

Bulletin

of the Rutherford Appleton Laboratory

26 June 1984 No.10

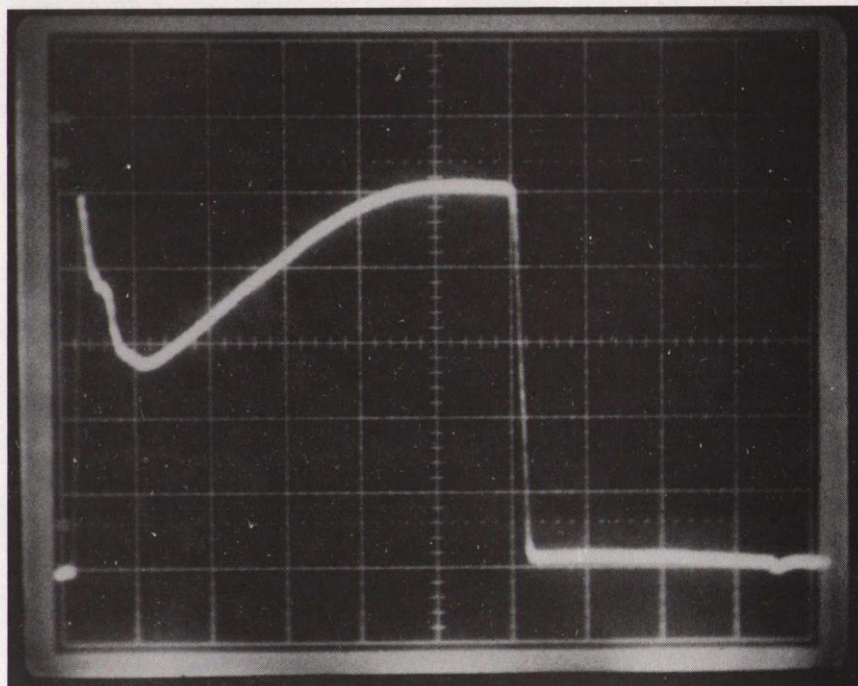
SNS Reaches 550 MeV

The SNS achieved a major milestone on Tuesday 5 June when protons in the synchrotron were accelerated to 550 MeV. This is the maximum energy which can be achieved with 4 of the eventual 6 radiofrequency accelerating cavities. It is also the minimum energy at which the accelerated protons can be extracted from the machine. It is planned to focus 550 MeV protons on to the SNS target to produce first neutrons at the end of the year.

Double Development

Since accelerating to 140 MeV using 2 RF cavities in April, two major pieces of equipment development have been necessary. Work has continued on the AC power supply, housed in the south-west corner of R6 (Hall 1) in the electrical plant, choke and capacitor buildings, to move further towards the high stability requirement on the 50 Hz AC part of the supply. With peak voltages of 19 kV and peak currents of 1050 A the specified stability of .01% is very demanding.

The other major piece of work was to get going the third and fourth RF cavities. They were first of all run up individually to a peak power of 100 kW. The demands on the RF system can be illustrated by reference to the diagram. Protons which have been injected have to be trapped during the minimum field period and accelerated during the 10 millisecond magnet rise time. The RF voltage has to follow a programmed demand during the cycle and the RF frequency has to match the rotational frequency of the protons which varies by a factor 2.5 during the 10 ms acceleration period. During injection, pairs of cavities are phased 180° apart so that there is no net acceleration. During the 20 microsecond RF turn-on period the cavities are moved into phase. In the trapping period the RF volts are held at a lower level and then follow the rate of change of field. During these voltage and frequency variations the relative phases of the cavities have to be held accurately to within a few degrees. Later events showed this to have been successfully achieved.

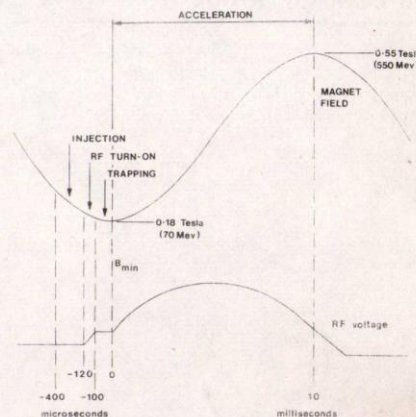


The photograph shows proton current as measured in the SNS synchrotron. The time base is 2ms/div so that beam is retained beyond the peak of the magnetic cycle. Proton current is increasing uniformly during the 200 microsecond injection period used for this picture.

