

# Aero Engine Controls

A Rolls-Royce plc and Goodrich Corporation joint venture

## Innovation & History

### 1930s - 1950s

- Lucas is involved in pioneering development work on the pumps and engine controls for the Whittle jet engine
- World's first control-by-wire engine control – Lucas provides pump and control on Bristol Proteus engine for its Britannia airliner
- UK's first level supersonic flight – Lucas supplies pump and control on Armstrong Siddeley Sapphire engines
- First civil jet enters service (De Havilland Comet) – Lucas supplies system on De Havilland Ghost engines
- First civil Turboprop – Lucas provides control and pump on Rolls-Royce Dart engine
- Lucas supplies combustion and fuel system for the world airspeed record by the Gloster Meteor: 606mph
- Lucas provides the fuel controls for the first civil jet flight with the De Havilland Comet

### 1960s - 1970s

- Lucas begins development of digital electronic engine controls
- World's first engine pressure ratio control enters service: FFR on RB211-11
- World's first flight of digital control demonstrator with 'full authority' on Olympus 593 powering Concorde
- Lucas develops world's first all centrifugal engine fuel pumping system in service on Olympus 593 for Concorde
- Lucas supplies the world's first civil generic non-dimensional control on Rolls-Royce Spey
- Lucas supplies pump and fuel control on Rolls-Royce Pegasus for Harrier
- Joint venture company "Pierburg Luftfahrgerate Union" (PLU) set up to produce fuel systems and electronics for the Tornado project.

### 1980s - 1990s

- Introduces world's first integrated propeller and engine control on Allison GMA2100
- Develops advanced integrated main engine and afterburner pumping and fuel metering unit (FMU) system for EJ200
- Introduces the world's first combined full-authority electronic main engine and afterburner control Lucas wins the engine controls on Rolls-Royce & BMW BR700 engine
- In 1998 the company announces its biggest ever contract, providing the engine control system for Rolls-Royce Trent 500 engines
- Lucas provides electronic engine control (EEC) and the integrated pump & metering unit on the Allison T406 engine on the Boeing V22 Osprey
- Lucas develops an advanced range of interfaces for electronic controls on the Rolls-Royce RB211-524G engine powering Boeing's 747-400
- 1993 Acquisition of Dowty Fuel Controls business by Lucas strengthens its position as the leading independent engine control systems supplier in the world. This is further strengthened in 1997 when Smiths Industries engine controls business is acquired
- 1996 Lucas Industries merges with the Varsity Corporation, to be called LucasVarsity
- 1999 TRW acquisition of LucasVarsity completed in May, forming one of the largest automotive and aerospace tier-one suppliers. Lucas Aerospace business renamed TRW Aeronautical Systems.
- Lucas assumes total ownership of its joint venture Pierburg Luftfahrgerate Union in Germany

### 2000 and onwards

- Developing controls for low emission staged combustion engines to be used in the next generation of jet engines
- Develops MODULinx™ technology used in Rolls-Royce Trent 1000 engine electronic engine control (EEC)
- Introduces unique DRIVElinx™ and FLOWlinx™ technologies
- Introduces SmartCal™ technology in Goodrich fuel metering units (FMUs)
- 2006: Goodrich wins the engine controls system on Rolls-Royce BR725 for the Gulfstream G650
- 2002: Goodrich acquires TRW Aeronautical Systems, creating the world's largest "pure play" aerospace company
- 2009: A joint venture between Rolls-Royce plc and Goodrich Corporation is formed, Rolls-Royce Goodrich Engine Control Systems Ltd, trading as Aero Engine Controls. The goal of Aero Engine Controls is become the world's best provider of Engine Intelligence

