

Howell Instruments, Inc F-15 Support technology

Derek Moffa

dmoffa@howellinst.com

www.howellinst.com

US Mobile 817 798 0215

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BAE SYSTEMS

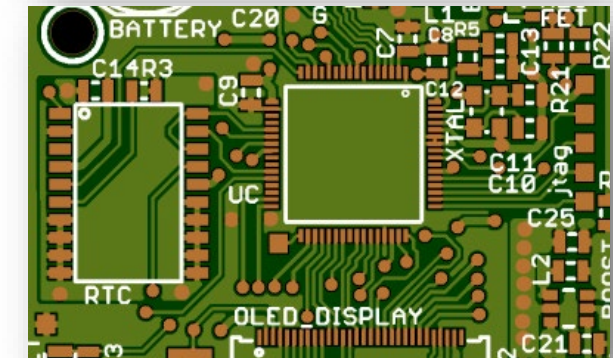


Global Reach



Engineering Capabilities

- Howell's engineering team is comprised of mechanical, software, and electrical engineers, technicians, and designers equipped with the latest technology to provide complete lifecycle support of all Howell products
- 30 Engineers on-site at Howell
- Offshore Engineers for Software Development and Reliability Analysis (FAA approved)
- Circuit Design and Development
 - Digital and Analog Circuit Design
 - Data Acquisition
 - Engine Interface Displays
 - Customized display options
 - Design to meet RTCA/DO-160D/E/G and MIL-STD-810/461



Production Capabilities

- Agile and Responsive to Low or high volume production
- Custom assembly: electronics, instruments, test sets, wire looms
- Printed Circuit Boards: through-hole/pick & place auto assembly
- CNC machines, automated metal forming, welding
- Injection Molding
- Cable/Wire harness, hose manufacturing
- X-ray Inspection Machine
- HALT/HASS Testing
 - Highly Accelerated Life Testing/ Stress Screening
 - Temperature, shock and vibration testing of ever complete unit assemble
- Surge/Rapid Production Capacity
- Efficient in low and high production runs



Howell Products (non-inclusive)

- Data acquisition Systems (Data Acquisition Units)
- Displays
- Turbine Engine Analyzers/Testers
- Acft/engine systems test sets
 - Brake System Test Sets (including F-15)
 - Engine and APU Testers
 - Environmental Control Systems Test Sets
- Indicator/Monitors



H585 Brake Test Set

- H585 Brake Tester (NSN 6685-01-300-9090)
- Accessory kits for F-15 aircraft – BH28585-15.
- For flight line operation
 - Measures fore and aft pressures on two sets of brakes
 - 4 Digital readouts
- Measures up to 4 independent hydraulic pressures
- Up to 5,000 psi operating pressure
- Hydraulic measurement channels and system surge port
- Calculates the pressure differentials between fore and aft
- Accessory kit for F-15 available and tested
- Multi aircraft configurations



H585 Brake Test Set

Specifications	
Input	1 - Power Inputs 115 VAC (nominal), 50 to 400 Hz 4 - Pressure Inputs Source: Aircraft hydraulic system Range: 0 to 4500 psig operating/5000 psig maximum
Accuracy	+60 °F to +80 °F ambient temperature: ± 15 psig -40 °F to +125 °F ambient temperature: ± 50 psig
Display	Four, four-digit red LED displays in which each digit is made up of seven segments.
Dimensions	12 inches H x 15 inches W x 15 inches D
Weight	13 lbs
Case Color	Green #24052 (per FED-STD-595 or equivalent)



F-15 Accessory kit

- BH28585 -15 F-15 Accessory kit available now.

