Fairey Surveys

Newsletter

April 1971

7

News of developments in the world of surveying and mapping

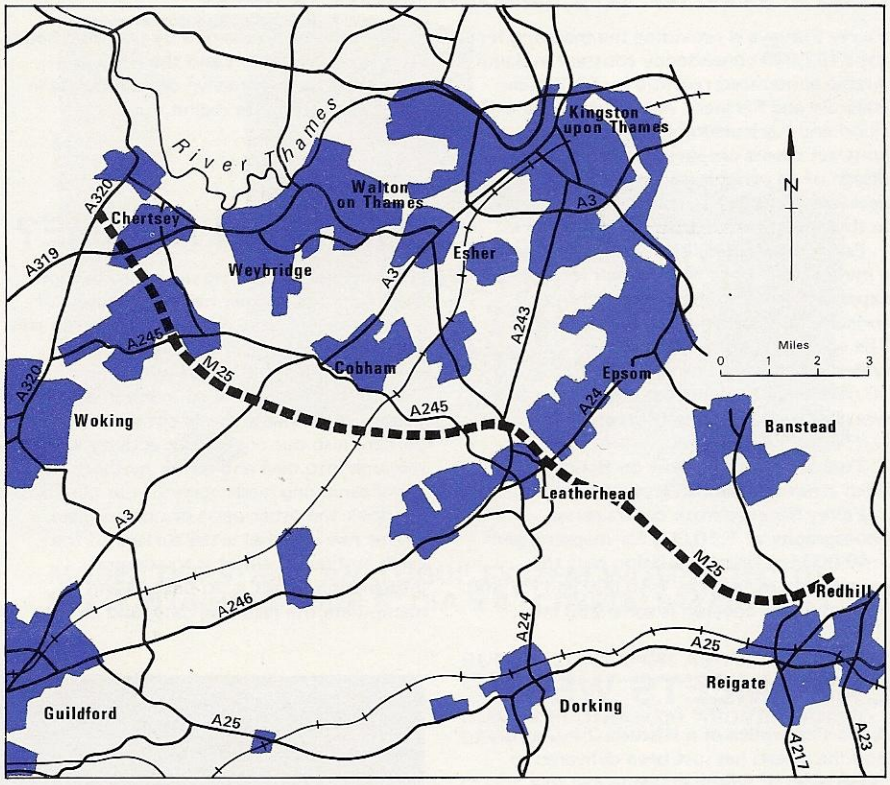
Published by Fairey Surveys Ltd of Maidenhead Berkshire England. Telephone Maidenhead 21371

M25 SURVEY FOR FAIREY

Fairey Surveys has been awarded the contract for surveying the 31 km. Chertsey to Reigate section of the M.25 South Orbital motorway. The client is the South Eastern Road Construction Unit. In addition to surveying and mapping the contract, due to be completed by 1973, covers cross-section measurement and incorporation of the engineering design into the final drawings.

The area is close to London Airport and the photographic programme involved the close liaison and teamwork of many departments. As the mapping programme develops the day to day co-operation between the Civil Engineers and the Surveyors will become such that the Fairey Surveys' staff involved will be working virtually as an extension of the Road Construction Unit Design Department.

The mapping work is in two parts. The first covers the initial up-dating and supply of O.S. plans plus a photographic mosaic of a route between Headley and Gatton. The major part of the aerial survey contract covers the photography and supply of 1:500 scale plans for the motorway and side roads together with contour information and spot levels.



The contract work is being carried out in stages —

Stage 1 Aerial photography

Stage 2 Producing machine plots of 1:500 scale survey.

Stage 3 Measuring cross-sections of the proposed route.

Stage 4 Plot out the centre line of the proposed route on fairdrawings.

Stage 5 Plot longitudinal section of route.

Stage 6 Supplying 1:500 scale fairdrawings of the survey showing natural detail, contours, proposed carriageway lines, top and bottom of bank lines, existing and proposed longitudinal section and spot levels.

Stage 7 Producing 1:250 scale drawings of typical cross sections.

Stage 8 Adding all design data to fair drawn plans and supplying sheets showing existing and all new work, and producing further longitudinal sections.

Stage 9 Producing plans at interchanges etc. showing existing and proposed longitudinal sections.

