

Claimed to be "second largest contract of its type ever let"

NAILSEA CELEBRATES MAJOR NEW SUBSEA EQUIPMENT CONTRACT



The informal part of the celebrations was a pig-roast party outside the canteen at Nailsea. Employees and families came along, and Divisional Manager Peter Hewlett (left) welcomed two of the Norwegian representatives Per Arne Nilsen and Kjell Arnesen, with Project Manager Roy Windsor and Marketing Manager Alan McGovern behind.

A new subsidiary company at Nailsea, GEC-Marconi Oil & Gas International Ltd, is to supply electro-hydraulic subsea equipment for Norsk Hydro's Troll Olje oilfield. The contract, valued in excess of £10m, covers the first phase of a two-phase project on the largest subsea development on the Norwegian Continental Shelf.

This is a major contract award in the offshore industry, referred to by one of the leading trade journals as "The Big One". MCD can be proud of their achievement,

which represents an impressive first success for G-MOGIL, a company established as the focus for GEC-Marconi's growing oil and gas related business.

It follows the success over many years of GEC Avionics' centre for subsea production control equipment at Nailsea, part of Monitoring and Control Division.

The Norsk Hydro Troll oilfield is located 100 km northwest of Bergen at a water depth of between 315 and 340 metres. For the first phase of the project G-MOGIL will

supply subsea control modules and equipment for wellheads and manifold structures on this 18 well development. The equipment will be installed entirely by remote-control underwater vehicles.

The new G-MOGIL control system will incorporate advanced technology used for another Norsk Hydro project and further developed by G-MOGIL under a licence from Aker Subsea A.S.

The technology allows communications signals to be superimposed on the

electrical power lines within the umbilical cables to the subsea control modules. This simplifies the power and communication system and reduces costs.

G-MOGIL will commence deliveries of system hardware in mid 1993 and will continue deliveries until September 1996. Once work has begun, the co-ordination of many sub-contractors will be a complex task, much assisted by the presence at Nailsea of some on-site representatives from the Norwegian company.

The new company, among whose directors are Rochester-based Brian Tucker, Tim Venables and John Colston, seeks to broaden the base of GAV's business both geographically and in its products. All the production work will be at Nailsea with some of the microprocessor based electronic design work in MCD at Rochester.

Commendation for 'START' Gyro



In the final stage of the competition at Highgrove, for the Prince of Wales Award for Innovation and Production, His Royal Highness presented GSD's Deputy DM Geoff Barnes and Project Manager John Stevens (centre) with a Special Commendation certificate.

See Pages 4 and 5 for a feature on the START and this achievement.

FAMILY SPORTS DAY

Sunday 12 July brought fine weather to Hoo, in contrast to other parts of the country, and a good number of athletes, spectators and families came to enjoy the various events.

In the main Athletics meeting, despite the absence of some well-fancied competitors, some good performances were recorded. Product Support Division took first place in the inter-divisional scores, ISD second and GAV third. Individually, Victor Ludorum was

GEC Avionics is joining an international team which will be competing for a major new business in the world's commercial air transport market.

In February at the Asian Aerospace exhibition in Singapore, where GAV was also exhibiting, Honeywell and Westinghouse announced the signing of a Memorandum of Understanding to develop and sell a system to be known as ESAS, the Enhanced Situational Awareness System.

This will be a visibility aid to the pilot, offering the

ability to 'see ahead' in all weather conditions by day and by night. ESAS will offer significant operational and safety benefits to airlines through the use of weather penetrating sensors, flight deck displays, and digital databases. Several airlines have already shown an interest.

Honeywell has now teamed with GAV to examine Head Up Display (HUD) system and digital terrain system requirements for the ESAS. In the displays area, development of a Head Up Display for commercial airliners is a key element of the team's ESAS concept.

According to Don Schwanz, Vice President of marketing for Honeywell's Air Transport Systems Division, "The Head Up Display technology is a crucial part of the total package we're putting together. And signing up with GEC Avionics completes the team. They produce more HUDs, worldwide, than anyone. We couldn't start out any stronger than by having

New All-weather Aid for Airline Pilots

the leading HUD manufacturer on our side."

GAV has been working on the development of a synthetic-vision HUD for civil aircraft which can be coupled with an infra-red sensor. In the military sphere digital terrain-following and navigation equipment, enabling the pilot to fly

accurately at low level without using external navigation aids or radar, is already coming into use in the SPARTAN system for the RAF Tomado. This work will now be exploited by the new team.

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Steve Driver of ADD in the cockpit of a Gulfstream G2 during trials of a prototype, looking through the retractable combiner glass in its lowered position.

INSIDE

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GAv has World-leading Helmet Projects

GEC Avionics has teamed exclusively with Helmets Limited for the EFA Helmet which will be vital to the performance of the pilot and the aircraft, and our bid for the contract is now being made.

This team brings together the expertise of the two companies, both internationally recognised for their success with state-of-the-art helmet technology. It climaxes a long and successful co-operation on research programmes such as Falcon Eye, I-Nights and the AFTI F-16, and in the development of our Knight-helm range of helmets.

In the USA the F-16 Falcon Eye programme in the late 80s integrated a 'biocular helmet' into the highly successful fighter aircraft, to demonstrate the application of head steered sensors to missions where the aircraft is attacking targets concerned with the immediate ground battle. The US joint services 'I-Nights' programme, for which assessment continues with the United States Air Force, has introduced a 35 degree field of view helmet with integrated infra-red and night vision displays. This programme led to the supply of Helmet Mounted Display systems for the 'Advanced Fighter Technology Integrator (AFTI)

F-16'. Flying out of Edwards Air Force base, the aim of this programme was to investigate the tactical applications of helmet mounted displays.

The Knight-helm range, described in our last issue, has evolved from the experience gained on these programmes, particularly the I-Nights demonstrator. GAv now leads the international development of HMDs; the UK Defence Research Agency, the German Army and the US have evaluated our helmets, ranging from wide angle

displays linked to eye tracking systems, to lightweight visor projected displays.

