programming Language Capability
- * AUTODIN Mode I Port
- * Back-Side Ports

* DDN Connection

2.1 Open Architecture

The hardware utilizes the MULTIBUS I architecture which provides built-in growth capability because of the great variety of intelligent controllers that are presently available as well as the state-of-the-art intelligent interfaces that will become available in the future.

2.2 High-Order Programming Languages

The Intel 80286 microprocessor can be programmed in a number of high-order languages (HOLs) including Pascal, FORTRAN, COBOL, Basic, PL/M, C and Ada.

2.3 AUTODIN Mode I Port

The intelligent communications controller residing within the MTC, is programmed to provide AUTODIN Mode I protocol capability. This enables the MTC to be interconnected to AUTODIN.

2.4 Back-side Port Capability

A serial terminal interface circuit card assembly is provided that will enable up to a maximum of twelve (12) "VT-100 like" terminals to be connected point-to-point in a star LAN configuration.

3.0 TECHNICAL

The MTC consists of a 5-1/4" floppy disk, a 5-1/4" Winchester disk, a MULTIBUS I ten (10) slot card cage with seven (7) MULTIBUS I circuit card assemblies (CCAs), a Mil-Stc-138 Adapter

CCA and DC power supplies all packaged within a TEMPEST enclosure. The MULTIBUS card cage contains the following complement of MULTIBUS CCAs.

- * Intel iSBC 286/10 Processors (including Intel 80286 Microprocessor)
- * 2 Mbyte Dual-Port RAM
- * Two (2) - 256 Kbyte CMOS RAM
- * Intelligent Communication Controller
- * Serial Terminal Interface
- * DCN Connection (Optional)

4.0 TASKS

4.1 Hardware

The hardware design is complete.

4.2 Programming

The programming is complete.

4.3 TEMPEST

The MTC was designed to meet the requirements of NACSIM 510CA.

5.0 COST

The Government will not incur any front-end development or non-recurring costs. The Government is requested to sponsor and support an application to DCA for Category III certification of the MTC. During the certification process, ACA requests that the Government provide, at no cost to ACA, test personnel, equipment, and test facilities for the Category III certification.

ACA will provide the cost of the MTC hardware and the cost to maintain the MTC hardware upon request.

SECTION 3
TECHNICAL DESCRIPTION
OF
SUBSCRIBER TERMINAL AUTOMATED RECORD TRAFFIC
SYSTEM-VERSION 2 (STARTS2) SOFTWARE

1.0 SCOPE

This section describes the Astronautics Corporation of America's (ACA's) STARTS2 software package which operates on the ACA Message Terminal Controller (MTC). The functionality that the STARTS2 software will provide when hosted on MTC hardware is specifically addressed.

2.0 GENERAL

This section describes the proposed software capability with respect to meeting current and future record traffic telecommunications needs of the Government and the Department of Defense (DoD).

Utilizing the proposed ACA developed STARTS2 software on the Message Terminal Controller (MTC) establishes a message concentrator that provides AUTODIN access to multiple concurrent users. The STARTS2 software enables multiple users to prepare messages in DD-173 format and have them converted within the MTC into JANAP-128 format. In turn, the JANAP-128 messages can be transmitted to an AUTODIN Switch Center (ASC) using the Mode I protocol provided by the MTC.

The STARTS2 also has the capability to receive JANAP-128 messages at any of the user terminals via the MODE I interface to the ASC. The received messages are journalled and a copy of the messages is printed on the printer that is co-located with the MTC. The journal enables the user to retrieve a message at some later time.

The STARTS2 software also provides supervisory functions to

control the access and usage of the system by different user groups as well as audit trail functions.

The MTC utilizes commercially available VT-100 (or equivalent) terminals as user interfaces. In lieu of the VT-100 terminals, PCs that emulate VT-100 terminals can be used for message edit and user interaction with the system.

3.0 IMPLEMENTATION FEATURES

The STARTS2 software was designed using modern software design techniques and is implemented using PL/M-286, a popular High-Order Language (HOL), for efficiency and maintainability.

3.1 Useability

The STARTS2 software can be used to implement systems that operate directly into an ASC with no intervening or supporting Automatic Message Processing Equipment (AMPE).

STARTS2 offers a great degree of flexibility to the system integrator and can be configured to operate in a variety of systems where real-time performance of message processing tasks is required.

3.2 Expandability

The STARTS2 software offers significant expansion capabilities. The system configuration provides for virtual addressing capability for increased memory utilization.

3.3 Maintainability

The software accesses the system resources through well defined interfaces. Changes in specific hardware components are handled

at the software driver level and are resolved locally, without impacting the upper layers of the Applications software.

3.4 Increased Efficiency

The STARTS2 software uses a real-time, multi-processor architecture, effectively distributing the I/O handling and the processing of messages.

3.5 Peripheral Device Support

Because of the varied installation requirements and traffic volume, the STARTS2 software provides a modular approach to hardware configuration.

The following lists the types and numbers of devices that are supported:

- * Printer

One (1) printer can be configured in the system. This printer is used for audit trail and log print-outs as well as report generation.

- * Remote Terminals

A maximum of twelve (12) remote terminals can be configured in the system.

The STARTS2 software supports the configuration of multiple VT-100 or equivalent, work-stations. The work-stations can be used for message preparation in DD-173 format.

4.0 TECHNICAL

4.1 Overview

The STARTS2 software is organized into the following three (3)

major modules:

- * System control software that runs on the Intel iSBC 286/10 Processor CCA under iRMX 286 Operating System.
- * Terminal controller software that runs on a MULTIBUS I Serial Terminal Interface CCA.
- * Mode I software that runs on the Intelligent Communications Controller CCA

4.1.1 The proposed STARTS2 system control software provides the following functions:

- * Built-In Test (BIT)
- * System Initialization
- * System Executive
- * Supervisory Function
- * Message Conversion
- * Message Transmission
- * Message Reception
- * Message Journalling
- * Audit Trail
- * Template File Maintenance

4.1.1.1 Built-In Test (BIT)

The built-in test module is resident in the MTC's EPROM. This firmware performs an operational check of the connected hardware and the communications interface when the MTC is powered-up.

4.1.1.2 System Initialization

This function loads the Application software from the secondary storage into the main memory and initializes the system data

bases. The system administrator is provided the option to set-up a variety of system parameters and tables including the system clock and other system administration data bases.

4.1.1.3 System Executive

The system executive controls the resources in the system and arbitrates the access to these resources by different programs and utilities. The system executive also monitors the executing software and hardware to detect error conditions. In case of severe errors, the system operation is halted. If the error is not severe, an error message is displayed on the system console for resolution by the system administrator.

4.1.1.4 Supervisory Functions

These functions enable the system administrator to authorize and authenticate users. Functions to allocate work space for users on the disks, class mark users and/or terminal ports (i.e. highest security level authorized for processing by the system and each user), set-up user privileges and access rights are also provided. Update utilities for FLA to RI conversion table maintenance and system parameter table entry and update are also provided by a supervisory function. System start-up functions are provided which allow the system administrator to enter such parameters as date, time-of-day, communications parameters and the lowest precedence level that will initiate an audible alarm.

4.1.1.5 Message Conversion (for transmission to AUTODIN)

The messages that are edited/validated using the terminal controller software are written to the disk in the user

partition. Upon request from the user, the message is converted to JANAP-128 format for transmission. PLA to RI conversion is performed using the local PLA to RI look-up table.

4.1.1.6 Message Transmission (to AUTODIN)

The message is authenticated to ensure that the user is authorized to release the type and class of the message he has prepared. The converted message in the user partition is transmitted to the destination via the Intelligent Communications Controller CCA. The transmit process validates each message header block, validates the framing of each transmission line-block and transfers the line-blocks to the Mode I CCA for transmission to the ASC. The control logic that is required to implement the Mode I protocol is resident in EPROM on the Intelligent Communications Controller CCA. The transmit process is also responsible for generating audit trail entries.

4.1.1.7 Message Reception (from AUTODIN)

Messages received by the Mode I CCA are retrieved from the dual-port memory and a local copy is printed. Message headers are composed of the following information and printed on top of each page:

- * Security Banners
- * Time of Reception
- * SIDN
- * Julian Date

4.1.1.8 Message Journalling

Received (and transmitted) messages are journalled. The user is allowed to query the journal depending on the access privileges that have been granted to him by the system administrator. Based upon the message identification parameters entered by the operator, the journal file is searched for the message. If the message is found, a copy of the message is copied to the user partition on the disk.

4.1.1.9 Audit Trail

The STARTS2 software provides a complete audit trail of all significant system activities. This module will record and maintain a complete log of all message transactions and all significant user activities. The capability for the generation of printed hard-copy output reports of the system activities is also provided.

4.1.1.10 Template File Maintenance

This function provides the users or the supervisor to copy and modify the message template file to create and maintain message templates. The message templates contain information that is routinely entered into a message. Consequently repetitive information can be entered once into a message template and used later in the creation of message files. This feature saves the time and effort associated with entering frequently used information.

4.1.2 Terminal Driver Software

The message editing, validation and user interface software resides on the terminal controller. A private copy of the user

interface and edit functions is loaded on the Serial Terminal Interface CCA for each user. This isolates users from one another. The Terminal Controller software has the following capabilities:

- * User Interface
- * Message Edit

4.1.2.1 User Interface

These functions provide the users the ability to interact with the MTC. The terminal control software will accept user requests for services that include copying the journal messages into the user partition, copying the message template file, initiating transmission of a converted message, etc. and passing it to the Intel 80286 microprocessor. It will also retrieve status and other information from the microprocessor and forward it to the user. The terminal controller also provides user log-on functions. Whenever a user attempts to log on to the MTC, it will accept the user's name and password. This is passed to the microprocessor for authentication. If the log-in is authenticated, other user requests are honored.

4.1.2.2 Message Edit

This function provides the users with the ability to compose and edit DD-173 messages. The DD-173 validation software also resides on the Serial Terminal Interface CCA. The editor software is capable of accepting the text information from an MS-DOS file generated by a PC Editor or Word Processor program.

4.1.3 Mode I Software

This function resides on the Intelligent Communications Controller. This software interacts with the SMARTS software through the shared RAM segment. The Mode I software is responsible for maintaining the Mode I protocol between the MTC system and the remote ASC. Received messages are placed in the dual-port memory for the STARTS2 software to process. Similarly the SMARTS software will place the messages to be transmitted in the dual-port memory for the Mode I software processing.

5.0 TASKS

5.1 Hardware

The hardware design is complete.

5.2 Programming (Software)

The software design is complete.

5.3 TEMPEST

The TEMPEST design of the MTC to meet the requirements of NACSIM 5100A has been completed.

6.0 COST

The Government will not incur any front-end development or non-recurring costs. The Government is requested to sponsor and support an application to DCA for Category III certification of the STARTS2 software. During the certification process, ACA requests that the Government provide, at no cost to ACA, test personnel, equipment, and test facilities for the Category III certification.

The Government will have the option, but not an obligation, to

purchase the STARTS2 software from ACA. ACA will provide the cost of the STARTS2 software code and the cost to maintain the STARTS2 software on a world-wide basis upon request.

AN INTELLIGENT ALTERNATIVE TO
DATA PBX'S



COP

COMMUNICATION ORIENTED PROCESSOR

A Network Control System that does complex things in a simple way

Let the power of COP direct and protect your valuable data traffic

What is a COP System?

The C.O.P. (Communication Oriented Processor) is an intelligent communication control system which adapts and directs data flow between selected resources, regardless of their characteristics. Selected devices may be Mainframes, Minicomputers, Microcomputers, Terminals, Printers, Modems, Digitizers or Plotters. It also provides field proven high level port access security with dialback and port contention capabilities. In other words, it can be user configured to perform any number of individual customer requirements, i.e., any port to any port switching, port contention/resource sharing, front end call back security or a combination of various customized data communication and data flow applications.

Why does the COP System stand out from the crowd?

Unlike typical data PBX systems, the COP communication controller provides greater network manageability and data security. In addition to supervisory activity monitoring, the system offers optional continuous hardcopy reporting, unauthorized entries, network malfunctions and detailed security audit trail information.

