

Office

# ORDER

## DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

1100.121A

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SUBJ: MANAGEMENT OF AIR TRAFFIC CONTROL AUTOMATION SYSTEMS

1. PURPOSE. This Order describes the responsibilities of the Systems Research and Development Service (SRDS), Air Traffic Service (ATS), Airway Facilities Service (AFS), regional automation organizations and field facilities, highlighting significant working relationships for the management of the National Airspace System (NAS) en route/terminal air traffic control automation systems.

2. DISTRIBUTION. This Order is being distributed to branch level in Washington Headquarters, regions, NAFEC, Aeronautical Center, all Air Traffic and Airway Facilities field facilities.

3. CANCELLATION. This Order cancels Order 1100.121, dated 12/17/69.

4. BACKGROUND.

- a. The rapid growth of air traffic in both numbers and complexity, and projected high rate of future growth make it imperative that the agency provide for rapid and orderly expansion of automation technology into the air traffic control (ATC) system. Thus, the NAS is now being expanded to include equipment and associated computer program installations at selected terminal and en route facilities throughout the nation. The basic software programs and equipment configurations of the NAS are common in nature but site-adapted to the environmental differences of each Terminal and Center.
- b. The standard national automation program approach materially reduces the cost and improves performance throughout the system. Standardization on a national basis must be maintained so as to gain maximum effectiveness from automation within realistic cost and timeframes, and to ensure effective interfacing of systems and facilities.

5. DEFINITIONS.

- a. Operational Computer Programs. Computer programs for control of air traffic that have reached Initial Operating Capability (IOC) at the first field site.
- b. Functional Computer Programs. Operational computer programs for the IBM 9020E Display Channel Complex (DCC) and Raytheon Computer Display Channel (CDC).

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- c. Diagnostic Computer Programs. Those programs which provide a means to test, analyze and verify hardware performance.
  - d. Operational Hardware. Equipment that has reached an operational capability in the field, maintenance has been assumed by the agency, and ownership and responsibility have been transitioned to regional control.
  - e. Local Changes. A change unique to one facility and that does not conflict with or alter national operations or procedures.
6. SCOPE. This Order pertains to the development, operation and maintenance of hardware and software for the automated ATC system. It applies to FAA organizations which have responsibilities for activities concerned with the development, production, testing, integration, operation and maintenance of the automated ATC system.
7. POLICY. To assure the integrity of the national automation system and to minimize the production and maintenance costs, a policy for centralized NAS software production and maintenance and hardware support is established. To maintain effectiveness this centralized concept requires a close coordination policy between ATS, AFS and SRDS. This coordination has been established and is contained in existing agency Orders and documented agreements among the three organizations. Although ATC software, support software, and hardware have been procured by contract, it is intended that the agency create within itself the capability to maintain the software and hardware.
8. WORKING RELATIONSHIPS.
- a. The working relationships described in the following paragraphs stem from the basic responsibilities contained in agency Orders and inter-organization agreements. Supplemented guidance material originated by the responsible Office/Service will be required to delineate the functions and procedures necessary to carry out the full objectives of this Order. ATS and AFS shall develop Procedures for Maintenance of NAS Computer Program Subsystems applicable once these systems have become operational. Similar procedures shall be developed for maintenance of operational hardware. These procedures shall include, but not be restricted to:
    - (1) Procedures for defining, reporting and resolving problems on the NAS operational system.
    - (2) Procedures and time schedules for product distribution from the National Field Support Group at NAFEC.
    - (3) Procedures for status accounting of NAS computer programs (software) and hardware.

