Automation Functional Programs

New Project Number	Title	Previous Project Number(s)	Page Number
A01	En Route Automation Program • Display Channel Complex Replacement (DCCR) • Host/Oceanic Computer System Replacement (HOCSR) • Eunomia • En Route Domain Infrastructure (ERDI)	21-12, 21-13, 56-29 Completed New New New	Automation-3
A02	Tower Automation Program (currently inactive)	21-12	Automation-5
A03	Automated Radar Terminal System (ARTS) Improvements • Terminal Automation Sustainment	22-09, 32-04, 32-06, 32-20, 32-29, 42-21, 42-25, 46-30, 52-21, 56-29 New	Automation-6
A04	Standard Terminal Automation Replacement System (STARS) • STARS Preplanned Product Improvements	62-25 New	Automation-8
A05	Air Traffic Management Program • Collaborative Decisionmaking (CDM) • Surface Movement Advisor (SMA) • Traffic Management Advisor (TMA) • Passive Final Approach Spacing Tool (pFAST)	21-06, 21-13, 41-06, 51-22, 62-20, 62-24 New New New New	Automation-9
A06	En Route Software Development	21-09, 41-21	Automation-14
A07	Operational and Supportability Implementation System (OASIS) for Flight Service Automation System (FSAS)	43-01, 43-04, 43-22	Automation-15
A08	Operational Data base Management System (ODMS)	43-21	Automation-16
A10	Oceanic Automation Program (OAP)	21-05, 61-22, 61-23	Automation-17
A13	Digital Bright Radar Indicator Tower Equipment (DBRITE)	32-16	Automation-18

Automation Functional Programs

New Project Number	Title	Previous Project Number(s)	Page Number
A14	Instrument Approach Procedures Automation (IAPA)	56-23	Automation-19
A15	Civil Aviation Registry Modernization	56-24	Automation-20
A17	Aviation Safety Analysis System (ASAS)	56-51	Automation-21
A18	Safety Performance Analysis System (SPAS)	56-58	Automation-22
A19	Portable Performance Support System (PPSS)	56-72	Automation-23
A20	Integrated Flight Quality Assurance (IFQA)	66-21	Automation-24
A21	Conflict Probe • URET Core Capabilities Limited Deployment (CCLD)	New	Automation-26
A22	Free Flight Phase I (FFPI) Integration	New	Automation-27
A23	NAS-Wide Information Services (NIS)	New	Automation-29

A01–En Route Automation Program

Program Description: Expected demand for NAS services is beyond the projected capability of the current air traffic control (ATC) system. The present ATC system is designed primarily to manage aircraft movement within defined corridors. To relieve expected demand overloads and associated higher aircraft operation costs, future systems must allow a progressive evolution to a free flight environment.

Complicating the need for growth is the need to replace aging and unsupportable equipment. Current en route controller automation workstation equipment is difficult to support due to lack of replacement parts, while the system architecture lacks sufficient flexibility to accommodate software enhancements.

Projects within the en route automation program will replace aging and unsupportable equipment and allow continued system growth while providing a safe, effective, and efficient air traffic environment. This program includes a number of discrete projects being developed in an evolutionary fashion. Though discrete, interdependencies exist between these projects.

Display Channel Complex Rehost (DCCR). This is a low-risk display system replacement. The project relies on commercially available products to provide a new controller display channel and associated firmware that will function with in-place software. The DCCR project has been completed and is meant to be a stopgap measure until display system replacement (DSR) implementation.

Display System Replacement (DSR). The DSR will modernize ATC display systems in all air route traffic control center (ARTCC) facilities in the United States. This project will provide air traffic controllers with a modern digital display system capable of processing and providing information in a fast, reliable manner. DSR implementation is a required precursor for Conflict Probe (A21/A22).

DSR will replace aging, unsupportable display equipment (i.e., Computer Display Channel, Plan View Display) and controller workstations with functionally equivalent, expandable hardware and software. The system will address the need for enhanced display management, high reliability, continuous operation, and adaptability. The modern DSR open system design is expandable and will easily accommodate new functions and upgrades. DSR will be functionally equal or superior to the current system. It will also replace equipment used to provide communications with the Host mainframe computer, alphanumeric data displays, and flight strip printers. DSR will also be able to display next generation weather radar (NEXRAD) information.

Host and Oceanic Computer System Replacement (HOCSR). This project will replace the Host and oceanic system hardware to solve current supportability and potential year-2000 compliance problems. Initially, the software running on the HOCSR platform will be essentially the same software architecture that was implemented in the early 1970's. To introduce early functionality, en route capabilities will be expanded in the early stages with new applications executing on processors external to the HOCSR (Host). Initial reengineering tasks of HOCSR (Host) will be performed to study the technical evolution from the current platform to the modernized en route architecture.

Eunomia. Direct access radar channel (DARC), peripheral adapter module replacement item (PAMRI), Host interface device/NAS local area network (HID/NAS LAN), and other ancillary en route systems functionality will be replaced by systems that facilitate a common en route open system architecture and the addition of new functions. The current systems will be replaced by 2004 when all are expected to reach their end-of-service life. The new systems will also provide additional enhancements designed to promote the transition to the Free Flight operational concept.

These additional enhancements include:

- Support of all relevant surveillance sensor types, including
  - Primary radar
  - Air traffic control radar beacon system (ATCRBS)
  - Mode S
  - Automatic dependent surveillance (ADS)
- Continuously available functionality (conflict alert (CA), minimum safe altitude warning (MSAW), Mode C Intruder)
- Improved tracker capabilities
- Improved computer-human interface (CHI)
- Expanded capacity (e.g., processor power and number of surveillance sensors).

En Route Domain Infrastructure (ERDI). This project has three segments.

The first segment will fund sustainment of currently deployed en route systems, such as Host, DARC, and PAMRI until they are upgraded or replaced as described above.

The second segment will implement HID/NAS LAN. This network will allow the air traffic control applications for the near-term Free Flight Phase 1 functions to reside and execute in processors outboard of the Host, while having access to Host computer data.

The third segment relates to upgrading en route system components to meet supportability, capacity, and new functionality requirements. Commercial en route system elements will be replaced as they reach the end of their service life. New functions and system capacity will be added to meet requirements

Products:

- Central Computer Complex Host (CCCH)
- Computer Display Channel (CDC)
- Display System Replacement (DSR)
- Display Channel Complex Rehost (DCCR)
- Direct Access Radar Channel (DARC)
- Enhanced Direct Access Radar Channel (EDARC)
- Host interface display (HID)/NAS local area network (LAN) (HNL)
- Peripheral adapter module replacement item (PAMRI)
- Host/oceanic computer system replacement (HOCSR).

Accomplishments (1/97–9/98):

- Commissioned the final four DCCR's at Fort Worth, Washington, Cleveland, and New York ARTCC's
- Decommissioned and removed Display Channel Complex (DCC) from the final site
- Delivered DSR equipment to 14 ARTCC's, the William J. Hughes Technical Center (WJHTC), and the FAA Aeronautical Center
- Completed DSR operational test and evaluation
- Initiated initial operating capability of DSR in June 1998
- Received JRC approval for MNS-309 (umbrella MNS for en route domain)
- Completed HOCSR program investment analysis and obtained JRC approval
- Delivered HOCSR equipment to six ARTCC's, WJHTC, and the Academy.

Sponsor Organization:

- ATS-1, Air Traffic Services.

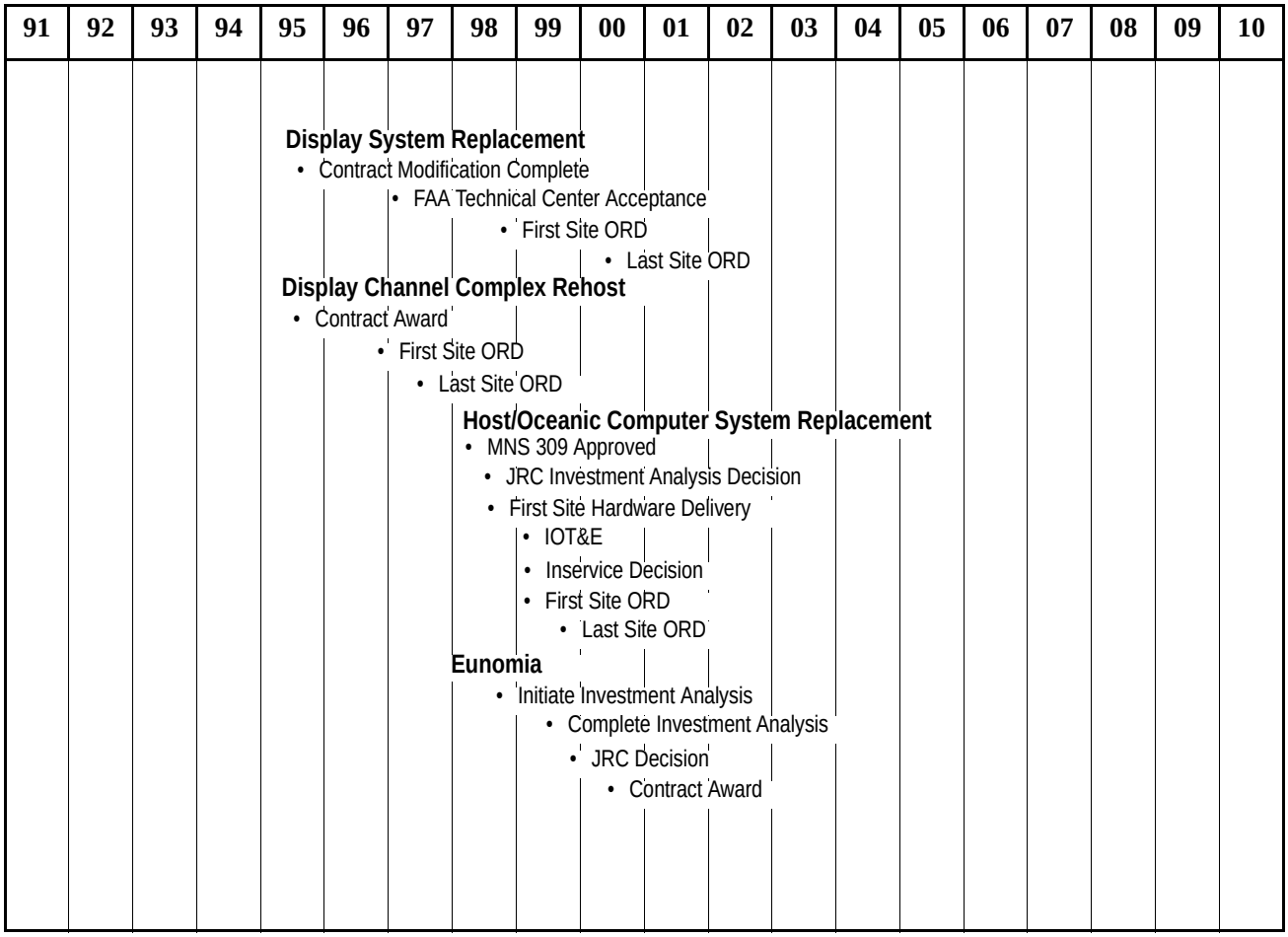
Performing Organization:

- AUA-200, IPT for En Route Air Traffic Systems Development.

Contractors:

- Lockheed Martin Air Traffic Management
  Rockville, Md.

Schedule: A01 - En Route Automation Program



A02–Tower Automation Program

Program Description: This program is inactive. Its purpose was to integrate new safety systems with existing systems in a consolidated automation platform with a common computer-human interface (CHI). There is no basic infrastructure to efficiently build new functionality/capability into towers. Airport traffic control towers have added status and control systems in a piecemeal fashion where space was available. This has led to a proliferation of individual keyboards and displays, creating an inefficient use of space and an overcrowded tower cab.

The basic problem is that controllers have minimal flexibility to rearrange operational positions for different tower operating conditions, and the individual control systems are not placed in optimal positions for the most efficient controller performance. Also, each system within a tower has a separate CHI that requires training on each individual piece of equipment.

A mission analysis is in progress for the tower area. The FAA will define a tower program based on mission and investment analysis results.

Products:

- Up to 50 tower automation platforms for selected high-density airports
- Two platforms for the Mike Monroney Aeronautical Center and one for the William J. Hughes Technical Center.

Accomplishments (1/97–9/98):

- Program inactive.

Sponsor Organization:

- ATS-1, Air Traffic Services.

Performing Organization:

- Program inactive.

Contractors:

- N/A.

Schedule: A02 - Tower Automation Program

91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
									INACTIVE (pending mission need analysis)										

A03–Automated Radar Terminal System (ARTS) Improvements

Program Description: Automated radar terminal systems gather information from surveillance sensors, process it, and present it to air traffic controllers in TRACON's and control towers. Requirements currently exist and will continue to grow for providing new automation systems that enhance services to users. Established facilities are experiencing increased demand for new system capability, capacity, and sustainability. The earlier ARTS IIA/IIIA systems are 1970's vintage and are experiencing reduced mean time between failures and increased maintenance costs. Industry no longer supports such critical components as magnetic tape drives, data entry display subsystems, and the central processor.