Another unique feature is the ability to queue and automatically call-back authorized remote terminal/modem users when contending for available computer ports. This feature plus normal direct connected user station switching and connection capabilities, provides for more efficient sharing of overall system resources.

PLUS:

- Easy to implement and use
- Flexible, user definable configurations
- Modular expandability
- High reliability
- Supports various interfaces — RS232C, RS423, RS422
- Zero signal distortion on data transmission

Who can use a COP System?

Everyone who wishes to reduce the number of "separate function-boxes" employed in a system without giving up flexibility and reliability.

- Anyone with multiple dial-up modem computer ports
- Anyone with multiple terminals or other resources which they wish to network
- Anyone with dissimilar devices to be networked, i.e., modems, printers, PCs, etc.
- Anyone needing expanded host computer access
- Anyone wishing to reduce the number of communication leased lines
- Anyone now using hard to use patch panels or function boxes
- Anyone interested in improving communication network control
- Anyone seriously interested in saving many dollars and eliminating many headaches.

How does the COP operate?

Because it is an intelligent processor controlled system, there are no time consuming and inflexible switch settings and strapping options. System set-up and subsequent changes are readily accomplished using just a terminal, or a PC. Menu defined plain language commands are utilized when assigning ports, defining routing, establishing high-level user password security, and configuring ports for the integration of dissimilar devices.

Featuring:

- Up to 152 ports, any port to any port switching
- Gateway interfacing to LAN's
- Selectable or pre-defined routing
- Time defined access control
- Port selection
- Modem or other resource sharing
- Port contention and automatic queuing
- Networking
- Port access security with call back security

CORPORATE BACKGROUND

BACKUS DATA SYSTEMS, INC., is a wholly owned subsidiary of Astronautics Corporation of America (ACA), the world's largest supplier of aircraft instrumentation.

BACKUS DATA COMMUNICATION PRODUCT LINES

- Data Security Devices
- Port Contention Units
- Statistical Multiplexers
- Data PBX
- Computer Port Expanders
- Special Purposes Communication Products

PARENT COMPANY — ACA PRODUCT LINES

- Digital Air Data Computers
- Flight Director and Computer Control Systems
- Multifunction Cockpit Display Systems
- Area Navigation Computer Systems
- DOD/AUTODIN Secure DIC & TAL Telecommunicator Systems

ACA Research and Development

- Thermomagnetic Refrigeration Systems
- Atmospheric Wind profiles Systems
- Hybrid Rocket/JET Propulsion Systems
- Android/Robotic System Development
- Advanced Scientific Computer Systems

The Company with a Lock on Data Communications



A Subsidiary of Astronautics Corporation of America

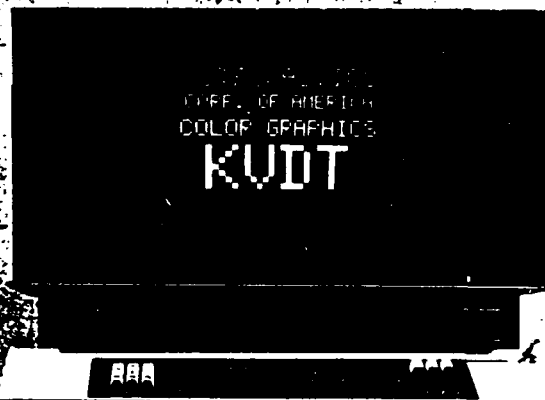
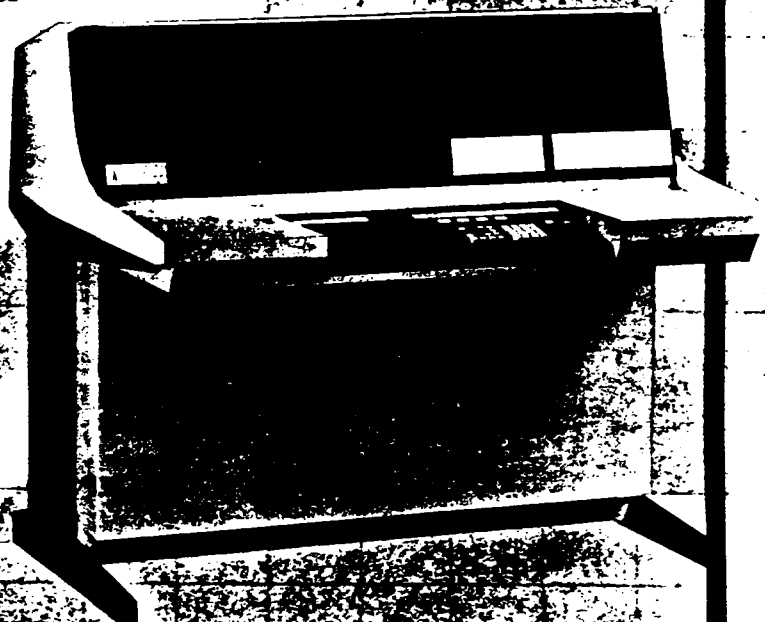
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Step Into The 21st Century With Performance Excellence: The Most Advanced TEMPEST-Certified SRT System

Our powerful Advanced Line Control Unit can be delivered to you now... or you can choose to extend the life of your present Standard Remote Terminal (SRT) System with our Field Service upgrading your Line Control Unit on site. With either choice, your entry into 21st century telecommunications will be smooth and uninterrupted.

The Advanced Line Control Unit features:

- Full Multibus™ (IEEE 796) architecture which incorporates the entire iAPX 86™ family of high-performance processors with memory management.
- System addressability which expands to 16 megabytes of real addressable memory and 1 gigabyte of virtual memory per task.
- Support for ADA, PASCAL, FORTRAN, COBOL, C, PL/M and Assembly.
- Expanded port capability for as many as 40 peripherals, including the remote Keyboard Visual Display Terminal, printers, mag tape units, optical character readers, punch card and paper tape equipment.
- Independent communication processor capability which supports line speeds up to 19.2 Kilobits per second.



Let Astronautics factory-trained Field Service respond to your needs, no matter where or when. They have an established record of SRT System availability and performance for nearly a decade in support of the worldwide telecommunication requirements of all U.S. Armed Forces.

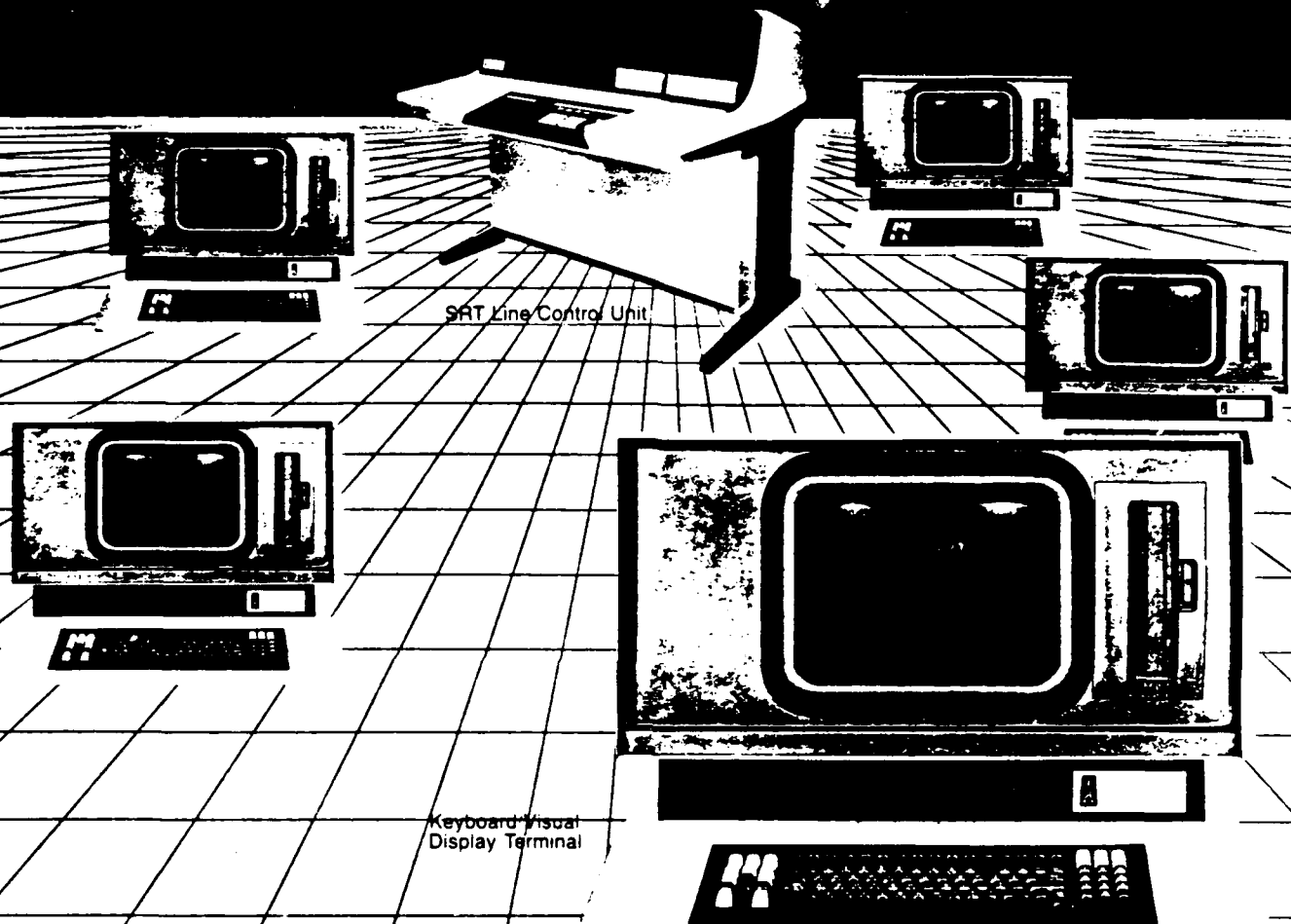
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Corporation of America

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World Leader in Data Systems, CRT Displays and Aircraft Instruments since 1959.

Expand AUTODIN Communications with Astronautics' Keyboard/Visual Display Terminals



Add remote Keyboard/Visual Display Terminal (KVDT) work stations to your Astronautics' Standard Remote Terminal (SRT) System and increase your communications capabilities. KVDT independent work stations interface with the SRT Line Control Unit to expedite message coordination, reception, and transmission to AUTODIN.

Other KVDT Key Features

- TEMPEST certified (NACSEM 5100A accreditation)
- Complete receiving, processing, storing, transmitting, retrieving and full-screen editing capabilities
- Provides direct access to 100 pre-formatted DD173 message forms
- Desk top convenience
- Requires minimum operator training
- Expansion capabilities include color graphics and word processing

Need SRT Applications Assistance?

- Our engineers customize configurations to your specific applications.
- Astronautics' worldwide factory-trained service force provides system installation.
- Maintenance available on two-hour response, 24-hours a day.
- On-site systems operations training is available, too.

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FAST SYSTEM II

BACKGROUND

FAST is a communication and office automation system sponsored by the Department of the Army. FAST is an acronym for Fast, Accurate, Simple, TEMPEST. FAST provides the user with the onsite capability to send and receive both narrative and data (in card image format) message traffic, in a secure mode using AUTODIN Automatic Digital Network). The FAST System offers an ideal solution to aging Model 40 Teletypes, Mohawks, DSTE (Digital Subscriber Terminal Equipment) and ARS (Automatic Receive/Send) 33's currently installed at military installations worldwide. The current FAST system consists of an 8100T, R8T, CPT TEMPEST TTY Comm, Genicom matrix printer and ACS Communications Line Controller (TLC). The line controller handles the TTY to Autodin Mode I protocol conversion as well as network status software.

The first FAST system was installed in 1981 in San Francisco at the Joint Military Postal Activity using QRIP (Quick Return on Investment) funds. To justify the procurement, the Army used a 2 year payback period. After the system was installed, actual manpower savings resulted in a payback period of 18 months. Subsequent installations include Ft. Huachuca, AZ; FEMA, MD; J.F. Kennedy Airport, NY; Nuclear Regulatory Commission, MD; Red Stone Arsenal, AL; Letterkenny Army Depot, PA; Jefferson Proving Grounds, Madison, IN; INAAP, Charlestown, IN; Bell Helicopter, TX; MTMC, San Pedro, CA.

