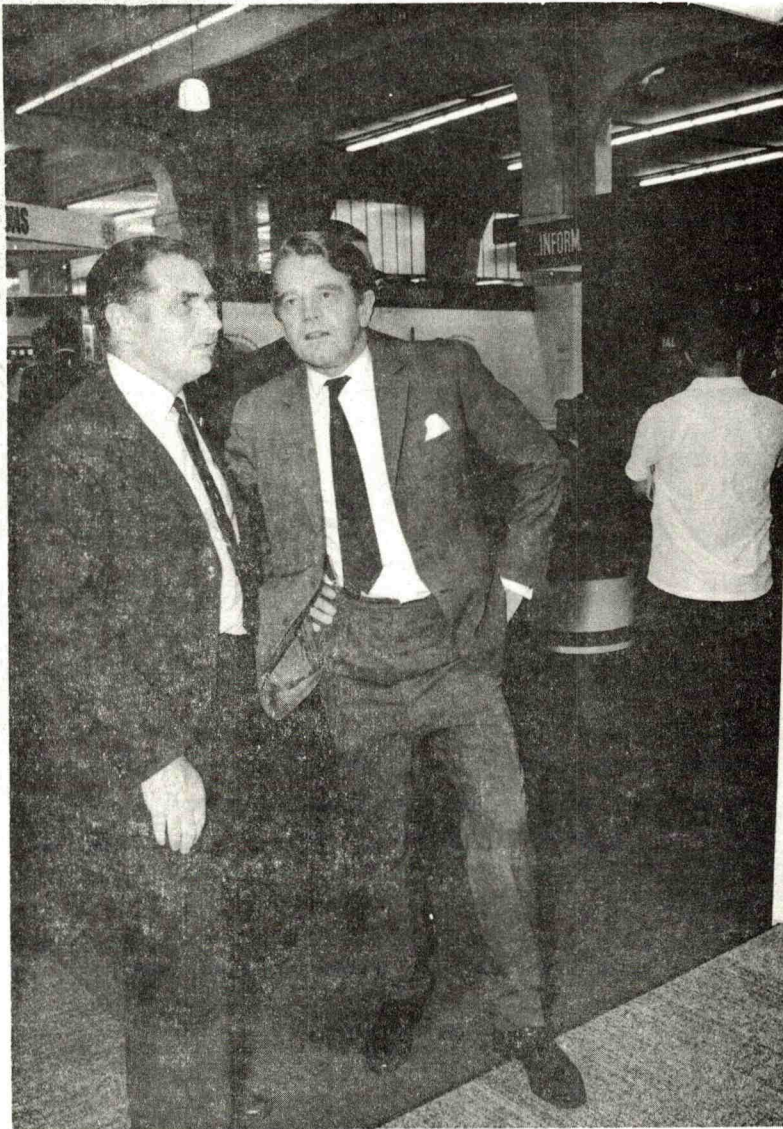


NEWSLETTER

No. 124

September 1971



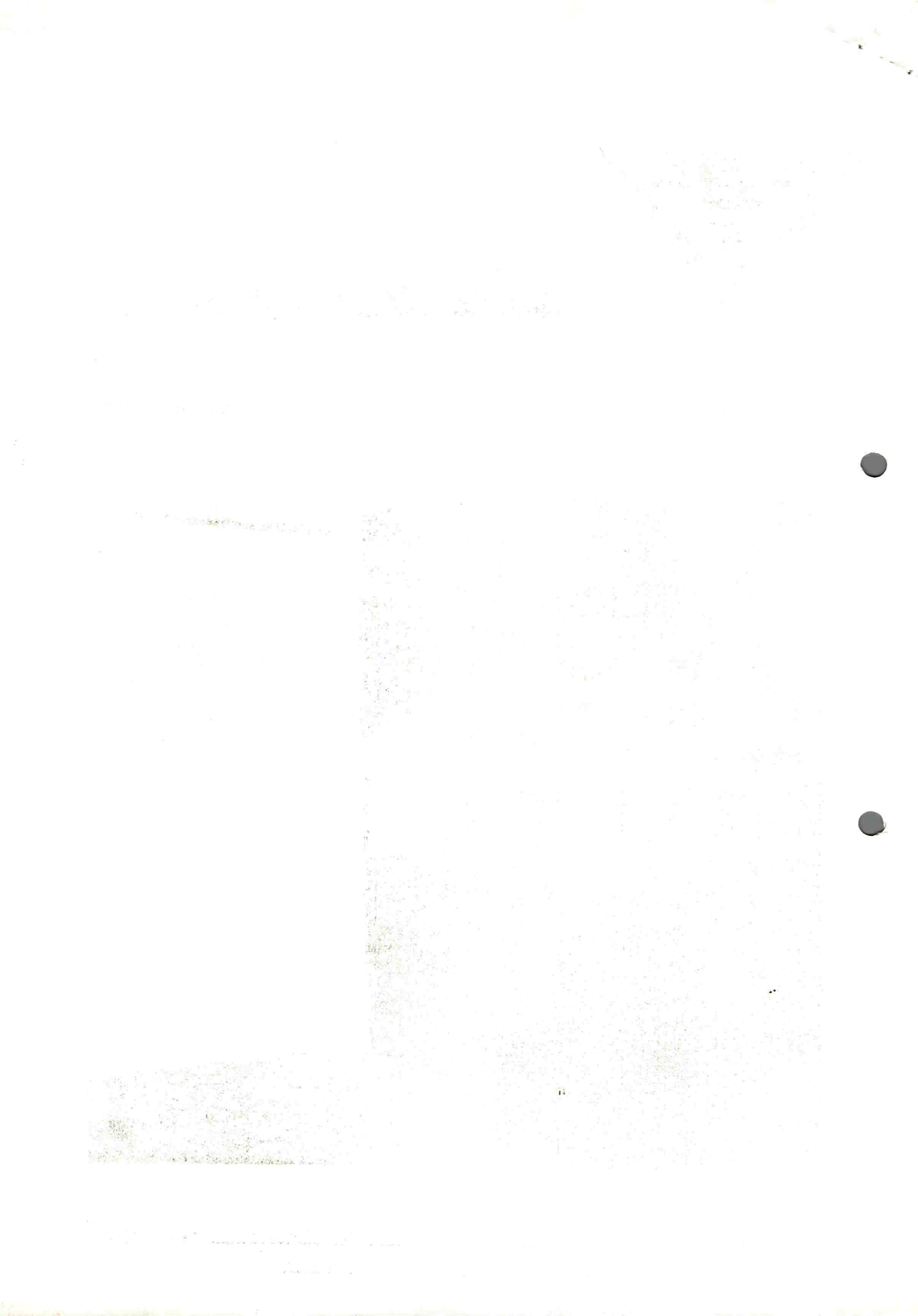
Radio and Space Research Station

L'un des laboratoires du Conseil de la recherche scientifique, le Centre de recherches radio et spatiales, poursuit des recherches sur la science spatiale et la propagation des ondes radio-électriques. Il prépare ses propres expériences pour fusées et satellites, et il offre également ses services pour le programme de science spatiale en général: acquisition et traitement des données obtenues grâce aux satellites et calcul de prévision des orbites de ces derniers. Il dirige une station d'acquisition de données dans les Iles Falkland, pour le compte de l'ESRO. Les recherches sur la propagation des ondes radio-électriques portent actuellement sur l'étude de l'effet produit par les phénomènes atmosphériques sur les ondes millimétriques.

The Radio and Space Research Station is one of the laboratories of the Science Research Council and is concerned with research on space science and on the propagation of radio waves. In addition to designing its own experiments for rockets and satellites, it provides services in support of the space science programme generally. These services involve the acquisition and processing of data from satellites, and the prediction of their orbits. It manages a data acquisition station in the Falkland Islands, under contract to ESRO. Research on radio propagation is at present concentrated on studies of atmospheric effects on millimetre waves.



Mr. Chataway, Minister of Posts and Telecommunications, with Dr. Horner
at the R.S.R.S. 'Telecom '71' exhibit



R.S.R.S. AT TELECOM '71

During last June the Telecom '71 exhibition was staged at Geneva. This, to echo the spirit of one report, showed that, in an increasingly literate world, becoming ever more populous, the need for personal and international communication was also increasing.

To this end, the telecommunications industry from all parts of the globe has been displaying its wares. In doing so a vast range of techniques from command satellites through colour television equipment to pocket paging sets has been available for examination by those interested.

