R. S. R. S. Newsletter

No. 72 April 1967

The Chilbolton Aerial

No member of the staff at Slough can now be unaware of the fact that we have a new station with a large instrument known as a steerable aerial or by one of a variety of other names. The succession of coaches plying between Slough and Chilbolton has enabled enough members of the staff to see the reality to make any description of the installation superfluous here. They will have seen what was on display to the press and a few guests on April 13th, to the participants in the opening ceremony on 14th and to nearly 1100 members of the public who decided on the afternoon of the 15th that the Chilbolton site was as good a place as any to bask in the sunshine.

Perhaps the most inappropriate name which has been used for the installation is a "facility", to use American terminology. The dictionary defines facility as "being without difficulty". Whatever impression may have been given on the opening day itself, those responsible would certainly not describe the days of preparation in these terms; for instance, even up to a few days beforehand no firm could be found who were prepared to erect a marquee on that windy site, and on concrete. Meadows, McGivney and their colleagues have displayed remarkable stamina in using most of the 24 hours provided in each day to ensure that all was well on the day - at least to outward appearances. Mention should also be made of the sterling work of M.P.B.W and A.E.I. in ensuring that we should put on a good show. In the event a good time was had by all, the press accounts were favourable and the Secretary of State said that he enjoyed himself more than he did when watching the G.L.C. election results on television the previous evening. Who could say more?

Now where do we stand. Much remains to be done before the Chilbolton enterprise can be said to be in full swing. The radio equipment now installed is the minimum required to prove that the dish can be used as a radio aerial -

a 3 cm receiver enabled signals to be received from a transmitter all of 14 miles away. Some further mechanical tests need to be made and other receivers are ready for installation. Longer transmission paths will be established, including one of 550 million light years, and radio observations can then begin in earnest. Much of the initial programme is concerned with propagation through the troposphere, but there are also to be ionospheric experiments. Some of the work will have direct application to practical radio problems, including those in satellite communications, while in other instances the connection will be more remote. A major feature of the programme will be that the aerial is not committed to any task of a largely routine nature, and that it will thus be available for a wide variety of projects which will no doubt arise from the fertile imaginations of the present and future staff.

F. Horner

The following summary of the Chilbolton aerial characteristics may be of interest to those unable to visit the site. - Ed.

Mount	:	Alt-Az motion giving full hemispherical coverage on a reinforced concrete tower. No radome.
Usable frequency range	:	Up to 10 GHz
Profile tolerance	:	95% of the reflecting surface within 0.1 inch of the best-fit paraboloid
Tracking speeds	:	Up to 2°/second in azimuth (with wind-speeds up to 45 m.p.h.) Up to 1°/second in elevation (with wind-speeds up to 45 m.p.h.)
Acceleration	:	Up to 2°/sec/sec in azimuth Up to 1°/sec/sec in elevation
Pointing Accuracy	:	2 minutes of arc (with wind-speeds up to 45 m.p.h.)
Position control	:	Manual, tape or autofollow
Diameter of reflector	:	25 metres
Focal length of reflector	:	9 metres
Reflecting surface	:	Aluminium stretch-formed honeycomb-sandwich petals, individually adjustable by screws, with tangential expansion joints to a steel backing structure. Sliding capacity-joints are provided along the edges of adjacent petals.

Measurement of reflector-surface accuracy	:	By a specially-constructed optical range-finder incorporating two fixed-angle pentaprisms of variable known position. The instrument is mounted along the axis of the dish so that the pentaprisms are moved by individual lead-screws along the axis. The instrument can be used in any configuration of the dish.
Reflector backing structure	:	Steel trusses and strong-ring supported by stiff platework associated with each of two large machined elevation drive racks. Great torsional rigidity is obtained by connecting the elevation-drive pinions by a torque tube. Radial expansion joints are provided between the strong-ring and sets of platework.
Elevation mount	:	The elevation drive shaft is supported on a very stiff platform which rotates in azimuth on the top of the concrete tower.
Elevation and Azimuth Drive	:	Electric servo-motors via spur gearing. Roller bearings are provided for the elevation motion and a single ball race for the azimuth.
Feed support	:	Tetrapod consisting of steel tubes meeting at a point beyond the focus-platform.
Feed arrangements	:	Provision for front-feed or Cassegrain. Remote control of horn positioning in three dimensions is provided.
Housing for equipment	:	(i) In concrete tower (ii) In large cabins slung from rotating platform. (iii) In annular cabin at back of apex of paraboloid (for Cassegrain configuration). (iv) In small cabins at the base of two of the feed legs, and behind the surface of the dish. (v) On a platform behind the dish constructed for a theodolite and sky-camera, with a special seat for the operator.

'It's all right, its one of ours!

Landing aeroplanes on the Stanley racecourse is becoming commonplace! One day last week, the cable drums and other obstacles which were placed on the course after the Christmas races in case of further invasion attempts, were rolled aside, the schoolchildren were given a half holiday and there was a flurry of activity in the meteorological office.

In the middle of the afternoon, two bright red and brand new aeroplanes flew in from the south west, circled the town a couple of times and then landed in quick succession on the racecourse. The Government Air Services' new Beaver aeroplanes had arrived, having taken 6 days to make the journey from the de Havilland factory in Canada via Florida, the Bahamas, the west coast of South America and Punta Arenas on the Straits of Magellan. This last section from Punta took only $3\frac{1}{2}$ hours. Perhaps the time is not far off when there will be a regular service from Stanley to the mainland.