Today's market demands a next generation FAST system configuration which uses a DOS based workstation as the AUTODIN Mode I terminal, updated peripherals and enhanced software capabilities. This document will describe the proposed FAST System II hardware configuration, enhanced software capabilities, timeframe as well as other considerations.

NEXT GENERATION HARDWARE

FAST System I	FAST System II
8100T	---> 9000T
R8T	---> New Genicom 55 cps daisywheel Option: LP-6T Option: NAI
Genicom Dot Matrix	---> Same Option: Low cost matrix
TEMPEST TTY Comm	---> Not required
TLC	---> ACS Plug in PC board (TLC1) ---> OCR ---> High level crypto plug-in PC board

NEXT GENERATION SOFTWARE - OVERVIEW

The current FAST system uses a message mask for both DD173 (see Exhibit A) and JANAP 128 (See Exhibit B) which must be completed by the operator. A more automated method of handling the message creation, conversion, transmission and reception is required. Custom code will be developed by both CPT and ACS Communications for FAST System II, with CPT handling the message creation and conversion and ACS handling the concurrent transmission/reception of messages. CPT software is handled by the bridge board; the ACS TLC1 program runs under the DOS operating system. Virtual softkeys for both CPT and DOS environments will exist and will offer a transparent operator interface.

FAST System II will be a controlled release of software with special installation and operating instruction.

Since the Autodin Mode I environment must be controlled for CAT 3 certification, the DOS window will not be available for other DOS applications unless standard DOS/CPT 9000 software is loaded.

Operator Interface

The message terminal will take advantage of CPT's full page screen. CPT will handle the interface between the message creation/conversion process and the transmission/reception task. The standard CPT 9000 interface will be altered slightly to accommodate the unique requirements of the Autodin Mode I terminal.

- The upper three lines of the CPT screen will be reserved to display Autodin system status messages
- CPT streamliner™ will handle the interaction between CPT and ACS so that virtual DOS softkeys can exist. For example, AUTODIN 1 softkey generates new level of softkeys which allow the operator to select TRANSMIT MSG, RECEIVE MSG, PRINT, AUDIT TRAIL, MODE I STATUS, etc. Sample softkey layout is found in Exhibit C.

Message Creation/Conversion

Automatic PLA (Plain Language Address) to RI (Routing Indicator) conversion (see Exhibit D) CPT "FAST Search"

Automatic message format creation: CPT Shortcut™
DD173 (See Exhibit E)
JANAP 128 (See Exhibit F)

Automatic message format conversion: CPT Shortcut™
DD173 --> JANAP 128 CPT "FAST Search"
DD173 --> DOI 123
DD173 --> ACP 127

Message Management

Automatic Logging and audit trails	ACS TLC1 software
Message Queuing FIFO by Precedence Routine (R) Priority (P), Immediate (D), Flash (Z) & Emergency Command (Y)	ACS TLC1 software
High Precedence Message Alarms (Flash and Emergency Command)	ACS TLC1 software
Concurrent processing: message creation/conversion message transmission and reception output to printer and disk	CPT Text Processing ACS TLC1 software ACS TLC1 software
Message Validation: message precedence, message classification routing indicators	CPT Text Processing ACS TLC1 software
Flash Override for high priority messages	ACS TLC1 software
Auto insertion of OSRI (originating station RI), SSN and time of file	ACS TLC1 software

TIMEFRAME

In order to be an approved terminal for direction connection to Autodin (vs connection to a switch like the AMME), the configuration must be both TEMPEST certified (CAT I) and CAT 3 certified. CAT 3 certification is handled by DCA and requires a TEST PLAN similar to that used for CAT I certification. CAT 3 certification deals with the reliability and integrity of the messaging system, ie what safeguards are included to handle message traffic when reception disk is full, or what safeguards are included if there is a printer jam, or what happens if disk drive is opened during message reception.

Tentative timeframe for completion of CAT 3 certification is August 1, 1988.

CPT 9000T

The CPT 9000-T is CPT's newest and most versatile family of IBM AT compatible workstations designed to meet the rigorous requirements of NACSIM 5100A. Based on the 80286 processor, the CPT 9000-T family offers an unsurpassed degree of configuration flexibility in terms of monitors, disk drives, keyboards and optional cards. The CPT 9000-T family provides a comprehensive solution for government accounts with a need to protect sensitive information, regardless of whether the requirement is for standalone processing, networking or secure communications. CPT offers a single vendor solution for text management, desktop publishing, communications (TTY, AUTODIN or 3270), or VT-100 terminal emulation, based on a standard platform of hardware and software.

- Full Page Display
CPT's hallmark 14 inch monitor, modified CPT AT keyboard, and text editing software is available on the TMP-1XX series. The TMP-1XX series provides an elegant solution to the integration of CPT's text processing and DOS application software. This series also serves as the foundation for CPT's desktop publishing, Autodin and integrated terminal emulation systems.

The TMP-2XX and TMP-3XX series features a 12 inch amber and 12 inch color display respectively, and a standard
- Removeable Media
Removeable disk drives allow sensitive information to be easily stored each evening in approved facilities. Options for expanded storage include 20 MB, 40 MB, 80 MB and 120 MB Winchester hard drives which are well protected in an erudited aluminum casing that is easily accessible in a slide out drawer.
- Security
A keylock devices provides physical protection against unauthorized access to the 9000-T workstation.
- Serviceability
Four removeable screws in the upper clamshell allow for easy access to and maintenance of the power supply and board subsystem.

AT keyboard, each available with a number of different drive combinations.
- Upgradeability
The 9000-T family is field upgradeable from a 80286 to a 80386 based CPU.

Genicom Dot Matrix Printer

Manufactured by Genicom, the dot matrix printer is a receive only printer which handles all incoming message traffic:

- | | |
|--------------|--------------------|
| ◦ TEMPEST | Meets NACSIM 5100A |
| ◦ SPEED | 180 cps |
| ◦ RESOLUTION | 9 X 9 matrix |
| ◦ WIDTH | 132 column |
| ◦ BUFFER | 512 character |

DP-55 Daisywheel Printer

The DP-55 will replace the current R8T daisywheel printer. The new daisywheel printer rated 55 cps is compact and quiet.

LP-6T

The FAST System II configuration will include a TEMPEST laser printer option which would replace the TEMPEST daisywheel printer.

The LP-6T offers the latest technology in laser printer, quiet operation and flexibility.

- TEMPEST: Meets NACSIM 5100A
- QUIET PRINTING: Less than 55 decibels
- FAST PRINTING: Up to eight pages per minute
- COMPACT: Destop Model
- RESOLUTION: 300 X 300 dots per inch
- INTERFACE: Centronics parallel
Optional RS-232 serial

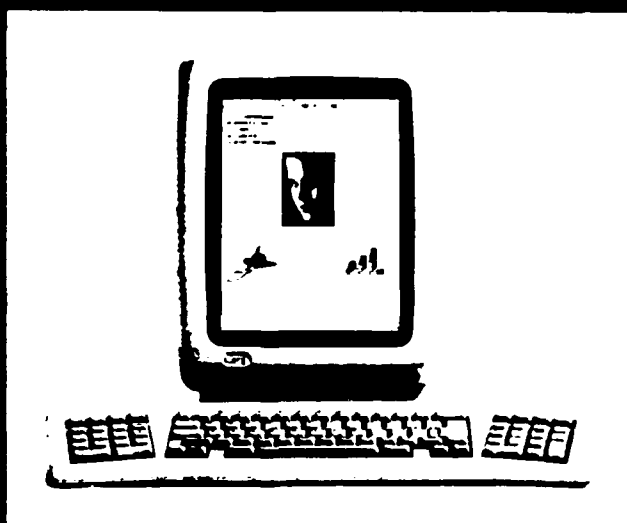
TLC1 Board

Manufactured by ACS Communications, the TLC1 replaces the standalone TLC line controller in the original FAST configuration. The TLC1 is an intelligent communications module which plugs into the CPT 9000-T. The TLC1 operates transparently, with the type of messages and format controlled by the workstation. The TLC1 operates in either block-by-block or continuous mode at line speeds up to 2400 bits per second on the synchronous side and 4800 bits per second on the asynchronous side.

- Message Transmission
 - Message Queueing FIFO by precedence
 - Flash Override
 - Operator Cancellation
 - Auto insertion of OSRI, SSN and time of file
 - Audit Trail
 - Log of messages by RI, precedence, classification, time/date group
 - Total messages processed
 - Total messages cancelled
 - Total messages rejected
- Message Reception
 - Simultaneous output to printer and disk
 - Audit Trail
 - System Information
 - Total messages processed
 - Total messages received
 - Total blocks

CPT.

TEMPEST



The CPT 9000T

The Best of All Processing Worlds.

Everything You've Asked For..

- **Meets NACSIM 5100A**
- **AT-Compatible†**
 - 80286
- **Configuration flexibility**
 - **Display Options**
 - 14" Full-page, high resolution, black-on-white - a CPT trademark
 - 13" EGA Color
 - 12" Monochrome
 - **Drive Options**
 - Floppy, disk (5¼" 1.2 Mb, 5¼" 360 Kb)
 - Removable hard disk (20 Mb, 40 Mb)
 - Removable cartridge drive
- **Interfaces with CPT networking products**
- **Runs wide variety of MS-DOS† application packages** - spreadsheets, database management, business, graphics, desktop publishing.
- **Heavy gauge aluminum protective enclosure**
- **Keylock device for workstation security**
- **Easy maintenance and serviceability**
- **Options**
 - **Printers:** Laser, Daisywheel and Matrix Printers
 - **Peripherals:** Mouse and Tape Back-Up
- **Custom configurations available**

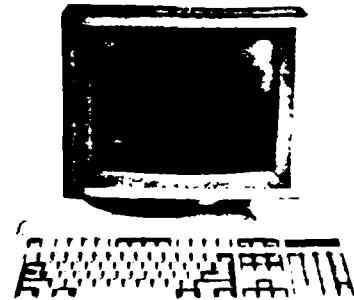
The CPT 9000T

Configuration Flexibility, Connectivity, Security.