The SRC exhibit comprised one of the stands situated in the British Pavilion. Mr. I. L. Arnison from London Office was mainly responsible for co-ordinating the SRC exhibit, which contained material particularly relevant to the adjoining Space Conference concerned with the allocation of frequencies up to 300 GHz (see report by Dr. Horner in Newsletter No. 123). During the exhibition, stand management was carried out by the two RSRS representatives Dr. Davies and Mr. Powell together with Miss Lyster from London Office. Apart from the RSRS exhibit, the SRC stand featured the internationally known, and SRC supported, work of the Radio Astronomy Observatories at Jodrell Bank (University of Manchester) and Lords Bridge (University of Cambridge) and of the Mullard Space Science Laboratory (University College London). A half-scale model of the proposed satellite UK.4 was also on show.

As part of what has been referred to as a 'modest but well-mounted exhibition' by the SRC, the hardware displayed by RSRS consisted of a working 71 GHz beam-switching radiometer fitted with a 0.3m parabolic dish and dual feeds which define the axes of two beams separated by about 3° .

In normal use, one of these axes is arranged to point at the centre of the Sun while the other points towards the sky 3° away. In a conventional radiometer, the input to the receiver is alternately switched between the noise source of interest and a standard load. This results in the addition to the background system noise of a modulation whose amplitude is a measure of the difference between the emission from the source and from the load. The principle of operation of the beam-switching instrument is similar to that of a conventional radiometer except that the switching is carried out between the signals from the two feeds instead of between one feed and a standard reference load. This enables the difference between the solar emission and sky emission to be observed directly so that the accurate measurements of tropospheric attenuation may be made without loss of solar burst data.

Also referred to was another important objective of the solar work at RSRS: to find some characteristic of solar radio bursts which can be identified with solar proton flares. These cause polar cap absorption of HF radio waves and constitute a potential hazard to astronauts. RSRS is the only observatory in the world to have carried out regular solar burst studies over the current sunspot-cycle at wavelengths as short as 4.2 mm.

Our studies of the effect of rainstorms and other meteorological conditions on radio communications at different wavelengths were also featured, for this information is needed for planning space communication links.

During the course of the exhibition, the British Pavilion was visited by The Rt. Hon. Christopher Chataway M.P. (Minister of Posts and Telecommunications) and Sir Frederick Mason, The British Ambassador at Berne and personnel from the British Consulate in Geneva. Dr. Horner received these visitors at the SRC stand. After his visit the Minister and the United Kingdom Delegation at the Space Conference held a reception at the Hotel des Bergues. On another evening, The Electronic Engineering Association were hosts at a dinner held at the Hotel du Rhone.

THE UNIVERSAL LAW OF CUSSDNESS

This law is well known to readers of the newsletter, possibly by a shorter name, and it states that

"Inanimate objects are Perverse"

However the widespread and devious ways in which this law makes itself felt may be recognised in the following corollaries to the law as applied to a specific situation.

Faulty equipment

- Corollary 1. The Fault will occur when the equipment is most needed.
2. An obvious cause of the Fault is remedied, but does not cure the trouble.
 3. The Fault will not occur for demonstration or for diagnostic testing.
 4. When the repair man has left, the Fault returns.
 5. Most Faults occur in inaccessible places.

6. Faults in easily accessible places conceal their accessibility until the equipment has been dismantled.
7. The Fault will lie dormant until the maximum amount of data obtained from the equipment has been invalidated by the Fault.
8. Instruction manuals hide.

However one must bear in mind the important fact that

"The Law will not operate reliably if its operation is anticipated"

In fairness to The Law it must be exonerated from blame for the following axiomatic situation

"You always find it in the last place you look"

(only a nut would go on looking)

P. H. G. DICKINSON

STATION NEWS

The Director will be visiting Israel during early October to deliver lectures in Haifa and Tel-Aviv. These will be part of the programmes arranged overseas to celebrate the centenary year of the Institution of Electrical Engineers.

Staff from Dr. J. E. Hall's group have been engaged on a further rocket campaign at South Uist.

STAFF NEWS

Congratulations to:-

Rosalyn Ford and Dave King on their engagement.

A. Anderson now Skilled labourer

A. E. Dilly " S/Skilled "

Welcomes to:

R. S. Guy

Executive Officer

D. Appleton

Tech.III (Chilbolton)

M. Brooks

Sandwich Course Student

Miss J. M. Gantlett	Sandwich Course Student
R. W. Tucker	Higher Executive Officer (from L.O.)
Miss S. Blacklock	Personal Secretary
S. Mrowka	Vacation Worker

Resignations

P. J. Smith	Sandwich Course Student
Miss H. K. Obhrai	" " "
P. H. Kamau	Vacation Worker
S. C. Lloyd	Sandwich Course Student
I. W. White	" " "
J. Rasmussen	Vacation Worker
J. H. G. Williams	Assistant Experimental Officer

E.S.R.O.

