No. 15 March 1979

MARCONI AVIONICS NEWS

House Journal of Marconi Avionics Limited

MOTTO FOR THE MONTH

"Genius is only a great aptitude for patience"

An AVRO Shackleton MR3, pictured over the North Sea. These aircraft have now been superseded by the NIMROD in carrying out maritime patrol duties.

United Kingdom and Australia get new Anti-Submarine Defence System

The first production deliveries of the world's most advanced airborne anti-submarine defence system, are now being made by the Company.

A formal handing-over ceremony took place at Rochester on 2 March, when the first complete aircraft installation of the AQS901 acoustic processing and display system was received by the Controller Aircraft of the UK Ministry of Defence (PE), Air Chief Marshal Sir Douglas Lowe. This was accepted on behalf of the operators, the RAF and the Royal Australian Air Force (RAAF), in the presence of a large and distinguished gathering and representatives of press and communications industry.

The Chairman of the Company, Dr. B.J.O'Kane CBE, presided and made an opening statement, then called on Mr. P.B. Rayner, Divisional Manager, to make a brief statement of explanation of the system. In the course of his comments, the Chairman paid tribute to the helpfulness, co-operation, effort and enthusiasm of all parties, including customers, sub-contractors, the MOD and our own work force. It was also emphasized that in spite of its complexity, great efforts have been made to ensure the system is cost-effective throughout its service life.

The Controller Aircraft MOD(PE) Air Chief Marshal Sir Douglas Lowe GCB, DFC, AFC, ADC, RAF gave a response.

A statement was made by Admiral Robertson, DSC, RAN, head of Australian Defence Staff.

The party then proceeded to the area where the system was set up, ready to be handed over. The formal handing-over ceremony, which was observed by many people on closed-circuit television in other parts of the division, included a description of the system by W.P.B. Rayner, Divisional Manager, after which he called on Stephen Mayes, a third-year apprentice, to make a speech of welcome and invite Air Chief Marshal Sir Douglas Lowe to formally accept the system by cutting the tape, taking a seat before the equipment and receiving a message.

To mark the occasion, trophies were presented to:

Air Marshal P.J.Lagesen, CB, DFC, AFC, RAF, AOC 18 Group for RAF Kinloss and St. Mawgan, and to Air Cdre. M.J. Ridgeway, AFC, RAAF, for RAAF Edinburgh Field.

These trophies are to be competed for on an annual basis, by the crews of aircraft operating the system (the basis of competition would be decided by each station later). Stephen Mayes made the presentation of an Australian 'Thunder egg', suitably cut, polished and mounted. ACM Sir Douglas Lowe then invited senior service representatives to make responses.

Australian 'Thunder egg' symbolises anti-sub defence breakthrough

Steven Mayes, an apprentice in MASD is pictured here holding a trophy he presented to the Controller Aircraft of the Ministry of Defence, which sponsored this important development, for RAF Nimrod and RAAF P3-C Orion ASW aircraft fleets.

Britain and Australia have co-operated throughout the programme and it is appropriate that the trophy is based on an Australian Thunder Egg, cut and polished and suitably mounted, as a souvenir of this successful co-operation.

AQS901

Maritime Aircraft Systems Division (MASD) designed, developed and produced the system for the MOD with important co-operation from its sub-contractors in Canada and the UK.

The development is part of a co-operative programme established for anti-submarine defence by the governments of Australia and the United Kingdom. This co-operation has led to the AQS901 being adopted for the RAF Nimrod maritime reconnaissance fleet as part of its avionics up-date programme, and for the RAAF fleet of P3-C Orion maritime patrol aircraft. Australia's important contribution is the new BARRA passive directional sonobuoy.

BARRA gives a better capability for the detection and location of submarines than any buoys in current service anywhere in the world, and the AQS901 is the only acoustic system which can operate with the BARRA. Major sub-contractors, with whom as prime contractors Marconi Avionics worked in close harmony, include Computing Devices of Canada Ltd., McMichael Ltd., and Rank Pullin Controls Ltd..

At the peak of the programme, one thousand engineers have been engaged on the AQS901 development and proving.

As a result of these and other developments, job opportunities have expanded considerably. Contracts totalling over £100 million are currently held.

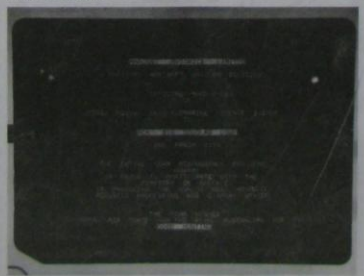
The system makes use of microprocessors, and from the experience gained over the past five years with these items, the Company is well placed for further advances using microprocessor-based systems, designed for use in RN Sea King helicopters, and Westland WG-34 long-range helicopters.

Frank Nicholas, Project leader, with a complete aircraft installation of the system.

Team work the key to Marconi Avionics' success

Pam Lee, Computer Programmer in the System Test group of MASD and John Burton, Project Manager in the same group, are pictured at the controls of the system they have helped to create.

Pam, 24, holds a BSc. degree in computers and cybernetics and has been with Marconi Avionics for 2½ years. John, 37, has a HNC in radio and electronics and has 10½ years experience with the Company. Both are popular members of the Company's growing and experienced team at Rochester.



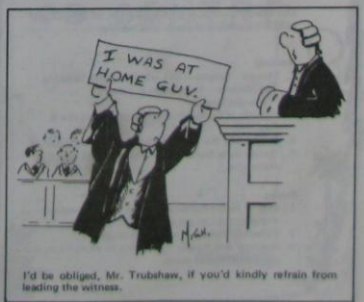
The anti-submarine defence system speaks for itself

When Controller Aircraft of the Ministry of Defence (Procurement Executive) Air Chief Marshal Sir Douglas Lowe, received the first production deliveries of the Marconi Avionics AQS901 anti-submarine defence system, the system presented him with its own message.

Marconi Avionics software specialists take a bow

In avionics, the airborne electronics system on which modern aircraft depend for their effectiveness, there is ample scope for engineers, scientists, mathematicians and technologists of many disciplines, to experience the practical results of their design and development work. The representatives of the software team pictured cover many aspects of software used in the complex analyses carried out in AQS901, in order to discriminate between submarine data and the high level of background noises in the sea.

The team pictured are (back, left to right):
Trevor Harrison, 27, Grad IMI, Senior Programmer; Raymond Walder, 27, BSc. Mathematician, Senior Programmer; Robert Giskey, 38, HND, Project Leader; and (front, left to right) Roy Davis, 26, BA Computer Systems, Senior Programmer; Dave Crowther, 24, BSc. (Mathematics), Computer Programmer; and Andrew Haworth, 24, BSc. Mathematics and Computer Science, Computer Programmer.



I'd be obliged, Mr. Trubshaw, if you'd kindly refrain from leading the witness.

FACTS ABOUT ANIMALS

Largest & heaviest

The largest animal now living (and probably the largest which has ever inhabited the earth) is the Blue or Sulphur bottom whale, which is sometimes known as Sibbalds morqual. The typical adult female measures 86ft in length and weighs about 109 tons.

