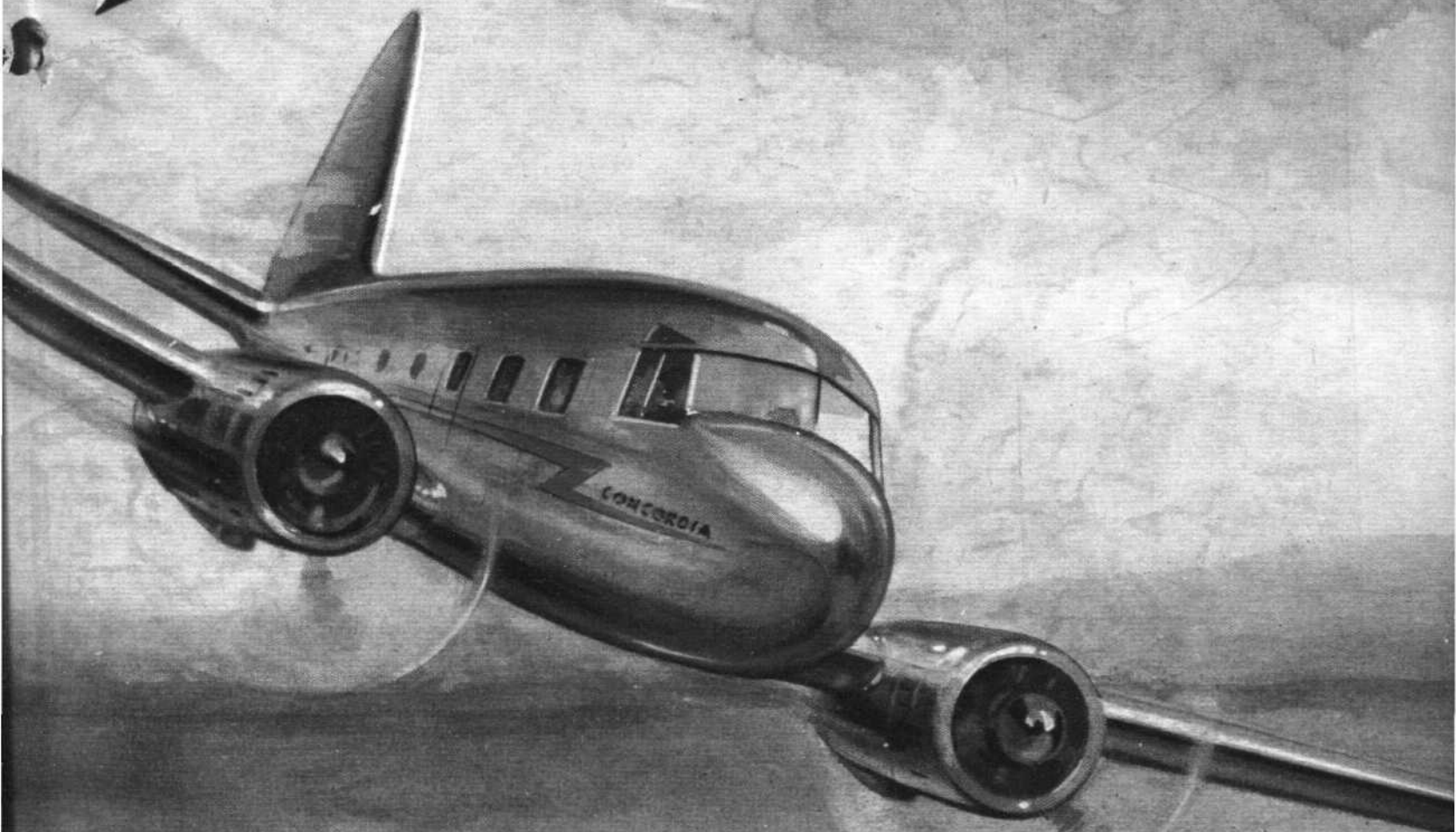


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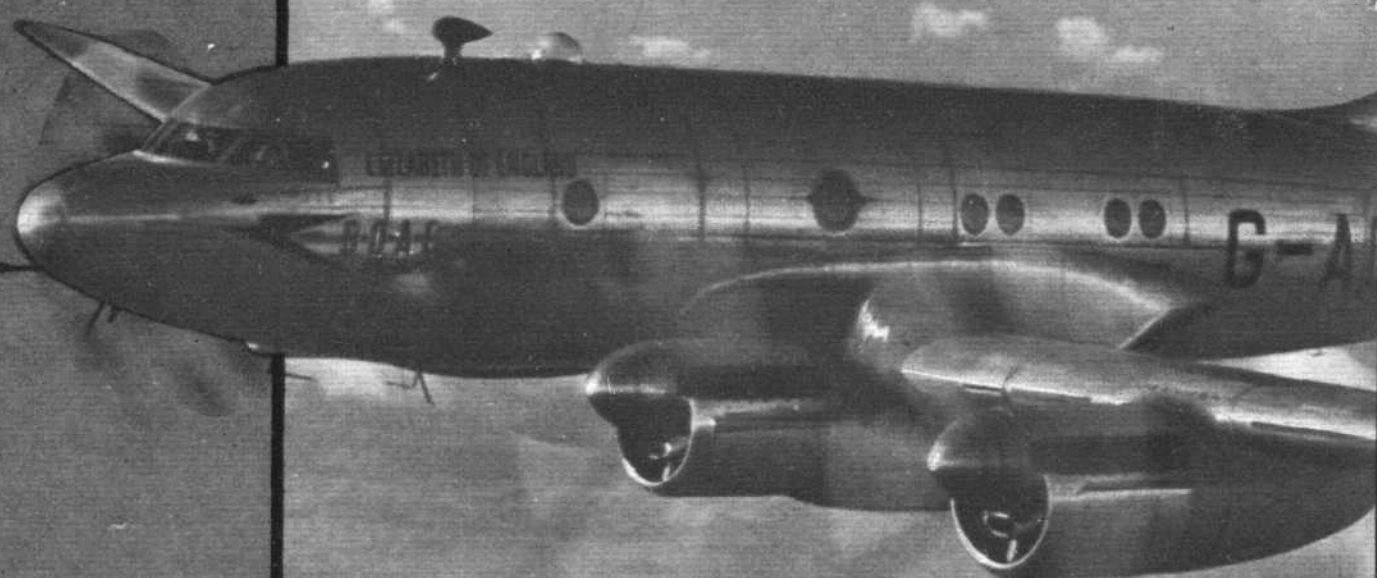
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The Outlook

Safety Precautions

THE official report on the accident to a Dakota at Croydon on January 25th, a summary of which we publish in this issue, discloses a somewhat alarming state of affairs. The number of things that were not done according to the regulations must make the attempted start of this flight almost unique. Yet something like 99 per cent of the blame is laid by the Chief Inspector of Accidents upon the pilot. In other words, the contravention of so many regulations, and the omission of various safety measures, might have had no serious consequences if the pilot had not committed the grave error of taking the machine off in a semi-stalled condition.

