



NEWSLETTER

No. 126

November 1971

JOURNEY TO A DESERT ISLAND

Few of us working on radiometeorology have ever had the opportunity of seeing at first hand the remarkable and persistent effects of atmospheric refraction in the tropics. Here in the U.K. such effects occur so rarely that we have coined the expression "anomalous propagation". This term is familiar to all radar people as "anaprop", and is applied mainly to echoes obtained from the ground when the weather conditions are right at ranges well beyond the horizon. Unfortunately a kind of mystique has grown up about anaprop amongst radar operators, which is not altogether surprising when one hears (as we do, through our maritime contacts) of the strange pictures which appear on ships' radar screens in the tropics. For example, coastlines where none actually exist, or ghostly mantles shimmering at a menacingly close distance to the ship and apparently moving with it, yet invisible to the naked eye. We usually find we can explain such things in terms of the troposphere as we think we know it, but sometimes with an uneasy feeling that maybe there is more to the matter since we have to admit to ourselves that adequate air-data are often lacking.

For some time past, however, there have been persistent and recurring rumours from several apparently unconnected sources of a phenomenon which we have been unable to explain quantitatively. This is the loss on radar displays of aircraft subtending high angles of elevation, allegedly due to atmospheric absorption or ducting during conditions of anomalous propagation, and particularly

in the tropics. The expression "high angles of elevation" means, in tropospheric terms, angles higher than about one degree. These rumours could not be convincingly dispelled by the application of cold arithmetic, so we thought we had better investigate at first hand. There were certainly some interesting features to the cases, and from what has already been said it can be imagined that we were not entirely averse to having a quick look at anomalous propagation in the tropics for ourselves.

The R.A.F. put at our disposal for a week or so a 10-cm radar on the airfield at Masirah, which is a small hot desert island off the Arabian coast, near the mouth of the Persian Gulf. We were told that this radar was bedevilled by anaprop and would make a good subject for our exorcisms. What is more, the R.A.F. would be only too pleased to assist in our ministrations. The practical object of the exercise was threefold. First, to use the radar to measure the apparent echoing area of standard radar targets as they were raised by radiosonde balloons released from some distant point on the island, thereby enabling any variation of radar performance with angle of elevation to be assessed. Secondly, to study and measure the cluttering-up of the radar display produced by echoes from the ground or sea during conditions of anaprop, and thirdly, of course, to make any recommendations which we as wave-propagation specialists might think to be of use. The exercise turned out to be a highly concentrated affair involving not only R.A.F. personnel but also the Meteorological Office staff at Masirah, and not much sleep was had because the anaprop turned up mainly at night. Some interesting results were obtained and (we hope) useful recommendations made. We established that, by and large, the tropical atmosphere seemed to obey fundamental principles, at least while we looked at it, and we learnt a lot about the characteristics of clutter and practical radar in the process.

The journey was also interesting to us personally because it was the first time we had been passengers of the R.A.F. Air Support Command. The first leg of the trip, from Brize Norton to Cyprus, was made uneventfully enough in a Britannia. It was a trifle odd seeing the front three-quarters of the aircraft filled by cargo, and rear-facing seats for the passengers. The steward and meal service arrangements were familiar, however, but alcohol is evidently considered unsuitable for service personnel. It was surprising, to us at any rate, to find that R.A.F. Brize Norton has comfortable departure lounges like its civil counterparts, complete with soothing background music. But this illusion of comfort was rapidly dispelled on the second leg of the journey as we clambered aboard a Hercules paratrooper for the overnight flight down the Gulf to Masirah. The centre of the aircraft was filled with a mountain of crates and we were expected to find what space we could down the sides. The more knowledgeable passengers

had brought ear-muffs with them against the terrible resonant rattles generated by the Hercules' turboprops. However, the crew made us as comfortable as they could and handed out goodies from time to time, which were passed down the line: we shall long cherish the memory of the quartermaster's individual food-boxes, each containing some fifteen items ranging from an orange through a sausage to a packet of chewing gum. We flew over Persepolis just before the celebrations took place there without seeing any sign of the visitors' tents, possibly because the sun was only just rising, but as a compensation we got a good view of the cradle of civilisation over the pilot's shoulder.

