ORDER

6190.15

Project Implementation Plan for ARTS IIIA Mode C Intruder (MCI)

February 7, 1994

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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DIRECTIVE NO. 6190.15

CHANGE TO BASIC	SUPPLEMENT			OPTIONAL	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL

FOREWORD

This order transmits the project implementation plan for the Automated Radar Terminal System (ARTS) IIIA Mode C Intruder (MCI) project. It provides management direction and technical guidance from project inception through commissioning for orderly implementation of the ARTS IIIA MCI project. The procedures and responsibilities of the Federal Aviation Administration (FAA) were developed using current agency directives. This order establishes program management, project implementation policy, and responsibilities governing the activities of organizations, and also identifies and describes specific events and activities to be accomplished in order to implement the ARTS IIIA MCI project.

Mitchell J. Narins
Program Manager

TABLE OF CONTENTS

CHAPTER 1. GENERAL

1. **PURPOSE.** This Project Implementation Plan (PIP) provides management direction and technical guidance to all levels of the Federal Aviation Administration (FAA) in the implementation of the Automated Radar Terminal System (ARTS) IIIA Mode C Intruder (MCI) project from inception through commissioning. The PIP provides overall guidance and direction to involved organizations by establishing program management and project implementation policy and defining organizational roles and responsibilities in support of project implementation. In addition to providing overall guidance and direction for implementation, the plan also identifies and describes specific events and major project activities.

2. DISTRIBUTION. This order is distributed to the branch level of the Program Director for Automation, Program Manager for Advanced Automation, Associate Administrator for Contracting and Quality Assurance, Offices of Air Traffic System Management, Air Traffic Program Management, Training and Higher Education, Requirements and Life Cycle Managment, Operational Support Service, National Airspace System **(NAS)** System Engineering Service, NAS Transition and Implementation Service, Systems Maintenance Service, Facility System Engineering Service, Air Traffic Rules and Procedures Service, and Air Traffic Plans and Requirements Service; to the branch level at the FAA Technical Center; to the branch level at the Mike Monroney Aeronautical Center; to the branch level of the regional Airway Facilities and Air Traffic divisions; and to Air Traffic and Airway Facilities field offices with ARTS IIIA automation systems.

3. AUTHORITY TO CHANGE THIS ORDER. This order is issued under the authority of the Program Director for Automation, ANA-l; the Director, Air Traffic Plans and Requirements Service, ATR-1; and the Director, Air Traffic Rules and Procedures Service, ATP-1. The authority to issue changes to this order is reserved for the Program Manager for Terminal Automation, **ANA-500.**

4. APPLICABILITY. The information contained herein will be used by FAA offices, services, regions, centers (Mike Monroney Aeronautical Center (AMC) and the FAA Technical Center (ACT)), terminal sites, and contractor personnel for accomplishing their support of the ARTS IIIA MCI project. The guidance and schedule information contained herein will form the framework for these organizations in the more detailed planning activities required at the regional and field levels. Deviations from this order must be approved by the Program Manager for Terminal Automation, ANA-500.

5. DURATION. The duration of this program will continue through commissioning of the last ARTS IIIA MCI site.

6.49. RESERVED.

CHAPTER 2. PROJECT **OVERVIEW**

20. SYNOPSIS. The ARTS IIIA MCI program will provide for functional and performance enhancements and establishment of a common-source software baseline for the ARTS IIIA terminal facilities. The common-source baseline will facilitate software maintenance until the terminal advanced automation system (TAAS) replaces the existing ARTS systems.

This common-source baseline product of the ARTS IIIA software development effort will be deployment of the A3.06 version of the ARTS IIIA operational software. Development of this version is a three-phase process. The initial phase utilized the A3.04 version deployed at the time of project initiation. This contained the operational functions that were in use for the ARTS IIIA facilities, additional functions to accommodate Tampa/Sarasota as another ARTS IIIA dual site, and performance improvements needed for increased capacity as derived from techniques successfully implemented at the New York (NY) Terminal Radar Approach Control (TRACON). The second phase was to integrate the MCI conflict alert (CA) from the NY TRACON ARTS IIIE, an enhanced performance monitor (EPM), retrack processing (RETRACK) and continuous data recording (CDR) editor modifications, and some processing efficiency improvements into the A3.04 standardized baseline. In a parallel effort, the ARTS IIIA Field Support Branch Software Section, AOS-413, was developing the next release of the ARTS IIIA operational software, A3.05, which was deployed in late 1992. The A3.05 software was provided to the contractor as Government-furnished property (GFP). The third phase was to integrate the MCI standardized baseline with program technical reports (PTR) into the A3.05 GFP as a new release of the operational baseline, A3.06. Figure 2-1 shows this development process.

21. PURPOSE. The Federal Aviation Act of 1958, as amended, charges the FAA with ensuring the safety of aircraft and the efficient use of airspace in the United States. One aspect of this responsibility is the safe and efficient control of aircraft in the terminal areas. Currently, some of the ARTS IIIA facilities are at or near the limits of software and hardware capacity. As the system becomes saturated, a consistent level of safety is more difficult to maintain and air traffic delays may occur. To accommodate the increased tracking and display requirements and maintain the necessary level of safety, additional equipment and upgraded software are required at each TRACON.

To handle the projected air traffic growth efficiently and remain within the existing ARTS IIIA environment, the ARTS IIIA Interim Support Program (ISP)/MCI contract was executed. The contract provides additional hardware and a software upgrade. To provide added safety, the MCI software in use at the NY TRACON will be adapted and incorporated into the ARTS IIIA operational baseline software in release A3.06. This will allow continued system growth within the existing ARTS IIIA architecture to operate with increased

numbers of sensors, attain a larger track capacity, and drive an increased number of local and remote displays while meeting the future air traffic control (ATC) demands until implementation of advanced automation system **(AAS).**

This PIP addresses the MCI operational baseline software portion of the contract. The additional hardware was addressed in the ARTS IIIA ISP PIP, Order 6190.14 dated February 1, 1993.

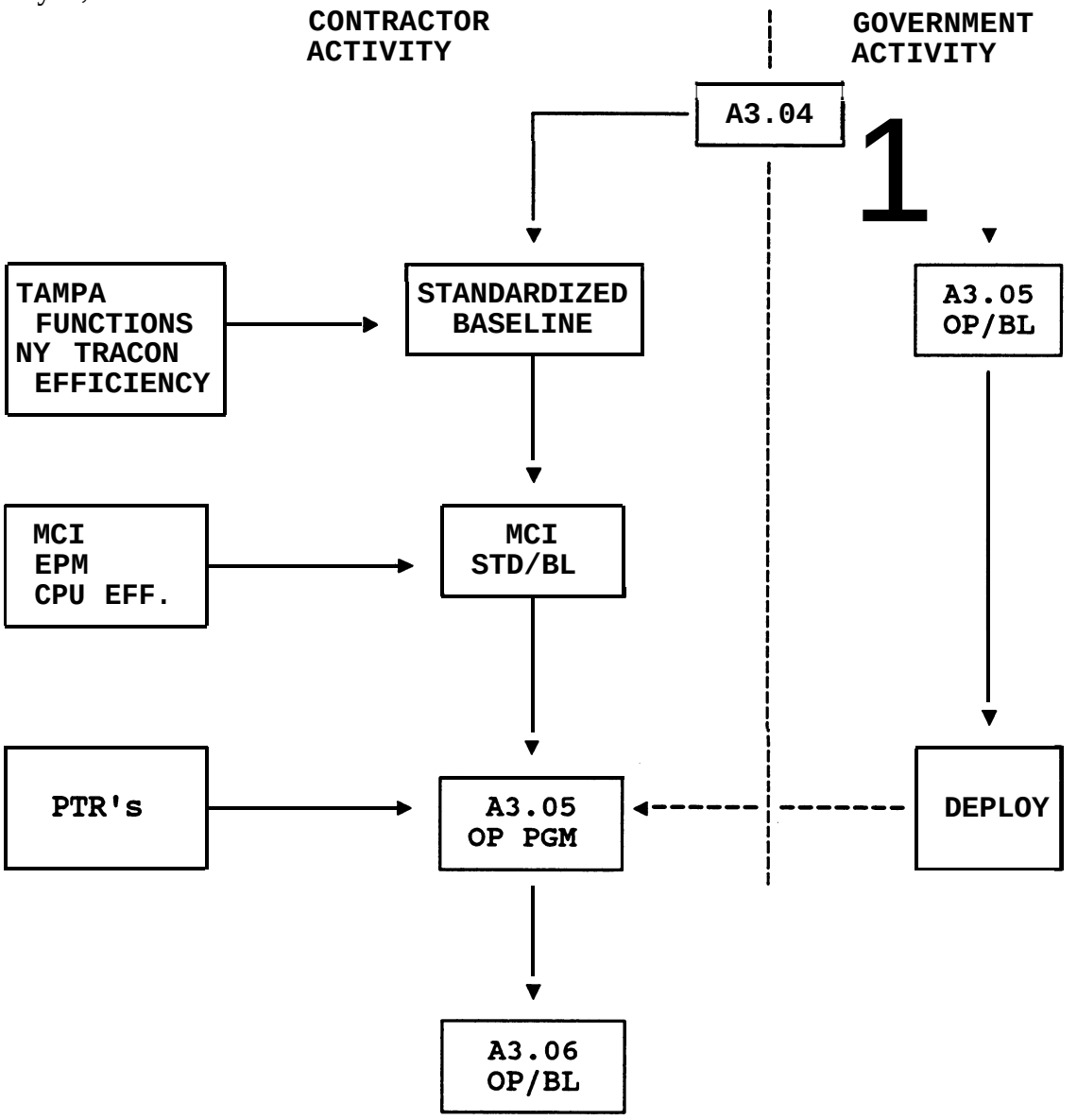


Figure 2-1. ARTS IIIA Software Development Process

22. HISTORY.

a. Current Capability. The ARTS IIIA equipment provides the capability to process, track, and display all primary and secondary radar data from single or dual sensors and supports radar-to-beacon target correlation. Additionally, it provides minimum safe altitude warning **(MSAW)** and CA.

