

MAY 1973

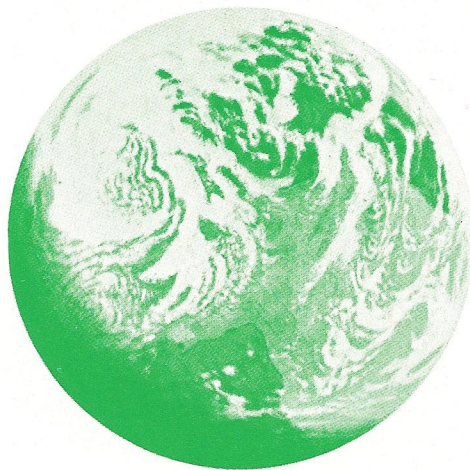
News of developments in the world of surveying and mapping

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RETROSPECTIVE

Some things seem to have changed but little in half a century. A DH9 biplane droning over the Irrawaddy Delta in the summer of 1923; a Beech B-80 flying the same precisely controlled patterns in the sky over Nepal 50 years later. Both taking photographs for aerial survey, both operated by the same company, now called Fairey Surveys which in that time has photographed over one and a half million square kilometres of the earth's surface in 50 countries.

It is easy with anniversaries to dwell on the past, on the pioneers and their work, even when half a century covers the lifetime of an industry and not just that of a company which serves it. But it is more instructive to see the developments in techniques, equipment and services in that time as pointers to the future development of the industry.



The airborne platform and camera are still our basic tools but improved, and still improving, beyond measure.

In 1923 a Delta was the ideal subject for aerial survey because the photographs could be mosaiced into maps with the minimum of ground height displacement. Today any terrain is ideally suited to aerial photography. It can be mapped, orthophoto-mapped, multi-spectral photographed, photographically interpreted, thermal sensed, probed beneath its surface for minerals or oil by airborne geophysics. It can be presented on paper or on computer tape or as a model either in three dimensional reality or in data bank.

The information is used by surveyors, engineers, planners, agronomists, foresters and many other specialists.

This is aerial survey 50 years on from the Irrawaddy Delta, a highly professional modern industry, still with the same basic intent — providing the data for the optimum use of the world's resources.

Major Libyan Contract

Fairey Surveys has won a major contract to survey the route of a new 630 km road in Libya, which will run from Bu-Grain, South of Misurata, on the coast, to Sebha in Central Fezzan. It will be a modern all weather highway and is part of Libya's national highway programme to improve the country's internal communications.

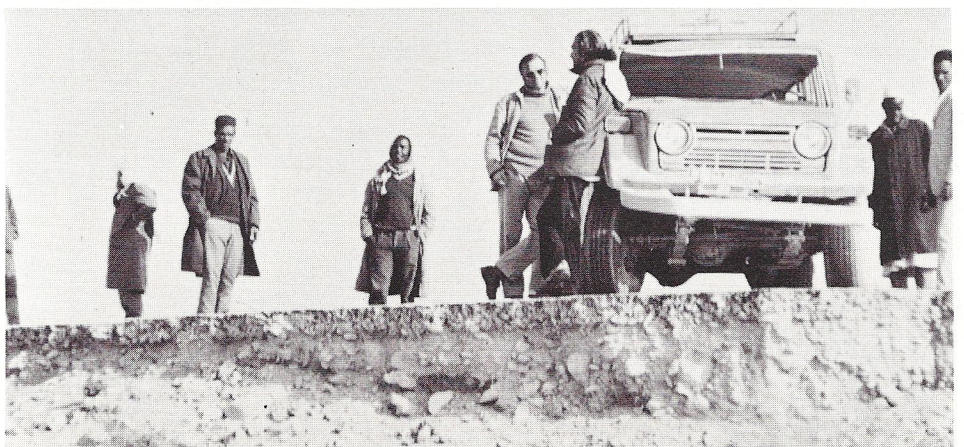
The contract was placed by the Egyptian Organisation for Roads and Bridges, consulting engineers to the Libyan Government and it is due to be completed at the end of 1973. The route is being surveyed in sections, and maps of the first section were delivered in March. Two aircraft were used to produce the photography at three photo scales.

An advance party of two surveyors pre-marked ground control positions prior to photography and the main survey party has been following on with traversing and levelling networks.