Air Commodore Vernon Brown concluded his report with the recommendation that, so far as practicable, it should be ascertained, before permission is given for an aircraft to take off, whether Air Navigation Regulations have been complied with, particularly by inspection of the certificates and licences of the aircraft and crew. Immediately after this accident, the Ministry of Civil Aviation issued to all airfields under its control instructions for the systematic inspection of Certificates of Airworthiness, Certificates of Safety, and Crews' Licences, with the object of ensuring that these papers are in order in all public transport aircraft taking off from these airfields. It might have been thought that such elementary precautions would have been normal routine, and that by January, 1947, the issue of instructions would have been superfluous, but apparently this was not the case until the recommendation was made by the Chief Inspector of Accidents.

It behoves all concerned to attempt to draw lessons from every flying accident in order that, so far as is humanly possible, there shall be no repetition of the circumstances which led to it. In this particular case the lesson appears to be that although the machine had not been inspected by the A.R.B.; although no C. of A. or

registration had been issued by the Department of Civil Aviation, Southern Rhodesia; although no member of the crew held a Navigator's Licence; although no flight test was made after the removal of the long-range fuel tanks which had been fitted for the ferry flight from America to this country, yet in spite of all these omissions, the machine might have reached South Africa safely but for the error committed by Capt. Spencer in allowing it to become airborne before it had gained proper flying speed and attitude.

The Chief Inspector of Accidents classes this as the primary cause and attributes it to "an error of flying technique by a pilot who lacked Dakota experience," but does not dismiss the possibility that the impairment of the pilot's judgment through fatigue may have been a contributory cause. (Capt. Spencer does not appear to have had more than about seven hours' sleep all told during the two previous nights.) His total flying time in Dakotas was 18½ hours, of which approximately 12 hours were as first pilot. That is not a great deal, certainly, but his "B" Licence was endorsed for the Dakota.

To us it appears that the fatigue consequent upon days of hard work and nights of insufficient sleep is more likely to have led to the accident than the relatively short experience of the Dakota.

One cannot escape the conclusion that all the unfortunate circumstances of this accident once more emphasize the fact that, necessary as they are, regulations cannot by themselves ensure safety in flying, and that the human factor still plays a very big part. It would obviously not be practicable to insist that every pilot who carries fare-paying passengers should submit to a medical examination before each flight in order to ascertain whether or not he was physically and mentally fit at that particular moment. In the vast majority of cases the pilot himself will be the best judge of that. Unfortunately Capt. Spencer allowed his anxiety to start to overrule his judgment on this occasion.

In Memory of Deliverance

TO the Service which held the bridge in 1940 the first tribute of history has now been paid. The names of the dead are inscribed on a worthy scroll. The crests of the living squadrons are worked into the design of one of the most lovely windows in Westminster Abbey. These two memorials of a great feat of arms are placed in the Royal Air Force Chapel which the King has opened and ordered to be dedicated.

Those of us who were in the battle but not of it, who watched and hoped and perhaps suffered, will be glad of a shrine where we can renew our gratitude and keep bright our ageing pride. For pride, no matter how unworthy it may seem, cannot be excised from the spirit of thankfulness evoked at every thought of the battle. We who knew the poverty of our defences and the imminence of invasion in 1940 cannot but be proud that our modest Air Force withstood the onslaught. Men and materials were fit for a superhuman trial. Their courage and their quality were our salvation and as a nation we had the right to mix pride with our sense of relief.

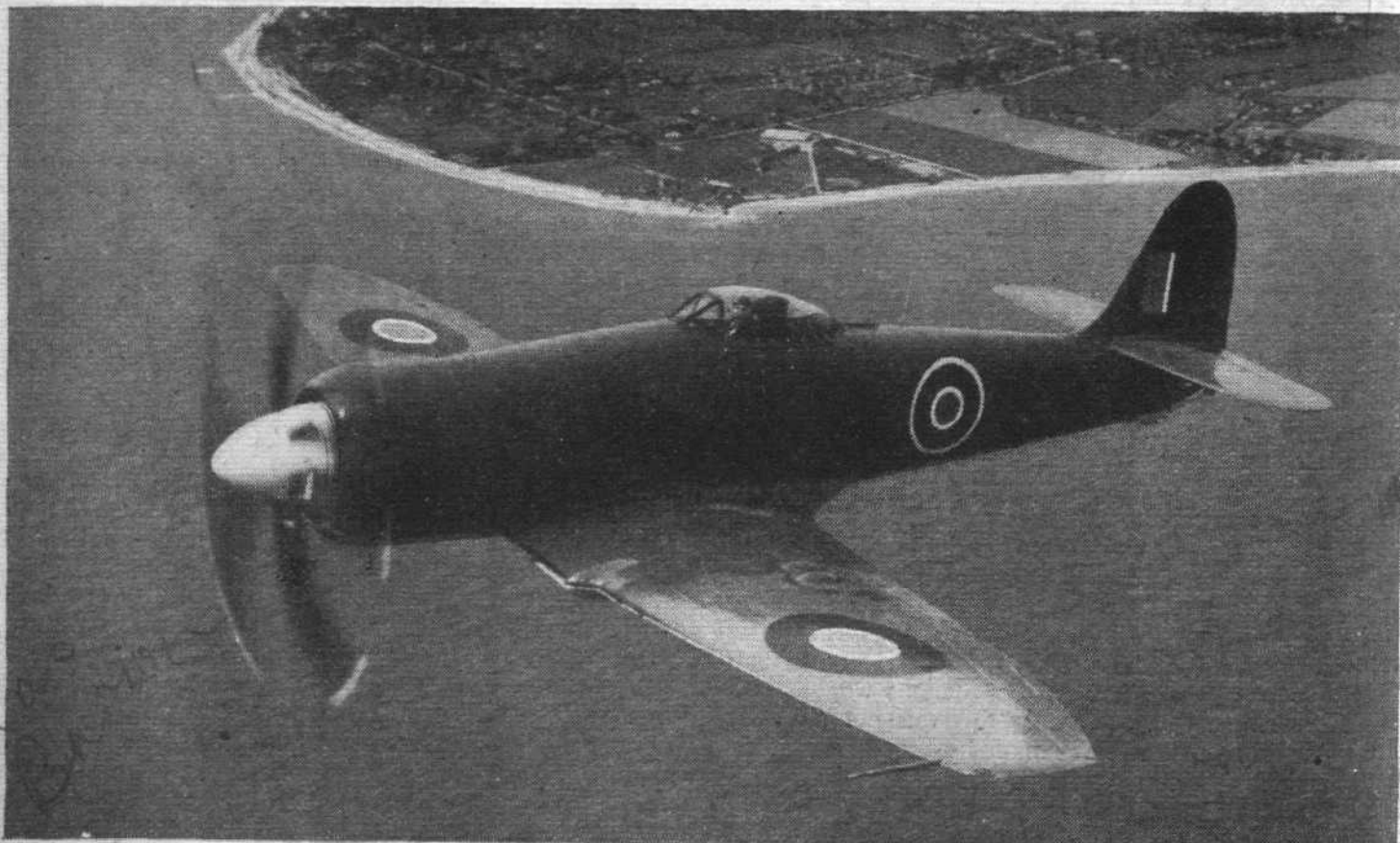
We of this generation have no doubt of the destiny that was determined by the valour of our airmen sons and the superiority of the arms with which we had equipped them. The flood of evil which submerged most of Europe was held, short of the one base whence the tide might be turned. A mere 63 squadrons with a nation behind them sufficed to stem the flow and thereafter to serve as the nucleus of the ampler air armadas which brought retribution to the disturber of the peace. Do we, so soon after the event, set this feat too high in our estimation? Are we moved, because it was the first resounding victory of Air Power, to find in it a magnificence which history will have to modify?