The ARTS **IIIA** uses radar and beacon data, flight data from an Air Route Traffic Control Center (ARTCC) host computer and manual data inputs to assist air traffic controllers in performing real-time tracking of aircraft within the terminal area. Logical and computational functions are performed by input/output processors. Processed data is supplied to multi-plexed display buffer memories which control the presentation of alphanumeric data on the controller displays.

The current ARTS IIIA systems have a maximum capacity of 700 tracks and 24 displays **in a** dual-sensor configuration, or 350 tracks and 16 displays in a single-sensor configuration. The ISP expands the capacity as follows:

Sensors	Number of Tracks	Displays
1	500	30
2	700	36
3	900	25

b. Planned Capability. CA provides visual and aural alerts to controllers in the event that aircraft under their control are predicted to come into potentially hazardous proximity to, are currently in close proximity to, or are noted to be in a maneuver which could result in a potentially hazardous proximity to other controlled aircraft. The CA function is extended in the MCI standardized software baseline to monitor and detect every potential conflict between unassociated and controlled Mode C aircraft in the same sensor subsytem. This MCI capability currently under development will be installed and operational at all ARTS IIIA sites by September 1995.

c. Contract History. The ARTS IIIA ISP contract, **DTFA01-89-C-00058,** was awarded to Unisys Corporation, St. Paul MN, on September 29, 1989. This contract provided for initiation of the MCI development for the ARTS IIIA system. The software tasks included design of the standardized ARTS IIIA baseline. This was the initial task for development and integration of the MCI capability. A letter contract was awarded to Unisys on September 28, 1990. This contract, modification 007 to the basic ARTS IIIA contract, was to complete the development, integration, and implementation of MCI. The letter contract was **definitized** via modification 0013 to the basic contract on June 28, 1991.

This contract not only provided for MCI software development, but also provided for the development and deployment of version **A3.06** of the ARTS IIIA operational programs. It is also the instrument for procurement of the hardware required to implement MCI.

23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

30. **FUNCTIONAL DESCRIPTION.** The MCI function will provide the controller with conflict situation warnings between controlled and uncontrolled Mode C-equipped aircraft. This is in addition to the CA's between controlled and unassociated Mode C-equipped aircraft. Conflict situations between uncontrolled aircraft pairs are not detected nor declared by the MCI or CA functions.

The CA function consists of two major software components that operate in series. These two components are the primary filter and the secondary filter. The primary filter acts as the front-end filter for the CA function. Its objective is to pass on to the secondary filters all aircraft pairs that are currently in, or that could possibly be in, a conflict situation within approximately 40 seconds, and to reject all other pairs. Its main purpose is to limit the computer resources needed by the more central processing unit (CPU)-intensive secondary filters, but not to eliminate aircraft pairs that are or could be in conflict. The CA primary filter accomplishes its job by searching in the vicinity of each controlled aircraft within a square geographical area for other controlled aircraft.

The three secondary filters contain the intelligent decision logic for detecting and declaring alerts on specific aircraft pairs. The purpose of the secondary filters is to analyze aircraft pairs data passed by the primary filter and determine which should result in an alert displayed to the controller. For a specific pair, any one or more of the three secondary filters can declare an alert on any given scan.

The change to CA to accommodate the integration of MCI occurs in the primary filter. The modification to the primary filter is the enhancement of the box-check to examine all controlled MCI-equipped aircraft for conflicts with uncontrolled MCI-equipped aircraft. The functionality of the CA secondary filter alert declaration logic remains unchanged from the current design. The only impact to the secondary filters is the increased number of aircraft pairs that must be processed. Once an MCI pair is in conflict, it will continue to qualify for secondary filter processing until the secondary filter declares that the conflict no longer exists. The primary filter modification is to perform a box-check to examine all controlled aircraft for conflicts with other controlled or uncontrolled aircraft. For all controlled aircraft below a certain threshold speed (200 knots), the size of the primary box is increased by a parameter distance on each side (3 nautical miles). Any new track on an uncontrolled aircraft will qualify for a primary filter box-check.

With respect to the CA function, addition of the functionality is transparent to the controller. It simply makes the primary filter more conservative by allowing more aircraft pairs to pass

onto the secondary filters. Even though more aircraft pairs will pass on to the secondary filters, these unmodified filters will prevent any extraneous, nuisance CA alerts from occurring.

31 PHYSICAL DESCRIPTION. This PIP describes the evolution of the MCI software capability within the ARTS IIIA operational program. There will be no physical change to the existing ARTS IIIA's. Additional input/output processors, type B (IOPB) will be provided to each of the existing sites that will raise the quantity to six for single sensor sites and eight at multiple sensor or high traffic volume single sensor sites.

This contract provides for the additional hardware equipment as well as the added safety features of the MCI software that allows continued system growth within the ARTS IIIA architecture, while meeting future ATC demands awaiting the implementation of the AAS.

32. SYSTEM REQUIREMENTS.

a. Required Operational Characteristics. The ARTS IIIA ISP/MCI must operate up to the capacity limits defined in section 22.a. These characteristics, although somewhat transparent to the air traffic controller, provide an enhanced capability over the ARTS IIIA (non-ISP systems).

b. Required Technical Characteristics. Detailed technical characteristics are those documented in the ARTS IIIA Computer Program Functional Specifications (CPFS) and ARTS IIIA Software Requirements Specification, ATC 40012. Major characteristics of the ARTS IIIA ISP are as follows:

(1) The capability to process up to 900 tracks, including flight plans.

(2) Processing capacity such that utilization will not exceed the specified amounts for the following baselines:

(a) MCI Standardized baseline - 75% of the total processor capacity with at least one spare processor available for system redundancy and support.

(b) Operational baseline - shall be measured but need not meet the requirements of the MCI standardized baseline.

(3) Memory utilization will not exceed the specified amounts for the following baselines:

(a) MCI Standardized baseline - 75% of available memory.

(b) Operational baseline - shall be measured but need not meet the requirements of the MCI standardized baseline.

c. Unique Characteristics. While all ARTS IIIA ISP sites will receive MCI capability, selected sites will utilize full digital ARTS displays **(FDAD)** in lieu of data entry and display system **(DEDS).** One site (Jacksonville) will operate in a unique triple-sensor configuration. A number of sites, due to their high traffic volume, will require eight IOPB's, rather than six IOPB's, to attain necessary expanded track capability.

33. INTERFACES.

a. Internal Interfaces. There are no changes to the internal **interfaces** within the system as a result of the changes to the code.

b. External Interfaces. The external interfaces also remain the same. The IOPB's interface with the sensor receiver and processor (SRAP) or the surveillance communication interface processor (SCIP) to receive surveillance data.

The interfacility communication adapter **(ICA)** provides the interfacility input/output (IO) interface to the ARTCC.

The local bright radar indicator tower equipment **(BRITE)** or digital BRITE **(DBRITE)** alphanumeric subsystem (BANS) processor has an interface to the local BANS and the remote BANS processor. It also has an interface to the remote display buffer memory **(RDBM)/BANS.**

34. - 39. RESERVED.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. PROJECT SCHEDULE AND STATUS. As noted earlier in this PIP, the primary product of this project is delivery of the new release of the ARTS IIIA operational program, A3.06, with the MCI feature incorporated. Implementation will be in accordance with the standard procedures for deploying a new operational program release. The software development/testing schedule shown in appendix 1 indicates that A3.06 release will occur in January 1994. At that time, AOS-413 will initate a notice of national release. It will then be the responsibility of the site to obtain a copy and adapt it to their individual site. Appendix 2 provides the delivery schedule for the hardware that must be in place prior to implementing A3.06 with the MCI function. As a result of the extended period for hardware delivery, those sites that will not receive the requisite hardware prior to the release of **A3.06** will not be able to implement MCI until after hardware installation. It will be the site responsibility to call for, site adapt, load, test and activate A3.06 based upon availability of installed hardware.

41. MILESTONE SCHEDULE **SUMMAR**Y. Appendix 3 provides the milestones required to complete the software development and deploy the A3.06 operational program.

42. INTERDEPENDENCY AND **SEQUENCE.** Relationship to FAA's Capital Investment Plan (CIP):

a. **CIP Project 32-20, Expand Automated Radar Terminal System (ARTS) IIIA Capacity and Provide Mode C Intruder (MCI) Capability.** In order to increase ARTS IIIA processing capability, four **IOPB's** are being added to the current system. MCI software is being procured and implemented into the existing ARTS IIIA systems. Ancillary ARTS IIIA hardware is also being procured to support MCI.

b. **CIP Project 46-30, Interim Support Program (ISP).** Provides interim support actions using off-the-shelf devices and existing facilities project contracts. These actions involve hardware replacement, the addition of operating positions at some existing facilities, and software adaptations to expand the capacity of some ARTS systems. This is the second major project that provides the basis for building to the ARTS IIIE components (see CIP project 32-20 above).

c. CIP Project 56-58, National Airspace Integrated Logistics Support (NAILS). Provides for two separate information systems to be established to aid program officials in life-cycle logistics management by providing (1) pre-commissioning logistics event scheduling and (2) actual field operations information.

43.- 49. RESERVED.