The basic approach is to sustain and improve ARTS until the systems' time-phased replacement by the Standard Terminal Automation Replacement System (STARS). The strategy also includes using displaced automated radar terminal equipment to support remaining fielded systems, thus making optimal use of limited resources.

ARTS improvements are divided into four major projects: Common ARTS, ARTS IIIA, Terminal Software Development, and Terminal Automation Sustainment.

Common ARTS. The ARTS IIIE A6.05 version replaces six ARTS IIIA systems and three ARTS IIIE systems at five of the Nation's busiest TRACON's. The A6.05 version can process up to 10,000 tracks from 15 radar inputs and display information at 223 controller workstations. The ARTS IIE A2.09 version replaces about 135 ARTS IIA systems at small to medium-sized TRACON's. The A2.09 version can process up to 512 tracks from two radar inputs and display information at 22 controller workstations. The two versions share a common high-order language software, use similar commercial-off-the-shelf equipment, and include the National Transportation Safety Board-mandated Mode C Intruder functionality. Neither version replaces the existing controller displays.

ARTS IIIA. This project is near completion. It replaces aging disk drives and disk drive controllers, refurbishes data entry display subsystems (DEDS), and adds new functionality such as final approach spacing tool (FAST), final monitor aid (FMA), and traffic alert and collision avoidance system (TCAS) resolution advisory (RA) display. The ARTS IIIA system is in use in over 60 medium to large terminal airspace areas, and is capable of processing up to 900 tracks from three sensors and displaying information at 36 workstations.

Terminal Software Development. This project provides contractor support for developing, integrating, and implementing software changes to correct operational problems and provides system enhancements. The contract augments in-house FAA resources and provides services for all the ARTS for tasks such as software system releases, configuration management, and maintenance of system software libraries.

Terminal Automation Sustainment. This project provides a continuous and predictable funding basis to support safe and effective fielding and inservice management of terminal automation systems in the NAS.

Costs associated with moving terminal automation products into operational air traffic control service include funding for:

- Recurring hardware and software problems (Hardware Discrepancy Reports (HDR) and Program Trouble Reports (PTR)) identified by the TRACON operational staff
- Air traffic safety-related problems identified by the operational controllers (Unsatisfactory Conditions Reports)
- Operational needs dictated by changes in airspace and air traffic procedures, such as site adaptations and system software revisions.

Required inservice management support includes:

- Routine evolution of software tools used to support automation system software development and software support environments
- Automation system component obsolescence
- Contractor dedicated automation system logistics services, as required
- Automation system configuration management support
- Automation system modification management support
- Automation system relocation and/or site reconfiguration support resulting from automation environment changes caused by evolution of the NAS air traffic characteristics.

Products:

- Common ARTS national software baseline
- ARTS IIA sustainment
- ARTS IIIA sustainment
- Common ARTS (ARTS IIE and ARTS IIIE) sustainment
- DBRITE/DBRITE video compression sustainment
- PTR, HDR, and NAS Change Proposal (NCP) management and resolution
- Configuration management
- Engineering support
- Common ARTS IIE at 135 sites as an upgrade to ARTS IIA or as a new acquisition
- Common ARTS IIIE at five sites as an upgrade to ARTS IIIE A6.04 or ARTS IIIA or as a new acquisition
- Contractor support for recurring and nonrecurring software support service tasks
- Interim support for 131 ARTS IIA systems until replaced by Common ARTS IIE
- Interim support for three ARTS IIIE A6.04 systems until replaced by Common ARTS IIIE
- Interim support for 61 ARTS IIIA systems until replaced by STARS
- Prototype and fielded display systems, including FMA, Full Digital ARTS Display, DEDS, Radar Alphanumeric Displays, and ARTS Color Displays
- Center TRACON automation system (CTAS), FAST, and initial terminal data link (ITDL) functional improvements for ARTS IIIE.

Accomplishments (1/97–9/98):

- Installed ARTS IIIE A6.05 hardware in the Dallas-Fort Worth, Chicago, New York, Denver, and Southern California TRACON's
- Completed development of the Common ARTS software and accepted the baseline system from the development contractor
- Completed Common ARTS testing at the Southern California and Pensacola TRACON's
- Declared initial operation capability (IOC) at all five ARTS IIIE sites, declared operational readiness demonstration (ORD) at two of five sites, commissioned system at one of five sites
- Declared IOC at 16 ARTS IIE sites, declared ORD at 14 of 16 sites
- Deployed ARTS Gateway to Dallas-Ft. Worth TRACON to interface ARTS IIIE (A6.05) to Center TRACON Radar Approach Control (CTAS)/ passive Final Approach Spacing Tool (pFAST)
- Deployed the Optical Disk Subsystem to ARTS IIIE sites.

Sponsor Organizations:

- AAT-1, Air Traffic Service
- AAF-1, Airway Facilities Service
- AOS-1, Operational Support Service
- ARU-1, Air Traffic System Development.

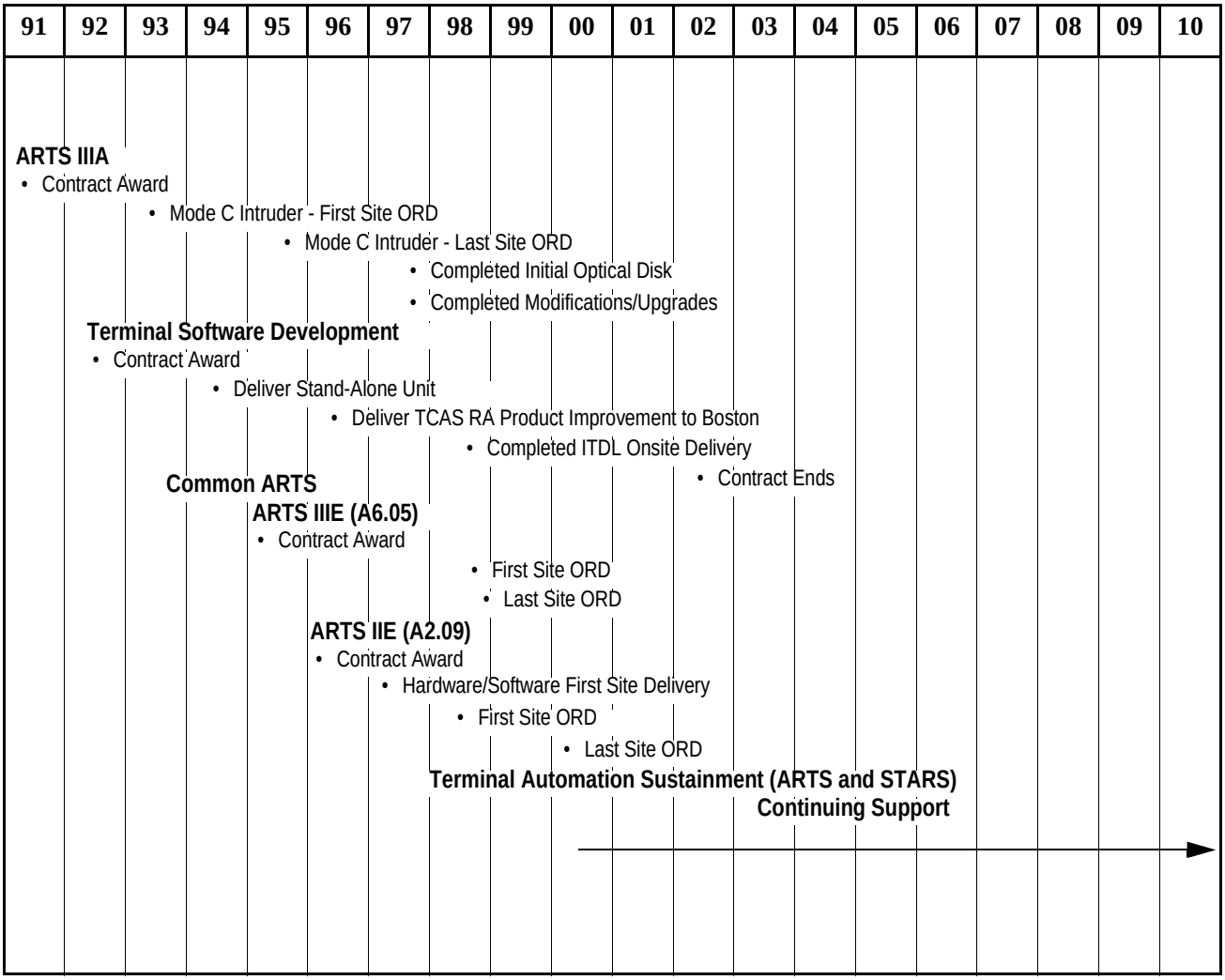
Performing Organization:

- AUA-300, IPT for Terminal, Air Traffic Systems Development.

Contractors:

- Lockheed Martin Air Traffic Management
  Rockville, Md.

Schedule: A03 - Automated Radar Terminal System (ARTS) Improvements



A04–Standard Terminal Automation Replacement System (STARS)

Program Description: This program develops and deploys a new terminal automation system. STARS is a scalable, open system architecture system designed to meet the automation needs of both small and large terminal area facilities; it will replace the FAA's Automated Radar Terminal Systems (IIA, IIE, IIIA, and IIIE), Digital Bright Radar Indicator Tower Equipment, and various DOD air traffic control systems. Its distributed processing network and display architecture is fast, cost-effective, and robust. Future enhancements will be incorporated through preplanned product improvements. STARS will solve existing capacity problems and satisfy future NAS requirements. It will also reduce controller workload and improve safety at major airports.

Products:

- STARS for approximately 172 TRACON's and up to 362 control towers
- Approximately 1,700 radar controller workstations, 550 tower displays, and 250 maintenance workstations
- Centralized maintenance and regional support facilities
- Contract hardware and software maintenance and support.

Accomplishments (1/97–9/98):

- Upgraded two STARS systems installed at the William J. Hughes Technical Center to the field operational configuration
- Completed major requirements and design reviews
- Completed five scheduled software development assessment demonstrations

- Demonstrated integration of the developed and commercial components in a common architecture
- Completed a key system test that successfully demonstrated the capability of STARS workstations to operate with existing terminal system hardware and software; configuration to be deployed at Ronald Reagan Washington National Airport
- Participated in the FAA Human Factors Working Group to identify and resolve computer-human interface (CHI) issues; developed rapid prototypes using new keyboards and trackballs to assist controller review of the CHI system
- Conducted integrated baseline review
- Completed site preparation, equipment delivery, and installation at Ronald Reagan Washington National Airport, Boston's Logan Airport, Eglin Air Force Base, and the Northeast Operational Support Facility at Nashua, N.H.
- Initiated formal testing on the STARS configurations for Ronald Reagan Washington National Airport and Eglin Air Force Base.

Sponsor Organizations:

- AAT-1, Air Traffic Service
- AAF-1, Airway Facilities Service.

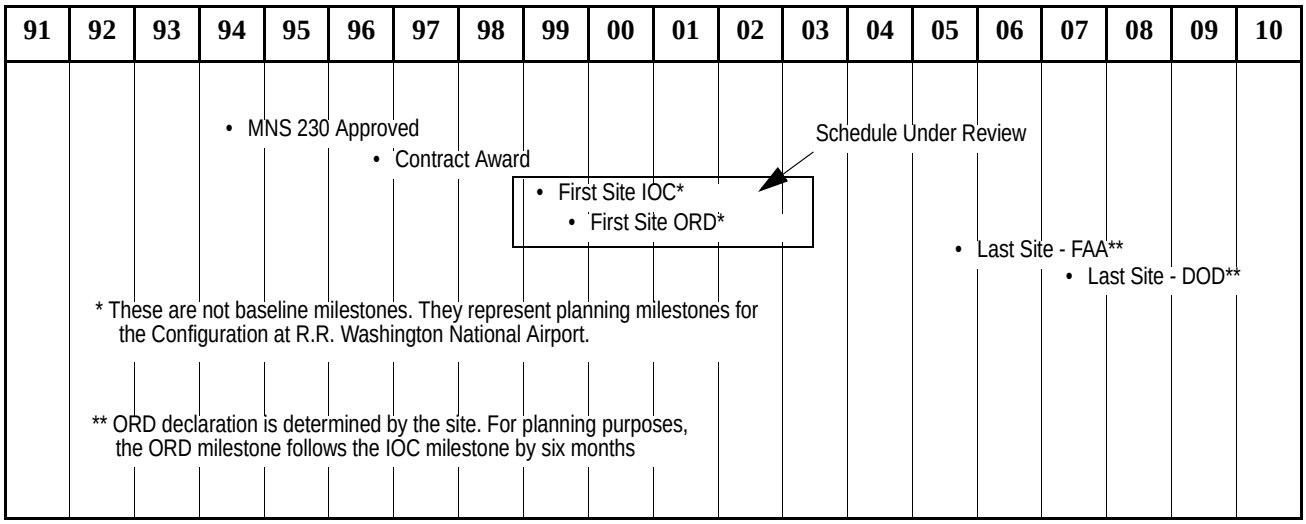
Performing Organization:

- AUA-300, Terminal IPT, Air Traffic Systems Development.