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Forthcoming Events, page 69

Shall our grandsons have to say that we mistook courage and endurance for a turning point in the course of the war—the epic for the epoch? We who were part of the ordeal have declared our belief and our faith. The world must do what it will with the victory. The British people held the bridge while that victory laboured to create itself out of unpreparedness. The force which held back the invader was later to release the means of Europe's deliverance from a tyranny planned to last a thousand years. That is the yardstick by which to measure the place of the Battle of Britain in history. Our splendid window of remembrance is bright with the colours of nine nations banded together under the ensign of the Royal Air Force. Citizens of all nine nations have places in our roll of honour. The beginning of unity among the violated nations was accomplished in the Battle of Britain and their hope of restoration came out of it. Small wonder that we are convinced we have neither painted its memorial too bright nor set that memorial too proudly in the best place among the emblems of our greatness.



FOR NAVAL AVIATION: Progressively through the pre-war and war years the Fleet Air Arm—now Naval Aviation—improved in efficiency and strength. Gradually the nautical mind started to think on more aeronautical lines and Naval air equipment began to match in performance that of the R.A.F. Above is the latest Naval fighter to go into service—the Hawker Sea Fury X with Bristol Centaurus XVIII engine. The next Hawker ship-borne fighter may well be jet-propelled.

Helicopter Topics

*"Putting Them Over" in Europe:
Employment : The Controls :
Problems and
Limitations*

A landing area for every street and large building is foreshadowed by this touchdown on a B.B.C. roof. The surface must be strong enough to support 3 tons per sq. ft. for this S-51.



ALL sorts of people talk glibly about helicopters these days, but the more deeply one digs into the facts the less one finds one really knows about them. An almost parallel example is the subject of atomic energy, which everyone must have mentioned at some time or other, but about which hardly anyone knows anything concrete at all. The old saying about a little knowledge being a dangerous thing probably applies more truly to aviation matters than to any others, and according to the attitude adopted now by the self-appointed "experts" and prophets the character of the helicopter might in advance be made or broken in the public mind without its being able to raise so much as a rotor blade in its own defence.

Before the war this country was in the forefront of rotating-wing developments, but it is estimated that we have lost as much as seven years of "know-how" by com-

parison with our fellow-enthusiasts across the Atlantic. We make no bones about this, and the Westland Company's purpose in obtaining a licence to build the American Sikorsky S-51, a scheme which has full official support, is intended to prevent the extension of this seven-year period. As a result of the agreement which, we understand, was on terms generous to this country, we are already profiting by practical experience with S-51s. When, later on, Bristol and Fairey designs and others are perfected and in production they will benefit greatly by being received in experienced hands and by being employed on work with which their species are already familiar.

A Big Responsibility

The Westland Company is under no illusions as to its responsibility in putting over helicopters in a sensible and practical manner to people in this and other European



The attractive little two-seater Sikorsky S-52 (175 h.p. Franklin engine) seen here beside an S-51, should be ideal for the wealthy private owner. It seems, however, that production costs for small helicopters will be almost as great as for larger ones.

Sikorsky

Helicopter Topics

countries. The unusual flying capabilities of the helicopter as compared with those of conventional aircraft tend to make a flying demonstration resemble a series of stunts, but flying sideways and backwards, hovering and parking down in a confined space are all serious and important manoeuvres in the repertoire of a commercial helicopter, apart from the fact that they illustrate the manoeuvrability of the particular machine and, incidentally, the skill of the pilot.

Demonstrations which have so far received publicity have all been designed to familiarize the general public with the helicopter—any helicopter, not just the Sikorsky, which happens to be the first commercial proposition available in this country. A relatively large number of people have now been given a flight (at Barnes and elsewhere); a Parliamentary Secretary has been carried from his home to his office; a landing has been made on a small roof surrounded by buildings; parking between rows of cars has been demonstrated; an engineer has been landed on a buoy from a hovering helicopter, and the uses of such an aircraft to reporters of news and sporting events have been considered and are being tried out.

Employment Still Limited

With all their experience, the Americans have made only very limited commercial use of helicopters to date; crop dusting and one or two examples of rescue work seem so far to have had the greatest appeal, while postal and taxi work come next on the list. We may safely take this as a guide to the future application of helicopters in this country and in Europe; in fact, the first commercial helicopter in England is the S-51 recently supplied to Pest Control, Ltd., by the Westland Company. A Swedish firm is also understood to be using three Bell helicopters for pest spraying. It goes without saying that all three armed Services are actively interested in helicopters, and have had quite considerable experience with the familiar but rather dated Hoverfly.

The list, below, of helicopters now being built in America, which was prepared by our contemporary, *Aviation*, is of considerable interest if only as an indication of the scope of this new branch of the industry. The comparatively short ranges, low cruising speeds and small disposable loads claimed for these types are significant.

