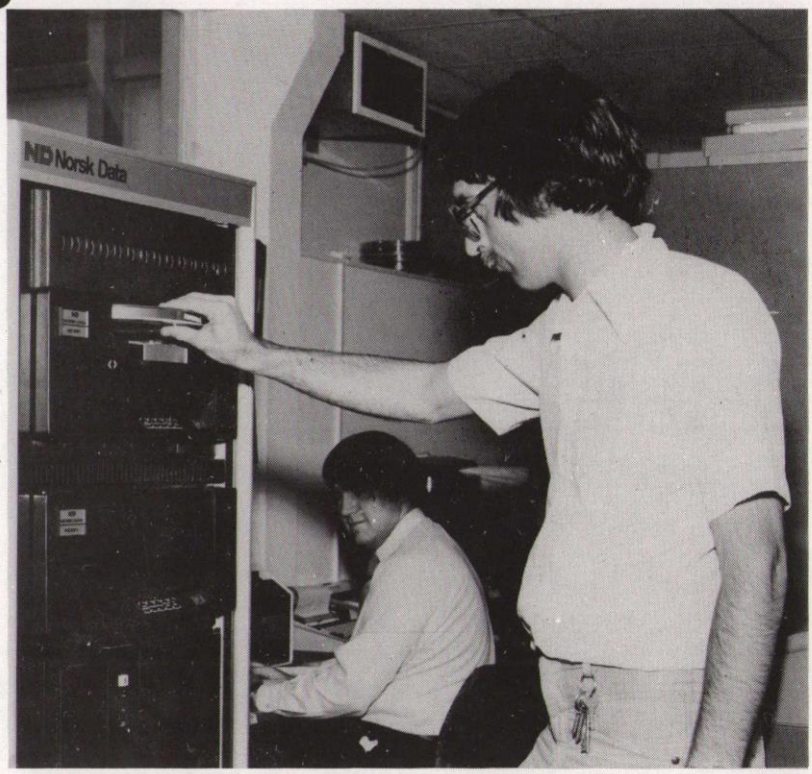
Bulletin
of the Rutherford Appleton Laboratory 10 July 1984 No.11

New Computer Speeds EISCAT Campaigns

The EISCAT section of G & R Division recently took delivery of a Norsk Data ND560/CXA supermini computer. After a few last minute snags had been ironed out, the machine was despatched from Norsk Data's UK headquarters in Newbury at about 9.30 on Monday 18 June, and, to the amazement of the RAL EISCAT section, was installed and running in R25 before lunch the same day. The installation team repaired to the nearest hostelry to celebrate leaving a deserted computer room for the photographer to discover when he arrived to record the unpacking.

The ND560/CXA is one of the fastest of the currently available superminis, processing approximately four million instructions per second. For EISCAT applications, the effective speed will be further enchanced by the use of an array processing microcode supplied with the system. The installation of a Norsk Data machine at RAL brings the UK EISCAT project compatibility with the EISCAT system itself, which uses a network of five smaller Norsk Data machines for data gathering and initial processing, and also compatibility with groups in the other five member countries of the EISCAT Scientific Association.



Alan Farmer and Steve Crothers giving tne Computer its first test. 84RB2886

The EISCAT Project

EISCAT, the European Incoherent Scatter Radar, studies the auroral ionosphere and magnetosphere from locations in Northern Scandinavia. The transmitting site in Tromso, in Norway, a few degrees inside the arctic circle. The scattered signals are received at Kiruna, in Sweden, and Sodankylä, in Finland, as well as the Tromso site. The raw data are partially processed on-line, at each site, before being recorded on magnetic tape for post-processing at EISCAT HQ in Kiruna, and in-depth analysis by user groups in the six member countries. The provision of the Norsk Data machine at RAL will enable the UK to play a much larger role in this area than has been previously possible.

The routine analysis of the data involves an interactive fitting of theoretical spectra to those observed by the radar. The final products are tabulated values of ionospheric electron density and temperature, and ion temperature, composition and drift velocity. From these basic parameters, many more can be deduced. The incoherent scatter technique is arguably the most capable of all available ground-based ionospheric observation methods.

