Bulletin
of the Rutherford Appleton Laboratory
28 Aug 1984 No.13

AMPTE~Looking Tremendous

A particularly anxious and hectic week for the AMPTE-UKS team ended at 15.48 BST on Thursday 16 August with the successful launch of the international 3-satellite tracer experiment AMPTE from the Kennedy Space Center.

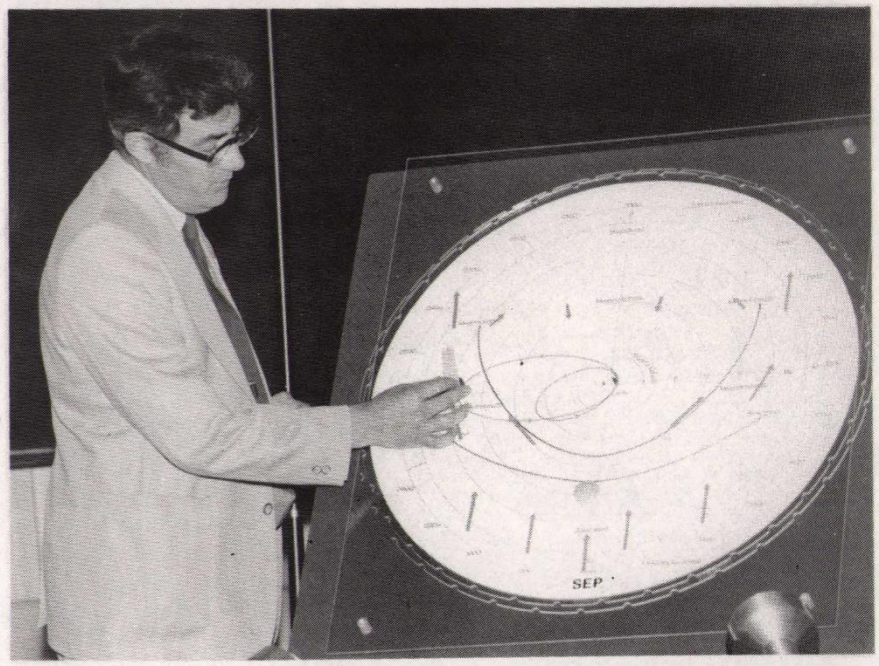
The AMPTE experiment, designed to discover the mechanisms governing the entry of particles of the solar wind into the Earth's magnetosphere by injecting tracer ions into different regions of the solar wind and magnetosphere, was originally scheduled for launch on Thursday 9 August.

Problems, first with a computer used to calculate orbits and antenna guidance and subsequently with contamination of the payload by flaking mylar in the air conditioning duct leading to the nose cone from the launch tower caused delays, which only super-human efforts by the project teams managed to restrict to seven days.

Launch relayed to RAL

As on the previous scheduled launch-day when press, radio and television reporters joined RAL staff and university visitors, the Lecture Theatre was again full of attentive spectators listening intently to the presentations given by Drs Geoff Manning, Alan Gabriel, Duncan Bryant and Professor Culhane (MSSL) on the history, mission itinerary and aims of the experiment. Dr Eric Dunford and Mr Ray Turner conducted us through the sequence of launch events as they were relayed live by radio-link from NASA control and at lift off an audible sigh of relief went round the theatre.

The culmination of a three year, three nation collaboration, the launch was only the first stage in the complex exercise to deploy the three satellites in the correct orbital formation for the experiment to begin. Stage 2 which took place at 16.54 BST on Thursday 16 August put the stacked spacecraft into a transfer orbit where the US satellite (CCE) will remain throughout the mission. Stage 3, the firing of the kick-motor taking the German (IRM) and UK (UKS) satellites into their mission orbit, occurred on Friday 17 August at 08.18 BST and separation of the UKS from IRM followed,4 hours after a full traversal of this 44 hour orbit,on Sunday 19 August at 08.45 BST.



Duncan Bryant (AMPTE-UKS project scientist) outlining the sequence of experiments that are scheduled for the mission, at a press briefing held at RAL on Thursday 9 August.