The Westland Company hopes to produce forty to fifty S-51s by next summer, and news of the first flights of the Bristol-Haffner 171 and the Fairey Gyrodyne is expected in a matter of weeks.

One of the problems which will have to be faced fairly soon is the question of training rotating-wing pilots. Even the most capable and experienced pilot of conventional aircraft needs about eight hours to solo a helicopter, and as



The pilot's view from a Sikorsky S-51 is almost perfect. The three controls—stick, pedals and collective pitch lever with twist grip throttle—are all visible in this photograph, but blind-flying instruments are conspicuously absent from the panel. Half way up the pedestal are the rotor brake (port) and wheel brake "pulls."

much as another twenty dual and solo mixed to handle the machine competently. This does not mean that the flying is very difficult, but that it is *different*, and calls for a new kind of co-ordination and a great deal of concentration and practice.

The chances of the helicopter must not be prejudiced in any way at this stage. It is, therefore, essential that only fully qualified and competent pilots should handle the earlier machines. The Westland Company is making it a condition of sale that the buyer shall send his pilots to Yeovil for a training course before the aircraft is delivered, and the company reserves the right to turn pilots down if they are not considered to be suitable. The purchase of certain stocks of spares is also a condition of sale, both here and in America. If we assume the cost of an S-51 to

Manufacturer	Model	Seats	Engine	Engine Type	Rated h.p.	Range (miles)	Max. Speed	Cruising Speed	Gross Weight	Empty Weight	No. of Rotors	Blades per Rotor	Diam.
Bell Aircraft ...	42 ...	5	1	P. & W. Wasp	450	300	125	100	4,891	3,446	1	2	47ft 6in
	47-B ...	2	1	Franklin	178	216	106	86	2,200	1,521	1	2	35ft 1 1/2in
Bendix Helicopters ...	J ...	4-5	1	P. & W. Wasp	450	—	—	—	—	—	2 Co	2	48ft
American Die and Tool	Chappedelaine	2	1	Franklin	130	—	—	—	1,700	1,200	1	2	30ft
de Lackner Helicopters	—	2	1	Lycoming	120	200	100	80	1,600	1,125	2 T	2	24ft
Doman-Frasier Helicopters	HC-1 ...	10	2	—	450	—	—	95	8,900	—	1	4	63ft
	HC-2 ...	10	—	—	1,200	350	—	100	9,000	—	—	—	63ft
Firestone Aircraft ...	XR-9B ...	2	1	Lycoming	135	275	105+	80	—	—	1	3	28ft
	50 ...	4	1	—	—	—	—	—	—	—	1	3	—
Gazda Engineering ...	Helicospreader	2	1	Gazda	130	—	130	150	1,200	—	1	3	25ft
Helicopter Engr. and Design	100 ...	1	1	Continental	75	—	100	—	750	350	1	3	19ft 6in
Kellett Aircraft ...	KH-2 ...	10	2	Continental	550	180	118	90	11,600	8,658	2 1	3	65ft
Landgraf Helicopter ...	H-2 ...	1	1	Pobjoy	85	—	100	—	850	636	2 1	3	16ft
McDonnell Aircraft ...	XHJD-1 ...	2	2	P. & W. Wasp	450	—	—	100+	—	—	—	3	46ft
Piasecki Helicopter ...	XHRP-1 ...	12	1	Con. Wright	525	320	125	107	6,700	—	2 T	3	—
Rotoron ...	XM-1 ...	1	1	—	25	—	—	—	400	—	2 Co	3	15.4
Rotor-Craft ...	XR-11 Dragonfly	2	1	Continental	100	—	—	—	1,100	700	2 T	3	18ft
Sikorsky Div., United Aircraft Corp.	R-5A ...	2	1	P. & W. Wasp	450	256	112	80	4,896	3,781	1	3	41ft 8in
	S-51 ...	4	1	P. & W. Wasp	450	240	103	80	4,985	3,735	1	3	48ft
	S-52 ...	2	1	Franklin	178	310	105	90	1,750	1,100	1	3	32ft
United Helicopters ...	Commuter ...	2	1	Lycoming	135	200	90	75	1,860	1,380	2 Co	2	33ft

Co = Coaxial. 1 = Intermeshing. T = Twin.

be in the region of £20,000 (£12,000 approximately in U.S.A.), plus spares costing up to £5,000, plus instructional costs of about £750 per pilot for a 20-hour course (£400 in U.S.A.), starting up a helicopter taxi service would seem to be a somewhat costly proposition.

So far as control in the air is concerned, the S-51 is a great deal better than the early R-4, which has one or two definite limitations and is under-powered. It would not be fair to accept the opinion of, for example, a Service pilot with only R-4 experience as being representative of later designs. It seems that a conversion course of at least two or three hours will be necessary for a pilot of one type of helicopter to master the flying of another.

Reverting to the difficulties of flying and the actual movement of controls, it must be remembered that there are three distinct primary controls, the stick, the pedals, and the collective pitch lever, and in the case of the S-51 one of the difficult points of co-ordination results from the need to operate with one's left hand a twist-grip throttle on the end of the collective pitch lever. Once a pilot has learned to hover successfully the real battle is over; the difficulty of hovering is due to the instability of helicopters and the complete absence of "feel" in the controls. The pedals (which may be called the rudder for convenience) are the most conventional of the three controls in that they do control yaw, and give fairly positive response under most circumstances. However, the difficulty arises that their primary purpose in the helicopter is to counteract the torque of the main rotor, and on the S-51 this is achieved by altering the pitch of the vertical tail-rotor blades. A change in main rotor pitch or speed resulting from a movement of either the stick or the collective pitch lever requires a carefully co-ordinated "rudder" movement if flying is to be smooth.

Stability and Bumps

Once adjusted for the straight and level attitude on a cross-country flight, a helicopter exhibits a fair degree of directional stability, but the effect of air bumps is quite unlike that on conventional aircraft, the tendency being to yaw the nose and perhaps give a slight pendulum effect without any of the normal "bump" sensations.

The stick (azimuth control stick to give it a fuller title) is purely concerned with the main rotor, and is placed and operated in the conventional manner. On the ground, it may be seen, by testing the controls with rotor turning, that the stick tilts the rotor disc by causing the blades to assume the highest angle of incidence at a given point and the lowest at an angle of 180 degrees from that position. One refers in this case to control of the cyclic pitch. The machine will fly towards the point of highest incidence as selected by stick movement.