J. S. Wright	Assistant Experimental Officer 3-yr contract ended.
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SPORTS AND SOCIAL CLUB NEWS

Motor Club

Fresh stocks of oil are now available and there will be, for the time being, no price increase. However, as the price to the Motor Club has increased 25% since the beginning of the year, the next batch of oil must, inevitably, be more expensive. Nevertheless the price will still be less than the C.S.M.A. charges individual members.

Club members are reminded that the range of accessories available on loan includes a torque wrench, carburettor turner, and cylinder compression tester. The hydraulic hub-puller range has been extended 4 in. and 6 in. legs may be used with two-or three-leg adaptors. The brake efficiency meter can give reassurance or otherwise to those members who have an imminent M.O.T. test. A stroboscopic ignition timing light will be purchased in the near future. Any member with experience of this device is invited to contact the Secretary.

At the time of writing, frost seems a long way off, but the anti-freeze season will soon be with us. Those who purchased C.S.M.A. anti-freeze last year are reminded that if the mixture in the engine has not been diluted, it should last for 2 years.

P. MUZLISH
Hon. Sec.

Table Tennis Section

Two teams have been entered in the Slough Table-Tennis League. The first matches are scheduled to take place during the week beginning September 27th.

Those members of the staff who play during the lunch period are requested to show some care in using the table. It is to be expected that some marks will appear on the surface of the table during the season but one or two dents look like hammer blows. This kind of abuse only reduces the pleasure of playing for others.

P. MUZLISH

Hon. Sec.

Wine Circle

The Circle has now purchased the following Books which members may borrow:

"Light-hearted Winemaking" by D. Gillespie - ideal for the beginner

"Recipes for Prizewinning Wines" by B. Acton - ideal for all winemakers

"Woodwork for Winemakers" by C. Dart and D. Smith - over 30 items of winemaking equipment from cork floggers to a complete Winery

Also we have a small stock of 3 mg Benerva tablets (Vitamin B1) at 6 tablets for 1p and CWE Formula 67 yeast at 3p for enough for 1 fermentation of from 1-6 gallons.

New Item of Equipment for loan - The Harris Filter - charge of 2p for sufficient filter material to filter up to 5 gallons.

First wine testing in October, watch the notice board for details!

F. BENNETT

Cricket

Scores: vs A.C.O. (A) A.C.O. 61, R.S.R.S. 62-8 (Kitt 23)

vs Phoenix 1971 (H) Phoenix 152-8, R.S.R.S. 109-7

(Moosajee 47 n.o., Davies 24)

The last two matches of the season resulted in another victory and a draw. After bowling out ACO for 61 we looked near to defeat until some hearty blows by Felix and Raphael carried us past their score in the last over. In glorious

sunshine with a very fast outfield the Phoenix batsmen enjoyed themselves although some persistent bowling by RSRS kept them within bounds. Against accurate bowling we were in trouble at 32-5 but some very good batting by Davies and Moosajee stopped the rot and we finished very creditably with 109-7. We thus finished the season with the balance of victories and defeats tipped not too badly against us and with one or two good scalps under our belts. The pitch is now playing far better than in the past and the number of people interested in playing has gone up, so that we can all hope that next season's cricket will prove as enjoyable as this one has been.

E. DUNFORD

Lunchtime Film Shows 1971/1972

The following films will be shown in the Boardroom on the dates indicated at 12.50

<u>Show Date</u>	<u>Distributor</u>	<u>Film</u>	<u>Synopsis</u>
4 Oct.1971	Vauxhall Motors	'Thursday the 14th'	The film sets out to illustrate the importance of the Road Haulage Industry in Britain by showing a 'Day in the Life of.....' every type of commercial vehicle from a van to an overnight long distance lorry.
		also	
	Barclays Bank	'A Piece of Plastic' and 'Travelling Light'	The first film is a light-hearted look at the famous Barclaycard, whilst the second shows how a girl in a bikini can shop anywhere with one.
1 Nov.1971	Barclays Bank	'The Curious History of Money'	This film takes you through the history of barter from flint spearheads and animal skins to