Since the velocity of the protons is increasing by a factor of 2.1 from injection to top energy, the current at peak energy would be 2.1 times the injected current if there were no loss of beam. The photograph shows that about half the beam is lost in the first 1.5 milliseconds. The intensity at 500 MeV on this pulse is about 1×10^{12} protons.

After a weekend getting the injector and its beam transfer line ready, beam was available at 9.00 am on Tuesday morning for trying acceleration. At first, beam was trapped, accelerated for about $\frac{1}{2}$ millisecond but then was lost. After some adjustments, at 10.27 am a small number of protons were seen to go to 550 MeV. The run continued until Wednesday evening and by then up to 1.2×10^{12} protons were being accelerated each pulse. This is about 5% of the design intensity per pulse of the SNS which was reckoned to be a great success for the first attempt. Only about 1% of the machine cycles were used as beam pulses to minimise induced radioactivity on machine components.

D A Gray



Obituary

Michael Rousseau

It is with great regret that we announce the death of Michael Rousseau on the 27th of May after a short illness.

Michael was born in France of a British mother and French father and was brought up in England by his mother. He started his career in research as a physics technician at the Royal Cancer Hospital (now the Royal Marsden Hospital) where he worked for several years on a very early form of ultra-sonic brain scanner. Frustrated by lack of funds he left to become Laboratory Superintendant in the Nuclear Engineering Department of Queen Mary College. His involvement in high energy physics started when he left Queen Mary College to join CERN and he remained in that field, working at Harvard/MIT, then at Daresbury and finally in HEP division at RAL.

Michael became a Chief Experimental Officer in 1974, just before the Experimental and Scientific grades were amalgamated following the Fulton Report. Among his recent achievements was the installation at CERN of the European Muon Experiment, one of the first of the new generation of very large particle physics experiments, involving 75 physicists.

Last year was a particularly rewarding one for Michael; he helped to lay the technical foundations for OPAL and negotiated a very large contract for this LEP experiment.

As OPAL takes shape over the next few years Michaels colleagues will be constantly reminded of the major contributions he made.

Michael was well known and respected throughout RAL and CERN. He worked with a flair and style that is rather rare in these days of large anonymous particle physics collaborations and his loss will be widely felt.

We extend our sympathy to Michael's wife Mary, his son Nicholas and daughter Kate.

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

Royal Society Exhibit

Rutherford Appleton Laboratory, this year together with Queen Mary College, Birmingham University and CERN, was once again invited to provide an exhibit for the Royal Society's May Conversazione. Under the title 'The Discovery of the W and Z Particles', a lively exposition of this exciting work was very well received by the guests at this prestigious scientific event in the Royal Society's calendar.

In addition to the main Conversazione -an evening function attended by several hundred Fellows of the Royal Society and scientific guests - there was an afternoon preview for the Press and a morning session attended by over 350 sixth form students.

It has been requested that the exhibition should be repeated at the Royal Society on Thursday 21 June.

Library Notice

A book has been returned to the Library - but it doesn't belong to us!

The title is, "M6800 Microprocessor Programming Manual" Motorola 1975.

Would the real owner please collect from the Library desk.

Missing

The following item is the subject of a loss report. Would anyone having information as to its whereabouts please inform the Directorate Support Office, Ext 5245.

Pifco Electric Desk Fan
Serial no: 06235.

The following item is the subject of a loss report.

Texax Instruments calculator
Type TI 580, RAL No: 15479.

Please contact R Lawrence, Ext 6396 if you have seen it or know anything regarding its disappearance from R3 over the last Bank Holiday.

Thanks RAL Blood Donors

The two day blood donor clinics at RAL last month were a resounding success with 257 donors attending of which 34 were new.

In a letter of thanks to Mrs Dorothy Irvine who organises the RAL sessions, Mrs Phipps the Oxford Regional Donor Organiser, expresses her gratitude to all donors, to Dorothy for the considerable effort needed to coordinate the sessions and to the management of RAL for their cooperation.

"The hospitality extended to the members of the Teams and Doctors was very much appreciated by all. My thanks to everyone for your continued and generous support of this vital service," she writes.

Are You a Member?

RAL and Central Office Death Benefit Scheme.

The object of the scheme is to provide a cash grant of £100 to the nominee of a member, in the event of the members death. The grant is paid as soon as possible after notification of death has been received.

It costs only 10p to join and thereafter a subscription from pay of 5p per week (for weekly paid staff) and 25p per month (for monthly paid staff).