Our partner Helmets Ltd is one of the world leaders in the design and manufacture of protective headwear and communications. Founded in 1924 and based in Hertfordshire, the company is the design authority for aircrew helmets for the UK Ministry of Defence. Products are exported to over 50 countries world-wide for both civil and military applications.

Another New Programme - APHIDS

A GEC-Marconi Consortium, led by GEC Avionics, is to supply an advanced experimental pilot's helmet to the Ministry of Defence for research into future military fixed wing aircraft cockpits. The contract, valued at approaching £1m, covers the supply of a helmet mounted display to the Directorate of Avionics Equipment and Systems (DAES) for the 'Advanced Panoramic Helmet Interface Demonstrator System' (APHIDS) project.

This programme aims to establish display and controls

philosophy for the UK's future military fixed wing aircraft cockpits. The GEC Avionics colour helmet display and its associated cockpit systems will undertake simulated missions, operating with a number of the latest interface technologies such as direct voice input/output and '3 dimensional' sound, allowing the potential of these technologies to be assessed. Our sister company Marconi Simulation based in Scotland will provide the generation of simulated outside world displays and symbology.

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Now that the team is complete, the first priority will be to develop concepts to determine what the HUD will show. "GEC will play an important developmental role", Schwanz said. "There are still a lot of issues to be addressed as to what kinds of data we want to show the pilots and how we integrate the HUD into the overall ESAS."

Brian Tucker, GAv Managing Director, said "We are delighted to join Honeywell and Westinghouse to create what we believe is the strongest possible team to address the many facets of the ESAS

program. Our civil HUD work brings together our unparalleled HUD and terrain-related experience with our capabilities in commercial flight control. This combination is wholly complementary to the capabilities of our team partners in Honeywell and Westinghouse."

The ESAS will enable a Category IIIa (700 ft runway visual range) landing or take-off using a runway which is only cleared for Category I (2400 ft). This is achieved by fusing sensor information with digital terrain data to provide synthetic imagery which can be displayed head up. The present requirement

to certify the crew, airplane, airports, facilities and equipments is significantly reduced.

A HUD-equipped aircraft may be allowed to take off or land when other non-equipped aircraft cannot. For airlines, this ability to meet schedules better and avoid cancelled flights could mean great cost savings, and reliability and convenience for passengers.

Other teams competing for this latest business include Rockwell-Collins with Kaiser and Kodak, Sextant, Hughes with Flight Dynamics whom they recently purchased, and Smiths.

BERLIN - ILA '92

In June, GAv was part of the GEC-Marconi stand at the International Aerospace Exhibition (ILA '92 in German) held in Berlin, on the Schönefeld Airport which was once in East Germany.

The event, first held in 1909 and the oldest of its kind, has returned to Berlin after a gap of 64 years; for 30 years since the war ILA has been held in Hanover, and now with the re-

unification of Germany the show has returned to its old venue.

As well as representation by more than 500 companies from over 20 countries, there were flying displays of all types of aircraft and a historical exhibition of aircraft from the 20s, 30s and 40s. For GAv however, the importance was our introduction to potential customers from East and West

of some of our latest systems and technologies. Among these were Active Noise Control equipment, HUDs and helmet displays, a Digital Map demonstrator and Fly-by-Wire control systems for passenger aircraft.

GAv, with other GEC-Marconi companies, shared a stand which was part of the SBAC complex, in which over 20 companies exhibited.

INDENTURE EVENING



Another first year apprentice is Daniel Evans, seen here with his parents and John Clover. Father, John Evans, is a Senior Applications Software Engineer in PSD.

The Annual Indenture Evening at Hopewell Drive was rated a great success in spite of this year's smaller numbers of apprentices. Tina Duffield was one of those receiving her Indentures from Production Director John Clover; she has sent us this account-

"When I first started the Mechanical Engineering Apprenticeship I never thought I would have achieved what I have. I was so pleased when I was told that I would be getting my Indentures signed.

"Then came the big night. I had been out that week and bought a skirt. I have a few but I thought they were a little on the short side for this occasion! I brought with me my Dad, Mum and younger sister, she wanted to come to see exactly what I do. When we arrived we went to the Mechanical Workshop where my work (some completed, some not) was on display and included my tool box. My Dad was quite surprised at what I had made. My Mum was amazed, and kept repeating how proud she was.

"We then waited outside the Lecture Room for Mr Wallington to call us in. He made a comment asking if it was me - I suppose I did look different to how I usually do at work, a skirt is 'slightly' different to jeans, long overalls and hat. My Dad signed the Indentures

and we all shook hands. Mr Clover asked how I was getting on with the work and the others in my group, and then he wished me well for the future. We then went into the Electrical Rooms, where my parents met other members of staff from the Training Department.

"After we had walked around all the Training Centre, we left for home. My parents both said how proud they were and what a good working environment I was fortunate to be in."

HARRY EAGLES Moves to GEC-Plessey

Harry Eagles, lately Chairman and Director of GEC Avionics Inc. in Atlanta, has now moved to become President of GEC-Plessey Naval Systems Inc., also based in Atlanta.

Before he went to the USA, Harry was for many years here at Rochester, with ADD from the time of its formation, he later became Divisional Manager of AS&RD, now PSD. One of the big events for Harry soon after he moved to Atlanta was his involvement - as then President of the Company there - with the building of the present factory, opened in 1984.

The many people who remember him here will wish him well in his new appointment.

USE YOUR SPARE TIME TO HELP YOUNG PEOPLE!

Don Short is looking for Young Enterprise Advisers for the Rochester/Strood area.

Why not join the team?

Please phone Ex 3647 for details.

CONGRATULATIONS FROM THE USA

Tony Henley, Chief Systems Engineer in GSD, and Barry Darlington, Principal Systems Engineer, recently gave a paper at the American Helicopter Society's forum in Washington, DC., entitled "Digital Terrain Systems for Helicopters".

The AHS, through its Crew Station and Human Factors Engineering Committee, selected the paper as Best Paper in its category, based upon both technical quality and overall presentation. Tony and Barry have a letter from the AHS thanking them for a very professional job "well done".