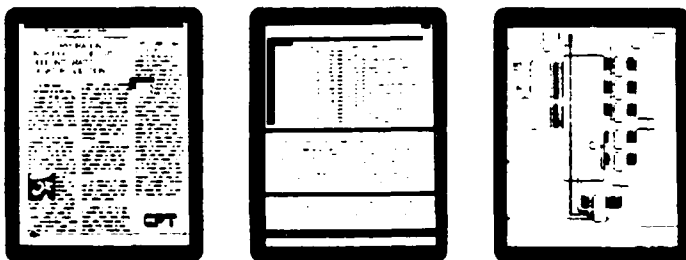
DISPLAY OPTIONS



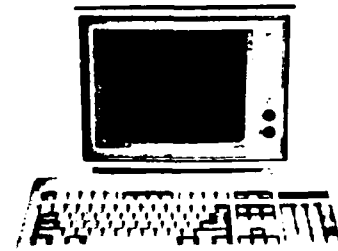
CPT 14" Full Page High Resolution



13" EGA Color Display



Full Page Applications - Desktop Publishing, MS-DOS, Windows and CAD

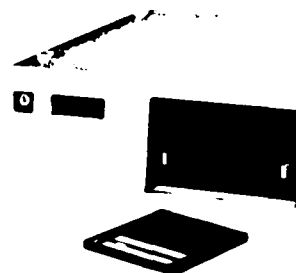


12" Monochrome Display

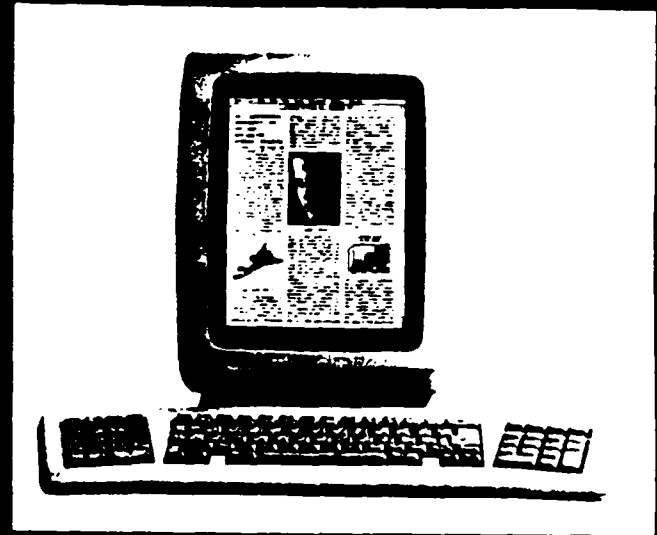
DRIVE OPTIONS



20 or 40 Mb Removable Hard Disk



20 Mb Removable Cartridge



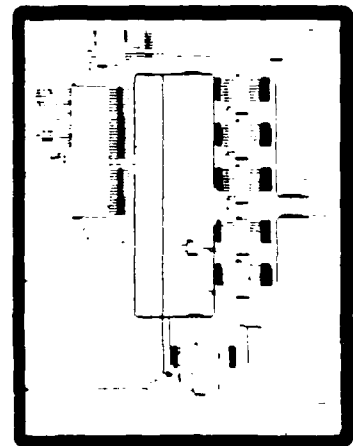
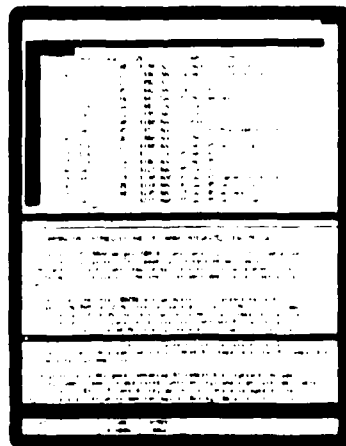
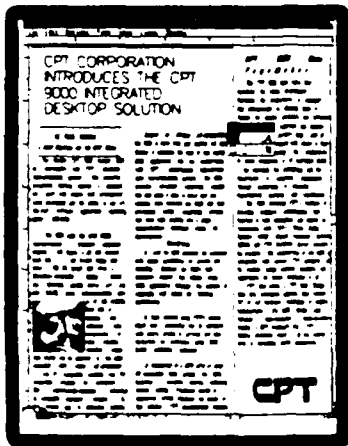
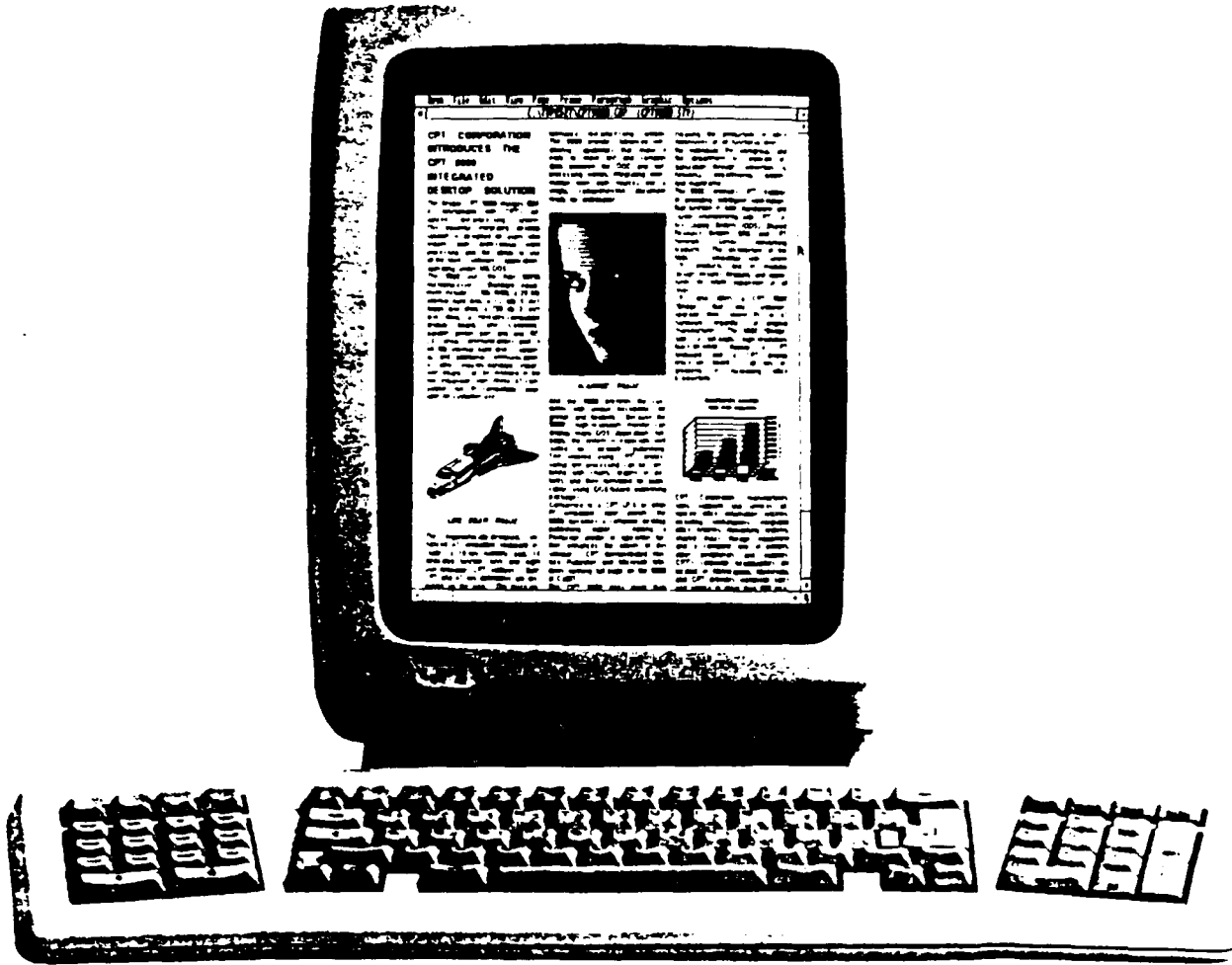
The CPT 9000
The Best of All Processing Worlds.

TEMPEST

D-67

The CPT 9000

Connectivity. Flexibility. Power.



Everything You've Asked For.

- ▶ **AT-Compatible.**
- ▶ **Interfaces with CPT networking products.**
- **Compatible with other networks.**
- **Runs most MS-DOS applications—**
spreadsheets, database management, business graphics, desktop publishing...
- ▮ **Full-page, high resolution, black-on-white display—**
a CPT trademark.
- ▮ **Exclusive split screen feature—**
allows you to use CPT text processing software to enhance a DOS software application.
- ▮ **Windowing capability—**
allows you the option of running more than one software application at the same time.
- ▮ **Features state-of-the-art CPT text processing—**
the standard of WP excellence, resident on the system.

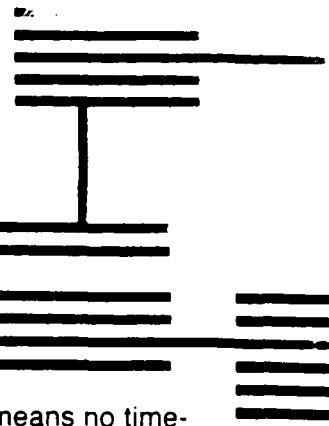


- **Ergonomic design—**
saves you space and makes the system a pleasure to use.
- **Offers efficient connection to a variety of storage or network systems—**
including CPT SRS and ODS products.
- **Wide range of disk drives—**
hard disk and printer options.

And all at a competitive price.

The complete solution to all your information management needs.

And So Much More.



The Key Is Connectivity

The CPT 9000 is AT-compatible, but it offers so much more than the many AT clones.

A CPT 9000 becomes the hub of your information management system.

The 9000 interfaces with most other networks, including all of

CPT's networking products and nearly any network you may already be using.

Its unique filing system allows you to send a CPT text processing or DOS file to any of CPT's shared resource devices. And the special transparent user

interface means no time-consuming conversion utilities – total file compatibility between CPT workstations and any other system running DOS.



MS-DOS Plus CPT Text Processing

For the first time, MS-DOS is supported on the same system that runs the exclusive CPT text processing software – the text processing software with the most efficient, sophisticated editing and composing features in the industry today.

That means that, with the CPT 9000, you can use a variety of MS-DOS application packages – LOTUS, CAD, VENTURA, MICROSOFT WINDOWS –

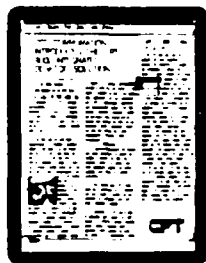
to interact with CPT's text processing software. Another reason why we say, "CPT is the best of all processing worlds."

And with that flexibility comes the text processing features which have made CPT famous. Upper and lower screens, advanced merging features, elegant and easy-to-use editing, outstanding spelling verifier and recorded keystroke capabilities. They're all built-in to the CPT 9000.

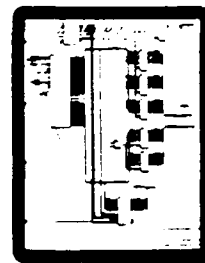
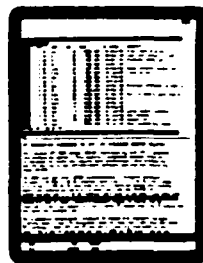
Sophisticated Screen Capabilities

The CPT 9000 features a full-page, high resolution, black-on-white display – for 10 years a CPT trademark.

But the exclusive split screen feature allows you to use CPT text processing in the lower screen while you run another MS-DOS application in the upper – at the same time!



Imagine creating a spreadsheet in the upper MS-DOS screen, then moving it to a middle screen for immediate, convenient editing. Next, you bring in stored text onto a third screen and merge that with the spreadsheet. The possibilities are endless.



CPT 9000's windowing feature means maximum flexibility. Integrate either on-screen or through easily accessed files with your network, our network, printers, mainframes, other workstations. Edit, print, store, process. CPT flexibility creates time and money savings for you.



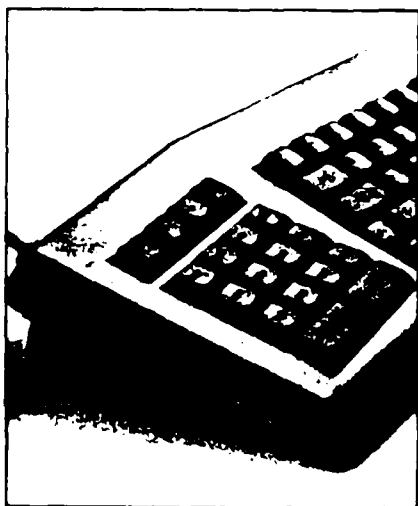
**ditional CPT
Quality – At a
Competitive Price**

The CPT 9000 sets a new standard in versatility, power and flexibility for AT-compatible workstations.

The sleek design of the CPT 9000 electronics module keeps your work areas clean and uncluttered. And for maximum space utilization, the system can become a free standing unit on the floor.

The CPT 9000 keyboard is ergonomically designed, featuring low profile, sculptured keycaps, and canted function keypads. And the DOS commands are printed right on the aprons of the keycaps – no more annoying, easy-to-lose plastic templates.

The CPT 9000 – outstanding innovation, traditional quality – and all at a price you'd expect to pay for a system with half the capabilities.



Support Services That Add Value – Not Frustration

From installation to service, the CPT family of trained professionals will always be there to provide the kind of support that CPT is known for.

It starts with pre-installation consultation and assistance – helping you to select the right peripherals, choose the best site selection, coordinate installation activities, and use CPT's thorough, easy-to-understand documentation.

It continues with training designed specifically for your work environment. CPT branches offer training classes both for the operation of the 9000 and its operation within your networking system.

A call to your local CPT representative puts you in touch with highly trained experts who can quickly and clearly answer all your questions about the CPT 9000.

