MARCONI AVIONICS

IS 03-004
Air Data System

- DESIGNED SPECIFICALLY FOR HELICOPTERS
- 3-AXIS AIRSPEED IN ALL FLIGHT CONDITIONS
- LOCATES BELOW ROTOR FOR SIMPLE RETROFIT
- SERIAL DIGITAL, ANALOG AND DISPLAY OUTPUTS
- LIGHTWEIGHT, COMPACT, RELIABLE
- DIGITAL MICROPROCESSOR COMPUTER
- BUILT IN TEST FEATURES
- IN SERIES PRODUCTION FOR U.S. ARMY

IS 03-004 Air Data System

Features

Measurement of helicopter air velocity in three axes

True airspeed and Indicated airspeed output data

Outputs include: Longitudinal, Lateral and Vertical airspeed, Static Air Temperature and Pressure and Rotor Downwash airspeed.

Provides continuous pilot displays of air velocity

Serial Digital outputs to user sub-systems

Velocity data interface with navigation system for reversionary dead reckoning.

Built-in Test equipment

System availability indicators and continuous performance monitoring

AVUM/AVIM Ground Support Equipment

The IS 03-004 is a helicopter air data system especially suited to meet the tactical requirements of Army aviation and close support operations.

By using a unique swivelling pitot-static pressure probe located in the rotor induced flow field together with an integral air temperature sensor, the system can determine essential air data parameters to a high degree of accuracy under all flight conditions, including low speed operation.

The facilities provided by the IS 03-004, its equipment engineering, method of operation, data display and maintainability features have been designed to satisfy the following objectives.

> An instantaneous display of airspeed and direction to reduce pilot workload and improve safety in the low speed flight region.

> Provide a system with high reliability and minimal maintenance actions to maximize availability and mission success rates.

> Provide accurate instantaneous data to user subsystems (e.g. fire control and navigation systems) to increase aircraft mission effectiveness.

> Minimize installed weight of system.

General Description

The IS 03-004 Air Data System consists of three principal units, the Airflow & Direction Sensor, the Electronic Processor Unit and the Low Airspeed Indicator.

The Airflow & Direction Sensor is a swivelling pitot-static pressure probe which is mounted external to the fuselage. The Sensor has an integral Air Temperature sensor and is equipped with anti-icing heaters. The probe is aligned with the local airstream under the rotor by stabilizing vanes and angle resolvers are used to measure the local flow direction.

The Electronic Processor Unit accepts input data from the Sensor consisting of airflow direction, air temperature, total pressure and static pressure. The Processor uses two pressure transducers to generate electrical data from the pneumatic inputs and a digital microprocessor converts the input data into the required outputs. The microprocessor computation applies corrections to the data to remove errors generated by fuselage and rotor induced flow effects. The processor also performs continuous system integrity monitoring and organizes the manually operated Built-in Test sequence.

The Low Airspeed Indicator accepts data from the Processor to provide the pilot with a cross-pointer display of longitudinal and lateral airspeed in the low airspeed region (below 50 KN IAS). The Indicator also provides a warning malfunction flag symbol in the event of system failure.

The IS 03-004 Air Data System is fitted to the Army/Bell AH-1S (Modernized) helicopter and has been given the U.S. Army nomenclature XM143.

Data Summary

Power Consumption	+28VDC 30W
Velocity Range	50 KN Aft to 200 KN Forward
	50 KN Left to 50 KN Right
	4000 Ft/Min Climb/Descent
Altitude Range	−2000 Ft to 15000 Ft
Velocity Accuracy	±3 KN
Output parameters	Longitudinal TAS and IAS, Lateral TAS and IAS, Vertical TAS, Static Air Pressure, Static Air Temperature, Downwash airspeed TAS, System Fail Discrete
Output Transmission	Serial Digital and DC Voltage Analog

Dimensions and Weights

	Height	Width	Depth	Weight
Airflow and Direction Sensor	3.8 in	12.5 in	9.67 in	2 lb. 6 oz
Electronic Processor Unit	4.2 in	8.2 in	7.5 in	7 lb. 6 oz
Low Airspeed Indicator	3.25 in	6.0 in	3.25 in	1 lb. 6 oz

Reliability

System Mean Time Between Failures greater than 3000 hours