UNION JACK FLIES HIGH

In celebration of the First Anniversary of the opening of the GEC Avionics Inc. office in St Louis, Missouri, flagpoles have been erected at the front of the office building, and the flag of the United Kingdom was flying high - and just in time for their special visitor, Brian Tucker.



Ron Adley is "Controller of the Year"

Ron Adley, who has just retired from his desk in the Airport Control Tower, was honoured in March by the Aircraft Owners and Pilots Association (AOPA) who named him "Controller of the Year, 1990-91" at a ceremony in London. Christopher Chataway, Chairman of the Civil Aviation Authority, presented a shield marking Ron's achievement in the General Aviation field of non-airline business and private pleasure flying.

"As an Aerodrome Flight Information Service Officer (AFISO) and recently as Senior AFISO, Mr Adley has established a reputation both for himself and for Rochester Airport of a friendly and welcoming service to pilots both local and visiting. He has been particularly helpful with encouragement and good advice to inexperienced pilots". So said his citation.

This is a fitting climax to a career which only moved into the Air Traffic Control area 5 years ago. Before that, Ron was for 30 years in the Kent Constabulary, in Sittingbourne and Gillingham, retiring as Patrol Sergeant. He then spent a time in retail

security. He also learnt to fly at Rochester and Headcorn, reaching PPL standard, which he says has now lapsed. He also keeps an interest in clay pigeon shooting, but not in close proximity to student pilots. Now he is retiring to live in the Lenham area.



Ron Adley in radio contact from the Control Tower with a pilot.

Veteran Spitfire Will Fly Again . . .



Spitfire PI965, with some of the MAPSL team, under the sky for the first time in four years.

In early March a rare Mk XI Spitfire, one of only 3 known survivors of this mark, was pushed from Hangar 4 after four years of total rebuilding and restoration by members of the Medway Aircraft Preservation Society Ltd (MAPSL), which is affiliated to the Medway Branch of the RAeS. Some 45,000 man hours have been spent in the spare time of the 42 volunteer members, in hangar accommodation provided by GAV.

The Spitfire, owned by a business man from Sussex, was first built in 1944 as a photo reconnaissance aircraft designed to operate at over 40,000ft altitude and more than 400mph, and will feature the blue PR livery and the ports used for the 3 cameras. As we go to press, the

programme of rigorous engine and safety tests, necessary to obtain certification for flight, is well under way. Flight plans for the summer include a number of major Air Shows both in the UK and abroad, as well as film and TV work.

This will be a fitting return, after 30 years of neglect and deterioration, albeit with a partial refurbishment by RAF personnel in 1975. The Spitfire, call-sign 'R for Rochester', will carry the coat of arms of the City of Rochester - upon - Medway, and the good wishes of around 50 other local firms who have supported this restoration project with skills and materials, reviving memories of the great days of the Short Brothers here at Airport Works.

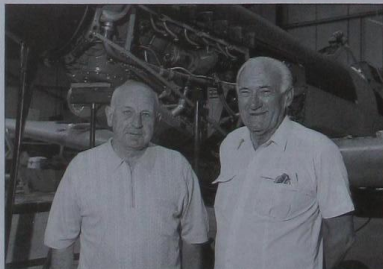
. . . Memories of WW2

In August 1943 Flying Officer Freddie Crewe was on a sortie over an airfield near Brest in Brittany (now the local airport) in his low-level Spitfire MkVB. He collected a cannon-round in the engine and made a very premature landing in a field, injured although not badly. He was

rescued by Robert Guyavarch, a member of the 'Maquis' or French Resistance, but fell into the hands of the German occupation. Most of Freddie's next two years were spent in the notorious Stalag Luft 3 PoW camp.

A couple of years ago, the two were re-united in France. And in May this year, Freddie was host to his rescuer; visits were paid to many places of interest in Kent and among them was the restored Spitfire at the Airport. Here Freddie (r) is seen with M. Guyavarch.

Freddie? Sales Manager and Regional Sales Manager in MASD until his retirement 5 years ago.



Professor Brain-Drain's Computer Corner

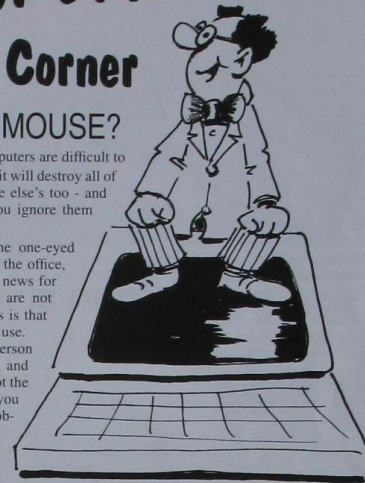
MONSTER OR MOUSE?

"Computers are boring!" "Computers are difficult to use." "If you touch the wrong key it will destroy all of your work and probably everyone else's too - and then you'll be in trouble." "If you ignore them they'll go away!"

If that's what you think of the one-eyed malevolent beast in the corner of the office, then I've got good news and bad news for you. The bad news is that they are not going to go away. The good news is that they really are becoming easier to use.

How hard is it for the average person to master this terrifying animal and prove that they are the boss and not the slave? Well I'm not going to lie to you and tell you that there are no problems, but let's just say that I can use them - and I can't even set the timer on my video at home!

You can't teach an old dog new tricks', is what they say. Yet experience has proved this old chestnut wrong. Again and again it has been found that older people are the equal of the young when it comes to using a computer for the first time. 'With age comes wisdom', is more often the case. Go to any Tech Pubs department and tell them that they are going back to using typewriters and watch their reaction. Yet they were all equally horrified a few years ago when word-processors first arrived.



True, computers can be awkward and frustrating, but that's not your fault it's theirs. It's easy to forget that computers have only been around for a short time, and the engineers who build them still haven't got it right. It's annoying when a computer 'beeps' at you and says that you have typed the wrong thing. If it's so smart why doesn't it tell you what you should have typed? Well at the moment they can't, but that will come soon.

Make Friends!

Already in some offices the old computer terminals are being replaced by models which are much easier to use. 'User Friendly' is the name that they give these new wonders, and they really are trying! Apple Macintosh micros are typical of this new breed of computer and they make life much easier for the novice.

