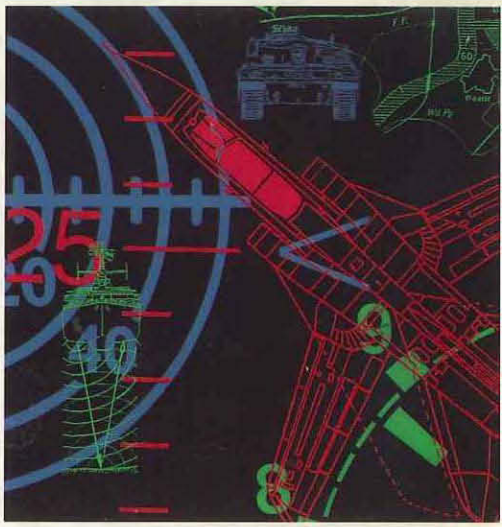
GEC Avionics

We Control the Future



GEC AVIONICS

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At GEC Avionics, control is our business.

In 1795, our founder, William Elliott, was apprenticed as an instrument maker and became one of the leading engineering lights of his time, one of a group of which included James Watt who developed the steam engine. William Elliott's firm went on to become one of the world's largest and most sophisticated avionics companies.

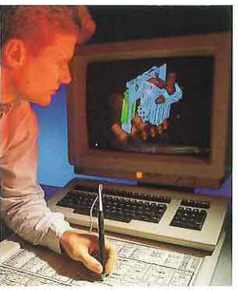
We've led development in the 'fly-by-wire' flight control systems that give modern military airframes their impressive manoeuvrability. This technology is now improving the handling of the latest passenger aircraft.

GEC Avionics also leads the world in the development of pilot displays, airborne computers and sonar signal processors. On the ground, GEC Avionics' systems are in use in land vehicles, test and support systems, and in the offshore oil industry.

With 50% of total production exported to over 70 countries, GEC Avionics is now Europe's leading avionics manufacturer. Membership of GEC (a group with worldwide annual turnover in excess of £6 billion) gives us staying power in major projects.

Already we are developing systems which will equip aircraft flying in the year 2000 and beyond.

At GEC Avionics we look into the future – and control it.



Flight Controls

Since the end of the 2nd World War, when the increasing speed of aircraft meant assistance was needed with their control, we have been involved in the development of flight control systems.

Modern performance aircraft rely heavily on digital technology and we have pioneered the growth of fly-by-wire and other safety-critical aircraft control systems.

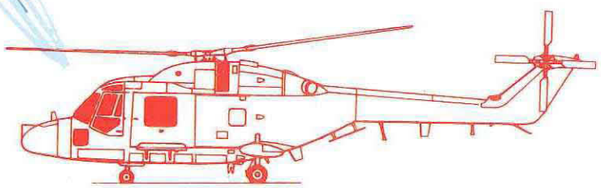
Tornado. We are prime contractors for the Tornado's triplex fly-by-wire control suite, and ourselves provide the autopilot and flight director, command and stability augmentation, and spin and incidence limiting systems.