Contractors:

- Raytheon Company, Equipment Division
  Marlborough, Mass.
- Sun Microsystems
  Mountain View, Calif.
- UFA, Incorporated
  Lexington, Mass.

Schedule: A04 - Standard Terminal Automation Replacement System (STARS)



A05–Air Traffic Management Program

Program Description: The existing NAS was not designed to accommodate user efficiencies created with the advent of inertial and satellite navigation systems or the Free Flight concept. Due to NAS constraints, users cannot reduce their operational costs by flying preferred routes or by receiving desired departure/arrival slots on the airport. Additionally, the aging NAS infrastructure imposes high operational costs on the FAA itself. Under the Free Flight concept, it is essential for the FAA to identify and understand air traffic dynamics within the en route and terminal environments. These measurements will enable development of a definition of what and how many functions will be needed to support Free Flight. As new functions are introduced, the need for information exchange with users must be accommodated through open systems and standard interfaces to allow for traffic flow collaborative decisionmaking.

The Air Traffic Management (ATM) program integrates the development and deployment of the traffic flow management (TFM) and air traffic control (ATC) functions into a single ATM system. This program is supported by an interagency organization, including representatives from the National Aeronautics and Space Administration (NASA), for research and development initiatives. The ATM program will

expedite developing and deploying an advanced TFM/ATC decision support system to enhance NAS safety, capacity, flexibility, and efficiency. The program consists of three principal projects:

Traffic Flow Management Infrastructure. The enhanced traffic management system (ETMS) is the backbone of the current TFM infrastructure. This project will modernize the ETMS in an incremental fashion, using an open systems architecture, which will result in a supportable, transportable TFM infrastructure.

In the near term, existing software is being converted to an open systems architecture to eliminate reliance on proprietary hardware that is rapidly becoming unsupportable. The converted software will be fielded on upgraded hardware. In the far term, this program will reengineer TFM hardware and software to provide an expandable infrastructure that can accommodate new functions. This new baseline infrastructure is the foundation for the advanced TFM functionality being provided by this project. This foundation is essential for maximizing aircraft throughput, minimizing delays, and increasing user benefits.

This system will replace the existing proprietary architecture fielded at all air route traffic control center (ARTCC), 28 terminal radar approach control (TRACON), and two combined center radar approach control (CERAP) facilities; nine regional offices; the William J. Hughes Technical Center (WJHTC); and the FAA Academy. Funding will also be used to implement the aircraft situation display and monitor alert functions in additional ATC facilities. This infrastructure reengineering will achieve year-2000 compliance.

This project upgrades wide area network (WAN) communications between the field sites and hub to satisfy availability and bandwidth requirements. It also reengineered proprietary communications software to migrate to standard commercial-off-the-shelf (COTS) messaging solutions and to remove dependencies on complex proprietary designs.

Advanced Traffic Flow Management (TFM) Functionality. This project develops collaborative decisionmaking and decision support tools for traffic flow management. These tools include:

- *Data Exchange:* Enables the FAA to provide users with near-real time NAS and TFM information, the Department of Defense to provide special use airspace (SUA) status and schedule information, and system users to provide the FAA with schedules and other operational planning information.
- *Collaborative Decisionmaking (CDM):* Enables traffic flow management specialists and industry planners to use common data and automation applications to generate traffic flow management strategies that balance FAA responsibilities with industry economics.
- *NAS Flow Analysis:* Gauges the performance of the TFM process, monitors compliance with TFM strategies, and increases FAA and industry understanding of TFM operational dynamics through a set of near real-time analysis tools.
- *Departure Flow Management (DFM)*: Aids in coordinating departures from multiple ATCT's. Flight plan data from the NAS are displayed and updated at ATCT's, TRACON's, ARTCC's, and (in the future) the ATCSCC. DFM also provides coordinated management of departures.

Advanced Air Traffic Control Functionality. This project develops decision support tools for surface, terminal, and en route functional areas. Both SMA and CTAS will support free flight capabilities and schedules. These tools include:

- *Surface Movement Advisor (SMA):* Monitors ground movement on the airport surface. SMA will provide a collaborative decisionmaking capability among ATC, the airlines, and airport operators to reduce delays in surface operations.
- *Center TRACON Automation System (CTAS):* Provides controllers with recommended miles-in-trail separation, meter fix crossing times, and runway assignments and demand information. It also provides warnings of predicted excess demand, reports delays to the National Airspace Performance Reporting System, and supports interfacility coordination.

  CTAS provides computer automation to enhance the arrival/departure throughput and efficiency of air traffic operations in the extended terminal airspace surrounding major airports. CTAS provides controllers and traffic management coordinators (TMC) with automation aids to assist in optimizing the:

  – Flow of traffic to high-volume airports within ARTCC and TRACON airspace

  – Use of available runways and surrounding airspace.

  CTAS consists of two major operational capabilities: the Traffic Management Advisor (TMA) used

in ARTCC's, TRACON's, and Towers; and the Final Approach Spacing Tool (FAST) used in TRACON's.

TMA-Single Center (SC) is a strategic traffic management tool that assists the ARTCC TMC function by creating a plan that can deliver properly sequenced aircraft to a TRACON and destination airport. TMA also provides optimal traffic flow strategies to the ARTCC controller in the form of meter lists at the sector positions. TMA-SC provides a meter list to the TRACON TMC for monitoring arrival traffic sequencing into TRACON airspace. TMA-SC will be developed as part of the Free Flight Phase 1, Core Capability Limited Deployment (FFP1 CCLD) program.

Passive FAST (pFAST) provides optimized aircraft landing sequence and runway assignments to ATC specialists in TRACON's to assist in merging and spacing aircraft to the runway. pFAST will allow more efficient use of both arrival and departure runways during peak periods in congested terminal airspace. pFAST will be developed as part of the FFP1 program.

Functional enhancements currently planned for implementation in CTAS following FFP1 include:

- TMA Multicenter (TMA-MC) will extend TMA capabilities to airports that require metering from adjacent center airspace into the airspace of the center containing the airport.
- Descent Advisor (DA) will provide optimized descent point and descent speed advisories to controllers. DA advisories will provide more efficient descent paths and more efficient use of the arrival airspace.

- *Controller Automated Spacing Aid (CASA)*: CASA assists air traffic controllers in visualizing spacing between aircraft on different flight plans within the terminal airspace. The initial implementation of this capability is known as the converging runway display aid (CRDA), which has been implemented in the ARTS IIA/IIIE computer software.
- *Automated En Route Air Traffic Control (AERA)*: This function is covered under a new title, "Conflict Probe" (CIP No. A21).

Products:

- 2 SMA Phase 1 tools
- 3-4 SMA Phase 2 tools
- 6 pFAST tools (terminal facilities)
- 8 TMA-SC tools (en route facilities)
- Integrated hardware and software
- Upgraded hardware at 52 operational ATC facilities and 12 support facilities
- Collaborative decisionmaking capabilities
- TFM decision support tools
- One high-fidelity airport traffic control tower (ATCT)/airfield simulator
- Collaborative departure scheduling tool
- Descent advisor capabilities at each CTAS location.

Accomplishments (1/97–9/98):

TFM Infrastructure:

- Implemented capability for airlines to receive current and projected air traffic control system demand
- Implemented ETMS at Tampa, Indianapolis, and Cleveland TRACON's; Los Angeles, Newark, San Francisco, and Kennedy control towers; and the Alaska Regional Office
- Implemented ETMS to ARTS IIIE interface at New York, Chicago, Southern California, and Dallas-Fort Worth TRACON's
- Implemented the San Juan CERAP ETMS-en route automated radar tracking system (EARTS) interface
- Implemented an ETMS to ODAPS interface at the New York Flight Information Region (FIR)
- Implemented DFM at New York Center; New York and Philadelphia TRACON's; and Philadelphia, Newark, JFK, and La Guardia airport towers
- Completed the interface to ODAPS at the Oakland FIR.

Advanced TFM Functionality:

- FAA and industry established the first Collaborative Decisionmaking network (CDMnet) communications capability enabling the exchange of data between the FAA and industry (7/97)
- Began prototype operations of the initial set of CDM ground delay program enhancements at San Francisco and Newark airports (1/98)
- Expanded CDM prototype operations to St. Louis and La Guardia airports (4/98)

- Established NAS Status Information data distribution infrastructure at the ATCSCC and hubsite (7/98)
- Expanded CDM prototype operations to all airports (9/98).

Advanced ATC Functionality:

- Completed SMA benefits and operational assessments at Atlanta
- pFAST tool in daily use at DFW
- Awarded TMA-SC/pFAST development contract task modification
- Awarded TMA-SC/pFAST adaptation contract
- Conducted TMA-SC/pFAST preliminary design review
- Implemented ground delay program enhancements.

Sponsor Organization:

- ARS-1, Air Traffic System Requirements Service.

Performing Organization:

- AOZ-1, FFP1 Program Office.

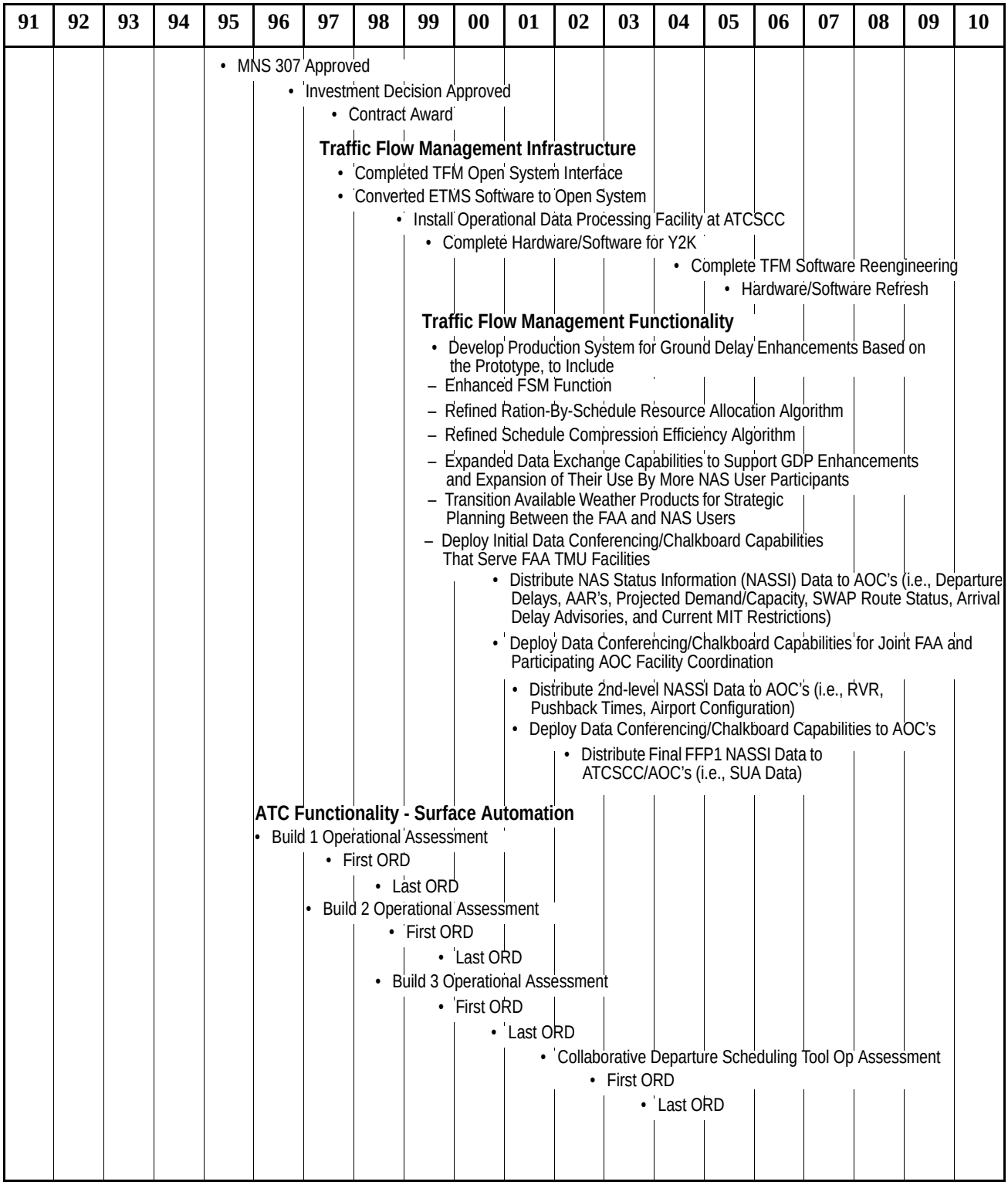
Contractors:

- Computer Sciences Corporation
  Egg Harbor Township, N.J.
- GTE/Contel Federal Systems
  Chantilly, Va.
- Federal Data Corporation
  Bethesda, Md.
- Crown Communications
  Washington, D.C.
- Sterling Software, Inc., Space & Transportation Division
  Falls Church, Va.
- Metron
  Reston, Va.
- Oak Ridge National Laboratory
  Oak Ridge, Tenn.
- National Center for Atmospheric Research
  Boulder, Colo.
- National Center of Excellence for Aviation Operations Research (NEXTOR)
  University of Maryland and MIT
- Electronic Data Systems
  Plano, Tex.