Unlike the VAX and ICL computers which most of us have to contend with, this new type of computer doesn't just display a blank screen and dare us to type something which it can complain about. Instead little pictures of typewriters, wastepaper baskets and filing cabinets are shown on its screen which help normal people understand what options the beast is offering. Instead of typing a command, which takes forever when you can't type, you simply grab a mouse, point an arrow at the picture you want, and give your mouse a squeeze. Let's face it, even if you don't know what I'm talking about, it sounds like fun.

There are few jobs within our company which can't be made easier with the help of a computer. Once a manager finally takes the plunge and

learns how to use a simple spreadsheet program he (or she!) will wonder how they ever managed without one.

So what is the first step which must be taken? You must decide that it's time you took a closer look at this bogeyman/bogeywoman and show it that you 'ain't afraid of no micro'. Use the Personal Development Credits which the Training Department has given you. Book yourself in for a small introductory course. It doesn't hurt and it can be interesting. It could even be fun. Ask yourself, in all the time I've known you, have I ever lied to you?

Agony Corner

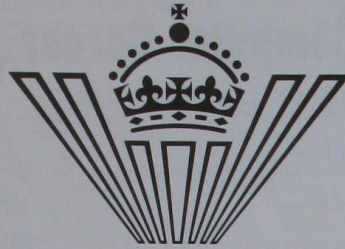
You know what it's like when you've got a nagging worry. For example, the boss tells you that you will have to start using the computer next month and you're terrified that you'll accidentally destroy all the department's records. Maybe you've heard that your whole department is going to be using PCs, and you don't even know what a blooming PC is. You may well have a seemingly simple question about your computer, like "can I get back the file I think I accidentally deleted?"

If only you knew someone you could ask, then perhaps you could save yourself a lot of worry. But who should you ask? The Boss? Why not send your question through the Internal Mail to Professor Brain-Drain, c/o The Editor, GAV News? No question is too trivial and no names are required; 'Worried Blue-Eyes of MASD' will do. But put your name and department on a note to Ed, so that he knows where to direct an answer prior to possible publication of Q and A in the paper.

START Receives the Royal Accolade

Wednesday 3 June was a memorable day for GSD and also a day of relief for a very small number of staff sworn to secrecy for the previous two months. This was when the BBC announced on their *Tomorrow's World* programme that START (Solid State Angular Rate Transducer) had received a "Special Commendation" in the Production stage of the Prince of Wales Award competition.

The judges were greatly impressed by the progress made on the gyro but as the traditional development phase for a gyro is much longer than the two years allowed by the competition, the judging panel reluctantly felt unable to make the winning Award to GEC Avionics. In the event we received a Special Commendation, awarded for the first time, recognising the potential of the product.



THE PRINCE OF WALES AWARD For Innovation and Production Finalist 1990

The START gyro has potential in many spheres; GSD has made a great deal of progress in marketing the gyro for a wide range of applications, from automobile active suspension to

astronauts' helmets, from the sensing of ocean wave motion to the stabilisation of camera lenses. This feature and the BBC programme highlight some of these new applications.



John Barrell, Production Technician, is seen here carrying out test procedures on START. The transition from engineering manufacture to production took place early this year, and the production rate is now up to 60 per month.

THE PRINCE OF WALES AWARD

"The Prince of Wales Award for Innovation and Production" was initiated by His Royal Highness to encourage the creation and growth of new business based on British inventions and technology. It is administered on his behalf by a small organisation entitled Business In The Community. The Award scheme has achieved a high profile through coverage by the BBC *Tomorrow's World* programme.

The Award is open to private individuals as well as registered organisations and normally attracts at least 500

entries each year. Each submission is reviewed purely on the material provided by the entrant and seven inventions are selected as finalists of the Innovation stage. This significant achievement is honoured by the award of a commemorative certificate. The finalist is then entitled to use the Award logo on company stationery and promotional material. Equally important for many entrants is the television exposure publicising their product in the UK and Europe, broadcast in a number of countries around the world.

Each finalist then goes on to the Production stage of the Award which runs for 2 years. At the end of this period each completes a questionnaire and receives a visit from two members of the judging panel to learn of the progress made. The progress of the product into production is assessed, as is its commercial success and its potential contribution to industrial production and employment in the United Kingdom.

A special *Tomorrow's World* features the progress made by each finalist and

One of the applications for START is in the research of upper-atmosphere sounding rockets and space experiments. In this TEXUS 27 rocket launched by Kayser-Threde GmbH of Munich, START was used to measure the roll rate of the vehicle with particular interest in weightless conditions. Performance was "entirely satisfactory" during a flight which included a boost acceleration at 9g to reach a height of 249km followed by a free fall lasting six minutes. Following the flight the unit was recovered and has since been used for several other applications.



A Morning at Highgrove

The filming at Highgrove, country residence of the Prince of Wales, preceded the day at Rochester and involved Geoff Barnes, Deputy Divisional Manager; John Stevens, Project Manager; David Brazier, Cameraman, and Frank Brown, President, Sigma Dynamics Inc. from Philadelphia.

The aim of the day was to personally involve the Prince of Wales by demonstrating to him the effectiveness of the START gyro when used in the Sigma Dynamics Camera Image Compensation System. This was to be done by filming the Lotus Active Suspension car from the back of the "Royal Land Rover", while traversing farm tracks, with Geoff Barnes explaining the proceedings to his Royal Highness.

With the knowledge that the Prince was only able to allocate two and a half hours for filming, an early start was required with an 8.30 muster at Highgrove. A delay at the entrance and being first on left

little time for setting up the demonstration vehicle and certainly no time for any practice runs. However there was time for Geoff Barnes to instruct the BBC support team to take the back door off the brand new Land Rover that had been hired specially for the day. As this required the use of wrenches, crowbars and wire cutters, the BBC Producer became somewhat alarmed.

The application of the Image Motion System to land vehicles is more demanding than air vehicles and there was trepidation about the size of the potholes in the tracks of the house grounds. This proved to be somewhat different from the practice runs carried out using the company mini-bus on the M2. At least the Lotus team knew why it

was being filmed; the same could not be said for drivers on the M2 who preferred to shield their faces from the camera.