The field survey party of eight had sandstorms and freezing nights to contend with. Daytime temperatures were around 65°–70°F, but high winds often brought sandstorms to blot out the sun and to blow sand into every corner of the tents, their clothes, their eyes and

even into the drinking water, which was brought by tanker over the desert. The traversing went well, but levelling was complicated by the nature of the terrain — featureless desert.

The traversing phase of the contract is completed and the photogrammetric mapping of the route at 1:5000 scale will produce almost 800 map sheets. 120 sheets have already been despatched to Libya.



Slight mishap with survey vehicle means short respite for field party

ORTHOPHOTOMAPS

IN THE PLANNING OF STONEHOUSE NEW TOWN

Distinct benefits have already been obtained from the use of orthophotography in the initial planning of Scotland's sixth new town, to be located at Stonehouse 18 miles south east of Glasgow on the M74 motorway link between England and Scotland. This has been almost entirely due to the comprehensive approach to mapping requirements by East Kilbride Development Corporation's Principal Planning Officer Francis A.B. Richardson, BA(Mod), Dip.T.P., MRTPI and Fairey Surveys' Asst. U.K. Marketing Manager Bill Clark.

When the Government's intention to designate a New Town at Stonehouse was first announced, a Joint Technical Study Team comprising officials of Lanarkshire County Council, the Scottish Development Department and East Kilbride Development Corporation was appointed to recommend to the Secretary of State for Scotland an area for designation. The Government also indicated that the planning and development of the New Town would be undertaken by the present East Kilbride Development Corporation. By utilising the existing Development Corporation's proven expertise and ability, it was the aim of the Scottish Development Department to see an early start made on site at Stonehouse in an attempt to meet

the initial target for population intake of 35,000 by 1981. The Development Corporation was therefore authorised to carry out basic surveys concurrent with the Joint Technical Study. The first was the preparation of 1:2500 contoured plans of the area. Because this work had to be accomplished with the utmost speed in advance of the formal Designation Order for the New Town, it was essential that costs were kept to a minimum though at the same time obtaining the maximum amount of information in a single package.