BH28078-1 purge hose

BH28336-1 hose assys

BH28321-5 Adapter assys

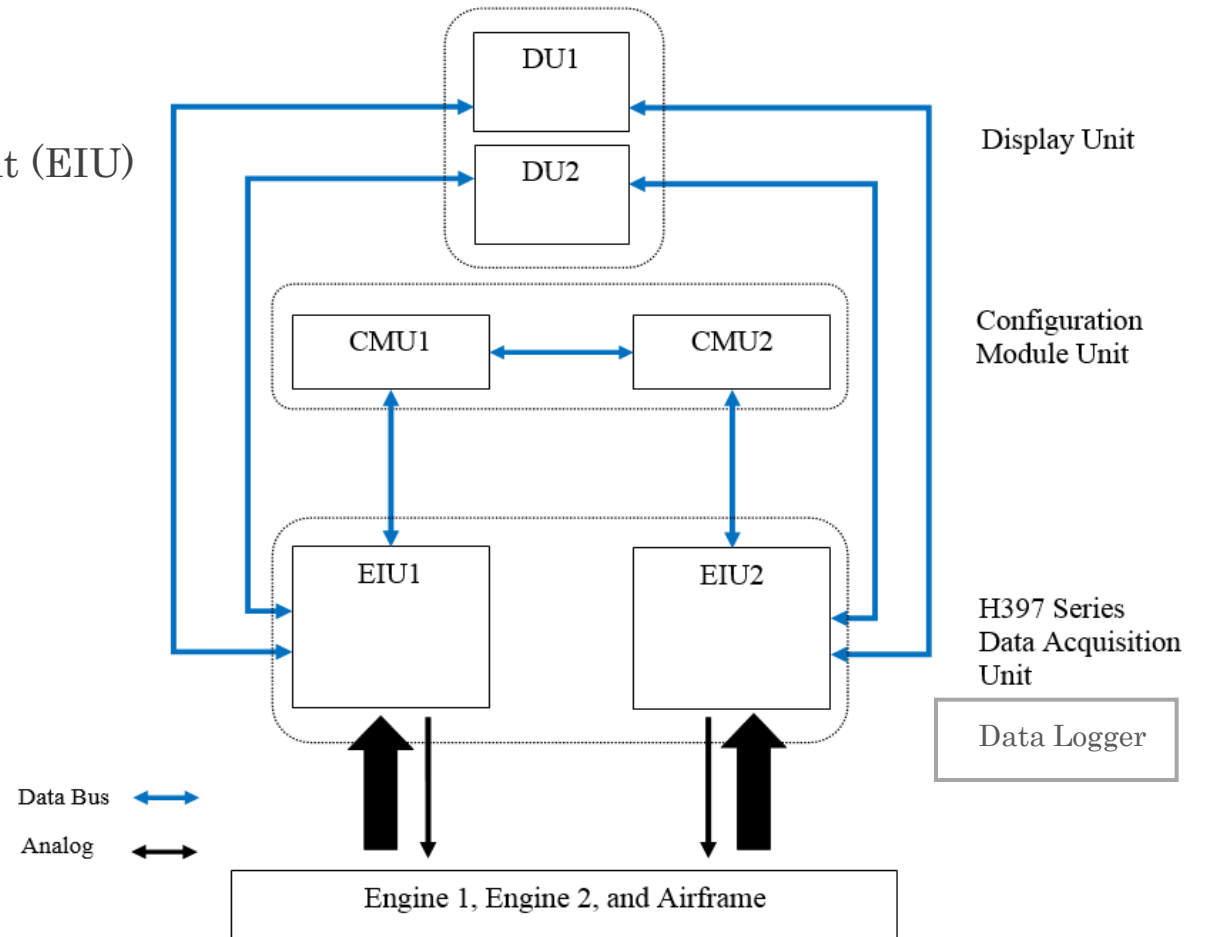
BH21701Z-3 case

- In Depot use at WRALC GA USA.



Typical System Description – DAS

- 3 or 4 Line Replaceable Units
- 1+ Dual Channel Data Acquisition/Engine Interface Unit (EIU)
- 1 or 2 Display Units (DU), and
- 1 Configuration Management Unit (CMU)
 - Each channel of the DAU/EIU will acquire signals from both engines and convert them to a digital format
 - Each DAU/EIU channel will operate independent from the other including the power source to mitigate any single point of failure within the system
 - The DU is a system expansion module that will provide the necessary human interface to safely operate the aircraft.
 - The DU receives the engine parameter information digitally from the DAU and converts it to the necessary representation of the engine and aircraft parameters.



Data Acquisition Unit (DAU)

- Data Acquisition Unit (DAU)
 - Multiple configurations:
 - Primary difference is the number of 'In/Outs'
 - 75 TO 384 Pin counts
 - Incorporates open architecture approach and novel 'series' FAA certification to ease platform integration
- Software Certification is to DO-178B DAL A
- Environmental certification is to DO 160-G
- Power: 28 VDC nominal per MIL-STD-704A.
Power consumption 15 Watt Max.
- TSO: C43c, C44c, C47a, C49b, C55a
- Reliability substantiated to 10^{-9}
(Catastrophic) per MIL-HDBK-217



Howell Engine Instruments Display System

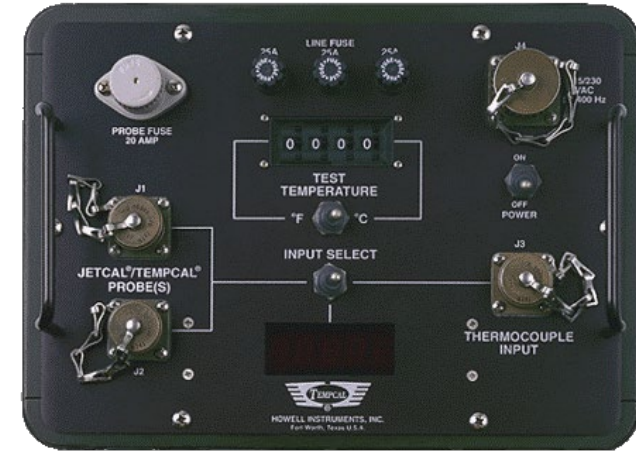
- Howell's Engine Instruments Display System (EIDS) can be packaged as one form, fit, line-replaceable unit.
- Two or more displays* with bezel button controls as required are on the front
- Data Acquisition Unit(s) can be mounted behind the displays or elsewhere
- Back plane may contain legacy compatible connectors taking all engine instrument signals, etc. to DAU for processing.
- In Form/Fit/Function application back plane connectors mate to existing legacy round dial indicator aircraft wiring connectors
- May be an exact panel fit, no wiring changes needed, line-replaceable, organizational-level change system

* Display number, DAUs, connections flexible to your needs.