<u>Show Date</u>	<u>Distributor</u>	<u>Film</u>	<u>Synopsis</u>
			today's sophisticated banking systems. (Literature supplied)
		also	
	Vickers	'The Australian Flight' (1919)	This is the flight of four Australian airmen in a Vickers Vimy airplane from England to Australia. The equipment used to record this historic event was a Williamson's brass-bound mahogany hand-cranked cinematograph camera.
6 Dec.1971	Random Films (& BEA)	'Clear to Land'	The film highlights the application of two modern techniques to improve passenger service, both on the ground and in the air. A typical passenger flight of the future is followed from Paris to a fog-shrouded Heathrow, where the Trident lands using automatic landing equipment.
3 Jan.1972	Gas Council	'Something Nice to Eat'	A film about the art of cookery showing the practice of this art by both the amateurs and the geniuses of the twentieth century. (1967 Award Winning Film)
7 Feb.1972	Gas Council	'Family Album'	The continuing story of the Blake family through yet another generation in their old family home. Authentic newsreels of a bygone age and careful presentation of fashions, social relationships and modes of living over the last hundred years make up this entertaining film.

<u>Show date</u>	<u>Distributor</u>	<u>Film</u>	<u>Synopsis</u>
6 Mar.1972	Vauxhall Motors	'Viva!'	This film describes the skill and craftsmanship necessary to build even a popular mass production car. It also shows how these cars are road tested in Europe.
10 Apr.1972	Unilever	'Water in Biology'	An Award Winning Film demonstrating the dependence of all living things on water. It examines osmosis, diffusion and photosynthesis, and shows how water provides a stable environment for biological activity.

Diversification?

Section 3:4 Orders to be submitted

Capacitors	£320
Oscilloscope unit	£400
Still	£200

(Extract from progress review for a certain project)

LETTER TO THE OUTSTATION

Dear Colleagues,

Two good reasons for a meteorological opener this month. One, the fine spell has already ended; two, the matter has not been much mentioned for some time, so why not give it a whirl again.

The anticyclones have really done us well for a few weeks past. Romantic morning mists have been quickly burnt off; lunch time promenaders have enjoyed

a sunshine, sustaining yet scorchless; birds have been glimpsed in the bushes, ruining their tights - gathering blackberries. The year has, as yet, shown us the pleasures of maturity untainted by the decrepitude of age; a brief vision of a golden time.

That same time's whirligig has, as you may see, brought Ray Tucker once more into our ranks after his years of exile at the heart of things. We are pleased to see again one who is so well versed in our own behaviour patterns; nobody, so far, has said to him 'not seen you for a bit, had a spot of leave then?'

Our corridors have, of late, been rendered a sort of steeplechase circuit by obstacles placed around those trapdoors which form gateways to our own R.S.R.S. underworld. Since some of these manholes are open it is perhaps just as well that we are thus saved from summary descent into the abyss. There, 'midst pipes, conduits and nameless half-seen things, labours a group of initiates seemingly quite happy to move from tunnel to tunnel in molelike obscurity. They must be content, for does not one of their number sing in a strong not displeasing voice.

Our own underworld did I say wasn't there that thing about a musician and his girl? Odd, too, I asked the singer about his wife but couldn't make much of the answer, it was all greek to

Yours sincerely

The Editor

S
R
C

S
P
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T
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D
A
Y

Photos by
Peter Hicks

Comments by
John Cathrew



"I wonder when these
Sports start?"

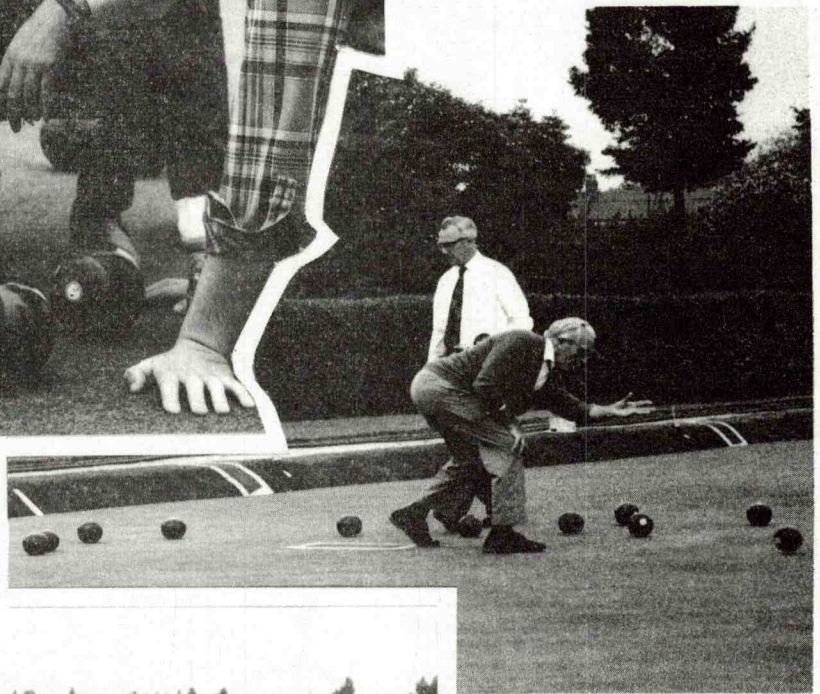
"Watch the fellow in the
velvet coat - he's a bit
of a smoothy!"



