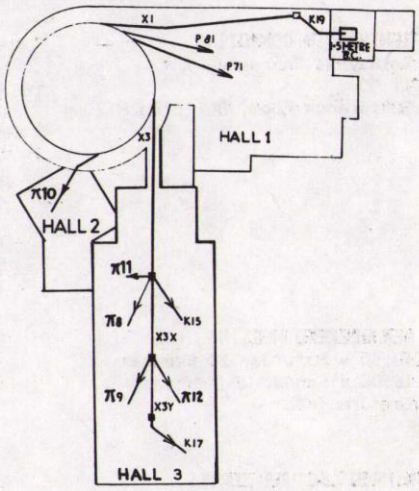
Rutherford Laboratory

19-26 February 1973

bulletin 7

NIMROD SHUTDOWN, FEBRUARY TO APRIL 1973 - PART 2

In Part 1 we gave details of the more newsworthy items of work to be carried out on Nimrod. This week, changes to extracted and secondary beams are discussed.



Experimental Hall 1 Following removal of the K9 beam, a new 600-800 MeV/c two-stage electrostatically - separated $\bar{K}$ beam, K19, for use with track sensitive target experiments in the 1.5 metre cryogenic bubble chamber, is to be installed.

As K19 will be considerably shorter than K9, the existing X1 extracted proton beam (EPB) needs to be extended by about 40 metres towards the south end of Hall 1.

The X2 EPB, together with its associated secondary beams, K12A and K13C, has now been removed and will be replaced by a new beam, P81. This beam is designed to deliver 10^{13} protons at 8 GeV/c. with a very low "halo" (beam outside the wanted emittance), to a 5 mm diameter polarised proton target. The protons are extracted from Nimrod by "peeling off" a very small part of the normal X3 spill within the machine, hence allowing simultaneous running with the Hall 3 experiments.

Experimental Hall 2 The π7 beam will be removed together with its two associated machine internal targets. This is to allow installation of the new 2nd harmonic RF drift-tube type accelerating structure in straight section 6 of the Nimrod ring.

Experimental Hall 3 To accommodate a new stopping kaon beam, a third target station, X3Y, is to be installed on the Hall 3 extracted proton beam, downstream of the existing X3X beam. The new beam, K17, will be a 600 MeV/c single-stage electrostatically separated $\bar{K}$ beam, for use in conjunction with an energy-loss degrader, to provide stopping kaons for nuclear structure physics experiments.

Another new beam in Hall 3 will be known as π12 and this will share the X3X target station with the existing π9 beam. This new beam is a 1-5 GeV/c pion beam at $5\frac{1}{2}^{\circ}$ production angle, for use with a polarised target. It is very similar in design to the π9 beam. The existing beams in Hall 3 - K15, π8, π9 and π11 will continue unchanged.

This new arrangement of beams on Nimrod means that all installed counter experiments together with the bubble chamber beam may take protons every machine burst, if required. This should lead to a considerable simplification of the operation of Nimrod and to increased flexibility in the scheduling of the experimental programme.

SUGGESTION SCHEME AWARD BRINGS A PLEASANT FORM OF INFLATION FOR DAVID PARKINSON

Most of us suffer at times from the inability to find a simple solution to an apparently complicated problem, often when that simple solution is staring us in the face.

David Parkinson, a skilled craftsman working in the preparation area of Building R2, looked at a problem, saw the simple answer and earned himself £90.

The problem was associated with the equipment used for refilling liquid nitrogen dewars. The old method required the use of flexible tubing between the feed line and the dewars. After passing liquid nitrogen through the tubing it tends to become very brittle and the removal of the tubing from the dewars or any mishandling, frequently caused damage and subsequently, repair or replacement of the flexible tubing. David's solution was to use two sizes of cryogenic stainless steel tubing, an inner ($\frac{1}{2}$ inch diameter) being fixed to the feed line and an outer sliding tube ($\frac{3}{4}$ inch diameter) which could be dropped into the dewar to a predetermined distance. The dewar would be filled, the outer tube raised and held clear of the dewar by simple clips.

This simple solution is estimated to save 80 man hours and £100 per year on repairs or replacements of the flexible tubes. In addition, greater safety is achieved, as the risk of the flexible dispenser blowing out of the dewar has been eliminated.

news continued on page 4

INTERNAL EVENTS

NIMROD LECTURE SERIES
Monday 19 February
11.30
Lecture Theatre

Neutrino Interaction in Hydrogen and Deuterium

Dr M Derrick/ANL and UCL

HEP DISCUSSION GROUP
Wednesday 21 February
11.00
Conference Room, Building R1

Amplitude Structure of πN Charge Excahnge at Large t.

