The Crew Force Measurement System consists of 8 strain-gage based force sensors and an analog-to-digital converter electronics module. This system is used to measure pilot/copilot input forces on the flight controls (elevator, rudder, and aileron) for use in the flight data recording (FDR) system on the aircraft. The analog force sensor signals are input into the A/D converter module and converted into ARINC 429 digital information, which is transmitted the length of the aircraft via twisted pair wire to the Flight Data Acquisition Unit (FDAU). THE A/D converter module is also used to provide excitation voltage to the force sensors.

This system is now a requirement for all new commercial aircraft over 20 passengers.

**System Performance Overview:**

- System Voltage: Nominal 28 Volts DC
- System Accuracy: ±5% over temperature and life
- Power Consumption: 350 mA max
- Operational Temperature: -40°C to +70°C
This system consists of:

- (4) Aileron Force Sensors
- (4) Elevator/Rudder Force Sensors
- (1) A/D Converter Module
- Built in Test (BIT) & Monitor functions
  - Force Sensor Short
  - Excitation Short
  - ARINC Fault
- ROM/RAM check
- Upgradeable Firmware

System Performance:

- Elevator/Rudder Force Sensor
  - Operating Range: +/-500 lbf.
- Aileron Force Sensor
  - Operating Range: 604 lbf. (tension only)
- Digital Output Frame Rate: 7.5 Hz
- Baud Rate: Transmit Low Speed (12.5 KHz)

System Environmental:

- Temperature/Altitude: DO160D, Section 4, Category A3Y
- Temperature Variation: DO160D, Section 5, Cat. B
- Humidity: DO 160D, Section 7, Cat. B
- Operational Shock: DO-160D, Section 7, Cat. B
- Vibration: DO-160D, Section 8, Cat. R
- Waterproofness: DO-160D, Section 10, Cat. W
- Fluid Susceptibility: DO-160D, Section 11, Cat. F
- Sand & Dust: DO-160D, Section 12, Cat. D
- Fungus Resistance: DO-160D, Section 13, Cat. F
- Salt Spray: DO-160D, Section 14, Cat. S
- Icing: DO-160D, Section 24, Cat. B
- Magnetic Effects: DO-160D, Section 15, Cat. Z
- Power Input: DO-160D, Section 16, Cat. Z
- Voltage Spike: DO-160D, Section 17, Cat. A
- Audio Conducted Susceptibility: DO-160D, Section 18, Cat. Z
- Induced Signal Susceptibility: DO-160D, Section 19 Cat A
- RFI Emissions: DO-160D, Section 21, Cat. M