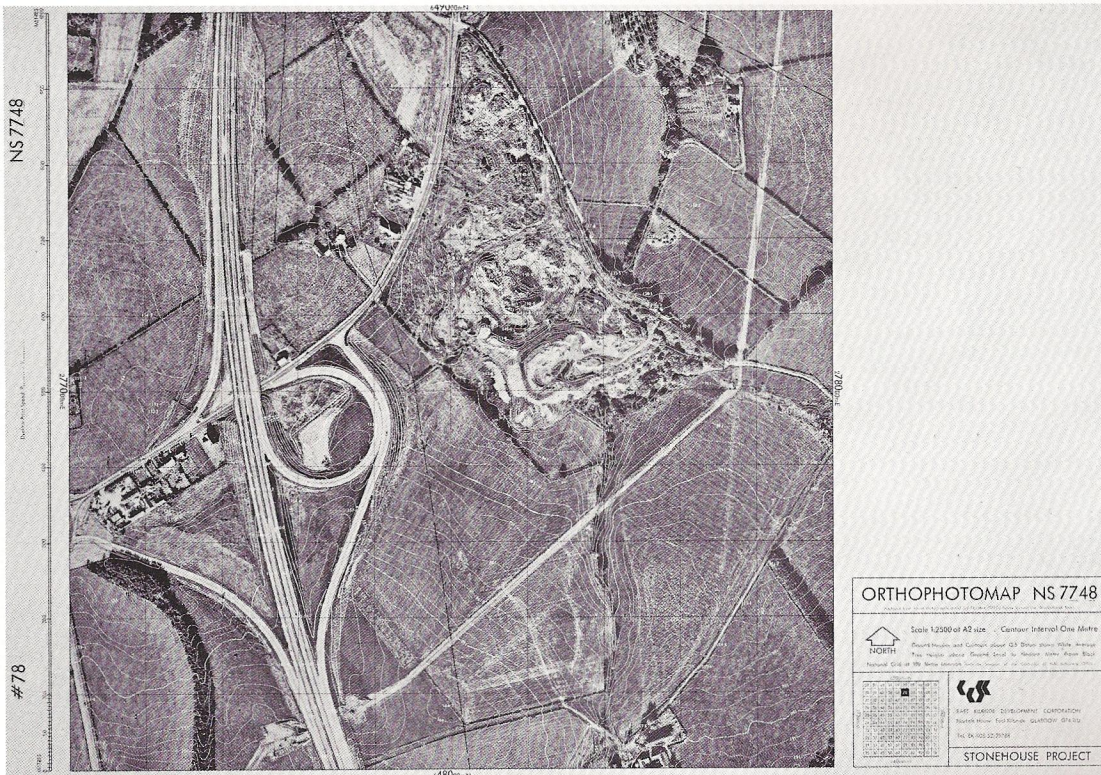
Data Requirements

Tenders were invited for the preparation of 1:2500 plans contoured at one metre intervals covering the study area of 52 sq. kms. The close contour interval was selected because the terrain over much of the area was undulating with several deeply incised valleys. Accurate measurement and assessment of different land slopes would be necessary because previous experience in East Kilbride has shown that development costs increase rapidly on land which is steeper than 1 in 10; the one metre contour interval would therefore allow this landform analysis to be carried out more effectively.

An opportunity was also given to tender for the preparation of orthophotomaps

with one metre contour intervals as it was realised that this new technique could provide at the working scale of 1:2500 a wealth of additional information. Such information is normally gathered separately in a piecemeal fashion and then superimposed on conventional line maps and contour surveys. It was significant that the Fairey Surveys tender for orthophotomapping was considerably cheaper than those for conventional surveys and in addition offered the fastest production rates, both these factors being critical for the Stonehouse project.

There was a basic requirement for contours and spot heights to be superimposed in white on the orthophotomap background. In addition, the National Grid at 100m intervals, heights of trees in metres and overhead electricity transmission lines (11kV and over) were requested and shown in black. One further requirement which had immediate production benefits as well as long term user benefits was the presentation of the orthophotomaps as 1 km National Grid squares on international standard A2 sheets. This new style of presentation was a refinement by E.K.D.C. planners of the Scottish Development Department's Graphic Data Handling System which has been recommended for adoption by authorities in readiness for the formation of a National Data Bank. The system is



Sheet No. NS7748 of the 1:2500 Orthophotomaps of area of proposed new town at Stonehouse.

based on the observation that a 1 km grid module or tile measures 400 mm square at 1:2500 scale and fits neatly on to an A2 size sheet format (420 mm x 594 mm). This allows for a 10 mm border at the north and south edges and a 40 mm border at the west edge used for punched hanging or binding, incorporating filing and dyeline printing instructions, and a scale bar 400 mm long. National Grid eastings and northings are simply located in the borders at the mid points of the tile edges.

Presentation

The wide margin to the east of the tile is used as a title panel in the Graphic Data Handling System. For the Stonehouse project E.K.D.C. planners designed a standard title panel which incorporated an ingenious key diagram with a simplified two digit reference system based on the 1:2500 National Grid sheet number. The key diagram, representing 100 square kilometres, includes the whole of the area of search for the New Town and shows the particular orthophotomap sheet in relation to the total orthophotomap coverage and the draft Designated Area boundary. The standard title panel (100 mm x 134 mm) was incorporated in each of the 52 orthophotomap sheets. The area above the title panel is left blank for users to add interpreted information or other survey data in alphanumeric form. In addition to the obvious advantages of having a co-ordinated map system which would also be compatible with a National Grid oriented Data Bank, Faireys recommended screening of the orthophotomaps image and reproduction on clear transparent Kodak High Speed Duplicating Film which was selected by East Kilbride for its black line density and the increased speed at which dyeline prints could be made compared with matt-based material. An additional requirement from E.K.D.C. engineers was the production of the contour and spot height component of the project as separate blackline overlays. Again these were produced on clear Kodak High Speed Duplicating Film and the format was arranged to fit on to the Ordnance Survey's 2 x 1 km 1:2500 transparencies of the area. This allowed the subsequent production of composite transparencies to be used as a base for sketch architectural and engineering design studies after the preparation of initial planning briefs based on the orthophotomaps. It also obviated the need for superimposing the place name information on the orthophotomaps which could well have obliterated important topographic detail and increased the production time unnecessarily.