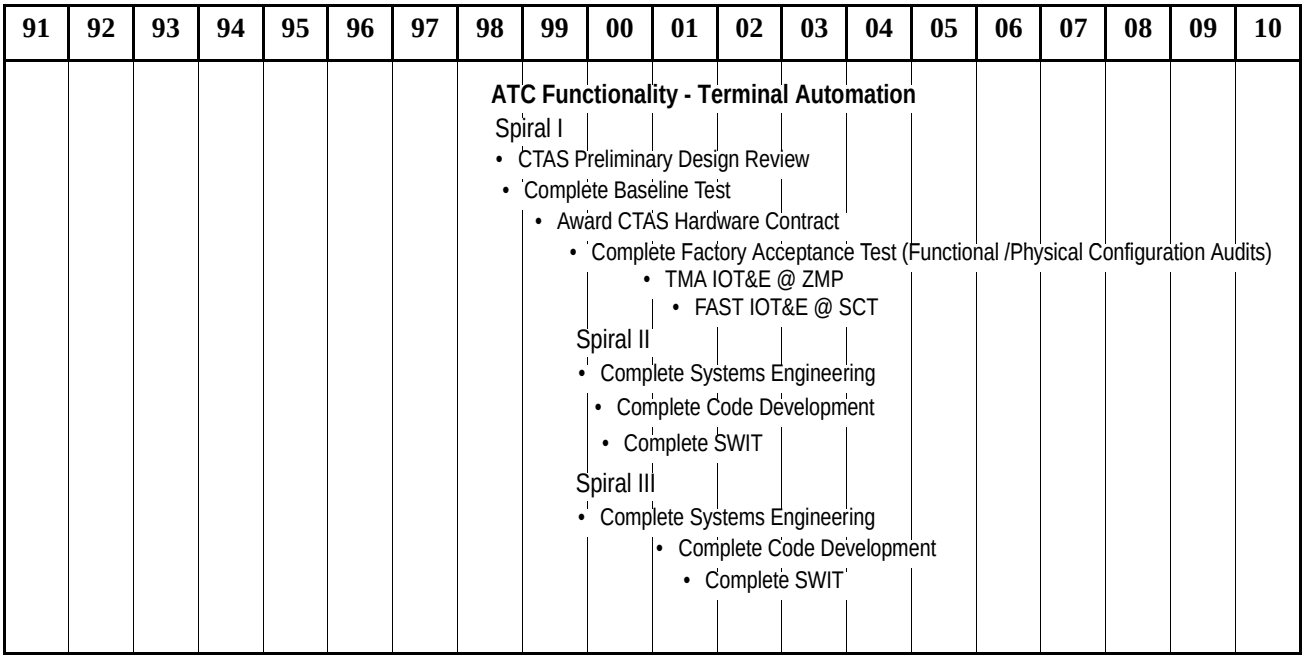
Interagency Partners:

- NASA Ames Research Center
  Moffet Field, Calif.
- Volpe National Transportation Systems Center
  Cambridge, Mass.

Schedule: A05 - Air Traffic Management Program (Part 1)



Schedule: A05 - Air Traffic Management Program (Part 2)



A06–En Route Software Development

Program Description: FAA's in-house resources are inadequate to satisfy requirements for developing, integrating, and implementing NAS en route software changes intended to correct operational problems and provide system enhancements.

This project supports software services that exceed in-house capabilities. Continued contractor support will be required in developing software functions and providing support services to implement and maintain en route software by performing the following recurring and nonrecurring tasks: implementing time-critical corrections to system problems; increasing system capacity through software updates; improving system security; continuing Host data link development; and developing and implementing new required software functions and providing support services to integrate new en route functions into the existing system.

Products:

- Contract support for en route software development
- Enhanced en route functionality, departure sequencing program, and aeronautical data link (ADL) studies.

Accomplishments (1/97–9/98):

- Provided test and integration support for all Host version software releases
- Supported development and key site of Host software Version A4e2.0, A4e2.1, and A5f1.0
- Supported development of Host software case files
- Installed and completed baseline testing of Host software Version A4e2.0 and A4e2.1
- Developed new sections of the ICAO engineering decisions notebook
- Developed draft ICAO interface requirements document
- Delivered final software development plan, software test plan, and verification requirements traceability matrix for Host data link.

Sponsor Organization:

- ATS-1, Air Traffic Services.

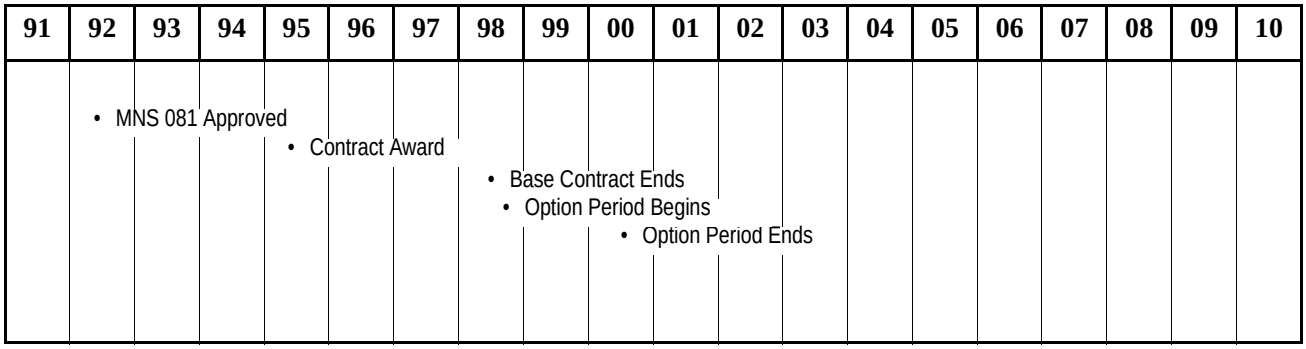
Performing Organization:

- AUA-200, IPT for En Route, Air Traffic Systems Development.

Contractors:

- Computer Sciences Corporation
  Silver Spring, Md.

Schedule: A06 - En Route Software Development



A07–Operational and Supportability Implementation System (OASIS) for Flight Service Automation System (FSAS)

Program Description: The Flight Service Automation System (FSAS) provides general aviation pilots with weather briefings and graphics, notices to airmen (NOTAM), and simplified flight plan filing. It cannot be expanded or enhanced to accommodate future functional requirements and has reached the end of its life cycle.

This program replaces the FSAS Model 1 Full Capacity (M1FC) at 61 Automated Flight Service Station (AFSS) facilities with a leased service. OASIS will consolidate the functionality of the Direct User Access Terminal (DUAT) service with the functionality of M1FC and the interim Graphic Weather Display System (GWDS). OASIS will initially import weather text and graphics products from commercial sources; eventually, it will be modified through preplanned product improvements to obtain weather graphics from the Weather and Radar Processor.

OASIS will be provided as a service from a contractor and includes a reliable, open systems compliant, commercial-off-the-shelf (COTS)/non-developmental item (NDI) hardware and software system configuration. In addition, the OASIS contractor will supply all of the engineering, second- and third-level maintenance, logistics, and training services.

Products:

- 61 OASIS installations.

Accomplishments (1/97–9/98):

- Completed Screening Information Request number two
- Completed operational capability test
- Awarded service contract to Harris Corporation.

Sponsor Organizations:

- ARS-1, Air Traffic System Requirements Service.

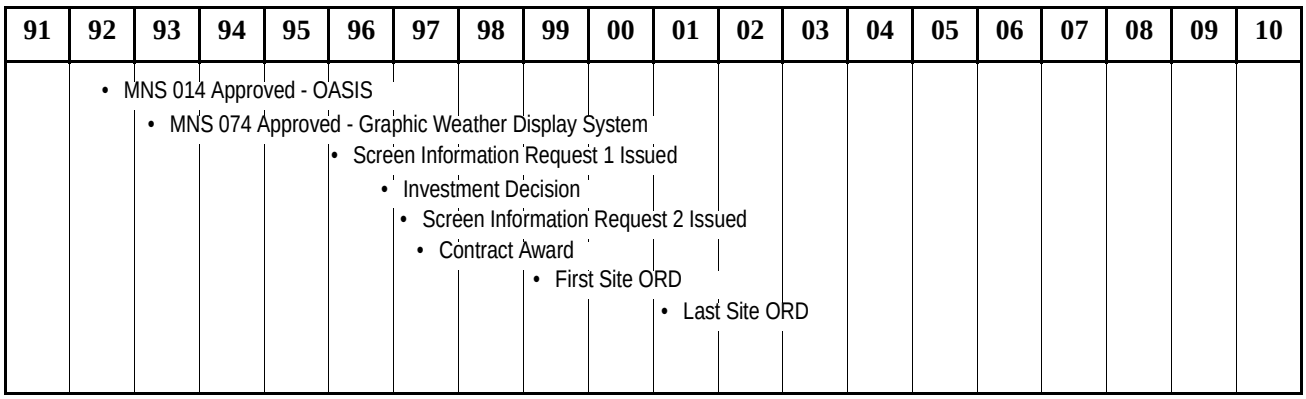
Performing Organization:

- AUA-400, IPT for Weather/FSS, Air Traffic Systems Development.

Contractors:

- Harris Corporation
  Melbourne, Fla.

Schedule: A07 - Operational and Supportability Implementation System (OASIS) for FSAS



A08–Operational Data Management System (ODMS)

Program Description: Current methods used to collect, validate, archive, and distribute NAS operational data are inadequate. The Aeronautical Information System (AIS) and notice to airmen (NOTAM) system are labor intensive, prone to data input error, use obsolete technology, and do not satisfy user requirements. Additionally, the FAA lacks a standard process and the necessary automation for performing airport airspace/analysis and obstruction evaluations. The program has also sought to fulfill the mission capability of storing operational data beyond 15 days to conduct meaningful capacity planning/trend analysis.

This program will eventually replace and integrate the existing AIS and NOTAM systems. The operational data management system (ODMS) will also provide a standard reliable process and automation tools for obstruction evaluation, airport/airspace analysis (OE/AAA) and will track case files—all in a single system that uses commercially available hardware and software. ODMS will allow rapid dissemination of critical aeronautical and safety information. It will facilitate standardization of airport/airspace analyses and obstruction evaluations.

As an interim phase toward the full system implementation, the program will implement replacement systems for the existing AIS and NOTAM system. The NAS Resources Subsystem (NASR) of ODMS will replace AIS. NASR will replace and augment the functionality of the existing AIS with automated data validation and quality-control tools and provide the platform for subsequent implementation of the OE/AAA tools. The existing NOTAM system will be rehosted to a modern commercially supported computing platform and the application software renovated for year-2000 compliance. The extended operational data storage capability was fulfilled through implementing an operational data archive in 1997.

Products:

- AIS and NOTAM replacement systems
- Obstruction evaluation and airport/airspace analysis casefile tracking system
- Access to archived operational data.

Accomplishments (1/97–9/98):

- Implemented operational data archive system
- Installed first increment of the NASR software
- Completed design of the second increment of NASR software.

Sponsor Organization:

- AAT-1, Air Traffic Service.

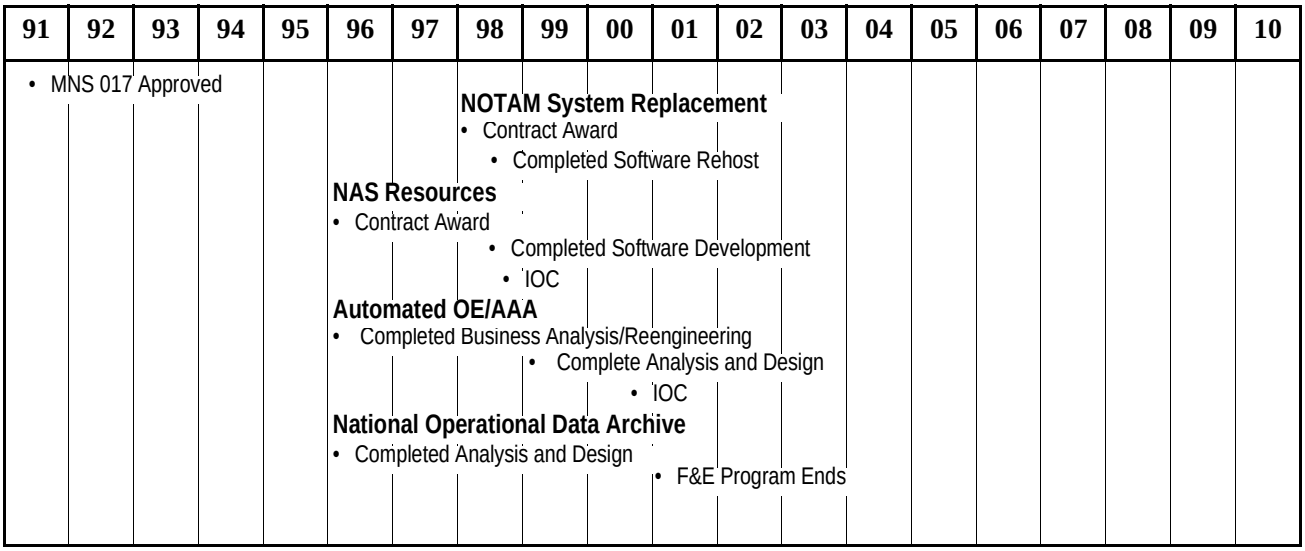
Performing Organization:

- AIT-200, IPT for Information Systems, Office of Information Technology.