Data links

Control from the United Kingdom Operations Control Centre (UKOCC) was established moments later. By the end of the day it had been re-oriented by pulses from the gas jets; its rigid booms deployed and the process of checking its many systems begun.Control and communications for the UKS satellite are the sole responsibility of UKOCC, the other two satellites being controlled by their respective control centres. Data transmitted by UKS is collected

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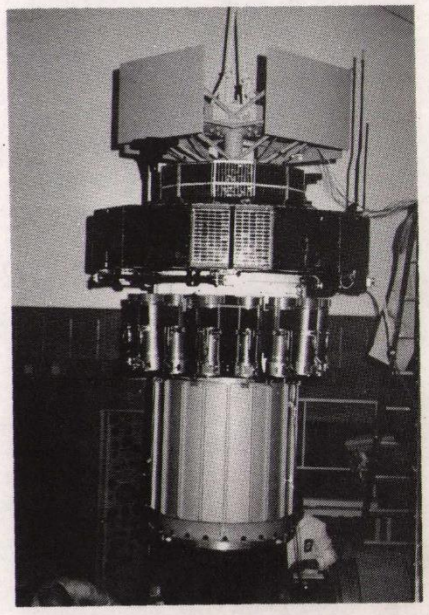


The three satellites stacked in launch configuration. The US craft, CCE (Charge Composition Explorer, a mass model of which was used in this vibration test) is located at the top; the German IRM (Ion Release Module) at the base, with the UKS nested between.

AMPTE *(cont'd from p.1)*

by the 25 metre Chilbolton antenna as well as at the Chilton dish. From Chilbolton, high speed data lines route the data to UKOCC. When UKS is out of sight of both of these antennae, the Deep Space Network with its world-wide coverage, can be called upon when necessary.

The results from the three national control centres will be pooled for analysis. Key features of the data will be displayed in a readily interpretable form within seconds of reception, so that the instruments on-board the satellites can be switched to the mode best suited to prevailing conditions.

The experiments begin

The next stage of the mission occurs in September when the German IRM satellite will release tracer ions into the solar wind just upstream of the boundary shock wave formed where the solar wind first encounters the obstacle of the Earth's magnetic field. A small number of these will manage to penetrate into the magnetosphere and be detected by the patrolling American satellite (CCE). UKS travelling close to (within 100 miles of) the IRM will serve to confirm that solar wind conditions are suitable for the release and observe the perturbation which the released ions cause locally.

In December another release into the flank of the magnetosphere will produce a comet-like phenomenon visible from the West Coast of the USA. Further releases in March 1985 in the tail of the magnetosphere will, in addition to being further sources of tracer ions, enable studies to be made of the perturbation caused in the static plasma which prevails in this region. One more release of lithium a little later in the year should produce an artificial aurora. These active experiments will be interspersed with and followed by high resolution studies of the natural state of the plasmas of the solar wind and magnetosphere.

Carried out over a period of some 15 months the whole mission promises to open a new era of space plasma research.

For further information of the mission please contact Drs Duncan Bryant, Ext 6515, Eric Dunford, Ext 5450, Kim Ward, Ext 4611.

Sales to Employees

The sale of scrap metal and plastics to RAL employees will take place at the R40 scrap compound on 14 and 28 September from 12-12.30 hrs.

RAL TECHNOLOGY LECTURES

The next lecture in this series will be held on Thursday 27 September 1984 at 3.00 pm in the R22 Lecture Theatre.

TESTING MATERIALS
WITH ELEMENTARY PARTICLES

Dr A E Hughes
HARWELL

Beams of elementary particles, especially electrons and neutrons, are extensively used to study the fundamental properties of solids. As techniques have become better established and understood, they have been extended to more directly practical problems such as testing materials and components. This talk will cover some areas of particles in technology. Examples covered are the measurement of residual stresses using neutron diffraction, the analysis of reactor materials with proton beams, and the detection of fatigue damage in alloys using positron annihilation.

Computing Seminars

THE COMPUTER AS VON NEUMANN
PLANNED IT

by

Dr M D Godfrey, ICL

This talk will take place in the Colloquium of the ATLAS Centre at 3.15 pm on Tuesday 11 September.

Dr Godfrey will describe the computer which was substantially defined in von Neumann's unpublished paper "First draft of a report on the EDVAC," Moore School, 30 June 1945. Motivation for the architecture and design will be discussed and the machine will be contrasted with the EDVAC which was actually constructed.

Missing

The following item is the subject of a loss report.

Bell gaussmeter probe
Serial No. 92416. Inv. No. L2022.

Please ring S. Johnston Ext 5694 with information.

Obituary

Dr Peter Fisher

His many friends at Harwell and the Rutherford Appleton Laboratory will be sad to learn that Dr Peter Fisher, University Lecturer in Nuclear Physics and Fellow of Trinity College, and a nuclear physicist of distinction, died on Saturday August 4th at the early age of 51 after a long illness.