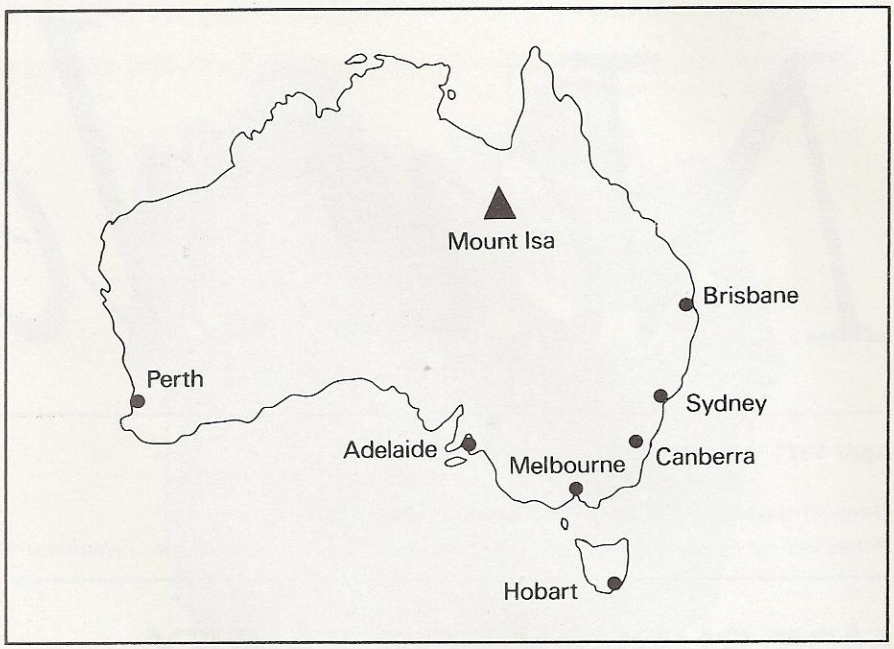
Stage 10 Carrying out a ground check of previously surveyed markers.

Contents

REMOTE SENSING – AUSTRALIAN TRIALS

A Fairey Surveys DC3 is en route to Australia for tests of multi-spectral and infra-red linescan remote sensing techniques in the Mount Isa area. The tests are part of a research programme being carried out by Professor Monica Cole of Bedford College into geobotany and geochemistry in mineral explorations. The Mount Isa vicinity was chosen as the test area because of its reliable weather, type of terrain and the fact that it is undisturbed by man.

The standard Fairey Surveys Multi-spectral installation will be used, the four cameras being loaded with black and white with green filter, black and white with yellow filter, true colour with an ultra-violet filter and infra-red false colour with a blue absorbing filter. Infra-red linescan missions will be flown over each area covered photographically and the results recorded on video-tape for playback in this country. The linescan missions will be flown early in the morning as soon as visual navigation becomes possible, so as to avoid solar reflection effects. A team of six is involved. During its return to the U.K. the DC3 will carry out a number of jobs in countries along the route.



FAST WORK ON SAUDI CONTRACT

Fairey Surveys is providing the mapping for the £152,000 consultancy contract in Saudi Arabia announced recently by Sir William Halcrow and Partners. Awarded by the U.N. Food and Agricultural Organisation the contract covers pre-investment study and design of an agricultural irrigation and land development project in the Wadi Jizan area in the south west of the country.

Fairey Surveys will be working as part of a multi-disciplinary team which includes experts on such subjects as economics, agriculture, land tenure and water rights. The vital mapping work is already well under way. Permission to fly was received 10 days after the contract but photography was completed and the film returned to the U.K. within two weeks.

Two surveyors are now on their way to Wadi Jizan to establish ground control.

Fairey Surveys work covers aerial photography at 1:10,000 for mapping and 1:40,000 for air triangulation plus the preparation of maps at 1:10,000 and 1:2,500. The total area covered is some 250 km^2.

The scheme is regarded by both the Saudi Arabian Government and the FAO as a prototype for progressive developments in this hitherto remote region.

WHAT'S IN A NAME?

It is now years since we dropped the word 'Air' from our former name of Fairey Air Surveys – but ideas die hard and we are still regarded mainly, if not solely, as an 'air survey company'. Perhaps with a first name 'Fairey' reminiscent of so much in the history of aviation, this is not so surprising; perhaps also our continuing activity and research into new and better methods of aerial surveying leads many of our clients to overlook the other parts of our business.

Our raw material is the surface of the earth and our business is to acquire information about it, to process and manipulate the resulting data, and then to present it in a form best suited to effective interpretation either by our clients or by ourselves.