Contractors:

- Volpe National Transportation System Center Cambridge, Mass.
- Electronic Data Systems Corporation Herndon, Va.
- The Analytic Sciences Corporation Rosslyn, Va.

Schedule: A08 - Operational Data Management System (ODMS)



A10–Oceanic Automation Program (OAP)

Program Description: With radar coverage unavailable and aircraft navigation limited to onboard systems, the current oceanic air traffic control system is significantly different from that of the domestic NAS. In addition to being largely manual, the system depends on air/ground communication through a third party via high frequency (HF) radio—which is subject to atmospheric anomalies and human error—to obtain position reports and maintain aircraft separation. This lack of reliable and timely position information requires large aircraft separation standards, severely limiting usable system capacity. As a result, oceanic users are rarely able to obtain maximum fuel efficiency, minimum travel time, and access to preferred takeoff times and flight paths. This project will develop new capabilities to increase oceanic air traffic capacity and efficiency, without degrading safety and leading to the introduction of Free Flight in oceanic air space.

This program was established to implement new communications, navigation and surveillance (CNS) technologies in oceanic airspace to enable airspace users to reduce operation costs while improving computer-human interface (CHI) features for air traffic controllers. The total program was originally designed to provide incremental functional enhancements for the oceanic environment through a series of software builds. During FY 1998, air traffic interfacility data communication (AIDC) initial operating capability (IOC) will be achieved, and alternative acquisition strategies will be examined for meeting the long-term oceanic architecture. In FY 1999, multisector oceanic data link (MSODL) will be completed, oceanic software will be certified as year-2000 compliant, and the FAA will embark on the selected acquisition strategy for meeting the long-term oceanic architecture.

In FY 2000 and beyond, an acquisition approach will be implemented to provide new CNS technologies in oceanic airspace to enable airspace users to reduce operating coasts while improving CHI features for air traffic controllers. Detailed program plans and schedules will be identified once an alternative solution has been identified that will meet the oceanic architecture. The oceanic air traffic control (ATC) system will provide improved system performance. A future goal is to reduce separation to 50 miles laterally and longitudinally (50/50) to produce increased capacity and efficiency.

Products:

- Build 1, which will implement ODL and G/G data link communications.

Products funded under A01:

- Interim replacement of ODAPS, OFDPS, and Series 1 hardware
- Build 1.X.

Accomplishments (1/97–9/98):

- Multi-Sector ODL was under development in FY 1997; in FY 1998, it underwent operational testing and evaluation and is expected to become operational in FY 1999.
- Interoperability testing of the G/G data link communications between Japan and Oakland was completed.
- Micro EARTS became operational at FAA offshore facilities in Anchorage, Honolulu, Guam, and San Juan.
- G/G data link communications operational at New York and Oakland enables message/coordination to be exchanged between U.S. oceanic flight information regions (FIR) and their equipped non-U.S. neighbors.
- Oceanic conflict probe became operational at New York and Oakland.

Accomplishments under A01:

- Host/Oceanic Computer System Replacement (HOCSR) acquisition planning led to a contract.

Sponsor Organization:

- ARU-1, Air Traffic Systems Development.

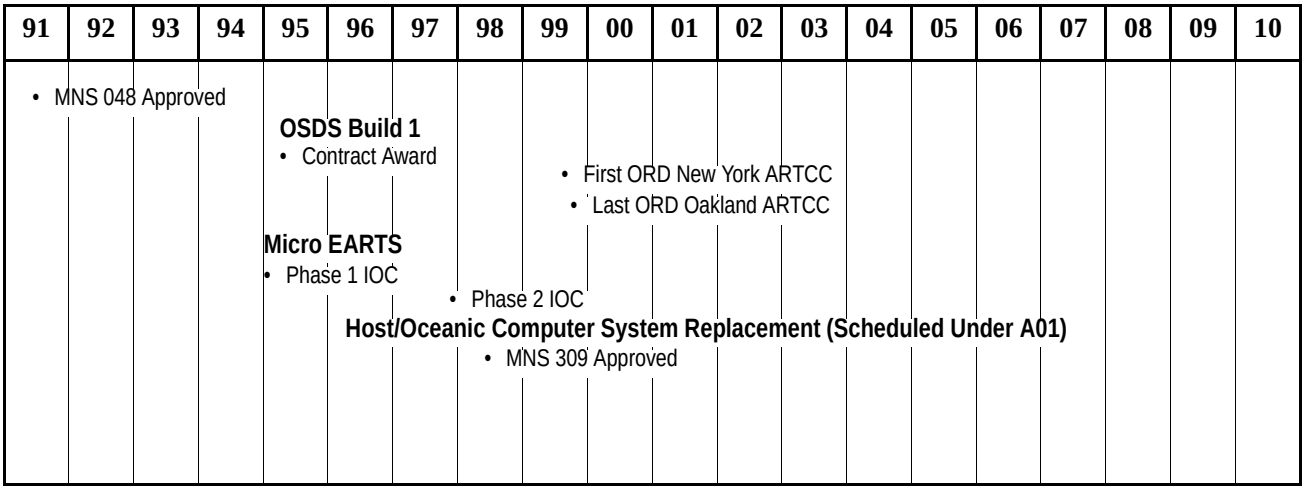
Performing Organization:

- AUA-600, Oceanic and Offshore Integrated Product Team.

Contractors:

- Raytheon Systems Company
  Marlboro, Mass.
- ARINC
  Annapolis, Md.

Schedule: A10 - Oceanic Automation Program (OAP)



A13–Digital Bright Radar Indicator Tower Equipment (DBRITE)

Program Description: Air traffic controllers working in brightly lit airport control towers need an easily readable graphical display of aircraft position information.

DBRITE provides air traffic control tower controllers with just such a visual display of the airport surveillance radar and beacon signals, plus alphanumeric data received from Automated Radar Terminal Systems. DBRITE displays aircraft position, identification, radar beacon, and weather information, even in bright daylight.

The DBRITE program was established in the early 1980's to replace the older Bright Radar Indicator Tower Equipment (BRITE) and BRITE alphanumeric subsystems (BANS). The original contract awarded in 1986 provided about 350 DBRITE systems to the FAA and Department of Defense. In August 1995, a contract to procure additional DBRITE systems was awarded.

DBRITE monitors located in remote towers require additional communications capability. Originally, this was provided using television microwave links and phone lines; today, communication is via fiber optics or phone lines using video compression techniques. The DBRITE video compression contract, awarded in 1996, will provide this capability to DBRITE systems located in remote towers.

The DBRITE program has completed the solution implementation phase and is currently in the inservice management phase of the acquisition management system (AMS) life cycle. It will be deleted from subsequent versions of the CIP unless additional capital investments are needed.

Products:

- 48 DBRITE systems for air traffic control towers (ATCT)
- 75 DBRITE video compression systems to support satellite ATCT installations.

Accomplishments (1/97–9/98):

- Completed DBRITE contract
- Deployed 28 DBRITE systems
- Initiated DBRITE Inservice Management
- Deployed 23 video compression systems
- Replaced three television microwave links and one fiber optic link.

Sponsor Organization:

- AAT-1, Air Traffic Service.

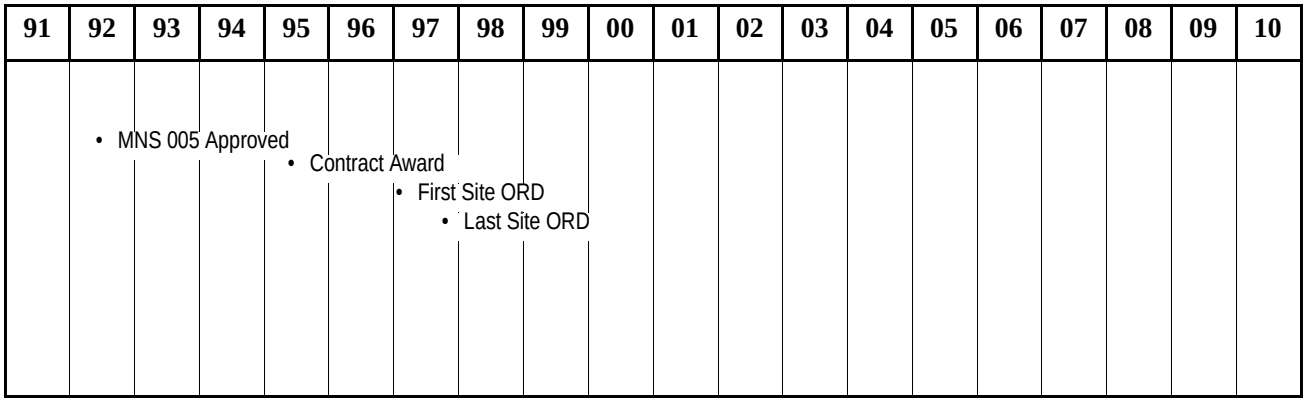
Performing Organization:

- AUA-320, IPT for Terminal, Air Traffic Systems Development.

Contractors:

- Lockheed Martin Air Traffic Management
  Frazer, Pa.
- Delta Information Systems Incorporated
  Horsham, Pa.

Schedule: A13 - Digital Bright Radar Indicator Tower Equipment (DBRITE)



A14–Instrument Approach Procedures Automation (IAPA)

Program Description: Pilots use instrument approach procedures to land at airfields during instrument flight rules (IFR) conditions. The FAA's National Flight Procedures Office develops and maintains all United States Civil Standard Instrument Approach Procedures (SIAP) including those operated by DOD. The FAA's requirement for developing and maintaining new procedures will increase as new navigation technologies are implemented in the NAS. This program provides automated tools that allow FAA specialists to develop more timely and accurate SIAP's and standard instrument departures.

The IAPA system is made up of commercial-off-the-shelf (COTS) workstations and FAA-developed software for use in developing SIAP's and standard instrument departures. In 1997, all IAPA workstations were upgraded to newer Silicon Graphics Indigo^2 workstations. This extended the service life of the system for another 6 years. This upgrade also made it possible to evaluate and display digital terrain and maps.

Products:

- 161 Silicon Graphics Indigo^2 workstations
- 11 file servers
- Associated peripherals, including printers
- Software for standardized development of instrument approach procedures
- Software to electronically transmit instrument approach procedures data
- Instrument approach procedures data base.

Accomplishments (1/97–9/98):

- Procured Silicon Graphics Origin 200 RAID server system to support digital terrain and digital map data bases
- Upgraded all Indigo^2 workstations to Indigo^2 Impact 10000 workstations
- Implemented software for the Copter GPS nonprecision final segment to a runway, direct missed approach, and added data for selected overseas U.S. Army bases
- Developed 16 other software enhancements for the IAPA system.

Sponsor Organization:

- AVN-1, Aviation System Standards.

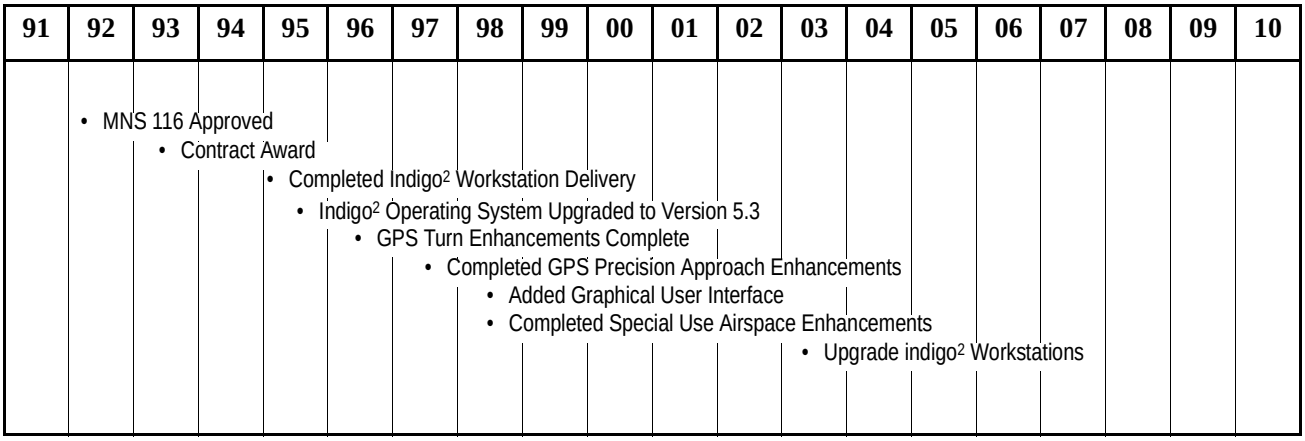
Performing Organizations:

- AVN-22, Automation Technology Branch, Resources Management Staff, Aviation System Standards
- AMI-200C, Flight Systems Team, Application System Division, Information Services, FAA Aeronautical Center.