The largest specimen on record was probably a female measuring 106ft taken near the South Shetlands in 1926.

Largest on land

The largest living land animal is the African Elephant. The average bull stands 10ft 6in at the shoulder and weighs 5¼ tons. The largest specimen recorded was a bull shot in the Cuando River region of South-western Angola on 13 November 1955. Lying on its side the animal measured 13ft 2in from the shoulder to the base of its foot, indicating that its living height was 12ft 9ins. It had an overall length of 33ft 2in, a maximum girth of 19ft 8in and its weight was estimated to be 24,000lb (10,7 tons).

Tallest

The tallest living animal is the Giraffe, now found only to the south of the Sahara Desert. A bull of one of the sub-species and measuring 19ft 3in in height from the hoof to the crown of the head has been recorded in Kenya. (A London bus is 14ft 6in high). It weighed 3800lb (1.7 tons); less credible heights of up to 23ft have been claimed.

Rarest

The rarest mammal in the world is a Pygmy Opossum (Borramys parvus). One of this species (a male) was found on 19 August 1966 in a ski hut on Mount Hotham, Victoria, Australia. This marsupial was previously known only from 20,000-year-old fossils.

Rarest in Britain

The rarest mammal is the Pine Marten, which is found in the highlands of Scotland, particularly in Coille Na Glas, Leitire, Ross and Cromarty, and thinly distributed in North Wales and the Scottish Border country. The largest specimens measure 34in from nose to tail and weigh up to 4lb 6oz.

Fastest

The fastest of all land animals is probably the Pronghorn Antelope, of the Western United States. Specimens have been observed to travel at 60 mph for two miles and at an average of 36 mph for 45 minutes. A speed of 60 mph has also been reported for the Mongolian Gazelle in the Gobi Desert and there is an unconfirmed report of 65 mph for a blackbuck.

Longest lived

No mammal can match the extreme proven age of 113 years attained by Man.

It is probably that the closest approach is over 90 years by the killer whale. A bull with distinctive markings known as 'Old Tom', was seen from 1839 to 17 September 1930 in Twofold Bay, Eden, New South Wales, Australia.

The longest lived land mammal, excluding Man, is probably the Asiatic Elephant. The greatest age that has been verified with reasonable certainty is an estimated 69 years of age in the case of a female named 'Jessie', who had to be destroyed at the Taronga Zoological Park in Sydney, Australia, because of senile infirmity on 26 September 1939.

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Just a thought

You start getting old from this day you're born
whether male or female, king or pawn,
Whatever your colour, black or white
you're each a day older every night!

But of course there are some that don't finish the span,
of that three score and ten that's allotted to man.
Just why they are picked as the first to go
is one of those things we just don't know.

It can't be the life they lived wasn't good
because some that are chosen are in childhood,
they havent lived long enough to commit crime
so what is the reason for so short a time?

You may have life easy, you may have life hard
but you'll never know when he'll pull out your card
so do what you can to make life worthwhile
then, when your time comes you can go out in style.

J.C.

LIMERICK

They showed him the job,
Which couldn't be done
And said if he tried, he would rue it.
But he tackled the job, which couldn't be done,
They were right – He could not do it!

MARCONI AVIONICS

Halifax Savings Plan

This scheme, announced in 1978, is beginning to prove popular.

To date we have had 225 applications to open new accounts, or have contributions paid into existing ones.

The annual total amounts to approx £75,000, and is a good factor for use when mortgages are requested.

Anyone contemplating taking part in this scheme, should get in touch with Mr. J.M. Neate, in Personnel Dept. (Int. 713). Participation can commence at any time.

THE TRUTH

The Devil sends the Wind, to blow the girls' skirts high,
But God is just, He sends the dust
to blind the bad man's eye.

contributed by Faith Hayhow

FOR YOUR DIARY

FUZE DIVISION REUNION

6 July 1979

Candlelight Supper and Dance
Club-house, Featherby Road
Dancing to 'Flying High Beat

CHATHAM AMATEUR OPERATIC SOCIETY
presents for its
Golden Jubilee production

THE VAGABOND KING

at the

TOWN HALL

Tuesday 3rd April to Saturday 7th April
1979
Evenings 7.30 pm
Matinee: Saturday 2.30 pm

Tickets £1.25 £1 60p
available from Central Hall (Tel. Medway 403868)
OR NIGHTLY AT TOWN HALL

LETTER TO THE EDITOR

Dear Editor,

With reference to the recent reports of Prince Charles' remarks regarding Managements being to "snobbish", I would like to pay tribute to our Production Director – Mr. A. Harrison, who has always been friendly with the workers, never too proud to pass the time of day, and you get his opinion spoken in down-to-earth language which we all understand. I have worked under his management for 20 years, and many more agree.

V. Bocking
CMS Inspection

"What mean those stones?"

These words are taken from the Bible, when Joshua commanded the Israelites to make a heap of stones to commemorate their safe passing over Jordan, so that, when their children asked "What mean those stones?", they could explain.

So we get them dotted about the countries of the world; rain-washed, awe-inspiring monuments where Man, from age to age, has erected them to commemorate some deed or happening of his life-time; their meaning long forgotten, like some dethroned King, his good works for his country expunged, but pride and majesty still to be seen.

The Sphinx, everlastingly staring over the hard, unbroken lines of the desert. What secrets could it tell, what heroic deeds of old Egypt could it tell as it remains there brooding, perhaps, on the great person or event to whose memory it came into everlasting and scientist-baffling existence?

In England there are little stones, tiny crosses, with no meaning as far as we know, (Kits Coty?) yet each a token of years gone by and children ask, "What mean those stones?" and receive no answer.

Stonehenge, majestic stones placed there by some giant hand it seems, for they are of great size, and the only kind of stone of that appearance for miles around. Still we ask "What mean those stones?" and for reply, we hear the soft lowing of the wind, and see the mocking height of the enormous tablets.

The million crosses in Flanders show where our gallant men fell in the First Great War, and in England the Cenotaph in London, and memorials in every town and village record their names, and sometimes deeds, and men in passing raise their hats in reverence. Yet in years to come, when storms have erased inscriptions, children will ask, "What mean those stones?"

So we have them as footsteps of the road of life, still enduring when the erector and imprinter are gone for ever, and their descendants ask, "What mean those stones?"

CASTAWAY

Our March Castaway is Eddie Barker, of MASD, and here is his choice of music and reading.

Records

1. **Mozart – Sonata K331** – for peaceful listening.
2. **The Mikado** – for a laugh at society.
3. **"With the Beatles".**
4. **Pictures at an Exhibition** (Emmerson-Lake & Palmer).
5. **Symphony No 7 by Beethoven** – music to stir.
6. **Kenny Balls Golden Hits** – for a world tour in miniature.

Books

1. **Life of Helen Keller** – to keep me going when things appear to get rough.
2. **Pickwick Papers** – for a good laugh.
3. **Geology and Fossils** – with this to work from, one would never feel alone.