F Elvekjaer/RHEL

SEMINAR IN COMPUTING
Friday 23 February
11.00
Conference Room, Building R12

Rutherford Laboratory Measuring Machines - Progress Report

A J Oxley and R A Lawes

A description will be given of experiences in measuring the first million Bubble Chamber events on HPD 1, and of how the system fits into the Laboratory environment in general. Recent experience with HPD 2 and some details of the tandem HPD system will be presented.

The proposed CHORD (Computerised Hardware Organised Reduction of Data) Computer System for HPD will be briefly mentioned.

HEP WEEKEND MEETING
10.30 - Saturday 24 February to
16.00 - Sunday 25 February
Lecture Theatre

This is a meeting on links between Weak and Electromagnetic Interactions.

Attendance is by invitation only.

NIMROD LECTURE SERIES
Monday 26 February
11.30
Lecture Theatre

Title and speaker to be announced next week.

THE NIMROD COOLING TOWERS

We are grateful to David Evans of the Chemical Technology and Radiochemistry Group for the first article in the new series which will appear intermittently under the general title of 'SCENE BUT NOT HEARD'. The Editor hopes that this article will encourage other members of the Laboratory to follow David's example and contribute to the series.

'This structure could certainly not be said to be the most aesthetically pleasing one on the site or even a likely contender for this first article. In fact the only time you may have considered the towers at all is if a floating piece of brown foam has taken your eye; or may be you were once lucky enough to get your car through the gate and then foolish enough to park it near the towers. Did you ever wonder about that salt deposit on the car?

At the laboratory there are four evaporative cooling towers. Three of these towers are linked and serve Nimrod and the fourth, smaller cooler, serves the auxiliary equipment.

The three Nimrod coolers each contain some 19,000 gallons of softened water and the flow rate through each tower is about 2,000 gpm. The auxiliary cooler circulates some 10,000 gallons of fully softened water at around 1,000 gpm. The total heat dissipated by these towers is about 20 megawatts (MW), composed of approximately 17 MW from Nimrod and associated equipment and some 3 MW dissipated by the auxiliary tower, this being heat removed chiefly from the air conditioning plant and vacuum pumps.

Evaporative coolers rely for their effect (ie the ability to cool to below ambient temperature) on the evaporation of a small quantity of the recirculating water. In the case of our four towers the total water loss may at times be as high as 4,000 gallons per hour. Of this loss only may be 10% is actually lost as spray (or windage). It is this spray loss that carries with it the salt that, if given the chance, deposits on your car.

The loss of cooling water must continuously be made good with water, which although fully softened, still contains quantities of dissolved solids. If the process of evaporation (and thereford concentration) were allowed to continue in an uncontrolled manner, high levels of dissolved solids would ultimately result in the cooling water. For untreated raw water a large proportion of water circulating would need to be continuously bled from the system (blow down) since concentration of dissolved solids would have to be limited to a factor of 2 or 3. The make up system for the Rutherford cooling towers uses softened water and the concentration effect is less significant and may be allowed to rise until the water contains 15 or 20 times the dissolved solids present in the make up water.

EXTERNAL EVENTS

NUCLEAR STRUCTURE & NUCLEAR ASTROPHYSICS SEMINAR
Monday 19 February
14.30
Nuclear Physics Lab., Oxford

How Far can Stellar Abundancies be Explained by Nuclear Physics?

Professor B Pagel/RGO & University of Sussex

PHYSICS & GEOPHYSICS COLLOQUIUM
Monday 19 February
17.00
University of Bristol

Experiments in High Energy Astrophysics

Professor C J Waddington/University of Minnesota & Imperial College

PHYSICS COLLOQUIUM
Monday 19 February
17.00
University of Reading

Evaporation of Liquid Helium

Professor D V Osborne/University of East Anglia

DARESBURY LECTURE SERIES
Tuesday 20 February
14.00
Daresbury Laboratory

Duality and Regge Approach to Inclusive Reactions

P B Roy/RHEL

THEORETICAL PHYSICS SEMINAR
Tuesday 20 February
14.30
Imperial College, London

One-Loop Corrections to Gravity

Dr R Delbourgo/I.C.