After graduating with a First in Physics from King's College London in 1954, Peter Fisher spent three years at Birmingham where he obtained his Ph.D. He then worked for two years at Princeton, New Jersey and returned to Oxford in 1959, where he became a University Lecturer in Nuclear Physics.

Peter Fisher carried out research on the PLA at the Rutherford Laboratory, and on the synchrocyclotron and variable energy cyclotron at Harwell. His most important research was undoubtedly the discovery, with D K Scott and others, of the selective excitation of nuclear states in heavy ion reactions at bombarding energies of about 10Mev/nucleon. This work attracted wide interest, and was developed and extended by many graduate students and visitors to Oxford.

Peter Fisher bore his terminal illness with great fortitude and courage; he kept in touch with research and was in the Nuclear Physics Laboratory at Oxford only a few days before he died. He is survived by his wife Priscilla, whom he married in 1964, a son Andrew now at Cambridge and a daughter Rachel.

Internal Events

COMPUTING SEMINARS
COLLOQUIUM ATLAS CENTRE - 15.15 hrs

11 Sept Dr MD Godfrey/ICL
"The Computer as von Newmann Planned it."

ASTROPHYSICS EVENTS
R61 CONFIRM - 14.00 hrs

12 Sept Dr R Hillier/Bristol
"Techniques of X- ray Astronomy.

19 Sept Dr GJ Daniell/Southampton
"Image Reconstruction by the Maximum Entropy Method."

RAL TECHNOLOGY LECTURE
LECTURE THEATRE - 15.00 hrs

27 Sept Dr AE Hughes/Harwell
"Testing Materials with Elementary Particles."

What Next Del?

Yet another of Del Forsyth's ships came in on Wednesday 15 August, this time bringing, a Suggestions Award of £280 and his running total up to £960.

His latest suggestion concerned the SNS correction magnets. These had to be split to introduce the ceramic vacuum chambers and be reassembled without damaging the insulation. Del's plan for a locating device which clipped onto the actual frame of the magnet and the further refinement of a turnbuckle to give finer adjustment when putting the magnets together again, saved a great deal of time, effort and frustration, and the award reflects this.

Presenting Del with his cheque, David Gray (Head of SNS) said that he hoped Del's success would encourage others to put in their ideas to the scheme, and congratulated him on his achievement.

We await with interest Del's progress to £1000.

ROSPA Awards

The Royal Society for the Prevention of Accidents, National Safe Driving Awards are announced for 1983.

We offer our congratulations to the RAL drivers who have received the following awards.

Mr B Turner Second Year Diploma

Mr P Brown Fourth Year Diploma

Mr M Fitzgerald 5 Year Medal

Mr A Hill (retired) 15 Year Medal

Mr D Stock Bar to 15 Year Medal
(17 accident free years)

Mr J Culley Bar to 15 year Medal
(19 accident free years)

Mr E Smith Bar to 20 Year Medal
(21 accident free years)

Trade Exhibition

Dowty Seals Limited will be visiting RAL on Thursday the 18th September with an exhibition of their engineering sealing components.

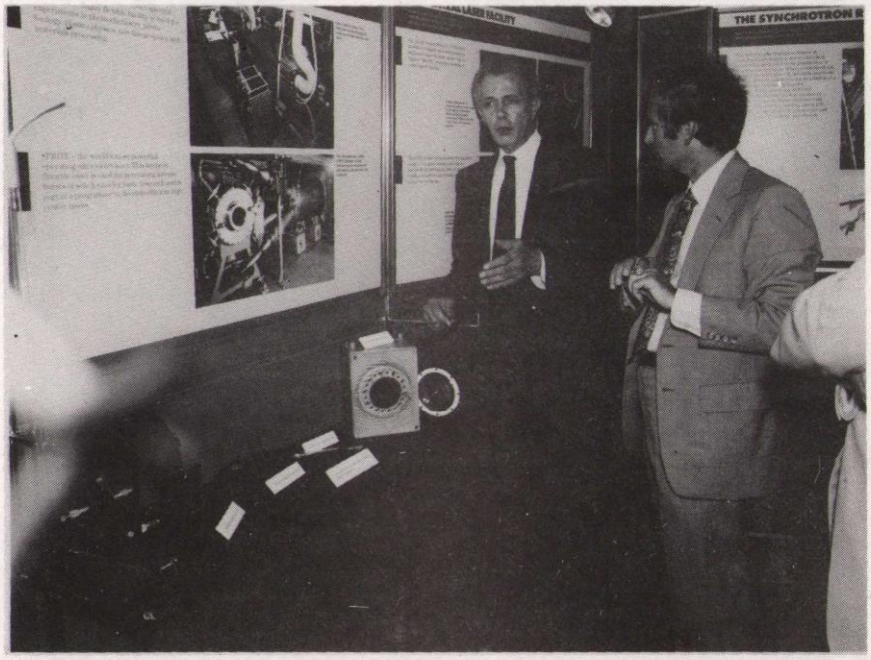
In addition to the comprehensive range of precision rubber seals, mouldings and bondings the display will include the 'Helicoflex' range of metal seating systems extensively incorporated in the JET project and other nuclear installations.