Masirah itself turned out to be much as expected: a hot flat sandy place with outcrops of rocky hills, but no trees and little shade. It has been an air staging post since the days of Imperial Airways in the early thirties, and is leased to Britain by the friendly Sultan of Oman - but with strings attached. With the U.K. evacuation of Bahrein the R.A.F. Station is being built up and is very overcrowded. The R.A.F. tour of duty is an "unaccompanied" posting of nine months, which, with little to do, and the heat, and the sandy monsoon winds, and gin at 50p a bottle, is probably quite long enough. Masirah is an interesting place to the naturalist and fisherman: the heavy dew and very occasional rain enable a few hardy plants to grow, which possibly provide food for the camels we saw being chased off the runway by a fire-engine, although the donkeys, we were told, would eat nothing but cardboard. However, on the whole we were glad to escape after five days of dormitory accommodation and ablution blocks, even though it meant facing the traumatic return flight to Cyprus in the Hercules. We were able to snatch a little sleep between Cyprus and Brize Norton on the comfortable family trooping plane - the R.A.F. children were much better behaved than children usually are on long flights. Perhaps that duty-free gin was put surreptitiously to good use.

R. W. Meadows

STATION NEWS

As part of investigations into the D-region winter anomaly state, Dr. J. E. Hall's group propose to launch six petrel rockets from South Uist during December and January.

The experiments are to make daytime measurements of electron density, collision frequency, U-V radiation in the Lyman- α line and X-radiation. It is hoped to be able to launch rockets in conditions of both high and low absorption.

Staff News

Congratulations to:

Henry and Pril. Rishbeth on the birth of their daughter Clare Margaret
on 30 November

Janet Roy and Charles Adams on their marriage

Mrs. L. M. Brindle, now Machine Operator P/T

Welcome to:

A. D. Smith	S.O.
R. W. Whittington	Tech. III
P. Springate	S.A.
M. D. Ivory	S.A.
T. E. Cooper	Craftsman I

Resignations

I. J. Brothers A.E.O.

Other Changes

P. M. Gondhalekar	S.O. Working at ARU Culham
C. Murphy	Tech. III Left Singapore for U.K.
R. J. Powell	E.O. Made permanent
M. E. Farman	E.O. " "
R. G. Mills	E.O. (Temp. Act.) Promoted from A.E.O. and made Ops Supervisor RSRS Station F.Is. w.e.f. 18.10.71

E.S.R.O.

T. P. W. Winteringham A.E.O. Left U.K. for Falkland Islands

Sports and Social Club News

Bonfire Night 1971

Our annual celebration in honour of Master Fawke's misdemeanours took place this year on the night of Friday the 5th November. As mentioned elsewhere in last month's newsletter, it was sad to some to see the passing of the old masts from North Park. However, I am sure that most will agree that they did add some spark to the occasion!

The extremely heavy rain threatened to mar the occasion in the early part of the evening but fortunately, at least for spectators, our trusty band of bonfire - and firework - set - piece - assemblers were the only people who received a drenching. When the time came to light the fire the weather was fine and dry and everything, even soaking wet fireworks, went off without a hitch. The evening was rounded off with the customary hot-dogs and coffee and the bar was open for "socializing" afterwards.

I should like to thank all those who helped to make the evening a success and especially those who volunteered to use their cars to transport the children who had been invited as Guests. One name I shall also mention in thanks for his excellent arrangement and supervising of the Fireworks, and that is Paul Dickinson.

The Christmas Dance arrangements are already being advertised but I would bring it to members' attention that there will be an informal Christmas Party in the Club premises on Friday 17th December. Tape-recorded music for dancing and refreshments will be provided.