In order to optimise the radar programs for particular observational objectives the system incorporates frequency and phase agility as well as comprehensive pulse code manipulation facilities, all under computer control. The EISCAT radar is by far the most sophisticated such incoherent scatter radar yet built, or planned, and the first to incorporate full computer control allowing observing programs to be modified, in real-time, in the light of the received data.

Operational Programmes

The radar is operated in two modes: regular 24 or 36 hour "Common Programmes", and particular "Special Programmes" usually run in campaigns by teams from individual member countries. The "Common Programmes" are designed to be run at intervals, in essentially unchanged form, over an extended period - at least a solar cycle, eleven years, in the first instance. Data from these runs are distributed regularly, in summary processed form, and will eventually provide a very valuable database for long term studies of the ionosphere, plasma physics of the auroral zone and studies of the relationships between the Earth's environment and the behaviour of the sun and solar wind.

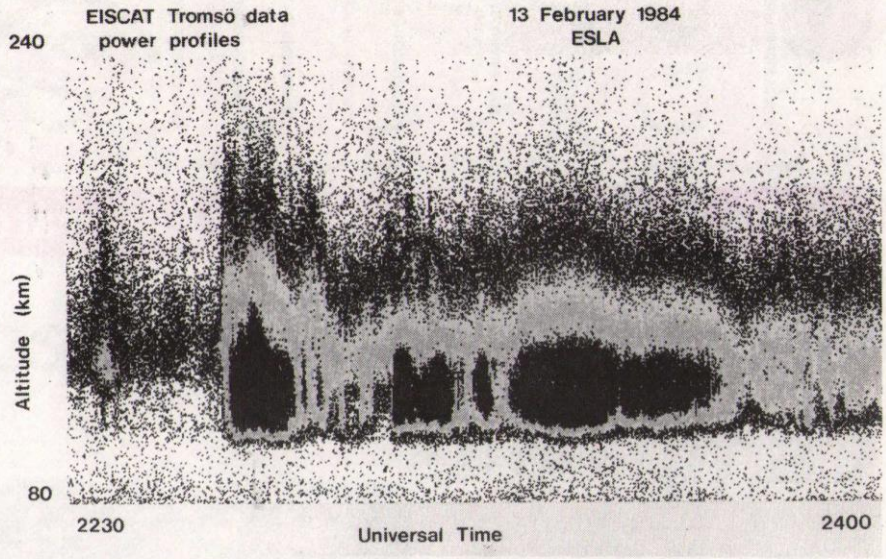
(cont'd over)

EISCAT *(cont'd from p1)*

This data processing and summary production, on microfiche and colour hard-copy, is performed by the RAL group, and a substantial data set containing runs from 1981 until the present, has already been made available, by RAL, to the UK user community.

The "Special Programmes" are designed to study phenomena of particular interest to individual research groups. An equal amount of observing time is reserved for Common and Special programmes, the latter being distributed amongst the associates in proportion to their financial contributions to EISCAT. The UK receives 25% of the available time and the bulk of this is used during three or four observing campaigns each year. The RAL group is responsible for the management of these campaigns, providing trained staff members and producing in consultation with the end-users, much of the required software. In addition, the group is actively involved in special programme investigations - usually in collaboration with UK University research groups.

The new computer will allow much of the preparatory work to be completed at RAL, thus both reducing the lengths of campaigns and allowing the development of much more complex programs, which could not previously be completed within one campaign.



