

Current Developments in Air Photography

IT is something of an anomaly that the world has learnt so much about the physical characteristics of the heavenly bodies from the standpoint of remote observation, but has not until comparatively recent time applied the same process to the earth itself.

The earth is of far greater interest to its inhabitants than the rest of the universe, and although man has measured, calculated and probed his way to some understanding, it is beginning to be realised that he must get off his hands and knees, as it were, and grapple to more effective purpose with the terrestrial problems which confront him and with which he battles to survive. From the dawn of civilisation until the advent of air photography this opportunity was denied him. Air photography in itself, however, was not sufficient, but when this subject developed into the science of photogrammetry (the three-dimensional measuring of aerial stereoscopic pictures), by which it is known today, man's outlook with regard to the face of the world changed.

This fact is receiving increasing recognition in every branch of human endeavour, for it would be difficult to find an instance in which air survey, air photography, and photogrammetry cannot be directly or indirectly applied with distinct benefit.

A Branch of Science

Air photography has been developed to a very high degree in England, though only a little used, on a foundation laid by Mr. Colin Williamson, C.B.E., in a very early chapter of aeronautical history. The first great purpose it served was in a national interest in the course of the 1914-18 war. This point is worthy of note, for from this period the Williamson Air Camera was subjected to the intense development which fitted it so well to cope with the tremendous responsibility which was imposed upon it during the recent wars. Step by step with the ever-increasing pace of aircraft performance, and under the most difficult conditions, these cameras continued to give excellent service, and with it the science of photogrammetry came into being.

Now comes the turn to apply the knowledge and the experience gained to the needs of economic reconstruction and the development of trade and commerce. The part that the air camera can play in these vital interests has already been recognised by a number of far-seeing individuals and bodies who have profitably established themselves in this branch of aeronautical activity. This has provided a very satis-

This article is of special interest at this time in view of the World Conference on Air Survey which now is being held in Britain.

World Air Survey Conference

IMPORTANT Dominion representatives are visiting Great Britain for a World Air Survey Conference. Those present include the managing directors of all the Dominion companies in the Hunting Group, to prove that private initiative in this sphere is very much alive, and include:

H. P. Van Asch, New Zealand Aerial Mapping Ltd.

Col. C. R. Robbins, Aircraft Operating Company of Africa.

F. W. Follett, Adastra Airways of Australia.

D. N. Kendall, Photographic Survey Company of Canada;

all of whom arrived in this country by air.

Distinguished persons from the aviation, photographic and industrial world will meet the visitors during their stay in this country. A carefully arranged programme of visits, entertainment, etc., is being introduced between breaks in the ten-day conference period. Some of the more important items are quoted here below.

Feb. 10 to 21. Hunting Aero Surveys Group Conference.

Feb. 10. Visit to Aerial Survey Exhibition at Elstree.

Feb. 11. Visit to Williamson Works at Willesden.

Feb. 14. Visit to Ordnance Survey at Chessington.

Feb. 15. Visit to the Percival Aircraft Co. Ltd., Luton Airports, Beds. Display of aircraft and equipment at Luton Airport, contributors include six leading aircraft manufacturing companies.

Feb. 17. Visit to Directorate of Colonial Survey at Kingston on Thames and General Survey Dept., War Office.

Feb. 19. Visit to Royal Aeronautical Establishment at Farnborough.

factory outlet to the thwarted ambition which so many suffered in consequence of the international tendency to nationalise air transport. Air survey and its associate activities has provided many opportunities to air operating personnel possessed of a business outlook to serve the increasing needs of industrial development. As the great potentialities of air photography in the almost limitless phases of its possibilities become apparent, so air operating concerns will expand in capacity along what promised to be a particularly unrestricted path to prosperity.

