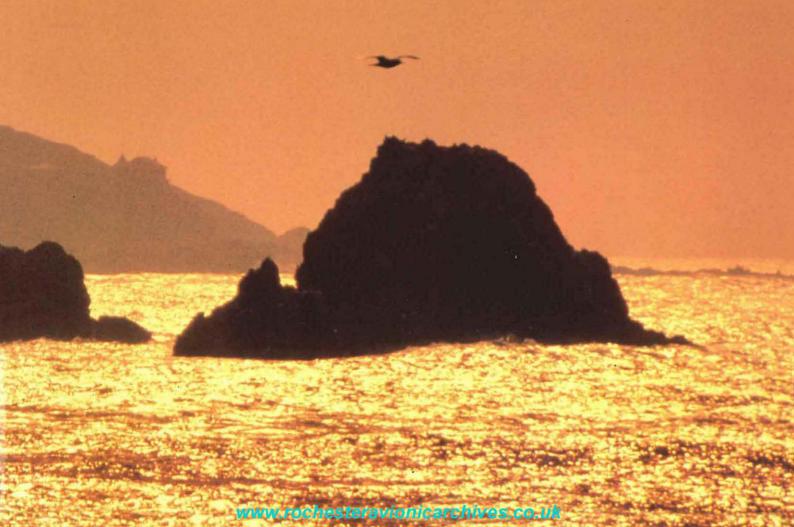
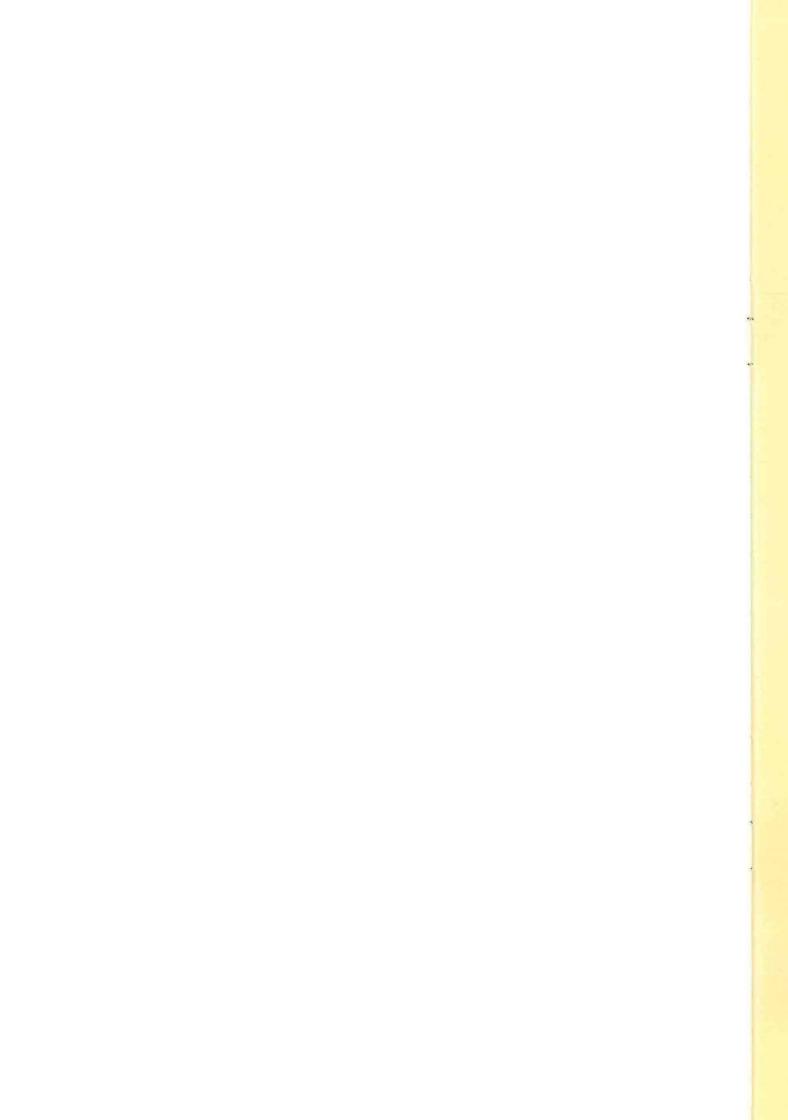
GEC AVIONICS





