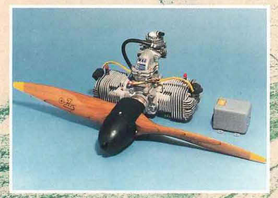
CONTROL

RPV Management System

The Engine Management System (EMS) for RPVs is designed so that it forms with the engine a 'stand alone' powerplant module. The EMS monitors speeds, temperatures and timing references on the engine and by controlling the ignition, fuel injection and throttle functions, it closes the speed control loop of the engine.
Overtemperature control is integrated into the loop when required, as is cold start enrichment. A minimal aircraft interface is required to input speed demand and return BITE information both before and during flight. Reversionary fail-safe modes are automatically introduced for in-flight engine problems that are recoverable, to allow return to base of a malfunctioning aircraft.

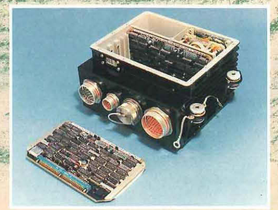


Engine Supervisory Control Unit

The modern high performance aero engine is an optimal blend of advanced aero-mechanical design and state-of-the-art digital electronics. One example is the Rolls Royce RB211-535 engine, in service on the Boeing 757 twin jet transport aircraft. The rugged Engine Supervisory Control Unit (ESCU), designed for engine fan-case mounting, trims the engine for optimum performance and provides essential over boost protection. Reliable design and extensive self-checking ensures high availability. (ESCU developed in conjunction with Lucas Aerospace).

Engine Limiter

The primary function of the engine limiter is to provide fan-speed and turbine gas temperature limit protection. This is accomplished by monitoring the two parameters and controlling fuel flow to the engine to restrict each parameter to the appropriate limit. The limits used are adjustable across the life of the engine if desired. As a secondary function the limiter acts as a fault-code collection and processing system. Symptoms are analysed to indicate the most probable fault areas. The results of this processing are stored for presentation on a display on maintenance request.



DISPLAY

Standby Instrument Panel

The Standby Instrument Panel provides all the displays necessary to allow recovery from unusual attitudes, recovery to base or diversionary airfield, and ground controlled or VFR approach. The flight instrument layout is a basic 'T' format providing Attitude, Altitude, Airspeed, Rate of Climb and Descent, Heading Reference, Turn and Slip indication and Millibar Setting. Bar Graph and digital information of engine parameters are added and torque and rotor speed for rotary wing aircraft. The panel measures 8″ x 8″ x 1″ and is designed with edge repeaters for 'pull out and snap down' storage.

The panel provides full night vision goggle compatibility and electroluminescent lighting to extend the use to all visual conditions. Total power consumption does not exceed 5 watts. The circuit architecture allows for isolated data channel operation or compatibility with avionic fail safe redundancy.

Engine Speed and Temperature Indicator (ESTI)

The Indicator provides two radial bar graph displays and two digital displays. The unit includes interfaces to engine pyrometers and speed probes and to the warning panel. The ESTI consists of four sub assemblies, the liquid crystal display includes a heater to extend the operating range to –40 deg C. The processor controls the input signal conversions and updates the display. A continuous BIT function is performed and the input signals are tested for 'out of range' conditions. In this case the display formats are changed.

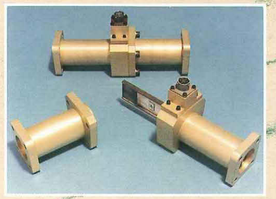
Common Control Unit

The Common Control Unit (CCU) is an interactive keyboard and display unit used to control avionics systems via an aircraft data bus. The unit is designed for low power, low weight and compactness. A removable flat panel liquid crystal display is incorporated using electroluminescent backlighting for display in all lighting conditions. The display has a very wide field of view. The normal display output is a series of menus with the options selectable by an array of push buttons. The unit interfaces can scan up to 80 keys and transmit the movement of a tracker ball. MIL-STD-1553B, ARINC 429 and EIA-RS232C interfaces are available. The sub-assemblies can either be assembled into one unit or be distributed giving great flexibility in layout.

MEASURE

Engine Health Monitoring

Powerplant Systems Division offers a range of equipments for monitoring Engine Health and Structural fatigue for fixed and rotary wing aircraft. Designed with on board data processing and a comprehensive Built In Test Equipment (BITE) they provide the pilot with information to which he must react. They also provide a single point access for the ground crew to establish the airworthiness of the avionics, aircraft and engines.