John Cathrew

Table Tennis

A slight improvement in the fortunes of the "A" team can be reported. The score now stands at Played 6, Won 2, Drawn 1, Lost 3. The "B" team is still sweeping all before it. However Windsor Baptists played with sufficient fervour to take R.S.R.S. to a narrow win of 6-4 in a tight struggle.

P. Muzlish (Hon. Sec.)

Car Club

I must apologise to those members of the staff who were unable to obtain anti-freeze. Anyone who wants a 5 gall. drum of oil should place order as soon as possible to catch the next purchase.

P. Muzlish (Hon. Sec.)

The Wine Circle announces

A Grand Christmas Cheese and Wine Party

on Tuesday 21st December from 1245 to 1330 in the Bar

All Staff are welcome

A small charge of 12½p to non-members and 5p to members will be made to cover the cost of the cheese and french bread.

Tickets will be on sale from

Mrs. D. Baldwin

Mrs. E. Thomas

Mrs. K. Shand

and F. Bennett

It would be appreciated if anyone who is willing to donate a bottle or two (the more there are the merrier we all shall be) of home-brewed wine or beer would let F. Bennett know so as to assist in the organisation of this event. Donations of bottles will be accepted at any time and stored until the day.

LETTER TO THE OUTSTATIONS

Dear Colleagues,

In obedience to the dictates of planning, finance, research requirements and what-have-you, projects come and projects go. Unchanging, save for minor variations, one domestic aspect has endured down the years; the tea-trolley with its cheerful acolytes has plied, more regular than the channel packet, up and down the long stretches of the main corridor. Melodious gong or staccato rap of two-bob-bit against the urn has served to rouse us sufficiently to refresh the inner man and brighten the mind with badinage over the buns.

Some variations in this state of affairs has recently been evident; emissary phenomena in the form of pipes and power points appeared. They heralded two rather sleek-slick machines which, their labels proclaim, will produce a variety of beverages, all piping hot, sweetened or not, as desired, do you but press the correct button and, of course, put the right money in the right place.

This type of fluid cornucopia has now offered its wares for some weeks and we have, on the whole, found it a useful thing. After all, hot soup first thing on a cold morning is not to be despised. To what extent this set-up will amend our old customs is not yet manifest, though you may rest assured that the peoples' will shall be given all consideration due to it, whatever steps are taken.

Meantime we have the best of both worlds - hot chocolate etc. at all hours - buns and chat at those appointed times when so many staff may be seen, moving with a speed and purpose above and beyond the call of duty, to take part in a ritual well loved by all, including,

Yours sincerely

The Editor

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List of Reprints

- D. Eccles
J. W. King
H. Kohl and J. R. Pratt
L. Thomas
R. A. Challinor
and D. Eccles
D. L. Croom
D. Eccles
J. W. King and
P. Rothwell
H. Rishbeth
A. J. Gibson
M. C. W. Sandford
- The semi-annual variation in the height of the F2-layer peak
J.A.T.P. Vol. 33, 1641-1646, April 1971
- Oxygen, Hydrogen and Nitrogen constituents in the mesosphere and ionization processes
Mesospheric Models and Related Experiments, 65-77, 1971
- Longitudinal variations of the mid-latitude ionosphere produced by neutral-air winds - I
Neutral-air winds and ionospheric drifts in the northern and southern hemispheres
J.A.T.P. Vol. 33, 363-369, 1971
- Solar Microwave Bursts as Indication of the intensity of Solar Proton emissions
Astrophysical Letters Vol. 7, 133-135, 1971
- Longitudinal variations of the mid-latitude ionosphere produced by neutral-air winds - II, comparisons of the calculated variations of electron concentration with data obtained from the Ariel I and Ariel III Satellites
J.A.T.P. Vol. 33, 371-377, 1971
- Use of F layer theory in ionospheric predictions
Proc. I.E.E. Vol. 118, 1323-1326, 1971
- The seasonal variation of the night-time sodium layer
J.A.T.P. Vol. 33, 1675-1684, 1971

Internal Memoranda

NIL