Jane Staff and Avionics— An attractive partnership

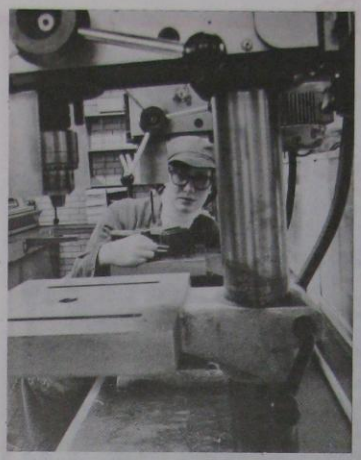
Jane Mary Staff, who was 17 in December, is making a career for herself in engineering — usually a male-predominated profession and one in which there is a nationwide shortage of young qualified people. Jane has started her apprenticeship in the special Training Centre of Marconi Avionics Limited.

Jane, who lives in Watling Avenue, Chatham, has little time for hobbies; her determination to be an engineer keeps her fully occupied. She relaxes by reading, playing the piano and cooking.

To start her career, she took extra studies in physics and mathematics and, acting on her own initiative, convinced Marconi Avionics that she was right for the job. She will take a year's intensive course at the Training Centre, a model self-contained factory with its own workshops, forge, wiring shops, drawing office, classrooms and canteen. With over 100 colleagues who began apprenticeships this year, she will have to work hard to reach the high standards of workmanship and quality which high technology aviation business demands. At the end of her first year, she will develop her training 'on the job' with the Company's divisions who design, develop and produce the world's biggest range of avionics — everything from automatic throttle controls for the Boeing 747 Jumbo jet to precision gyroscopes and instruments. During the course she will return to the Training Centre for refresher courses and, by the time she is 21, she will be fully trained.

Jane plans to be a design engineer, a highly-responsible position in the Company. This will entail a detailed understanding of the engineering standards involved in mechanical and electrical design and a good appreciation of the safety standards applied in aviation — vitally important in such applications as blind landing systems. (The Company's system for Concorde, for example, was recently cleared to land in fog).

She has a wide choice of possible careers, the Training Centre catering for electronic technicians, designers, technical assistants, estimators, planners, technical writers, quality engineers, product support engineers and instrument technicians. During her course she will learn about all of these techniques before specializing in her chosen career as a design engineer.



Jane Staff at the machine.

Jane Staff in relaxing mood.

So far only 5 out of 120 students in the 1978 intake are women. Marconi Avionics, which devotes considerable effort to career guidance and career supervision for its 9,000 employees, is successfully overcoming the critical shortage of suitably qualified young people interested in engineering. The Company especially welcomes young women who have the same opportunities of advancement as men. Training is available throughout an avionics career and more than 10% of the total work force is undergoing training of some sort at any time.

These facilities have always been available to women but the fast-growing Company, which, over the past three years, has trebled the value of its exports, is stepping up its activities in encouraging women to take these opportunities. They can reach the top in engineering, computer programming and commercial and general management in a company whose management are all professionally qualified and experienced in doing the jobs they now manage.

Jane's family have no engineering background. Her father Harry, is the Company Safety Officer but, he confesses that Jane's entry into the Company, as an apprentice engineer, was her own idea. She can be proud of her father's efforts, however: Marconi Avionics already holds 12 British Safety Council and 3 Employers' Federation Awards for its safety record, which is recognized as among the highest in the country. Safety standards are nowhere more meticulously observed than in the Training Centre and the picture of Jane shows her wearing her safety glasses and protective clothing while working on the correctly-guarded machine.

MOVING ON

Mrs. Susan Crittenden has now left the Company to start a family. She had been working in CMS Production Dept. for some three years, coming to us after service with Thorns.

As her hobbies are knitting and reading, she will be able to use them for a worthwhile objective. Clothes for the baby and eventually knowledge to feed the child's mind.

Susan is the daughter of Nick Carter, for many years a well-known personality at Rochester, until ill health forced him to a premature retirement. We are advised that Nick is now recovering well.

On leaving, Susan was presented with suitable gifts for a mother-to-be, in a spirit of best wishes and joviality, which the camera captured.

Susan Crittenden enjoying the CMS joke.

"Tis better to have loved, and lost, than never to have loved at all" says the poet, and when it happens in reality one realizes it is not sentimental slush.

Those who know Jim (C.J.) Dear, formerly Sales Manager of ISD, will number him among those who are lost to the Company "for a while".

Jim left earlier this year, for health reasons, and the best wishes of all friends and colleagues go with him for a full and complete restoration to health and strength. On leaving, Mr. Frost, Divisional Manager, presented him with gifts subscribed for by his many friends and acquaintances. He expressed his appreciation for the opportunity to have worked with a lot of nice people at MAv, and looked forward to renewing these friendships and acquaintances in the not too distant future — perhaps through the RAeS (Medway Branch) of which he is the Treasurer.

A native of Norfolk, he was born near Norwich, and was educated at Bungay Grammar School, which he left in 1943, and began an indentured apprenticeship with the forerunner to the Eastern Electricity Board as an Electrical Engineer.

Longing for adventure he 'put his age up' in 1944 and volunteered for Service in the Fleet Air Arm as a trainee pilot. The advent of VE day ended that idea, and he re-mustered as Electrical /Instrument Fitter, but not for long, being demobilized in 1945!

Returning to Norfolk, he completed his apprenticeship and in 1949 joined the Ministry of Aviation at the Maritime Aircraft Experimental Establishment located at Felixstowe.

He was fortunate in gaining a great deal of experience designing and operating flight test equipment, logging many flying hours.

In 1952 he moved to Saunders-Roe, Helicopter Division, and set up the Flight Test Dept., progressing to become Chief Flight Test Instrumentation Engineer.

He then joined Elliott Flight Automation in AEID, as a Technical Liaison Engineer. In 1965 he was appointed Sales Manager AEID, and was confirmed in this role when AEID and FID became ISD, in 1970.

He is still in the selling business, but away from electronics and engineering.

A keen golfer, of no mean ability, he hopes to get fit and well, so that he can indulge in his hobby more, and carry out the odd jobs to satisfy his DIY cravings.

Jim Dear receiving his gifts from Mr. J.Frost on leaving the Company.

Generosity

APPRECIATION AND THANKS

Mrs. P. Ferigan would like to thank all those who donated towards the sum of £332.60 which was collected in six weeks for the purchase of a KINGS FUND BED and MATTRESS which was specially required for use in the Cancer Ward of St. William's Hospital. After this purchase there was enough surplus money to enable me to also buy a portable 14" television and an electric razor.

For the very generous donations I thank you all very much.

Phyl Ferigan
Purchasing
Instrument Systems Division

FACES TO VOICES

We introduce you this month to the "Hello" girls, who are so much a voice-only contact that very few know who they are and what they look like.

If beautiful voices go with beautiful faces, then Marconi Avionics has quite a surfeit of both.