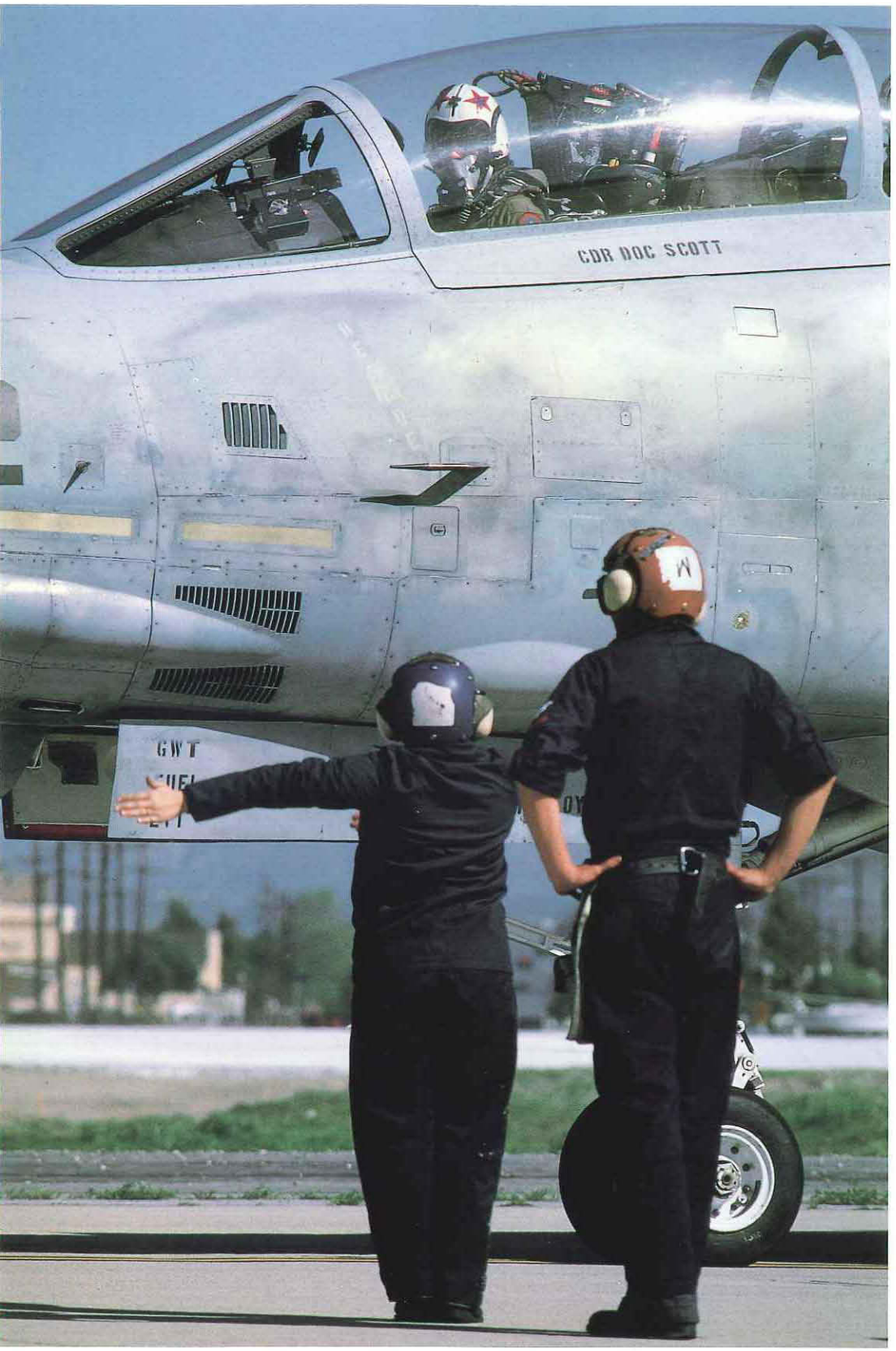
Advanced Fighter Aircraft. Our control systems are fitted in the Sea Harrier, the AMX and UK Experimental Aircraft programmes. And we will equip leading next generation US and European fighter aircraft – the YF-22A contender for the USAF Advanced Tactical Fighter, the USN A-12 and now the European Fighter Aircraft (EFA).

Helicopters. Helicopters are still largely manually controlled. In the 1990s our fly-by-wire electronic flight control systems will take helicopters to new levels of control and agility.

Civil Aircraft. We equipped Concorde with the world's most sophisticated flight control computer of its time. Airbus, the first civil aircraft to install full primary fly-by-wire flight control, flies with GEC Avionics systems. And now we can add the Canadair Regional Jet, a standard-setter in the growing 'commuter' aircraft market.