TECHNOLOGY IS OUR TRADITION

When William Elliott established his successful instrument making business in London, in 1800, he laid the foundation of a company which has grown to be Europe's leading producer of electronic systems for aircraft -GEC Avionics Limited.

Formerly Marconi Avionics Limited, we bear our new name with pride, as a major part of GEC, the United Kingdom's foremost engineering group.

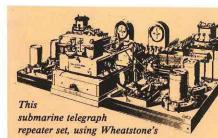
From its very foundation, our company has made many important technological achievements, in fields as diverse as scientific instruments, computing, telegraphy, radio, navigation, automation, radar, electro-optics and electronics of every kind.

This record of achievement, over many years, has been achieved by determination to succeed, and through innovations in technology and resource management.

The same qualities are applied to the most challenging projects of the present day.

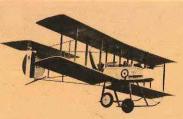
Technology is indeed the proud tradition of **GEC AVIONICS**

The BAe Jaguar, with special "strakes" (shown), depends on the GEC Avionics digital flight control, at the heart of the aircraft's "fly by wire" system, for safe, stable handling by pilots.



principle, was produced in 1895 by Elliott Brothers (London) Limited.

182



19th Century balloonists flew with Elliott instruments, which were also fitted in the earliest of aeroplanes, like the Vickers Gun Bus.



Marconi AD1 Communications System c 1919. The airadio and electro-optical business of Marconi was combined with Elliott's flight automation and radar business in 1967. It is this same team which has grown to become GEC Avionics Limited.

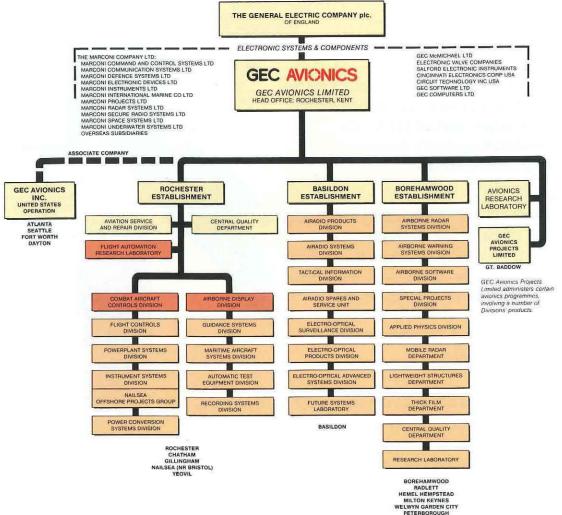
DEDICATION IS OUR STRENGTH

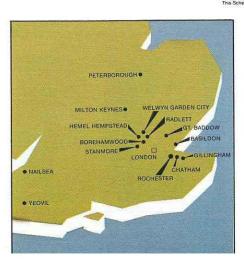
GEC AVIONICS

GEC Avionics Limited is a wholly-owned subsidiary of GEC, the United Kingdom's most powerful engineering group, with the resources and experience to tackle projects on an international scale.

Business is conducted by a number of long established Divisions, each specialising in its own field and responsible to its own customers.

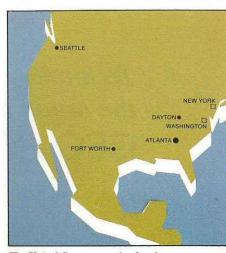
This enables resources and expert attention to be dedicated to projects large and small.





The company is a highly efficient team of 12,000 men and women, many of whom are professionally qualified scientists and engineers, supported by skilled technicians and crafts people.