The leader in charge of the Telephone Exchange is Olive Ellen, who can look back on 19 years' service of "Number please?".

Olive is, like most of the telephonists, GPO trained, but she confesses to having served at Wingets before coming to the Airport, after a very successful career in the ATS Signals and Telephones during World War II. Her eyes light up with pride as she speaks of her service days, and recalls her active participation in the 'D' day affair, maintaining contact (telegraphically) and connecting the multitudinous calls.

The exchange is the contact point with the rest of the world and it is worthy of note that all international calls are dialled direct from our exchange.

An average day needs about 70 international calls, and since America is 6-7 hours behind our time, the afternoon becomes a very busy period.

Hundreds of calls per day are handled, both outgoing and incoming apart from those dialled direct by staff, after being given 'a line'.

Olive Ellen – Leader in Charge.

Eve Watson – GPO trained – 8 years' service.

Patsy Dean – GPO train

Ellen Hicks – GPO trained – 5 years' service.

Cynthia Tindell – GPO trained – 2 years' service.

Joyce Cole – GPO train

Christine Collier – GPO trained – 1 years' service.

Lesley Shephard – GPO trained – 1 years' service.

Sue Dugan – GPO trained – 1 years' service.

Myra Malone – recently arrived.

Linda Thompson – 2 years' service Telex..

Olive Ellen flanked by assistants at the exchange control desk.

Ruth Hessey – recently arrived Telex.

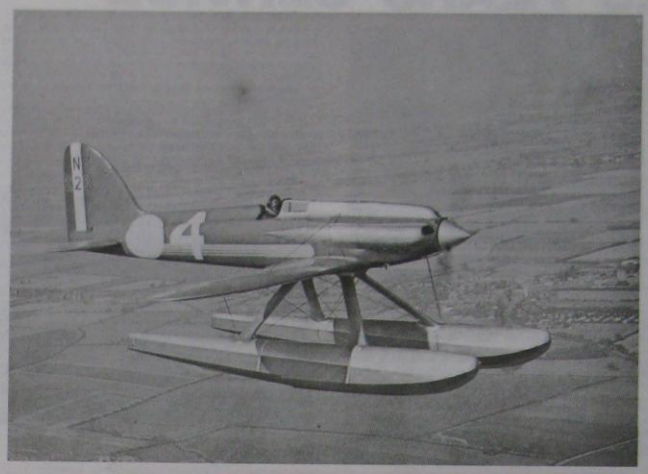
Two views of the 'boards' being 'manned'.

…ined – 8 years' service.

Alice Murtagh – GPO trained – 7 years' service.

…ned – 2 years' service.

Janet Streten – GPO trained – 8 years' service.



This photograph shows a faithful scale replica of the Supermarine-Napier S5 Racing Seaplane N220 which won the Schneider Trophy for Britain on 26 September 1927 in Venice, at a speed of 281,54 mph.

MARCONI AVIONICS LTD/MARCONI-ELLIOTT AVIONIC SYSTEM LIMITED
ELLIOTT FLIGHT AUTOMATION LIMITED

A Brief History to 1970

Past history

1800 The Company's use of the name Elliott stems originally from William Elliott, who set up in business as a maker of 'philosophical instruments' at a shop in the Strand, London, in the year 1800. He was a young man, only recently out of his apprenticeship, for which his indentures are still preserved. The business prospered, and in due course became well enough known to be called upon by leading scientists such as Faraday and Wheatstone to make experimental equipment. It appears likely that much of the routine business lay in the manufacture of navigational instruments for marine use. At the end of the century the business was transferred to new premises at Lewisham in South-East London, proudly named Century Works, commemorating not only the new era but also the first hundred years of its existence.

1900 By this time the Elliott family were no longer associated with the Company, but the managers of the day must have been alert to possible new fields of activity. As early as **1910** 1910 a panel of Elliott instruments was being offered as an 'optional extra' by Short Brothers, who had established the first aircraft factory in the world, making aeroplanes based on designs by the Wright brothers; and Elliott's advertised in early issues of the new magazine 'Flight'. This area of activity received an impetus during the First World War, by the end of which the range of instruments included altimeters tachometers and fuel flowmeters.

Shortly afterwards it seems that interest in aircraft instruments was allowed to flag, possibly owing to a greater concentration on Admiralty business. Between the two **1919 - 1939** World Wars, the Company, now styled Elliott Brothers (London) Limited, continued to manufacture electrical measuring instruments, but became expert in mechanical analogue computers (as they would be known today) for **1939 - 1945** the control of naval gunnery. As a result, the Company was overwhelmed with naval work during the Second World War and devoted virtually all its efforts to this type of equipment.

1945 At the end of the war, the Company was badly placed to re-enter the commercial market. A Research Laboratory was established at Borehamwood, but an obsession with Admiralty work still remained. Most of the activity over the **1945 - 1950** next few years was devoted to gunnery director work, involving microwave radar, high-accuracy power servomechanisms a stable platform with digital transmission of angular data, magnetic amplifiers, and first steps towards special-purpose digital computation using thermionic valves. However, research work was not likely to produce any volume of production in the short term, and the rapid decline of production orders at Lewisham presented the Company with a very serious situation. In an attempt to re-establish the **1948** Company on a sound footing a new management team was introduced. In retrospect, it can be seen that it was this action that led to Elliott's re-entry into the aircraft instrument field, and the eventual formation of Elliott Flight Automation Limited. To make this clear it is necessary to retrace a few steps in time.

Origins of Elliott Flight Automation Limited

1930 In 1930 Leon Bagrit had founded the Swift Scale Co. for the manufacture of commercial scales and weighing machines, in the conviction that with a good product and aggressive marketing it would be possible to compete with established manufacturers. In spite of the period of trade depression the business became established.

1939 - 1945 During the Second World War the manufacturing company, styled B & P Swift Limited, turned to war work, and manufactured aircraft equipment for the Ministry of Aircraft Production. This included flap and undercarriage actuators, which called for good gear and screw-cutting facilities, for which the Company, though small, developed a high reputation.

1945 At the end of the war, the aircraft industry began the design of larger and faster aircraft, and it began to appear that pilots would have difficulty in controlling them because of the larger forces required. The Ministry of Supply therefore initiated the development of electro-mechanical power assisters, and placed a contract with Swift. This contract represented the first aircraft design work undertaken by the Company, and installations were completed in a large **1946 - 1947** flying boat built by Short Brothers, the 'Shetland', and 'Tudor' commercial airliners built by A.V. Roe.

Early days

1948 In 1949 Leon Bagrit became Managing Director of Elliott Brothers (London) Limited, and began the task of saving the Company. The future of the instrument business was thought to be in the wider exploitation of automatic control methods – 'automation' as it became known – and two policies were necessary to make the Company less vulnerable: the rapid acquisition of new product lines by the manufacture of established designs under licence, and the diversification of markets to spread the risk. First expansion lay in **1949** the field of instruments for industrial process control and fluid control valves, but within a short time a batch of aircraft autopilots were being made from a design by the Royal **1950** Aircraft Establishment (RAE).