Project Planning

The very comprehensive list of user requirements including the systematic specification of 52 individual 1 kilometre square orthophotomaps, allowed Fairey Surveys to plan the whole project in an

entirely new way and thereby overcome or reduce many of the problems in the production of orthophotomaps. Image distortion normally present at the edges of orthophotomaps and identified by relief displacement ("leaning buildings") and "chopping" of roof lines and bridges is hardly noticeable because only the central portion of the original unrectified photograph was used in the scanning for the orthophoto. This was achieved by setting a 90% forward overlap and plotting the flight path for the aircraft along the centres of the National Grid squares in an East-West direction resulting in a 50% lateral overlap. Consequently, no mosaics were necessary within each 1 sq.km. orthophotomap, while comparative photographic definition and density checks were carried out at every stage of the production process. So good

The contract for the whole project was authorised on 22nd September, 1971 and it was stipulated that flying for both the panchromatic and the infra-red photography must be completed by the first week in October, 1971. This was necessary because in Scotland deciduous foliage loses chlorophyll at the beginning of October and falls by the middle of the month, which would render both sets of photography less effective. Priority was given to the panchromatic photography and whilst this was achieved most successfully, deteriorating weather conditions meant that the false colour sorties had to be deferred to the following year. This has now been provided and is being used along with the previous 1:10 000 photography and more recent 1:3 000 photography in detailed geological and soil surveys.



Section of polyurethane landform model at 1:2500 measuring 3m by 3.2m.

was the matching of adjacent 1 km orthophotomaps that E.K.D.C. subsequently requested 1 metre square composite reduction sheets at 1:5000 scale (4 sheets) and 1:10 000 (1 sheet) of the 52 orthophotomaps. Mosaics from 1:24 000 scale photography by the Scottish Development Department were used to fill in the fringes surrounding the orthophotomaps area and blended to achieve a satisfactory visual effect. Isolated place names were also added to assist location and orientation. These smaller scale composite sheets, containing all the wealth of information of the original orthophotomaps, are proving particularly useful in the preparation of the first basic master plan for the New Town.

Production Priority

It was necessary to chart the positions of old underground coal workings, the extremely varied soil types in the area — ranging from wet and peaty to dry and sandy, and the mixed agriculture and vegetation types. To assist in determining and classifying these characteristics quickly, it was decided to obtain infra-red (false colour) photography in addition to panchromatic photography.

Production of all the 1:2500 scale orthophotomaps was completed within seven months of the flying. An accurate expanded polyurethane landform model at 1:2500 and measuring 3 m by 3.2 m was completed by Fairey's modelling department in August, 1972. Working copies in the same material produced as castings from a fibreglass resin mould of the master model have recently been delivered to East Kilbride. These working copies will be used to demonstrate alternative planning schemes at conferences and exhibitions.

Finally, detailed slope analysis maps at 1:2500 scale covering the whole area in 12 gradient categories ranging from 1 in 5 to 1 in 100 were produced from the 1 metre contours by two geographers with E.K.D.C. during six weeks in the summer of 1972. These new style maps will be an important tool in selecting the most appropriate urban land use for any particular slope of site. As well as savings in costly earthworks in developing difficult sites this new technique should result in a pleasing urban form for the New Town in sympathy with the present attractive natural environment of Stonehouse.

Marketing Profiles

In this issue we feature the overseas marketing team led by our Overseas Marketing Director, Col. R.T.L. Rogers. Col. Rogers is one of the best-known figures in international surveying and mapping. He is a past Secretary General of the International Society of Photogrammetry, a Member of the General Council of the R.I.C.S. and the British representative on the Geometers Liaison Committee to the E.E.C.



Responsible for the commercial aspects of all overseas contracts is Jim Daly. He joined Aerographic Surveys, Weybridge, in 1948, after four years in the Royal Engineers, Survey Regiment. Aerographics became part of Fairey Surveys in 1949, and Jim gained experience in all the practical aspects of air survey and mapping before being made U.K. Project Manager for a two year mapping programme of 130 Iranian towns, and villages. When this contract finished, in 1962, he continued on the administrative side and with growth and division of the marketing department into U.K. and Overseas, Jim became Overseas Commercial Manager.



Senior Executive in the field is Reg Caudle. After scientific training in the air photographic division of the Royal Aircraft Establishment at Farnborough, Reg. Caudle joined Fairey Surveys in 1956, and by 1967 had become Manager, Research and Engineering Division, spending much of his time on camera installations for British military aircraft. In 1970 he became Public Relations Manager and assistant to the Managing Director and in January 1972 was appointed Manager, Overseas Marketing. He has since travelled widely, particularly in Europe and the Middle East.

