

Bulletin

of the Rutherford Appleton Laboratory

24 Sept 1984 No.14

First Ion Release from AMPTE

The AMPTE mission, just twenty six days into its 15 month exploration of the solar wind and magnetosphere, made its first lithium release on Tuesday 11 September at 0825 hrs BST.

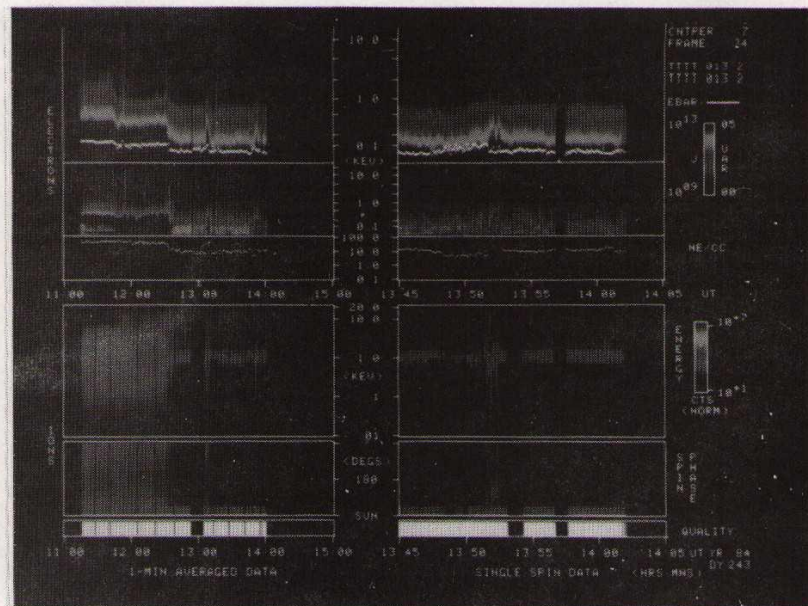
With an early start to the day, at 0500 hrs, data received at the NASA tracking centre at Canberra was relayed via the Deep Space Network (DSN) to the UK Operations Control Centre at RAL so that the UKS, having been switched on by timer, could be checked to be working in the correct mode.

At 0600 hrs, when the missions three spacecraft were in suitable positions for the release, the network link was handed over to the Ion Release Module (IRM) while the UKS data continued to be received and recorded at Canberra. These data were replayed to UKOCC via the DSN Canberra later the same day. Conditions in the solar wind, as relayed from the UKS between 0500 hrs and 0600 hrs and continuously thereafter by IRM, were discussed and evaluated in a three-way link-up between the operations centres in the USA, Germany and at RAL. Computer programmes were run at Johns Hopkins Applied Physics Laboratory to show whether or not ions released, under the prevailing solar-wind speed and density and magnetic field direction, would be expected to pass through the bow-shock to reach the magnetopause (the outer surface of the magnetosphere), and therefore stand a chance of finding their way into the radiation belts within the magnetosphere where the Charge Composition Explorer (CCE) was waiting to detect them.

At 0812 hrs conditions were deemed to be suitable and Professor Haerendel, at the German control centre, announced that he had sent the command for the release. At 0815 two of the IRM's sixteen cannisters were released and after a suitable interval, when they had reached a distance of 1 kilometre from IRM, the reaction between Li and CuO was activated to release an expanding cloud of lithium atoms which were photoionised by solar ultra-violet.

Data Evaluation

Measurements made at the IRM itself, at the UKS 35 kilometres away at the time of release, and at the CCE some 80,000 kilometres away, are currently being examined very closely, (especially



RAL and MSSL particle measurements as the spacecraft entered the solar wind from the magnetosheath, crossing the Earth's bow shock at 12.30 GMT on 30 August. (original in colour).

in the cases of IRM and UKS those obtained within the first few tens of seconds of the event) in order to evaluate them to the point which will allow a second release to be embarked upon within the remaining section of the window, which closes 28 September giving six opportunities for release.

Meanwhile, the three spacecraft are continuing their studies of the natural magnetosphere and solar-wind. All five UKS experiments are continuing to provide high resolution information about the speed and composition of solar-wind ions and of the scattering caused as they penetrate the bow-shock. Heating of solar wind electrons and the formation of jets both at the bow shock and at the boundary of the magnetosphere have also been observed particularly clearly. Changes in ion and electron behaviour are accompanied by growth of waves in the local electric field and periodic pulsing of the particle streams themselves. Measurements of the local magnetic field serve to co-ordinate the other observations and clearly reveal the nature of the

transition from the Earth's dipole-like field to the Sun's magnetic field embedded within the solar wind.

In the AMPTE control centre (UKOCC) at the RAL, these observations are given considerable dramatic impact by appearing as colour displays, only moments after being made by the satellite instruments, to give continuously forming images of the medium through which the satellite is moving. This permits optimisation of experiment modes and enables rapid comparisons to be made between conditions at the UKS and at the IRM.