Immediately after the end of the war there had been a great upsurge of activity in guided weapon development, and RAE had foreseen that there would be a need for radio-controlled 'drone' pilotless aircraft on the lines of the pre-war 'Queen Bee', for use as targets in guided weapon trials. The design of an autopilot for this purpose, Type A, had **1947** been started, but had been shelved subsequently since no particular requirement existed. In 1948 the specification was issued for a small jet-propelled target aircraft, the 'Jindivik', to be designed and built in Australia. A revised version of the Type A autopilot, Type B, was completed for this purpose, **1950** and Elliott Brothers was entrusted with manufacture of a development batch. This was the first of a succession of variants, the descendants of which are still being made today by Elliott Flight Automation.

1950 In August 1950 a design study contract was placed on Elliott Brothers which opened a new door. This was for a special-purpose visual bombsight for installation in the English Electric 'Canberra'. The problem was a difficult one and did not lead to any development, but it represented an entry into the bombsighting field from which stemmed further work with major consequences.

With the introduction of aerodynamically 'clean' high-speed aircraft such as the Gloster 'Meteor' it was found that their stability in flight left something to be desired, especially for weapon-aiming purposes. In particular, they suffered from combined rolling and yawing motion known as 'Dutch roll', and RAE investigated a method of stability augmentation by means of a quick-response actuator operating on a rudder trim tab, controlled by a gyro measuring rate of yaw (possibly with a component of roll rate as well). **1951** Experiments were successful, and once again Elliott Brothers was asked to manufacture a development batch of auto-stabilizer equipment. This work, together with the current work on autopilots, justified the establishment of a separate manufacturing unit at Lewisham, initially known as Aero Division. When a large production order for autostabilizer equipment. A contract for the bomber version was awarded **1952** at Lewisham, and the unit was soon transferred to Rochester. At the same time the name was changed to Aviation Division. The rate gyro for the autostabilizer was developed from the original RAE design, and is still in production today, virtually unchanged.

Branching out

During 1952 the Company had tendered for the development of two models of a stable reference unit, one for fighter aircraft and one for bombers. This was to take the form of a gyroscopically-stabilized platform carrying accelerometers and altitude-measuring transducers, to serve as a central source of data for other navigational and weapon-aiming equipment. A contract for the bomber version was **1953** and a team formed at Borehamwood to carry out the devel- **1955** opment. This was successfully completed with the testing of Master Reference Gyro Type B, but did not lead to production; nevertheless the experience gained laid the foundations for later work on other stable platforms which have been produced in reasonable numbers.

1952 In 1952 work was started, in conjunction with a team at RAE, on the development of the control system for a new type of guided bomb. This was to fall freely from an aircraft, but was steerable towards a pre-defined target by means of movable surfaces controlled by an automatic navigator. The calculation of distance to be travelled towards the target was to be achieved by double integration of signals from accelerometers mounted on a gyroscopically-stabilized platform. This was therefore a true'inertial' navigation system, but could be relatively primitive, since errors would accumulate only during the time of fall. Equipment in the aircraft of some complexity was required, including a visual sighting head and a control unit to feed data signals to the bomb before release. In order to determine the maximum latitude attainable in the choice of aircraft position relative to the target at the moment of release it was necessary to compute families of three-dimensional trajectories, given the aerodynamic characteristics of the bomb. For this purpose, a small digital computer was built at Borehamwood, with support from the National Research and Development Corporation. This was known as 'Nicholas', owing to the use of a nickel-wire delay-line store, and although it had a deplorably low mean time between failures, proved to be capable of carrying out the necessary calculations. This **1953** bomb project was cancelled before completion, just as a trials team was being assembled. The cancellation was a blow at the time, but the project led within two years to a logical successor, the powered bomb 'Blue Steel', which was to mean so much to the Company.

to be continued

25 YEARS' SERVICE

W. Cowley, together with a group of friends, including G. Bull and D.I. Jackson (extreme right) on the occasion of receiving his clock to mark 25 years, as reported last month. (A)

"I would not like to calculate how many pens and pencils have been worn out by **Harry Mepstead**" said Mr. S.A. Williams when he presented an 'Elliott Movement' mahogany clock to mark the completion of 25 years unbroken service. Pointing out Harry had served all those 25 years in the same department, though not in the same job, as he is now Section Leader, within the Goods Inwards. Things have changed over the years, at one time all items coming in passed through the department, including Fishers, with hundreds of castings. Now it is only Marconi Avionics goods that pass through the department, even so the throughput is upwards of 500 items per day, and whereas it was once a male stronghold, nowadays the clerical work is undertaken by females.

Before coming to Elliotts in 1954, he saw service with Pobjoys, both at Rochester and Bedford, as a fitter. Called up for war service in 1943, he joined Aylesford Paper mills after demobilization, then with Burnet & Rolfe as a Press operator.

Married he has one daughter, and his interests are DIY, and gardening.

He is perhaps one of the best-known persons on the site, and with his contact with so many people over the years, his memories, both grave and gay are multitudinous. Mr. Williams summed it all up, when he quoted

"Time marches on, but memories remain
To cheer us on our way."

Harry Mepstead, with members of the Goods Inwards and Transport Dept. (C)

The presentation of a 25 years' Service Award, acknowledges the loyal and devoted service to the Company given by the recipient. It also, in many cases, demonstrates that the Company is alert to talent and promotes from within.

Such a case is that of **Ron Cooke,** the Transport Manager. Ron was presented with his chosen gift by Mr. S.A. Williams, Works Engineering Services Manager, amidst the paraphernalia of the Inwards Goods, which Ron also controls.

He started at Elliotts, as a Driver under Mr. Randall, progressing to Foreman, successively becoming Transport Officer and Transport Manager.

Previous to joining the Company, he had spells with CAV and A.F. Smith, after leaving the RAF where he was in the Transport Section for 6 years, seeing service in Singapore as well as locally at West Malling.

He has an obvious pleasure in driving, and also 'tinkering' with engines, etc. His hobbies, besides the maintenance of vehicles, he lists as DIY (a fanatic he avers), swimming and movie films, 8mm variety.

Ron and Mr. S.A. Williams in a happy mood as the gift is handed over. (B)

LONG SERVICE ASSOCIATION

The Long Service Association (Rochester) was reconstituted when it was decided that continuous service with companies now within GEC would qualify for 25 years awards. It is worth noting that all employees who complete 25 years' service are entitled to select a gift, donated by the Company, and to join the Association.

To date there are 260 members at Rochester, covering a staggering total of 5,639 years' service. Some have now retired and others will retire during the year. The President is Vic Spencer (CQD) and the Senior Vice President is D.H. Harries (IND) which indicates they are both senior long-serving employees.

For your diary

THE ANNUAL PANTOMANIA PRODUCTION
by the
SPORTS CLUB COMMITTEE
will take place in the
MAIN CANTEEN
on

22 March 29 March
23 March and 30 March
24 March 31 March

LONG SERVICE ASSOCIATION
ANNUAL DINNER DANCE
SATURDAY 7th APRIL
Details from your Committee Member

DON'T TAKE IT TO HEART

If we'd only look back just now and again,
and give life a little more thought,
could we learn anything in that space of time,
or do we still get caught?