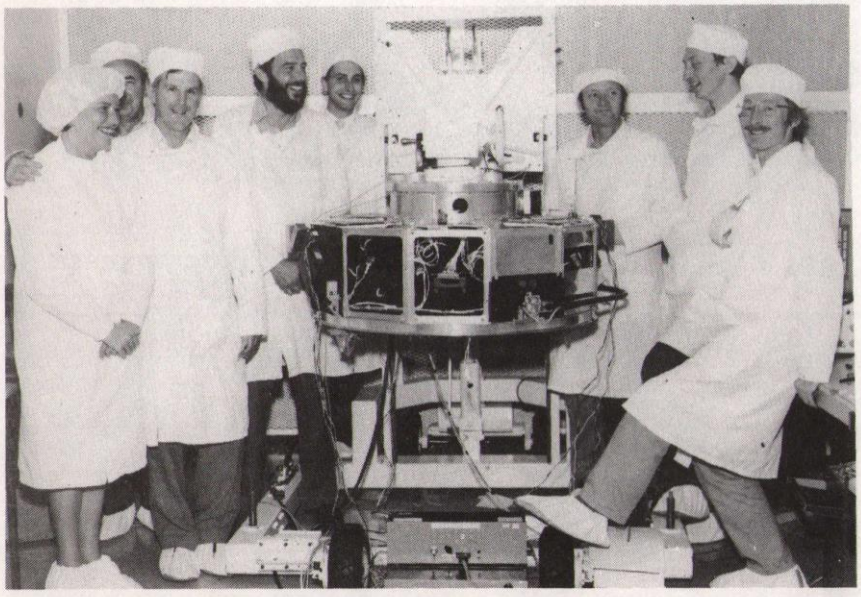
The two-tone print-out shows some data recorded during a joint UK-Finnish campaign in February this year. It shows relative variations in electron density with an unprecedented temporal and spatial resolution; this observation program is designed to study very thin, intense layers of ionisation at an altitude of about 110km - so called Sporadic E layers - and more transient thin layers at greater heights. The latter are more common in Summer than Winter, and a UK team is currently at EISCAT preparing to perform further observations of these phenomena.

AMPTE Observations

The next major experiment will be a series of cooperative observations with the AMPTE UK sub-satellite on four days in September and October. It is planned to run EISCAT from RAL (for this program) using the new machine and to recover and process the data in near real-time for direct comparison with the AMPTE data recorded at RAL. . The combined results from both instruments will provide a new insight into the phenomena of plasma convection at high latitudes .

For more information of the UK involvement with EISCAT, contact Tony van Eyken Ext 6498.

AMPTE Away



Members of the AMPTE-UKS team putting the finishing touches to the spacecraft before it was crated and shipped on its final terrestrial journey to Kennedy Space Center, Florida on Tuesday 19 June. Launch is scheduled for around 9 August by Thor Delta rocket, when together with its companion American and German satellites it will begin a nine month mission to explore the Magnetosphere. 84RB2839

Missing

The following items have disappeared from their accustomed resting places and their owners would be glad of their return.

a) Soldering Iron type: Weller PU3D
Serial No: TF 11207

Removed from Electronics Group, R68, room G13 Contact R Matson R68, Ext 6704.

b) A box of video tapes of a Design Course at Brunel and a box of about six computer tapes containing software. The property of Peter Dewar, they were removed from room 2.93, R25 between 22-25 May.

Please contact Joyce Wells, Ext 5424

c) Casio Calculator type HL101
R026740-CI00726
Removed from G50, R1
Contact Mrs G W Stuart, Ext 6172

d) Desk Fan FN5529
Removed from Room 1.32 R1
Contact Brian Payne, Ext 6118

Southampton Confers

Honorary Degree for Prof Allen

Friends and former colleagues will be delighted to hear of the conferment upon Professor W D (Doug) Allen of an honorary degree by the University of Southampton on Thursday 12 July, for distinguished services to electrical engineering and electrical science and for services to the University of Southampton as Visiting Professor of Electronics.

Doug's career with AERE/NIRNS/ Rutherford Laboratory spanned 31 years during which time he built and commissioned the small EM separator, the large EM, the Van der Graaff and the Vertical Tandem Generator, at AERE; became Head of the "Oxford Project" which produced the Vertical Electrostatic Generator for the Department of Nuclear Structure, at Oxford University, and then Head of the Proton Linear Accelerator Division at the Rutherford Laboratory. During this latter period he was also Professor of Engineering at Reading University. In 1977 he retired from the Laboratory, but continued to use his wealth of experience to good effect at Reading and afterwards at Southampton.

Congratulations, Doug, on your much deserved honour.

Stephen Lovesey made Visiting Professor

Dr Stephen Lovesey, Group Leader for condensed matter theory in Neutron Division, appointed visiting Senior Fellow at the Department of Physics, University of Southampton in 1981, has recently been conferred with the title Visiting Professor. Stephen has, over the past years, played a large part in building up Southampton's condensed matter theory group, now well respected in its field.

We proffer our congratulations to you too, Stephen.