With over 2.4 million sq.ft of well equipped premises, GEC Avionics leads Europe in avionics production. The company trades with 70 nations and exports more avionics than any other UK company.



The United States operation has its own development and production facilities.

A TOTAL SYSTEMS COMPANY

total capability...

We deliver total systems hardware, software and support for applications in the air, at sea, subsea, on land and underground.

Systems, chosen for the highest standards of cost-effective performance and operational safety...



...worldwide applications...

Royal Australian Air Force.

supplying direct to customers in seventy nations.

In addition, we have sub-contracting relationships with overseas companies.

This world-wide business involves

microwave techniques, meeting the

latest international specifications.

To meet customers' international trading obligations, we have also successfully established worksharing in a number of programmes.

GEC AVIONICS

All European Tornado aircrast are fitted with this advanced automatic flight control system including "fly-by-wire" control and digital autopilot/flight director.



MIL STD 1553B systems integration and test facility in use on the UK's Experimental Aircraft Programme (EAP).



The EAP aircraft is equipped with GEC's advanced Fly-by-Wire, HUD and other avionics



Special "fail safe" software techniques are applied in digital electronics for slat and flap control.

...including retrofit

Our total systems expertise covers the re-equipment of aircraft already in service, with integrated, missioneffective systems. More than 50 types and variants worldwide are now updating with our avionics

OUR PRODUCTS...

...in avionics

Our range of avionics, wider than any other company's, is complemented by a variety of related-technology products. Unique systems integration capabilities stem from this breadth of product experience.

Broadly, these cover aircraft guidance and control, navigation and instrumentation, weapon aiming and tactical systems, location systems, pilot displays and night vision systems, communications, mission systems, remotely piloted aircraft, ground aids for avionics and engine testing, research and logistics support.

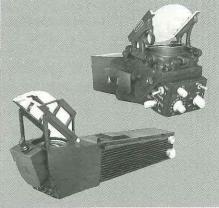


We are pioneers in airborne radar with advanced combat and early warning systems in production, This is our SKYRANGER lightweight ranging radar.

These include systems for missile guidance and control, land navigation, vessel stabilisation, security and surveillance, subsea wellhead control, data recording, automatic test equipment and



GEC AVIONICS



Our wide range of Head-Up Display/Weapon Aiming Systems are chosen for the new combat aircraft, and HUDWAC available for the Mirage, F-5 and A-4, are typical of systems for many aircraft already in world-wide service.



Standard Central Air Data Computers, based on these modules, are chosen to equip 30 different variants of USAF and USN aircraft, with 80% commonality and full interchangeability with existing units.

We are the main contractor for the UK's highly successful Thermal Imaging Common Modules Programme. From the 12 standard modules shown any indirect-view imager can be configured for land, sea or airborne use.





...and related fields



The "Intelligent Pig" for British Gas incorporates magnetic tape data recording equipment for remote inspection of pipelines.



Systems supplied for defence include many for fighting vehicles.

AIRBORNE APPLICATIONS

civil and military transports



Systems and equipment for automatic flight control, automatic landing, navigation, communications and instrumentation are proven in round-the-clock operations world

as well as supersonic, subsonic and STOL transports.



GEC AVIONICS

AD 660 Doppler Velocity Sensor, an effective groundspeed measurement system for airliners, can also be used in tactical navigation.



AQS901 ASW System is in service in Nimrod ASW aircraft of the Royal Air Force and P-3C Orion aircraft of the Royal Australian Air Force.

maritime aircraft

We supply a full complement of en-route and mission avionics for maritime helicopters and patrol aircraft, used by several nations for defence against submarines.

These well-proven acoustic processing and display systems, and more advanced performance systems under development, are geared to



and backed by experience in integrating on-board processing and displays for a variety of ASW installations





AQS902 Lightweight Acoustic Processing and Display System, LAPADS, is in service on Royal Navy Sea King Mk 5 helicopters. This system can operate with free sonobuoys, or dipping sonar.

ground attack

Our avionics permit high accuracy in navigation, control and weapon aiming, by day and night, in all weathers.