Completing the team are sales executive Ken Pinkney and Technical Executive John Keay.

NEWS IN BRIEF

Fairey Surveys has acquired a substantial interest in the Survey Services Group of Companies and associated partnerships — one of the largest surveying organisations in South East Asia. With offices in five centres around the South China Sea. Survey Services has a comprehensive capability in land, engineering and hydrographic surveying and provides both consultation and mapping services throughout South East Asia. Mr. John H. Chinchin, 33, has been appointed Managing Director of Survey Services. The two companies have been associated since 1969 through technical cooperation and the representation of Fairey Surveys in the Far East.

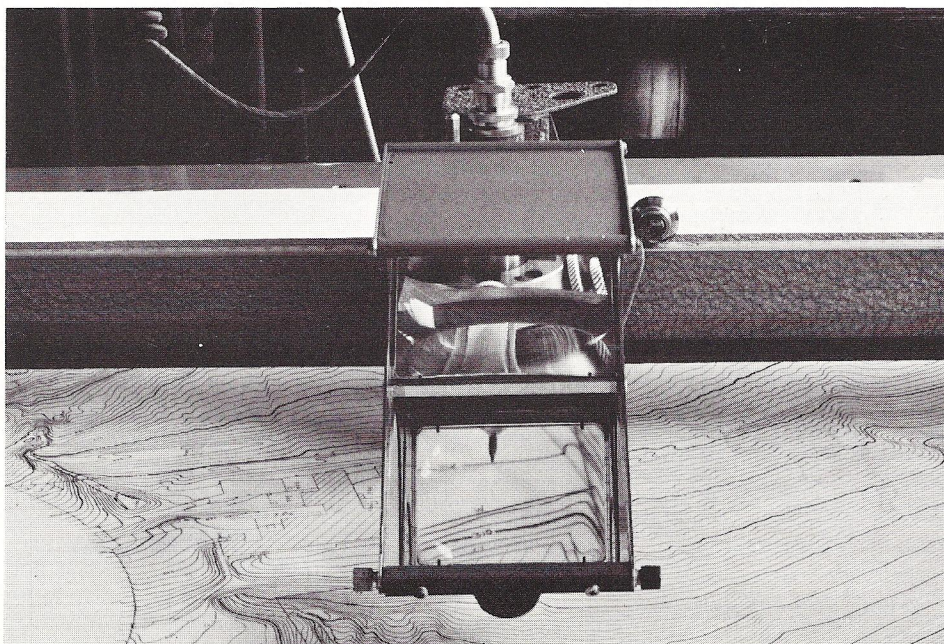
Largest single contract so far placed with U.K. Sales is for mapping of 50km of Stoke—Derby Motorway Link between the M1 and the M6. Mapping will be at scales of 1:500 and 1:1000. Client is the Midland Road Construction Unit.

Recent subject for orthophotography was certain areas of Berkshire. Orthophotographs at scales of 1:2500 were supplied quickly and at low cost from existing 1:10,000 county cover. Nearly 10,000 square miles of central Ghana are being photographed at 1:40,000 for DoS.

Fairey Surveys Geophysics Division's coverage of the off-shore areas of Europe is being extended to include further coverage of the coastal shelf off Southern Ireland. Fully interpreted results will be available for sale to organisations which are not contributing members of the survey consortium.

We are producing town plans and gazetteers for four principal towns in Cyprus. Scale is 1:7500. Client is the Mapping and Charting Establishment of the Ministry of Defence.

Fairey PLOTTERSCOPE



Almost twelve years ago it became apparent that an attachment was needed for the co-ordinatograph table of our plotting machines to enable the operator to see both the pencil point and the surrounding area of the plot without leaving his seat. Fairey Surveys Research and Instrument Division designed and manufactured a prism and mirror instrument, the PlotterScope. This is easily fitted to the Wild A7, A8, A10, Zeiss Stereometrograph and Zeiss Stereoplanigraph instruments and special adaptors to other plotters can be supplied to order. The saving in operator time and convenience is dramatic, and the instrument is in service with many of the world's survey departments, both Government and privately owned. The Ordnance Survey of Great Britain recently purchased ten plotterscopes for its photogrammetric laboratories at Southampton. A descriptive leaflet printed in English, French and German is available on request. Twelve years on, the plotterScope, priced at less than £60, delivered anywhere in the world, is still the market leader.