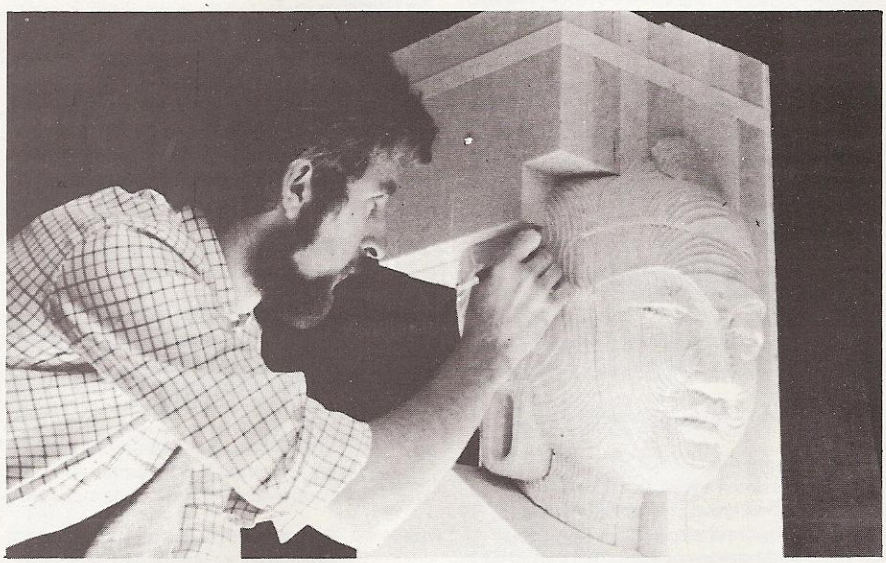
To obtain the data, we use aircraft (fixed wing or helicopter) because they are often the most economic vehicles for acquisition, but this is by no means always the case. In many instances, other methods are used. For special purpose mapping, for example, or for land-use series, atlas maps and similar projects, our sources may be data banks or desk or library research; for many types of topographical mapping, ground survey techniques are sometimes both faster and cheaper; while for geological or geophysical studies a combination of air, ground and marine methods is often desirable.

What this all adds up to is that we are professionals in the surveying and mapping business and whatever features or characteristics of the earth's surface we are commissioned to measure or record, we will use the best combination of tools available to carry out the task.

EAST MEETS WEST

A life size replica of a Historic 7th Century Buddha's head has just been delivered to Japan. Part of a bronze statue lost in a Temple fire in the 15th Century, the original damaged head was found in a secret basement in the same Temple in 1937. In common with a number of other historic statues, the head was photographed and contour plans made photogrammetrically by the Nara National Research Institute of Cultural Properties. Fairey Surveys' agents in Japan – Nissei – obtained the contract for the modelling of the head in expanded polyurethane using the existing plans. The model is being used to help craftsmen in the restoration of the head.

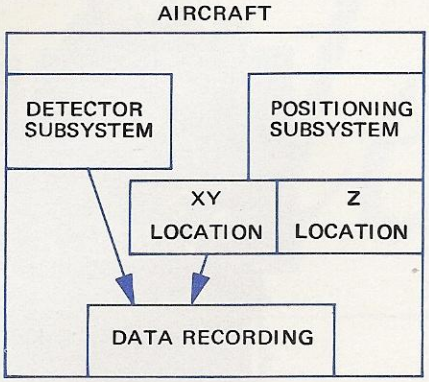
The scope of Fairey Surveys' modelling service continues to grow. The service is not limited to terrain models. If the subject can be shown as a contoured plan, Fairey Surveys can model it.



TOOLS OF EXPLORATION A system for mineral exploration

A new geophysical surveying tool recently acquired by Fairey Surveys is the Exploranium DGRS 1000. The DRGS has been developed to provide the mining and survey industry with a system permitting radioactive element discrimination analysis from either aircraft or ground vehicles.

The system has a maximum capacity of four channels, which provides a method of estimating the abundance of potassium, uranium and thorium in surface rocks beneath an aircraft. The fourth channel being utilized for Total Count. Instrumental and physical factors which have to be considered in an airborne system are closely inter-related: (a) the distribution of potassium, uranium and thorium in rocks, (b) the attenuation of radiation of various energies with altitude (and masking effects of overburden and water) (c) optimum detector size (d) number of detectors (e) altitude (f) resolution (g) air speed in relation to interpretation constant. Other aspects of survey which require careful consideration are methods of data recording; track recovery; the most suitable aircraft for the equipment in particular and the operations in general.