All three satellites are reported by their respective authorities to be functioning well in orbit. The UKS is working faultlessly and its control and data reception using antennae at RAL and Chilbolton and processing by UKOCC are very effective.

For further information contact Dr Duncan Bryant, Ext 6515.

Apprenticed at RAL



Alan, Stephen, Ron Russell, Adam, Dave and Geoff Manning.

The first ever group of RAL trained electronic apprentices received their indentures from Dr Geoff Manning on Friday 24 August.

Since the Laboratory was originally formed we have used the Harwell Apprenticeship Scheme to train our mechanical, electrical and electronic craftsmen but in 1980 an increase in our allocation for apprentice training could not be coped with by Harwell and it was decided that we should start our own scheme for electronics apprentices.

So far the scheme has proved very successful, achieving 100% pass rate in exams, none of the apprentices having left and all having taken jobs at RAL.

Presenting the indentures to Stephen Deane who will join Peter Wilde's group and to Adam Johnson, David Rippington and Alan Saxby who are to join the R18 workshop, Dr Manning

congratulated all four students and wished them success in their careers. Following the Harwell tradition their deeds were presented in tankards which the apprentices had provided. Dr Manning hoped that in future these could be provided by the Lab.

Also present to wish them well were, the originator of the scheme Ron Russell who was head of SNS Division at the time, Brian Claxton former apprentice supervisor, and Vic Thorp, apprentice manager.

We are also pleased to report that nine more RAL apprentices have successfully completed their training in the Harwell Engineering Scheme and have also accepted craft appointment with the Laboratory. These are P Bailey, J C Elgar, W Pollock, P J Tonner, S Lees, M J Miles, P Self and T J Whelan.

Congratulations and welcome to you all.

Cash Point

The long-promised cashpoint is due to be installed outside the main entrance to the R1 foyer in the next week or two, and to open for business on Monday 8th October.

The cashpoint will be available to all Lloyds customers between 6.30 am and 11.30 pm, Monday to Friday. It will dispense up to £100 per account per day, and report balances on accounts to close of business on the previous day.

'100' Club

Prizewinners for

June:

£125 A Forster
£ 25 L Claringbold

July:

£25 J Gilbert

August:

£25 C Bruce

CONDENSED MATTER SEMINARS

R3 CONF RM - 1330 hrs

- 2 Oct B T M Willis/Harwell
'Neutron Diffraction Studies and Perfect Silicon Crystals and Imperfect Uranium Oxide Crystals'
- 9 Oct R K Heenan/RAL
'Everything You Wanted to Know About Gas Electron Diffraction, But Were Afraid to Ask'
- 16 Oct T Hicks/Monash & Southampton
'Flipping Neutrons'

Library Notice

"The Hamlyn Guide to Astronomy" has been mistakenly returned to the Library in R61. Would the owner please claim it at the reception desk.

Obituary

Dr Brian Duff

Dr Brian Duff of University College London died suddenly and completely unexpectedly of an aortic aneurism on Monday, 27 August. He was at home, having driven back over the weekend from CERN with his wife and two teenage children after a few weeks of running on the WA78 experiment.

Brian Duff began high energy particle research when he joined the UCL counter group after graduating in 1959. He was involved in the first generation of NIMROD experiments at Rutherford Laboratory, and in others throughout the NIMROD programme, as well as working on experiments at the CERN PS, the ISR and the SPS. He was closely concerned with the development of the combined emulsion-spark chamber technique by UCL physicists in the late 1960 s, which led eventually to the first direct observation of charmed particle decays and to a whole series of important experiments on short-lived particles. Perhaps his most important work on the ISR was on inclusive production in an experiment which helped to lay the basis for quark-parton models of hadron-hadron collisions.

As a teacher he combined mastery of his subject matter with clear and often witty presentation. Despite the demands on his time which were made by experimental work and committee work at CERN and elsewhere, he carried a significant share of departmental responsibilities at UCL including a recent stint as admissions tutor for Physics undergraduates. He was a member of the ISR committee at CERN from 1974 and in 1976 he acted as secretary to a Royal Society committee which investigated future UK policy on nuclear energy. From 1978 to 1980 he was the director of the Rutherford summer school for experimental particle physics postgraduate students.

His colleagues will miss him most for his effectiveness as an administrator and leader of research. He will also be missed as a musician both at UCL, where he sometimes conducted ensembles for the chamber music club, and especially by his neighbours in Surbiton where he had been choirmaster at St Matthew's church and was still a regular organist.

We proffer our deepest sympathy to his wife Marjorie and to his children Oliver and Harriet.

Film Badge Notice

It is period 10 Film strip BLUE.

Please be sure you are wearing the current dosimeter and return all old ones.

Next film issue - Monday 8 October