Among the wide range of systems for fixed wing aircraft and helicopters are automatic flight control, Head Up Display/weapon aiming/navigation systems, laser INS, Rnav, air data and



We are the world's foremost producer of Head Up Displays. This wide angle raster HUD is the latest of over 1,500 HUDs already delivered for the General Dynamics F-16 family of aircraft.



This unique Helicopter Air Data System measure airspeed and direction accurately, right down to the hover, on Bell Helicopter Textron AH-1S aircraft of the United States Army.



2,000 Vought A-7 Corsair 2 aircraft are fitted with our Head-Up Displays. The U.S. Navy's A-7E was the first aircraft in service with a "raster HUD" for night operations.



High-performance FLIR pods, based on interoperable TICM II modules, equip subsonic and supersonic aircraft and are chosen for RAF Harriers and Tornados and the USMC AV-8B.

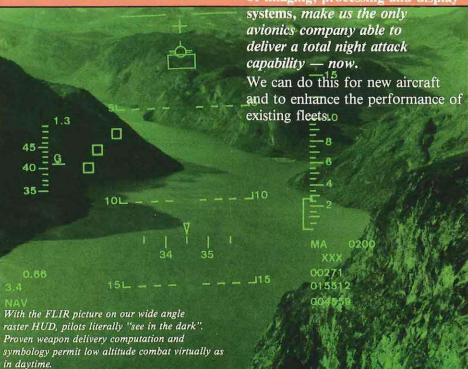


"Cat's Eyes" NV goggles permit night vision outside the cockpit and a capability to read normally lit instruments.

night vision

Actual night operations experience, worldwide, and a complete range of imaging, processing and display

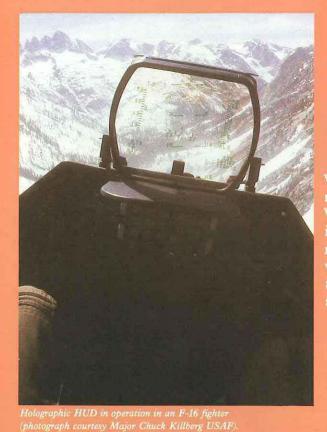
displays and many others.



AIRBORNE APPLICATIONS...

air defence

Rapid response and interoperability are key factors in modern air defence, in which avionics have a vital role.



We supply AI and ranging radars, Head Up Displays/ Weapon Aiming Systems incorporating doglight and missile modes, together with related avionics, and air defence systems for surface use.

communications, information and intelligence



The AD3400 multimode communications system, adopted by British and overseas air forces, can cover all VHF/UHF bands, AM and FM.

Systems which keep the commander well informed aid tactical decision-making. An important contribution is made by a range of equipments, extending to fully integrated systems.

Current airborne communications capabilities, for example, include tactical multimode, jam-resistant and secure systems, and systems management.

Aerial surveillance is also our field, with day/night imaging/data link systems for helicopters. We also supply, and fully equip, remotely-piloted vehicles for battlefield surveillance.



Foxhunter AI radar is an advanced multi target track-while-scan system in service on Royal Air Force Tornado fighters.



An automatic gather and guidance system and gyro assembly form part of the semi-automatic command-to-line-of-sight system (SACLOS) of the Shorts Javelin missile.



Precision gyroscopes are supplied for the Skyflash missile guidance system.



Communications sub-systems provide clear and secure voice and data on HF, VHF and UHF.

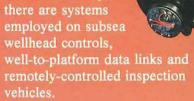


We are prime contractor and programme manager of the UK team producing the British Army's PHOENIX remotely-piloted battlefield surveillance system.