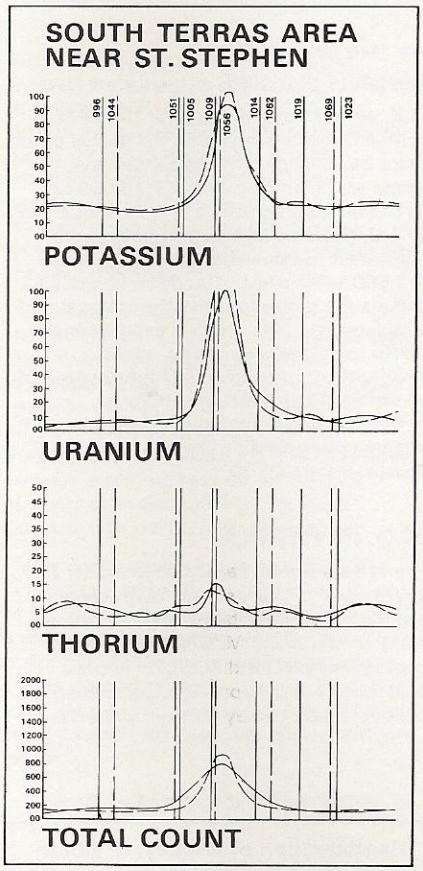


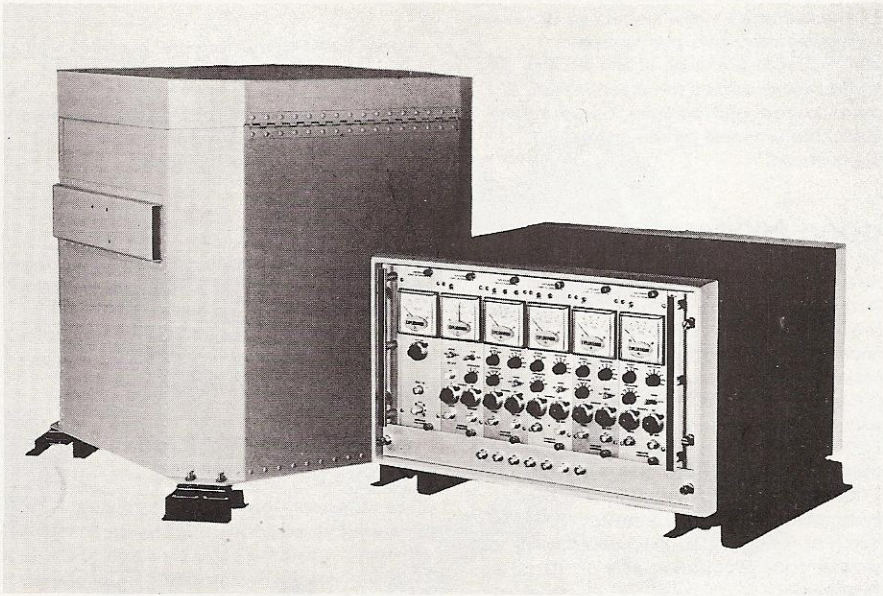
An elementary block diagram of an instrumentation package is shown above.

When a gamma ray strikes certain natural or synthetic crystals (such as for example a thallium activated sodium Iodide crystal) a scintillation (a minute flash of light) is produced. This minute flash of light is then converted into electrical energy and amplified in a photo-multiplier tube coupled to the crystal. The resulting electrical pulse, which is proportional to the original energy of a gamma ray, is fed through various pulse shaping networks and sensed by the main electronic detector (channel analyser).

The final display is in terms of counts per second ("pulses" per second) on each "channel" proportional to the number of gamma rays originally impinging on the electro-crystal. The total count represents all gamma rays, while "uranium", "thorium" and "potassium" channels represent relative amounts of gamma rays at those three corresponding energy levels.

Recorded gamma radiation must be referred to positions on the ground surface. The flight path and altitude of aircraft are evaluated from the information provided by ancillary equipment, normally consisting of radio-altimeter, positioning (tracking) camera and/or Doppler Navigator.





MODEL DGRS-1000 ANALOGUE SYSTEM WITH DETECTOR BIN CONTAINING FOUR 6" DIA. x 4" CRYSTALS (440 cu. in.)

