

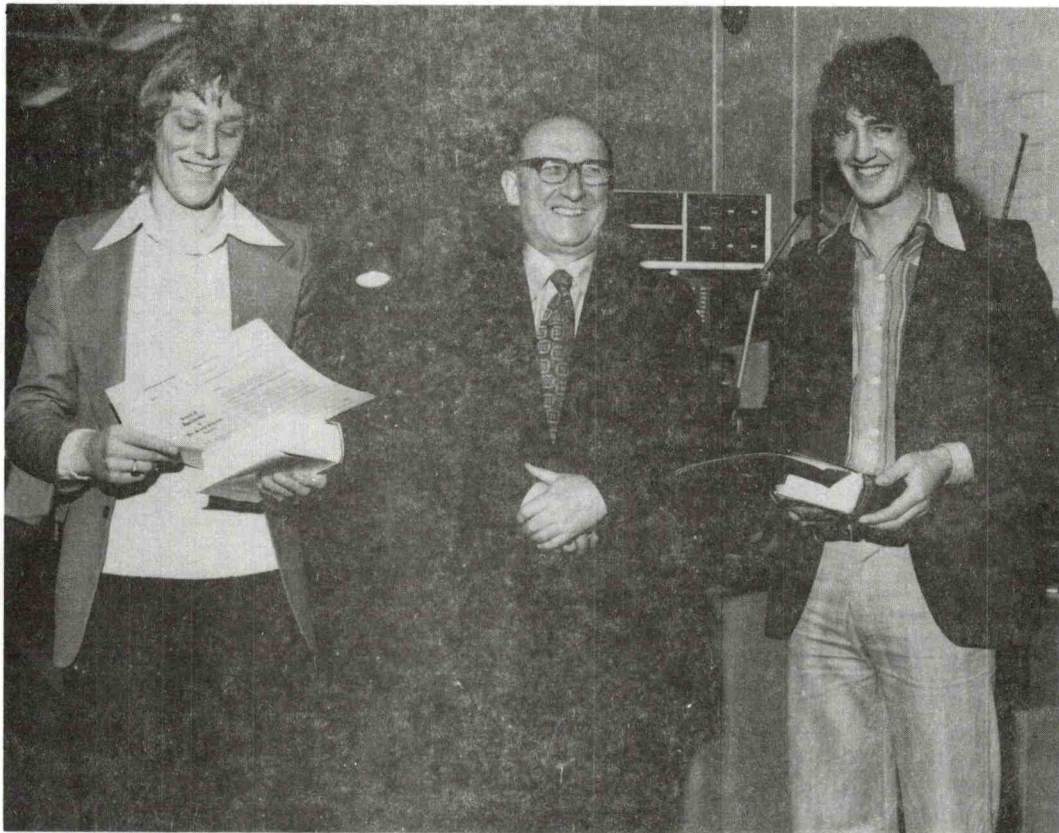
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# APPLETON LABORATORY NEWSLETTER

No. 164

January, 1975



Terry Adams and Joe Bains recently completed their apprenticeship. In company with the Director, they are shown enjoying the ceremony marking this important moment in their careers.

South Uist goes international  
(or how 100 and 150 became one)

The measured tones of the ground controller announced over the intercom to all stations, "Gentlemen you may be interested to know that we have just launched the 100th Petrel rocket from South Uist". That was at 1117 on November 29th, and the rocket carried the first German built experiment in the British programme. It was also the first use of IRIG FM/FM telemetry at South Uist, with the German team providing their own flight and ground telemetry, made "in haus" also for the first time at any range. Their experiment was a mass-spectrometer to measure the positive ion and neutral composition of the D region of the ionosphere. At that height the gas pressure is still too high for the operation of their mass-spectrometer so the instrument has to be enclosed in a vacuum pumped chamber with a small sampling hole. The pumping was achieved by condensing the gas on surfaces cooled to 4°K (-452°F) by liquid helium.

This was another first. Never before had liquid helium been brought to South Uist, and many now hope never again. Its successful arrival was an achievement quite comparable to that of launching the rocket. Passenger airlines may not touch it. The danger arises from the possibility of icing up of the dewar vents which would cause pressure build-up as the helium boils. This was emphasised during the campaign by the explosion of a dewar of liquid helium at Harwell - not one of ours fortunately. A specially chartered flight could not bring our two dewars because they were too bulky, until after much negotiation, the packing was stripped and they were just squeezed into the aircraft.

The danger of cold feet or worse did not prevent a successful launching from which useful mass spectra were obtained to the gratification of our colleagues from Heidelberg.

On the same day, within two hours, two further Petrels were launched with payloads from the Appleton Laboratory to measure atomic oxygen, and from Aberystwyth, to measure electron density and also atomic oxygen by an alternative technique.

Three days later we heard over the intercom that we had just witnessed the 150th Petrel to be launched by the SRC. First reactions were that a scoring rate of 50 in three days was reminiscent of England's efforts not far from Woomera, and was treated with incredulity. However the SRC launches Petrels from other places besides South Uist, so the two statistics were not incompatible. This flight was also carrying a mass-spectrometer, but it was BRITISH, from MSSL, cleverly designed to need no vacuum pumping. All went well.

The Hebridean winter games were not yet over. We had four payloads to launch in one night. We might need more liquid helium for the second German mass-spectrometer. The empty dewar began a farcical journey lasting 4 days pursued by the Army, the man from Air Products and a man from the Met Office, rejected by handlers at Glasgow Airport, even when it was empty, and remotely controlled by literally hours of telephone calls from the Range. It finally arrived by sea in force 8 gusting 9 gales on the same day as we launched the rockets, using the last of the back-up supply. So it all got poured away in the end.

We were all ready to launch on the Friday night when we heard that Thursday's gales, only 45 knots at South Uist, had been blowing 120 knots on St Kilda, and the hurricane had blown something like the side of a hut through the radar dome exposing waveguides and personnel to the rain and Britain's sea defences to attack. This made it difficult for the Army, but they fixed a temporary repair and we stood by to launch. There was also a search and rescue operation going

on, off Harris, for the survivors of a foundered trawler. This was started by a hoax Mayday call which was was not funny for the fishermen, lifeboatmen and aircrew searching in 200 yards visibility for 24 hours, nor for us as the Range was closed during the futile operation all Friday night.

As a concession the Army let us launch on the Saturday night, December 7th. We launched all four rockets, including one from Belfast to measure airglow, within  $2\frac{1}{4}$  hours. The last one went literally two seconds before the last permitted launch time, so that the sanctity of the Sabbath was preserved. That really matters on South Uist.

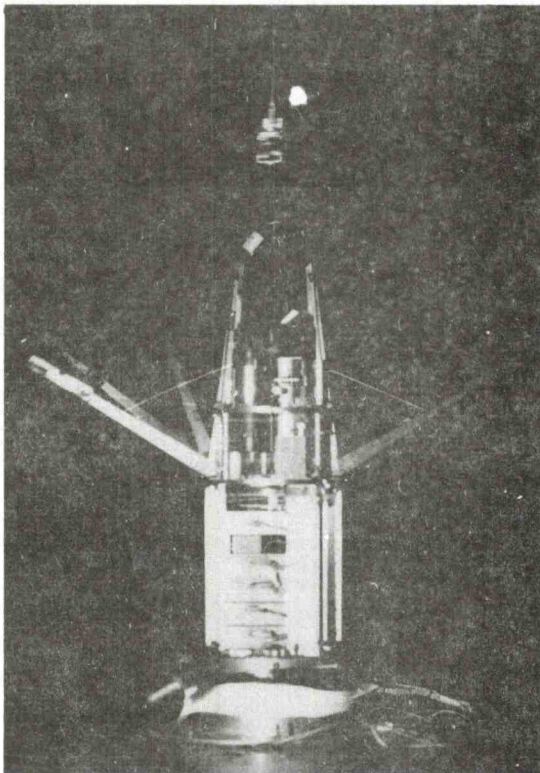
Afterwards it was noticed that a boost carriage from one of the flights had landed on, and neatly severed the ground telemetry leads from the aerials to the German receivers, fortunately after their flight was over. This was yet another first, as no boost carriage ever damaged any installations before.

As a finishing touch there was the strike of the airport firemen so that no one could get off the island at the end of the campaign.

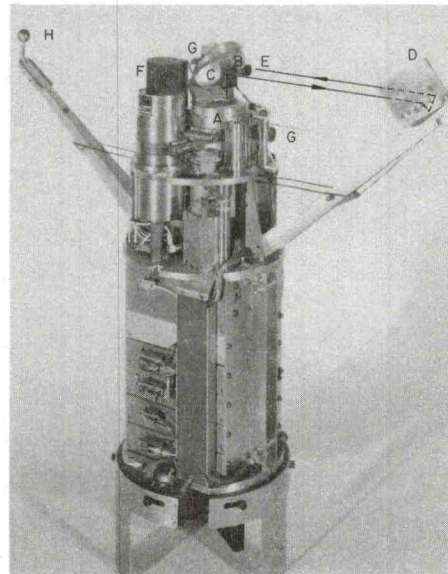
Meanwhile someone appears to have demanded a recount and it seems that not the first but the second flight of the German mass-spectrometer was the 100th Petrel to be launched from South Uist and it was also the 150th Petrel to be launched by the SRC. So  $100 = 150$ .

That was the one that had the nose cone failure ..... the only flight of the campaign that gave no useful results ..... schade.

P.H.G. Dickinson.



A Payload undergoing environmental tests.



- A Resonance lamp radiating at 130nm
- B Concave cylindrical mirror
- C Reflection of lamp window in mirror
- D Corner reflector
- E Ion chamber and collimator (part hidden)
- F Photomultiplier to detect resonance fluorescence
- G Two flux-gate magnetometer attitude sensors
- H Langmuir probe

Optical path for the absorption experiment is A B D E

A Petrel Payload for the measurement of Atomic Oxygen concentration.

CUTS BY THE SCORE

(Organisation and method research is carried out to improve the efficiency of working of groups of people. The following are extracts from a report by O.&M. after a visit to the Royal Festival Hall).

For considerable periods the four oboe players had nothing to do. Their numbers should be reduced, and the work spread more evenly over the whole concert, thus eliminating peaks of activity.

All the twelve first violins were playing identical notes. This seems unnecessary multiplication. The staff of this section should be drastically cut; if a large volume of sound is required, it could be obtained by means of electronic amplifiers.

Much effort was absorbed in the playing of demisemiquavers. This seems an excessive refinement. It is recommended that all notes should be rounded up to the nearest semiquaver. If this were done it would be possible to use trainees and lower grade operatives more extensively.

There seems to be too much repetition of some musical passages. Scores should be drastically pruned. No useful purpose is served by repeating on the horns a passage which has already been handled by the strings. It is estimated that if all redundant passages were eliminated the whole concert time of two hours could be reduced to twenty minutes, and there would be no need for an interval.

The Conductor agrees generally with these recommendations, but expresses the opinion that there might be some falling-off in box-office receipts. In that unlikely event it should be possible to close sections of the auditorium entirely, with a consequential saving of overhead expenses -- lighting, attendants, etc.

If the worst came to the worst, the whole thing could be abandoned and the public could go to the Albert Hall instead.

With apologies to .....

NPL News  
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17(1969)

ANON

STAFF NEWS

Congratulations to:

Serge and Georgette Volonte on the birth of their Son, Pierre-Yves on 3rd January. \*

Jim Lang on his engagement to Susie Reid \*

John Adam on gaining his Ph.D. \*

Ray Turner now P.T.O. I. \*

Barbara Dorman now Sen.Mach.Op.

Mary Thrift now Typist I. p/t.

\* With acknowledgements to ARD News.

Welcome to:

K. Ayres	A.S.O.
H. M. Shah	H.S.O.
H. A. Cook	Cfn. I.
P. P. Clarke	S/S. Lab.

Resignations and Retirements

D. Wright	S.O.
Mrs. J. Taylor	Photop. I. p/t.
M. W. V. Haq	H.S.O.
W. Parker	S.C.S.
Mrs. M. Harris	S.O.
Mrs. E. M. Watson	Cleaner p/t
Mrs. E. M. Belcher	Cleaner p/t

RETIREMENT OF MRS. E. M. BELCHER

Mrs. E. M. Belcher retired from her work at the Laboratory on Friday, 10th January, after more than twenty five years' service. At an informal leave-taking ceremony attended by the Director and many of the Staff, she was presented with a rose bowl as a token of our good wishes. All of us, particularly those who remember her as a familiar figure from Radio Research days in the Old Building, will miss her help and thoughtfulness.