SEABORNE APPLICATIONS

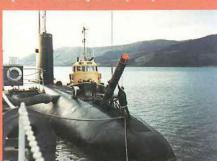
The widespread use of our seaborne systems extends to surface vessels, surface effect craft, submarines, submersibles and to the sea bed itself.

They include sonar processing and display systems as well as naval compass stabilisers for frigates, fast patrol boats and submarines, guidance control units and gyroscopes for torpedoes, Hovermarine autostabilisers, and thermal imagers for ship fire control/ anti-missile defence systems. For the offshore industry, there are systems employed on subsea wellhead controls.





sts in thermal imaging systems, we supp







GEC AVIONICS

Rugged "strapdown" gyro assemblies and digital electronics, such as this, are at the heart of guidance and control systems of Sting Ray and Spearfish torpedoes.



We are responsible for subsea remotely operated vehicles such as MICROV



Special signal processing electronics are vital to the guidance of Sting Ray air-launched torpedoes.



LAND-BASED APPLICATIONS



navigation and gun control gives high performance at a fraction of alternative system







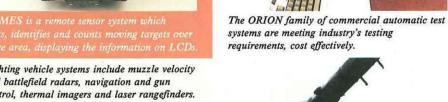


GEC AVIONICS



Our equipment and capabilities

are applied to road transport and





A TOTAL SERVICE

GEC AVIONICS

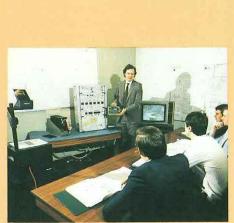
As well as supplying equipment from current production, we will engineer its installation - or meet new operational requirements with competitive high technology.

This total service, available world-wide, covers research, programme management, software engineering and integrated logistics support.

integrated logistics support

We have long experience in providing total support, in specialised "packages", as well as in helping customers to support themselves. Support, not limited to our own equipment, can apply from project definition right through operational service.

This policy of Integrated Logistics Support, aimed at more cost effective operations for our customers, consists of logistics planning, training, documentation, supply management, engineering support and equipment repair and maintenance.



Customers' operational and maintenance staff are trained using our modern facilities.



Expert field service for military and civil operations is available on the flight line and can extend right through to repair depot.





Dedicated repair workshops are designed for flexibility, to ensure fast turn-round times across a wide product range.

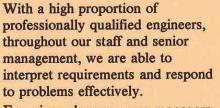


Several million parts are stocked to support our avionic systems alone. A full range of civil and military support data is also supplied as manuals, microfiche, punched cards or audio visual material.

A TOTAL SERVICE...

programme management

In every Division, skills and resources are dedicated to each customer programme so that performance achievement, on time and on budget, can be the primary objective.

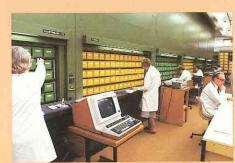


Experienced programme managers are backed up by the most modern facilities for the design and production of hardware and software to support every project phase, including:

- operational analysisproject definition
- specification writing
- design
- development
- quality assurance
- field trials
- manufacture
- qualification
- supply



Reliability testing on the production line assures low defect rates in service.



Automated parts storage in a typical division.



A typical engineering test facility in one of our factories.



Extensive use is made of Automatic Test
Equipment throughout production. This Orion
ATE, our own product, is highly cost-effective for
printed circuit board testing.



Good programme management begins with a thorough understanding of the task and the operating environment.





Extensive Computer Aided Engineering facilities also have advanced capability for custom LSI design.



Professionally qualified engineers conduct and support field trials where required.

A TOTAL SERVICE...

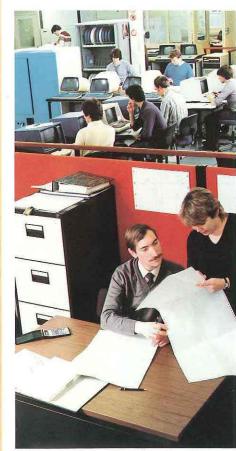
software engineering

Our wide range of advanced performance digital products is based on more than 25 years of experience in airborne digital systems of every kind.