Engine Controls. Our engine monitoring systems equip over 50 military and civil aircraft types around the world: combat helicopters, ASW helicopters, trainers, air superiority fighters, transports, surveillance aircraft, civil airliners, executive jets, and a wide variety of retrofits.





GUN ARMED

AIR TO AIR

AIR TO GROUND

LOCK ON

MISSILE ARMED

RELEASE

Airborne Computing

Early this century 'Elliott Brothers' saw the potential of the infant aircraft industry. Many of the handful of aircraft flying before 1909 carried lightweight Elliott instruments – if they carried any instruments at all!

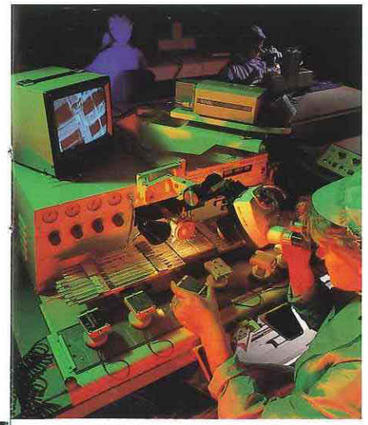
Today, GEC Avionics' air data computing experience covers helicopters and fixed-wing aircraft, central and distributed systems.

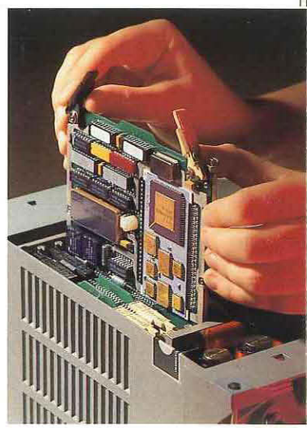
SCADC. The Standard Central Air Data Computer (SCADC) is a highly successful design which standardised the on-board computers on many US military aircraft.

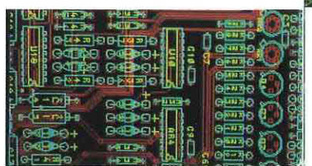
There are only six SCADC configurations. Hardware commonality is 80%. And yet it provides a 'form, fit and function' replacement for original, often analogue, equipment in over 40 different aircraft types – with immediate advantages in maintenance terms. New technology has allowed us to develop a smaller, lighter version – 'Mini SCADC' – to equip new aircraft and retrofit a wide range of current airframes.

Helicopters. We have developed the world's first digital air data computer designed specifically for helicopters. The system features a unique swivelling probe sensor which provides accurate air data for the full flight envelope. Over 1300 units have already been supplied for the AH-1S Cobra, A-1209 Mongoose and EH 101.

Using the SCADC modular design principle, we supply equipment to control and monitor aircraft stores, as well as flight data recorders and rugged recording systems, combining advanced technology with low maintenance.







Displays and Navigation

In 1913, Elliotts began large-scale production of gyroscopes, gunsights, altimeters and bombsights.

Today's technology has changed. But production is still large-scale and the equipment is still the best there is.

HUD. GEC Avionics is world leader in Head Up Display (HUD) technology. We currently handle more than 50% of the Free World's HUD production, having made more than 6,500 units for over 25 aircraft types. The success of the F-16 across the world is due in part to its high-performance GEC Avionics HUD.

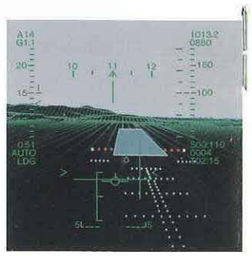
Night into Day. We can turn day fighters into 24-hour, all weather aircraft, using night vision goggles, covert navigation systems, and helmet-mounted displays.