Do we take heed of others' mistakes,
and say it won't happen to me!
then go away and the very next day,
carry on, just as if we can't see.

Why dash about from place to place?
as if the world will end tomorrow;
is it really something that just can't wait?
or is it time we're trying to borrow?

If we'd just remember THE GOLDEN RULE
tomorrow hasn't been started!
and we won't do it all, there'll be plenty left
long after we've departed.

J.C.

EPITAPH

The following verse was placed on the tombstone of a departed:

Husband, weep not for me,
Go home, prepare to die.
A little longer be,
Then come and lay by I.

This is what some person pencilled underneath:

Dear wife, I cannot weep;
I cannot come to thee.
Another wife I keep
And I must lie by she.

Apprentice News

The following apprentices have completed their training and have been posted to the Division and Department shown.

We wish them many years of satisfactory service in their chosen profession and duties.

Osborn P.M.	1.1.79	**AS & R Field Service**
Arlington B.	2.1.79	**AS & R W.A.T**
Parfett A.	7.1.79	**CMS M/C Shop**
Watson S.C.M.	19.1.79	**IN M/C Shop**
Rowe S.	1.2.79	**ISD Wiring**
Needham M.	2.2.79	**ADD Insp.**
Reynolds C.J.	6.2.79	**ATE Planning**
Kindred L.G.	7.2.79	**FCD Test**
Brooks I.J.	14.2.79	**ATE Wiring**
Pack C.	15.2.79	**MASD Test**
Watts J.E.	18.2.79	**GYRO Model Shop**
Rolf S.I.	23.2.79	**IN Test**
McGregor P.J.	25.2.79	**ATE Fitting**
Milner S.	2.3.79	**ATE Wiring**
Kelly M.E.	12.3.79	**FCD DO**
Perkins S.R.	12.3.79	**FCD DO**
Dymott A.S.	14.3.79	**FCD Test**
Smith T.A.	16.3.79	**FCD Prod. Services**
Bradford M.J.	19.3.79	**ISD Tech. Writer**
Potter S.M.	12.3.79	**FCD QA Test**

LAUGHTER THE BEST MEDICINE

Paddy was stopped in his car at the traffic lights because of an infringement, and when he produced his licence, the 'Law' informed him that it was a 'gun licence'. Paddy replied I am driving a shooting brake.'

Did you know, we have a race horse called Cigarette?
The trouble is I never have enough 'to backer'!

Did you hear of the Irish 'Evel Knievel' who failed to jump 36 motor cycles in his bus? He was half way over when the conductor rang the bell!!

The Haskett Trophy

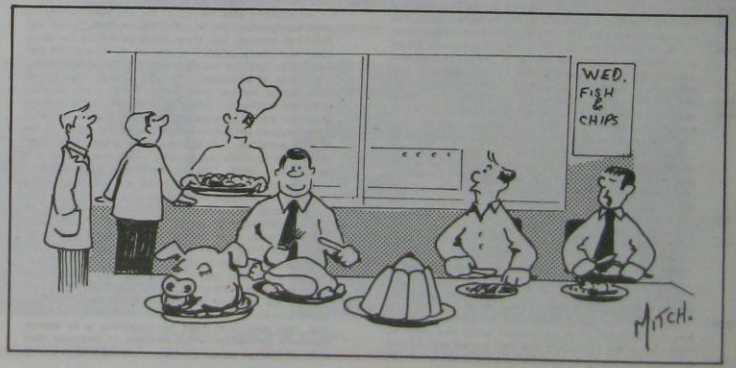
The adjudication panel, having completed its assessment of entries submitted for the trophy, has announced the winners as:

Dr. M.D. Stephenson
Mr. W.A. Waller FARL
Mr. A.J. Forham

Their entry entitled "Measuring Wing-Mounted POD Orientation.

The panel also recommended that a meritorious runner-up award be made to Dr. A.R. Runnalls of IN Division for his entry "Development Studies for Navigation Terrain".

Fuller details will be published in due course.



DOWN MEMORY LANE

The day was cold, with a hint of a frost to come, yet the sun shone. A day of expectancy, as in the early morning the 'Fair' had begun to arrive in the village for the annual feast.

The Village Church was dedicated to All Saints, and the 'feast' was celebrated in early November.

At morning playtime the whole school population had gathered on the railings (marking the extremity of the school grounds) to watch the showmen erect their equipment, and fantasize on what the fair would offer for personal delight.

Many children had a quickly-snatched lunch, to enable them to wander among the stalls and equipment being set up, before afternoon school began.

Classrooms were filled, but minds were not on the three 'Rs', and consequently inattention pervaded. Children became irksome, and misbehaved, and to restore order and gain control one teacher decided on stern measures. "The next one I have to reprimand" she said "will go to the headmaster for caning." Quiet fell, for a while, and then it happened – one boy broke the rule and was despatched forthwith to the headmaster's classroom.The doors into the large classroom from the corridor were large sheets of glass and swung both ways.

The lad, sheepishly, entered the room, and stood before the head, who enquired why he was there. No reply was given, and the head went to the class from which he had come, to ascertain the reason.

On returning he went to the cupboard, felt for and obtained the thin cane. Flexing it, he turned to the culprit and ordered him to bend over a vacant desk, while the whole of the class held their breath.

All of a sudden, the boy dashed from the room, and out through the swing doors, into the corridor, and outside. The headmaster quickly overcame his shock at the sudden departure, and ran after the lad, meeting the swing doors as they came back, putting out his hand to send them forward again, and chased after the fugitive.

Excitement mounted as minutes went by, scholars standing on desks to look out of windows to see what was happening.

All changed, when after what seemed ages, the headmaster returned alone!, but with a face ashen, and holding his hand. Sitting in his chair, he ordered the writer, being the nearest one, to ask his wife (also a teacher at the school) to come in.

This done, it was soon apparent that a serious situation had arisen, for blood was running down the arm. General commotion ensued, while first aid was applied, and the details began to emerge. The doors on being pushed open by the boy, had hit the wall of the corridor and cracked, and when the headmaster put out his hand to push them back again, the cracked glass broke, and cut the hand, almost severing the right thumb.

School closed – presumably the doctor was called and the damage received medical treatment.

Next day, hands heavily bandaged, and the right arm in a sling, the headmaster was in his accustomed place at morning assembly. The miscreant was in his place too – but nothing was said.

The incident was quickly forgotten, in the prospect of riding on roundabouts and taking part in all "the fun of the fair."

Two years later, the writer was to leave school, and also the boy of the great escape, with others. As was the custom, school leavers on their last day, at the end of school, stood in line to say farewell and to receive, if asked for, a reference! Without hesitation the headmaster sat down, took out a sheet of paper, and wrote. Folding it and placing it in an envelope he handed it over, wished him well and he left.