Specialised Approach

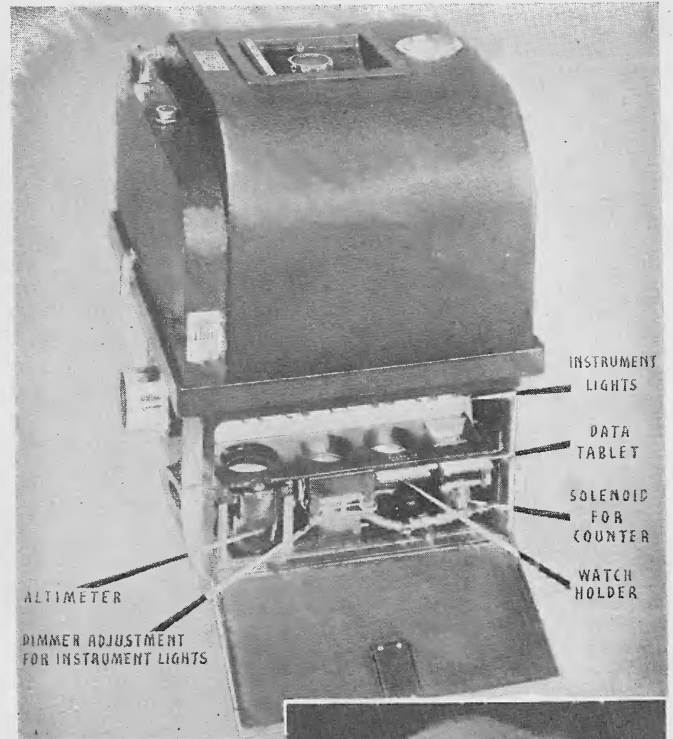
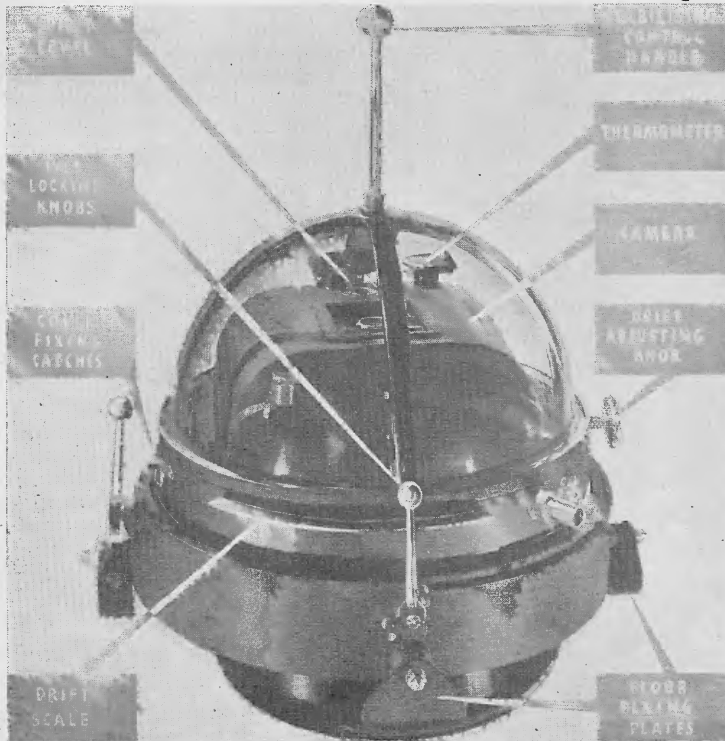
When considering the vast areas which comprise the earth's surface, the mere point to point distances embraced within the operations of normal commercial air operating activities fade almost to the point of insignificance. In every square mile many reasons occur for a separate and specialised approach for a surface or sub-surface analysis of the conditions bearing upon a particular problem. The term sub-surface is not used in a radiological sense, but in the manner that the experienced eye of the medical practitioner is able to 'see below the surface', and to know just what he is expected to find in the course of a more detailed diagnosis.

The science of photogrammetry only commences with photographs taken from the air. Geologists and prospectors concerned with the earth's immeasurably rich resources, are provided with an unerring pointer to new fields of development, and what is as important, with the minimum expenditure of time.

Years spent in geological surveys by the old methods can be reduced by the new science to a matter of days. Checks and re-checks can be instantly made from the evidence produced and at any time a comparison can be made bearing upon seasonal, climatic, social, industrial, irrigational and agricultural changes dependent upon varying circumstances.

The photographic results can be read from many angles. This means that a separate story can be extracted as the result of one survey. At the same time a specialised approach to one problem can be made, such as in a military interest, and therefore is only truly suitable to one purpose.

In Canada alone, air survey organisations have done excellent work in the new branch of science, and the R.C.A.F., in one phase of operations, concluded a 200,000 sq. mile survey in the course of one year. In these activities dependence was placed



upon the Williamson O.S.C. Mk. I camera and other photographic equipment produced by that company.

Measuring Depth of Water

A point of added interest to air survey operating personnel is the fact that not only land, but water, is now becoming a subject for the attention of the air camera. Some interesting work is being done by Coastal Command in measuring the depth of water round the wastes of Europe by means of aerial photographs. Existing charts of certain coastlines did not give reliable indication of the details of sand-banks, reefs, and other under-water obstructions, but charts can now be rectified with the minimum of time by the application of air photography.

Simultaneous vertical air photographs are taken on panchromatic film by two cameras, one fitted with a red, and the other fitted with a green filter.

By comparing the two photographs, the depth of the water can be registered at any point to within 3 ft., so long as some point of known depth is shown on one run of the photographs. The reason for this close interpretation is that coastal sea-water has a maximum transparency for green light, and a considerably reduced transparency for red light. Objects below the water, therefore, appear much darker with the red than with the green filter.

As a comparison with this scheme, infra-red film is also used to ascertain the exact position of high-water mark. On normal panchromatic film, shallow water is often very difficult to detect on an air photograph, but by use of infra-red film and filters the water is rendered black on the print and the water mark is thus easy to trace.