Film Badge Notice

It is period 7 Colour Strip BLUE. Please be sure you are wearing the current dosimeter, and return all old ones.

Next Film Issue
Monday 16 July

Sales to Employees

Sales of scrap metal and plastics will take place on Friday 20 July at the R40 scrap compound from 12-12.30 hrs.

Birthday Honours

Alf Brown, BEM

We are delighted to announce that Mr A J (Alf) Brown of SNS Division was awarded the British Empire Medal in this years Birthday Honours List.

After a marine engineering apprenticeship and wartime service in the Royal Navy, Alf became a mechanic at AERE in 1950. He transferred to the Rutherford Laboratory in 1959 as workshop foreman and then assisted the teams of research physicists using Nimrod. He gained a specialist knowledge, unique and used throughout the Laboratory, of the movement and transport of specialist equipment and heavy loads. Despite pressures arising from short time-scales and limited effort, Alf has earned the reputation of an enthusiastic officer, energetic in his efforts to give satisfaction and paying attention to detail, especially in safety matters, so important in his type of work.

In private life he has long been associated with the Royal British Legion.

Other SERC Recipients

Also the recipients of Birthday Honours are the following of our SERC colleagues to whom we also offer our hearty congratulations.

Professor K A Pounds, Member of Council and Chairman ASR Board, who becomes a CBE.

Mr H Kleeman, Chairman, Polymer Engineering Management Committee and Member of the Chemical Engineering Committee, also awarded the CBE.

Professor D L Schultz, Member of the Engineering Board and the Machines and Power Committee.

Alexander Rose Collection

The RAL collection amounted to £91.94, for which we are thanked by Mrs Brenda Cairns, Harwell Welfare Officer.

She would also like to say thank you to the organisers, and collectors, namely the RAL messengers.

Well done Ladies.

Jump for Charity

Two of our RAL colleagues hurled themselves into space, at 2,500 ft on Sunday 3 June and made safe landings, and £600 for charity.

Linda Wensley of Cosener's House and Nick Fernyhough of R25 workshop, both members of Abingdon Rotaract made this, their first parachute descent in aid of Abingdon Hospital's appeal for funds to provide the physiotherapy department with an Interferential machine for the treatment of rheumatic diseases and soft tissue injuries.

Linda and Nick began intensive training missions for the jump on Saturday with a group of 50 novices under the watchful eyes of instructors of the RAF Sports Parachute Association at Weston on the Green. By Sunday lunchtime they had mastered simulated drops, standing techniques etc, were au fait with canopy emergencies and aircraft emergencies and ready to go.

A long wait ended at 7.30 pm when the wind dropped below the stipulated 10 knots and Linda was the first of the group to drop followed soon after by Nick in the last group of the day.

Nick describes vividly the sight of the tail of the plane disappearing from view and his canopy replacing it above him. "Free-fall is incredible and indescribably exhilarating," he said afterwards.

Both of them hope to repeat the experience just for fun this time.

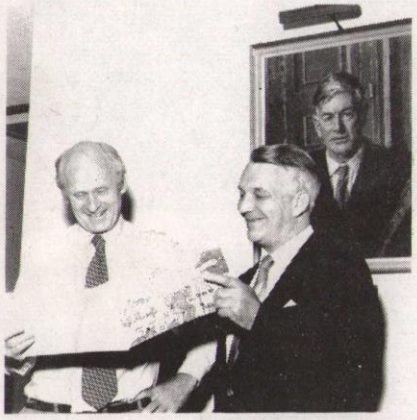
This method of getting above it all seems to be catching on in RAL circles We hear that Steve Hancock of R2 intends to jump on 25 July, also for a very worthwhile charity.

Farewell Presentations

"Old Rutherfordians" gained two further members recently on the retirements of Peter Wroath and Gerry Regan. With nearly sixty years service to the Laboratory between them, little wonder their presentation ceremonies were well attended and very nostalgic occasions.

Central to both ceremonies were the special cartoon cards prepared by Ray Roberts, from which, with delightful humour, we learned of Peter and Gerry's careers, foibles, hobbies and ambitions for the future - cards that are always treasured by the recipients.