The sort of difficulty the new pilot might experience with the stick, apart from the lack of feel already mentioned, is the effect of, say, moving the stick forward to pick up speed following a take-off; the machine may "plunge" forward with nose down and some initial loss of height. This is the result of loss of lift due to the cyclic alteration of the main rotor blade pitch, and it must be countered by a co-ordinated movement of the collective pitch lever. This extra control, which is a combined rotor-pitch lever and throttle, alters the pitch of all the rotor blades simultaneously and independently of the stick. To descend, the lever is pushed down or, to ascend as on take-off, it is pulled up.

The lever and the throttle together control the engine and rotor r.p.m. and, in order to help the pilot, the throttle is interconnected with the pitch lever as well as having a



The now familiar parking demonstration indicating the way in which a quite large helicopter can be put down and tucked away between vehicles in a car park.

separate twist-grip control on the end. When starting-up, the separate throttle is used to keep the engine at its idling speed of about 900 r.p.m. and, when ready for take-off, to increase the speed to about 1,500 r.p.m. when the automatic rotor clutch begins to take up the drive. Two brakes are needed, one for the wheels and one for the rotor blades (for cautious use after switching-off the engine).

When discussing helicopters, one quite often meets the "knowing" type who, adopting an aggressive stance and a look of "that's put you on the spot!", says, "and what happens if the engine stops?" In such circumstances a few years ago the pilot, according to his altitude at the time, was in a rather tough spot, but to-day, if he is quick with the use of his controls, and if he has not allowed his rotor speed to become unreasonably low, it is a matter of seconds to assume the autorotative attitude prior to gliding-in, in much the same way as on a fixed-wing aircraft. The judgment of the hold-off before landing calls for plenty of experience, but at the worst should not result in more than a bent undercarriage. The critical height band for engine failure is between 30 and 300ft, but experienced pilots maintain that even between these two limits quick and correct action should prevent loss of control to an extent which would cause injury to passenger or crew.

C.G. Sensitivity

All helicopters are sensitive in regard to their c.g. position, and at present on the S-51 it is necessary to shift a few pounds of lead from under the pilot's seat to the luggage compartment at the rear to compensate for a full load of three passengers as opposed to the pilot and one passenger. This somewhat primitive arrangement will no doubt be superseded by a device built into the aircraft.

Most people who have flown in a helicopter agree that for some unknown reason they are conscious of a marked feeling of security which is absent when flying in a conventional aircraft.

Less frequently mentioned, but of greater importance, is the problem of blind-flying on helicopters. At present they cannot be flown either at night or in cloud, due to the lack of instruments for indicating their various motions, and to their instability. Experienced pilots in America are tackling the problem, but at the moment the answers are obscure. In spite of such limitations, of persistent teething troubles and a fair list of most important questions alongside which are a corresponding number of blank spaces, *Flight* continues to have the greatest faith in the ultimate triumph of rotating-wing aircraft. M. A. S.

HERE AND THERE

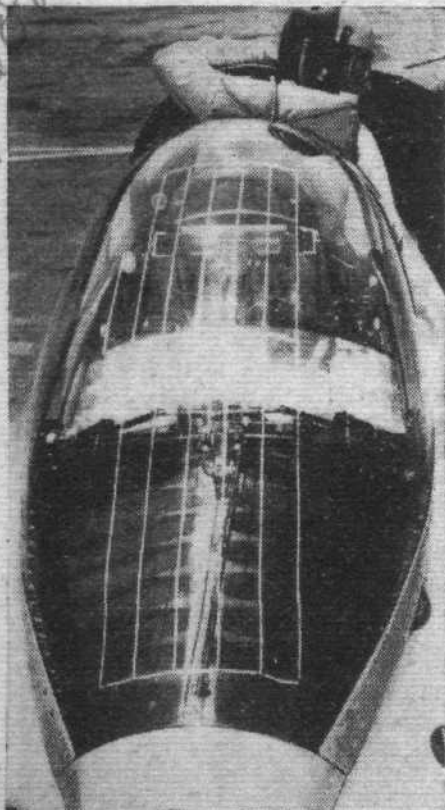
ELEVEN THOUSAND POUNDER: Loading the 17ft ship's propeller-shaft on to the Lancashire Aircraft Corporation's Halton at Heathrow on July 5th. The flight from London to Calcutta took 2½ days and the s.s. Photinia was ready for sea by July 15th (see "Urgent Charter" "Flight" July 10th.)

Turbine Talk

TOMORROW, Friday, the Gas Turbine Collaboration Committee is meeting at Burnley, and on this occasion Joseph Lucas, Limited, will be the hosts. Our readers will know that the Lucas laboratories have been responsible for much of the development work in connection with the fuel and combustion systems for gas turbines and Lucas activities have already formed the subject of an article in this journal.

More B-29 Visits

MAJOR - GENERAL CLEMENTS McMULLEN, Deputy Chief of the U.S. Strategic Air Command, has stated that the frequency of training missions to overseas theatres by Boeing B-29 Superfortresses is to be stepped up to the point where B-29s would be on hand in Europe



SHOCK WAVES AND WIRELESS WAVES: To reduce drag on the latest Lockheed Shooting Stars the wireless masts are eliminated and the aerials are built into the cockpit canopy.



and the Orient "most of the time." Flights will be undertaken a little oftener than once a month during the summer months, but bad weather might restrict flying during the winter.

10,000 h.p. Aircraft Engine

REPORTS from America, according to B.U.P., state that the Curtiss-Wright Co. are testing a 10,000 h.p. turbine-type aircraft engine, claimed to be the largest of its type known to be under practical development. The report adds that the engine will be ready for trial flights sometime this summer, and plans have already been made to install it for flight-testing as a fifth engine in the nose of a Flying Fortress. Ground tests are being carried out in the company's laboratory at Wood Ridge, New Jersey, where more than half the laboratory's work is being devoted to the development of turbine engines. The company's laboratory cost nearly £1,000,000 to build and equip.

R.34 Reunion

THIS month marks the twenty-eighth anniversary of the first trans-Atlantic crossing accomplished by an airship. On July 6th, 1919, the British airship, R.34, commanded by G. H. Scott, A.F.C., landed at Mineola, Long Island, after a voyage which had lasted 108 hours and 12 minutes.

Now Mr. R. F. Durrant, of 73, Alexandre Road, St. John's Wood, who was chief radio officer of the airship, is planning to hold a reunion service at St. Ethelburga's Church in the City, as soon as he can contact surviving members of the R.34's original crew. So far, Mr. Durrant tells us, he has found only five members of the crew, but he is hoping to get in touch with about fifteen.

