Fairey Surveys
newsletter

MAY 1977

News of developments in the world of surveying and mapping

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NIGERIA–A DEVELOPING STORY

FAIREY Surveys involvement in Nigerian aerial photographic and mapping projects can best be related to three well defined periods; the first being the colonial era which terminated with the granting of independence in 1960, the second being the succeeding decade up to 1971, and the third, which extends up to the present time.

Fairey Surveys operational tasks during the first period were mainly to produce aerial photography under contracts awarded by the UK based Director of Colonial Surveys (subsequently Overseas Surveys).

During the period from 1960 to 1971 Fairey performed a wider variety of survey tasks both for the Federal Survey Department and some newly-formed regional Survey Departments. In addition, the D.O.S. aerial photographic contracts continued to be awarded, also one United Nations aid project, which merits special mention. This was the F.A.O. sponsored SOKOTO-RIMA River Basin study, the survey element of which involved 800 kilometres of precision levelling in addition to small and large-scale photography. The wider variety of tasks included numerous large-scale mapping contracts for both Federal and Regional Departments among them:-

1. The cities of Lagos (including Lagos University Site), Enugu, Ibadan Pilot Project, Greater Kano, Jos-Bukuru, Greater Kaduna, and Zaria.
2. 20 towns located in Northern, North Eastern, Western and Eastern Regions.
3. Various developments such as the Jos Water Supply Project, and the Gongola agricultural project.

Also this period saw the first contracts for Fairey from consulting Engineers in need of project mapping for their road and railway designs. Finally, from time to time in the 1960's Fairey were able to accept Nigerian trainees at their production HQ's in England. Mostly the trainees were from the Federal Survey Department and included one lady map compiler, whose husband was also studying in the UK.

Chief J. O. Laniyonu M.B.E. F.N.I.S. greets Captain C. Morton-Clarke at Ibadan Airport.

In 1971 the Nigerian Government made it known that it desired Nigerian licensed Land Surveyors to be associated with all surveys carried out in the country. In order to conform with this policy, Fairey formed a partnership with the Nigerian firm of licenced Land Surveyors known as Geodetic and Aero Surveys (Nigeria) Limited. The three principal Partners had a lot of survey experience some of it in distant parts of the World. Chief J. O. Laniyonu, MBE., FNIS., was in Burma with the West African Survey Company during World War II having previously served in Abyssinia, and Isaac Body-Lawson, FNIS., a Togolese/Nigerian and William Gascoyne, OBE., FNIS., had seen most of West Africa during surveying assignments. Bill Gascoyne was the first non-expatriate Surveyor General appointed in Nigeria and had visited Fairey in England during 1961 when he escorted his Minister for Lands and Housing Western Region, on an official visit to the UK.

The partnership has only recently become fully operative consequent on the publication in 1975 by the Federal Military Government of their 5-year development plan, within which the need for a massive aerial photographic and mapping programme is defined and budgeted (Sixty Nine Million Naira). Following from tenders submitted in December, 1975, the partnership (GAS/FSL) was awarded block photography at 1/25,000 contact scale covering 230,000 square kilometres in the Northern part of the Federation, also the township mapping at 1/2,500 of Maiduguri and Kafanchan and of Lafia at 1/2,000. These contracts are being performed under the technical direction of the Director Federal Surveys and are to be

completed by mid-1978. An unusual feature lies in the arrangements for the large-scale aerial photography required for the township mapping, in that separate contracts have been placed for the photography, with different companies in most cases to those responsible for the ground control, including pre-marking where necessary, and the map production. The obvious need for integration of conflicting priorities will prove difficult in practice, and it remains to be seen how this can be achieved by the Federal Survey Officers and the companies involved.