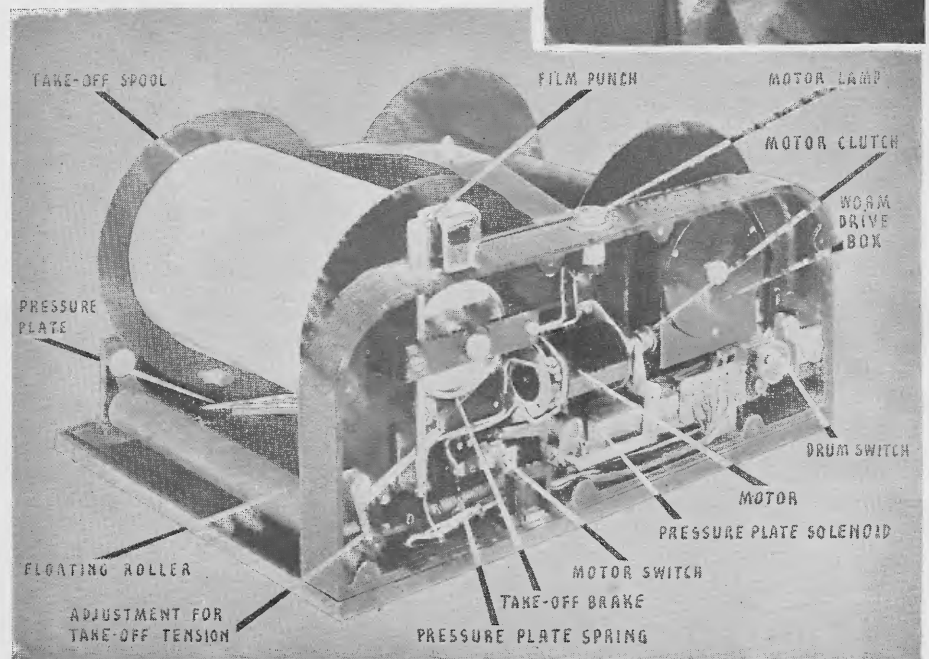
Air photography personnel deal with vast figures of coverage in the course of

The above illustrations show (left) the latest type of O.S.C. Camera in its mounting in its heat insulated enclosure; and (right) the instrument panel in the side of the casing. The data is reproduced on every exposure made

Mr. Colin Williamson, C.B.E., one of the leading figures in the Air Survey photographic equipment world

(Below) The magazine withdrawn from the camera. This has a capacity of 500 exposures and is driven by its own self-contained driving motor.

[Photos of camera by courtesy 'Latin American World'



normal routine, but reflecting upon the efficiency of the process is the comparatively small amount of staff and personnel needed. Such as are employed do not need to be highly trained specialists, although a very high degree of proficiency is soon reached in the use of the equipment.

Actually, the Williamson company have instituted a three weeks' course in Canada in the operation and maintenance of the air camera, which should in itself provide some indication of the simplicity with which it can be handled. The course is open to either civil or Service personnel.

British prestige in this widening phase of air activity stands very high, and in this connection it is of interest to note that a de Havilland Rapide belonging to that progressive concern, Hunting Aerosurveys Limited, recently left Croydon for the Persian Gulf to survey a large area for an oil company. The Rapide has been equipped for all types of aerial survey under extreme climatic conditions, and such will naturally be experienced from the tropical ground temperature prevailing, to the low temperature met with in high altitude operational flying.

No Need for Highly Specialised Equipment

The employment of a de Havilland Rapide for this purpose is of interest in proving that a highly specialised type of aircraft is not essential to the purchase of modern air survey even in such an important matter as this.

These activities may be considered as signposts to the place air survey will eventually take in the interests of commerce.

A further interesting development in air survey work is provided by the announcement that the Photographic Survey Company Ltd., of Canada, has just broken what undoubtedly amounted to a virtual United States monopoly by securing large scale survey contracts for oil companies in Venezuela and Colombia, South America. The latest news is that the flight from Canada to South America had been successfully accomplished. Not inconsiderable laurels will go to Mr. D. N. Kendall for this project. He has proven himself capable of tackling big jobs in a big way.

While it is true that at the present time this country is considered to have the lead in the matter of technical personnel and equipment, and it may be fairly said that a British survey party has no equal in the world, signs are not wanting that this predominant position is likely to be challenged in the near future with the re-emergence of other countries in this field. For example, we learn that the Dutch are becoming active in air survey work in different parts of the world and that a specially converted K.L.M. Dakota, equipped with additional built-in petrol tanks, has left Schiphol for Curacao to assist in the extensive aerial photographic survey now being made in the Netherlands West Indies, and two other machines will be flown out in the course of the next few weeks.



Town plan layout on the outskirts of London



Working from stereo pairs the artist can put in the colour on relief models prepared from these photographs



Preparing models of a factory site from information taken from air photographs



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