Aircraft to Trailers

FOLLOWING in the footsteps of the many American light aircraft firms which have cut down production recently, the Waco Aircraft Company has announced that development and tooling work on the Aristocraft has been discontinued because over-all financial requirements would be uncertain of attainment in the face of prevailing conditions within the American aircraft industry. All

distributor and dealer advance payments on the aircraft are being refunded, and the company is now producing, under contract, a utility trailer of welded metal construction. The company will continue to devote its facilities to "variety" manufacturing until a suitable production aircraft design can be offered.

Business or Pleasure?

SCRUTINY of two recent months' passenger lists on B.O.A.C.'s Empire and Atlantic routes reveals that, of the travellers who gave their occupations, 45 per cent were "business," 18 per cent were in the Services, and 10 per cent were Government officials.

The remaining 27 per cent were in miscellaneous professional categories, such as lawyers, doctors, school-teachers, clergymen and journalists.

Scholarship Award

GEORGE GATES, a 21-year-old employee of Miles Aircraft, Ltd., has been awarded the Walter Copley Scholarship for this year, which will enable him to attend the University of London where he can take the B.Sc. Engineering degree. Walter Copley, in whose memory the scholarship was created, was killed while testing a Spitfire in 1945. At the time of his death he was one of Miles' leading executives.

Detachable Undercarriage

AT the Hamilton plant of the Cub Aircraft Corporation seaplanes take off from concrete runways! The method employed in this operation is rather unusual. The seaplane is placed on an ingenious three-wheeled dolly which fits snugly beneath the floats and forms a temporary undercarriage. A normal take-off is carried out and as soon as the aircraft attains flying speed it is lifted off the dolly which remains on the runway.

Weather Maps for Newspapers?

IN its June editorial, *Weather*, the monthly magazine published by the authority of the Royal Meteorological Society, advocates the printing of a daily synoptic chart in our national newspapers. *Weather*, quite rightly,

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MANCHESTER, "Barford," 23 Olive Road, Timperley, Cheshire.

HERE AND THERE

points out that the publication of a daily weather map would interest a surprisingly large proportion of newspaper readers, including aviation and sailing enthusiasts, farmers and even holiday makers.

The Press are issued with a daily weather chart, together with a forecast weather chart (a "prebaratic") for noon of the following day from the Meteorological Office, and the fact that the British public has already paid for the compilation of this information would seem to be a strong argument for its publication in the national newspapers.

Current Figures

IT has been estimated that enough electrical power to supply the domestic needs of an average community of 144 homes, with a population of 700 persons, will be available in each of the new Boeing Stratocruisers which have been ordered by B.O.A.C. Seventy kilowatts developed by six 28-volt direct-current generators, two alternators and five inverters supply the requirements for more than 100 electrical functions on this 67½-ton airliner.

The 2,523lb generating and distribution system on Stratocruisers now under construction includes 10 miles of wire and 482 switches. There are also 119 motors, 411 lights and three batteries in the aircraft.

Airborne Chef

THE latest enterprise in transatlantic airline catering was revealed to passengers of a K.L.M. airliner recently, when out of the all-electric kitchen of a K.L.M. Constellation there emerged a Chef, complete with customary white coat and tall hat, to take the passengers' orders for dinner.

K.L.M. are now introducing a chef on board each of their transatlantic aircraft in addition to the stewards and air-hostesses normally carried.

DC6—Freighter

THE production of a cargo version of the DC6 is being considered by the Douglas Aircraft Co.

The cargo DC6, as outlined by Douglas, offers basic characteristics of the passenger DC6 but will have a reinforced fuselage to meet structural requirements for a 30,000 lb payload and a maximum take-off weight of 100,000 lb. The proposed power units are Pratt and Whitney R. 2,800 CA15 engines with Curtiss electric model 740 airscrews.

Cabin windows will be eliminated, but the upper-berth windows retained as skylights, and cargo flooring with 200lb sq.in. design strength will be used.

Magnet Material

INCREASED use of small magnets in radio and electrical equipment has called for a suitable magnet material which can be shaped with the minimum of machining operations. The Plessey Company, of Ilford, have introduced Caslox, a pressed powder permanent magnet material, which is a mixture of iron cobalt oxides and a small quantity of plastic binder. The advantage claimed for Caslox is that it can be moulded into any shape without machining operations, and it is particularly suitable for use in small motors and generators.

News in Brief

Mr. W. J. McLaughlin, C.A., has been appointed secretary of the Aluminium Development Association in place of Mr. Davies who has resigned.

Sir Frederick Leggett, C.B., has been appointed chairman of the London and South Eastern regional board for industry.

The Hymatic Engineering Co., Ltd., of Redditch, Worcestershire, announce the

appointment of Mr. G. V. Bloomfield, B.Sc., as research physicist. He will be engaged primarily on research into the mechanism of drop formation with particular reference to spraying fluids.

The New Zealand Government has given a contract to Auster Aircraft, Ltd., for Auster aircraft to be used by the forestry commission for fire-fighting purposes. Auster aircraft will also be used by the New Zealand Government for Army and Air Force liaison duties.

Hangars at Schiphol airport have now been named after the various European airports to which K.L.M. operate regular services. Already the names Cröydon, Le Bourget, Bromma, Kastrup, and Fornebu can be seen freshly painted on the new buildings.

Mr. M. J. H. Bruce, C.B.E., has ceased to be managing director of Cunliffe-Owen Aircraft, Ltd., and the directors of the company have placed the aircraft business of the company under the direction of Mr. Trevor C. L. Westbrook, M.I.P.E., M.Inst.M., A.F.R.Ae.S., as consultant. Mr. D. H. Cunliffe-Owen, a director of the company, will be in general charge of the company's business under the board of directors.