This will be an opportunity to examine the varied range of sealing products and discuss their applications with the engineers in attendance.

The exhibition will be held in R12 Conference Room from 10.00 am to 4.00 pm.

On Monday 24th September, Cifer will be demonstrating microcomputers in R12 Conference Room from 10.00 am - 4.00 pm.

Sir Keith Visits RAL Exhibits



Sir Keith Joseph in discussion with Dr Geoff Manning beside a display of the work of the Central Laser Facility, at a recent exhibition mounted at Central office to illustrate the role of the SERC in UK research.

Sir Keith also saw exhibits on other facets of RAL's wide spectrum of research activities including the SNS, Millimetrewave Telescope and the Laboratory's involvement in the discovery of the W and Z particles.

Tim & Lorna Win Again

The Blossom Fields Club at Edgebaston was the chosen venue for the SERC tennis tournament this year. On a very hot day five pairs, in both the mens and mixed tournament, spent a pleasant day in friendly competition. In a round robin, in both events, each pair played a total of 12 games against every other pair.

Three of the five men's teams, including the holders of the event, were unable to beat the formidable pair from RGO who emerged as winners.

Although the mixed teams were representative of most of SERC (RAL CO RGO ATLAS), it was from RAL that the strength came. After competing all day in the hot weather a tie occurred between Tony Short/Jan Charles (RAL) and Tim Pett/Lorna Claringbold (ATLAS). Both pairs attained 36 games with the next nearest being a pair from RGO with 25 games. A final had to be played off, something not seen for a number of years. Tim and Lorna won the short set 6-3 with Tony and Jan promising to get their own back next year! (Especially as they had beaten Tim and Lorna in the Round Robin).

Lorna Claringbold.

Signs & Portents

A letter received by "Health and Safety" recently addresses us as the "Signs and Engineering Research Council.

Is this the writing on the wall?

Farewell to Fred

Friends and colleagues of Fred Salter who were unable to attend the informal ceremony to mark his farewell to RAL will, we are certain, wish to know that their gifts of a book on antique clocks, watches and their makers, a pair of silver plated candlesticks and a silver plated salt cellar were accepted with great appreciation by Fred. He sends his thanks to all.

Thanks

Peter Hey wishes to convey to all his many friends his thanks for "a great send off into retirement. The generous gift tokens and hundreds of signatures on Ray Robert's incredible card will always remind me of many happy years spent at AERE and RAL. Many thanks and best wishes to all," he writes.

Crib

The 1984/85 lunchtime league season starts soon.

Last season we had 12 teams competing, we hope for more this year. Anyone interested in playing, either teams or individuals, is invited to contact Tony Lubbock, R2, Ext 5217.

Swan Song of a Southern Cleaner

When I retire, dear friends o' mine,
And say goodbye to graft,
You'll wonder; will he vegetate,
Chase girls, or just go daft.

To put you in the picture then,
And set your minds at rest,
I'll tell you now, that Option Two's
The one I like the best.

What do you mean, I'm past it now?
A fiddle, old may be,
But many a good tunes played thereon,
With that, you will agree.

However; hearing what you say,
(My hearts' quite sound you know!)
I think I'll turn to sowing seeds,
And watching turnips grow.

I've always fascinated been,
By roses on a wall,
And shrubs, that bear their flowers in Spring,
I like above them all.

But there is one; perhaps the Best,
For which I'll have no room,
Nay; tho' I live a hundred years,
No way, will I grow - broom.

JoT.

STOP PRESS

The RAL layout "Houghton Park", will be on display at the Didcot and District Model Railway Club Exhibition at the Civic Centre Didcot on September 8th from 10.30 am to 5 pm.

Bulletin

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