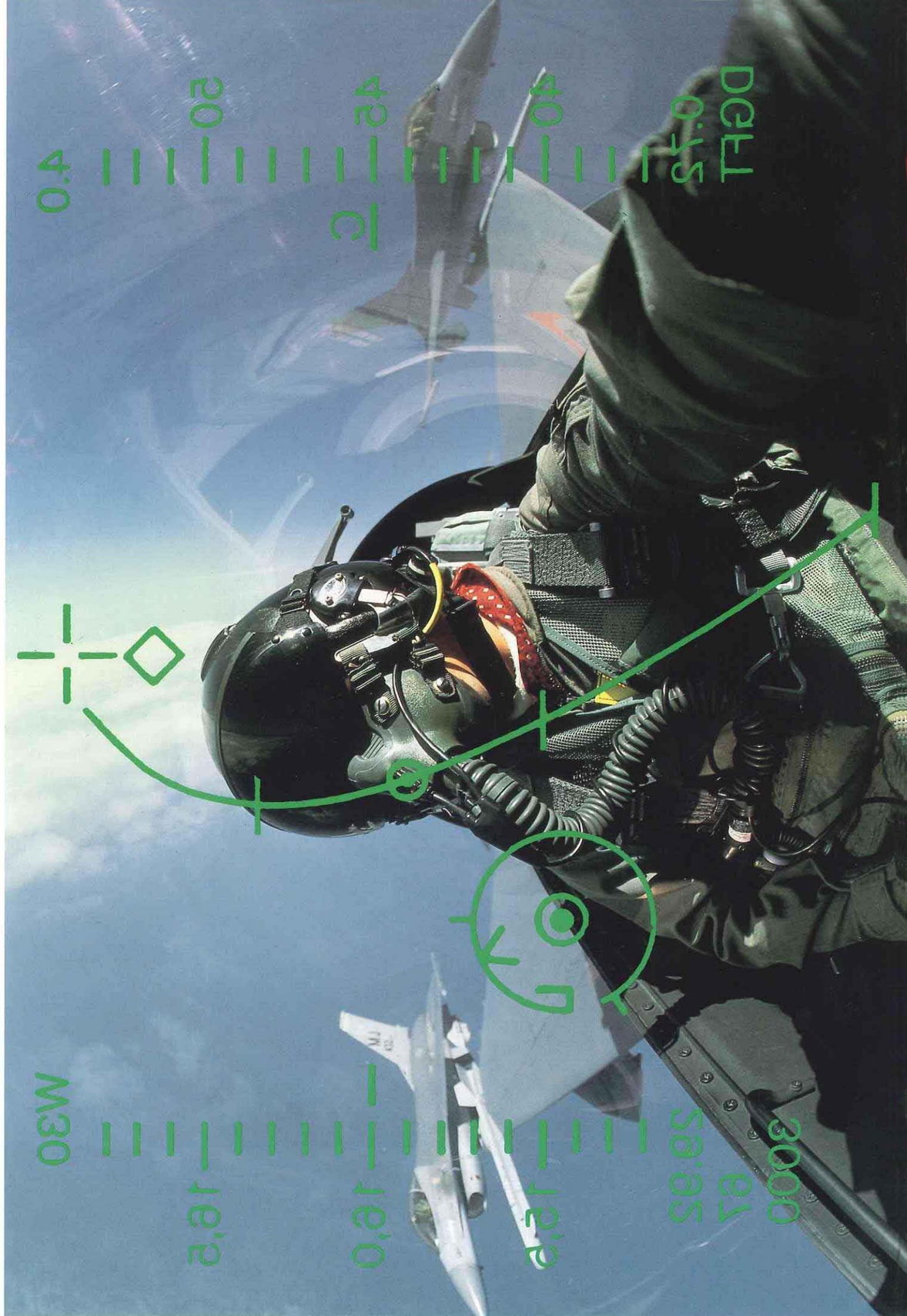
Low Level Night Attack. GEC Avionics can supply a complete integrated suite for low level night attack. The pilot's HUD displays a moving relief image of the landscape derived from the digital terrain data base. Enhanced by laser-powered obstacle detection, and linked to the autopilot, this enables fast, low level night penetration – hands off!