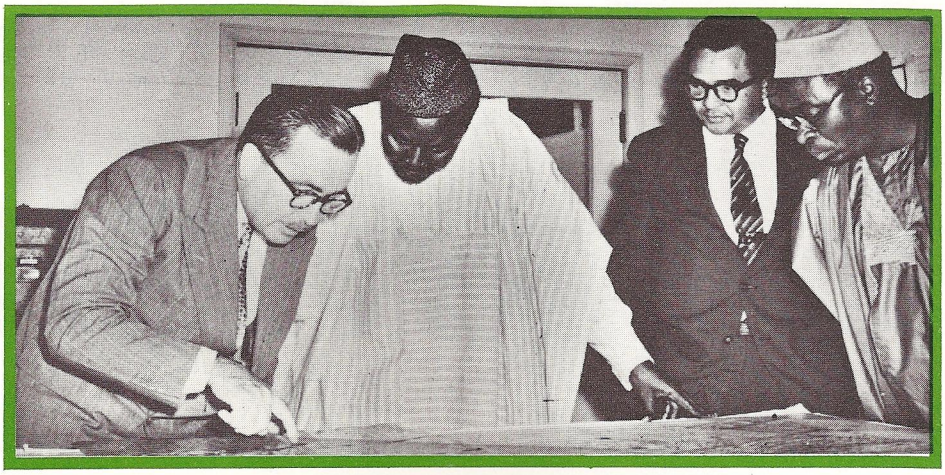
The block photography is currently being undertaken by Fairey Surveys Operations Division, using two photographic aircraft based in Kano and Maiduguri. Film processing is being completed on site, with the production of sets of contact prints and the photo-lay-down type indexes being subsequent to acceptance for coverage and quality by Federal Surveys representatives travelling up from Lagos.

The ground control for the township mapping contracts will be a joint operation by GAS and FSL surveyors. In order to co-ordinate this stage and the later map production stages, a Fairey Surveys Project Manager, Mr. J. A. Cripwell, is working in Ibadan at the Headquarters of GAS. The maps will be in metric units and based on the National Grid System. In areas where government control beacons are sparse or non-existent, a control network of Primary, Secondary and Tertiary lines shall be provided such that:-

1. Every 160 sq. kms. of the area has a perimeter traverse of primary standard with distance measurements accurate to 1 part of 50,000 and standard error in observational mean not in excess of $\pm$ 0.6 seconds. This traverse to be connected to a cadastral framework traverse or a triangulation beacon.
2. The area enclosed by the primary traverse is in turn broken down into a network of secondary and tertiary traverses such that no secondary traverse runs for more than 30-50 kms. and no tertiary traverse covers more than a length of 20-25 kms.

The azimuth of the traverse bearings is to be controlled by, in the case of the Primary traverses, observation of at least 8 pairs of East and West stars at intervals of 10 kms or every tenth station, whichever is the lesser interval.

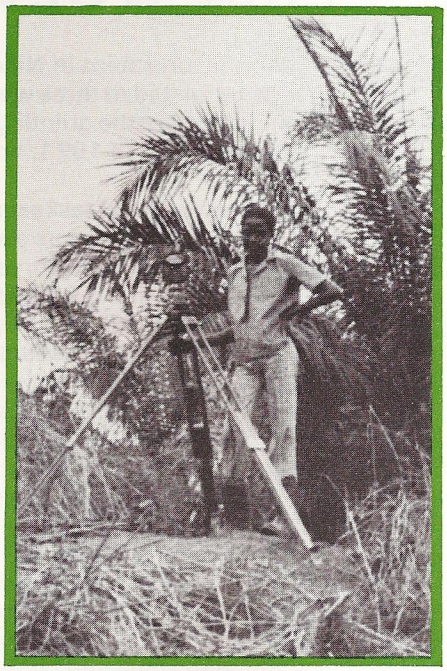
The mapping programme being initiated by the Director of Federal Surveys, which during 1977 will also include tenders for 1/25,000 scale mapping of 180,000 sq. kms. and



The Minister for Lands and Housing, Western Nigeria, during a visit to Fairey Surveys in 1961, Mr. W. A. Gascoyne is second from the right.

township mapping at scales of 1/2,000 or in some cases 1/1,000 of 162 townships totalling in area some 16,500 sq. kms., is not the end of the story. Each of the nineteen state survey departments within the Federation is busy arranging for large scale aerial photography to be undertaken on its behalf, plus the production of mosaics and in some cases, large scale mapping from their separate state budgets. It is too early to attempt to quantify this additional demand, but it is fair to say that the activity is considerable. The urgent development of improved road and rail communications also raises a need for project mapping which is required quickly by local-based firms of Consulting Engineers, responsible for the design and the supervision of construction.