This has created high levels of skill in software engineering to meet many different real-time computing requirements and the most stringent conditions of safety and integrity.

This expertise in applications software extends both to languages and their implementation. We are meeting the latest international standards with navigation, weapon-aiming, air data, display, flight control and other systems in current production.

As well as being an invisible asset to our hardware, software can be a deliverable item in its own right. Our capabilities in the architecture, testing, quality assurance and configuration control of high level languages, are backed by the use of the most powerful minicomputers available to industry.



Software engineering teams throughout the company are at the forefront of new systems technology. They apply engineering disciplines to every aspect of software design, development and support.



research

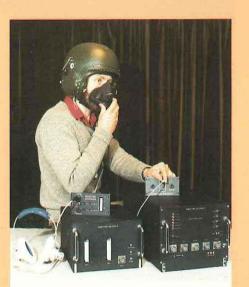
Applied research to support every aspect of our business involves creating new techniques, solving operational problems, studying new applications and advancing the technology applied in systems.

Our laboratories have close links with product Divisions, where new ideas often originate, ensuring that research is geared to our customers' needs.

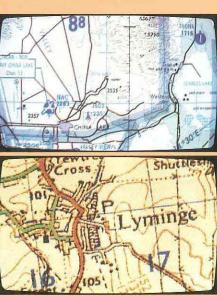
In addition to private venture working, we undertake research contracts for customers.

These include systems studies, operational analyses, VLSI and VHPIC design and development in materials, data processing, automation, optics, communications, radar, applied physics, electro-optics and many other fields.

Looking to the future, we are carrying out advanced research in such areas as Intelligent Knowledge-Based Systems (IKBS), parallel processing, interactive systems and molecular electronics.



An important application for IKBS is Direct Voice Input control systems for military and civil aircraft of the future.



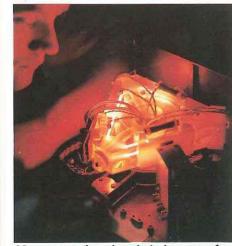
The digitally-formed images on this versatile colour map, derived from a convenient bulk store, can be presented in various forms on a variety of electronic display surfaces.



Extensive work



Aircraft actuators signalled by impulses of light can isolate an installation electrically, for greater flight safety.



Measurement of angular velocity by means of a ring laser gyro.

INVESTING IN THE FUTURE

Since our company's foundation, technology has had a historic effect on the lives of people throughout the world. To ensure future benefits in prosperity and security, industry must recognise changing needs and invest accordingly.

Our company invests in people and their skills, in facilities and products, in new technology, and, of growing importance, technology transfer.

people and skills

Having created and sustained a large team, we are developing jobs by forming new skills and harnessing new technologies.

In addition to progressive training throughout all departments, this involves initial training for new entrants including apprentices, and liaison with schools, colleges and universities. We dedicate some of our best skills and resources to young people in Youth Training Schemes, giving them real job prospects, both with us and other companies.

About a third of our workforce, including virtually all our managers, are professionally qualified men and women, mainly in science and engineering.

new facilities

Our factory sites are improved and extended to meet the changing needs of our business. New technology for research, design, manufacture and quality assurance, covers electronics, computer aided design and manufacture, hydraulics, electro-optics, microwave techniques, automatic test equipment and automated supply systems.



The United States company, having expanded several times during its 21 years of operations, now has a completely new Atlanta facility.

GEC AVIONICS



Young people are our whole future. Alongside our regular intake of apprentices and other full-time trainees, our training for other school leavers, under national Youth Training Schemes, is resulting in large numbers finding useful employment.



Retraining extends the capabilities of those who already have industrial experience.



Part of our latest factory development at Milton Keynes



Falcon Building at Rochester has specially stabilised foundations for high precision manufacture.

INVESTING IN THE FUTURE...

new products

To meet increasing demands for system performance, improved technology is incorporated in existing products and new products are produced and qualified.