Chart Speed 125mm per min.
Time Constant 2 Seconds
Full Scale Value c.p.s.
Potassium 100
Uranium 100
Thorium 50
Total Count 2000

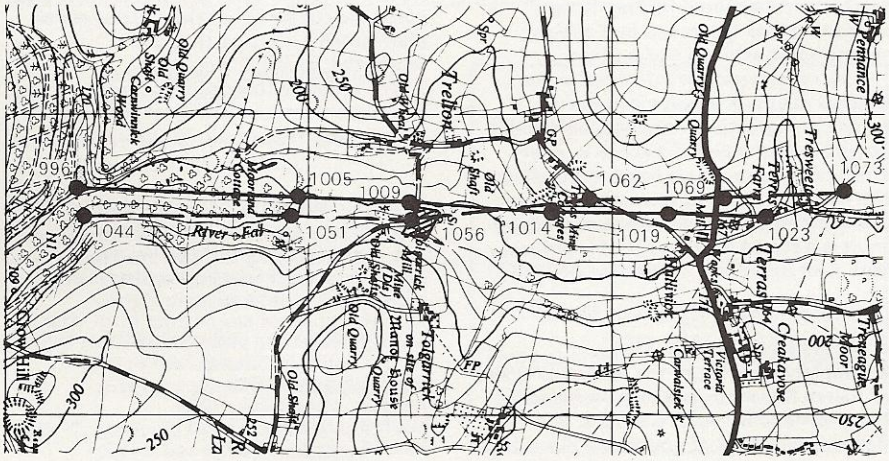
WEST
METRES 200 100 000 100 200
EAST

Typical run flown with new Digital Gamma Ray Spectrometer.

Section of O.S. map at 1:25,000 showing target area and flight lines.

RUN 9 FLOWN 540ft ABOVE GROUND LEVEL ————

RUN 9a FLOWN 560ft ABOVE GROUND LEVEL — — — —



OIL PROSPECTING OFF IRELAND

One of Fairey Surveys DC3's fitted with long range tanks and up-rated engines will soon be flying 8 hour missions looking for oil-bearing geological formations off the Irish coast. Working for a consortium of international oil companies, Fairey Surveys is carrying out an off-shore airborne geophysics survey covering 13,110 line miles of sea stretching anti-clockwise in an arc from Bally Kelly in the north to Dublin in the east. The reconnaissance type survey will be flown at 1500 ft. using a proton precession magnetometer with a ± ½ gamma sensitivity. Navigation will be by Loran C to ensure maximum accuracy as the aircraft will be on line for several hours at a time at distances up to 180 miles off-shore.

This contract is one of a series of off-shore searches which Fairey Surveys is undertaking.

ALL ABOUT MULTISPECTRAL

A new leaflet on Fairey Surveys multi-spectral service is now available. It includes samples of results obtained using black and white film with yellow and green filters and true colour and false colour film.

The examples in the leaflet can be viewed stereoscopically and give a graphic illustration of the value of the services. The leaflet also describes some application of multi-spectral photography. Copies of the leaflet are available on request from Maidenhead.

GOOD PROGRESS IN BURMA

As this issue went to press, ground parties were at work on Fairey Surveys' £83,000 Sittang River Valley contract in Burma. This contract, placed by the United Nations, will provide the basic information for two projects aimed at exploiting water resources in the Sittang Valley under a U.N. technical assistance programme. At Yenwe, a 200 ft high dam across a tributary to the river will store sufficient water to irrigate 1,000 square miles and supply a 36 MW hydro electric plant. At Sinthe, 300 miles North of Rangoon, an irrigation scheme will increase food production over a 140 square mile area.