The challenge both to the public and private sector of the Surveying profession in Nigeria is a demanding one, which hopefully will produce the vigorous and professional response so necessary. If the professional management and quality control aspects can succeed whilst allowing the technical production to progress according to schedule, then Nigeria will certainly be a developing story to be proud of.



A Nigerian surveyor working on a current road project in Oyo State.

SILVER JUBILEE BEACON MAP

THE Silver Jubilee of her Majesty's Accession is being celebrated this year and one of the festive events will be the lighting of beacons on the night of Monday, 6th June.

This event is being organised by the Royal Institution of Chartered Surveyors, and they have commissioned Fairey Surveys to produce a Souvenir Map depicting the nationwide network of beacons. Eight continuous chains of bonfires, using traditional beacon sites, will link Windsor with the most distant points of the British Isles. The furthermost sites being Saxavord in the North, Jersey in the South, Dover to the East and St. Kilda in the West.

Her Majesty the Queen will light the first beacon in Windsor Great Park at 22.00 and then the two which have sight of Windsor will be lit; one on the Hog's Back in Surrey and the other on the heights of Dunstable Downs in Bedfordshire. Spreading from these two, four others will be lit and so on, along each chain through the length and breadth of the Kingdom. It is estimated that the last bonfire will be burning within two hours of her Majesty applying the torch to the first one in Windsor.

LASER DISTANCER IN BAHRAIN

Cementing a surface marker precisely above a buried marker to establish a permanent primary geodetic station in Bahrain.

IN the six months since Fairey Surveys announced, in the last issue of our Newsletter, the award of the Bahrain survey contract, considerable progress has been made. The photography was finished mid-February, the ground control for the geodetic network is almost complete, and the mapping programme is moving smoothly ahead.

A particular feature of the geodetic survey being undertaken is the accuracy specification of one part in 50,000, or better, for all distances. Some of the distances to be measured are relatively short and the average is 12 kilometres. The microwave type instruments which have formed the basis in the recent past of the surveyors' tools of trade would not be practical for these requirements, and as a result a modern laser distance measuring device has been introduced. The laser beam is also far less affected by the variations in the earth's atmosphere along the line to be measured. The particular laser being used is capable in theory of measuring distances up to 25 kms. Accuracies of plus/minus 5 millimetres plus one part per million are predicted with a maximum measurement time of 15 minutes.

The geodetic network comprises 22 first order stations and 50 second order stations. All stations are to be connected by a precise levelling chain, based on mean sea level obtained by observations at a tide gauge over a period of 12 months. Permanent benchmarks will be established along the levelling circuits at intervals varying from 1 kilometre up to 4 kilometre spacing, dependent on their location in the island. In addition to the geodetic control, extra control points in positions ideal for mapping are being co-ordinated and identified. The entire field control operation will be completed in 9 months.

OVERSEAS STUDENT TRAINING PROGRAMMES

FOR many years Fairey Surveys has made available training facilities for a limited number of overseas students. This aspect of our work is something of which we are particularly proud; our very first Newsletter printed in 1969 carried a picture of a young Kenyan surveyor who came to Britain to further his training with us, and to qualify as Kenya's first air photographer.

Since then we have accepted students from Saudi Arabia, Libya, Turkey, Nigeria and Zambia for training courses varying from six weeks to thirteen months.

Courses are not standardised, rather each student has an individual programme devised for his particular needs, laying emphasis on certain subjects or skills as required by his government. Particular subjects and skills which have been taught in this way include – photo mosaicing; geophysical data presentation; photogrammetric plotting; map compilation and photo-interpretation. The majority of the students are trained within the Photographic Department, and those taking the longer courses have the opportunity to do the full range of Photo-Lab. work, including in some instances, operating an aerial camera in flight over an area which they have flight planned.

Mr. P. N. Sharman instructing two students from Saudi Arabia in photo-mosaicing techniques.

For one cartographic student from Saudi Arabia, we arranged a schedule which gave the opportunity of limited practical training in all production departments of the Company. During his stay in the Drawing Office he produced a map of Saudi Arabia which he took with him to use as a lecture aid when he resumed his career as a cartographic teacher in his home country.

On-the-job training is the keynote, as there is no shortage of opportunities elsewhere for theoretical study; at Fairey Surveys every effort is made to involve the student in production tasks where he will meet with practical problems – learn the professional way to overcome them, and experience the satisfaction of being part of a working team doing a productive job.