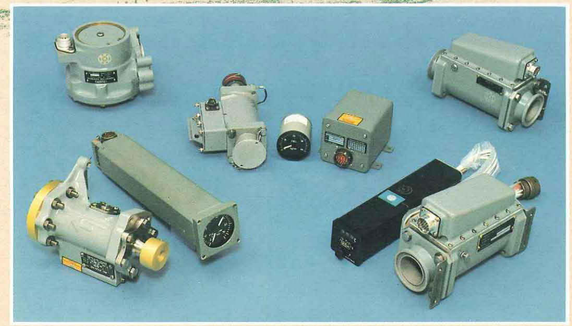


Fuel Sensors

An unrivalled experience in fuel sensors has been gained over 30 years through supplying quantity gauging and flow measurement systems for a wide variety of civil and military aircraft. Expertise in quantity gauging systems for hydraulic fluids, fuel and water, and flow measurement systems for volume and mass flow applications, provides a solid foundation for new technology developments. New techniques of measurement are providing both an enhanced capability in meeting existing needs and a potential to solve new problems.

Fuel Management Systems

Over 50 aircraft types have been fitted with fuel measurement and fuel management systems supplied by GEC Avionics, from energy management computers and quantity gauging systems on both military and civil aircraft types. Continuing development allows GEC Avionics to offer cost-effective systems to measure, compute and display in both single and multi-parameter applications. Thorough testing and evaluation in our Fuel Systems Laboratory ensures reliable performance.



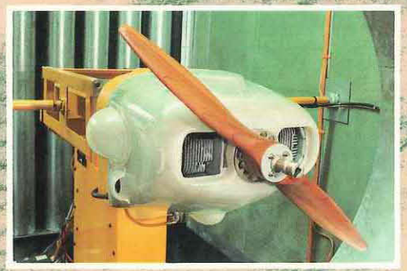
TEST

Maintenance Data Panel

The location and diagnosis of airframe and engine faults and the checking of aircraft consumables, is made simpler and faster with a Maintenance Data Panel (MDP). Using data buses, dedicated links and other data sources, the MDP, a key part of any utilities management system, provides sequenced maintenance information concisely and clearly, under operator control. A recorder output enables information to be transferred to an off-aircraft data base. The panel provides a single access point to check consumables and initiate, control and confirm status in replenishment.

Automated Powerplant Test System

The power and flexibility of the Automated Powerplant Test System (APT) is derived from a variety of standard hardware and software modules, configured especially for each engine/airframe application. These proven systems acquire, display and record engine and test facility parameters, provide on-line correction and calculation of performance data, and guide the operator through the test and diagnostic sequences. A software model of the engine provides operator training capability and aids in fault diagnosis.



RPV Engine Test

Powerplant Systems Division operates an RPV engine test facility consisting of a dynamometer test bed and an engine thrust measurement cell. Both systems have computer controlled engine health monitoring and data collection. These comprehensive facilities allow rapid testing and evaluation of a variety of RPV powerplants for both production and development of engine control equipment.

Automated Powerplant Test Unit

The Automated Powerplant Test Unit (APTU) is an "intelligent" data acquisition subsystem, designed to interface with any host computer to produce a cost effective, flexible engine monitoring and test system.

The APTU provides the operator with accurate and repeatable data and includes self calibration and self test routines to achieve high system availability.

Powerplant Systems Division

Product Support

As part of its total commitment to the programmes in which it is involved GEC Avionics offers full product support. This comprehensive capability is provided by the Company's Aviation Service and Repair Division, AS&RD, an organization specializing in avionics support. Using computer data bases, the Division also provides the required logistics support and associated technical publications to ensure that the needs of each programme and user are fully met.

Overseas Support

A vital extension of the support capability in North America is provided by GEC Avionics Inc. at Atlanta, Georgia; Dayton, Ohio; Fort Worth, Texas; and Seattle, Washington. The Atlanta site has full development and manufacturing facilities. In other countries throughout the world, support on a local basis is provided by a network of sales representatives and associate companies, and by AS&RD.

Research

New generations of avionics need new techniques and technologies to enhance performance, increase reliability, and reduce acquisition and ownership costs. GEC Avionics continuously researches and develops new ideas and equipment, through its advanced research centres, until they can be used by the Company's manufacturing divisions to benefit its customers.

GEC AVIONICS

1983 MARITIME AIRCRAFT SYSTEMS DIVISION

1983

1985 AIRBORNE DISPLAY DIVISION

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