**The CPT 9000 – A system to unite,
integrate and automate your entire office.
The best of all processing worlds.**



Execute 1

1 Help
 2 Select database
 3 Enter and query data I
 4 Enter and query data II
 5 Write report
 6 Create report
 7 Create database
 8 Prepare forms
 9 Check report formats
 10 Maintain database records
 11 Display files
 12 Merge files

DATABASE

INT LOCAL
 14 August 1984

LINE

ABC WASTING

John Ward
 Commercial
 JR 11

As requested I have enclosed 4 copies of the Fall issue of NIGHTLIFE
 for quarterly news order which features Captain Jeff D. Chudd as the
 "The Tonight Show" personality.

1989	1990	1991	1992
\$ 6 111 907	\$ 3 514 750	\$ 6 111 907	\$ 3 514 750
2 695 758	1 332 380	2 695 758	1 332 380
1 238 509	317 008	1 238 509	317 008
456 329	245 158	456 329	245 158
10 522 677	5 879 792	10 522 677	5 879 792

FORMAT 1 FILING 2 SCREEN 3 SELECT FILES 4 TEST INSERTION

MARGIN 1 16 LINE 240

DOS FILE DOS WINDOW SCREEN DOWN

CPT INTEGRATED SOFTWARE

It's As Easy As 

CPT INTEGRATED SOFTWARE

CPT Corporation has the finest reputation in the industry for providing top-of-the-line text processing software -- software that is designed with the user in mind. Whether you work in a production environment or have the more specific requirements of the professional user, CPT Integrated Software is well suited to your needs.

CPT Integrated Software, running on the CPT 9000, provides you the flexibility of choosing from the multitude of MS-DOS[†] application programs available, while maintaining the power of a dedicated text processing system.

In addition, CPT Integrated Software runs on workstations connected as part of any of CPT's networks, including the CPT Shared Resource System (SRS), CPT NetWork Server, and CPT Office Dialog System[™] (ODS[®]). And, the software is functionally compatible with all of CPT's workstation products.

HIGHLIGHTS

- CPT has a flexible and powerful text editor -- a benchmark in the Office Information Systems marketplace.
- An excellent spelling verifier and corrector package is completely integrated with the text editor. No reloading of software is necessary and all checking and correcting can happen interactively.
- CPT software supports the creation of macros (recorded keystrokes). These macros can be recorded to disk and are easily edited. Keystrokes are recorded as the user performs the functions and are

completely integrated with the text editor.

- Shortcut, a decision-making program, is an excellent tool and can be used in conjunction with CPT's math program to perform spreadsheet applications. Shortcut programs are created and performed real-time and can be saved with a document or as separate files.
- CPT provides a TTY communications protocol which can be accessed within the text editor and run in the background while other text processing functions are performed.
- CPT software provides an integrated records processing function which can be used for automatic letter writing and other merge functions that may require the ability to select from a set of variables.
- CPT software provides the direct link to CPT's Office Dialog System for the sharing of storage, peripherals, and applications software, like electronic mail, database management, full-text search, calendaring, and more.

FEATURES

- Automatic Centering
- Headers and Footers
- Automatic Decimal Alignment
- Justification
- Automatic Hyphenation
- Line Drawing
- Automatic Pagination & Repagination
- Math
- Automatic Table of Authorities
- Outlining
- Automatic Table of References
- Overstrike

- Automatic Underlining
- Page Numbering
- Block Move/Copy/Delete
- Phrase Insert
- Bold
- Recorded Margins
- Column Move & Copy
- Redefinable Keyboard
- Custom Soft Keys
- Redlining
- Directory Tracking
- Screen Sort
- Erase (Forward and Backward)
- Simultaneous Input/Output
- Footnotes
- Speed Typing
- Forms Fill-In
- Sub/Superscripts
- Global Search & Replace
- Variable Line Spacing

SYSTEM REQUIREMENTS

- 1) CPT 9000 with a minimum of:
 - a single 3 1/2" diskette drive or 5 1/4" 1.2Mb diskette drive,
 - the CPT Bridge Board,
 - the CPT 9000 keyboard (a modified AT keyboard with a low profile, sculptured keycaps, and canted function keypads), and
 - the CPT 9000 high resolution, black-on-white, full-page display, or
- 2) IBM AT[†] with the CPT Bridge Kit, which includes the CPT Bridge Board, the CPT 9000 keyboard, and the CPT full-page display.

Note: CPT Personal Typewriter, a subset of CPT Integrated Software, is available for the CPT Office Companion 2000 and other PC compatibles.

[†] MS-DOS is a trademark of Microsoft Corporation
[†] IBM AT is a trademark of IBM Corporation

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DEPARTMENT OF THE NAVY
COMMANDER, NAVAL TELECOMMUNICATIONS COMMAND
NAVAL TELECOMMUNICATIONS COMMAND HEADQUARTERS
4401 MASSACHUSETTS AVE., N. W.
WASHINGTON, D. C. 20390

IN REPLY REFER TO
NAVTELCOMINST 2010.4B
TelCom-N3
03 AUG 1984

NAVTELCOM INSTRUCTION 2010.4B

From: Commander, Naval Telecommunications Command

Subj: NAVAL TELECOMMUNICATIONS SYSTEM (NTS) AUTOMATED SYSTEM SOFTWARE CONTROL AND MANAGEMENT PROCEDURES

Ref: (a) OPNAVINST 2010.4 (NOTAL)
(b) DOD Manual C-5030-58-M of 16 May 1977 (NOTAL)
(c) DNI Memorandum Ser 009D332/252560 of 28 Sep 1979 (NOTAL)
(d) SECNAVINST 3560.1 (NOTAL)
(e) NAVTELCOMINST 5230.9

Encl: (1) NTS and Interfacing Automated Systems and Subsystems
(2) ~~System Software Management, Control and Support Activities~~
(3) Software Configuration Control Board (SCCB) Membership
(4) Procedures for Software Change Proposals (SCP) Submission
(5) Control Numbers of SCP's
(6) Classification and Configuration Control of Security Related and and DSSCS Software
(7) Standard Operational Procedures for Site Development of LDMX/NAVCOMPARS SCP's

1. Purpose. To promulgate procedures for the configuration control of automated systems and associated software used in the Naval Telecommunications System (NTS) and for systems which interface with or obtain direct or indirect service from the NTS.

2. Cancellation. NAVTELCOMINST C2010.4A

3. Effective Date. This instruction is effective upon receipt.

4. Action. All activities responsible for the development, operation and maintenance of automated systems, used in or interfacing with the NTS, will follow the procedures of this instruction.

5. Responsibilities. In accordance with the authority promulgated by reference (a), Commander, Naval Telecommunications Command (COMNAVTELCOM) is responsible for the establishment and promulgation of procedures to control software in automated systems used in the NTS and for the control of interface software in automated systems which impact the NTS. Those systems and subsystems used in, or interfacing with, the NTS are listed in enclosure (1), the activities responsible for the management, control and support of software are listed in enclosure (2), and the composition of Software Configuration Control Boards (SCCB) is shown in enclosure (3).

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6. Definitions. For the purpose of this instruction, the following are defined:

a. Software: Those computer programs, computer data and associated documentation related to the operation of a digital processing system.

b. Software Control Authority: The authority which approves or disapproves changes to software.

c. Software Management Authority: The authority that manages, plans, programs and budgets for the software of those automated systems over which it has Life-Cycle Software Support (LCSS) responsibilities.

d. Software Support Activity: The activity responsible for the analysis and development of software modifications to an automated system, and for their installation and maintenance after integration and certification.

e. Software Accreditation Activity: The activity with the authority to give approval for the operation of automated telecommunications equipment or a Telecommunications Center (TCC) that meets the criteria of reference (b).

~~f. Software Reaccreditation Activity: The activity responsible (in accordance with reference (c)) for ensuring the periodic reaccreditation of Navy-operated systems to process Sensitive Compartmented Information (SCI).~~

g. Software Certification Activity: The activity responsible for testing software modifications to systems/interfaces used in the NTS and certifying that their functional capabilities meet design specifications, and that their installation will meet all performance requirements.

7. Procedures. To ensure the overall inter-system and intra-system integrity, changes to existing software or development of new software used in, or interfacing with, the NTS must be rigidly controlled. Such changes will be made only after approval by COMNAVTELCOM, development by a designated software support activity, completion of acceptance testing, integration testing, quality assurance (QA) testing, and certification on by the Naval Telecommunications System Integration Center (NAVTELSYSIC). The following procedures will be used:

a. Systems interfacing with the NTS: Requests to establish new interfaces with NTS operating systems must be submitted to COMNAVTELCOM in accordance with reference (a), with copies to NAVTASC and NAVTELSYSIC. The requests must contain an Interface Design Specification (IDS) in the format specified in reference (d). If approval is granted, the requestor's Software Management Authority may proceed with software development. When software development is complete, the requestor's Software Management Authority, will coordinate with COMNAVTELCOM and NAVTELSYSIC for integration and certification testing of the interface prior to use. COMNAVTELCOM and NAVTELSYSIC will be provided one copy each of the Program Performance Specifications and Operator's Manual(s). Subsequent to successful certification testing, COMNAVTELCOM will approve the interface and defer to the interfacing system's Software Management Authority for installation of the system. Changes affecting the interface must be approved by both the Software Management

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Authority for the interfacing system and COMNAVTELCOM. Those changes will be tested and certified by NAVTELSYSIC prior to implementation.

b. Systems used in the NTS:

(1) All software changes to current systems will be originated by Software Change Proposal (SCP). The nature of the required software change will determine whether it is submitted as an urgent, priority or a routine SCP.

(a) Urgent SCP: To be designated an urgent SCP, the change must be required to immediately correct deficiencies which cause one or more of the following situations:

- i. Recurrent complete system/subsystem outage
- ii. System security degradation
- iii. Message non-deliveries

(b) Priority SCP: To be designated a priority SCP, the change ~~must be of a nature that is not critical, but requires correction prior to or~~ for the next numbered release; such as:

- i. Inordinate message delay (Defined as that which has a detrimental impact on mission accomplishment)
- ii. Time sensitive (Exercise requirements, major deployments, etc.)
- iii. Cost effective (To overall system/subsystem operation)

(c) Routine SCP: All requests for changes not fitting the criteria of an urgent or priority SCP will be submitted as a routine SCP; such as:

- i. Future release enhancements
- ii. Required but not critical
- iii. Documentation

(d) Project Request. For software changes, or combination thereof, which are extensive in nature and application, a Project Request will be submitted by COMNAVTELCOM to the appropriate software support activity in accordance with procedures contained in reference (e).

(2) Submission of SCP's. SCP's will be submitted as shown in enclosure (4). SCP's may be submitted by any operating activity listed in enclosure (5), except for RIXT SCP's which should be submitted by the LDMX/NAVCOMPARS to which it is homed. Discrepancies detected during certification tests will be submitted by NAVTELSYSIC.

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(3) Classification of SCP's. Classification of SCP's will be determined by content. Detailed instructions for classification of security-related SCP's are contained in enclosure (6).

(4) Precedence of SCP's. All SCP's will be subject to precedence change at the discretion of COMNAVTELCOM.

(a) Urgent (Shore). When the urgency of the situation necessitates immediate local corrective action, urgent changes may be installed at site direction (excluding CUDIXS) without prior approval of COMNAVTELCOM if, in the judgment of the Commanding Officer or Officer in Charge, this change is necessary to the continuance of the mission. Changes made in this fashion must be forwarded to COMNAVTELCOM as an urgent SCP by message info NAVTASC and NAVTELSYSIC, with suggested coding, and are subject to modification by the support activity after analysis. If there is reason to believe that the site-directed and installed SCP may have a detrimental impact on the NTS or if the site-directed and installed SCP does not meet the criteria of an urgent SCP, COMNAVTELCOM will require its removal pending further analysis.

(b) Urgent (Afloat). When the situation meets the criteria as stipulated in ~~Para 7b(1)(a) (definition of urgent SCP)~~, a message is to be generated to COMNAVTELCOM and NAVTELSYSIC in accordance with enclosure (4) Tab B.

(c) Priority (Shore). When the situation meets the criteria stipulated in Para 7b(1)(b) (definition of priority SCP), a routine message is to be generated to COMNAVTELCOM and NAVTASC requesting COMNAVTELCOM approval before an on site change is installed, in accordance with the format contained in enclosure (4) Tab A.