During the courses arrangements are made for students to visit the manufacturers of equipment and materials, and time is allowed for an initial introduction to colour printing.

SMALL SCALES

OUR Small Scales Division has widened its horizons quite considerably over the last few years, accepting the challenge of undertaking a wider and more varied selection of projects. A long term involvement with the traditional production of Fairey leisure maps and atlas map sheets continues to claim a major share of the Department's attention but a greater variety of tasks are now being introduced. By making further use of the artistic and literary talents of our drawing office staff we are now able to produce 'in house' the large number of illustrations and text which form such an integral part of modern books of maps. Our current workload makes good use of these skills; we are for instance, compiling a total of eighty pages for a Swedish atlas with a marked Scandinavian emphasis. For this project we have produced physical, land-use and climatic maps. Maps showing bird migration, tree foliage, patterns in agriculture, the seasons and maps tracing the course of the ice-age. We have also drawn planet artwork and historical maps of each continent.

Recently some interesting work has been done on a historical atlas of Africa which makes a bold attempt to compile maps of the African continent as it was before colonization when it was the limits of tribal territory which dictated the boundaries and frontiers. Another historical project almost completed is forty-eight pages for an atlas supplement which traces through maps, photographs and text the development of major world civilizations and the history of exploration from the earliest recorded travels to present-day space exploration.

Examples of the variety in map-based publications designed and produced by Fairey Survey's Drawing Office.

The variety of the work on hand can best be judged by the number of different projects at present on the 'drawing boards'. In addition to the atlas work already mentioned, preliminary work has started on a 1:50,000 scale topographical map of Bahrain, and a Hydrographic Chart of the Bahamas is well advanced; also in the course of preparation we have maps destined to be included in two comprehensive guides. One to Golf in Britain and one to sea and freshwater fishing in and around the United Kingdom.

Not to be out-done our leisure map section has announced two new titles in the Fairey Leisure Map series – MALTA and CRETE all ready for the 1977 holiday season. Work is due to begin shortly on a new map of a holiday island the name of which has not yet been released.

The Fairey Leisure Map range of current titles:- Cyprus, Corfu, Rhodes, Jamaica, Majorca, Ibiza, South-West Ireland, Malta, and Crete.

NEWS IN BRIEF

Karachi Seminar

UNITED Nations Training Seminar: A most interesting training seminar on remote sensing applications was held for two weeks during January in Karachi, Pakistan, under the aegis of the United Nations. An invited paper by Dr. John van Genderen, Co-ordinator of Fairey Surveys' Environment and Resources Consultancy, was presented with the title "A Low-Cost Operational Methodology for producing land use maps in semi-arid developing countries using LANDSAT imagery". Participants from twenty countries attended this training seminar, from Middle East countries including Qatar, Iraq, Iran and Yemen, as well as from many south-east Asian countries.

Taff Valley

ON behalf of the Welsh National Water Authority, contouring is being carried out at 0.5 metres vertical intervals for approximately 1,100 hectares flanking the lower reaches of the River Taff in the Cardiff area. The survey will be used to design a physical model for hydrological studies for the flood control of the Taff Valley.

Monitoring the February Floods

FOLLOWING the unusually wet winter, the heavy rainfall in February this year caused river levels to rise dramatically and in many parts of the country rivers overflowed their banks; filled the storm drains and eventually flooded acres of low-lying farmland. The full extent of the problem can best be recorded from the air and is a task ideally suited to aerial photography. The Thames Valley Water Authority again called upon the assistance of Fairey Surveys to fly the Upper Reaches of the Thames in the Oxford area to take photography which will be used for future flood control planning.

D.G.M.

A DIGITAL ground model, based on a 100 metre square grid, is being recorded for an area of about 4,200 hectares on Salisbury Plain. The ground survey work was completed during the Easter Bank Holiday, when firing was halted on nearby artillery ranges.

Fuel Stock Volumes

AERIAL survey methods are being used for the accurate measurement of a number of fuel stock piles; some the property of the Central Electricity Generating Board, and others owned by National Smokeless Fuels Limited, Something in the region of 70 stockpiles, mainly concentrated in Wales, are involved in this project.

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,

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