SPERRY UNIVAC
DEFENSE SYSTEMS

Mitsubishi Electronic Corporation

Air Traffic Control

Land-Based

Data Processing System Hardware and Software, Display Consoles, and Operational Program.

JARTS

JAPANESE AUTOMATED RADAR TERMINAL SYSTEM

The Japanese Automated Radar Terminal System (JARTS) is similar to the Automated Radar Terminal Systems (ARTS III) installed by Sperry Univac at 64 air terminal sites in the United States. JARTS assists air traffic flow by automatically performing many of the repetitive and time-consuming tasks previously performed manually by air traffic controllers. This aids in the efficient use of airspace in the terminal area and helps ensure the safe and efficient flow of arriving and departing aircraft.

Sperry Univac was selected for this contract on the basis of extensive involvement in automated air traffic control systems. The Sperry Univac Automated Radar Terminal System (ARTS III) has been successfully operating in the United States since 1971.

In 1973, Sperry Univac was awarded the JARTS contract by the Mitsubishi Electronic Corporation for two terminal air traffic control systems to be located at Tokyo's Haneda Airport and at Osaka's Itami Airport.

Sperry Univac provided the automated system which consists of the processing system, display consoles, and operational software. The automated system interfaces with an existing primary radar and accepts secondary radar digital-data from a Mitsubishi-supplied data acquisition system.

The JARTS system includes the functions of the basic ARTS III air terminal control system installed by Sperry Univac and currently operating at 64 air terminal sites in the United States.

The Japanese ARTS III is essentially a beacon-tracking system which accepts beacon data from an Airport Surveillance Radar (ASR) sensor.

The data acquisition subsystem, provided by Mitsubishi, receives beacon video from transponder-equipped aircraft, detects and isolates beacon-reply code trains, and transmits the beacon replies in digital form to the data processing subsystem.

The data processing subsystem accepts these beacon replies, along with flight data from an Air Route Traffic Control Center and manual data entered at keyboards by air traffic controllers. Using this information, the data processor detects beacon targets and performs real-time tracking of transponder-equipped aircraft within the terminal area. The data processing subsystem translates information into alphanumeric data that is displayed on air traffic controller video screens.

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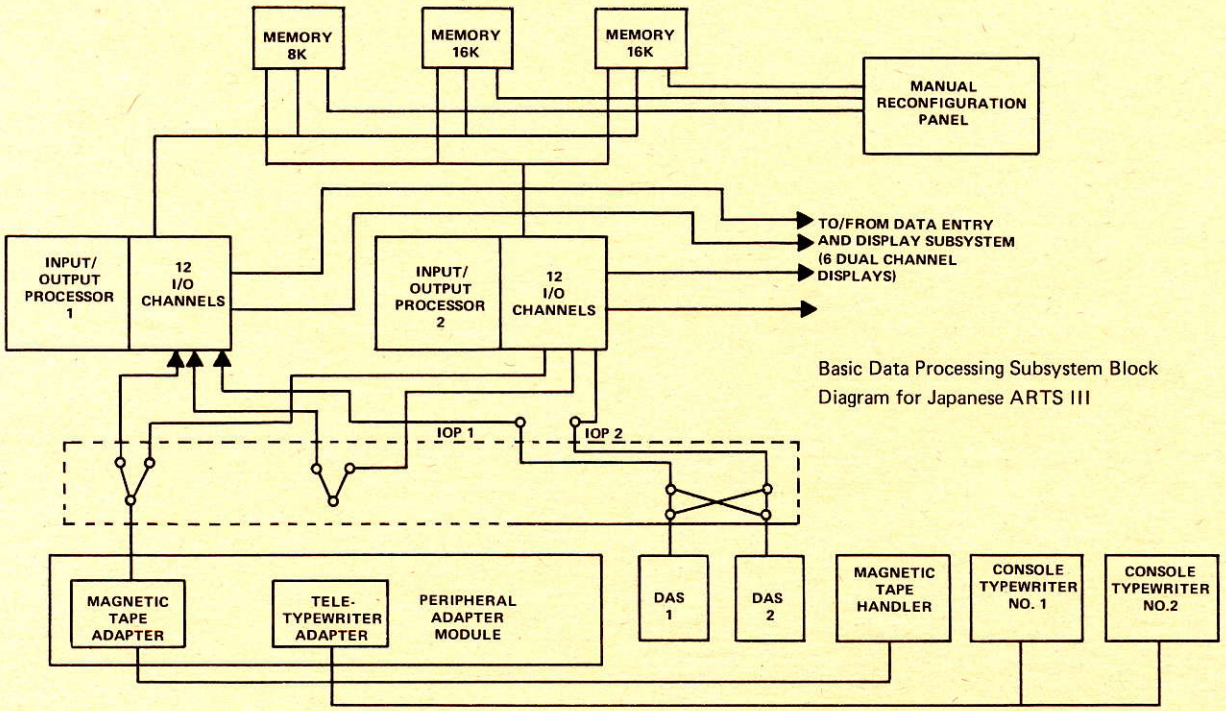

Basic Data Processing Subsystem Block Diagram for Japanese ARTS III

The data entry and display subsystem provided by Sperry Univac accepts the data from the data processor and displays alphanumeric identity, altitude, and ground speed information for each controlled aircraft. Primary data video is also displayed on the console, without alphanumeric identification, for non-transponder-equipped aircraft. Keyboard-entered information is also handled by this subsystem.

Several additions have been made to the basic ARTS III system for use in JARTS. Redundant hardware has been provided in critical areas and special software has been implemented to improve system availability.

Optimum hardware reliability is assured by this system redundancy, with maximum fault-detection and automatic system reconfiguration in case of hardware malfunction. JARTS has additional processing capabilities through use of several input/output processors, shared memory, and the executive software system.

The Japanese Automated Radar Terminal System was installed at the Tokyo and Osaka airports in 1974. The modularity of the Sperry Univac system allows expansion of hardware and software capabilities as air traffic loads increase. It also provides for the addition of system enhancements as new features are needed or desired.

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