



# APPLETON LABORATORY NEWSLETTER

No. 155

April 1974

## UK-5

UK-5, or Ariel 5 as it will be known when it is in orbit, is the fifth in a series of British scientific satellites. It has been designed and constructed for the SRC by Marconi Space and Defence Systems at Portsmouth to serve as a platform for six scientific experiments - five British and one American. These experiments will be used to study different and complementary characteristics of stellar X-ray sources, and the data obtained from them will provide a comprehensive picture of the radiation from the X-ray sources, together with accurate identification of the source positions. Four of the experiments are designed to point directly at a selected source and study it in detail, while the other two continuously scan the whole sky as the spacecraft spins and can give early indication of unusual events whilst simultaneously accumulating information about many different sources. The launch aboard a scout rocket is expected to take place late in August 1974 from the Italian 'San Marco' launch facility in the Indian Ocean off the coast of Kenya near Mombasa.

There are almost 200 known X-ray sources and during the first year of operation the spacecraft will be pointed at up to 100 of these which have been selected for detailed observation by the 'pointing' experiments. At the same time the scanning experiments will be collecting information about all the known sources, and possibly about some which have not yet been identified. The pointing direction of the spacecraft is changed when commands from the ground open small gas jets. There is enough gas on board for at least one year's operation of the satellite.

Once the spacecraft is in orbit all spacecraft operations will be directed from the Ariel 5 control centre which has been built at the Appleton Laboratory in Slough. Commanding and telemetry reception facilities at the NASA ground stations at Quito and Ascension Island will be used to provide direct contact with the spacecraft while NASA data links will be used to relay commands from Slough to these stations and to transmit to the control centre telemetry relayed in real time from them. The telemetry is recorded and simultaneously monitored as it reaches the control centre and a variety of devices are used to display the information on spacecraft performance and status which is contained in the telemetry. As soon as the ground station loses contact with the spacecraft after a pass the recorded data are transmitted over GPO DATEL 2400 data links to the ICL 1904A computer at the Appleton Laboratory, or if this is not available to one of the similar ICL computers at the Atlas Laboratory, Chilton or at Computel, Bracknell.

These large computers are used to process the data and to calculate the current pointing direction, drift rate and orbit positions, to check the experimenters' data, and then to transmit all this information over data links back to the control centre, where it is recorded on magnetic tape. In the control centre the information required by each experimenter is selected and is transmitted over GPO DATEL 600 data links to the experimenter at his University where it is recorded in a suitable way on his own computer. This use of data links enables the experimenter to obtain results within an hour of the time at which the spacecraft was commanded to transmit the data, and makes it possible for him to make changes to his experiment within a very short time, and therefore to make the best possible use of this opportunity to study stellar X-ray sources.

E.M. Doyle

#### STATION NEWS

The I.U.E. team have now joined us at Ditton Park. We welcome back Messrs. Vaughan, Bevan and Guy and offer our greetings to their colleagues Messrs. Jones, Trowbridge, Lillington and Ackland.

During June, Mr. Dalziel with Drs. Rishbeth, L. Thomas and King will be visiting Sao Paulo, Brazil to attend the International Symposium on Solar-Terrestrial Physics and the 17th Annual Plenary Meeting of COSPAR.

Dr. Rishbeth will then visit the U.S.A. for discussions at the University of Texas at Dallas.

Dr. Bain has recently returned from a NATO Advanced Studies Institute meeting on E and VLF propagation at Spatind, Norway. Mr. Piggott, now of B.A.S., also attended.

During the period 1st-3rd April, at S. Uist, the D-region rocket group launched two Petrels carrying new experiments using U.V. resonance techniques for measuring atomic oxygen. The work, which was in conjunction with rocket-borne experiments of the University College of Wales, Aberystwyth, was completely successful in the case of the first round and partially so in the second.

#### STAFF NEWS

##### Congratulations to:

Mr. J.W. Reed  
Mr. R. Halton

now P.P.T.O.

On his being awarded second prize in the S.R.C. suggestions scheme poster competition. His design will be used throughout the Council.

##### Welcome to:

Miss N.A. Regan  
B.M. Turner

T/P Op.  
Driver

##### Resignations:

P.R. Button  
J.A. Murphy  
R.L. Anderson

S.O.  
H.S.O.  
Dvr./Storekeeper (E.S.R.O.)

STAFF NEWS (CONTD.)