Helicopters. These systems – combined with a fly-by-wire flight computer – can make a helicopter into a highly capable fighter, able to manoeuvre, navigate and acquire targets in all conditions, by day and night.

Digital Mapping. The Digital Map replaces paper with a video display. The map moves and rotates as the aircraft travels, showing elevations higher than the flight path, threat zones, and waypoints, targets and intelligence programmed before take-off. Digital Maps are already in production for the RAF Night Attack Harrier.

SPARTAN. SPARTAN, a complete covert navigation and terrain following (TRN/TF) system, compares stored map and elevation data with flight profile information to fix the aircraft's position. SPARTAN has already been ordered for the RAF Tornado IDS – the world's first contract for a system of this kind.





Maritime Systems

GEC Avionics has worked underwater – and over it – for many years. In 1963, we took charge of the navigation systems for the UK Polaris fleet. At the same time we began to develop an advanced system for hunting down submarines from the air.

ASW. Today, we are one of the world's leading suppliers of acoustic and tactical processing equipment for ASW aircraft and helicopters, with systems able to process and display data from any combination of sonobuoys and dipping sonars. We have been selected to equip the anti-submarine forces of many nations.

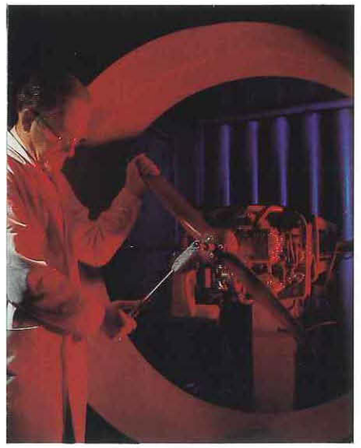
Our latest systems have been developed for the Royal Navy's next generation of ASW helicopters.

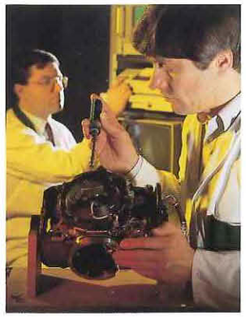
Mission Management. The same proven technology has been applied to our tactical processing systems, including full mission avionic suites which integrate data from the extensive range of sensors, weapons and navigation systems installed in the modern anti-submarine aircraft. We have recently developed and supplied the tactical mission system for the Sea King Mk 42b – probably the most advanced mission avionics system yet operational.

Mission Planning. For multi-aircraft missions, our mission planning systems allow the complete operation to be planned by a single coordinator.

The Energy Business. Our experience in safety-critical flight controls has been applied underwater, in equipment for the oil and gas industry. Our control systems are installed subsea in fields controlled by a number of major oil and gas producers, including Occidental, British Petroleum, Chevron UK and Total.

Remotely controlled pipeline systems by GEC Avionics are used to monitor and control the flow of fuel across many kilometres of seabed, while our remotely operated vehicles are designed for a variety of subsea inspection and monitoring tasks.





Land Based Systems

The aircraft quality of GEC Avionics equipment has proved to be ideal for land-based applications demanding a high degree of precision and systems integration.

Unmanned Aircraft. The Elliott team started work on remotely-piloted observation aircraft as long ago as 1950.