Filming went smoothly but Geoff's interview with Prince Charles had to be severely edited for the final programme and unfortunately the presentation of the Award certificate to Geoff and John was not broadcast. The visit to Highgrove was of course the chance for John to renew acquaintances having visited Sandringham along with Bob Ruggles (then DM, GSD) in 1990 to receive the first stage Innovation Award from Prince Charles.

As the team left Highgrove House the BBC engineers were seen to be attempting to re-assemble the Land Rover.

The "START" Gyroscope

START is a good example of the exploitation of an idea which has been known for a long time but required the right combination of physical mechanical and electronic skills to turn it into a practical device required by the market. This combination was provided by the physicists at the Marconi Research Centre and the engineering team in Guidance Systems Division, funded entirely from GEC's research and development budget.

Back to Basic Principles

Engineers divide all movement into two types, linear and rotational. For example, when you are travelling in a car along a straight road, the motion is sensibly all linear,

even the bumps due to pot holes, but when the car reaches a roundabout or turns a corner the movement is a combination of linear (forward) and rotational. In addition the passengers in the car feel a force sliding them across the seat towards the outside of the turn. The linear movement is forward, the turn is about the vertical and the sliding force is at right angles to both of these. This is a generally applicable principle and experience on the back seat tells us that the heavier the passenger and the faster the car speed in the turn, the larger the force. If the car is braked out, the passengers are still able to tell when it is turning and in which direction; the seat-of-the-pants effect again.

This is a good working definition of what a gyroscope is required to do. To control

www.rochesteravionicarchives.co.uk



The camera equipment installed in the Range Rover is hurriedly checked by Geoff Barnes, David Brazier, and (right) Frank Brown of Sigma Dynamics.

The BBC Comes to Rochester

In support of the Prince of Wales Award, GSD was approached by the BBC to help feature START in a number of its applications to provide three minutes of good television for the special *Tomorrow's World* programme. The request fitted in well with work being done by GSD to re-gyro the Sigma Dynamics Camera Image Compensation System. Consequently there was an opportunity to feature this new and highly effective method of camera stabilisation on nationwide TV.

The idea certainly excited the BBC and they set to work planning to use a helicopter-borne camera to film a Lotus car fitted with an active suspension system (also using the START) and shipping

movements on the River Medway. In the meantime many hours of effort were being applied at Signal Dynamics Inc. in Philadelphia and at GAV in Rochester to bring forward development milestones.

A bright sunny but windy day made good conditions for filming, which went well despite some interesting teething problems with co-ordination between the cameraman who was almost hanging out of the helicopter doorway, and the pilot. All came good and some excellent shots were taken of the Lotus from the air, particularly impressive to the professionals was the ability to read the car's number plate from the air.

For ground shots with Howard Stableford the presenter, around ten attempts were needed before the BBC was satisfied - usually because somebody walked into shot, the runway was suddenly occupied or an aircraft revved up!

Air-to-air filming was also to be undertaken with the Air Ambulance - until it was suddenly called out. They were able to return later to finish the job, and those present were entertained to a game of follow-my-leader as the two helicopters flew around the airfield at low level. Unfortunately this piece was not televised.

Later, the BBC moved indoors to the GSD Production Department where there was much grooming of appearances by the company "extras". This part was only briefly seen on the programme but overall the coverage of the START in action was entertaining and impressive.



Flight clearance certification procedures for new aircraft and helicopters require aircraft manoeuvres to be sensed and measured. START has been supplied for this purpose and is seen here with John Mantle, Aircraft Filter of Rochester Airport Services. (Photo copyright Mike Patterson for Central Office of Information).



Thorn-EMI have selected START for measuring movement in all 3 axes of an elevated mast (seen here retracted) on an armoured vehicle. This is part of the British Army Air Defence Alerting Device which uses thermal imaging to detect air attack. 400 units have been ordered for this project, with options for a further 360. (Picture courtesy of Thorn-EMI).



START is included in a Norwegian Seatex Wavescan Databuoy used for investigations into ocean wave motion.

HOW IT WORKS

accurately the direction in which a ship, aircraft, space craft, indeed any vehicle is pointing it is essential to be able to measure its rate of turning. This is the literal meaning of the word gyroscope (gyro) in Greek. The gyros are normally deep inside the vehicle so they are in the same position as the passenger in the blacked-out car.

In order that turning of the vehicle can be measured by the gyro, some part of it must be moving (equivalent to the car's forward speed). It is not practical for any part of the gyro to keep moving in a straight line because it would rapidly leave the vehicle! The engineers' solution is to make the movement circular, as in the spinning wheel of a child's toy gyro. This technique has been the principle used in all



1. Opened-up view of the START Gyro.

practical mechanical gyros, for the past 100 years.

In theory, it had been suggested that another method for producing the necessary movement would be by vibrat-

ing a part of the gyro. In the early 1980s the Marconi Research Laboratory at Great Baddow was challenged to produce a basic design using this principle, which would be approximately 1 inch cube, light in weight and so rugged it would continue to work after being fired in a shell from the Army's largest guns. Dr Roger Langford proposed a vibrating cylinder as the best solution. This was the basic principle of the START gyro.

The gestation time for the new gyro was lengthy and involved a great deal of research. It was not until the late 1980s that a version of START was produced which we could confidently offer to potential customers. Although the basic principle is simple, a considerable degree of sophisticated design has been applied

to make START perform accurately and reliably in extremes of temperature, vibration and shock. A traditional spinning wheel gyro, which is a complex piece of mechanical engineering, is highly sensitive and therefore cannot be used in harsh environments. However, the original concept was sound and eventually the new gyro was born.

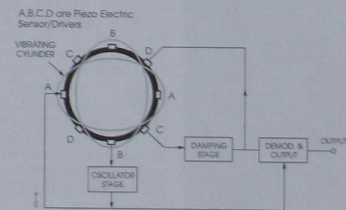
In the picture of the START cylinder shown you can see there are 8 small crystal 'transducers' fixed around the open end of the cylinder. These work in conjunction with the small electronic circuit also shown. Four of the transducers set up an accurately controlled vibration pattern in the cylinder as shown at 2. To make the speed of the vibrating parts high, they reverse direction an incredible 30,000 times every second.