On my turn, being the last in the line, I shook hands, and made my request. This being done, and the precious document being safely in my pocket, I ventured to ask – "Sir, may I ask why you gave A.B. a reference?"

"Yes," said the head, "you may ask, and I will tell you – if you cannot say anything good about a person, then never say anything bad either."

A lesson in diplomacy, tact and forgiveness I have never forgotten.

Footnote: the thumb eventually had to be amputated.

"PUSSY PUSSY"

The recent case of a tin of salmon being contaminated with the bacillus Botulism, reminded me of a story concerning a certain housewife in Hertfordshire who is reputed to have, on one occasion, made tinned salmon sandwiches for her husband's lunch which he ate at work each mid-working day. The remainder of the tin she gave to their cat who promptly scoffed this much appreciated feast and afterwards evacuated through its cat door.

Some time later the pussy returned in the same manner, staggered into the kitchen and collapsed on the floor. "Salmon poisoning!" thought the distraught housewife and rushed her feline pet to the nearest vet, who stomach pumped the animal, which then made a speedy recovery.

Pussy was taken home and put to rest awhile in its basket, when the housewife suddenly remembered she had a husband. Frantic 'phone calls to his place of work (where like another company we know, the switchboard denied all knowledge of his existence), eventually contacted him. Too late, the unfortunate spouse had already consumed his lunchtime sandwiches. The Management, not wishing an employee to die on the premises, rushed him to hospital where he, like his cat, was introduced to the indignity of the stomach pump and kept in for observation.

The next day, whilst paying the milkman, the latter asked if her cat was OK."Oh! How did you know there was anything wrong with him?" asked the puzzled housewife.

"I should", said the milkman, "yesterday morning, I accidently dropped an empty on its head!"

J. Gate

HOBBIES

Beautiful 18 year old FRANCINE BAILEY of Stock Control Department, F.C.D. Division. Seen here modelling coloured, striped leg-warmers, and swim wear.

Francine's interests are fashion modelling, disco dancing, racing cars, swimming and reading.

Francine is much in demand for modelling. She began her work for Marconi in August 1976.

Pictures by Les Smee

Yoolbelucky

(A Real-Time Programmer's Lament)
With Apologies To Lewis Carroll.

'Twas past delivery date again,
The IFU was sparking well.
The CPU was up in flames,
The rig resembled Dante's Hell!

Beware the software bug, old son,
Hardware BITE and gates that latch.
Beware unstructured blocks and shun
The duff machine-code patch.

His CORAL manual close at hand,
The macro-free's he searched for fault.
So idled he by a decision tree
And strobed a 'WHILE' as taught.

And as the dubious word he traced,
The binary glitch, from deep in core,
Interrupted the interface
And corrupted all the store.

'GOTO', 'GOTO', by 'VALUE',
He collated all 1-0 syntax.
He scrubbed a 'THEN' and with an 'END'
Dumped out the program stacks.

"It cycles now? 'Bout time too.
Still now it's done, I suppose it's great.
This'll please QA, 'ARRAY', 'ARRAY',
It's only three months late.

'Twas past delivery date again,
The IFU was sparking well.
The CPU was up in flames,
The rig resembled Dante's Hell.

Anonymous

Sports and social club round up

INDOOR GAMES

held in the Club-house, Featherby Road

The results to the beginning of February, of both the Monday and Wednesday leagues are produced below.

MONDAY LEAGUE

DARTS

	P	W	L	F	A	Pts
MASD	7	6	1	23	12	12
Mdt. Shop 'A'	6	5	1	21	9	10
ATE 'A'	6	4	2	18	12	8
EDP	7	4	3	19	16	8
CMS	5	3	2	15	10	6
IN D/O	7	3	4	18	17	6
Fisher	7	3	4	16	19	6
AS & R 'A'	6	2	4	15	15	4
GYRO	6	2	4	13	17	4
FCD D/O	5	2	3	7	18	4
Fac. Apps.	5	1	4	9	16	2
Apps. Sup.	5	1	4	6	19	2

EUCHRE

	P	W	L	F	A	Pts
ATE 'A'	6	6	0	23	7	12
Fisher	7	6	1	22	13	12
IN D/O	7	5	2	22	13	10
MASD	7	5	2	22	13	10
AS & R 'A'	6	4	2	16	14	8
EDP	7	3	4	17	18	6
Apps. Sup.	5	3	2	13	12	4
CMS	5	2	3	10	15	4
FCD D/O	5	1	4	9	16	2
GYRO	6	1	5	11	19	2
Fac. Apps.	5	1	4	4	21	2
Mdt. Shop 'A'	6	0	6	11	19	0

CRIBBAGE

	P	W	L	F	A	Pts
GYRO	6	5	1	15	15	10
Mdt. Shop 'A'	6	4	2	18	12	8
CMS	5	4	1	15	10	8
ATE 'A'	6	4	2	17	13	8
Fisher	7	4	3	16	19	8
FCD D/O	5	3	2	16	9	6
IN D/O	7	3	4	18	16	6
MASD	7	3	4	18	17	6
AS & R 'A'	6	2	4	14	16	4
Apps. Sup.	5	2	3	14	11	4
EDP	7	2	5	15	20	4
Fac. Apps.	5	0	5	3	22	0

COMBINATION

	P	W	L	F	A	Pts
ATE 'A'	18	14	4	58	22	28
MASD	21	14	7	63	42	28
Fisher	21	13	8	54	51	26
IN D/O	21	11	10	59	46	22
Mdt. Shop 'A'	18	9	9	50	40	18
CMS	15	9	6	40	35	18
EDP	21	9	12	51	54	18
AS & R 'A'	18	8	10	45	45	16
YRO	18	8	10	39	51	16
FCD D/O	15	6	9	32	33	12
Apps. Sup.	15	5	10	33	42	10
Fac. Apps.	15	2	13	16	59	4

WEDNESDAY LEAGUE

DARTS

	P	W	L	F	A	Pts
IN	7	6	1	23	12	12
ISD Eng.	6	5	1	20	10	10
MA services	7	5	2	20	15	10
AS & R 'B'	6	4	2	19	11	8
Mdt. Shop 'B'	6	4	2	16	14	8
ATE Eng.	5	3	2	12	13	6
FCD 'A'	8	3	5	14	28	6
ADD D/O	6	2	4	14	18	4
FCD 'B'	5	2	3	11	14	4
Training can.	5	1	4	12	13	2
Accounts	5	1	4	7	18	2
GYRO	6	0	6	12	18	0

EUCHRE

	P	W	L	F	A	Pts
MA services	7	5	2	23	12	10
IN	7	5	2	20	15	10
ISD Eng.	6	4	2	19	11	8
Mdt. Shop 'B'	6	4	2	17	13	8
AS & R 'B'	6	4	2	17	13	8
ADD D/O	6	3	3	18	12	6
FCD 'A'	8	3	5	12	28	6
GYRO	6	2	4	15	15	4
FCD 'B'	5	2	3	12	13	4
Accounts	5	2	3	10	15	4
Training can.	5	1	4	9	16	2
ATE Eng.	5	1	4	8	17	2