CHAPTER 5. PROJECT MANAGEMENT

50. PROGRAM/PROJECT MANAGEMENT, GENERAL.

a. ARTS IIIA ISP MCI Management. ARTS IIIA MCI integration will be accomplished by means of matrix management techniques, using established functional organizations. This approach requires a program manager (PM) to consolidate the efforts of a broad range of supporting organizations, including FAA headquarters organizations, technical and aeronautical centers, regional and field facilities, and possibly other government agencies and contractors. The ARTS IIIA MCI project will be accomplished through the established FAA Facilities and Equipment (F&E) program management organizations and lines of authority. F&E PM's will be accountable for their respective projects.

b. Memoranda of Agreement. The ARTS IIIA MCI PM will establish agreements with each supporting organization and F&E program offices as required. These agreements will be memoranda of agreement **(MOA)** outlining the tasks to be performed, products to be delivered, schedules with milestones, and resource requirements. These agreements will serve as commitments to satisfactory completion of agreed-upon tasks within the allocated time.

c. ARTS IIIA MCI Project Manager Responsibility. The ARTS IIIA MCI project manager is responsible for overall management of the ARTS IIIA MCI project according to established **MOA's,** periodic review of accomplishments, tracking of program resources, and final review and approval of all tasks and products.

d. Executive Directors. Executive Directors for System Development, AXD-1 and System Operations, AXO-1, are responsible for providing organization support to the ARTS IIIA MCI project. They will ensure that all support services, deliverable products, and resource requirements are provided within established schedules.

e. Project Management. Management of ARTS IIIA MCI project is the responsibility of the Terminal Automation Program Office. The PM, ANA-500, is the ARTS IIIA MCI project manager and the single focal point for all project management activities. The project manager will ensure that the contractor has access to technical documentation, appropriate data bases, and sources of information relative to GFP. In support of the projects, a contracting officer (CO) acting as the Associate Program Manager for Contracts (APMC) was designated by the Associate Administrator for Contracting and Quality Assurance **(ASU)** to perform general contract management activities to assure that the terms of **performance** under the contract are met. The CO has designated the Associate Program Manager for

Engineering (APME) as the technical officer (TO) within ARTS division (ANA-900) to provide technical guidance and direction to the contractor within the scope of the contract.

The CO is the only person authorized to make changes affecting prices, deliverables, or schedules. Management and technical support to the project manager and TO is provided by the Advanced Automation Program (AAP) Systems Engineering and Technical Assistance (SETA) program contractor.

51. PROJECT CONTACTS. Appendix 4 provides a listing of project management personnel designated as contacts for their respective organizations.

52. PROJECT COORDINATION. Coordination between FAA organizational elements is required in order for each organization to fulfill its assigned responsibilities. The following paragraphs list organizational elements requiring coordination and their respective responsibilities in support of the project.

a. Headquarters. The following organizations within FAA headquarters, Washington, DC, will fulfill the indicated project responsibilities:

(1) PM for Terminal Automation, ANA-500

(a) Provide overall management and direction of all FAA activities necessary for successful development, acquisition, production, test and evaluation, transition to user organization, and engineering support of the project.

(b) Define project needs, define tasks to be performed and expected results, staffing estimates, contract cost estimates, budget estimates, schedules, management procedures and controls, and required equipment and facilities.

(c) Establish matrix support agreements and hold functional organizations accountable for integrated logistics support, systems engineering technical support, facilities planning, production quality and planning, test and integration, contracting, and legal.

(d) Ensure timely preparation and submission of reports relative to established cost, schedule, benefit and budget baselines to higher management and advise them of project status and progress.

(e) Be the single focal point and point of contact (POC), serve as the spokesperson, and provide coordination of all project management activities. The PM will coordinate all public statements with the Office of Public Affairs.

(f) Initiate, conduct, and complete a thorough and objective project deployment readiness review (DRR) including fulfilling DRR team leader responsibilities.

(g) Develop project requirements (project verification requirements traceability matrix [VRTM]), prepare program directives for testing activities, prepare requirements for development test and evaluation @T&E), coordinate shakedown testing, and prepare documentation necessary for approving the budget to fund for the accomplishment of DT&E, integration, and shakedown testing.

(h) Co-chair the National Airspace Integrated Logistics Support (NAILS) Management Team (NAILSMT).

(i) Formulate and manage the ARTS IIIA MCI budget. Provide regular reports of the ARTS IIIA MCI status relative to established cost, schedule, and budget baseline.

(j) Manage project interdependency with interfacing projects.

(k) Prepare and maintain the ARTS IIIA MCI master plan and other documentation required to describe and manage the activities of the ARTS IIIA MCI project.

(1) Serve as the spokesperson for the ARTS IIIA MCI project and control and approve the dissemination of program information according to FAA and Department of Transportation (DOT) regulations. Represent the FAA in dealings with the Office of the Secretary of Transportation (OST), other government agencies, contractors, and the congress on matters regarding the ARTS IIIA MCI project.

(m) Develop and implement program controls and tracking systems to support the management process.

(n) Provide liaison across organizational boundaries when necessary to facilitate implementation of ARTS IIIA MCI.

(2) ARTS Engineering Division, ANA-900

(a) Provide technical guidance and direction to the contractor in the design, development, testing, installation, integration, and production of hardware and software and ensure that all technical contract requirements are met. Serve as the contract TO.

(b) Serve as the Associate Program Manager for Engineering (APME).

(c) Serve as a member of the ANA Configuration Control Board (CCB).

(d) Provide guidance to all offices, services, centers, and regions on project implementation.

(e) Ensure availability of funds and keep the contract within budget limitations.

(f) Serve as a member of the Test Policy Review Committee (TPRC) as defined in Order 1810.4B, appendix I, page 19.

(g) Establish and chair project working groups as required.

(h) Prepare the Master Test Plan (MTP) jointly with the Engineering Test and Evaluation Service (ACN).

(i) Conduct the Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA).

(3) Requirements and Life Cycle Management Service, Life Cycle Division, ALM-500.

(a) Serve as the Associate Program Manager for Logistics (APML) to support the PM in managing the total NAILS effort.

(b) Plan and coordinate the development of NAILS requirements.

(c) Coordinate development and update of the Integrated Logistics support Plan (ILSP).

(d) Evaluate and integrate NAILS requirements in the planning and procurement process.

(e) Monitor and track all NAILS functions.

(f) Review contractor NAILS data deliverables.

(g) Review all procurement documents for inclusion of NAILS requirements.

(4) Operational Support Service, National Terminal Engineering Division, AOS-400.

(a) Develop software modifications tasked by the Air Traffic (AT) CCB.

(b) Integrate new software into the operational software.

(c) Test new software during development and prior to operational use.

(d) Provide technical input into the requirements definition process.

(e) Establish requirements for support software tools to be used in their testing and maintenance of software.

(f) Support field elements in their software maintenance activities.

(g) Provide input to operational test and evaluation (OT&E) requirements.

(h) Support formal system tests.

(i) Develop system shakedown requirements.

(j) Develop shakedown test plan and procedures in accordance with FAA-STD-024b, Preparation of Test and Evaluation Plans and Test Procedures.

(k) Conduct shakedown testing, perform data analysis, and prepare reports.

(l) Support shakedown testing at the key field sites in accordance with PM program directives.

(m) Support system on site tests (SOST).

(n) Support the FCA and PCA.

(o) Ensure software quality is maintained.

(5) Operational Support Service, National Systems Requirements Analysis Division, AOS-100.

(a) Provides an interface within headquarters between air traffic, airway facilities and program offices.

(b) Serves as a member of the CCB as required.

(c) Provide technical input into the requirements definition process.

(d) Ensures availability for second-level support functions.

(6) Air Traffic System Management Service, Airspace Management, Current Systems Branch, ATM-520.

(a) Determine the operational acceptability of new terminal ATC operational computer programs or systems prior to their delivery for operational testing and use in the field facilities.

(b) Monitor computer program implementation schedules to ensure terminal operational requirements are met.

(7) Air **Traffic Rules and Procedures Service, Air Traffic Procedures Division, ATP-100.**

(a) Serve as the Associate Program Manager for Procedures (APMP).

(b) Update the operations and procedures orders as may be necessary.

(c) Coordinate with FAA components responsible for AT controller operations to provide information on procedural matters.

(8) Air Traffic Plans and Requirements Service, System Plans and Programs Division, ATR-100

(a) Serve as the Associate Program Manager for Requirements (APMR).

(b) Develop plans, requirements, programs, and standards for system improvement, modification, and expansion of the air traffic control system, and maintain the air traffic system plan.

(c) Establish operational requirements for air traffic systems throughout the agency. This excludes the development of operating procedures and separation standards.

(d) Validate and develop requirements in support of today's and the near term air traffic environment for:

1 Integrating the results of development efforts into the operating system.

2 Expanding and improving the current system.

(e) Develop specific capital investment priorities based upon air traffic system requirements for the F&E budgetary processes for current and near-term planning scenarios.

(f) Identify and validate telecommunications requirements necessary for the accomplishments of air traffic activities, and coordinate with Systems Maintenance Service to develop plans for implementing the required service.

(g) Serve as the air traffic focal point for coordination of today's and the near-term programs and system requirements with other offices, services, agencies, and organizations.

(h) Collaborate with the Automation Software Division, the Advanced Systems and Facilities Division, and the Operational Support Service to ensure that the validated requirements are being satisfied during development, testing, and evaluation of new systems.

(i) Assess current programs and proposed planning requirements, based on agency planning standards and guidelines; recommend priorities for system improvement, modification, and expansion; and make adjustments as appropriate.

(j) Plan for a secure and effective air traffic system communications capability and develop air traffic communications requirements.

(k) Serve as the air traffic focal point for coordinating FAA policy and planning relating to privatization activities and aviation weather services provided by air traffic facilities.

(l) Determine operational requirements for appropriate real-time data interchange capability between en route, terminal, and flight service elements of ATC automation systems.

(9) Air Traffic Plans and Requirements Service, Automation Software Policy and Planning Division, ATR-200

(a) Develop software requirements.

(b) Monitor development activities to ensure software requirements will be met.