This makes the gyro sensitive to quite small turning motions.

When the vehicle in which it is installed moves, the cylinder is turned about its centre line. This moves the vibration pattern around the cylinder; the faster the rotation the greater the amount of movement. The other four transducers measure

and control this movement of the pattern, producing an electrical signal which is a measurement of the rotation. This is a gyroscope.

As such, it has much in common with the more familiar vibrating or singing wineglass, set in play by a damp finger rubbed round the rim.



2. The vibration patterns, and block diagram of the electronic unit.

KATE TWYMAN - ROUND-THE-WORLD SAILOR

Kate Twyman is taking leave of absence from her job in FCD, Software team leader on the Canadair Regional Jet project, to fulfil a lifetime ambition of sailing round the world. She will be a crew member on one of ten identical steel-built 67ft yachts taking part in the British Steel Challenge. Racing the 'wrong way' against the prevailing winds, following the track of the original circumnavigation single - handed by Chay Blyth, who is 'Admiral' of the fleet, Kate will depart from Southampton in September on a race that has never been done before.

Kate is already greatly experienced in long distance open sea sailing; among her exploits she has been Skipper of the GEC Avionics sponsored yacht in the 24-hour race round the Isle of Wight. Preparations for the Challenge have been in hand since she won her place among the all-amateur crews back in 1989, including training races, much fund-raising towards her 'ticket', cookery lessons, circuit training, and helping in the search for corporate sponsorship of her yacht. This has now been obtained from Teesside Development Corporation, in whose honour "Pride of Teesside" was named by HRH The Princess Royal in April. Kate's efforts are much assisted by the award of a Travelling Fellowship from the Winston Churchill Memorial Trust.

Recent events have included sailing the yacht to Hartlepool to meet the sponsors and hundreds of supporters. In March, Kate was asked to join the crew of



Kate at the helm on passage to Spain, keeping a close eye on the compass.

"British Steel Challenge" delivering a yacht to Seville as part of the outdoor British exhibit at Expo '92. This also enabled her to qualify for the RYA Yachtmaster Ocean Certificate, needing a 200 mile passage further than 50 miles from land.

It has been a busy and exciting time, and we shall hope to see further progress reports once the race has started; plans include a series of programmes about the race on BBC TV.

But Kate will not spend the long days at sea exclusively on seamanship, as part of her objective is to carry out research on the effects of stress on the effects of dyslexia's performance in conditions never before possible on a daily basis. "As a diagnosed dyslexic myself" she says, "I hope also to extend my personality and show others with this difficulty that if you want to do something hard enough then it is possible to succeed."

Bon voyage, Kate, from us all.

'JESS' GRIFFITHS BEM

Jesse Griffiths, who finished a long and varied career with this company by becoming the first Editor of the re-formed Company Newspaper in 1977, has died after a period of increasing disability which contrasted with the great activity of a very full life. His 20 years at Rochester included time in the former AEID (now ISD), when he set up the manufacture of Fuel Gauging Systems. Jess then transferred to Fuze Division and when they moved away he joined FCD, until taking semi-retirement and running the paper.

Jess loved meeting and helping people, and was always interested and a

worker in Politics, national and local, and was at one time a Parliamentary candidate. He was also a much sought after and well-known public speaker and lay preacher, and was awarded the British Empire Medal in the 1982 New Year Honours List. This was a tribute he always felt belonged also to his wife for 48 years, who herself died some years ago.

After his retirement, Jess was until very recently a mainstay of the activities of the Reaper Club for retired employees. He will be much missed, and I as Editor also owe a great deal to his wisdom and enthusiasm.

FCRL

25 Years Service



Ron Chester began in the Training School and became a Wireman at ATED; he then went to ACD and in 1973 to IND. Later he went to MASD where he became an Inspector, a position he still holds in CACD.

as ADD since leaving the Royal Navy. After a time as Planner and Planning Engineer, Colin became a Production Engineer in 1984.



Roy Hanson followed his 15 years in the RAF by joining the former Aircraft Engine Instruments Division - now ISD - as Mechanical TA. Since his promotion to Development Engineer in 1970, he has moved into QA where he is now a Senior Engineer responsible for the Barometric Lab. He also makes many trips to RAF stations in the UK and Europe to support test equipment calibrations. Roy's son Kevin works in MCD Engineering.



Barry Lane, Quality Manager MCD Nailsea, started his career with GEC Avionics in the former Airborne Computing Division at Borehamwood and transferred to Rochester with the division. He was a Senior QA Engineer when ACD became MASD, and remained there until his promotion and transfer to Nailsea in January 1981. He was Quality Assurance Manager of PCSD until the merger of the Nailsea site with MCD Rochester in September 1990 when he was appointed to his current position.



Donald Dracup started in the Environmental Test Lab at the Flying School, and moved to ATED in 1970 as Tester. 1973 brought a move to IND, and as Tester and Test Technician he has been there since; with the merging with Gyro division and the change to GSD he spent many years specialising with gyroscopes, most recently on MLRS systems.



Project Leader **John Kenward** started in 1967, initially employed as a Project Engineer in AEI Division working on Fuel Flowmeter and Contents Gauging Systems. He joined ISD in 1970 as part of the amalgamation with FID/AEI and was appointed Project Leader Fuel Systems. In 1977 he transferred to PSD (now MCD) and is currently involved with the development of the EFA Total and Dry Fuel Flowmeters.



Derek Channon, taking into account his service with companies forming part of the history of the company at this site, has spent much more than his nominal 25 years here. He joined Short Bros at the age of 14, and was with Spemby who occupied the New Road site before Elliotts/GEC. Derek came to the company as Inspector in the former PCB manufacturing area, and has since been in CMS and for the last 14 years in FCD and CACD Model Shops.



Colin Bennett has been with the division now known

Retirements

Cyril Adams, with just over 25 years' service, has now retired as Chief Storekeeper in ADD. Cyril had been in Stores since ADD's inauguration and has been responsible for kitting all of the major programmes, from Buccaneer to F-16 and NVGs.