Other Changes

P. Monk	S.O.	Transferred to Rutherford Lab.
F.F. Freeman	H.S.O.	" " " "
B.C. Boland	S.S.O.	" " " "
J.W. Reed	P.P.T.O.	Transferred to Grp 3 Divn.3 as Group Leader wef 1.3.74
E.H.M. Rayner	S.S.O. )	Transferred to Grp 3 Divn 3 from Grp.1 wef 1.3.74
R.L.T. Street	S.S.O. )	
M.P.L. Sweatman		Transferred to Grp 5 Divn.2 (D. Eccles Group) from Grp.2 Divn.2 wef 11.3.74
M.C.W. Sandford		Transferred to Divn.1 Grp 2 (P. Vaughan's Group) from Divn 4 wef 25.3.74
M.A. Trower		Transferred to Divn 1 Grp 2 (P. Vaughan's Group) from Divn 6 wef 27.3.74

A.L. SPORTS AND SOCIAL CLUB

The new Committee for 1974 to 1975 is as follows:

Chairman	Chris Gibbins
Vice-Chairman	Rick Street
Secretary	Janet Ryder
Treasurer	Wendy Willard
Minutes Secretary	Bob Young
Bar Manager	Rodney Knight
Bar Stewards	Alan Buck, Steve Denney, Piers Eggett
Members:	Julie Coombes, Mike Trower, Mary Wiltshire

I would like also to take this opportunity to thank all the retiring members of the Committee for their unceasing hard work and enthusiasm during the previous year.

Chris Gibbins

WINE CIRCLE

The wine circle held its A.G.M. on 23rd April. The following Committee members were elected:

Chairman	F. Bennett
Secretary	Mrs. E. Morgan
Treasurer	G. Bennett
Lit.Organiser	T. Edwards

It was decided by the members present to raise the annual subscription to 15p to cover the increased cost of the Winemaker magazine. It was also decided to cancel one of the Winemaker's and replace it with a copy of Wine and Beer-making. It was also decided to reduce the entrance fee from 12<sup>1</sup>/<sub>2</sub>p to 10p. During the meeting a bottle of Rosehip Wine (Donated by T. Edwards) was enjoyed by all.



UNSAFE PRACTICES COULD BE  
YOUR PASSPORT TO A LONG REST!

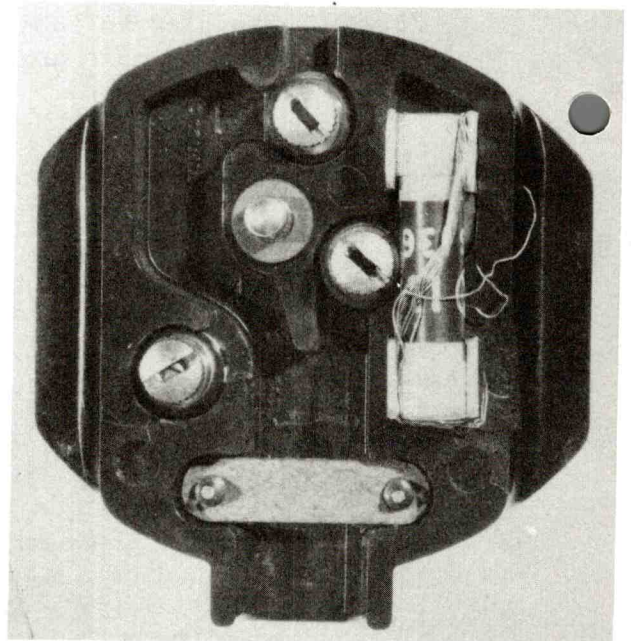
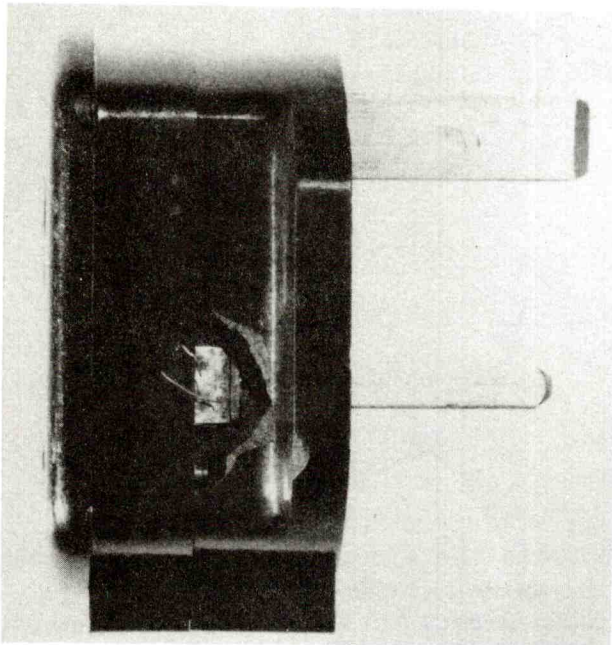
EXAGGERATION? WELL - READ ON:-

One member of the staff recently :-

- (a) allowed a 13 amp 3-pin plug to be used in a damaged condition - the damage being a hole in the plastic bodywork allowing fingertip access to the live terminal.
- (b) having blown the tubular fuse in the plug he bridged it with stranded wire thus increasing the current carrying capacity to approximately 50 amps.
- (c) then the final touch - he arranged for the whiskered ends of the stranded wire to protrude from the hole in the casing ensuring that anyone gripping the plug whilst it was in use would be absolutely certain to receive an electric shock.

This is a true incident and the Safety Officer now has the plug in safe custody but he would like to impress upon whoever was responsible that this incident could have had serious consequences, even resulting in death.