Why not support the scheme? Please contact Sylvia Fones for an application form.
Personnel Group, Room 65, R20, Ext 6677

Thanks

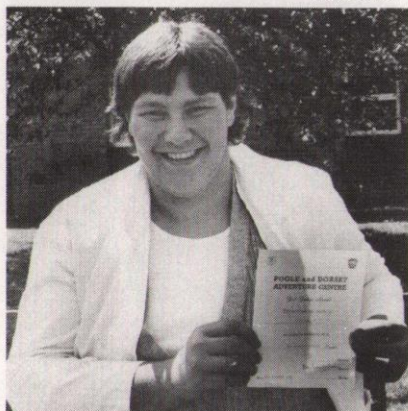
Mary Normington of the UK Liaison Office, CERN, wishes to thank everyone for their kindness to her during her stay at CERN and for the lovely presents. She hopes to see many of you back in Abingdon.

Apprentice Pieces

EETPU Prize for Phil

Adventure Award

84RB2785



RAL Electronics apprentice Mark Wheeler with his certificate awarded for an outstanding performance on a "Challenge for Industry" course. Residential courses are run by the Poole and Dorset Adventure Centre and are designed to develop self-discipline, self-confidence and co-operation in a group, under wild and testing conditions. All apprentices attend such courses and participate in activities which include rock climbing, canoeing, underwater swimming, night map reading exercises and camping, all in the Swanage coastal and Wareham Forest areas - usually in November!

Pedal Car Marathon

Pictured here is 'Carlo' the W reg pedal car which will be entered by RAL Electronics Apprentices in a race to be held in the Bus Park on Sunday 1 July.

A team of RAL lads will pedal around a 400 metre course for 7 hours in competition with 20 other cars from all over this area. The teams are sponsored and all monies raised go to research into a cure for multiple sclerosis.

(Sponsorship forms are available from Tony Kershaw R18).



84RB2781



84RB2801

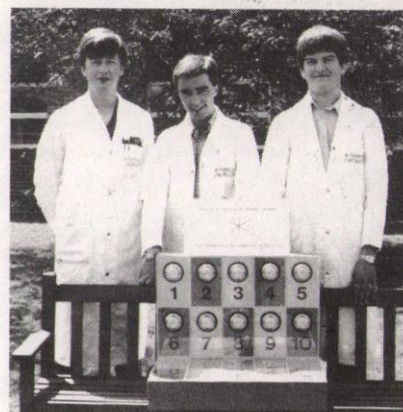
RAL apprentice Phillip Bailey had justifiable cause to feel pleased with himself on Wednesday 6 June, when he was presented with an EETPU (Electrical, Electronic, Telecommunication and Plumbing Union) prize by Mr Goodburn, Secretary to the Union's Didcot Branch.

One of ten winners of this annual national competition organised by the EETPU, Phil is a fourth year apprentice, sponsored by RAL to the Harwell apprenticeship scheme. This prize was gained for his answers to a questionnaire concerning his work experience and what he felt he had accomplished in his apprenticeship. Assessments of his capabilities at training school and college were also taken into account, bringing him the reward of a cheque for £30 and a £10 book token.

Also attending the presentation to wish him well, and pictured with him in the photograph were, (left to right, standing) Mr Ferrari, EETPU convener, RAL; Mr Gilkes, Didcot Branch Treasurer; Mr Gray, Chairman, Local Joint Consultative Committee; Mr Lewis, Chairman, Didcot Branch and Mr Reed,

Senior Steward, AERE. Seated either side of Phil are Mr Goodburn, (left) and Mr Henry, Chairman of the AERE Harwell Apprenticeship Board.

Sue Ryder Home Help



84RB2783

These likely lads (Steven Heads, Steven Cox and Chris Spencer) volunteered their services to help out and run a side-show at the home in Nettlebed during the Annual Shetland Show and Fair.

On a very wet Bank Holiday Sunday they did well to raise some £25 with a rather damp electronic game of fortune designed and made in the R66 Apprentice School under the guidance of apprentice supervisor Tony Kershaw.

The Sue Ryder Home has, in the past, given much help and comfort to members of the Laboratory and their families and it is hoped to continue supporting such a worthwhile cause as part of apprentice citizenship training.

Ten Times Five-a-side Soccer

The 10th National Bubble Chamber Five-a-Side Soccer Tournament was held in a windy, Royal Hyde Park on Saturday 12th May. This annual competition has grown, since its inception at the same location in 1975, to become a major event involving 15 teams from the High Energy Physics Groups at Birmingham University, Oxford University, Rutherford and Appleton Laboratory Imperial College and University College. The location changes from year to year but the format is now well established featuring two leagues containing both mens' and ladies' teams in which all teams play each other. The top two mens' teams in each league enter a knock-out competition and the top ladies' teams in each league play-off for the ladies' championship. The mens' versus ladies' games are an important feature of the tournament, though the rules of engagement might not be recognised by the Football Association or the Equal Opportunities Commission.