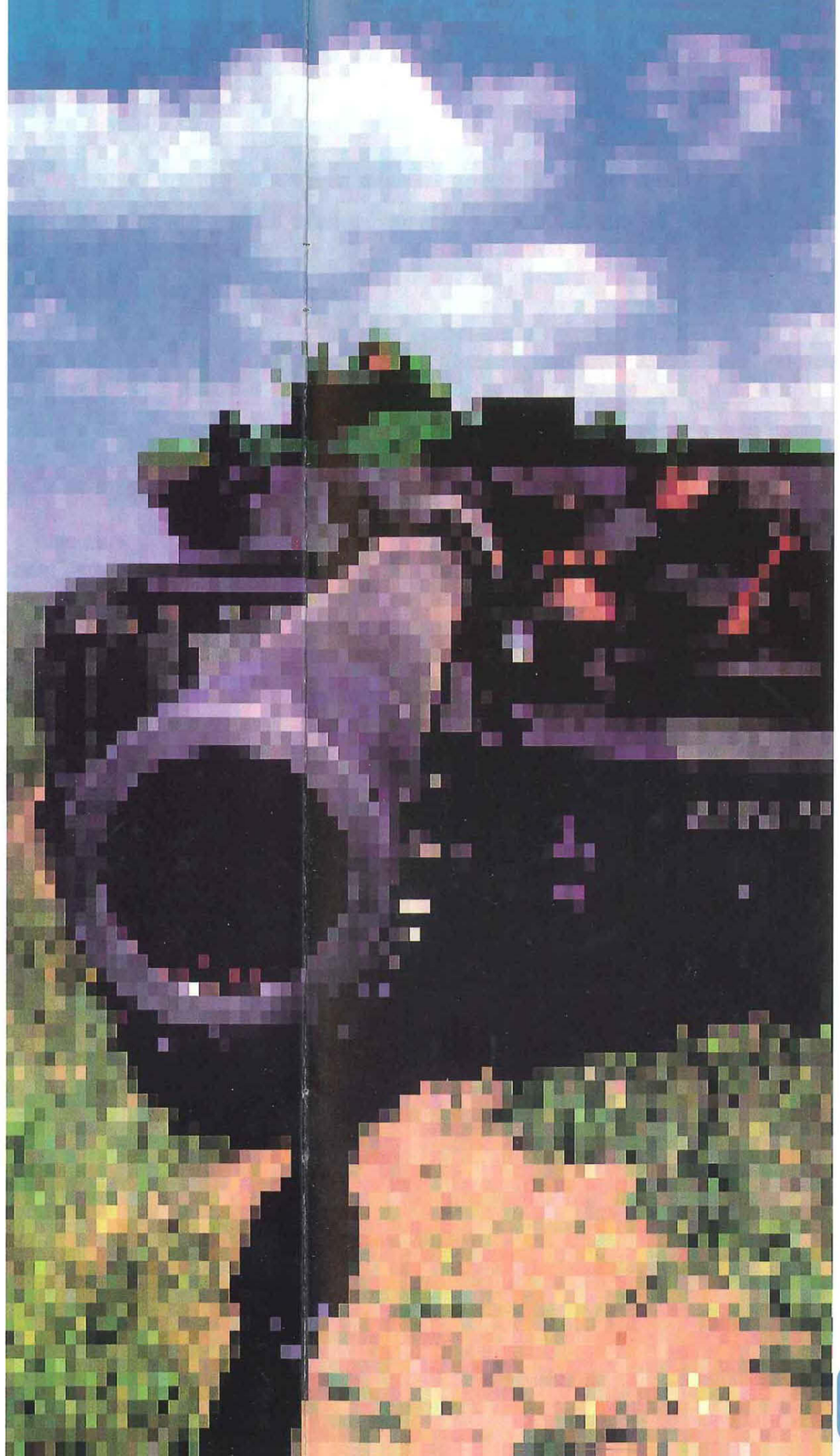
Today, we are the prime contractors to the UK Ministry of Defence for the British Army's Phoenix airborne observation system, designed to provide accurate, up-to-the-minute battlefield surveillance and targetting data, by day and night, in all weather conditions. The system consists of a recoverable remotely piloted aircraft, launcher, data link and ground control station.

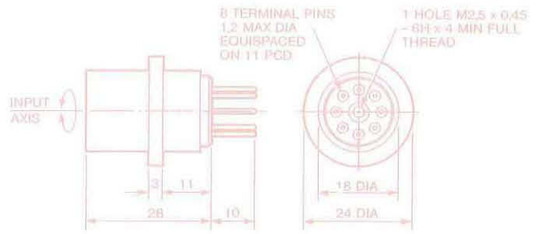
Remote Sensors. We have developed 'Hermes', a covert, easily deployed, remote ground sensor. Using seismic and passive infra-red sensors, Hermes detects and identifies both vehicles and men, indicating their direction and their numbers.