Peter Wroath



84RB2894

Peter we learned, joined AERE Harwell in 1959 as a member of PLA Nuclear Physics Group under Dr J J Thresher who, fittingly made the presentation. He was involved in the initial commisioning of the PLA and setting up some of the first experiments. In 1962 he became part of the original Physics Apparatus group and was responsible for the calibration of PLA beam-line magnets. When the RHEL/Bristol group were setting up the K15 experiment on Nimrod, he ran the data retrieval programmes and organised close support for experimenters. He did a very consciencious job looking after the Neon/Helium gas recirculator system for the spark chambers (his special baby) and was involved in the testing of a prototype Ring Image Cerenkov counter at the time of Nimrod's closure. He subsequently worked on Multiwire Proportional Chambers for the NAII experiment at CERN, and on the gas mixer installations for TASSO at DESY, Hamburg. For the past 3 years the RAL Annual Report, and monographs on HEP and space have claimed his time.

These experiences together with his previous (and sometimes concurrent) occupations as businessman, RAF reservist, soldier and theological student made for some very interesting coffee time discussions, as John Thresher testified when making the gift of a radio to Peter on behalf of all his friends.

"In 25 years you have had a pretty active time, and we all wish you a very happy future," concluded John.

Peter thanked everyone for their presence and especially John Thresher and Laurie Lintern. "RAL is really a nice international club and the comradship has been fantastic. I hope that friendship will continue and we will keep in touch," he said. "I have enjoyed myself. The Lab was a great place when it was small, and now it has grown into a multi-role establishment I wish I could turn back the clock and start again. Thank you very much one and all."

Gerry Regan

84RB.2990.

Gerry Regan, another ex-Nimrod man, joined the Lab, via REME, RAE (where he worked on telemetry for Concorde without being aware of it) and Aldermaston. On Nimrod he was involved with the steering magnet power supplies. With the Applied Physics group he developed what he always regards as his special contribution, a liquid helium level gauge, used on 100 litre dewars, it is still in use today, 15 years later. (Gerry wonders if its time for an up-date!) He was also engaged in electron beam work and the micro-wave aspects in polarized targets.

Then began, what Ron Newport referred to as, his cold period. With the Dilution Refrigerator,(providing temperature only minimally above absolute zero) Gerry has helped provide a service for university researchers for the past ten years, much appreciated by his customers, as their contribution to his farewell gift proved. On his part Gerry found this period in his career most interesting. He enjoyed working with young university people and got great satisfaction from helping them along. "A rewarding experience", he terms it.

Thanking Gerry for all his work, and expressing on behalf of all present good wishes for a very happy future, Ron Newport presented Gerry with The Card, a gold watch, and a book on Video.

Gerry thanked all present for coming to see him off and everyone for the gifts, especially Ray's card. He spoke of his appreciation of the efforts of Ron Newport and Susan Read to make his leaving ceremony such a pleasant occasion. His amusing reminiscences of his life at the Lab indicated that he had enjoyed every moment, and references to hilarious catastrophes associated with various hobbies, indicate that he will have plenty to occupy him in the future.

"Thank you Ladies and Gentlemen, it has been a pleasure to be amongst such nice folks", he ended.

Season Comes Rounder-gain

It's rounders time again and the inter-establishment league (Harwell, NRPB, ETSA, RAL) is in full swing. Four teams are fighting it out for RAL under the inspired leadership of; Christine Gare - CAG GIANTS, Helen Dorsett - ANTHILL MOB, Mike Claringbold - ATLAS and Richard Lawrence - NEUTRON STARS.

Atlas promise us that they are going to win, but this is strongly disputed by the ANTHILL MOB. The other two teams say they have been lulling the opposition into a false sense of security.

Team	Played	Won	Scores
ANTHILL MOB	3	3	7-5 13½-7 13½-5
CAG GIANTS	1	0	
ATLAS	2	2	12½-1½ 10½-½
NEUTRON STARS	2	0	5-9 5-8½

The rules, as far as we can gather, stipulate teams of 10 of which at least 4 shall be girls. There are 4 divisions each of 6 teams and within these divisions every team plays all others. At this stage in the proceedings the top 2 teams per division go into a knock-out situation. We think! The story will unfold as the season progresses.

Bulletin

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Deadline for insertions: