



APPLETON LABORATORY NEWSLETTER

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PROBLEMS OF STAFF DEPLOYMENT

As our present role in the overall programme of the SRC develops it is becoming increasingly evident that the deployment of staff at the Laboratory will from time to time present considerable problems. The difficulties arise mainly from the fluctuating requirements of our University support activities, primarily in the field of space science, coupled with the fact that such programmes nearly always operate within a closely defined time-scale. For the Laboratory's future well-being it is essential that we should not fail to carry out this part of our work efficiently and well.

It is equally essential that we should maintain a good programme of scientific research, whether the work be entirely in-house or in collaboration with University groups. Only in this way can we have a healthy and interesting Laboratory and at the same time maintain the expertise required for our other responsibilities. It is therefore my intention to strive to maintain a reasonable balance between our research and other activities.

However it has to be admitted that some research projects do not have the pressing urgency for completion in a fixed time as does most of our support work. This being so and given that, in the present national economic climate, pressures on SRC resources are likely to continue to be severe for some time ahead, it is unrealistic to expect Appleton Laboratory manpower and resources to be varied significantly to meet changes in the nature of our workload, and certainly so for short-term purposes.

Within limits, therefore, steps may have to be taken from time to time to reinforce the space science management and other support-work at the temporary expense of research projects which would not suffer too seriously from a slower rate of progress. There will be times when demands on our support services will decrease and correspondingly more effort will then be devoted to the research programme.

I do not foresee drastic oscillations in our staff deployment from now on and have no wish to give the impression by this statement that we are in any danger of having an overall research programme too small to be viable in the long term. However, staffing problems of the nature discussed above are bound to occur from time to time. I therefore hope that, in the best interests of the continued prosperity of Appleton Laboratory, staff will be prepared willingly to cooperate with me in changes I may find it necessary on occasion to make in the deployment of effort.

J. A. Saxton

SOME NOTES ON THE UK5 PROGRAMME

The Spacecraft's Journey To The Launch Site

At the time of writing (Sunday afternoon 1st September) the UK5 spacecraft in its special container plus the 20 x 8 x 8 (ft) checkout cabin and all the spares and other equipment should be on its way from Thorney Island to Malta. It is flying in a Transmeridian Skymaster Aircraft - one of the 'Guppy' series based on a CL44 - the only available aircraft capable of taking the checkout cabin, and it is destined for Nairobi. Until a few days ago it was scheduled to land in Mombasa but when the flight plan was filed it was discovered that the unloading areas at Mombasa airport would not take the weight, and a last minute change had to be made. At Nairobi the equipment will clear Customs and will be loaded onto trucks for the 300m journey to Mombasa where it should arrive on Wednesday afternoon. At Mombasa it will be loaded into a lighter which will, during Wednesday night, be towed the 90m up the coast to the San Marco platform.

The sea off the coast of Kenya has been rougher than usual during August but it seems that the monsoon has now ended and weather is improving. During the first few hours of daylight the sea is usually calmer anyway, and it is hoped to unload during this period on Thursday morning.

Personnel Travel

From the Appleton Laboratory Dr. Courtier and myself will be leaving on Saturday 7th on the direct 747 flight to Nairobi which will take about 8½ hours. From there the journey is either directly to Malindi by air or else to Mombasa and then driving the 70m northwards to Malindi. The road to Malindi is quite good although subject to delay on two toll bridges and a ferry. My journey will be broken in Nairobi in order to visit the British High Commission.

The Launch Site

The San Marco range is the only one from which a NASA Scout Rocket can put a spacecraft into an equatorial orbit. If the desired 500 km circular orbit at 2.9° inclination is achieved the X ray sensors in the six experiments will be subjected to the lowest possible exposure to the radiation belts round the earth while ensuring a satellite 'lifetime' of several years and a minimum amount of aerodynamically induced attitude drift.

The range has two platforms about 3 miles out in the Indian Ocean in Ngwana Bay and about 500 metres apart, and a base camp. One platform, the San Marco is a converted mobile harbour 300ft by 90 ft and stands above the sea on its twenty extensible legs. A standard Scout launcher and mobile shelter are mounted on the platform, plus a storage shelter used when the four solid rocket stages are first delivered, and also a clean room where the spacecraft is prepared. The shelters have to be air-conditioned to keep everything at a reasonable temperatures.

The second platform, the Santa Rita, is a converted oil rig platform having 3 main legs, together with 2 smaller platforms mounted on piles. One of the latter houses the diesel generators and the other two, radars used to track the Scout vehicle. The range control centre and vehicle control trailers are on the Santa Rita. During the final countdown, after the shelter has been rolled back and the Scout launcher and vehicle raised from the horizontal to the vertical, the San Marco platform is evacuated and the vehicle is controlled from the trailer on the Santa Rita platform. At this time the Automatic Checkout Equipment in the spacecraft checkout trailer (which will stand next to the clean room on the San Marco platform) and also the spacecraft will be remotely controlled from a trailer on the Santa Rita. Both the spacecraft and vehicle control trailers are of course linked by telephone to the Range Control Centre which is linked to the NASA SCAMA system and the Appleton Laboratory Control Centre through Mombasa/London voice and teleprinter circuits.

The Base Camp is near the village of Ngomeni and about 20m by dirt road from Malindi. Of this 20m about 14 has a reasonable gravelled surface but after turning off this road the rest of the journey is over a narrower road with, in places, a loose sandy surface having many holes and over which it is quite difficult to travel after rain.

Most of the Italian Centra Ricerche Aerospaziali team live at the Base Camp or out on the Santa Rita platform. As well as the living accommodation and canteen the range administrative offices are at the Base Camp together with all the usual paraphernalia of stores, vehicle workshops, generators etc. In addition there is a telemetry station for spacecraft telemetry - that for the vehicle being on Santa Rita.

The UK party is expected to comprise 48 people at the time of launch, about half from the contractors, M.S.D.S., and the rest S.R.C., M.O.D.(PE) and the experimenter's representatives. We will all be resident at one of the four "package tour" type hotels at Malindi and, together with the NASA and LTV representatives, be travelling daily to the Base Camp. Those going to the platforms on the 7.0am boat will have to make an early start.

Travel to the platforms is by motor launch and as few people avail themselves of the very limited covered accommodation the 40 minute journey can be rather dampening. At the platforms, people and small items of equipment are off-loaded using a "Billy Pugh" net suspended from a crane. The net has a solid circular base and rope sides (with gaps) fastened to a top ring. With the motor launch rising and falling to any extent good timing is required to get into or out of the net. Journeys between the platforms or urgent ones to the Base Camp are made by inflatable boats with outboard motors. With only 2 on board plus the Kenyan boatmen the boat is lifted in or out of the water with each end on a cradle, but any other passengers disembark by means of a commando-type landing net on each platform. On these journeys one gets very wet but of course clothes soon dry in the 80° or more ambient temperature.

The Programme at San Marco

After the equipment has been off-loaded onto the San Marco platform the ACE cabin will be moved next to the Clean Room and unpacked and the ACE commissioning will start. We are somewhat worried about the ACE as it has needed repair after several of its moves in the U.K., but we hope to have it operating in about a week. As soon as we are reasonably sure that the ACE has arrived in one piece, the experimenters will arrive and set up their test equipment (also computer controlled) in a room on the Santa Rita platform and will then start checking out their Flight Spare experiments.

In connection with the latter those who assisted with the Thermal Vacuum Testing of the Imperial College Flight Spare experiment at the Laboratory will be pleased to know that this equipment is in fact in the spacecraft and will be the Flight Unit. Thank you again to those who spent many tedious hours in Hut 16 and to those who helped to get and keep the chamber operating.

During the first week other activities such as the mechanical checking of the spacecraft, battery preparation, and preparations for magnetic testing will start. After the ACE is commissioned the spacecraft electrical testing, which will check all the "common user" systems and the experiments in all modes of operation, will commence.

By the time these tests are completed magnetic measurements of the spacecraft will have been made, and spacecraft handling tests using an engineering model structure completed. Also the ACE remote control equipment will have been installed and checked out on the Santa Rita platform. The final spacecraft preparations will include solar cell cleaning, the loading of the propane attitude control gas and leak testing, and the fitting of the flight battery.

After this and about 8 working days before launch the spacecraft will be assembled onto the Scout vehicle, and the final arming of the latter, heat shield installation etc will commence. There will be a Dress Rehearsal 3 days before launch and if all goes to schedule UK5 will lift off between 1050 and 1150 hrs local time on October 15. It should be pointed out however that none of the Ariel launches to date have gone on the date scheduled for a variety of reasons mainly connected with the vehicle, and as there were some problems during the most recent Scout launch additional delays could arise.

The final countdown itself will begin, for those of us out on the platforms with a motor launch journey around midnight. Proceedings will open with a range communication check at T - 10hrs and gradually gather speed until, with all lights green the Scout vehicle is, for the final 30 seconds, controlled by an automatic sequencer. Immediately after launch I will be reporting(via the SCAMA system) the progress of the vehicle as it is detailed in the Range Control Centre until it passes out of the view of the range equipment as orbital flight is achieved just N.W. of the Seychelles Island.

J. F. Smith

NOTE FROM MEASUREMENTS LABORATORY

We are at present engaged on a physical check of inventory items held by individual officers, which we are required by Council Auditors to carry out at least every 2 years. All items of equipment must be accounted for and the cooperation of all staff is requested. All holders of inventory items receive a periodical reminder in the form of a computer print-out to enable them to keep an up-to-date check on their holdings.

D. Howard

STAFF NEWS

Congratulations to:

Ron and Pam Bohlander on the birth of their daughter Elisabeth on 31st July.
Mrs. P.G. Willmott now Typ.I p/t
Mrs. G.H. Lawder " Mach.Op.p/t
G.W. Ackland " P.T.O. 1.

Welcome to:

C.J. Walters H.S.O.
G.D. Ludbrook S.O.
J.S. Wright S.O.
Miss B. Okolotowicz Vac. Wkr.
D.G. Cox " "
T.H. Lim " "
A.J. Knight " "
K. Kirkaldy " "
E.R. Prevost S.C.S.
M.E. Sparkes "
G.R. Daniels "
R.J. Watts Driver

Transferred from Atlas
Culham

Resignations

K.F. Tapping	H.S.O.
A.D. Smith	S.S.O.
Mrs. C.E. Winkless	S.O.
L.G. Peardon	S.C.S.
Miss M. Fawcett	Vac. Worker
F.J. Williamson	Cfn.I. retd.
R.H. Elston	Cfn.II (Driver) retd.
G. Sinden	P.T.O. IV End of ESRO contract
D.W. Hardy	S.O. End of ESRO contract
Miss D.Pole Evans	Clk/Typ. (F.I.) End of ESRO contract
J.H.M. Bailey	H.S.O. " " " "
J. Ford	Local Recrt.(F.I.) End of ESRO contract
P. Morrison	Dvr./Mech. End of ESRO contract

Other Changes

G.M. Johnston	S.S.O. Transferred to A.L. complement in F.I. (Changed from Div.I to Div.IV)
A.F. Smith	H.S.O. From Div.I to Div.IV
G.W. Luscombe	P.S.O. From Div.I G3 to Div.III G.4.
J.A. Crawford	S.O. Seconded to U.C.L.

RETIREMENT OF MR. R.H. ELSTON

Mr. Richard Elston recently retired from duties at the Laboratory. That rather formal statement derived from the still bleaker form of staff returns scarcely does justice to the situation. The short exchange 'Dick's retired'.. 'I don't believe it' sums up far better our reaction to the departure of another stalwart from the Ditton Park scene.

This feeling of shock at change in what appeared changeless must have been produced at the end of his first career, for, in point of fact, Dick joined the staff of Ditton Park after having completed thirty years with the Electricity Supply Industry. All-in-all a total of well over half a century of Public Service, which included some eighteen years as a part-time member of the National Fire Service.

Just over a year ago his efforts were acknowledged by the award of the British Empire Medal, an honour well deserved.

His retirement day was marked by a ceremony at which the Deputy Director conveyed our good wishes in forms both verbal and tangible and in addition handed over a fine picture of the Laboratory by Ron Halton.

We wish him many happy years of retirement.

SPORTS AND SOCIAL CLUB NEWS

ACO EVENING

The summer season sees many of the inhabitants of Ditton Park on their annual pilgrimages towards the sun, leaving behind only the more stalwart to participate in the second leg of Ditton's own olympics - the return match with ACO. The opposition seemed, however, to suffer more than we from this affliction of disappearing to all points of the compass.

Nevertheless, after a degree of frantic telephoning, a cricket match was arranged, tennis and badminton matches took place, table tennis, billiards and darts were played, followed by the eating of food and drinking of ale, that all go to make a very convivial evening with those from across the moat.

I would like to thank all those who took part in the sports, and who helped in the bar and with the food. Special thanks also to Peter and Marion Davies for their welcome assistance in clearing up at the close not only of the ACO evening, but also of Gail and Lloyd's thrash.

Chris Gibbins

LETTER TO THE OUTSTATIONS

Dear Colleagues

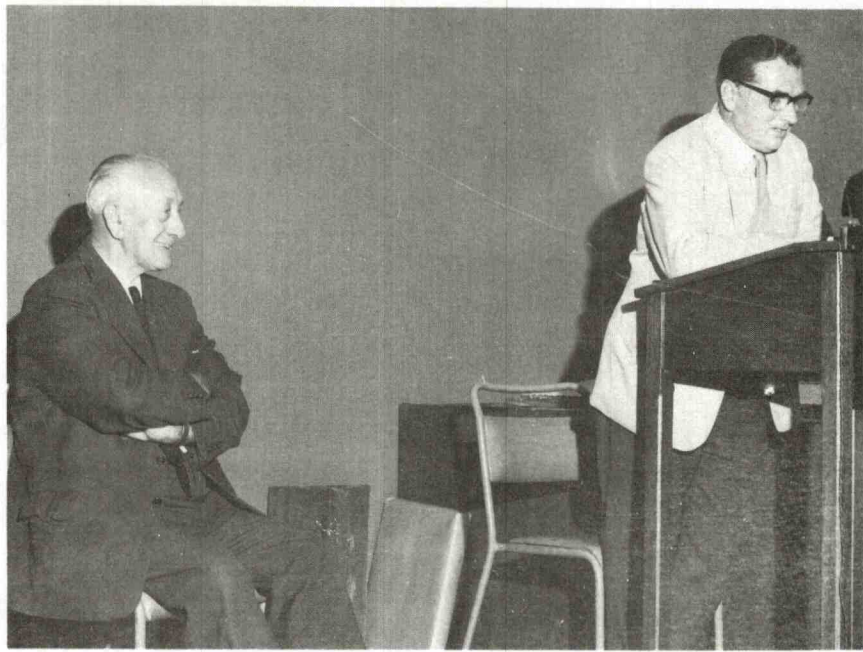
The biggest flute in Northern Europe, or perhaps a sculpture, destined for the Director's Lawn and bearing some such title as 'Interactions in Spatial Dimensions'. It came to mind that either, or indeed both, of these purposes might be fulfilled by the fascinating array of steel pipes, flanges, tapers (geometrical not combustible) and other more or less hydraulic-looking mysteries first seen outside the boiler house some weeks ago.

These things, were moreover, not static. Far from passively providing stimulus in the out-worn aesthetic of a mere Michaelangelo, they were ever-changing, adapting, varying. It was really more of a happening with mobiles. Welders welded and, I'm sure, reamers reamed whilst elsewhere things were, without doubt, being drilled bored and countersunk. It was the future being shaped. This future holds contented Staff, screened from Winter's rages, wrapped in an ambience controlled by limits no doubt subtly defined in Regulations. They are lapped by warmth sufficient for comfort yet not such as to induce sloth. New boilers and things have been installed and will soon be ready.

Such matters are part and parcel of the life cycle of any large establishment, but what really governs the decision to re-equip? The Laboratory has lately seen some interesting work undertaken in looking for long-term relations between phenomena on high and the murky swirl of weather here below. The matter is healthily controversial. Has it already gained the acceptance of hard-bitten 'works' types? That were a victory indeed; or have the heating engineers, from their own ancient mysteries, divined frost fairs and white Christmases.

Anyway, all the stuff bids fair to be installed by the time it's really needed. To forecast a good supply of light and fuel is something other. Even those who have scaled the topmost heights of Staff College courses would surely shrink from such a task. Still, it should perhaps be revealed that there are two spare candles and a home made candlestick in the desk drawer of,

Yours sincerely
The Editor



Presentations and good wishes from colleagues at Dick Elston's retirement ceremony.

List of Reprints - August 1974

C.R. Negus	Grazing-Incidence mirror system for use with a Grating Spectrometer in the extreme Ultraviolet	Applied Optics Vol. 13 1974	1974	1216
A.1004 L. Thomas M.R. Bowman	Changes in concentration of oxygen and hydrogen constituents in the mesosphere during an eclipse	J.A.T.P.	1974	1421- 1426
A.1021 L. Thomas M.R. Bowman	A theoretical study of negative-ion changes in the D-region during an eclipse	J.A.T.P.	1974	1411- 1420
A.1019 G.N. Taylor P.H. McPherson	Diurnal and seasonal variations of exospheric heat flux at a mid-latitude station	J.A.T.P.	1974	1135- 1146
A.987 G.M. Courtier D.A. Bryant	Electron precipitation in a non-uniform glow aurora	Planet. Space Sci.	1974	1067- Vol. 1074 22

INTERNAL MEMORANDA - NIL

<u>363</u>	K.F. Tapping G.R. Kennedy	A new method for intensity modulation of oscilloscope displays
<u>364</u>	R.F. Turner	Vibration Testing Practice for ARD Skylark Rocket Payload. (Raven V1 + Goldfinch)