(c) Verify that requirements have been met before new functional software is operationally utilized.

(d) Maintain configuration control of the software.

(e) Ensure the quality of air traffic **functionalities.**

(f) Provide the primary air traffic interface within headquarters on automation software and automation performance issues.

(g) Establish and monitor policies and procedures used in testing, implementation, and administration of all air traffic automation efforts.

(h) Ensure continuity and compatibility between air traffic automation software systems and activities.

(i) Serve as chairperson of the AT CCB.

(10) NAS System Engineering Service, Automation Division, ASE-100

(a) Provide an Associate Program Manager for Systems Engineering (APMSE).

(b) Serve as a member of the ANA CCB.

(c) Serve as a member of the AT CCB.

(d) Provide NAS system level requirements for test and evaluation **(T&E).**

(e) Verify compliance with the NAS system level and **OT&E** requirements.

(f) Coordinate test policy waivers.

(g) Verify compliance with Order 1810.4B, FAA NAS Test and Evaluation Policy.

(h) Develop the VRTM.

(i) Coordinate approval of the MTP.

(11) NAS Systems Engineering Service, Engineering Specialties and Configuration Management Division, ASE600

(a) Provide NAS system level requirements for T&E.

(b) Verify compliance with NAS system-level and OT&E requirements.

(c) Coordinate test policy waivers.

(d) Verify compliance with Order 1810.4B.

(e) Provide guidance and direction on the conduct of FCA and PCA.

(12) Associate Administrator for Contracts and Quality Assurance, Contracts Division, Automation/Advanced Automation Branch, ASU-350.

(a) Serve as the CO.

(b) Serve as the Associate Program Manager for Contracts (APMC).

(c) Plan, negotiate, execute, and administer all prime and related contracts in support of the PM.

(13) Associate Administrator for Contracts and Quality Assurance, Industrial Division, Quality Assurance Branch, ASU-420.

(a) Provide an onsite Quality and Reliability Officer (QRO).

(b) Provide support to ANA-500 during' factory verification tests.

(c) Provide quality assurance support for production acceptance test and evaluation (PAT&E).

(d) Provide support to T&E parameters for incorporation in shakedown testing.

(e) Serve as a member of the TPRC.

(f) Provide an Associate Program Manager for Quality (APMQ).

(14) Office of Training and Higher Education, Airway Facilities Training Program Division, AHT-400

(a) Develop and recommend technical training policies, programs, standards, systems, and procedures to meet FAA program requirements, applicable federal laws, and Office of Personnel Management (OPM) and DOT regulations.

(b) Administer technical training programs and policies.

(c) Evaluate the technical training programs and ensure that measures are taken to correct deficiencies.

(d) Provide training programs.

(e) Develop, operate, and maintain a management information system.

(15) Office of Training and Higher Education, Air Traffic Training Program Division, AHT-500

(a) Develop and recommend air traffic technical training policies, programs, standards, systems, and procedures to meet FAA program requirements, applicable federal laws, and OPM and DOT regulations.

(b) Support the Training Requirements Program (ATZ-100) in the development and administration of the training program.

(c) Provide consultant services to ATZ-100 as requested.

(d) Develop, operate, and maintain a training management information system.

(16) Office of Air Traffic Program Management, Training Requirements Program, ATZ-100

(a) Administer the national air traffic technical training program through training proposals, review and approval of training plans, review of specifications and contractor-developed proposals in response to request for proposal for training, and the development of training courses and materials.

(b) Develop and administer technical training policies, programs, standards, systems and procedures to meet FAA program requirements, applicable federal laws, and OPM and DOT regulations.

(c) Evaluate the technical training programs and ensure that measures are taken to correct deficiencies.

(d) Provide training programs.

(e) Develop, operate, and maintain a management information system.

(17) SETA Contractor. The SETA contractor is responsible for program support in the following areas:

(a) Assist in the preparation of procurement packages for systems and subsystems.

(b) Assist in reviewing contractor technical proposals for systems and subsystems.

(c) Monitor system and subsystem design and the status of system and subsystem technical activities.

(d) Provide technical assistance in the review and evaluation of system and subsystem designs, production and test; and perform analyses of technical problems as directed.

(e) Monitor activities associated with field installation of systems and subsystems.

(f) Support the configuration management process.

(g) Provide technical assistance in the review and development of training policies, programs, standards, systems and procedures.

b. Field Organizations. Responsibilities of the FAA Technical Center, regions, and other field organizations follow:

(1) Federal Aviation Administration Technical Center, Engineering, Test, and Evaluation Service, Automation Division, ACN-100. The FAA Technical Center will provide the support necessary to test and evaluate the project for functional and operational performance and for compliance with contract requirements. The FAA Technical Center will perform these duties in accordance Order **1810.4B,** which designates **ACN as the test** director. Accordingly, ACN will designate a test director for the projects. **ACN will also:**

(a) Serve as the Assoicate Program **Manager** for Test **(APMT).**

(b) Develop **OT&E** and NAS integration requirements for each subsystem (project) in coordination with air traffic, airways facilities, other user organizations, and acquisition **PM's.**

(c) Prepare testing program directives and coordinate agreements with **ATR/ANA/AAF/ASU/AOS/ATZ.**

(d) Prepare test monitor guidelines; prepare test plans and test procedures for **OT&E** in accordance with FAA-STD-024b; prepare NAS integration test plans and procedures in accordance with FAA-STD-024b; and prepare/concur on **DT&E** test plans and procedures.

(e) Direct the conduct of **DT&E,** NAS integration, production acceptance test and evaluation (PAT&E), and **OT&E;** conduct **DT&E,** NAS integration and **OT&E** data analysis, and prepare reports.

(f) Support ASE in development of NAS system-level requirements for T&E.

(g) Support acceptance testing at the first field site in accordance with PM program directives.

(h) Maintain the status of test progress and test problems.

(i) Present reviews to the PM, as required.

(j) Serve as a member of the CCB, as required.

(k) Operate and maintain NAS subsystems delivered to the FAA Technical Center after FAA acceptance of the equipment.

(l) Provide for facility readiness at the FAA Technical Center.

(m) Maintain project documentation in accordance with Order 1750.6.

(n) Establish initial training requirements for FAA Technical Center personnel and coordinate with the Office of Air Traffic Program Management, Training Requirements Program, ATZ-100.

(o) Establish financial and item management control and accountability for all agency property received at the FAA Technical Center.

(p) Support the DRR process.

(2) Mike Monroney Aeronautical Center, FAA Academy, AMA-400.

(a) Develop, monitor, and conduct training programs as directed by the Director of Training and Higher Education, AHT-1.

(b) Participate, as requested by AHT-1, in the review of instruction books.

(c) Assure timely selection of necessary instructors and maintenance personnel to meet Mike Monroney Aeronautical Center training and staffing requirements.

(3) **Regions.** Each cognizant region has appointed a regional associate program manager (RAPM). The RAPM will ensure that facilities and engineering work, if required, is completed prior to the delivery. The RAPM will monitor installation and coordinate requests for contractual or technical support with ANA-900 and AOS-400. The RAPM will arrange for the appointment of a Technical Onsite Representative (TOR) at each facility. The regions will fulfill the following responsibilities:

(a) Prepare and monitor site installation in accordance with the schedules discussed in chapter 4 and provided in appendices 1 and 2. Coordinate with ANA, ATR, and AOS on any changes to these schedules.

(b) Assign a regional integration group (RIG) to provide for coordination, direction, and guidance necessary for effective and timely implementation of the project. The RIG will be chaired by the regional APM (RAPM) and will be comprised of

regionally selected AT and Airway Facility (AF) personnel knowledgeable in implementation of automation programs. The RIG will be responsive to the guidance and direction of the region for monitoring the efforts at each affected site within the region. The RIG is to monitor and provide assistance and guidance in all phases of the terminal automation implementation for all regional sites.

(c) Designate a TOR to serve at each affected terminal facility. The TOR provides the regional coordination, direction, and guidance necessary for effective and timely accomplishment of site preparation functions during the terminal automation implementation at the site to which he/she is assigned. This includes on-site decisionmaking and day-to-day problem solving. The TOR is to be the principal on-site regional representative who reports problems, progress, and other matters to ANA900 through appropriate regional representatives. The TOR is to be guided by approved test documentation and the project implementation plan. Established channels of communications between regions and PM are to be used in carrying out the terminal automation program. The TOR is also to serve as a member of the RIG and terminal integration group (TIG).

(d) Serve as a member of the TIG at each affected site. The TIG is to be comprised of designated on-site regional AT and AF personnel experienced in the implementation of electronic and/or automation systems. The TIG will be responsive to the guidance and direction of the TOR. Personnel assigned to the TIG are to be engaged in test activities subsequent to initial operational capability (IOC).

(e) Provide regional logistics requirements to ANS-430, ANA-500, and the FAA Logictics Center.

(f) Support the development of test plans and procedures for integration and shakedown testing.

(g) Conduct software integration and shakedown testing.

(h) Conduct and/or monitor site acceptance and field shakedown testing.

(i) Conduct the operational readiness demonstration (ORD) and commissioning.

(j) Support ACN during OT&E testing.

(k) Conduct site shakedown and operations changeover testing in accordance with the requirements of the test plans for these functions.

(l) Obtain through the Defense Commercial Communications Office (DECCO), as appropriate, all telephone company (TELCO) services required for the timely acquisition of communications required for ARTS IIIA ISP/MCI.

(m) Assure that appropriate FAA/military local on-site agreements are reached.

(n) Prepare the operations changeover plan.

(o) Conduct the formal certification exercise (commissioning) for designated terminal facilities.

(p) Generate site-specific adaptation data for the creation of system load tapes.

(cl) Establish financial and item management, control, and accountability for all agency property received in the region.

c. Project Support Organizations.