George Adams, Production Technician in CACD Inspection, retires after fourteen years of which the first few were spent in MASD. The family name continues in the company as son Graham, an ex-apprentice, is now in ISD as Wireman.

American-born **Dan Fouché**, retiring after almost 20 years in IND/GSD, has been a Test Technician specialising in gyros and accelerometers. His wife **Ivy** has also retired after 17 years making up the weekly wages in Accounts Dept.

Roy Limbrick, Production Technician at Nailsea, retired recently after six years with the company, working first for the Recording Systems Group and latterly for the Power Conversion Group on Goods Inwards Inspection.

During his retirement he intends to lower his golf handicap!

Alan Page of CMS Model Shop was once in TACD, and after a break in service was in ADD Model Shop until the move into CMS. Alan's total service was around 35 years.

Fred Beighton, also a 35 year Model Shop technician, first started in CMS and then spent periods in Gyro and CACD before returning to CMS.

Reg Hoskins, with around 20 years of service including a break, was originally in FCD but later in AS&RD/LCSD/PSD in Spares and Logistics, and finally in Customer Support as a Modifications Engineer.

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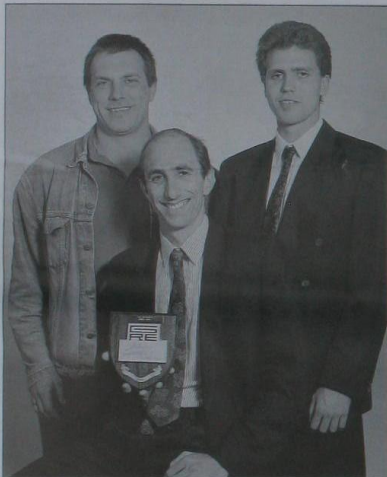
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Drive
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(Nailsea)
Jean Wilson, APD
Borehamwood
Lynne Bates, GA, Av Inc,
Atlanta USA.

GAv Athletics Club is in the Running

GEC Avionics AC started the season in tremendous style by winning their first British Athletics League Division 5 match at Hayes in early May. In the second fixture in June they did extremely well to come second and still stay top of the League, despite missing England Internationals Martin Forder and Nigel Stickings. With two fixtures remaining, the Club looks a good prospect for promotion to Division 4.

Paul Slythe (200m), Steve Baggaley (400m) and Paul Ralph (triple jump) have been major contributors to the points, along with Graeme Saker. Martin however has been showing his class by setting six Club records and personal bests, also being picked to run for England in Norway at 800m. He came 3rd, behind the winner Olympic runner Curtis Robb, and teammate Nigel Stickings came 3rd at 200m.

Martin recently beat Steve Cram in a mile race at Corby, and made the Final of the Olympic Trials 1500m with a personal best and Club record of 3:42.53. He also ran a fast 1:48.51 at 800m in a win for England AAA. He will be leaving us soon to take up a Sports Scholarship at a university in Louisiana - where Graeme Saker was some years ago.



Graham Storer (ADD), Graeme Saker (PSD) and Martin Forder (PSD) after the first winning fixture.

GAV CENTRAL CHARITY FUND THANKS ALL CONTRIBUTORS

The 1992 AGM took place on 24th June. The Treasurer's report recorded donations made during the financial year to March 1992 amounting to just over £5000, and it was noted that in the three subsequent months a further £3700 has been distributed. Thanks are due to the 700-plus regular donors.

Lists of donations are regularly posted on Company notice boards - they range from amounts of up to £200 for major local charities for many different needs, to raffle prizes in kind to a number of organisations who are themselves fundraising for

their chosen charity. A notable donation was £250 to the Kent Association of Care Committees for Chest, Heart and Stroke.

The Committee concentrates on charities not previously helped, at a time when many are struggling for funds.

REMEMBER - this Scheme provides a ready means for you to contribute regularly to charity by payroll deduction. The company matches your contribution pound-for-pound.

Contact Personnel Records for application forms.

NON-SMOKING AREAS IN THE CLUBHOUSE

To comply with Health and Safety regulations, certain parts of the Clubhouse at Hoo have been designated as non-smoking areas.

They are the Entrance and Upper Lobbies, and the Family Room.

Please help ensure that these small but necessary restrictions are observed.



RAY AND DAVE ARE SLIMMER... But Special Care Baby Unit Funds are not!

During January of this year both Dave de Knopp and Ray Newman of PSD were encouraged to lose weight. "Do it for charity" was said, so given that AS&RD/LCSD/PSD had an affinity with the Special Care Baby Unit at All Saints' Hospital in Chatham, Dave and Ray signed up with "Weight Watchers". On February 5th Dave weighed in at 21st 5lb whilst Ray tipped the scales at 15st 3lb. It was agreed to have a time limit on the sponsored slim so 16 weeks was chosen. Wednesday night became "Weight

night" for Dave and Ray, taking their place in the queue to learn how good or how bad they'd been; it was surprising how many GAV people attended the same class.

The 16 weeks seemed to fly by and eventually the final weigh-in was held. Dave had slimmed to 19st 6lb, a loss of 27lb and Ray had reached 13st 11lb, a loss of 29lb. Both hope to continue in order to reach their goal weights. A total of £200 was collected and Dave and Ray visited the SCBU to present the cheque, and were given a tour of the unit.

Both would like to thank all their sponsors for their support and encouragement during the 16 weeks of the slim.

In turn, a letter of thanks from All Saints' tells Ray that the £200 will be put towards the purchase of equipment for two more cots in Intensive Care. This will bring the capability to eight cots and enable more babies to receive all their treatment in the SCBU rather than transfer elsewhere.

GAV Long Service Association

The Ninth Annual General Meeting took place on 19th June, with a lower attendance than in previous years.

The following were confirmed as Committee members:

- Harry Staff President;
- John Goodhand Chairman;
- Ray Beevis Vice President;
- Brian Rogers Secretary;
- with Ted Farbrace, Irvin Gray, Velma Gooch, Tony Rye, Malcolm Ainsley, and Ted Herbert representing the Reapers Club.