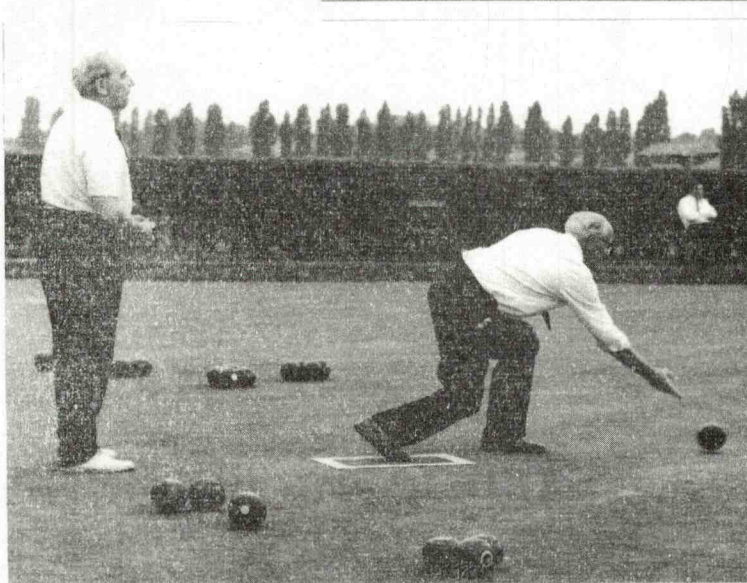
"If the boys won't
let me play with
them"



"Now let's get down to it
and sort this one out"

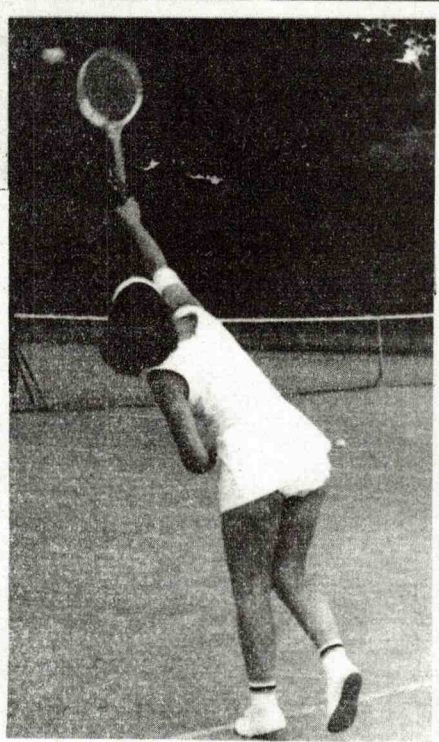


"Whoops! Watch
that foot!"



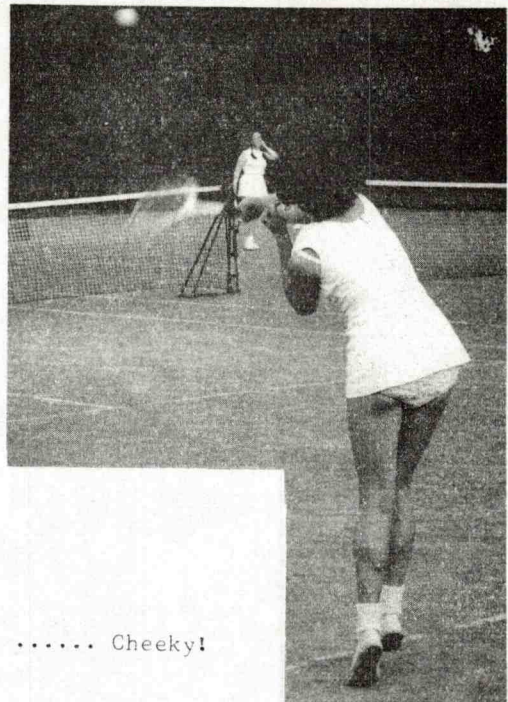
"..... That's better!"