(1) In accordance with Order 1800.8F, National Airspace System Configuration Management, the CCB is authorized to approve or disapprove baselines and changes to the baselines. There is a central NAS CCB to establish and control baselines and to administer configuration control. From this CCB, authority is delegated to lower-level CCB's to effectively administer proposed changes at the most appropriate level. All lower-level CCB's will be accountable to the NAS CCB which has been established through a charter defining its authority, responsibilities (including the specific documents over which the CCB has control), and membership. Decisions and directives are documented in configuration control decisions (CCD), which either approve, disapprove, defer, or refer the change request to another CCB. When contractual action is required, the CCD serves as a basis for preparation of a procurement request which is submitted to the CO. CCD's may also be distributed to other government agencies and serve as an official notification of CCB action. Representation on the CCB includes the various agency/services/offices that have responsibilities to acquire, support, and operate the system. Representatives of other organizations may be invited to attend as required.

(2) Two lower level CCB's have been established to oversee modifications to the ARTS IIIA MCI system. The ANA CCB was established to act on NAS Change Proposals (NCP) relating to the hardware and hardware specifications/standards. The ANA CCB will refer NCP action to the NAS CCB if the circumstances dictate. The ATR CCB

was established to act on NCP's relating to changes submitted to the operational software or the software CPFS's. They too have the authority to refer actions to the NAS CCB if necessary.

(a) ANA CCB.

1. Chairperson:

Director, Automation, ANA-l, or designated representative.

2. Executive Secretary:

ASE-620 or designated representative, Manager, Configuration Management Branch.

3. Other Permanent Members:

Manager, Maintenance Engineering Division, ASM-100

Manager, Advanced Automation System Division, AAP-200

Manager, Industrial Division, ASU-400

Manager, Automation System Engineering Division, ASE-100

Manager, Engineering Specialties & Configuration Management Division, ASE-600

Manager, System Plans and Programs Division, ATR-100

Manager, Automation Software Policy and Planning Division, ATR-200

Manager, Facility Programs and Transition Division, ANS-200

Manager, National Systems Requirements Analysis Division, AOS-100

Cognizant PM

Cognizant SETA manager

Cognizant SEIC manager.

4. Ad Hoc Members:

Ad hoc members represent FAA organizations other than those already represented by the permanent ANA CCB membership, which will be impacted by changes being decided by the ANA CCB. Their function is to ensure that proposed changes are consistent with the technical and policy positions of their organizations. Ad hoc members include:

Manager, National Engineering Field Support Division, AOS-200

Cognizant project TO.

Cognizant Program Engineering Service Division managers as appropriate

Manager, Contracts Division, ASU-300

Manager, National Airspace System Division, AOV- 100

Manager, FAA Logistics Center, AML-1

Cognizant program CO.

5. Technical Advisor, Consultants, and Program Control Specialist:

Personnel from various government and contractor organizations are invited to attend ANA CCB meetings to provide specialized technical or program management information.

(b) AT CCB.

1. Chairperson:

Manager, Air Traffic Automation Software Division, ATR-200.

2. Executive Secretary:

Branch Manager, Configuration Management, ASE-620.

3. Other Permanent Members:

Manager, System Plans and Programs Division, ATR-100

Manager, Procedures Division, ATP-100

Manager, Civil Operations Division, ATM-100

Manager, National Terminal Systems Engineering Division, AOS-400

Manager, Advanced Automation System Division, AAP-200

Director, Automation ANA-l, or designated representative

Manager, Maintenance Engineering Division, ASM-100

Manager, Advanced Systems and Facilities Division, ATR-300.

4. Ad Hoc Members:

Ad hoc members represent FAA organizations other than those already represented by the permanent AT CCB membership, which will be impacted by changes being decided by the AT CCB. Their function ensures that proposed changes are consistent with the technical and policy positions of their organizations. Ad hoc members include:

Cognizant SETA manager

Cognizant SEIC manager

Manager, National Airspace System Division, AOV-100

Manager, Engineering Specialties and Configuration Management Division, ASE-600.

5. Technical Advisor, Consultants, and Program Control Specialist:

Personnel from various government and contractor organizations are invited to attend AT CCB meetings to provide specialized technical or program management information.

53. PROJECT RESPONSIBILITY MATRIX. Table 53-l identifies organizational offices having primary and supporting responsibility for major project activities.

TABLE 53-l
ACTIVITY RESPONSIBILITY MATRIX

TASK/PLAN/ACTIVITY	PRIMARY OFFICE	SUPPORTING OFFICES
Implementation Schedule	ANA-500	Regions
Training Programs Schedules and Assignments	ATZ, AHT-400/500	ATR, ANA-900, ATM, AAT AMA, AOS-400, Regions
Configuration Management (Operational Software)	ATR-200	ANA-900, ATP, AOS-400 Regions
Software Maintenance (Operational Software)	AOS-400	ANA-500, ANA-900 Regions
NAS Integration Test Plan and Procedures	ACN-100	ANA-900, ATR-200, AOS-400, ASE-100, ASE-600
Shakedown Test Plan and and Scripts	AOS-400	ANA-900, ATP, ATM, ATR, ACN, ASE, ASU
Operations Changeover Plan	Regions	AOS-400, ATR, ATP, ATM
Logistic Support Planning	ALM-500	ANA-900, ANA-500, AML, Regions
ORD Test Plan/Procedures	Regions	ATR, ANA-500, ANA-900, ATP, ATM, AOS-400, ASE

54. PROJECT MANAGERIAL COMMUNICATIONS. Project managerial communications are provided monthly to ANA-l, through a program director status review (PDSR). This PDSR provides insight into cost, schedule, technical, and logistics issues that may exist.

Communication to the various branches of ANA, ATR, AOS, ATM, ATP, AMA, AML, ATZ, FAA Technical Center, and the regions occurs formally through technical interchange meetings (TIM) that are conducted during all stages of the program and weekly core team meetings.

55. IMPLEMENTATION STAFFING. Staffing peculiar to implementation of this project includes assignments of regional APM's, RIG's, TOR's, and TIG's. Responsibilities of these persons and groups are defined in paragraph 52.b.

56. **PLANNING AND REPORTS.**

a. Reports.

(1) The configuration control and status accounting report provides the . information needed to identify configuration identification and determine the status of change proposals, deviations, and waivers including implementation status.

(2) The project progress report provides the PM, CO, and TO a monthly assessment of contractual effort as of the date of the report, work scheduled for the next period, and special problem areas including proposed solutions.

(3) The PDSR provides monthly information to FAA management on cost, schedule, and technical status of the projects.

(4) The PAT&E test report documents the results of PAT&E and is the responsibility of the FAA Technical Center test director.

(5) The hardware discrepancy report documents hardware discrepancies.

(6) The operational changeover report documents the changeover activities to bring a site into the NAS.

(7) The program technical report documents software discrepancies.

(8) The shakedown test report documents the results of FAA Technical Center shakedown testing.

(9) The NAS integration report documents the results of NAS integration testing and is the responsibility of the FAA Technical Center test director.

(10) The OT&E test report documents the results of OT&E and is the responsibility of the FAA Technical Center test director.

b. Plans.

(1) The shakedown test plan defines tests of the system in an operational environment to assess the readiness of people, procedures, and the system to assume field operational status.

(2) The operational changeover plan defines the procedures, schedules and techniques, coordination and training required to transition a facility to a new system/subsystem without degrading NAS operations.

(3) The **OT&E** test plan defines testing to be accomplished for assessing the operational suitability and operational effectiveness of the system.

(4) The training plan defines those training activities to be accomplished to ensure personnel are qualified before participation in site or system certification.

(5) The NAS integration test plan defines testing to be accomplished for verifying compliance with NAS integration requirements. Integration requirements assess the operation of multiple interfaces and integration with other systems in as realistic an operational environment as possible.

(6) The **DT&E** plan defines testing to be performed for design assistance, technical risk assessment, and specification performance verification. **DT&E** plans are developed by the contractor in accordance with the contract.

(7) The site shakedown test plans define the tests required to confirm the integrated readiness of people, procedures, and the system to assume field operational status.

(8) The ARTS IIIA MCI baseline test plan defines the test to assess performance in an operational environment.

(9) The ILSP defines the elements of the NAILS program applicable to the project. The ILSP also describes the maintenance concept to be applied.

(10) The MTP defines the T&E program for the project and provides a framework for the systematic test and evaluation of the system to ensure that all functional and performance requirements are satisfied.

(11) The CIP provides a comprehensive plan for modernizing and improving ATC and airway facilities through the year 2000.

57. APPLICABLE DOCUMENTS. See appendix 5.

58.-59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. PROJECT **FUNDING** STATUS, GENERAL. The ARTS IIIA MCI project implemented by this project plan is **funded** according to the following profile:

FUNDING PROFILE ($000) - ARTS IIIA MCI PROJECT

	FY91	FY92	FY93	FY94	TOTAL
MCI S/W	$2,600	$6,052	$300	$6,838	$15,790

61.- 69. RESERVED.

CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. A DRR will be conducted in accordance with Order 1800.63A and all critical checklist items resolved prior to deployment. See appendix 3 for the DRR schedule. Site deployment planning, site preparation, installation of required equipment, and scheduling shall be the responsibility of the FAA. Each site will prepare site-specific implementation schedules consistent with their own requirements. Required equipment installation and testing will be the responsibility of the contractor as described in Order 6190.14, dated February 1, 1993.

71. SITE PREPARATION. No additional site preparation beyond that described in Order 6190.14 is anticipated for implementation of A3.06.