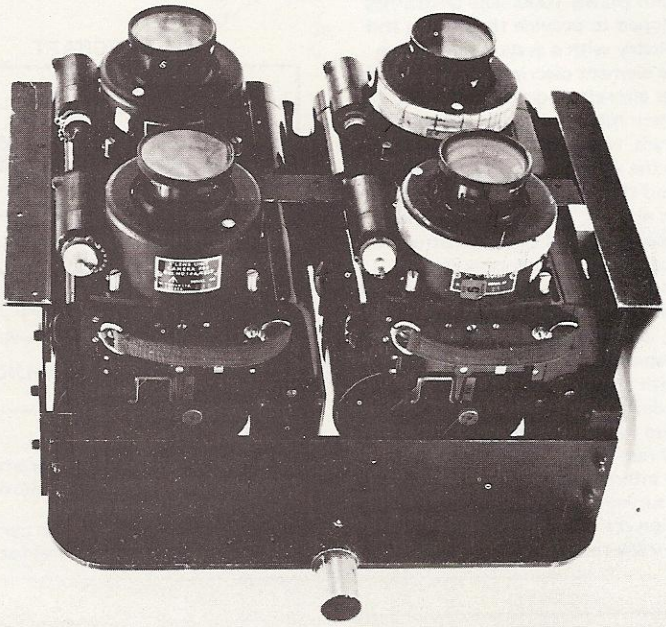
The 3 man strong Fairey Surveys Team on site has recruited and trained 10 local ground surveyors for the ground survey and has completed the Sinthe area. Work is now in progress on the Yenwe area. Mobility for the teams is provided by a fleet of five cross-country vehicles.

Aerial photography for the contract was flown by the Burmese Air Force using a Beech Queen Air aircraft. The flying programme was supervised by Fairey's photographic manager in Rangoon.

U.K. readers may be interested in the seasonal nature of surveying in Burma. Aerial photography is only possible from December to the end of February, after which period the clouds begin to build up. The monsoon starts in June and the rainy season continues up to November. The result is a closed season—even for ground work — of up to half of the year.

THE THINGS WE DO

A comprehensive list of the services provided by Fairey Surveys is available on request. Please write to Mr R. C. Caudle at our Maidenhead Office, if you would like a copy.



Fairey Surveys multispectral camera installation (see news item at left).

ON SHOW TO THE WEST

Fairey Surveys took part in the Welsh Public Buildings and Works Exhibition at Cardiff from 30th March to 1st April.

CORRECTION

There was a typographical error in the front page article 'Volumetric Analysis in Action' in the last issue of the Newsletter. The vertical interval at which the contours of Wraysbury Reservoir were plotted was given as 25 ft: this should have read "2.0 ft.".

ORTHO-PHOTOGRAPHY IN SPENCER COUNTRY

The village of Cookham in Berkshire — featured in many paintings by Sir Stanley Spencer — was the subject of one of the first ortho-photography contracts to be placed with Fairey Surveys following the introduction of this service. (Newsletter 5.)

The contract was placed by Berkshire County Council as part of its revision programme for the 1:2500 Ordnance Survey maps of the County. Revision of the map sheets for the Cookham area was particularly urgent and ortho-photography was selected as the fastest way of bringing these up to date. Both production time and cost were cut by use of the existing aerial photographic cover of the county, illustrating its value once again.

The ortho-photography was made up into one larger-than-standard sheet covering all of Cookham R.D.C. and its boundaries.

BACK NUMBERS

The following issues of the Newsletter have just been reprinted to meet the regular demand for back-numbers which many clients find of interest.

If any of these are missing from your set of Newsletters please write in to Mr. R. C. Caudle for copies.

Issue 1 April, 1969
Issue 2 September, 1969
Issue 3 January, 1970
Issue 4 April, 1970

TAKING COUNT

U.K. authorities preparing for the 1971 census will be interested in the special photo maps being offered by Fairey Surveys. These are based on existing 1:10,000 or 1:12,500 scale aerial cover. This is enlarged to 1:2,500 scale to provide photographs equivalent to individual Ordnance Survey 1:2,500 series plans. Any distortion due to camera tilt is removed and the national grid superimposed. The result is an inexpensive photo map ideally suited to census requirements containing full information of all visible detail in the area covered.

Cost per photo map sheet for a 2 km x 1 km area using existing cover is approximately £9.00.

M.D. IN CYPRUS

Fairey Surveys' Managing Director, Mr W. P. Smith, visited Cyprus in October where he negotiated an important mapping contract. While on the island Mr Smith attended a Photogrammetric Exhibition in Nicosia organised by the Cyprus Photogrammetric Society, where Fairey Surveys had a stand.

If you require further information on items featured in Fairey Surveys Newsletter or would like to be added to the mailing list for future issues: Please contact:

Mr. R. C. CAUDLE
Fairey Surveys Limited,
Reform Road, Maidenhead,
Berkshire, England.
Telephone Maidenhead 21371.
Telex CHAMCOM (SLOUGH) 84314
Prefix messages for Fairey Surveys