The organisers are also proud that the teams generally contain a good mixture of physicists, technicians, research students, computing and scanning staff, and even a Professor. The diversification of bubble chamber groups over the years has been reflected in the increasingly frequent sightings of counter physicists, ex-bubble chamber physicists, some non-high energy physicists and even the odd theoretician. Of particular note is the increasing number of sons and daughters of veteran players who are making their appearance in the teams. The occasion has become something of a family affair with the post-match reception assuming considerable importance.

Meanwhile back on the soccer field the hard ground and a strong wind made skillful football difficult. The knockout stage of the mens' competition was contested by two Rutherford and Appleton Laboratory teams an Oxford team and an Imperial College team. This was the first time anyone could remember a semi-final stage without a Birmingham team. The final between Rutherford A, the winners of the 1983 competition, and Imperial College Physics Wanderers was an extremely close affair culminating in a single goal victory by the latter in extra time. The ladies competition was won convincingly by Oxford who defeated Rutherford ladies in the final.

In 1985 the tournament returns to Oxford. Other teams who can demonstrate possibly a tenuous connection with bubble chambers will be welcome to apply to compete. They should bear in mind, however, that there is one trophy that is awarded to the team with the worst

record in the tournament. It is a hideous, plastic gnome with flashing eyes and a repulsive cackle. It would be tactful to withhold from public view the name of the 1984 winners. The holders themselves will be endeavouring to do likewise with their trophy!

Dr K W J Barnham
Physics Dept.
Imperial College, London

Crib

The 1983/84 season ended with the Crib Evening held in the RAL Restaurant on Friday 18 May. Thirty six players took part in the competition, playing a minimum of 8 singles and 3 doubles matches.

The honours were won as follows:-

DOUBLES - Winners Ray Jones and Robin Wastle
Runners-up Steve Hancock and Vernon Jones

SINGLES - Winner Malcolm Davies
Runner-up Tudor Morgan

The Trophies were presented by the retiring RecSoc Chairman, Peter Craske

LUNCH-TIME LEAGUE HOUOURS

CHAMPIONS 'Ace Holes'-
Peter Craske
Malcolm Davies
John Moir
Steve Stoneham

RUNNERS-UP 'Live Wires'-
Geoff Brown
Janice Brown
Chris Bruce

KNOCKOUT WINNERS 'Jokers'-
David Kent
Maureen Smith
Cyril Watkins

RUNNERS-UP 'Ace Holes'

Congratulations, Malc on your two trophies and one runners-up place.

A LUBBOCK

Retirement of Archie Hill

Archie's last day at the Laboratory was Thursday 31 May. He had requested that there would be no formal presentation.

However, there was a small gathering of his colleagues in R54 Transport section. Dr David Baugh presented Archie with a Silver Carriage Clock and a wall Barometer on behalf of his many friends. Archie was well known as the Post driver for many years.

RAL Square Dance

The RAL Barn Dance Club is holding an evening of American Square and Contra Dances, with the renown "Blue Mountain Band" on Friday 20 July from 8pm until 11pm in the RAL Restaurant. The callers will be Mike Courthold and Derek Cragg.

This dance will be a club evening for dancers or able novices. Tickets will be limited, so an early purchase is recommended.

Tickets at £1.50 each or £1 for RAL RecSoc or EFDSS members, are available from Mike Courthold, R12, Ext 6462 (lunchtime only). People attending the dance are also asked to bring a plate of food and their own drinks.

Radio Control Model Club

When this Club was formed last year, I never knew how many people on site were interested in this hobby! So far club members are all interested in gliders or aircraft, so I would still like to hear from R/c car enthusiasts.

Last November we held two lunch-time flying displays, coinciding with the Art and Craft Week. On 6 May this year we invited The White Horse Model Club, The North Berks Model Club and The Oxford Model Club to the RAL sportsfield for a "fly-for-fun" afternoon. There were about 30 modellers who came along, and quite a few spectators - it was a great afternoon. We are hoping to hold a few more lunch-time displays, but as yet, no date has been set. We are also proposing to have another "fly-for-fun" later in the year.

So, if you are a radio control modeller and would like to join this club, please give me a ring.

P C Angell
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Ext 5545 or 5505.

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Deadline for insertions:

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