72. DELIVERY.

a. Software. The contractor is responsible for packing and shipping software including computer program tapes (operational and other computer support tapes), manuals, and other documentation to ACN-100 at the FAA Technical Center. Subsequent delivery of the operational software is made by ACN-100 to AOS-400 who prepares the software for distribution to individual sites. (NOTE: ACN-140 shall forward a copy of the manuals and other operating and instruction documentation to ATP-100 for review to determine if any document change proposals are necessary.)

b. Engineering Services. The contractor shall be available to provide hardware and software engineering services throughout the life of the contract. This includes providing changes to the MCI software (operational, diagnostic, off-line, and utility), firmware, and documentation to correct discrepancies observed during installation and testing. The ARTS III PM, ANA-500, is the single focal point for obtaining contractor engineering services to correct discrepancies observed during installation and testing. All requests for contractor engineering services shall be made through AOS-400 (operational software maintenance software, hardware, and firmware), to the project TO, who will arrange for the required contractor support.

73. INSTALLATION. Upon completion of key site testing, AOS-400 will announce a national release of the new baseline operational software for ARTS IIIA sites that includes the MCI functionality. Based on the status of the required equipment availability, each site will be responsible for requesting the release from AOS-400. The individual sites will be responsible to perform the necessary site adaptations, and load the new program for local testing and cutover. AOS-400 and the contractor field engineering personnel will be available for assistance upon request.

74.979. RESERVED.

CHAPTER 8. VERIFICATION

80. **GENERAL.** When completed, the ARTS IIIA ISP/MCI project will provide safety and efficiency enhancements for ATC terminal systems. Assurance of this enhancement is provided by a program which verifies that project requirements compliance is successfully accomplished. This verification program is applicable to all produced and deployed project hardware and software and is applicable to other project operational requirements. Essential to the verification program is the T&E process. This process is documented by detailing the plans, procedures, and results of system testing. This documentation shall:

a. Define the scope of testing required to ensure that the system, subsystem, computer system configuration items (CSCI), computer software components (CSC), and computer software units (CSU) meet applicable requirements. The requirements are contained in, or derived and allocated from, the System Requirement Specification (SRS) and CPFS's.

b. Discuss the test configurations and test environments and identify the test facility, equipment, the simulation program requirements, and the methods employed to measure performance. The discussion should include the data reduction and analysis requirements and provide a schedule for conducting the tests.

c. Include a traceability matrix to document the software interface requirements that are to be satisfied or partially satisfied by each test.

d. Identify the corresponding test procedures and reports to be provided.

81. TEST DOCUMENTATION. The test documents, prepared for FAA approval, will be updated and submitted to support each of the different software development phases.

a. System Test Plan. The system test plan (STP) will serve as the overall test control document for the contractor's ARTS IIIA MCI test program. The plan will describe the contractor's test approach to verify all requirements described in the requirements analysis effort. Also included will be plans for conducting full qualification testing (FQT), software stress testing, and plans for integrating CSCI's with other configuration items. The test plans will include a specification compliance matrix that clearly states the procedure to be used for requirements verification. Detailed planning will be provided to address factory acceptance test as the final phase of DT&E, formal FAA Technical Center OT&E, system integration/and shakedown test, and site test. The test plans will be revised prior to critical design review and test readiness review (TRR).

b. System Test Procedures. The system test procedures (STPR) developed prior to critical design review contain the test cases necessary to perform FQT of a CSCI identified in the STP. The STPR's developed prior to TRR will be revisions of earlier STPR's.

c. **Test Report(s).** The system test reports (STR) provide records of the FQT performed on the CSCI's.

d. System On-site Test Procedures. The system on-site test (SOST) procedure documents prepared by the contractor define the minimum requirements for the system, subsystem, and unit test procedures. This document will include such items as test objectives, manning responsibilities, test support hardware and software, detailed test operations, instructions, and the requirement and procedures for the reduction and analysis of test data.

e. OT&E/Integration Test Plan. ACN-100E will be responsible for developing this test document. The OT&E/integration test plan will specify the approach that will be used to verify that the ARTS IIIA MCI standardized baseline functions in accordance with the requirements stated in the SRS and that the ARTS IIIA operational baseline can successfully replace the existing ARTS IIIA software. The OT&E/integration tests will include operational tests and interface tests, and will include scenarios and operational simulations that will verify the operational suitability and operational effectiveness of the ARTS IIIA MCI operational baseline software in the NAS environment. Various levels of testing will be conducted at the FAA Technical Center and at the operational site(s).

f. OT&E Shakedown Test Plan. The Operational Support Service, National Terminal Engineering Division (AOS-400) will be responsible for developing the plan and procedures for verifying the systems' operation in an NAS operational environment. OT&E shakedown testing will confirm that all requirements are met.

82. DT&E

a. DT&E to Date. DT&E dry run testing and formal system testing of the MCI standardized baseline has been completed at the FAA Technical Center.

b. Future DT&E. The contractor will conduct additional DT&E activities as described in FAA-STD-026/DOD-STD-2167A in the course of the operational baseline software development. The contractor will conduct an operational baseline TRR prior to CSCI integration testing.

(1) DT&E Objectives. These tests will confirm that the CSCI's interface with each other and that the functionality of the CPFS's meet the requirements as stated in the SRS; that changes in functionality are those expected from the incorporation of case files

identified for the ARTS IIIA standardized or operational baseline; and that there has been no significant degradation in system performance. ARTS IIIA operational baseline software will be demonstrated at the CSCI level at the FAA Technical Center as the final phase of DT&E.

(2) DT&E Events/Scope of Testing/Basic Scenarios. The DT&E phase of this upgrade, performed by the contractor, begins with informal module testing and continues through component testing for both the standardized and operational baselines. These tests may be performed on individual modules, components, or combinations of these entities. Formal DT&E follows the TRR with CSCI testing and is scheduled to end at the completion of contractor acceptance testing.

c. Critical DT&E Items

(1) Testing memory requirements.

(2) Testing performance requirements of the IOPB.

83. OT&E INTEGRATION TESTING. OT&E integration testing, the responsibility of ACN, will verify that the software meets the NAS integration requirements when the operational environment includes a complete system configuration consisting of all ancillary components and connectivity to external systems. Integration activities will be conducted at the FAA Technical Center and the operational baseline integration activities will also be conducted at a site to be selected and may be combined with OT&E.

a. OT&E Integration Testing to Date. No ARTS IIIA MCI OT&E integration testing has been performed to date.

b. Future OT&E Integration Testing.

(1) OT&E Integration Testing Objectives

a. Test system performance end-to-end.

b. Test subsystem level of conformance to requirements.

c. Establish NAS baseline performance for the operational baseline.

d. Verify no NAS performance degradation.

(2) OT&E Integration Testing Events/Scope of Testing/Basic Scenarios. OT&E integration testing will be accomplished on at least two levels. At the FAA Technical

Center, the baseline system will be tested in either a simulated or actual ATC environment by FAA Technical Center personnel. Upon satisfactory testing of the operational baseline at the FAA Technical Center, the software will be installed at selected sites and tested by the Terminal Field Support Branch, AOS-410. After system acceptance testing at the sites, the system will be further tested by site personnel. Site testing includes integration into the NAS to assure that an accurate, realistic test scenario is obtained.

c. Critical OT&E Integration Testing Items. No critical NAS integration issues have been identified.

84. OT&E OPERATIONAL TESTING. The OT&E operational testing will verify the software's operational effectiveness and suitability requirements when the operational environment includes a complete ARTS IIIA MCI system configuration connected to external systems. OT&E operational testing may be combined with OT&E integration testing and will be conducted at the FAA Technical Center and at the various sites upon installation of the operational baseline.

a. OT&E Operational Testing to Date. No ARTS IIIA OT&E operational testing has been performed to date.

b. Future OT&E Operational Testing. The ARTS IIIA operational baseline system will be tested at the FAA Technical Center to verify suitability, supportability, and maintainability. The operational baseline system will be site adapted and tested at the FAA Technical Center and at the specific sites where it is to be installed.

(1) OT&E Operational Testing Objectives. Testing will be conducted to prove the operational effectiveness and suitability of software with user participation. Testing will include:

a. Reliability and availability.

b. Degraded operations and operational utilization scenarios.

c. NAS loading and stress testing of all inter-operable subsystems.

(2) OT&E Operational Testing Events/Scope of Testing/Basic Scenarios. The OT&E operational testing event/scope of testing/basic scenarios will be developed during the OT&E phase of the program.

c. Critical OT&E Operational Testing Items. None identified at this time.

85. PAT&E. The ARTS IIIA MCI system will use hardware which has been thoroughly tested and accepted as a non-developmental item **(NDI).** With the assumption that PAT&E is performed on serially produced equipment only, no PAT&E testing will be performed.

a. NAS PAT&E to Date. The ARTS IIIA MCI hardware has been tested and accepted as NDI. There is no requirement for software PAT&E.

b. Future NAS PAT&E. Not applicable.

(1) NAS PAT&E Objectives. Not applicable.

(2) NAS PAT&E Events/Scope of Testing/Basic Scenarios. Not applicable.

c. Critical NAS PAT&E Items. None identified at this time.

86. **OT&E SHAKEDOWN TESTING.** The responsibility for the creation of the **OT&E** shakedown test plan is assigned to AOS. The **OT&E** for both the standardized and operational baselines will be conducted in accordance with policies and Order **1810.4B** and procedures described in Order 1320.48. **OT&E** shakedown testing is conducted to exercise the system in an operational environment to determine the suitability and maintainability of the ARTS IIIA MCI system. The operational and functional requirements of both baselines of the ARTS IIIA software will be tested at the FAA Technical Center and for the operational baseline at a site to be upgraded. The testing will be directed by AOS-410.

a. OT&E Shakedown Testing. Initial ARTS IIIA MCI **OT&E** shakedown testing of the software will be performed by AOS-410 at the FAA Technical Center. **OT&E** shakedown testing at the sites to be upgraded involves system users in an operational environment and will be directed by regional AF and AT division personnel using the operational baseline.

(1) OT&E Shakedown Testing Objectives

a. Identify any risks associated with development and deployment of the ARTS IIIA operational baseline software.

b. Identify any additional modifications required to the standardized baseline software before it undergoes operational baseline software development.

c. Identify any additional modifications required to the operational baseline software prior to going operational.

d. Identify issues that are critical to the operation and have an adverse impact on the system.

(2) OT&E Shakedown Testing Events/Scope of Testing/Basic Scenarios. None identified at this time.

b. Critical OT&E Shakedown Testing Items. None identified at this time.

87. OPERATIONAL READINESS DEMONSTRATION (ORD). The ORD determines and establishes the date on which a facility is to be placed into operational use. To accomplish ORD, the facility must satisfy installation, performance, operation, and maintenance criteria. The ORD is the culmination of the site shakedown activity. It formally documents that the facility, system, and equipment are ready to support real time ATC tasks and the readiness of personnel, procedures, hardware, software, and support services to support these tasks.

NOTE: Special emphasis will be placed on software functions. Adequate testing and possible modification of site adaptation data and system parameters require close coordination of site and test personnel.

88. JOINT ACCEPTANCE AND INSPECTION. The joint acceptance and inspection (JAI) activities shall be conducted in accordance with Order 6030.45, Facility Reference Data File. Accordingly, a JAI board shall be established to ensure that each ARTS IIIA facility meets specified requirements for operation and maintenance and has demonstrated that the facility is ready to be commissioned. The joint acceptance board, when convened, may include the following representatives:

a. The ANA-900 APME or his representative.

b. AF sector manager (or designated person).

c. Regional AT division representative.

d. AT facility manager (or designated person) from the involved facility.

e. Aviation Standards National Field Office, Flight Inspection Field Offices, or the regional Flight Standards Division representatives as appropriate.

f. Logistics division representatives.

g. Other representatives of the regional office, national headquarters, and the FAA Technical Center, when so selected.

89. RESERVED.

CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. MAINTENANCE CONCEPT.

a. Software Maintenance. The Terminal Field Support Branch, AOS-410, will be responsible for the operational software (including site adaptation software and associated documentation) and non-operational support software, including maintenance of diagnostic software and the associated documentation upon delivery to the first site.

b. Technical Reporting. Software technic&l reporting is accomplished via program technical reports (PTR). PTR's are completed by the ARTS IIIA MCI sites and forwarded to AOS-410 for operational software/non-operational support software and diagnostic software, in compliance with paragraph 12 of Order 1100.134A. Patches for reported PTR's will be provided to all sites via either magnetic tape or floppy disks.

91. TRAINING. All training will be developed in accordance with FAA Standard 028B. The contractor will conduct software training and cadre training for controller courses and provide each course graduate with a certificate of training. All classes will be held at the contractor's facility and will utilize contractor furnished training equipment.

92.-99. RESERVED. .

CHAPTER 10. ADDITIONAL PROJECT IMPLEMENTATION PLAN ASPECTS

100. CONFIGURATION MANAGEMENT. The configuration management procedures for the ARTS IIIA MCI project will follow established FAA procedures identified in Order 1800.8F, National Airspace System Configuration Management; and NAS-MD-001, NAS Subsystem Baseline Configuration and Documentation Listing. Configuration management is required during the life cycle of the system. The following further defines the configuration management process.

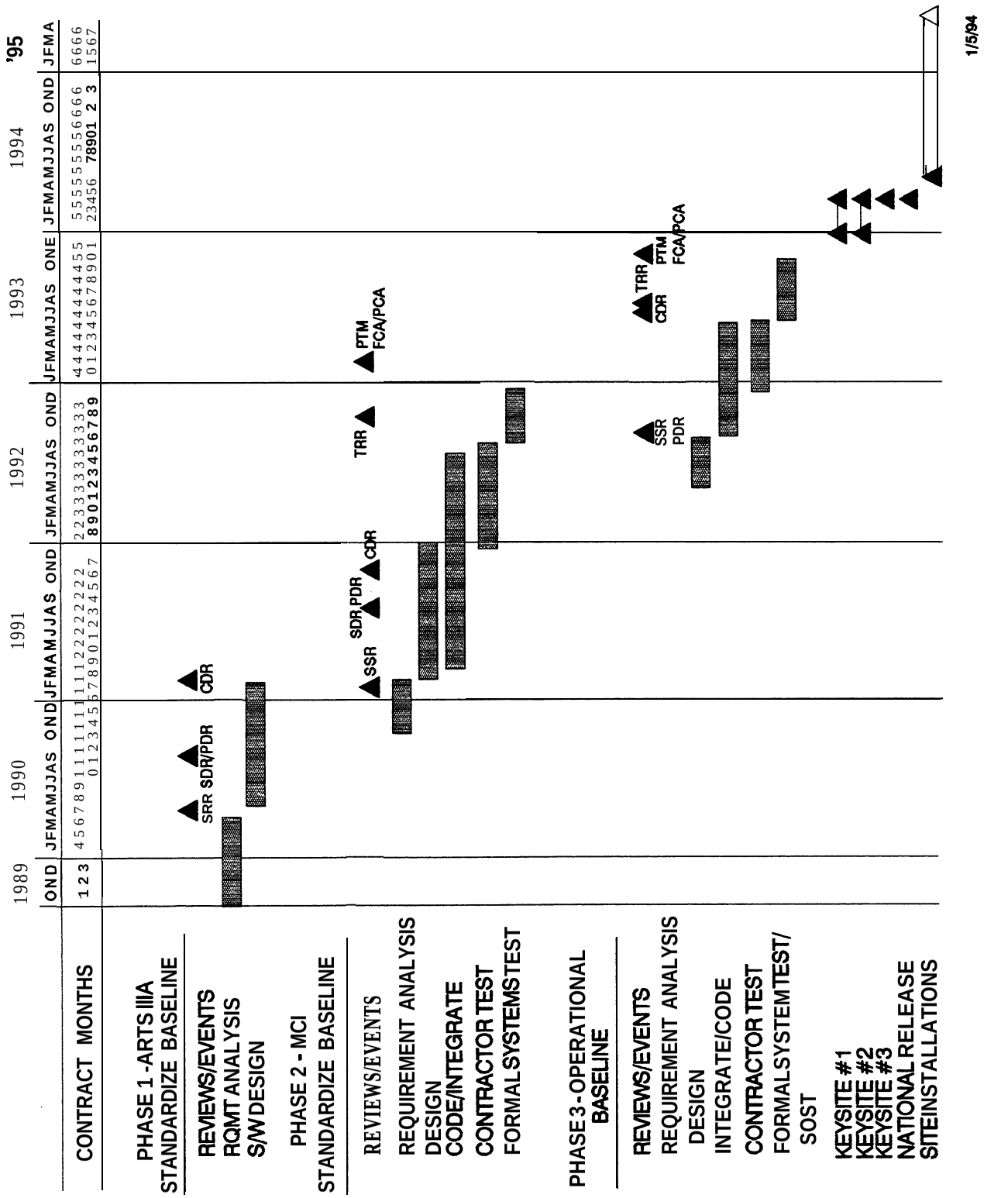
.a. Software Configuration Management (SCM). Software refers to the operational, non-operational support, and diagnostic computer programs delivered at the time the product baseline is established; i.e., system acceptance at the FAA Technical Center. ANA-500 will assume configuration management responsibility until the software product baseline is established. The Automation Software Division (ATR-200) will assume configuration management responsibilities for operational software upon delivery to the first site. AOS-400 will have configuration management responsibilities for support software.

b. Reviews and Audits. Configuration reviews and audits are conducted to verify that the level of performance achieved for each subsystem at that point in the life cycle is as specified. Reviews are the mechanisms by which the different levels of specification documentation are examined and approved before proceeding with the development. Configuration audits must verify documentation against previous baselines and added changes, as well as compare the configuration against the approved configuration identification document.

101. COMMERCIAL SOFIWARE. There is no commercial off-the-shelf software utilized in the A3.06 operational software; therefore, no requirement for any commercial license. In the course of implementing A3.06, the disposal of any existing commercially licensed software that becomes excess shall be accomplished in accordance with the procedures in Order 4800.2B.

102.409. RESERVED.

APPENDIX 1. SOFTWARE DEVELOPMENT AND TEST SCHEDULE



APPENDIX 2. MCI HARDWARE DELIVERY SCHEDULE

Installation of processors to support MCI implementation will begin in April 1993 with installation completed at all ARTS IIIA sites by March 1995. Operational software (A3.06 with MCI functionality) will be ready for installation in January 1994. It is estimated that six months will be required to adapt, build, and test the program after delivery of hardware or software, whichever is later. Full implementation should be completed approximately 21 months after national release.

SITE	H/W INSTALL COMPLETE	SITE ADAPTATION	ORD
Dallas	3/11/93	Key Site	12/31/93
Chicago	4/8/93	6 Months	7/7/94
Houston	4/30/93	Key Site	12/31/93
Dulles	5/18/93	6 Months	7/7/94
Atlanta	6/10/93	6 Months	7/7/94
Boston	6/24/93	6 Months	7/7/94
National	7/2/93	6 Months	7/7/94
FAA Academy	8/9/93	6 Months	7/7/94
Oakland	9/5/93	6 Months	7/7/94
Detroit	9/5/93	6 Months	7/7/94
Tampa	10/6/93	6 Months	7/7/94
Seattle	10/6/93	6 Months	7/7/94
Ontario (1)	10/6/93	6 Months	7/7/94
Providence	11/4/93	6 Months	7/7/94
Miami	11/4/93	6 Months	7/7/94
St Louis	11/4/93	6 Months	7/7/94
Pittsburgh	12/6/93	6 Months	7/7/94
Indianapolis	12/6/93	6 months	7/7/94
Memphis	12/6/93	6 Months	7/7/94
Columbus	12/6/93	6 Months	7/7/94
San Antonio	1/6/94	6 Months	7/7/94
Phoenix	1/6/94	6 Months	7/7/94
New Orleans	1/6/94	6 Months	7/7/94
Buffalo	2/6/94	6 Months	8/6/94
Cincinnati	2/6/94	6 months	8/6/94
Milwaukee	3/6/94	6 Months	9/6/94
Dayton	3/6/94	6 Months	9/6/94
Fort Rucker	3/6/94	6 Months	9/6/94
Portland	4/6/94	6 Months	10/6/94
Nashville	4/6/94	6 Months	10/6/94
Charlotte	4/6/94	6 Months	10/6/94
Louisville	5/5/94	6 Months	11/5/94
Tucson	5/5/94	6 Months	11/5/94

SITE	H/W INSTALL COMPLETE	SITE ADAPTATION	ORD
Birmingham	5/5/94	6 Months	11/5/94
Salt Lake City	5/26/94	6 Months	11/26/94
Tulsa	5/26/94	6 Months	11/26/94
Omaha	5/26/94	6 Months	11/26/94
Albuquerque	6/23/94	6 Months	12/23/94
Rochester	6/23/94	6 Months	12/23/94
Oklahoma City	6/23/94	6 Months	12/23/94
Burbank (1)	7/24/94	6 Months	1/24/95
Des Moines	7/24/94	6 Months	1/24/95
Raleigh Durham	7/24/94	6 Months	1/24/95
Albany	8/23/94	6 Months	2/23/95
El Paso	8/23/94	6 Months	2/23/94
Syracuse	8/23/94	6 Months	2/23/95
Shreveport	9/23/94	6 Months	3/23/95
Hartford	9/30/94	6 Months	3/30/95
Sacramento	10/23/94	6 Months	4/23/95
Orlando	10/30/94	6 Months	4/30/95
San Juan	11/23/94	6 Months	5/23/95
Minneapolis	11/30/94	6 Months	5/30/95
Cleveland	12/24/94	6 Months	6/24/95
Santa Ana (1)	12/24/94	6 Months	6/24/95
Baltimore	12/30/94	6 Months	6/30/95
Las Vegas	1/23/95	6 Months	7/23/95
San Diego (1)	1/30/95	6 Months	7/30/95
Honolulu	2/22/95	6 Months	8/22/95
Jacksonville	2/22/95	6 Months	8/22/95
Kansas City	2/22/95	6 Months	8/22/95
Norfolk	3/24/95	6 Months	9/24/95
Philadelphia	3/24/95	6 Months	9/24/95
Los Angeles (1)	3/24/95	6 Months	9/24/95
Denver	3/24/95	6 Months	9/24/95

(1) TRACON's moving to Southern California TRACON.
SCT relocation commissioning dates:

Los Angeles	2/94
Santa Ana	4/94
Burbank	10/94
Ontario	4/95
San Diego	9/95

With the exception of Los Angeles, the relocated TRACON's should commission on A3.06. The dates in this table are predicated on presently contracted hardware delivery/installation schedules.

APPENDIX 3. MCI PROGRAM MILESTONES

Activity Description	Scheduled	Date Completed
Contract Award		9/29/89
System Requirements Review (SRR) (1)		4/18/90
System Design Review (SDR) (1)		8/15/90
Preliminary Design Review (PDR) (1)		8/15/90
Contract Modification (MCI/OP Baseline)		9/30/90
Critical Design Review (CDR) (1)		2/27/91
Software Specification Review (SSR) (2)		2/27/91
SDR/PDR (2)		8/21/91
Initial DRR Team Meeting		10/10/91
CDR (2)		10/30/91
MCI Hardware First Article Test		3/10/92
SSR/SDR/PDR (3)		9/10/92
Test Readiness Review (TRR) (2)		9/11/92
Formal System Test Complete (2)		12/6/92
Functional/Physical Configuration Audit (FCAIPCA) (2)		3/2/93
TRR (3)		5/25/93
CDR (3)		6/22/93
Formal System Test Complete (3)		7/28/93
FAA System On Site Test (SOST). (3)		9/17/93
FCAIPCA (3)		11/19/93
Key Site 1 Test (Dual Sensor)		12/3/93
DRR Executive Committee (Software Only)		12/7/93
Key Site 2 Test (Dual Sensor)		12/17/93
Key Site 3 Test (Single Sensor)		1/14/94
National Release A3.06		1/28/94

NOTES: (1) Phase 1 - ARTS IIIA Standardized Baseline
(2) Phase 2 - MCI Standardized Baseline
(3) Phase 3 - Operational Baseline (A3.06)

APPENDIX 4. PROJECT CONTACTS

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Training-Technical

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APPENDIX 5. LIST OF APPLICABLE DOCUMENTS

DTFA01-89-C-00058	ARTS IIIA Enhancement Contract
Order 1100.134A	Maintenance of National Airspace System Automation Subsystems
Order 1320.48	Engineering Field Support Sector Maintenance Program Procedures, National Airway Engineering Field Support Sector, and National Automation Engineering Field Support Sector
Order 1750.6A	NAS Documentation Facility
Order 1800.8F	National Airspace System Configuration Management
Order 1800.63A	National Airspace System Deployment Readiness Review Program
Order 1810.4B	FAA NAS Test and Evaluation Policy
Order 4800.2B	Utilization and Disposal of Excess and Surplus Personal Property.
Order 6030.45	Facility Reference Data File
Order 6190.14	ARTS IIIA Interim Support Program Project Implementation Plan
FAA-STD-024B	Preparation of Test and Evaluation Plans and Test Procedures
FAA-STD.026	National Airspace System Software Development
FAA-STD-028B	Contract Training Programs
DOD-STD-2167A	Defense System Software Development
MIL-STD-1521B	Technical Reviews and Audits for Systems, Equipment, and Computer Software
ARTS IIIA	Computer Program Functional Specification NAS MD-631 through for ARTS IIIA, Operational Program A3.05 NAS MD-649 contained in A3.05 Site Bulletin 1, April 15, 1992
NAS-MD-001	NAS Subsystem Baseline Configuration and Documentation Lising
ATC 40012	Software Requirements specification, Update 03 (Operational Baseline), Revision A

APPENDIX 6. ACRONYM LIST

The acronyms in this list are used within this document.

Acronym	Definition
AAP	Advanced Automation Program
AAS	Advanced Automation System
ACN	Engineering, Test, and Evaluation Service
AF	Airway Facilities
ALM	Requirements and Life Cycle Management
APM	Associate Program Manager
APMC	Associate Program Manager for Contracts
APME	Associate Program Manager for Engineering
APML	Associate Program Manager for Logistics
APMP	Associate Program Manager for Procedures
APMQ	Associate Program Manager for Quality
APMR	Associate Program Manager for Requirements
APMSE	Associate Program Manager for System Engineering
APMT	Associate Program Manager for Test
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
AT	Air Traffic
ATC	Air Traffic Control
BANS	BRITE Alphanumeric Subsystem
BRITE	Bright Radar Indicator Tower Equipment
CA	Conflict Alert
CCB	Configuration Control Board
CCD	Configuration Control Decision
CDR	Continuous Data Recording
CIP	Capital Investment Plan
c o	Contracting Officer
CPFS	Computer Program Functional Specification
CPU	Computer Processing Unit
CSCI	Computer System Configuration Item
c s c	Computer Software Component
c s u	Computer Software Unit
DBRITE	Digitial Bright Radar Indicator Tower Equipment
DECCO	Defense Commercial Communication Office
DOT	Department of Transportation
DRR	Deployment Readiness Review
DT&E	Development Test and Evaluation

EPM	Enhanced Performance Monitor
F&E	Facilities and Equipment
FAA	Federal Aviation Administration
FCA	Functional Configuration Audit
FDAD	Full Digital ARTS Display
FQT	Full Qualification Testing
GFP	Government Furnished Property
ICA	Interfacility Communication Adapter
ILSP	Integrated Logistics Support Plan
IO	Input/Output
IOC	Initial Operational Capability
IOPB	Input Output Processor, Type B
ISP	Interim Support Program
JAI	Joint Acceptance and Inspection
MCI	Mode C Intruder
MOA	Memorandum of Agreement
MSAW	Minimum Safe Altitude Warning
MTP	Master Test Plan
NAILS	National Airspace Integrated Logistics Support
NAILSMT	NAILS Management Team
NAS	National Airspace System
NCP	National Airspace System Change Proposal
NDI	Non-Developmental Item
NY	New York
ORD	Operational Readiness Demonstration
OPM	Office of Personnel Management
OST	Office of the Secretary of Transportation
OT&E	Operational Test and Evaluation
PAT&E	Production Acceptance Test and Evaluation
PCA	Physical Configuration Audit
PDSR	Program Director's Status Review
PIP	Project Implementation Plan
PM	Program Manager
POC	Point of Contact
PTR	Program Technical Report
QRO	Quality Reliability Officer

RAPM	Regional Associate Program Manager
RETRACK	Retrack Processing
RDBM	Remote Display Buffer Memory
RIG	Regional Integration Group
SCIP	Surveillance Communication Interface Processor
SCM	Software Configuration Management
SETA	Systems Engineering and Technical Assistance
SOST	System Onsite Test
RAP	Sensor Receiver and Processor
SRS	Software Requirement Specification
STP	System Test Plan
STPR	System Test Procedures
STR	System Test Report
T&E	Test and Evaluation
TELCO	Telephone Company
TIG	Terminal Integration Group
TIM	Technical Interchange Meeting
TO	Technical Office
TOR	Technical Onsite Representative
TPRC	Test Policy Review Committee
TRACON	Terminal Radar Approach Control
TRR	Test Readiness Review
VRTM	Verification of Requirement Traceability Matrix