(d) Priority (Afloat). When the situation meets the criteria stipulated in Para 7b(1)(b) (definition of priority SCP), a routine message is to be generated to COMNAVTELCOM and NAVTELSYSIC in accordance with enclosure (4) Tab B.

(e) Routine (Shore and Afloat). When the situation does not meet the criteria of an urgent or priority SCP as stipulated in Para 7b(1), a letter is to be generated to COMNAVTELCOM in accordance with Para 2 of enclosure (4). COMNAVTELCOM will determine the system-wide application of requested changes, coordinating with other commands/activities as required. Once a change is approved by COMNAVTELCOM and developed by the software support activity, it will be subject to integration and certification testing by NAVTELSYSIC. NAVTELSYSIC will notify Commander, Naval Data Automation Command (COMNAVDAC) when security-related SCP's are scheduled for testing and certification.

(5) Promulgation and Installation of SCP's. Changes developed in response to urgent and priority SCP's will be promulgated to other activities on an as-occurring basis. Routine changes will accrue after development to be incorporated into a numbered software release. LDMX/NAVCOMPARS/RIXT SCP's which are priority precedence may be called out to the current release instead of accruing to the next numbered release. Enclosure (8) defines site

development of LDMX/NAVCOMPARS SCP's. For major systems with dynamic change rates, the coordination for the development, certification and integration of software changes will extend to biweekly convening of a Software Configuration Control Board (SCCB). For lesser systems/subsystems, coordination will be on an as required basis. Software releases for each system/subsystem will be planned and scheduled by COMNAVTELCOM with an objective of one release annually.

(6) Report of SCP Installation. All LDMX/NAVCOMPARS sites will report installation of SCP's and numbered software releases in Part II of their monthly system performance report. All other shore sites will report installation of SCP's or numbered releases to COMNAVTELCOM by letter with copy to NAVTASC and NAVTELSYSIC within one week after installation. SCP's will, operations permitting, be installed within two weeks after authorization from COMNAVTELCOM. Numbered software releases will be provided a minimum of three weeks prior to the scheduled installation date. Sites will ensure that capability changes are promulgated to appropriate personnel prior to the installation of an SCP or numbered software release. The LDMX/NAVCOMPARS NAVTASC site representatives in conjunction with designated supervisory personnel will be present during and for a sufficient time immediately after installation of an SCP or numbered release to ensure correct system operation. For automated systems afloat, receipt and implementation of numbered releases will be reported by letter to NAVTELSYSIC with a copy to COMNAVTELCOM. If implementation of the numbered release does not immediately follow receipt (such as in the case of a ship undergoing ROH), then a letter acknowledging receipt should be sent followed by letter notification after actual implementation.

(7) Summary Report of SCP Status.

(a) NAVTASC will publish a monthly summary report on status of all cognizant SCP's.

(b) NAVTELSYSIC will publish a semi-annual summary report on the status of all cognizant SCP's.

(c) COMNAVTELCOM will publish an annual summary report on the status of SCP's for all other systems, subsystems and interfaces listed in enclosure (1).



T.F. ARNOLD
Deputy

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FG1 (Naval Telecommunications Headquarters) (200 copies)
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NAVTELCOMINST 2010.4B

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03 AUG 1984

NTS AND INTERFACING AUTOMATED SYSTEMS AND SUBSYSTEMS

1. The following is a list of those automated systems, subsystems and interfaces affected by this instruction.

Short Title	Long Title
CDPS	Communications Data Processing System (LHA1 Class)
MPDS	Message Processing and Distribution System (AN/SYQ-5 for LCC-19; AN/SYQ-6 for CVN-68 Class)
NAVMACS	Navy Modular Automated Communications System (AN/SYQ-7V(1); variants (1) through (3), V2 Neversail, SYQ-5 V2, V2 (MPD), V2 Fallback, V3 Fallback, and V5 (For V5 see Note 1)
CUDIXS	Common User Digital Information Exchange System (AN/USQ-64V(1))
ISABPS	Integrated Submarine Automated Broadcast Processing System (AN/FYQ-87V) (Note 1)
CLCU	CUDIXS Link Control Unit (ON-143(V)7)
SSIXS	Submarine Satellite Information Exchange Subsystem (AN/USQ-64V(2)) (Note 1)
AICS	AUTODIN Interface Communications System (Note 1)
LDMX	Local Digital Message Exchange
NAVCOMPARS	Naval Communications Processing and Routing System
RIXT	Remote Information Exchange Terminal
SAT	Standard AUTODIN Terminals
SRT/MATE	Astronautics Standard Remote Terminal/ Modular AUTODIN Terminal Equipment
TRS	AN/FGC-73 Teletype Routing Set Replacement
SSMPS	Shore Station Message Processing Set (AN/SSQ-113(V))
SUNS	Sperry-UNIVAC Narrative System (OCR)
FOTACS	Fleet Operational Telecommunications Automated Control System
ASWCCCS	Anti-Submarine Warfare (ASW) Command and Control Communications System to NTS to AUTODIN Interface (Note 1)

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DSSCS	Defense Special Security Communications System (Note 1)
DAMA	Demand Assigned Multiple Access (Note 1)
DDN	Defense Data Network (Note 1)
NEDN	Navy Environmental Data Network (Note 1)
OLA	On-Line AUTODIN (Note 1)
OSIS	Ocean Surveillance Information System (Note 1)
WWMCCS	World-Wide Military Command and Control Systems to NTS to AUTODIN ADP Interface at Navy supported WWMCCS sites (Note 1)
USPACOM AUTOCONET	US Pacific Command AUTODIN Conferencing Network
PDSC	PACOM Data System Center (Note 1)
COMTEN	AUTODIN Interface Control Unit for the Marine Corps AMDAHL 470 Processing System (Note 1)
ICS	Integrated Communications System (Note 1)
STT	Shore Targeting Terminal (Note 1)
TIA	Terminal Interface Adapter (Note 1)
IDHS/AMHS	Intelligence Data Handling System/Automated Message Handling System (Note 1)

Note 1: COMNAVTELCOM is not the Software Management Authority for these systems/subsystems; however, these systems/subsystems interface with or are integral to the NTS and thus all software changes which may impact the NTS are subject to COMNAVTELCOM approval and NAVTELSYSIC certification.



SYSTEM SOFTWARE CONTROL, MANAGEMENT AND SUPPORT AUTHORITY/ACTIVITIES

AUTOMATED NTS SYSTEM	SOFTWARE CONTROL AUTHORITY	SOFTWARE MANAGEMENT AUTHORITY	SOFTWARE SUPPORT ACTIVITY
CDPS	COMNAVTELCOM	NAVTELSYSIC	FCDSSA SD CA
CLCU	COMNAVTELCOM	COMNAVTELCOM	NAVTELSYSIC
CUDIJS	COMNAVTELCOM	COMNAVTELCOM	NAVTELSYSIC
DSSCS	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
FOTACS	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
LDMX	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
MPDS	COMNAVTELCOM	COMNAVTELCOM	NAVTELSYSIC
NAVCOMPARS	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
NAVMACS	COMNAVTELCOM	COMNAVTELCOM	NAVTELSYSIC
USPACOM- AUTOCONET	COMNAVTELCOM	USCINCPAC	NAV TASC
RIXT	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
SAT	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
SRT	COMNAVTELCOM	COMNAVTELCOM	U. S. ARMY (ISSA)
SSMPS	COMNAVTELCOM	COMNAVTELCOM	EMF CORP'N
SUNS	COMNAVTELCOM	COMNAVTELCOM	NAV TASC
TRS	COMNAVTELCOM	COMNAVTELCOM	NAV TASC

SOFTWARE CONFIGURATION CONTROL BOARD (SCCB) MEMBERSHIP

SYSTEM	CHAIRMAN	PRIMARY MEMBERS	ASSOCIATE MEMBERS
CDPS	COMNAVTELCOM	NAVTELSYSIC/COMNAVELEXSYSCOM	FCDSSA SD CA/ COMNAVSEASYSKOM
CLCU	COMNAVTELCOM	NAVTELSYSIC/COMNAVELEXSYSCOM	
CUDIXS	COMNAVTELCOM	NAVTELSYSIC/COMNAVELEXSYSCOM	NAV TASC
DSSCS	COMNAVTELCOM	NAV TASC/NAVTELSYSIC	COMNAV DAC
FOTACS	COMNAVTELCOM	NAV TASC/NAVTELSYSIC	IMC
LDMX	COMNAVTELCOM	NAV TASC/NAVTELSYSIC	COMNAV DAC
MPDS	COMNAVTELCOM	NAVTELSYSIC/COMNAVELEXSYSCOM	
NAVCOMPARS	COMNAVTELCOM	NAV TASC/NAVTELSYSIC	COMNAV DAC
NAVMACS	COMNAVTELCOM	NAVTELSYSIC/COMNAVELEXSYSCOM	
USPACOM- AUTOCONET	COMNAVTELCOM	USCINCPAC/NAV TASC	NAVTELSYSIC
RIXT	COMNAVTELCOM	NAV TASC/NAVTELSYSIC	COMNAV DAC
SAT	COMNAVTELCOM	NAVTELSYSIC/NAV TASC	SPERRY CORP'N
SRT	COMNAVTELCOM	NAVTELSYSIC/U.S. ARMY	ASTRONAUTICS
SSMPS	COMNAVTELCOM	NAV TASC/NAVTELSYSIC	EMF CORP'N
SUNS	COMNAVTELCOM	NAVTELSYSIC/NAV TASC	SPERRY CORP'N
TRS	COMNAVTELCOM	NAVTELSYSIC/NAV TASC	

TAB A

PROCEDURES FOR SCP SUBMISSION

1. URGENT and PRIORITY SCP's will be submitted by MESSAGE as follows:
 - a. LDMX, NAVCOMPARS: Action to COMNAVTELCOM and NAVTASC; Info to AIG 61. (Plus COMNAVDAC if SCP is security-related)
 - b. RIXT, SSMPS: Action to COMNAVTELCOM and NAVTASC; Info to AIG 7614. (Plus COMNAVDAC if SCP is security-related)
 - c. SRT/MATE: Action to CDRUSACEEIA FT Huachuca AZ; Info to COMNAVTELCOM and NAVTELSYSIC.
 - d. SAT, FOTACS, TRS, SUNS: Action to COMNAVTELCOM; Info to NAVTELSYSIC and NAVTASC.
 - e. MPDS, NAVMACS, CLCU: Action to COMNAVTELCOM and NAVTELSYSIC; Info to Operational Commander, Type Commander, Fleet CINC, COMNAVELEXSYSCOM. ~~NAVELEXCEN San Diego CA, NAVELEXCEN Charleston SC.~~
 - f. CDPS: Action to COMNAVTELCOM and NAVTELSYSIC; Info to FCDSSA San Diego, CA, Operational Commander, Type Commander, Fleet CINC, COMNAVELEXSYSCOM, COMNAVSEASYSYSCOM, NAVELEXCEN Portsmouth VA, all other ships with CDPS platforms.
 - g. CUDIXS: Action to COMNAVTELCOM and NAVTELSYSIC; Info to NAVELEXCEN Vallejo CA, COMNAVELEXSYSCOM, Fleet CINC, all other CUDIXS sites.
2. All ROUTINE SCP's, regardless of the system/subsystem, will be submitted by letter to COMNAVTELCOM with copies to NAVTELSYSIC, appropriate software support activity (as shown in enclosure (2), and other activities deemed appropriate.
3. The SUBJECT LINE of all SCP's will consist of the system/subsystem short title from enclosure (1), with a control number assigned in accordance with enclosure (5). SCP submission formats may be located as follows:

Enclosure (4) TAB A: LDMX; NAVCOMPARS; RIXT; SRT; SAT; SUNS; FOTACS; SSMPS.

Enclosure (4) TAB B: MPDS; CUDIXS; NAVMACS (All variants); CDPS; CLCU.
4. Paragraph 1.A should describe the problem and its impact in commonly understood language. Reserve elaboration and detailed technical language for subsequent paragraphs.