Contractors:

- Concept Automation Incorporated
  Sterling, Va.

Schedule: A14 - Instrument Approach Procedures Automation (IAPA)



A15–Civil Aviation Registry Modernization

Program Description: The 1988 FAA Drug Enforcement Assistance Act mandated a number of recordkeeping, procedural, and communications changes. The FAA must modernize the Civil Aviation Registry to comply with these changes and satisfy the increased workload imposed by the act.

This program will modernize the airmen certification and aircraft registration systems to support changes mandated by the Anti-Drug Abuse Act of 1988 and support the operational needs of the Civil Aviation Registry Division. This modernization effort will provide better service to law enforcement agencies and the aviation community. Upgrades to basic document recording, storage, and retrieval will enable more efficient data exchange among Government agencies. This effort addresses 14 areas of concern specified in the act.

The enhanced registry system will comply with the FAA Drug Enforcement Assistance Act mandates. The FAA will procure new automation and document storage equipment that will be used for registering aircraft, certifying pilots, and processing major aircraft repair and alteration forms.

Products:

- Electronic Document Management System (EDMS) hardware and software
- Photo identification pilot certificates
- Machine-readable aircraft registration and pilot certificates
- Verification of original registration applications by an FAA office or designee when immediate flight authority is required.

Accomplishments (1/97–9/98):

- Completed backfile conversion of fiche, film, and paper documents to digital images
- Completed Integration Test of system components
- Installed 85 percent of EDMS equipment at Registry.

Sponsor Organization:

- AVR-1, Regulation and Certification.

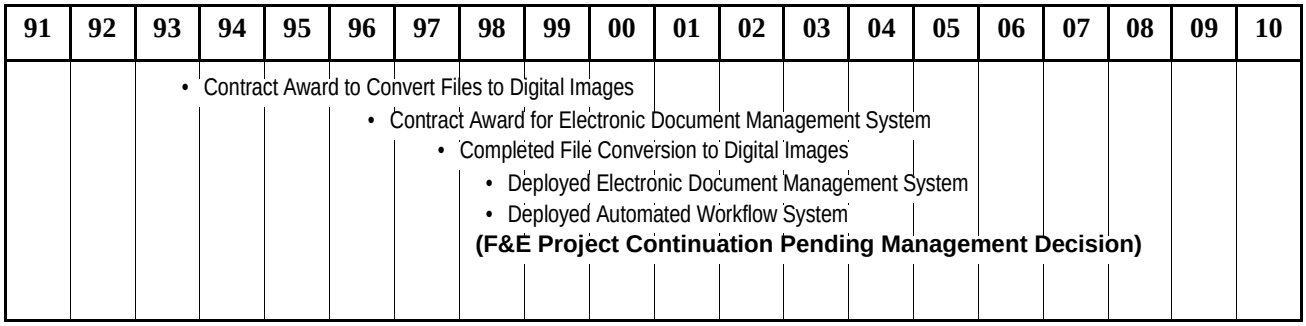
Performing Organizations:

- AFS-700, Civil Aviation Registry, Flight Standards Service
- AMQ-100, Acquisition Support Division, FAA Aeronautical Center.

List of Contractors:

- Volpe National Transportation Systems Center
  Cambridge, Mass.
- Wang fka I-NET, Inc.
  Bethesda, Md.
- DataCom Sciences
  Oklahoma City, Okla.
- PRC, Inc.
  McLean, Va.

Schedule: A15 - Civil Aviation Registry Modernization



A17–Aviation Safety Analysis System (ASAS)

Program Description: The FAA has a limited capability to capture, disseminate, and analyze safety- and security-related data. Program managers, accident investigators, safety inspectors, and support personnel who need safety-related data currently use manual procedures to obtain, use, and disseminate the data.

This program provides the FAA safety and security workforce with automated tools that integrate safety-related information in a common data base linked to the FAA's business process. With ASAS, the safety workforce can effectively analyze data for potential safety concerns. ASAS can also monitor air carriers and airport operators; support evaluation of the structural integrity of aircraft; monitor antidrug programs; and analyze accident information. The automated information systems contained within or supported by this program will substantially improve the accuracy, commonality, and sharing of safety-related information.

Products:

- Local area networks, microcomputers, software tools, and telecommunications links
- Integrated safety and security information management and decision support tools
- Electronically distributed safety information
- Electronic air carrier operating specifications and certification
- Licenses, certificates, and registrations
- Automated regulatory processes
- Digital transmission of electrocardiogram data for first-class pilot medical certification
- Internet application for secure transmission of pilot medical certification data
- Document Imaging and workflow system for pilot medical certification records.

Accomplishments (1/97–9/98):

- Deployed the first phase of the Designee Information Network
- Deployed hardware and software infrastructure as a precursor to deploying the Regulatory and Guidance Library (RGL).
- Deployed RGL to Engine and Propeller and the Transport Aircraft Directorates
- Deployed Clinic Health Awareness program medical/clinical information subsystem.

Sponsor Organizations:

- AVR-1, Regulation and Certification
- ACS-1, Civil Aviation Security.

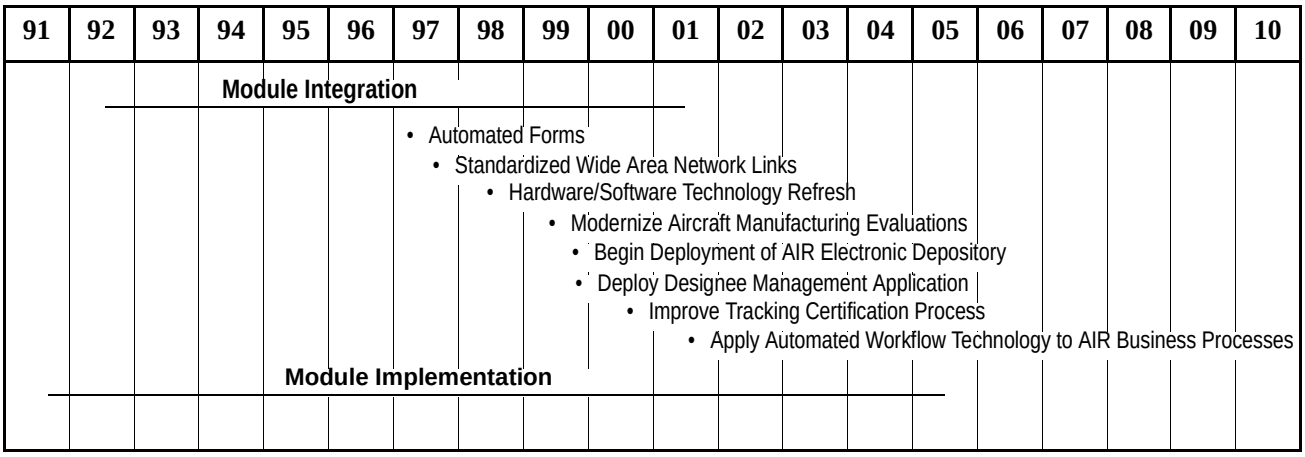
Performing Organization:

- AVR-1, Regulation and Certification.

Contractors:

- Electronic Data Systems
  Plano, Tex.
- Battelle Corporation
  Columbus, Ohio.
- Volpe National Transportation Systems Center
  Cambridge, Mass.
- American Management Systems
  Fairfax, Va.
- Computer Data Systems, Inc.
  Rockville, Md.
- Universal Systems, Inc.
  Arlington, Va.
- Mortarar Instruments, Inc.
  Milwaukee, Wis.

Schedule: A17 - Aviation Safety Analysis System (ASAS)



A18–Safety Performance Analysis System (SPAS)

Program Description: The FAA has the statutory responsibility of conducting surveillance of air operators, air agencies, aircraft, and air personnel to ensure conformance with FAA aviation regulations.

One of the major functions of safety inspectors is to prevent safety problems. To do that, safety inspectors must have access to synthesized information that reflects potential problem areas in a timely fashion. Existing data bases are not integrated, and information cannot be analyzed in an automated fashion. Thus, the FAA does not have the capability to provide safety inspectors with trend analysis information for targeting areas of highest risk or priority or to dynamically adjust work program plans.

SPAS provides an automated capability to analyze safety-critical areas, using performance indicators designed for the needs of safety inspectors. It also provides immediate access to relevant underlying data. Currently, SPAS includes 11 data sources, and 15 other candidate data sources are being evaluated. Current and candidate data bases have differing data structures and protocols and contain information on thousands of operators, air agencies, aircraft, and air personnel. SPAS presents a standardized, easy-to-use graphic display with many features to assist inspectors in retrieving critical data from these diverse sources to meet their unique requirements.

With SPAS, safety inspectors can target high-risk certificate holders that pose a greater safety risk and thus dynamically modify the surveillance work program. SPAS also allows the FAA to:

- Monitor the status of aging aircraft
- Track the growing number of aircraft operations
- Increase industry accountability for aviation safety
- Assist the Flight Standards Service in determining resource needs and improving data quality.

The project will minimize development costs by using existing data bases with commercial-off-the-shelf hardware and software when appropriate. User requirements have been further refined during operational testing. Following successful operational testing, production version, incremental field implementation began, with specially developed training, in September 1997 and will continue through FY 1999.

The initial production version of SPAS, SPAS II, and its supporting infrastructure will be implemented throughout the safety inspector community. SPAS II will support a large inspector user population through a distributed client/server design and enhanced functionality.

Future plans address the requirement for all FAA inspectors to access, review, analyze, and integrate additional agency and industry proprietary data. Inspectors will be able to respond rapidly to dynamic aviation changes, changing safety priorities, increased efficiencies available through technology, international aviation concerns, and an avalanche of incoming information. The large number of international operators and an extensive amount of industry technical data outside the FAA's system of records will be referenced to provide the most comprehensive decision support possible for internal deliberation by FAA inspectors.

Products:

- SPAS II software

- Communications network
- Distributed client/server architecture
- SPAS software enhancements
- SPAS enhanced analytic tools.

Accomplishments (1998):

- Trained over 2,200 users by the end of FY 1998
- Released software for versions 2.03 (4/98) and 2.04 (9/98)
- Completed benefit-cost study for SPAS II in 1997
- Received JRC approval of acquisition program baseline
- Completed SPAS II Initial Production Software
- Completed SPAS II Applications and Installation Testing
- Initiated inspector training for SPAS II
- Provided SPAS II installation guidance and ongoing hotline support.

Sponsor Organization:

- AFS-1, Flight Standards Service.

Performing Organization:

- AFS-900, Flight Standards Service, Flight Standards Certification Program Office.

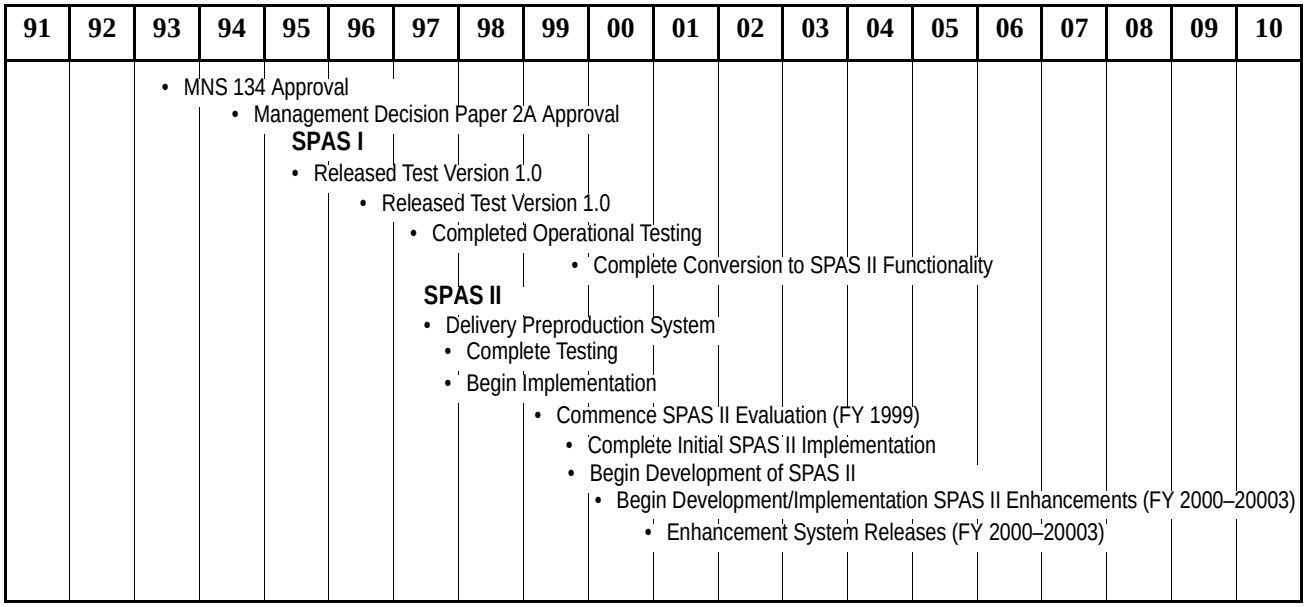
Contractors:

- Computer Sciences Corporation
  Cambridge, Mass.
- Brattle Corporation
  Cambridge, Mass.
- Rutgers University
  N.J.
- Systems Resource Management Incorporated
  Washington, D.C.
- Crown Communications Incorporated
  Washington, D.C.

