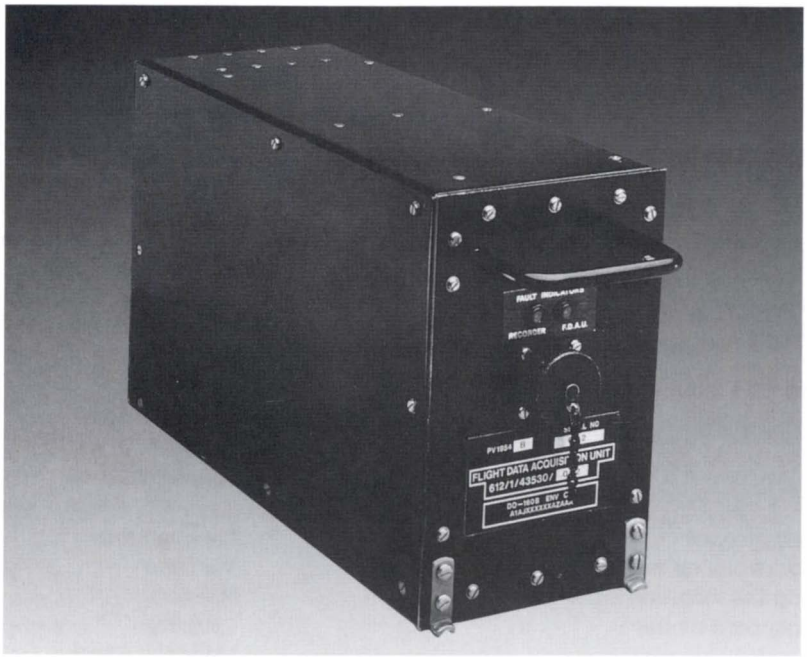
GEC-Marconi Electronic Systems

ESD1954 Series

Flight Data Acquisition Units (FDAU)



- *Chosen for the Gulfstream IV and the British Aerospace 146 series 2 and ATP aircraft*
- *Meets 32 parameter Flight Data Recorder FAA, CAA, ICAO and EUROCAE requirements*
- *Compatible with all ARINC 573/717/747 Digital Flight Data Recorders*
- *Latest CMOS technology means low power consumption and high reliability*
- *Wide variety of signal input types accepted*
- *Expansion capability for Engine or Airframe Usage Monitoring*

The ESD1954 series Flight Data Acquisition Units (FDAU) have been developed from earlier systems and embody all of the previous experience in this field. The ESD1954 fulfils all of the requirements for a 32 parameter Flight Data Recorder (FDR) and provides ample expansion capablity for additional maintenance monitoring.

Conditioning circuits enable the ESD1954 to sample data from a wide variety of input signals. These inputs may be analogue, digital or discrete. The information is sampled in a pre-determined sequence and assembled into a digital data stream in a format compatible with any standard ARINC 573/717/747 Digital Flight Data Recorder (DFDR).

A programmable read only memory controls the input signal sampling sequence. This method of control permits the user to define the content of all data words in the frame, except synchronisation words. Each data word may be individually defined for input pin and signal type.

Programmable logic devices are used extensively in the unit. The size of the devices is chosen to allow up to eight aircraft programmes to be stored in a unit. Selection of the programme is by means of up to three wire links (jumpers) in the aircraft installation, enabling the same part number unit to be used in a variety of aircraft types.

The FDAU provides comprehensive Built-In Test Equipment B.I.T.E., according to the principles laid down in EUROCAE ED-55. In addition to testing the functions of the unit, the FDAU determines whether recorded data is reasonable or not.

In a typical FDAU, four or five module positions will be available for system expansion. This may take the form of additional signal conditioners or the unit may be expanded into an integrated microprocessor-based monitoring system, to provide engine or airframe usage monitoring.

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Input capability

1. Analogue signals

56 input wires in standard configuration for signals of the following types:

- Synchro
- DC and AC voltage ratio
- High level DC (0 to 32V)
- Low level DC (0 to 5V)
- Bipolar DC (± 5V or ± 32V)
- Potentiometer (FDAU excited)

One 300 to 800 ohm thermobulb
Four very low level DC (± 400mV)

2. Discrete inputs

- Shunt (0V or open circuit)
- Series (open circuit or 28V)
- Marker beacon

In the standard configuration, 54 input wires are provided.

3. Digital inputs

The FDAU provides a wide variety of combinations of digital and frequency inputs. One or two modules offering the following input capability are provided dependent on the aircraft signal sources:

- Eight ARINC 429 inputs (up to three high speed)
- Eight frequency inputs
- Four ARINC 429 plus four Frequency Honeywell Avionics Standard Communications Bus (ASCB) both clocked (version A) and unclocked (version B)
- Collins Serial Digital Data Bus (CSDB)

In addition to these input modules, the FDAU also provides an input for a GMT clock conforming to ARINC 585.

4. Relative time counter

The FADU also provides a frame (relative time) counter.

Output capability

Data outputs

The ESD1954 provides an output of 64 twelve-bit data words per second in Harvard Bi-phase format to the DFDR.

As an option, this data rate may be increased to 128 or 256 words per second.
An auxiliary data output in RZ format is provided for use with an optional Quick Access Recorder at a rate of 64 words per second, with an option to increase the data rate to 128 or 256 words per second.
A time synchronisation output in Frequency Shift Key format is provided to synchronise the DFDR to the Cockpit Voice Recorder.

Transducer supplies

The FDAU provides the following supplies for transducers:

- nominal 5V DC for potentiometers
- nominal 28V DC for accelerometers

Environmental

To RTCA DO-160B

Temperature	Category B1 (-20 to+70°C)
Temperature Variation	Category C
Humidity	Category A
Vibration	Category J/Y
Magnetic effect	Category A
Electromagnetic Compatibility	Category A

Power input

Nominal 28V DC to
DO-160B category A
Maximum consumption 15W max.

Dimensions

The ESD1954 FDAU is housed in a standard 1/2 ATR short case to ARINC 404A.

Weight

In typical configuration the weight of the FDAU is 5.0kg (11.0lb)

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Radar and Defence Systems

Electronic Systems Division
Browns Lane, The Airport, Portsmouth, Hampshire, PO3 5PH.
Telex: 869442 MARDEF G
Tel: (+44) 01705 226000 Fax: (+44) 01705 226001
e-mail: charles.andrews@gecm.com

USA
GEC-Marconi Office, 1111 Jefferson Davis Highway, Crystal Gateway North, Suite 800, Arlington, Virginia 22202, USA Tel: 1(703) 4166582 Fax: 1(703) 4160135

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