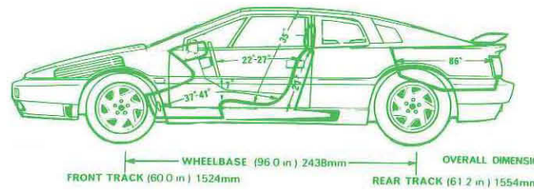
Land Vehicle Systems. Our skills in aircraft navigation have helped us develop navigation systems and gyroscopes for military land vehicles.

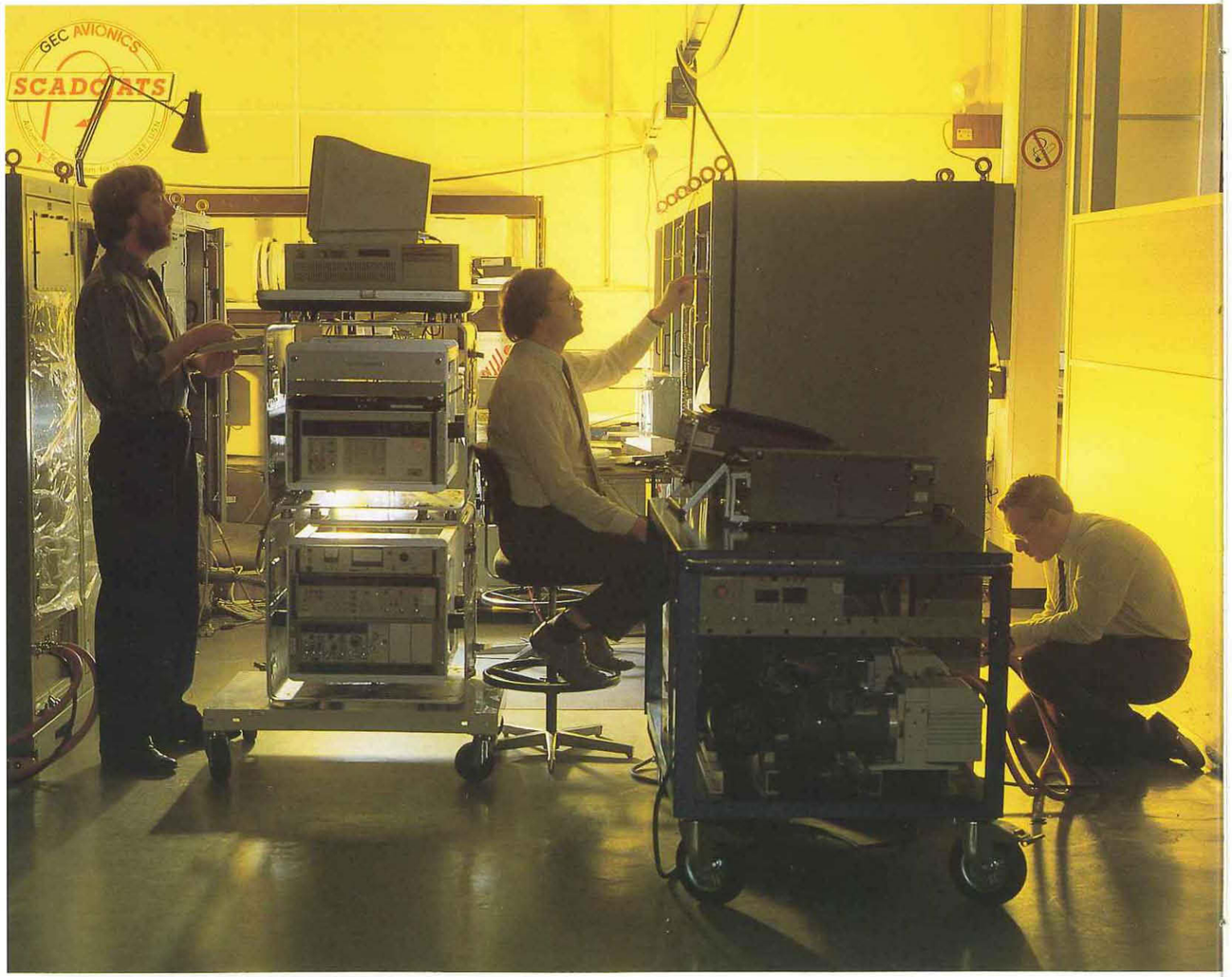
We provide the highly accurate artillery positioning system known as 'APES' (Azimuth, Position and Elevation System) for the British Army's WARRIOR Observation Post Vehicle.