H394R for Boeing, F-35, V-22, C-130, more

- H394R (NSN 4920-01-468-9406)
 - Tests thermocouples, thermal switches, and continuous-fire fire/overheat detection systems
 - Systems can be tested in-situ:
 - Tester is man-portable, used at aircraft
 - Heater probes designed for specific applications to ensure high levels of accuracy



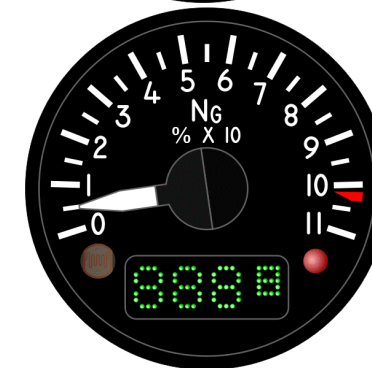
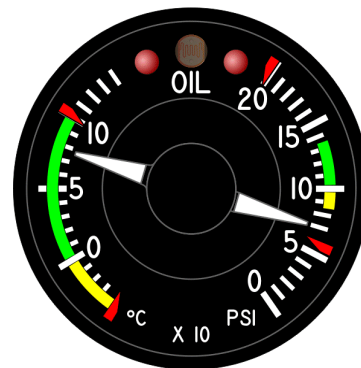
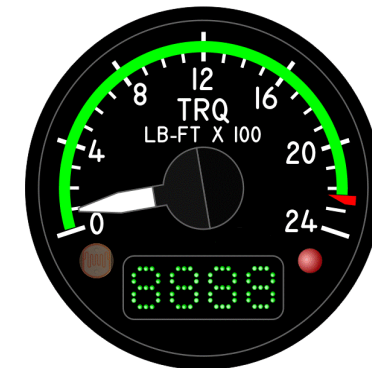
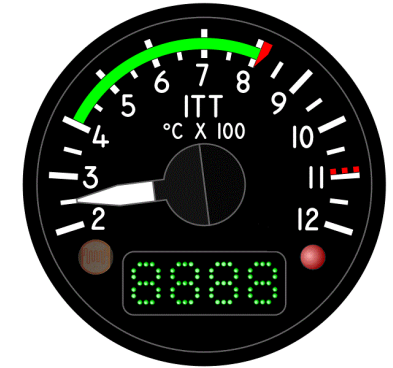
Auxiliary Power Unit (APU) testing

- H296G series APU Tester (NSN 4920-01-374-7511)
 - Designed to test GTC Series Garrett Auxiliary Power Units
 - Temperature (°C or °F units are selectable)
 - RPM (RPM, %RPM or Hz units)
 - Elapsed Time (in 0.1 second increments)
 - Control Air Pressure (0 to 100.0 psig)
 - High Fuel Pressure (0 to 1000 psig)
 - Oil Pressure (0 to 250 psig)
 - Low Fuel Pressure (0 to 250 psig)



H8000 Indicators, Indicator/Monitors

- Modular design maximizes adaptability, flexibility, and expandability to multiple aircraft types with minimal redesign and recertification.
- Share a common architecture and feature an ARINC 825 digital bus output, allowing for system expansion with the addition of any number of modules, including data recording, tone generation, or discrete processing.
- Monitoring
 - Capable of receiving several parameters for customized monitoring
 - A/C & Engine Identification
 - Engine Starts
 - Engine Hours
 - Engine Cycle Counts
 - Exceedance Data
 - Trend Data



MRO/GSE Capabilities

- GSE experts to completely overhaul equipment and return to service.
 - Our team visits you to assess equipment, provide customized plan for your specific needs
 - Once in house, each piece of equipment is thoroughly evaluated, tested and diagnosed including wires, switches, plates, panels and electrical system components.
 - 98% of the repairs are conducted in-house. Once repairs are complete, all equipment is 100% recertified prior to delivery.
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- Cabin pressurization units
 - Cargo loaders
 - Engine stands
 - Ground power units
 - Heaters, air conditioners
 - Hydraulic power units
 - Industrial generators
 - Lifts, jacks, fork lifts
 - Load testing
 - Maintenance Stands,
 - Non-powered equipment
 - Push backs
 - Scissor lifts
 - Tow bars
 - Tugs, tractors, transport units



Discussion

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