Fred ponders.....



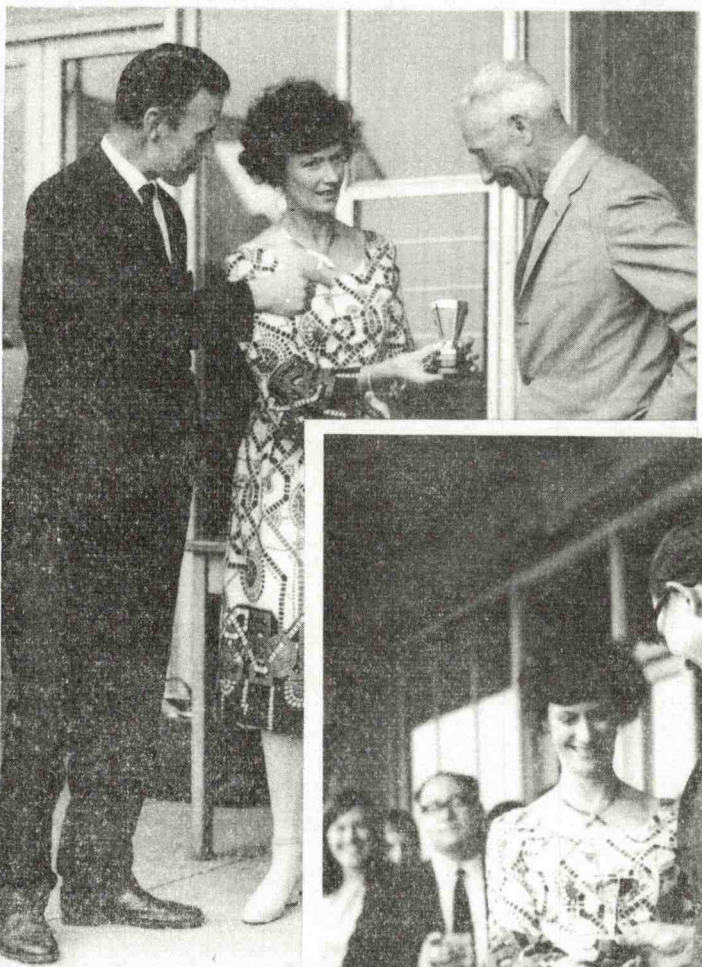
Marie shows deuced good form

..... Eric makes his move



..... Cheeky!

The Director
chats with
Bill Nicholson
(SRC Sports Club
Deputy-Chairman)
and
Sir Brian Flowers



Arthur Roberts and Gus Gordon-Smith
receive the Men's Double Tennis Cup
from Lady Flowers

Eric Bramley receives
the Chess Cup



SEPTEMBER 1971

List of Reprints

- J. W. King
D. Eccles
and H. Kohl
The behaviour of the Antarctic Ionosphere
J.A.T.P. 1971, Vol. 33, p. 1067-1077
- L. Thomas
and J. R. Smeathers
The internal reflection of whistler waves in the
lower ionosphere. J.A.T.P. 1971, Vol. 33, p. 959-962
- L. Thomas
and S. Horowitz
The ionospheric absorption of downgoing whistler waves
during nighttime. J.A.T.P. 1971, Vol. 33, p. 879-888
- D. L. Croom
The 2.53 mm Molecular Rotation Line of Atmospheric O₂.
Planet.Space Science 1971, Vol. 19, p.777-789
- J. R. Norbury
J. W. White
A rapid response rain gauge. Journal of Physics E.,
1971, Vol. 4, 601-602
- L. Thomas
Airglow observations and the interpretation of
ionospheric disturbances associated with Magnetic Storms.
The Radiating Atmosphere, D. Reidel Publishing Co. 1971,
p. 105-115
- D. Eccles
J. W. King
R. A. Challinor
Universal time control of the Antarctic Ionosphere.
Nature Physical Science. 1971, Vol. 230, No. 17,
p. 198 only

Internal Memoranda

NIL