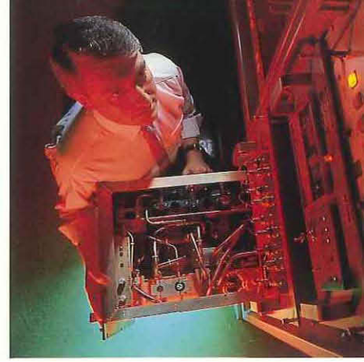
Solid State Gyroscopes. Our latest gyroscope, known as START, has revolutionised gyroscope technology. Its solid state design makes it highly resistant to shock. Used in guided artillery shells, it resists a firing acceleration of 25,000g. Small, lightweight and inexpensive, START's immense potential in vehicle active suspension and in navigation systems is now being realised in trials with major automobile manufacturers worldwide.











Support Today and Tomorrow

In the early 1800s William Elliott earned his living developing equipment for the leading scientists of the time.

Today, the growth of GEC Avionics, and our reputation around the world, is due not only to our investment in research and development, but also to our belief in thoroughly supporting our products.

ATE. We have a specialist division of some 350 people who develop and supply the latest automatic test equipment to simplify and speed the complex task of avionic equipment testing.

Training. We have teams dedicated to developing tailor-made training for operators and maintenance staff, and other groups designing and implementing through-life integrated logistic support programmes.

Research. In research, we push technology to its limits. Our laboratories explore ideas and investigate the potential of the latest technological developments, to begin the creation of tomorrow's systems. We work in collaboration with governments and aircraft manufacturers, in research and development programmes which will increase the Company's contribution to control: in the air, on land and at sea.

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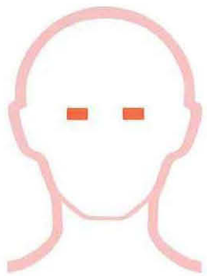

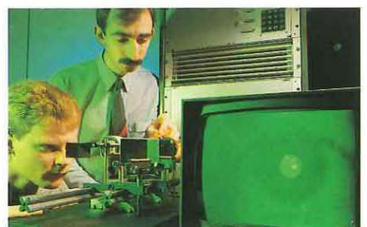

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$$\left(\begin{array}{l} 0 \leq \#(OTHERLANE - ch) \\ < \#(OTHERLANE - ch_0) \end{array}\right)$$

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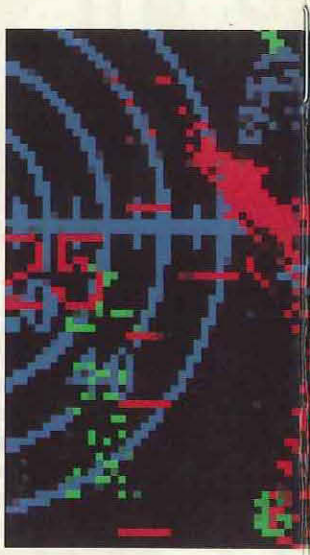

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