Report all dangerous electrical fittings IMMEDIATELY you discover them. Remember the person who grasped the plug described here could have been YOU.



THIS AND THAT

SOME BIRDS OF DELEGATION

- The White-Shirted Hoverer - A bird who gives a subordinate a job to do and then perches on his shoulder
- The Pin-Striped Whoopster - A bird who, like the hoverer, watches closely over his subordinate and becomes very raucous when they deviate from the way he thinks the job should be done.
- The Yellow-Bellied Credit Snatcher - A bird well known in enterprises and one who is often highly regarded.
- The Lesser White-Crested Cuckoo - The fair-headed prince who, by habit, lays his eggs in the other fellow's nest.
- The Duck-Billed Double-Talker - A bird who really never made clear what authority he meant to delegate.
- The Golden-Crowned Mourning Dove - A bird who mourns the lack of people he can trust with decisions, yet who won't let his subordinates decide anything.
- The Black and White Organisation Creeper - The bird who delegates authority and then creeps around the structure to lower-level subordinates and thereby nullifies the delegation.
- The Red-Headed Firefighter - Who thinks he is delegating authority when he has his subordinates check with him before making even the most minor decisions.
- The Lion-Kicking Vulture - The boss who sits back and waits for his subordinates to make important mistakes and then kicks these 'dead lions' with great gusto and bravado.

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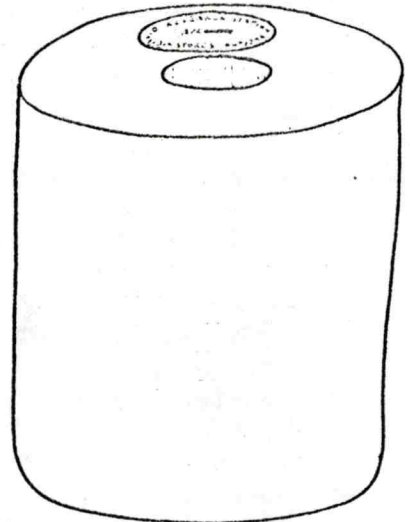
LETTER TO THE EDITOR

Sir,

I was surprised today to put my hand on a roll of paper with the inscription "Radio Research Station Stores" and dated "APR".

I understand that there has been some hoarding during the present shortage, but this would seem to have been a relic of an earlier crisis.

Fortunately there was no deterioration of the product, or at least no outright failure.



Yours etc.  
(Name and address supplied)

List of Reprints - April 1974

- B.C. Fawcett  
R.W. Hayes                      The Classification of Transitions between levels  
of Principal Quantum Numbers 2 and 3 in S X to XIV  
and of Isoelectronic Spectra in P,C1 and Ar.  
Physica Scripta Vol.8 1973. 244-248
- M.R. Bowman  
L. Thomas                      A Numerical Study of Oxygen-Hydrogen Constituents  
in the Mesosphere and Thermosphere - Effect of changing  
chemical rate Co-efficients. J.A.T.P. 1974 657-665
- H. Rishbeth  
W.B. Hanson                    A Comment On Plasma 'Pile Up' in the F. Region  
J.A.T.P. 1974 703-706
- E.W.V. Acton                    Some Aspects of the Management of the Science  
Research Councils space activities.  
Journal of Interplanetary Society Vol.27 1974 343-348

INTERNAL MEMORANDA

NIL

LETTER TO THE OUTSTATIONS

Dear Colleagues,

The sun's return, May Day, rites of spring and all that carry-on has seen many of us creeping back to our country cabins after winter's exile in temporary lodgings. The nine holy weeks of electrostation were duly observed. Now current flows again. We are back in the huts with the heaters on.

Doubtless implementing the principle of avoiding reaction by continuous revolution, much relocation is taking place throughout the laboratory. Desks and filing cabinets are observed in an apparently brownian motion. This state, though tedious to the furniture's owners, can be rewarding to the historian when some long-forgotten fragment is unearthed by the general turbulence.

The twin themes of history and unearthing seem to have been carried over to the grounds hard by the Old Buildings. Earth plots have been parcelled off with pegs and string, here and there crumbling pillars and foundations are revealed as groups of diggers worry away at the topsoil. What's going on? A Gold/Oil rush? No; Archaeologists then; seeking more light upon those very odd domestic habits of our former Roman overlords?

This seemed most likely until, being present at the discovery of a sizable chunk of wall footings or whatever, I found their appearance greeted by an oath, indeed several. This brickwork was, it seems, an impediment to the progress of agriculture. Some of us have come over all atavistic and allotments are now all the go. No doubt rising prices, crises and global gloom have all played their part in this return to the peasant economy.

In the face of dwindling resources and being particularly mindful of the probable return to favour of the horse, there are those who have seen fit to cultivate their garden come what may. This philosophy is, it is to be hoped, as much a comfort to its practitioners as is the sight of all that effort to idlers such as,

Yours sincerely,

The Editor