This involves the use of increasingly reliable silicon chip technology, advanced data processing, new sensors and measurement techniques and a host of other improvements.

technology transfer

For many years, we have been applying the technology developed for aviation and defence to many of society's other needs.

We are also working with government and academic institutions and other industries, to develop new, specialised technologies outside our own field, wherever we can see a real requirement for them.

The few examples illustrated here

are typical of many others.



Reversionary instruments for aircraft are a unique application of liquid crystal displays.



New tank sight, incorporating our CO, laser.

Getting oil ashore from satellite wells in the BP Magnus field depends on these "fail safe" controls and high integrity data links from each wellhead to the platform. This technology derives directly from military aircraft control systems.

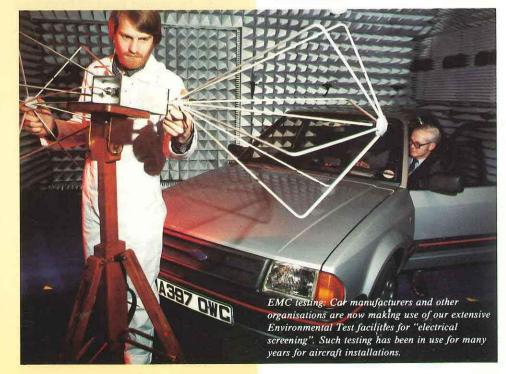


This J-band radar is used underground to detect the level of coal in storage bunkers.





Doppler Velocity Sensor for road vehicles measures groundspeed by radio beams as in aircraft dopplers. Sensors have been supplied for magnetically-suspended train systems.



SALES & SERVICE

Company Head Office

GEC Avionics Limited. Airport Works, Rochester, Kent ME1 2XX England Tel: Medway (0634) 44400 Telex: 96333 MEAROC G Telefax: (0634) 827332 Contact: M.F. Moulton

Virtually every kind of electronic system for aviation, and allied-technology systems and equipment for defence and industry.

GEC Avionics Projects Limited

GEC Avionics Limited. Address, etc. as Head Office. Contact: C.C.F. Naylor, Manager Specific avionics projects involving products from a number of Divisions.

Avionics Research Laboratory

GEC Avionics Limited, West Hanningfield Road, Great Baddow, Chelmsford, Essex CM2 8HN Tel: (0245) 73331 Telex: 99201 Contact: D.W.G. Byatt, Manager

P.O. Box 81999, Atlanta, Georgia 30366

United States Operation

Divisions

Rochester Establishment



Aerial view of Airport Works, Rochester



Towers Site, Airport Works, Rochester

GEC Avionics Limited, Address, etc. as Head Office

Tel: 404 4481947 Telex: 708447

Contact: H.D.F. Eagles, President

GEC Avionics Inc.,

U.S.A.

2975 Northwoods Parkway,

Airborne Display Division Divisional Manager: G.R. Sleight

Automatic Test Equipment Division Divisional Manager: A.J. Colwell

Aviation & Service Repair Division Divisional Manager: M.O. Barton

Central Quality Department Divisional Manager: K.W. Boardman

Combat Air Controls Division Divisional Manager: K.S. Snelling

Flight Automation Research Laboratory Tel: (0634) 44433 Divisional Manager: R.P.G. Collinson

Flight Controls Division Divisional Manager: B.G.S. Tucker

Guidance Systems Division Divisional Manager: R. Ruggles

Instrument Systems Division and Offshore Projects Group Divisional Manager: J.M. Colston

Maritime Aircraft Systems Division Divisional Manager: L. Hampson

Powerplant Systems Division Divisional Manager: I.S.D. Stitt Head Up and Head Down Display systems and weapon aiming systems.

Computer controlled automatic test systems for production and services applications.

Repair, overhaul and after sales support. Integrated logistics support.

Quality control systems, environmental, EMC and component testing, mechanical and electrical calibration.