APPLIED PHYSICS COLLOQUIUM
Wednesday 21 February
16.30
University of Reading

Artificial Intellegence

Dr A M Andrew

APPLIED MATHS SEMINAR
Thursday 22 February
14.30
Royal Holloway College

Duality and Regge Absorption Models

Dr R Warden/RHEL

ELEMENTARY PARTICLE THEORY SEMINAR
Friday 23 February
14.15
Nuclear Physics Lab., Oxford

$K_{\ell 3}$ Decay and Quark Model Commutators

K Schilcher

COLLOQUIUM
Friday 23 February
14.15
Clarendon Laboratory Oxford

Flux Lines in Small Ginsburg-Landau Type II Superconductors

Professor U Essmann/Stuttgart

EVENTS AT AERE

NUCLEAR PHYSICS COLLOQUIUM
Thursday 22 February
15.30
Conference Room Hangar 8

The National Radiological Protection Board

Mr L D G Richings/NRPB

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Room 42 Building R20
Rutherford Laboratory
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Abingdon 1900 Ext 484

Deadline for Insertions	GENERAL & SOCIAL NEWS	INTERNAL & EXTERNAL EVENTS
	Tuesday 1600	Wednesday 1200

Norman Venn who made the presentation, said he was delighted to hand over the cheque and told David that far from being a gift, it had been really well earned.

UNDELIVERABLE MAIL

A letter addressed to Miss N Byers containing an invitation from Professor Salam, to participate in the topical meeting on Weak Interactions at Trieste, can be collected from the Editor.

A letter, in answer to a request from someone at the Laboratory for information on a small precision calculator, ORIGINAL - ADDIATOR, can be collected from the Editor.

FILM BADGE NOTICE

It is Period 2. Colour Strip - GREEN for βγ films. Neutron packs for Period 2 are now to be returned as owing to the Nimrod Shutdown, they are no longer necessary.

Next film issue - 26 February.

MISSING EQUIPMENT

The following item of equipment has been reported missing from the Radiochemistry Wing, R34:

Stopwatch Serial No 57/0177

Anyone with information on the present whereabouts of this item is asked to contact J T Morgan, R34 Ext 537.

OVERSEAS VISITS

Messrs D R Culliford, P Swan-Taylor and J Whittaker, to CERN, 18 - 21 February, for commissioning of the 400 kW rectifier and M5 magnet for the S120 beam.
Mr A Bishop and Mr B H Skinner, to CERN, 18 - 21 February, for investigation of installation and commissioning problems associated with CERN polarised target to be operated in P81 beamline with Nimrod.
Mr D C Salter and Mr D H C Harris (of AERE) to Grenoble, 18 - 22 and 18 - 23 February respectively for discussions with ILL staff.
Dr C J S Damerell, to CERN, 19 - 22 February to attend meetings on PS & SPS experiments.
Dr R A Rosner, to CERN, 21 - 23 February to discuss analysis of the Omega and ISR experiments and to inspect interactive graphics facilities at CERN.

SOCIAL NEWS

RECORD SOCIETY

Tuesday, 20 February at 12.40 in the Lecture Theatre. When an electronic organ sets out to be a comparable replacement for a pipe orgen the purists set about knocking it down. The Allen Company in America, using the technique of digitising waveforms and storing them in a computer memory, are making a new break-through, which is standing up well.

Stephen Hicks uses its faster than pipe organ attack time to play The Ride of the Valkyries also Vidor's Toccata and Simon Preston playing Crown Imperial by Walton on the Westminster Abbey organ as a finale.

(John Hardaker who has contributed the above, may in truth have set the cat amongst the pigeons as it were. The transient response of a pipe organ of course varies considerably according to the type of organ but it should be interesting to hear this new electronic organ - Ed.)

SOCCER SEVEN-A-SIDE CHALLENGE TROPHY FINAL

A good crowd turned up to watch the final of the Rutherford Challenge Trophy which was played on Friday last. After some rather scrappy play in the first half, both sides settled down to some good football. After a number of missed chances by both sides, Group Office (G O) opened the scoring. Building 351-2 however came back strongly with two goals to win by 2 - 1, so the Rutherford Trophy goes across to our neighbours, AERE, for 12 months. Well done 351.

Rutherford Seven-A-Side Soccer League started this week on Wednesday, 14 February with Apprentices v G O kicking off. Fixutres for next week:-

Tues 20 Feb. R9 v Transport; Thurs 22 Feb. R25 v Admin.; Fri 23 Feb. Casuals v Apprentices.

CHRISTIAN FELLOWSHIP

Pastor Brian John of Wantage Baptist Church will be visiting the Laboratory on Friday, 23 February. All are welcome to come along to meet him and listen to his talk, at 12.30 in the Conference Room, R12.