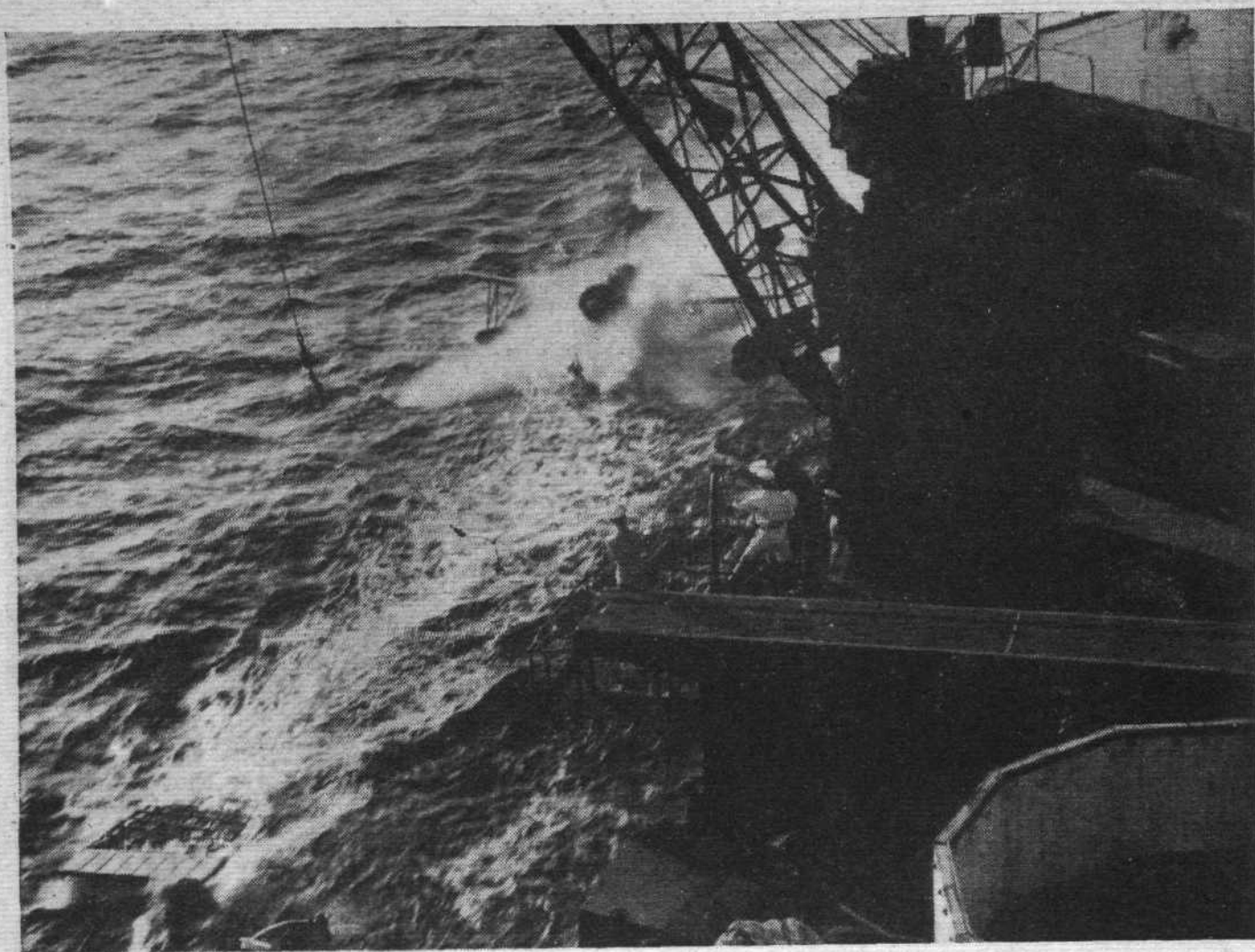
It is reported that the S.O. 1100 "Giravion" displayed at the last Paris Show by the S.N.C.A. du Sud-Ouest, is now making taxiing trials and has also tried one or two "hops." M. Guignard, ex-R.A.F. Free French fighter pilot, is doing the testing. A picture of the S.O. 1100 appeared in *Flight* of November 28th, 1946.



SOUVENIR: Captain H. W. C. Alger, presents the steering column of "Canopus," (first of the series of 28 Empire flying boats), to Mr. H. H. Green, mine host of Canopus Inn.



THE SHRINKING WORLD: The B.O.A.C. stand at the Blackpool Air Pageant (July 2nd-23rd). It is estimated that 20,000 people visit the static exhibition each week. Featured in the B.O.A.C. display are models of the Brabazon I and Tudor II aircraft.



A Kingfisher taxiing in to hook on to the towing net (left foreground). The spray drench is bad even at 8 knots.

“Slick” Alightings

Some Sidelights on one of the Most Difficult and Least Known of Naval Aircraft Evolutions

By R. B. ELMES (Ex-Lieut. (A), R.N.V.R.)

Pictures show
A CONSIDERABLE amount of information has been published on deck landings, but so far nothing has been said of the far more difficult art known in official naval language as “Slick” alightings. Probably the term derives from the etymological meaning: smooth, clean, but it may be associated with an old naval reference to rough water made smooth by artificial means. A slick of oil amidst broken water is not an uncommon sight, even to city dwellers who take holidays at coastal towns.

Slick alighting is a combined operation carried out by a parent ship and her seaplanes. The ship by a manoeuvre makes a slick of calm water, and the returning seaplane alights on it and is then lifted aboard by mechanical hoists. It is as simple as that (to the observer), but deck-landing pilots would almost certainly die violently if they tried it.

Once upon a time the slick was made by discharging hundreds of gallons of oil overside, but this was soon abandoned for reasons of economy and strategy. Large patches of oily water would mean as much to

enemy submarines or aircraft as to home-coming pilots, but the mental reaction would be different.

The drill finally established is illustrated in Fig. 1. In particular, the reference is to Armed Merchant Cruisers, carrying Kingfisher aircraft, commissioned to make extensive patrols and raids against blockade runners. The writer's personal experience is confined to this category, but the general principle is the same throughout the Naval Air Arm.

It was found that the Kingfisher was unstable and difficult to handle in “out-of-wind” conditions, due mainly to its high centre of gravity and to the fact that the spoilers which came into operation on lowering flaps gave little lateral control at low speeds. It was possible to “waggle” the control column from side to side without material effect.

This characteristic required that the Kingfisher should land into wind regardless of the direction of swell. When the direction of wind and water coincided, the difficulty and the danger were greatest.

SETTING a landplane down on the deck of a carrier is a difficult enough operation, but in the opinion of the author of this article it is small beer compared with putting a seaplane down on the “slick” formed by the parent vessel. He explains the procedure followed in the Royal Navy in the case of Kingfisher aircraft and Armed Merchant Cruisers.

With the basic conditions inherent in natural difficulties, the tradition of naval efficiency was called on to provide the neatest and quickest solution. It did not fail, and the evolution of the drill that is now described is not only a tribute to the youngest naval branch but may be numbered amongst the hundreds of minor triumphs which in the aggregate succeeded in maintaining our supremacy on the High Seas.

Referring to Fig. 1, the aircraft has been sighted by the ship's look-out and signals of recognition exchanged. By means of a signal flag at her yardarm the ship indicates her intention to make a slick to port or starboard, according to the side on which the aircraft is required to alight. At the same time, course is altered to bring the wind 40 deg on the bow. The pilot responds to signal and manoeuvre by proceeding at a height of 300ft to a position half a mile astern. This distance is maintained until the appropriate moment by following a zig-zag course.