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TAB B

FORMAT FOR LDMX, NAVCOMPARS, RIXT, SRT, SAT, SUNS, FOTACS, TRS, SSMPs.

Subj: (System/subsystem short title and control number)

Ref: a. NAVTELCOMINST 2010.48

1. The following SCP is forwarded in accordance with reference a:

a. (Problem description)

(1) (Statement of problem)

(2) (Impact of problem on system/subsystem throughout, operation or security)

b. (Problem definition)

(1) (Current release installed)

(2) (Specific system components affected)

(a) (Subsystem name or names) (If SSMPs, include host site ID)

(b) (Module name or names)

(c) (Program)

(d) (File)

(e) (Procedure)

(f) (Documentation)

(3) (Can the problem be recreated?)

(4) (Does reload or restart clear the problem?)

(5) (Was core dump forwarded to NAVTASC?) (For SRT: forwarded to CDRUSACEEIA?)

c. (Recommended solution if PRIORITY SCP)

OR

d. (Action taken if URGENT SCP)

2. Point of Contact (POC) for this SCP is (...), Autovon (...), Commercial (...).

FORMAT FOR MPDS, CUDIXS, NAVMACS (Variants), CDPS, CLCU

Subj: (System/subsystem short title and control number)

Ref: a. NAVTELCOMINST 2010.4B

1. The following SCP (Local SCP number in accordance with reference a, enclosure 5) is forwarded in accordance with reference a:

a. (Problem description)

(1) (Statement of problem)

(2) (Impact of problem on system throughout, operation or security)

(3) (Supporting data)

b. (Problem Definition)

(1) (Current release in use)

(2) (Specific information; select and report applicable items)

(a) (System environment; includes traffic environment, circuit quality, traffic load, system operating mode, system response time (normal-slow), number and type of incoming and outgoing circuits.)

(b) (Hardware on line; includes number and configuration of CPU's, peripherals, and interfaces on line or connected.)

(c) (Special items)

(Can specific action or events duplicate problem?
If yes, explain)

(Can changing hardware configuration modify problem?
If yes, explain)

(Can changing software (restart, recovery, initialization, reload, etc.) modify problem?
If yes, explain)

(Can any generalized change in system operations (mag tape operation, limited hardware configuration, increased traffic volume, etc.) be associated with problem?
If yes, explain)

(d) (Computer stop data; indicating if memory dump is available and list type of stop or bite error and register contents taken in accordance with system operator manual.)

2. Point of Contact (POC) for the SCP is (...), Autovon (...), Commercial (...).

CONTROL NUMBERS OF SCP'S (SHORE)

1. Control Numbers will be assigned to all SCP's by the originating activity and will consist of the system/subsystem short title from enclosure (1), an appropriate system site designator from enclosure (5), TAB's G-J and a four digit sequencing number. Originating SCP's received by NAVTASC which may require further enhancement will be identified by the same base number with each successive derived SCP being assigned a numerical suffix; for example: COMNAVTELCOM's originating SCP VV2345 may result in subsequent SCP's, i.e. VV2345.1, VV2345.2, etc.

CONTROL NUMBERS OF SCP'S (AFLOAT)

1. Control numbers will be assigned to all SCP's by the originating activity and will consist of the system/subsystem short title from enclosure (1), an appropriate system site designator from enclosure (5), TAB's A-F, and the last three letters of the originating activities International Call Sign. Upon receipt of the SCP by NAVTELSYSIC, a sequential numerical designator will be assigned, retaining the respective system site designator.

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SYSTEM SITE DESIGNATORS (SHORE/AFLOAT)

TAB	SYSTEM/SUBSYSTEM:
A.....	MPDS-SYQ6
B.....	MPDS-SYQ5
C.....	NAVMACS
D.....	CDPS
E.....	CLCU
F.....	CUDIXS
G.....	NAVCOMPARS/LDMX
H.....	RIXT, FOTACS, T SSMPS
I.....	AUTODIN TERMINA and SUNS

TAB A

MPDS - SYQ6 SYSTEM SITE DESIGNATORS

COMNAVTELCOM	VMA
NAVTELSYSIC	XMA
SHIPS	LAST THREE LETTERS OF OWN INTERNATIONAL CALL SIGN

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TAB B

MPDS - SYQ5 SYSTEM SITE DESIGNATORS

COMNAVTELCOM	VMB
NAVTELSYSIC	XMB
SHIPS	LAST THREE LETTERS OF OWN INTERNATIONAL CALL SIGN

TAB C

NAVMACS SYSTEM SITE DESIGNATORS

NAVMACS (V)1	..... COMNAVTELCOM	VND
	..... NAVTELSYSIC	XND
	..... COMNAVELEXSYSCOM	END
NAVMACS (V)2 (Note 1)	..... COMNAVTELECOM	VNA
	..... NAVTELSYSIC	XNA
	..... COMNAVELEXSYSCOM	ENA
NAVMACS (V)3	..... COMNAVTELCOM	VNB
	..... NAVTELSYSIC	XNB
	..... COMNAVELEXSYSCOM	ENB
NAVMACS (V)2 MDP	..... COMNAVTELCOM	VNC
	..... NAVTELSYSIC	XNC
	..... COMNAVELEXSYSCOM	ENC
NAVMACS (V)5	..... COMNAVTELCOM	VNE
	..... NAVTELSYSIC	XNE
	..... COMNAVELEXSYSCOM	ENE

SHIPS USE LAST THREE LETTERS OF OWN INTERNATIONAL CALL SIGN

(Example: JFK0001 would indicate USS JOHN F. KENNEDY SCP number 0001)

Note 1: Includes: NAVMACS (V)2, NAVMACS (V)3 FALLBACK, NAVMAC (V)2 FALLBACK, NEVERSAIL, and MPDS SYQ-5(V)2.

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TAB D

CDPS SYSTEM SITE DESIGNATOR

COMNAVTELCOM	VRA
NAVTELSYSIC	XRA
FCSSA SAN DIEGO	DRA
SHIPS	LAST THREE LETTERS OF OWN INTERNATIONAL CALL SIGN



TAB E

CLCU SUBSYSTEM SITE DESIGNATOR

COMNAVTELCOM	VLA
NAVTELSYSIC	XLA
FCOSSA SAN DIEGO	DLA
SHIPS	LAST THREE LETTERS OF OWN INTERNATIONAL CALL SIGN

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TAB F

CUDIJS SYSTEM SITE DESIGNATOR

COMNAVTELCOM	VCA
NAVTELSYSIC	XCA
NAVCAMS LANT	NCA
NAVCAMS WESTPAC	GCA
NAVCAMS EASTPAC	HCA
NAVCAMS MED	TCA
NAVCOMMSTA STOCKTON	KCA

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TAB G

NAVCOMPARS/LDMX SYSTEM SITE DESIGNATORS

SITE	DESIGNATOR
NAVTASC.....	AA
MTCC CAMP LEJEUNE.....	BB
NAVTELSYSIC (90/60 HAT).....	CC
NTCC CHARLESTON.....	DD
NAVCOMMU LONDON.....	EE
NTCC PEARL HARBOR.....	FF
NAVCAMS WESTPAC.....	GG
NAVCAMS EASTPAC.....	HH
NTCC BREEZY POINT.....	II
NAVCOMMSTA JACKSONVILLE.....	JJ
NAVCOMMSTA STOCKTON.....	KK
NTCC HAMPTON ROADS.....	LL
NTCC CRYSTAL PLAZA.....	MM
NAVCAMS LANT.....	NN
NTCC NEW ORLEANS.....	OO
NTCC CAMP H M SMITH.....	PP
NTCC NORTH ISLAND.....	QQ
NAVCOMMSTA ROOSEVELT ROADS PR.....	RR
NAVCOMMSTA SAN DIEGO.....	SS
NAVCAMS MED.....	TT
CNTC PES MAINTENANCE.....	UU
COMNAVTELCOM.....	VV
UNASSIGNED.....	WW
NAVTELSYSIC.....	XX
UNASSIGNED.....	YY
NAVCOMMSTA PUGET SOUND.....	ZZ

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TAB H

RIXT, FOTACS, TRS, SSMPS SYSTEM SITE DESIGNATOR

NOTE: RIXT, FOTACS, TRS, SSMPS SCP's will be submitted by the NAVCOMPARS/LDMX site to which it is connected using Enclosure (4) TAB A and identifying the RIXT, FOTACS, TRS, SSMPS site in paragraph B.(2)(a) thereof.



TAB I
AUTODIN TERMINALS

NTCC NAVSHIPYD PORTSMOUTH NH.....	ABA
NTCC NEWPORT RI.....	ACA
NTCC BROOKLYN NY.....	ADA
NAVPRO GREAT NECK NY.....	AEA
NAVFINCEN CLEVELAND OH.....	AFA
ASO PHILADELPHIA PA.....	AGA
NTCC PHILADELPHIA PA.....	AHA
SPCC MECHANICSBURG PA.....	AIA
NAVPRO BETHPAGE NY.....	AJA
NTCC NSC NORFOLK VA.....	AKA
CG MCB CAMP LEJEUNE NC.....	ALA
CG FMFLANT.....	AMA
NTCC BREEZY POINT NORFOLK VA.....	ANA
NAS PENSACOLA FL.....	AOA
CCGDELEVEN LONG BEACH CA.....	APA
CCGDTHREE NEW YORK NY.....	ARA
NTCC NEW ORLEANS-DET BAY ST LOUIS MS.....	ASA
NAVCOMMU KEY WEST FL.....	ATA
NAVADMINCOM ORLANDO FL.....	AUA
CG MCLB ALBANY GA.....	AVA
NTCC NEW ORLEANS LA.....	AWA
NAS CORPUS CHRISTI TX.....	AXA
COMFLEACT SASEBO JA.....	AYA
CCGDFIVE PORTSMOUTH VA.....	AZA
NAVELEXSYS COM TECHREP NASHUA NH.....	BBA
CG MCB CAMP PENDLETON CA.....	BCA
CG MCAS EL TORO CA.....	BDA
CG MCLB BARSTOW CA.....	BEA
CG MCAGCC TWENTYNINE PALMS CA.....	BFA
NTCC LONG BEACH CA.....	BGA
NTCC OAKLAND CA.....	BHA
NAVAVIONICEN INDIANAPOLIS IN.....	BIA
NAVCOMMSTA PHILLIPINES SAN MIGUEL RP.....	BJA
NAS CHASE FIELD BEEVILLE TX.....	BKA
NTCC SUBIC BAY RP.....	BLA
NTCC MONTEREY CA.....	BMA
NAVORDSTA INDIAN HEAD MD.....	BNA
MCAS IWAKUNI JA.....	BQA
CCGDSEVEN MIAMI FL.....	BPA
NAVCOMMSTA ROTA SP.....	BSA
NAVSTA GUANTANAMO BAY CUBA.....	BTA
NTCC MAYPORT FL.....	BUA
NTCC AGANO NAPLES IT.....	BVA
NAVCOASTSYS CEN PANAMA CITY FL.....	BWA
NAVSWC DAHLGREEN VA.....	BXA
CG FIRST MAW.....	BYA
NAVCOMMSTA YOKOSUKA JA.....	BZA
USS HOLLAND.....	CBA
USS PROTEUS.....	CDA



