

United States Federal
Aviation Administration

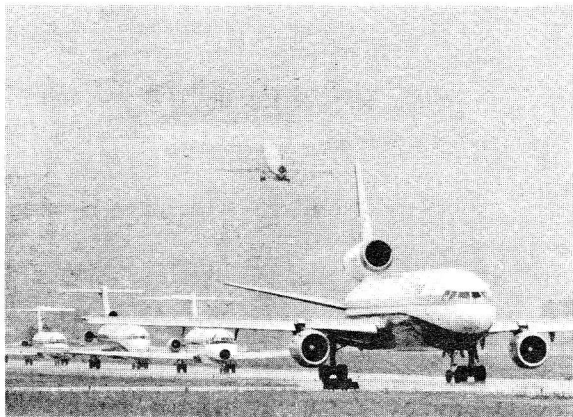
Air Traffic Control System

Land-Based

Hardware, Application and
Support Software, Training,
Documentation, System
Installation and Checkout.

ARTS IIIA

AUTOMATED RADAR TERMINAL SYSTEM ALPHA



The Automated Radar Terminal System Alpha (ARTS IIIA) is an expanded version of the ARTS III system now operating at 64 air terminal sites in the United States. The ARTS IIIA system is the latest step in the expansion of the ARTS III system, necessary to meet the increasing traffic demands in terminal airspace. ARTS IIIA includes primary radar tracking, with alphanumerics, of non-transponder-equipped aircraft, capacity for additional radar displays, multiprocessing, and automatic failure detection, reconfiguration, and recovery in the event of component failure. ARTS IIIA also provides continuous data recording and editing, improved aircraft tracking, and automatic overload sensing and protection.

Sperry Univac was chosen to implement ARTS IIIA because of the company's success in the development of automated air terminal systems. Following the installation of ARTS III systems in 1971-1973, several contracts were awarded to Sperry Univac by the United States Federal Aviation Administration (FAA) for enhancements to the basic ARTS III system. The major additions included in

ARTS IIIA are a result of an extensive research and development effort between the FAA and Sperry Univac in the development of air traffic control components and systems.

In 1976, the FAA awarded an implementation contract to Sperry Univac to upgrade 29 of the highest traffic-density ARTS III sites to ARTS IIIA installations. The largest ARTS IIIA system will be installed at O'Hare Field, Chicago. The largest automated radar terminal system in the world, the New York system, is a specialized version of ARTS IIIA.

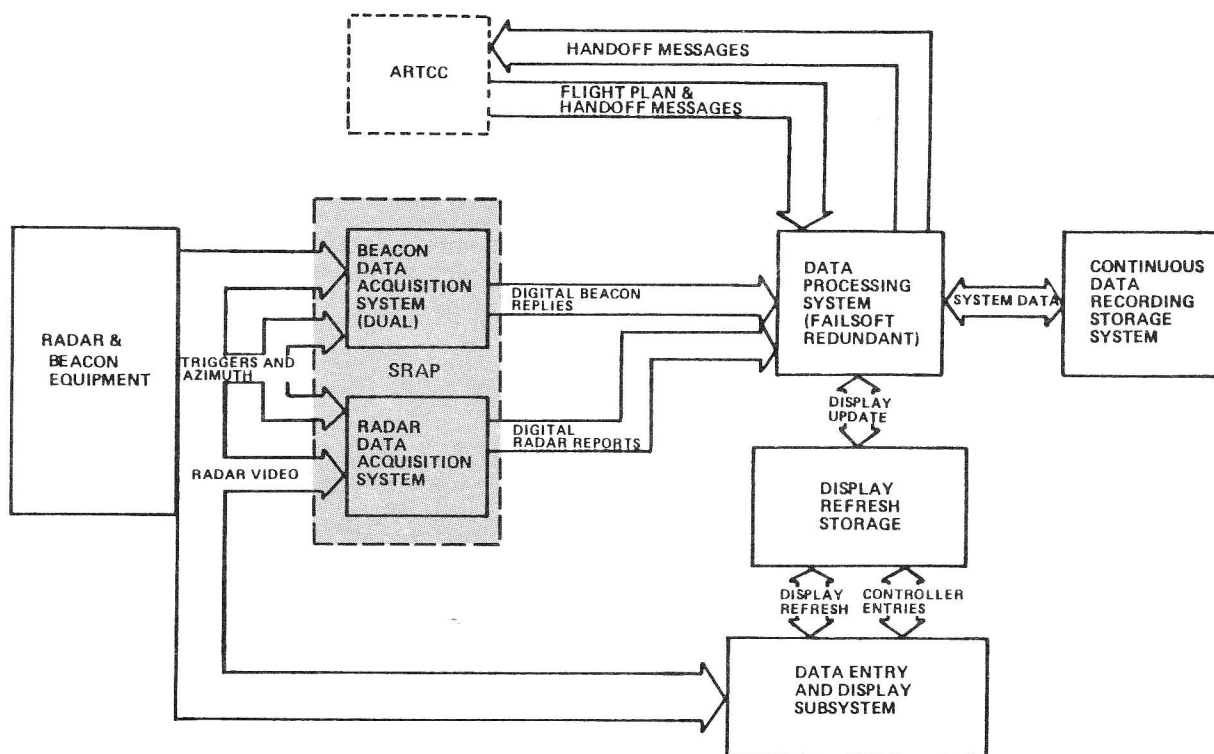
In addition to basic ARTS III capabilities, the ARTS IIIA system offers:

- primary-radar tracking of aircraft without transponders
- multiprocessing and failsoft applications
- on-line data recording and editing
- on-line system program generation
- improved aircraft tracking capabilities
- automatic failure detection, reconfiguration, and recovery
- automatic overload sensing and protection
- ancillary on-call programs

ARTS IIIA primary-radar tracking provides the air traffic controller with alphanumeric data blocks for aircraft without transponders. The sensor receiver and processor transmits radar-only and beacon reports to the data processing subsystem, where the correct association of target reports and tracks is maintained. Radar tracking also helps to ensure track continuity during beacon fades.

ARTS IIIA is a multiprocessing system which allows simultaneous operation of the various software modules. Multiprocessing also enables use of an alternate channel selection in case of primary channel failure. The failsoft application uses additional backup-program

AUTOMATED RADAR TERMINAL SYSTEM ALPHA



levels in case of component failure to enable system operation with reduced capacity.

The major improvements in the ARTS IIIA tracking system lie in the areas of overall reliability and accuracy during aircraft maneuvers. The system automatically initiates and tracks all aircraft and the ARTS IIIA track-oriented smoothing filter provides improved response to aircraft maneuvers.

The ARTS IIIA system contains automatic failure detection, reconfiguration, and recovery. During operation, the system periodically records critical operating data necessary to enable a return to normal processing in a minimum time after a failure. The system detects both hardware and software failures. Should a failure be detected, the failsoft application initiates a recovery process which determines functioning system elements, configures appropriate software, retrieves critical

operating data, and immediately restores operation of the system.

ARTS IIIA also contains automatic overload sensing and protection. Primary radar inputs are monitored and thresholded by sector, thereby removing the possibility of degrading system response during excessive heavy input conditions.

The ARTS IIIA system contains on-call programs. To more efficiently use computer memory, a specific area has been designated to accommodate the execution of various on-call programs. These programs are resident on disk until rolled into memory as a result of operator commands.

For additional information, contact Marketing Communications, Sperry Univac, Defense Systems, Univac Park, St. Paul, MN 55165, or contact your local Sperry Univac representative.