May she have a long and happy retirement.

STATION NEWS

The Laboratory Committee will be meeting here on Thursday, 30th January.

On Tuesday 4th and Wednesday 5th February, a meeting of the Astronomy II Committee of the Astronomy Space and Radio Board of the S.R.C. will take place at Slough. Examples of some of the Laboratory's work will be on show to the committee on the Tuesday.

A one-day colloquium on millimetre and sub-millimetre wave spectroscopy of the atmosphere will be held at the Appleton Laboratory on 19th February. The meeting is being organised in association with the Spectroscopy Group of the Institute of Physics. The main topics to be covered are measurements of spectra of atmospheric constituents by field and laboratory techniques, the implications of the results in relation to theory, and recent developments in experimental technique.

Dr. Bramley visited Moscow at the end of November to attend a Symposium on Beacon Satellite Investigations, held at IZMIRAN, the Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation of the USSR Academy of Sciences.

An Appleton Laboratory one-day colloquium entitled 'Some Aspects of Satellite Control and Data Processing' will be held at Culham on Tuesday, 25 February, in the Lecture Theatre. This is being organised by Dr. B.R. Martin and is open to all members of staff subject to the agreement of their Group Leaders. Mr. G.I. Janes is making arrangements at Culham.

FALKLAND ISLAND NEWS

Old Falkland hands will be sorry to learn of the sudden death, at his home in Sussex, of Capt. F.W. White, O.B.E., one of the Elder Brethren of Trinity House. Until his retirement some years ago, he had been master of R.M.S. Darwin and her predecessor the Fitzroy.

A seaman of great experience, particularly in South Atlantic waters, 'Freddie' White was a lively and generous host who will long be remembered by many now that he has joined those others of the past who are the Islands' history.

SPORTS & SOCIAL CLUB NEWS

The Christmas Dance and Children's Party

The month of festivities, upon us once more, saw feverish activity among the members of the S.S.C. committee, making preparations for the major events in our social year - the Christmas Dance, when all and sundry show a pretty leg cavorting around the dance floor, and the Children's Party, otherwise known as "Parents' Shopping Day". Both functions took place relatively uneventfully, although the band was half-an-hour late, and there were not too many fights at the party. I hope all those who attended enjoyed themselves.

I would like to express the sincere thanks of the committee to Mrs. Loudonsack for her magnificent effort in preparing the food for the dance, and to Peter Hicks and Ernie Coles for their assistance at the children's party, and to all those others too numerous to mention, who gave their time and energy in helping with the preparations and running of these events.

CHRIS GIBBIN

LETTER TO THE OUTSTATIONS

Dear Colleagues,

I write this amid the tropic heat of a January afternoon - well, it's all of 10°C, anyhow, which isn't too bad for the time of year. What with that and the almond blossom, (In my book anything that blooms early on a tree of moderate size is almond blossom) last month's junketings seem light years away, separated from current events by the broad stream of annual leave.

However, some fragments have crossed this stream and lie stranded on the bank, waiting. Notes, reminders and such like, written by me in the twilight of '74 for the new, vital, alert, me of New Year's Day.

Alas, in their crossing they have suffered a sea-change and are at once incomprehensible and incomplete. What, for instance, am I to make of 'Sort out B's stuff' 'Check Gino' 'What about May'. What indeed. Gino - masculine in gender can wait; but B? What frightful chaos must he/she be in, that even I can confer some degree of order? As for May - a possible date or a possible Date? Time and the telephone will doubtless reveal all (If they don't ring they don't care).

Still, on second thoughts, it might be just as well to be active in the matter of Gino. He may be a Mafioso and one doesn't want to appear unco-operative even at such a humble level as,

Yours sincerely,

THE EDITOR.

REPRINTS JANUARY 1975

A 1095  
J.E.ALLNUTT  
J.E.HALL

Site-diversity advantage for Satellite communication  
at 11 GHz.

Electromo Letters 1974  
Vol 10 No. 25/26.

A 1121  
A.H.GABRIEL

A magnetic model of the chromosphere - Corona transition  
region

Chromospheric Fine Structure  
1974 295-298  
(Ed. R.Grant Athay). pub.IAU

INTERNAL MEMORANDA

N I L