Autopilots, Auto-stabilisers and "Fly by Wire" Systems for combat aircraft.

Advanced technology in Avionic products.

Active controls, automatic flight control systems and automatic landing systems for transport aircraft, stabilising systems and autopilots for helicopters, control systems for RPV and drone aircraft.

Rate and attitude gyros, accelerometers, multi-axis gyro/accelerometer units, strapdown guidance and control units.

Laser and other navigation systems for aircraft, ships & land vehicles, hybrid navigation systems, weapon delivery systems.

Air data systems, stores management systems. Wellhead and subsea control systems.

Airborne sonics, processing and central tactical systems, advanced flight data recorders.

Powerplant control systems. Instrumentation and monitoring. Fuel flowmeters, fuel contents systems.





Nailsea Site

Borehamwood **Establishment Divisions** and Main Departments





Premises at Welwyn Garden City

Basildon Establishment Divisions



Principal Basildon Site

GEC Avionics Limited, 2 High Street, Nailsea, Bristol BS19 1BS

Market Development Manager

Nailsea Site,

Manager: H. Jones

Tel: (0272) 856511 Telex: 444791

Power Conversion Systems Division Divisional Manager: H. A. Jones

Recording Systems Division

systems for military and environmental Divisional Manager: D. Hooper applications. GEC Avionics Limited,

Elstree Way, Borehamwood, Tel: (01) 953 2030 Herts WD6 1RX Telex: 22777 Contact: J.A.C. Kinnear,

Airborne Radar Systems Division Divisional Manager: J.A.G. Luck Airborne Software Division Divisional Manager: Mrs N.J. Coulter

Airborne Warning Systems Division Divisional Manager: A.C. Bull **Applied Physics Division** Divisional Manager: D.S. Harris

Central Quality Department Quality Manager: H. Goldberg Lightweight Structures Department Departmental Manager: P. Miles

Mobile Radar Department Departmental Manager: J.A.P. O'Keefe

Research Laboratory Divisional Manager: J. Welsh **Special Projects Division** Divisional Manager: S.I. Fraser

Airadio Products Division

GEC Avionics Limited,

Thick Film Department Departmental Manager: T.W. Troll Radar systems for interdiction interceptor, close support and combat aircraft.

Magnetic tape data recording and replay

Power Conversion

Real time computer-based systems and

Airborne warning and surveillance radar, command and control systems.

Neutron and laser equipment and security

systems.

Quality assurance, testing and calibration

High-performance lightweight composite structures eg. communications and radar aerials.

Battlefield radar and sensor systems.

Radar and allied systems research.

Advanced digital signal processing systems for ship and submarine sonar systems.

Thick film hybrid microcircuits.

Christopher Martin Road, Tel: (0268) 22822 Basildon Essex SS14 3EL Telex: 99225 Contact: W.R. Paterson General Manager

Divisional Manager: D.W.Bowyer Airadio Systems Division Divisional Manager: E.G. Walker **Tactical Information Division** Divisional Manager: A.G. Barrett **Electro-Optical Advanced Systems Division** Divisional Manager: L. Robinson **Electro-Optical Products Division**

Divisional Manager: D.R. Ormerod

Electro-Optical Surveillance Division Divisional Manager: M.V. Bennett

Future Systems Laboratory Manager: T.A. Lewis

Airborne radio communications and navigation equipment.

Command and communications systems.

JTIDS and other tactical information systems.

Weapon guidance, acoustic signal and image processing equipment.

E-O tracking and weapon control systems

video and data transmission, fibre optics. E-O sensors, surveillance: Visual low-light and thermal bands.

Future E-O systems design development and feasibility studies.

This brochure is intended only to give a general impression of the products and services which are available and none of the descriptions contained herein shall form part of any contract.

GEC Avionics Limited

Head Office:

Airport Works Rochester Kent England Telephone: Medway (0634) 44400 International: 44-634-44400 Telex: 96333 Facsimile: 827332







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