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AEROSPACE STANDARD

SAE AS8002

REV.
A

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AIR DATA COMPUTER - MINIMUM PERFORMANCE STANDARD

FOREWORD

Changes in the revision are format/editorial only.

1. SCOPE:

This SAE Aerospace Standard (AS) covers air data computer equipment (hereinafter designated the computer) which when connected to sources of aircraft electrical power, static pressure, total pressure, outside air temperature, and others specified by the manufacturer (singly or in combination) provides some or all of the following computed air data output signals (in analog and/or digital form) which may supply primary flight instruments:

- Pressure Altitude
- Pressure Altitude, Baro-Corrected
- Vertical Speed
- Calibrated Airspeed
- Mach Number
- Maximum Allowable Airspeed
- Overspeed Warning
- Total Air Temperature

In addition, the computer may supply one or more of the following signals:

- Pressure Altitude, Digitized
- Equivalent Airspeed
- True Airspeed
- Static Air Temperature
- Altitude Hold
- Airspeed Hold
- Mach Hold
- Angle of Attack
- Flight Control Gain Scheduling
- Others

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1.1 Purpose:

This Standard defines minimum performance requirements under standard and environmental conditions for Air Data Computer equipment for use in Subsonic Aircraft.

2. APPLICABLE DOCUMENTS:

“U.S. Standard Atmosphere, 1976”, NASA/USAF/USWB, Washington, 1976. (Notes 1 and 3)

“Tables of Airspeed, Altitude and Mach Number; Based on Latest International Values for Atmospheric Properties and Physical Constants” Livingston and Gracey, Technical Note D-822, NASA, Washington, 1961. (Note 1)

“Environmental Conditions and Test Procedures for Airborne Equipment”, Document No. RTCA/DO-160A, January, 1980. (Note 2)

“Federal Aviation Regulations, Vol. III, Part 25, Airworthiness Standards: Transport Category Airplanes”, FFA, Washington. (Note 1)

“The International System of Units; Physical Constants and Conversion Factors”, Mechtly, Special Publication 7012, NASA, Washington, 1964.

NOTES: (1) Available from Superintendent of Documents, Government Printing Office, Washington 20402.

(2) Available from Radio Technical Commission for Aeronautics, 1717 H Street, N.W., Washington 20006.

(3) Identical to ICAO Standard Atmosphere for values within the scope of this AS.

3. GENERAL STANDARDS:

3.1 Operation of Controls:

The operation of controls intended for use during flight, if any, in all possible position combinations and sequences including OFF, shall not result in a condition whose presence or continuation would be detrimental to the continued performance of the computer.

3.2 Accessibility of Controls:

Controls which are not normally adjusted in flight shall not be readily accessible to flight personnel, when the computer is installed in accordance with the manufacturer's instructions.

3.3 Compatibility of Components:

If the computer consists of more than one component and these components are individually acceptable but require matching for proper operation, these individual components shall be identified on the equipment nameplate in a manner that will ensure proper matching.

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3.4 Interchangeability:

Instruments and components which are identified with the same manufacturer's part number shall be interchangeable.

3.5 Fire Resistance:

Except for small parts (such as knobs, fasteners, seals, grommets, and small electrical parts) that would not contribute significantly to the propagation of a fire, all materials used must be self-extinguishing when tested in accordance with the requirements of Federal Aviation Regulation 25.1359 (d) and Appendix F thereto, with the exception that materials tested may be configured in accordance with paragraph (b) of Appendix F or may be configured as used.

3.6 Altitude Reference:

Calibration of the static air sensing mechanism for pressure altitude outputs (including baro-corrected if supplied) shall be to the geopotential altitude tables of U.S. Standard Atmosphere, 1976.

3.7 Calibrated Airspeed and Mach Reference:

Calibrated airspeed and mach outputs shall be calibrated per Tables in NASA Technical Note D-822 dated August 1961.

3.8 Alarm Signal:

A means shall be provided to activate a warning device when electrical power (voltage and/or current) is not supplied to the computer. If the equipment has a self-test capability, a malfunction in the self-test system which affects output accuracy of the computer shall be indicated in a positive manner.

3.9 Self-Test Capability:

If the computer contains integral arrangements to permit preflight and/or in-flight self-test checks on the operation of the equipment and/or in combination with other aircraft subsystems, a means shall be provided to permit deactivating a using subsystem which might be adversely affected during the self-test cycle. In-flight self-test activating controls shall provide a means to warn the pilot of this mode of operation and which subsystems, if any, are deactivated. The self test feature shall be spring loaded or otherwise arranged to return automatically to the normal operating mode.