Support Organizations:

- Volpe National Transportation Systems Center
  Cambridge, Mass.
- William J. Hughes Technical Center
  Atlantic City, N.J.

Schedule: A18 - Safety Performance Analysis System (SPAS)



A19–Portable Performance Support System (PPSS)

Program Description: Safety inspection, reporting, and analysis is a critical portion of FAA's safety mission. Aviation safety inspectors currently operate under a labor-intensive, inefficient, time-consuming system for monitoring aviation safety. Inspectors do not have ready access to all the information and documentation they need to support safety-related decisions in the field; and management does not have timely information to appropriately assign safety inspectors for focused safety surveillance. The results are decreased safety inspector productivity, delays in entering critical safety data into the FAA safety systems, and increased costs to the aviation industry.

The 90-Day Safety Review Task Force reviewed the Portable Performance Support System (PPSS) system (September 1996) and recommended accelerating PPSS development and deployment to FY 1999. Due to $2.5M being deferred from FY 1999 to FY 2000, the deployment schedule established by the 90-day review will be delayed by 6 to 8 months.

PPSS leverages inspector productivity. The system provides automated hypertext links to multiple forms, reports, and reference materials, rather than relying on paper documents available only in district offices.

The PPSS program has used a methodical approach to software development and field office deployment/training:

- FY 1996: Deployed Beta test to nine selected field sites
- FY 1997: Refined software and deployed to all inspectors in 32 Flight Standards Field Offices (FSFO)
- FY 1998: Accomplished major upgrade of software
- FY 1998: Deployed about 45 new field offices
- FY 1998–2000: Deploy software and hardware to remaining FSFO's.

A follow-on enhancement that was tested provides direct access to FAA safety data bases using commercial wireless communications technology—allowing safety inspectors to send and receive critical safety-related information in real time. Similar evolving technologies and reengineering are planned for adaptation to PPSS from FY 2000 to FY 2004.

Products:

- 638 state-of-the-art laptop computers in FY 1996 and 1997
- Deployment of about 1,429 computers in FY 1998
- FAA-developed graphic user interface and software
- Wireless communications capability.

Accomplishments (1/97–9/98):

- Deployed system to all inspectors in 45 Flight Standards Field Offices
- Integrated system with other flight standards applications and data bases
- Completed development and testing of version 2.0 of the system software
- Completed benefit-cost study (10/97).

Sponsor Organization:

- AFS-1, Flight Standards Service.

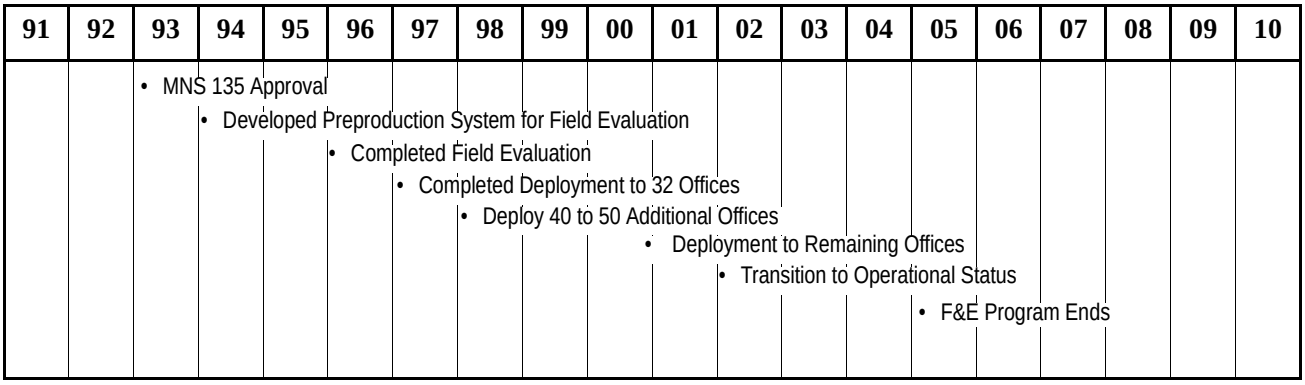
Performing Organization:

- AFS-20, Information Resources Management Office, Flight Standards Service.

Contractors:

- Galaxy Scientific Corporation
  Atlanta, Ga.

Schedule: A19 - Portable Performance Support System (PPSS)



A20–Integrated Flight Quality Assurance (IFQA)

Program Description: Modern digital aircraft can continuously record digital electronic flight data, providing a detailed audit trail for all phases of flight, from pushback to docking. This information is an accurate measure of aircraft performance within the NAS and is a potentially invaluable tool for quality management—by both the FAA and the airlines—whether the focus is on flight operations surveillance, aircrew performance, or air worthiness. Realizing this potential requires a coordinated flight operational quality assurance (FOQA).

This program facilitates industry implementation of FOQA programs, coordinates development of voluntary FOQA data standards, and provides the FAA with the means for using FOQA information to accomplish its safety mission more effectively.

The FAA, along with the airline industry and systems manufacturers, will install, evaluate, and use technology for:

- Airborne digital flight data recording
- Data downloading
- Data analysis
- Data base development
- Data-sharing infrastructure
- Information archiving.

The program will evaluate both functional issues and the cost/benefits associated with alternative system configurations. It will also develop and implement the infrastructure necessary for the FAA to use FOQA information effectively.

Products:

- Distributed computer resources
- Custom-developed software.

Accomplishments (1998):

- Demonstrated use of FOQA technology for proactive corrective action based on routine acquisition and analysis of digital flight data
- Documented effective strategies for analyzing FOQA data and transforming it into knowledge about meaningful safety trends
- Documented use of FOQA data to objectively identify national trends in flight operations and aircraft subsystem malfunctions
- Began expansion to regional carriers and determined appropriate technology alternatives and developed methods to minimize resource requirements
- Developed a cost-benefit analysis program—based on industry experience—to allow carriers to generate return on investment, estimated savings per flight, and break-even information
- Documented pilot awareness and training program modifications used by carriers to promptly and effectively convey FOQA findings to the pilot community
- Continued a demonstration program on the use of alternative RF-link technology for downloading FOQA data
- Initiated a demonstration program on the use of remote data transmissions systems for transfer of flight data from aircraft to FOQA processing facility in a more timely manner
- Generated functionality requirements for product evaluation to assist airlines in selecting most appropriate and effective FOQA technology.
- Developed problem resolution system and equipment reliability reports to convey industry concerns and perspectives to vendors
- Initiated evaluation and integration of enhanced methods for visualizing and communicating flight data
- Continued the development of an approach for the integration of FOQA data with other data-driven safety programs, such as the Advance Qualification Program and safety reporting programs
- Initiated development of a FOQA aggregate electronic data acquisition and information management infrastructure within the U.S. airline environment that provides secure data sharing between flight operations, safety, maintenance, and engineering
- Initiated development of a standardized FOQA event and measurement library to minimize development resources, provide baseline to airlines, and facilitate data sharing
- A cost-benefit study is in progress.

Sponsor Organization:

- AVR-1, Regulation and Certification.

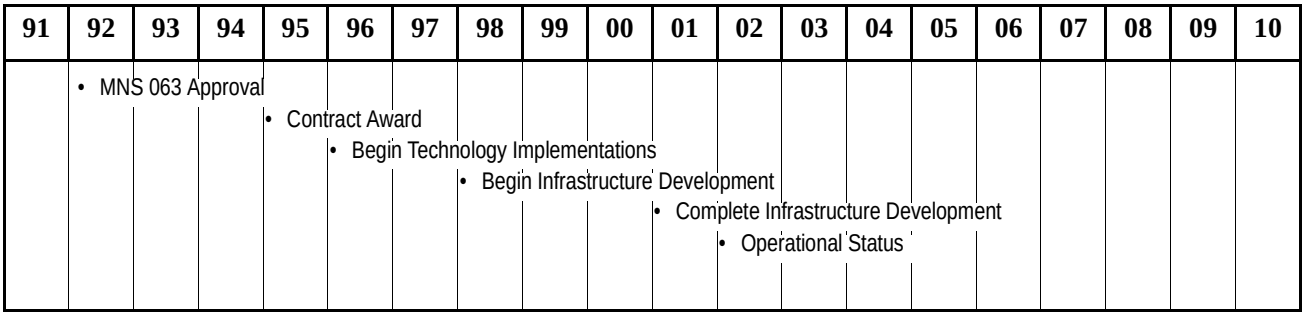
Performing Organization:

- AFS-230, Advanced Qualification Program Branch, Flight Standards Service.

Contractors:

- Universal Technical Resources Services, Incorporated.

Schedule: A20 - Integrated Flight Quality Assurance (IFQA)



A21–Conflict Probe

Program Description: The NAS currently cannot support unlimited user-preferred routings or trajectories. Regulatory measures (structured airways, separation standards, flow instructions, etc.) are the primary means for balancing demand with capacity. The primary reasons for this are:

- Inability to accurately predict future air traffic conflicts
- Lack of conflict resolution aids.

This program will develop and implement a conflict probe capability through an evolutionary process.

User Request Evaluation Tool Core Capability Limited Deployment (URET CCLD). URET CCLD follows the Display System Replacement (DSR) project as a preplanned product improvement. This tool is an element of the Free Flight Phase 1 (FFP1) initiative. It allows controllers to manage en route traffic with an awareness of future conflict situations and to assist in granting user requests or to resolve conflicts through the use of a trial planning capability. Functionality consists of trajectory modeling, conformance monitoring and reconformance, current plan and trial plan processing, automated coordination, and automated problem detection. The tool interfaces with the Host, external data sources, and interfacility URET CCLD systems.

The program will develop and implement a conflict probe capability based on the concept of evolutionary development and incremental deployment, which supports the ability to incorporate user feedback. Initial daily use of the tool will begin at the first site in November 2001. A full-scale deployment decision will be made based on the results of the FFP1 benefits analysis and evaluation.

URET Prototype. The URET prototype consists of an independent processor connected to the Host computer for flight data and to a source for weather, a local area network, and displays with keyboards and pointing device installed in the M1 console at each ARTCC sector. The existing URET prototype is in daily use at the Indianapolis and Memphis ARTCC's and is being maintained until transition to the DSR control room.

Products:

- Two-way Host Interface for URET
- URET CCLD available at selected FFP1 sites
- Maintenance of URET prototypes

Accomplishments (1/97–9/98):

- Conducted technology transfer and risk-mitigation activities
- Coordinated requirements definition and specification development
- Prototyped and evaluated enhanced capabilities, including interfacility.

Sponsor Organization:

- AOA-1, Office of the Administrator.

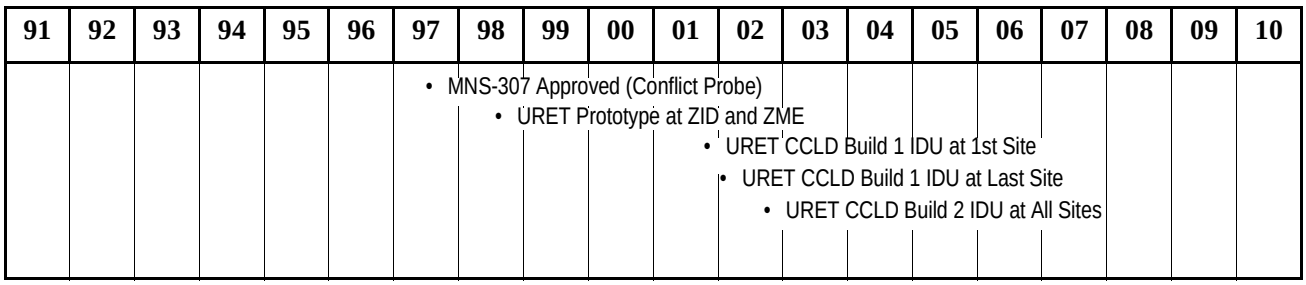
Performing Organization:

- AUA-200, IPT for En Route System Development
- AOZ-1, FFP1 Program Office.

Contractors:

- Lockheed-Martin Traffic Management (URET CCLD)
  Rockville, Md.
- MITRE CAASD (URET)
  Vienna, Va.

Schedule: A21 - Conflict Probe



A22–Free Flight Phase 1 (FFP1) Integration

Program Description: New tools that give controllers, planners, and service operators more complete information about air traffic control (ATC) and flight operations comprise a large part of the NAS Architecture's near-term plan.

This program integrates and implements the FAA's FFP1 core capability limited deployment (CCLD) strategy, as outlined in NAS Architecture Version 4.0. It will deploy selected air traffic controller automated decision support, and traffic-flow planning tools—currently in limited use at some ATC facilities—to a limited number of other ATC facilities. Program objectives are:

- Prepare for national deployment of these tools (2003–2007) of NAS modernization
- Deploy selected automated tools by the end of 2002 to obtain and evaluate early user and service provider benefits
- Reduce deployment constraints of certain capabilities
- Reduce system acceptance risks.