CRIBBAGE

	P	W	L	F	A	Pts
GYRO	6	5	1	20	10	10
IN	7	5	2	21	14	10
Mdt. Shop 'B'	6	4	2	16	14	8
ADD D/O	6	4	2	16	14	8
FCD 'A'	8	4	4	19	21	8
MA services	7	4	3	16	19	8
ATE Eng.	5	3	2	13	12	6
Accounts	5	2	3	12	13	4
ISD Eng.	6	2	4	14	16	4
AS & R 'B'	6	2	4	14	16	4
FCD 'B'	5	1	4	9	16	2
Training can.	5	1	4	8	17	2

COMBINATION

	P	W	L	F	A	Pts
IN	21	16	5	64	41	32
MA services	21	14	7	59	46	28
Mdt. Shop 'B'	18	12	6	51	39	24
ISD Eng.	18	11	7	53	31	22
AS & R 'B'	18	10	8	50	30	20
FCD 'A'	24	10	14	45	75	20
ADD D/O	18	9	9	48	42	18
GYRO	18	7	11	47	43	14
ATE Eng.	15	6	9	33	42	12
FCD 'B'	15	5	10	32	43	10
Accounts	15	5	10	29	46	10
Training can.	15	3	12	29	46	6

ATHLETICS

The Elliott Athletic Club teams continue to have mixed successes in the various competitions, but with a fine group of youngsters, improving all the while as they tackle the various types of opposition.

On 7 January, amid the arctic conditions at Mote Park, Maidstone, the **Youth** team gained a creditable victory in Kent AA cross-country championship.

Dave Brechin, set a cracking pace early on, and finished in 2nd place for the Silver, returning 18' 15", after his team-mate **Alan Guilder** had broken away to be the first man home and take the Gold in 18' 09".

With **K. Hayes** (19' 22") in 9th place and **G. Saker** 10th in 19' 24", Elliotts were assured of the Team Prize, defeating last year's winners, Tonbridge.

In the **Junior** 5-mile race, **D. Black** led the Elliott contingent in 29' 52", being placed 3rd, and this in his first year! With a total of 30 points, the Junior team was placed 3rd.

For the **Seniors, Arthur Champ** shook off the 'flu to represent the Club, and finished in 26th place to be the first Elliott man home.

The rest of the team, **Mo Jury** was 50th, **S. Henderson** 78th and **V. Lennon** 84th. The team finished 6th out of 11 teams taking part.

COMPANY CLASH

The 1978/79 Quiz Contest arranged jointly by the Junior Chamber and BBC Radio Medway, has now been completed and is in course of being broadcast each Sunday and repeated on Wednesdays.

The Marconi Avionics team consisting of

Rod Cole MASD, Jimmy Crick ADD, Ted Seal ADD, and Barry Coltham ADD were unable to come up to the position of last year, being defeated in the semi-final tie, by Reeds Int., who eventually went on to become the trophy winners.

On their way to the semi-final, which was held at Corpus Christi Hall, Maidstone, on 1 February 1979, the Marconi Avionics team were successful against CAV and BP. Our photographs were taken for MAv News by L. Smee of CMS.

The Marconi Avionics team ready for action.

An ardent supporter makes sure the mascot is seen to advantage.

With some of the supporters, and mascot.

MARKET REPORT

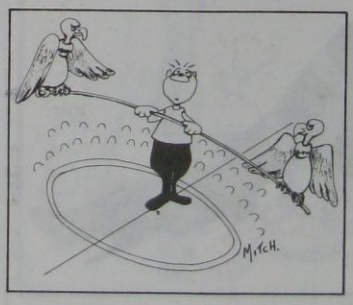
Pens and Paper are stationery
Cutlery is very dull.
Cheese, firm and fairly active.
Butter strong, but inclined to be slippery.
Whiskey lively and unsteady.
Hops lively and active.
Gunpowder inclined to be rising.
Eggs opened strong.

COMMUNICATION

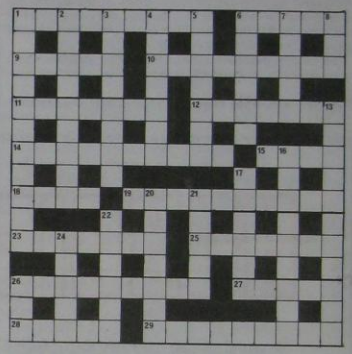
Consider the amateur aerial adjuster, precariously perched on the roof while his wife below watches the TV set.

"That's much better", she calls, unaware that the aerial has just fallen to the ground leaving behind the disconnected transmission line.

Adapted from "Frequency Independent Antennas" J-GATE



CROSSWORD No. 15



ACROSS

1. Without a drum he's in charge (4, 5)
6. It is let in (5)
9. Enlarge sideways (5)
10. Put on to create impression (4, 5)
11. Where the birds home in summer (7)
12. You go on to travel (2, 5)
14. Annual Anti-nuclear hike (6, 4)
15. Sword (4)
18. You take one as passenger (4)
19. The top sound of birds (7, 3)
23. But it could be Henry, if fishy (7)
25. Becomes a candidate for election (7)
26. Short language after wireless (9)
27. Animal of South America (5)
28. The way ahead (5)
29. Juicy morsel after the end (4, 5)

DOWN

1. His feet are firmly, but likeable (4, 2, 5)
2. Before a bath in birthday suit (9)
3. A boy goes to war by song (8)
4. Tell-tale mark of addict (3, 4)
5. At the fair, your pennies one does (4, 3)
6. Don't get around as strongly (6)
7. Bathroom tool that suggests a note (5)
8. Still to come, awaited (3)
13. No Jill to go up this hill, without pail (7, 4)
16. Strong when taken before meal (9)
17. A coating with silicate? (6)
20. The speaker, but under stress (7)
21. A musical note, of value (5)
22. Able seaman gets land legs, and tramps (6)
24. Give it out, or a big way to spoon (5)
26. To split as a rodent (3)

For amusement only

SOLUTION TO CROSSWORD No. 14

ACROSS

1 Penny farthing, 9 Utopia, 10 Gallop, 11 Placard, 13 Ted Ray, 14 Severn, 15 Pet, 17 Hip-ache, 18 Edition, 19 Ale, 21 Camera, 24 The Raj, 26 Plummet, 27 Eureka, 28 Lagoon, 29 Playing truant.

DOWN

2 Evoked, 3 Yearly, 4 Attache, 5 Tigers, 6 Nellie, 7 Burnt-the-cakes, 8 Spinning Jenny, 11 Pay Corp, 12 Delight, 15 Pea, 16 Ill, 20 Limping, 22 Merryl, 23 Alkali, 24 Teller, 25 Renown.

Photographs taken by the Staff Photographers will be acknowledged in the following way: (A) Alan Keats, (B) Susan Ruddlesden (C) Linda Jones (D) Tim Murray.

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