- b. The Procedures for Maintenance of NAS Computer Program Subsystems will be maintained and updated by the ATS and AFS.
  - c. The Procedures for Maintenance of Operational Hardware will be maintained and updated by the AFS.
  - d. The Procedures for the Computer Program Plan for the NAS covering development of Operational Computer Programs will be maintained and updated by the SRDS.
  - e. Detailed program schedules, responsibilities, and relationships have been or will be set forth in System Program Plans (SPPs) and other guidance material as required.
  - f. Preparation, coordination and submission of changes to the automated ATC systems shall be in accordance with Order 1800.8, ATS/AFS Procedures for Maintenance of NAS Computer Program Subsystems, Procedures for Maintenance of Operational Hardware, and Procedures for the Computer Program Plan for the NAS, as applicable.
9. SYSTEMS RESEARCH AND DEVELOPMENT SERVICE (SRDS).
- a. The Director, SRDS, is the Chairman of the Configuration Control Board (CCB) for any problems or changes affecting automation systems yet under development or installation until such systems become the responsibility of the operating Services. The transfer of responsibility will be by mutual agreement between the Director, SRDS, and the Directors of the operating Services.
  - b. The Director, SRDS, is the single manager for the development and implementation of the total ATC en route and terminal automation program effort. As such, he provides management direction and program guidance for implementing the automated NAS as set forth in Chapter 44, Handbook 1100.2, FAA Organization - FAA Headquarters; in Order 1800.27, System Program Plan En Route Automation; in Order 1800.29, System Program Plan Terminal Automation; in Order 1100.102c, Establishment of NASPO Field Office; and in other documents as may be found necessary.
10. AIR TRAFFIC SERVICE (ATS). The Director, ATS, is the Chairman of the Configuration Control Board (CCB) for any problems or changes affecting Operational Computer Programs or any other system elements for which ATS is responsible. Requirements which result in baseline or contract changes will be coordinated and processed as specified in Order 1800.8 and the ATS/AFS "Procedures for the Maintenance of NAS Computer Program Subsystems." The Air Traffic Service is responsible for the management of en route and terminal air traffic control Operational Computer Programs. Specific responsibilities are delineated below. ATS will:

- a. With the support of the AT regional automation branches/staffs and the respective facility Data Systems Staffs provide timely, accurate and authoritative inputs to the SRDS to support development and installation of ATC computer programs.
  - b. Provide technical support to the software producer.
  - c. Provide interpretation and definition of the air traffic control requirements, and insure formal documentation.
  - d. Monitor the development and production efforts of ATC computer programs.
  - e. Provide the AT regional automation branches/staffs with national ATC automation standards.
  - f. Review standards for program acceptability; monitor program testing, checkout and acceptance.
  - g. Provide technical and operative support to SRDS during program installation and checkout, system integration and system shakedown at the facilities.
  - h. Provide direct ATS representation to insure a rapid integration of NAS automation into the ATC operation without derogation to safety or efficiency.
  - i. Provide technical direction to support a centralized computer program maintenance activity.
  - j. Define system adaptation requirements and provide for adaptation data collection.
  - k. Authorize urgent changes to Operational Computer Programs where the change is national in scope and operational need dictates immediate implementation of such a change. For such changes ATS will immediately prepare and submit an NCP to the secretariat of the Configuration Control Board.
11. SUPPORTING THE ATS RESPONSIBILITIES ARE:
- a. AT Regional Automation Branches/Staffs. The regional Automation Branches/Staffs serve as the communications channel between ATS in Washington Headquarters and air traffic control facilities in the field. These branches/staffs are the focal point for all air traffic control automation activities and will have full authority to act for their Air Traffic Division in all related matters. Within their regional area of responsibility, they organize and coordinate computer programs involving air traffic control automation systems. They will also provide the following support:

- (1) Review air traffic standards, criteria, procedures, policies, utilization and effectiveness of ATC automation services within the region.
  - (2) Insure that the AT field facilities adhere to the national ATC automation standards.
  - (3) Authorize changes to Operational Computer Programs where the change is local in scope.
  - (4) Research and recommend to ATS ways of extending automation services, optimizing existing services, and assuring compatibility between existing procedures and automation techniques.
  - (5) Record non-operational support programs considered an asset to facility operation, and standardize these programs where feasible. Provide the information to ATS and to other regions about locally developed administrative programs and their techniques.
  - (6) Because of the significant overlap in areas of concern, the Automation Branch will coordinate closely with the Airway Facilities Division representative in each region.
- b. Facility Data Systems Staff. Facility Data Systems Staffs have the responsibility for close coordination with the on-site Airway Facilities Automation Staff on all automation matters on a timely basis. In addition, they have the responsibility for:
- (1) Identifying and defining problems relating to air traffic automation programs and recommending solutions. In matters pertaining to automation direct communications are authorized with the National Data Systems Branch at NAFEC, with follow-up coordination with the AT regional Automation Branch/Staff.
  - (2) Facility Data Systems Staff shall provide support to ATS and SRDS as required.
  - (3) Facility Data Systems Staff assumes additional responsibilities as described in ATS/AFS Procedures for the Maintenance of NAS Computer Program Subsystems.
12. AIRWAY FACILITIES SERVICE. The Director, AFS, is the Chairman of the Configuration Control Board (CCB) for any problems or changes affecting Functional Computer Programs, operational hardware, or any other system elements for which AFS is responsible. The Airway Facilities Service is responsible for management of operational hardware, Functional Computer Programs, diagnostic software and related support software.