Anyway, the wings of the 'planes have already been removed and one of the 'planes was towed across to the seaplane hangar today. Soon the second will join it there, the extra fuel tanks will be removed and the wheels replaced by floats.

They will then be ready to take over from the Beavers at present in service. One of these arrived in the early 1950s and the second was not long after. Since then they have been in almost daily use and are now a well-established and vital part of the life of these islands. May their successors carry on the good work as successfully.

Don Mortimer

Staff News

Congratulations to:

Cliff and Hannah Hale on the birth of their son, Karsten Martin, at Stanley on 4th April.

Veena Dogra and Gurbaksh Singh Bhalla on their marriage on 19th March.

Mike James on his engagement to Maureen Silvey.

Jane Willsher and Martin Pike on their engagement.

David Smith, on his being admitted Ph.D. of the University of London.

Welcome to:

I. A. Parkin	Perm. S.O.
F. W. Stainer	Est. E. O.
G. F. S. Heaney	College based Sandwich Course Student
W. Bellchambers	Est. Assist. Signals Officer
Mrs D. E. M. Blay	Non-Perm. Canteen Assistant, Part time.

Resignations

D. G. Rees	Est. A.E.O. Transferred to G.C.H.Q. Cheltenham
Miss V. Dogra	Non-Perm. Shorthand Typist
Miss M. G. Powell	Temp. A.E.O.
A.J. H. Lucas-Smith	Temp. A.E.O.

Sports and Social Club

A.G.M.

The A.G.M. of the Sports and Social Club will be held in the canteen at 1715 on Thursday 27th April 1967. These meetings last about an hour, and several matters of general interest to club members are usually raised.

Since this will be my last opportunity as club chairman may I thank all the committee members for their efforts during the year, and on their behalf thank all the others on the station who have helped and supported our activities.

Martin Hall

Motor Club

The Motor Rally for the Smith-Rose Cup took the form of a navigation trial held on Sunday 9th April. Contestants spent the afternoon driving through the Chilterns looking for marshalls with some success, but the marshalls were more successful, No. 7 managing to hide so well that no one found him!

The overall winner was Mr. A. Murphy, and the south team beat north by 7 to 4 points. Later everyone met at the Sports Club bar for refreshments. Thanks are due to all those who helped to make the occasion a success.

The club oil scheme is now in operation and the first order for 40 gals. has been distributed. It is hoped to place an order each month and requirements for Snowdrift oils, greases or detergents should be added to the list on the Sports Club notice board. Delivery is quick once the order has been placed and drums are not damaged as had been experienced previously.

Later it is hoped to make arrangements for a tyre scheme and a spare parts discount scheme.

Progress on the club building is improving now better weather is here, and more volunteers are needed to make the project a success - please contact me if you can help.

E. Golton

Chess

There will be a chess evening on Monday May 1st. Play starts at 5.30, sandwiches and tea will be provided.

Albin Zavody

The Smith-Rose Cup

The opinion was voiced at the last A.G.M. of the Sports and Social Club that the current method of dividing the Station into Spurs for the purpose of the Smith-Rose Cup was very artificial. It was decided therefore to return to the older method of division and this year the two teams competing comprised people owing their allegiance to the North or the South of the country. Eight events were held and, although the events were divided equally between the teams, the North team won on a points basis by 43 points to 33. Details were as follows.

Event	North	South	Allocation
Badminton	4	14	2 points per match
Bridge	12	0	12 points to winning team
Car Rally	4	7	1st 5 pts., 2nd 3 pts., 3rd 2 pts., 4th 1 pt.
Chess	8	0	2 pts. per match
Cricket	No competition		
Snooker	9	3	2 pts per match
Table Tennis	6	9	1 pt per match
Tennis	No competition		

Camera Club

John Juleff and Mrs Rix showed slides of Yugoslavia during a recent lunchtime meeting. About thirty black-and-white prints were displayed in the Club's exhibiton in the Dining Hall, after which a meeting was held to discuss the prints.

Henry Rishbeth

Letter to the Outstations

Dear Colleagues,

So now we own a dish· elsewhere in the newsletter you will find what might be called the vital statistics of the apparatus. As one of the party of staff who last week went to look at it, I must own to being impressed, a reaction common to most of the visitors. Parties were carefully shepherded from point to point; a very necessary precaution this, otherwise one might find oneself standing in the wrong place at the wrong time, or marching out of a door on to a non-platform, the required article having moved twenty degrees further round the perimeter.

Within the bowels of the beast things are strongly reminiscent of being on board ship. Motors hum, smells of oil and warm air circulate round rooms and up companionways, and great wheels go, as they say, round and round. This is not to imply that the dish itself moves slowly, far from it; to the outside observer the aerial wheels and turns at an alarmingly swift rate.

Without a doubt the whole thing is impressive even to those who know little enough about such pieces of machinery, less even than,

Yours sincerely,

The Editor

Discussion on Millimetre and Sub-Millimetre Waves

A one-day discussion meeting on the generation, detection and propagation of millimetre and sub-millimetre waves is to be held at R.S.R.S. on May 11th 1967. The meeting will deal with the possible applications of these waves in communications and related research. About 30 visitors are expected.

J. A. Lane