HELP - CALL POLICE

Not a message that we hope will be used. However, Harry Staff has available some highly reflective notices, produced for the Crime Prevention Panel, for the use particularly of lady drivers in the event of car breakdown if they would feel unsafe leaving the vehicle to seek help.

Contact Harry on Ex 3674.

Harry is also planning to have for sale some Personal Attack Alarms for ladies.

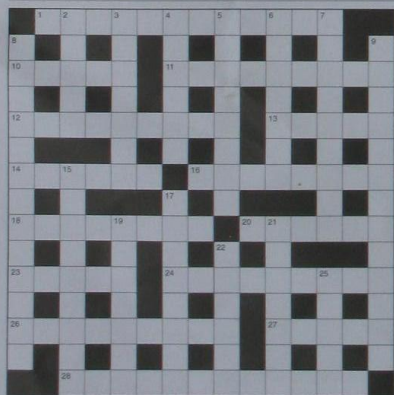
CONGRATULATIONS

On 6th May at Gibraltar Registry Office, the wedding of Arthur Colwell (ex Divisional Manager of ATED - that was) and Diana Firth (ex Exhibitions Manager, GAV) took place. On the evening of the next day, guests attended the official blessing ceremony and a reception which was held in the gardens of the Tennis Club near to where they are now living. Guests, including relatives, friends and colleagues (with half a dozen from GAV!) came from far and wide and such a good time was had by all, that many stayed for as long as a week! We are sure that everyone will join together in wishing them Good Luck and a long and happy life together.

See picture on Back Page.

Congratulations also to Richard Watters, Technical Executive in CACD, and Norma Collyer also previously in that division, on their recent marriage.

Crossword No. 109 (For amusement only)



ACROSS

1. The Boss in charge. (5-2-5)
10. To fit out with necessary items. (5)
11. It may be an arrow or instruction. (9)
12. Come between a model and her work. (9)
13. The name on the cheque for credit. (5)
14. A famous name and a column. (6)
16. He is usually in charge of the lifeboat. (8)
18. Baked hard? (4-4)
20. STIFLE (anagram). (6)
23. Does not wear the victor's crown. (5)
24. A man of history, or recent times! (9)

26. Most ports have one, very fragile. (9)
 27. A hermit may live in it. (5)
 28. The heat is on, it must surely win. (3-9)
- DOWN
2. A ghost does, or bad memory. (5)
 3. A grass, but not a mark. (7)
 4. The necktie denotes him. (3-3)
 5. He only stands and stares, or measures. (8)
 6. One shows one's agreement. (7)
 7. A bedtime story, maybe (5-4)
 8. The novice's reward. (9-4)
 9. A single occasion, but final. (4-3-3-3)

15. No fire, but a craftsman. (9)
17. A famous musical? What a state! (8)
19. Goes with cake but not power. (7)
21. The instructor who shows how. (7)
22. An outhouse addition perhaps. (4-2)
25. What the golfer should replace. (5)

Solution to CROSSWORD 108

ACROSS

1. Visual Statistics; 8. Light Ale; 9. Reffill; 11. Mate; 12. Snappdragon; 13. Hours; 15. New Issue; 19. Elegance; 20. Ning; 23. Boatload;

25. Sole; 27. One-Gut; 28. Pentagon; 29. Mad as a March Hare.

DOWN

1. Volume; 2. Tight Rope; 3. Leth; 4. Taint; 5. Sparrows; 6. Ice; 7. Splinter; 10. Spice; 14. Realities; 16. Sun Loggia; 17. New Bloom; 18. Scott; 21. Veneer; 22. Scance; 24. Amend; 26. Utah

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Alan Keats
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Scanner Appeal Update

Events have been continuing over recent months in support of the company's Appeal. A total of £100,000 is now "so near, and yet so far" and it is hoped that the Grand Summer Draw will help enable that magic figure to be reached.

The good news for the main Medway Cancer Scanner Appeal is that the Government, encouraged by the generosity of people throughout the local area, is to contribute £300,000,

and the eventual target of £1 million should now be reached many months earlier than hoped. Nevertheless, Dr Mohan Velamati, Chairman of Trustees, emphasises that nobody can relax - £300,000 is still needed, quickly so that the scanner can be in use early next year.

Here is a glimpse of some of the efforts made over the last few months at GAV Rochester, and now under way or planned.



Way back at Christmas, these young ladies from ISD collected a note from Keith Snelling, before setting forth among us all with their buckets. They are (l-r) Tracy Bestwick, Karen Still, Joanne Witt, Nicola Davis, Emma Hargreaves, Paula Bower and Cath Bloore. They collected over £600.



The company stall at the Dickens Festival, bringing in £523, was 'manned' by Brenda Jewell, Doris Taylor, Brenda Clutton, Sue Westrup and Sharon Edwards....

.... then it rained!



First Prize in the Grand Summer Draw - the child-size 4-wheel drive Pick-up, on show here with Lesley Pritchard, Harry Staff and Zoe Edwards. The Pick-up, valued at £600, was donated by Peter Martin of Medway Toyota.

Alan Hindlet, running also for Bob Kemlo as mentioned in the last issue, raised £468.50 in the London Marathon.

Dave Humphries of ISD won a trip to the 'Chippendales' show, maybe disappointing the young ladies in his division to whom he sold £40 worth of raffle tickets. This effort raised £400.

Also in ISD, Mark Horn won tickets to the England/Brazil football match - this raffle raised £126.

The Easter Bunny raffles in the Canteen, CMS, and the Reaper Club brought in £130.

Ken Raines of CACD raised £110 in the Thanet Marathon.

A GSD Wine and Wisdom evening, again successful, raised £403.

Our colleagues in the USAF Office donated £10. Donations have also come from Jim Collins, £200; CACD, £126; Evening Cleaners, £22.

Small change collections, £349.16 in a bottle from GAV Admin, and £13.27 in pennies from Sandra Birch in GSD.

ISD Football Pontoons have raised £2646.



Blossom time at the wedding of Arthur Colwell and Di Firth. See "Congratulations" on Page 7.



Brian Rogers outside one of the bigger boats at the Social Club Boat Fair. On a hot and sunny day the takings came to £652.