In addition, the AFS will support the ATS in maintaining the following subprograms of the en route Operational Computer Programs: System Monitor and Radar Data Processing. Specific responsibilities are delineated below. AFS will:

- a. Provide engineering support for both automation hardware and software systems, as they become the responsibility of the operating services. Requirements which result in baseline or contract changes will be coordinated and processed as specified in Order 1800.8, ATS/AFS Procedures for Maintenance of NAS Computer Program Subsystems, agency Orders 1800.25 and 1320.33.
- b. Monitor computer program development and provide technical assistance as required.
- c. Assure that all automation systems delivered to the operating services fulfill the requirements of AFS and Airway Facilities Divisions.
- d. Provide the regions with technical guidance, policies and standards for automation systems.
- e. Provide technical and operative support to SRDS during installation and checkout, system integration and system shakedown at the facilities.
- f. Provide software support to field facilities through a centralized computer program maintenance activity.
- g. Provide hardware support to field facilities through a centralized automation engineering activity.
- h. Authorize urgent changes to the Functional and Diagnostic computer programs where the change is national in scope and operational need dictates immediate implementation of such a change.

13. SUPPORTING THE AFS RESPONSIBILITIES ARE:

- a. Regional AF Divisions. The regional AF Divisions will provide a focal point for all AF automation activities within the region and will coordinate with the regional AT Division on matters pertaining to automation. They shall also provide the following support:
  - (1) Review automation standards, criteria, procedures, policies, and effectiveness of automation services within the region.
  - (2) Insure that the field facilities adhere to national automation standards.

- (3) Review and coordinate changes to automation system baseline configurations as described in ATS/AFS Procedures for the Maintenance of NAS Computer Program Subsystems and Order 1800.8.
  - (4) Research and recommend to AFS ways of extending automation services, optimizing existing services and assuring compatibility between existing procedures and automation techniques.
  - (5) Provide field technical direction and contract administration of the Phase II ARTCC building expansion and modernization program in accordance with the National Construction Management Plan.
- b. AF Field Facilities. The field facilities shall be responsible for:
- (1) Identifying and defining problems relating to certification, operation, maintenance, and support of the ATC Automation System recommending solutions to these problems. In matters pertaining to automation, direct communications are authorized with the Automation Engineering Support Branch at NAFEC, with followup coordination with the appropriate regional organization.
  - (2) Supporting AFS, SRDS, and ATS during hardware and software installation and checkout, system integration, system shutdown, operational readiness demonstration and operational changeover as specified in applicable SPPs and related documents.
  - (3) Supporting the Facility Data Systems Staff in the maintenance of the System Monitor and Radar Data Processing portion of the En Route Operational Program. Further facility responsibilities are described in ATS/AFS Procedures for the Maintenance of NAS Computer Program Subsystems and other agency Orders.
14. NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER (NAFEC). NAFEC resources will provide support in the development, production and maintenance of the ATC computer programs as designated in Order 1100.5 and Order 1800.27. Task agreements may be required for special support services.
15. LOGISTICS SERVICE. The Logistics Service is responsible for advance procurement planning, award and management of NAS contracts and to determine the quality and acceptability of the material and equipment provided under their contracts. To expeditiously meet these responsibilities LGS shall, at the earliest possible time, be informed of and participate in requirements and technical planning and budget reviews of NAS programs.

16. UTILITY AND SUPPORT PROGRAMS. Responsibility for maintenance of utility and support programs used by both ATS and AFS shall be determined by interservice agreements at the time of transfer of these programs from SRDS to the operating services.
17. SYSTEM CERTIFICATION. Airway Facilities Service will be responsible for total system certification. ATS shall support AFS in accomplishing that end.
18. AERONAUTICAL CENTER. The Aeronautical Center, through the FAA Depot, provides material and supporting shops services for implementation of NAS configuration control directives as provided for in the applicable EEM Handbooks.



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