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USS SIMON LAKE.....	CEA
USS HUNLEY.....	CFA
NTCC CUBI PT RP.....	CHA
CG THIRD FSSG.....	CIA
NTCC CONCORD CA.....	CJA
CCGDEIGHT NEW ORLEANS LA.....	CKA
CG THIRD MAR DIV.....	CLA
NAVMATDATASYSGRU MORGANTOWN WV.....	CMA
NAVCOMMSTA THURSO UK.....	CNA
NAS BERMUDA.....	CPA
NAS SOUTH WEYMOUTH MA.....	CQA
CCGDONE BOSTON MA.....	CRA
CCGDNINE CLEVELAND OH.....	CSA
CCGDTWELVE SAN FRANCISCO CA.....	CTA
NAS MERIDIAN MS.....	CUA
WPNSTA EARLE COLTS NECK NJ.....	CVA
NAVAIRENGCEN LAKEHURST NJ.....	CWA
NAVPRO STRATFORD CT.....	CXA
NAVPRO PITTSFIELD MA.....	CYA
NAF EL CENTRO CA.....	CZA
NAS MEMPHIS MILLINGTON TN.....	DBA
NAS DALLAS TX.....	DCA
SUPSHIP PASCAGOULA MS.....	DDA
MCAS H FUTENMA JA.....	DEA
NTCC SWEEPERS COVE ADAK AK.....	DFA
COMSUBGRU SEVEN.....	DGA
CBC GULFPORT MS.....	DHA
NAS KINGSVILLE TX.....	DIA
NAS FALLON NV.....	DJA
USS ORION.....	DKA
NAVAIRDEVEN WARMINSTER PA.....	DOA
NAVCOMMSTA KEFLAVIK IC.....	DPA
NAVCOMMSTA NEA MAKRI GR.....	DSA
NAVCOMMSTA HAROLD E HOLT EXMOUTH AS.....	DTA
NAVCOMMSTA DIEGO GARCIA.....	DUA
NAF ATSUGI JA.....	DVA
COMSCFE YOKOHAMA JA.....	DWA
NAS BRUNSWICK ME.....	DXA
SUBASE NEW LONDON CT.....	DYA
WPNSTA YORKTOWN VA.....	DZA
NAS OCEANA VA.....	EBA
NAVSPNSUPPCEN CRANE IN.....	ECA
NAVWPCEN CHINA LAKE CA.....	EDA
NAS PATUXENT RIVER MD.....	EFA
MCAS YUMA AZ.....	EGA
NTCC GREAT LAKES IL.....	EHA
COMNAVFORKOREA DET CHINHAE KS.....	EIA
SUBASE KINGS BAY GA.....	EJA
NUSC DET AUTEC ANDROS IS BAHAMAS.....	EKA
NAS WHITING FIELD MILTON FL.....	ELA
NAS CECIL FIELD FL.....	EMA
NTCC PORTSMOUTH VA.....	ENA
CG MCB CAMP BUTLER JA.....	EOA



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COMFLEACT OKINAWA JA.....	EPA
COMUSCARIB KEYWEST FL.....	EQA
MARAD WASHINGTON DC.....	ERA
NAVPRO ST LOUIS MO.....	ESA
COMNAVTELCOM WASHINGTON DC.....	VDA
NAVTELSYSIC CHELTENHAM MD.....	XDA

CLASSIFICATION AND CONFIGURATION CONTROL OF
SECURITY-RELATED AND DSSCS SOFTWARE

1. The following procedures apply to the processing of SCP's pertaining to security-related and DSSCS software used in TCC's which process SCI messages in the Defense Special Security Communications System (DSSCS) and General Service (GENSER) messages in the NTS.
2. Security-related software applies only to those systems/subsystems which process consolidated DSSCS and GENSER traffic, and is that software which provides protection against security compromise and denial of service, and which guarantees data integrity. A final determination of which modules are security-related can only be made after a detailed review of all software modules and their use. This determination is a joint effort by COMNAVDAC and the Software Support Activity which should be accomplished before software change development starts. Software is defined as detailed specifications and flow charts, application program libraries and source listings.
3. The following list of general areas which are considered to be security-related is provided to focus on their nature:
 - a. Modules which maintain DSSCS/GENSER separation.
 - b. Modules which can alter security markings or parameters.
 - c. Modules which determine or modify message addressing information.
 - d. Modules which control, enforce or affect access control decisions, including error reporting to the Security Officer.
 - e. Modules which implement security test and diagnostics.
4. For purposes of system integrity all application programs in security-related software, when resident in the message processing system and operating on data and messages therein, will be classified for the system high mode as defined in reference (b).
5. For purposes of classified material control, the software package certified for operational use at the DSSCS/GENSER site, when not resident in the message processing system, will be classified CONFIDENTIAL. The certified software package consisting of object programs and application source modules is classified confidential and is unclassified upon removal of security-related code from DSSCS modules.
6. For purposes of classified material control during development of software changes, those portions of application programs designated by COMNAVDAC and the Software Support Activity as security-related will be segregated and classified as CONFIDENTIAL; all other portions will be unclassified.
7. SCP's which relate to the subject software will be classified according to their content. In order to reduce classified SCP's, program instructions which might be recommended by the SCP originator, if pertaining to security related software, will be forwarded separately to the same address as the SCP.

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8. Core dump media which might be forwarded by the SCP originator to aid SCP development will be classified as determined by the onsite Automated Message Processing System Security Officer (AMPSSO). Core dumps with SCI information will be forwarded to COMNAVTELCOM ONLY. Core dump media not containing SCI will be sent to the Software Support Activity only.
9. SCP's will be screened by the Software Configuration Control Board (SCCB) chaired by COMNAVTELCOM, with COMNAVDAC participation. Development of those SCP's dealing with security-related software will be subject to the controls specified in reference (b).
10. Testing of any security-related or DSSCS software changes at NAVTELSYSIC will be witnessed by COMNAVDAC.
11. Installation of program changes to security-related or DSSCS software will be witnessed by the AMPSSO as defined in Chapter 3 of reference (b).
12. The provisions of paragraphs 9 through 11 above apply to multi-change releases as well as to single change callouts.

STANDARD OPERATIONAL PROCEDURES
FOR
SITE DEVELOPMENT OF LDMX/NAVCOMPARS SOFTWARE CHANGE PROPOSALS (SCP'S)

1. Purpose: To define the additional level of response to SCP's submitted with site developed/tested code. Only SCP's with a precedence of priority or urgent may be installed prior to a numbered release.

2. NAVTASC Site Representative's Responsibilities:

a. Select SCP's from the list of approved candidate SCP's provided with the biweekly NAVTASC Software Configuration Control Board (SCCB) minutes. Selected SCP's will be subject to the following constraints:

(1) COMNAVTELCOM and NAVTASC are to be notified of SCP's selected from the candidate list.

(2) Maximum testing will be performed by the developing site.

(3) On-site testing will not be performed at the expense of the ~~primary message processing mission.~~

(4) Correction responsibility will be assumed by the NAVTASC site representative for problems reported by NAVTELSYSIC of side developed SCP's forwarded for certification out of the release Q&A cycle.

(5) DSSCS and security-related SCP's will not be developed by field activities.

b. For site tasked SCP's approved by COMNAVTELCOM, the NAVTASC site representative will:

(1) Coordinate with NAVTASC via LANT/PAC team leader to provide project completion dates.

(2) Perform coding, unit testing, and system testing to the maximum degree possible without interference to normal system operation.

(3) Forward completed SCP's, including all required program and operator documentation to NAVTASC Cheltenham MD.

c. SCP's developed on-site will require:

(1) Prior approval for development by COMNAVTELCOM.

(2) Certification by NAVTELSYSIC.

(3) Removal of developed SCP's until certified by NAVTELSYSIC and authorized for installation by COMNAVTELCOM.

3. COMNAVTELCOM Responsibilities:

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a. In coordination with NAVTASC and NAVTELSYSIC, review SCP's submitted for site development and approve for site development at the biweekly SCCB meeting.

b. Authorize urgent or priority SCP's certified by NAVTELSYSIC for site installation.

4. NAVTASC Responsibilities:

a. Coordinate with on-site NAVTASC representatives in selecting candidate SCP's. The following criteria will apply in selecting SCP's for site development.

(1) Site's ability to test.

(2) 70/45 - 90/60 compatibility.

b. Advise COMNAVTELCOM on the technical evaluation of candidate SCP's at biweekly SCCB meetings and identify SCP's recommended as candidates for site development in the Software Control Accounting Tracking System (SCATS) by updating the SCP's "status" field to "CANDIDATE SITE DEVELOPMENT."

c. For those SCP's approved by COMNAVTELCOM for site development.

(1) Identify SCP's approved for site development in SCATS by updating the SCP "status" field to "site tasked" and comment to read "approved for site development."

(2) Coordinate development product availability date with site representative and monitor on-site development progress.

(3) Receive completed SCP package from site and have development project staff "desk check" site-submitted code and documentation. Priority SCP's will be expedited for "pre-release" or the next numbered release by NAVTASC but will not impact on processing of urgent SCP's or other major project development schedules.

(4) Update current operational program libraries.

(5) Forward SCP's to NAVTELSYSIC for certification.

(6) Return SCP's not successfully certified to submitting site for correction(s) as noted.

(7) Forward to sites SCP's certified by NAVTELSYSIC and authorized by COMNAVTELCOM for installation.

5. NAVTELSYSIC Responsibilities:

a. For those SCP's approved for "pre-release" by COMNAVTELCOM and submitted by NAVTASC:

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(1) Perform SCP certification testing for SCP's on U90/60, U70/45 and notify COMNAVTELCOM and NAVTASC of test results. This will be expedited for "pre-release" of the SCP's to operational sites but will not impact testing of urgent SCP's or other major project test schedules such as release integration or quality assurance tests.

APPENDIX E
CONTACT LOG

SSAMPS CONTACT LOG

Analytics Communication Systems Inc.		
Herndon, Virginia	Mr. Arthur Greer	703/471-0892
	Mr. Jim Griffis	703/471-0892
	Mr. Paul Jones	703/471-0892
	Mr. Jerry Randell	703/471-0892
Army Materiel Command, MMDF PMO,		
Alexandria, Virginia	Mr. Dick Harmon	703/274-8950
	Mr. Jack Leathers	703/274-9073
	Mr. Frank Risso	703/274-9073
Astronautics Corporation of America		
Milwaukee, Wisconsin	Mr. Mike Burke	414/447-8200
	Mr. Dave Haberman	414/447-8200
	Mr. Robert Lessin	414/447-8200
	Mr. James Patage	414/447-8200
Arlington, Virginia	Mr. Frank Baker	703/751-0101
AUTODIN Mail Server Program		
Ft. Huachuca, Arizona	Mr. Lyle Johnson	602/538-8375
	Mr. Floyd Negley	602/538-0930
Booz, Allen & Hamilton		
Arlington, Virginia	Mr. Fred Webster	703/769-7700
CCSO Tinker AFB (SARAH Pgm.)		
Tinker AFB, Oklahoma	Mr. Mike Norman	405/734-5152
COMNAVTELCOM		
Washington, D.C.	Mr. Ron Vasauskas	202/282-0815
CONTEL ASC Government Networks		
McLean, Virgin	Mr. Baxter Ragsdale	703/790-2086
	Mr. Al Walden	703/790-2177
	Mr. Chuck Freed	703/790-2085
CPT Corporation		
Minneapolis, Minnesota	Mr. Doug Cook	612/937-8000
	Ms. Kathy Hurley	612/937-8000
	Ms. Karen Taylor	612/937-8000
Arlington, Virginia	Mr. Paul Whitbread	703/527-2770
DCA AUTODIN Test Activity		
Mitre Bldg.	MAJ Jack Freeman	703/285-5488
McLean, Virginia	MAJ Dennis Winchell	703/285-5217
	Mr. Jeff Johns	703/285-5459
FAST PMO		
San Francisco, CA	COL. D. Martin	415/550-5616

SSAMPS CONTACT LOG (Cont'd)

Hewlett Packard Corporation Palo Alto, California	Mr. Mark Laubach	415/857-7142
Information Management Associates Leesburg, Virginia	Mr. Mickey Finn	703/689-1008
Mark Space, Inc. Sterling, Virginia	Mr. Mike Tuck	703/444-1330
NAVTASC Cheltenham, Maryland	Mr. Bob Boggs Mr. Richard Davis Mr. Jack Eller	301/238-2374 301/238-2276 301/238-2276
NAVTELSYSIC Cheltenham, Maryland	Mr. Ed Poff Mr. Russ Hersh	301/238-2276 301/238-2276
Simpact Associates, Inc. Reston, Virginia	Mr. Jack Hill Mr. Tom Swanson	703/478-5600 703/478-5600
Telenet Corporation Reston, Virginia	Mr. Frank Pacello	703/478-3055
Teqcom, Incorporated Rockville, Maryland	Mr. Jack Keilsohn Mr. Jerry Keilsohn	301/424-3870 301/424-3870
Zenith Inteq Corporation Herndon, Virginia	Mr. Dave Garvis	703/471-1500