FFP1 is the result of an agreement between the FAA and the aviation industry to implement certain highly desired capabilities at a few locations to obtain immediate user benefits. The locations are being finalized with assistance from the aviation community.

FFP1 tools are:

- *User Request Evaluation Tool (URET) Core Capability Limited Deployment (CCLD), A21.* Conflict probe using URET CCLD enables controllers (in the nonradar position) to manage user requests in en route airspace by identifying potential traffic conflicts. URET CCLD evaluates user requests by checking requested routes for conflicts between aircraft and between aircraft and special use airspace boundaries. If a conflict is detected, URET CCLD provides the controller with a visual indication of the problem.
- *Traffic Management Advisor (TMA) Single Center (SC), A05*. TMA-SC meters the sequences of inbound aircraft within the ARTCC airspace. This tool provides controllers (in the radar position) with the capability to develop arrival sequence plans for selected airports. It assigns aircraft to runways to optimize airport capacity. TMA computes the aircraft's arrival time and assigns scheduled arrival times for aircraft to ensure that they meet flow constraints established by traffic management coordinators.
- *Passive Final Approach Spacing Tool (pFAST), A05*. pFAST is designed to maximize runway usage in congested terminal airspace areas by helping controllers sequence aircraft and assign runways according to user preferences and system constraints. It enhances the controller's situational awareness, especially during heavy traffic operations. pFAST uses flight data, controller inputs, and track information to generate a set of trajectories for arriving aircraft. These trajectories are based on models that consider weather and aircraft characteristics. pFAST provides controllers with landing sequence numbers and recommended runway assignments.
- *Collaborative Decisionmaking (CDM), A05.* CDM support tools provide airline operations centers and the FAA with real-time access to current NAS status information, including infrastructure and operational factors. Users and the FAA are able to work collaboratively to manage NAS traffic better. Traffic flow managers' ability to manage traffic will improve with better flight information data. Users will have more timely and complete decisionmaking information on the operational status of the NAS.
- *Surface Movement Advisor (SMA), A05*. SMA facilitates sharing aircraft information with airlines to augment decisionmaking about aircraft movement on the airport surface.

FFP1 will develop the core capabilities and provide the integration activities needed to develop and deploy each core capability. The integration activities will address cross-cutting product issues leveraging resources to effect efficiency and yet ensure effective solutions are implemented. Areas to be addressed include training, procedure development, benefits metrics, and airspace analysis. FFP1 capabilities are dependent on other modernization activities for critical prerequisite functions and architectural support. These include the Display System Replacement (DSR), and Standard Terminal Automation Replacement System (STARS). These programs will continue to be funded and developed separately, and FFP1 will coordinate with all interdependent programs.

FFP1 is a subset of NAS modernization activities planned for the near-term period (1998–2002). It uses an evolutionary approach and strategy for FFP1 implementation and risk mitigation. It provides a low-risk method by which early user benefits can be realized. Through this approach, the aviation community will be able to deliver on its goal of early benefits while managing risk with the highest concern for safety.

The FAA will involve representatives of the Federal Government, aviation industry (represented by RTCA), and other stakeholders, such as pilot and controller unions, to provide consensus and guidance on capabilities, locations, operational issues, and risk-mitigation strategies needed to realize these early benefits and to disseminate these benefits throughout the NAS quickly.

Products:

- Improved response to en route user flight requests (URET CCLD)
- Arrival sequence plans to optimize airport capacity (TMA)
- Integrated operational procedures
- Increased runway acceptance rates (pFAST)
- Increased coordination of system resources among users and service providers in real time (CDM)
- Reduction of taxi times and takeoff delays (SMA).

Accomplishments (1/97–9/98):

- Achieved consensus among user community for definition of the FFP1 program.

Sponsor Organization:

- AOA-1, Office of the Administrator.

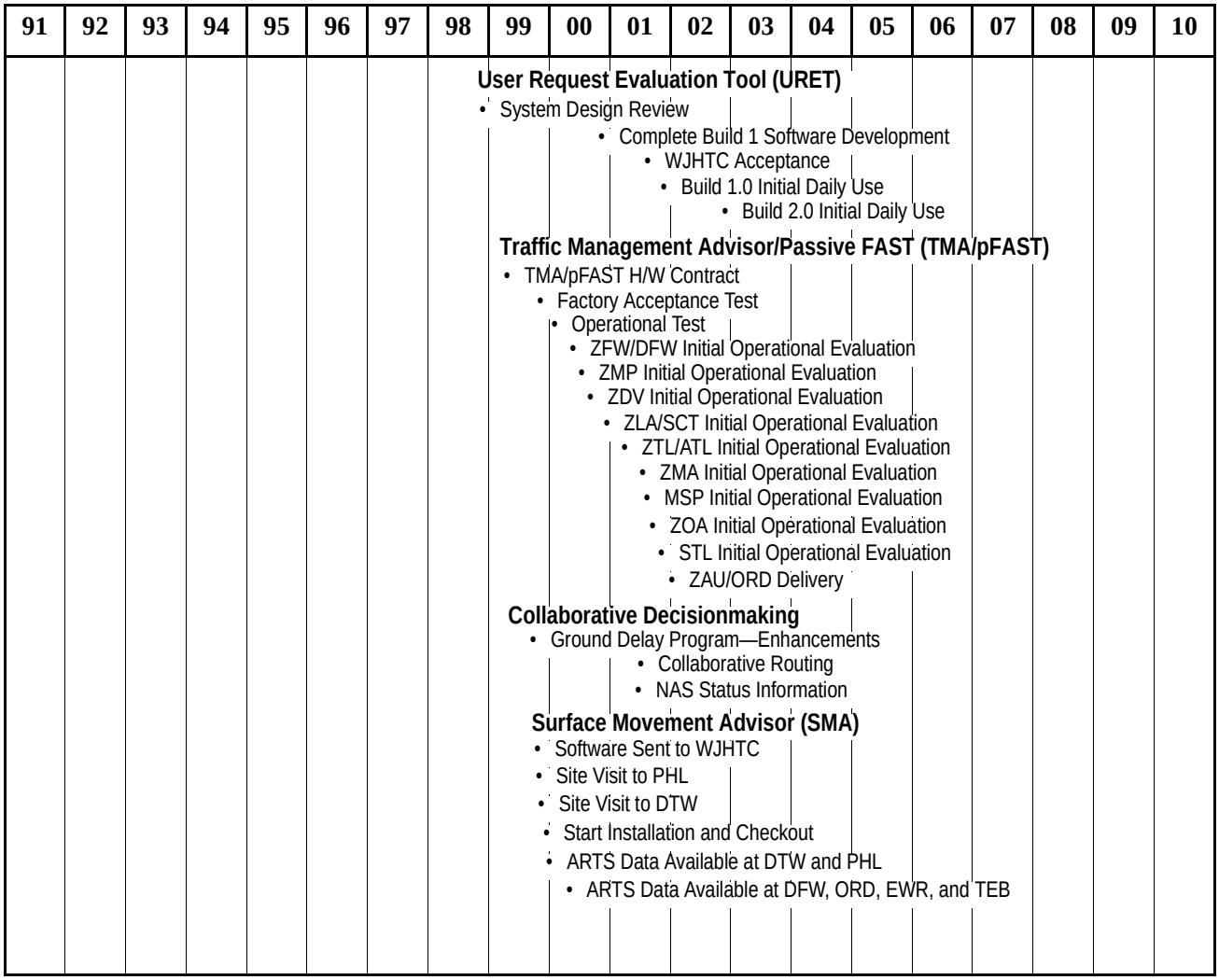
Performing Organization:

- AOZ-1, FFP1 Program Office.

Contractors:

- Lockheed-Martin Air Traffic Management
  Rockville, Md.
- Computer Sciences Corporation
  Egg Harbor Township, N.J.
- Sterling Software, Inc., Space & Transportation Division.
  Falls Church, Va.
- Lincoln Laboratory
  Lexington, Mass.

Schedule: A22 - Free Flight Phase 1 (FFP1) Integration



A23–NAS-Wide Information Services (NIS)

Program Description: The concept of operations (CONOPS) for the NAS envisions an environment in which decisionmakers access and use operational data in real and near-real time to make decisions about aircraft separation (safety) and traffic flow (efficiency). Such an environment requires common, standards-based information services, processes, and procedures. Increased interoperability of NAS information systems will be necessary for updating aircraft flight trajectory information so that flight plans can be adapted—in real time—to changing airspace usage, weather, airport conditions, and air traffic density. Collaboration, as envisioned in the CONOPS, requires a flow of intent, negotiation, and approval information among service providers and users.

This program will facilitate the distribution of timely, accurate, and consistent information in electronic form across the NAS for improved and safer services to users, more efficient use of NAS resources, better flight planning, and more cost-effective systems development and acquisition. Information services will give users and service providers a common view of NAS information for cooperative and collaborative decisionmaking. Implementing NAS-Wide Information Services is a prerequisite for achieving capabilities such as Free Flight and increased system collaboration. It will also serve as a transition enabler to help current systems—most of which were developed independently of one another—to interoperate more efficiently through a combination of message translation and internal restructuring, using common data standards and models. The program is currently undergoing validation and definition. It focuses on three areas:

NAS Architecture and Engineering. This project supports definition of NAS-Wide Information Ser-

vices as part of the NAS Architecture. The work involves formulation of standards, requirements, policies, and guidelines for information sharing among NAS systems, including coordination with industry as required. Engineering support involves NAS-level design, documentation, assessment, testing, validation, registration, and publication of standard information objects. It also involves delivery of expert information management assistance to integrated product teams (IPT) and supports investment analysis.

Integrated Product Team Information Engineering. This project supports IPT information services of common concern and for the integration of individual systems. The work includes facility and system-specific information management services for system requirements, design, development, test registration, and configuration management of common communications, navigation, and surveillance/air traffic management (CNS/ATM) data. The work also includes information technology (IT) and software acquisition to develop facility/system data marts as required. NAS automation, communication, navigation, and surveillance systems benefit from these system integration services, resulting in a more cost-effective transition to a modern NAS.

Information Exchange Policy Compliance. This project enhances the FAA's NAS information technology (IT) capabilities in policy compliance, in conformance with the Information Technology Management and Reform Act (ITMRA), General Accounting Office (GAO) guidance, and other Federal requirements for IT. The project also develops a meta data compliance capability for new systems interfaces with the existing infrastructure of the NAS.

Products:

NAS Architecture Phase 1:

- New NAS-wide data management roles and responsibilities
- Data models (flight object, traffic flow management (TFM) common data for FFP1, etc.)
- Flight object requirements and standards
- Collaborative Internet-based process to review and discuss common data models and objects and agree on standards
- Systems engineering directory repository for all data models and associated meta data for common NAS objects
- Information architecture-related data security polices

NAS Architecture Phase 2:

- Requirements and standards for NAS resource (facility and airspace)
- Development of local information systems capabilities
- Distribution of flight data via NAS-wide network.

NAS Architecture Phase 3:

- Standardized, common data services support to NAS applications
- NAS users access to all authorized data.

Accomplishments (1/97–9/98):

- Published NAS-Wide Information Architecture and Services for Collaboration and Information Sharing section in the draft NAS Architecture – 1998
- Initiated and organized the NAS Information Architecture Committee (NIAC) and created working groups, including the TFM Common Data, Collaborative Environment, Meta Data Repository, and Geospatial Information System working groups
- Organized and managed NAS Data Conference
- Developed (with AOP-600) Interoperability Process Prototype.

Sponsor Organization:

- ARS-1, Air Traffic System Requirements Service
- ARA-1, Research and Acquisition
- AAF-1, Airway Facilities Service.

Performing Organization:

- ASD-110, NAS Architecture.

Contractors:

- To be determined.

Schedule: A23 - NAS-Wide Information Services (NIS)

91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
Pending Mission Need 327 Approval																			

New Automation Mission Needs (2001–2004)

New automation plans expected to need funding in the next 5 years are described below. Actual requirements will be addressed through the acquisition management system (AMS):

Oceanic. New oceanic requirements include:

- Interfacing between the Dynamic Ocean Tracking System (DOTS) Plus and the Enhanced Traffic Management System (ETMS)
- Transitioning from paper flight strips to strip-less operations in the ocean sectors.

NAS Automation. New NAS automation requirements include:

- Developing flight data management (FDM) prototype within a single region, which will run separately and in parallel with the current flight data processor
- Developing a national FDM system, which provides a fully distributed flight data processing capability for the NAS, using the flight object
- Developing a surveillance data processor (SDP), which replaces the current radar data processing capability.

Terminal Automation. New terminal automation plans include:

- Improving weather reporting and display capabilities on STARS terminal controller workstation (TCW) and surface movement advisor (SMA) equipment
- Deploying SDP TRACON
- Providing technical refresh for terminal facilities
- Deploying initial ATC decision support systems at TRACON facilities.

Tower Automation. New terminal automation plans include:

- Consolidating status and display devices at air traffic control tower (ATCT) facilities onto a single display at each controller position
- Developing SMA Build 1
- Upgrading tower display workstation capabilities for STARS installations.

Flight Service Automation. Flight service automation plans include:

- Replacing the OASIS/NADIN interface.