When the Officer of the Watch is satisfied that the Pilot is in position, he gives the order "Starboard 30" to the helmsman and "close-up" to the signalman. In response to these commands the ship swings to starboard on maximum rudder, and the yardarm signal is "closed-up" from the warning to the executive position.

In the engine room there is a flurry of activity in anticipation of the order to stop engines. While still making about 20 knots, the ship heads into the wind and then brings her engines to rest.

The yardarm signal is hauled down, and the pilot receives a prearranged lamp signal to alight at his own discretion. While still carrying way, the ship now steadies on a course to bring the wind 40 deg on the opposite bow, and engines are restarted to maintain a speed of 5 to 8 knots, depending on the roughness of the sea.

It is now the pilot's responsibility to put into practice the sequence of operations which drill and experience have made second nature to him, but at which his human nature never ceases to boggle.

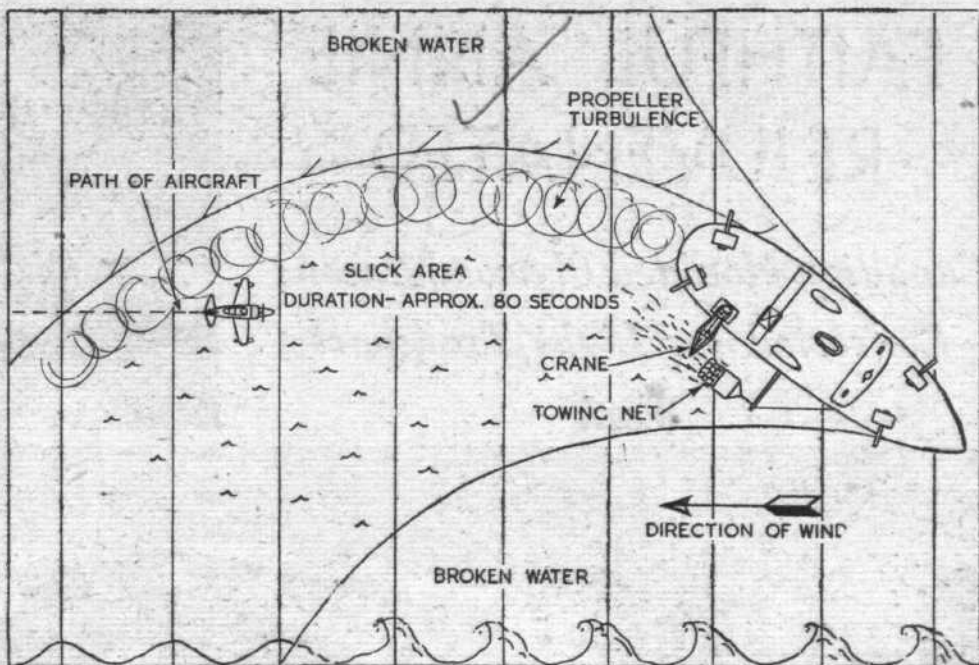


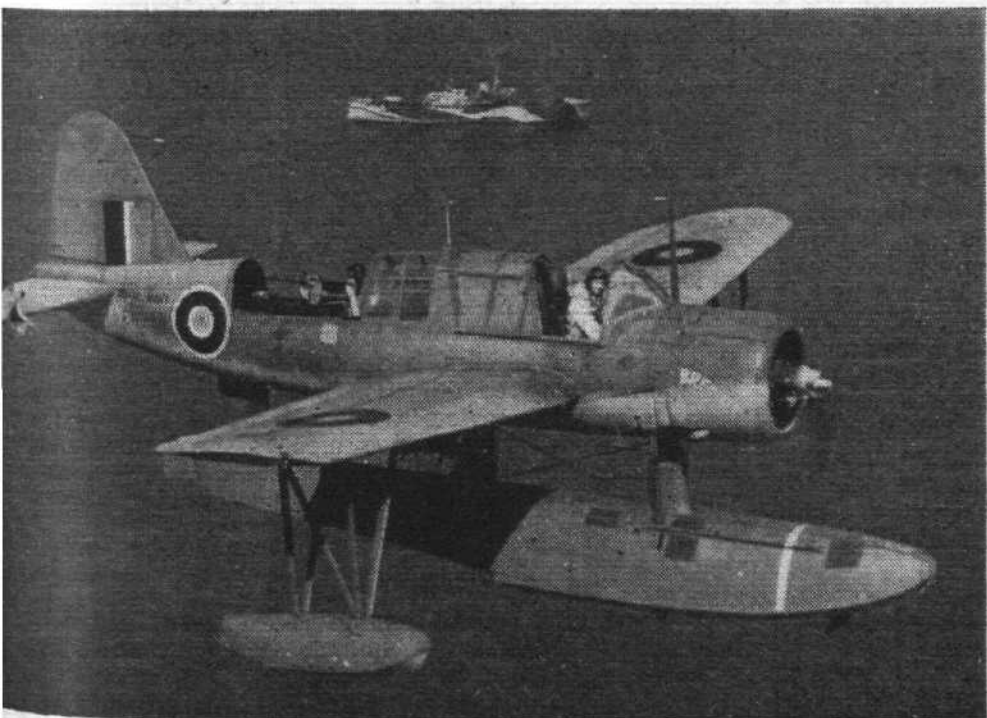
Fig. 1. Diagram showing the method of making a "slick."

Within an average period of one minute he has to touch-down in the "slick," finish the run, lower the aerial, raise the flaps, taxi alongside, hook to a towed net and then with his returning breath hook on to the crane which will hoist him and his aircraft aboard—together, if he has been skilful and lucky. In the racing seconds between touch-down and hook-up, the pilot is a beautiful subject for the student of man, his nature and language.

An Anxious Moment

As the main float caresses the first crest of the swell at 50 knots, the pilot swallows his heart and offers thanks, to await the impact of the second. His trained hand automatically jerks open the throttle to regain lost speed. His ears are deaf to the roar of the engine because his eyes are devouring the lessening distance between him and the towering wall of the ship's hull and measuring his chance of "sitting" on the second crest and sliding gratefully into the trough. If he misses it with his main float, his tail will catch it and toss him nose-down into the trough, where the next swell will fall on him without mercy, and the side of the ship will ride the heaving sky above him like doom. The pilot will curse and pray in language having neither elegance nor originality, but somehow or other he will pull out, and in the last second his machine will taxi smoothly to the net and hook-on. Raising his eyes he will see, through the storm of his emotions, the calm, stolid face of the directing officer waiting patiently for him to end his antics and be hoisted inboard.

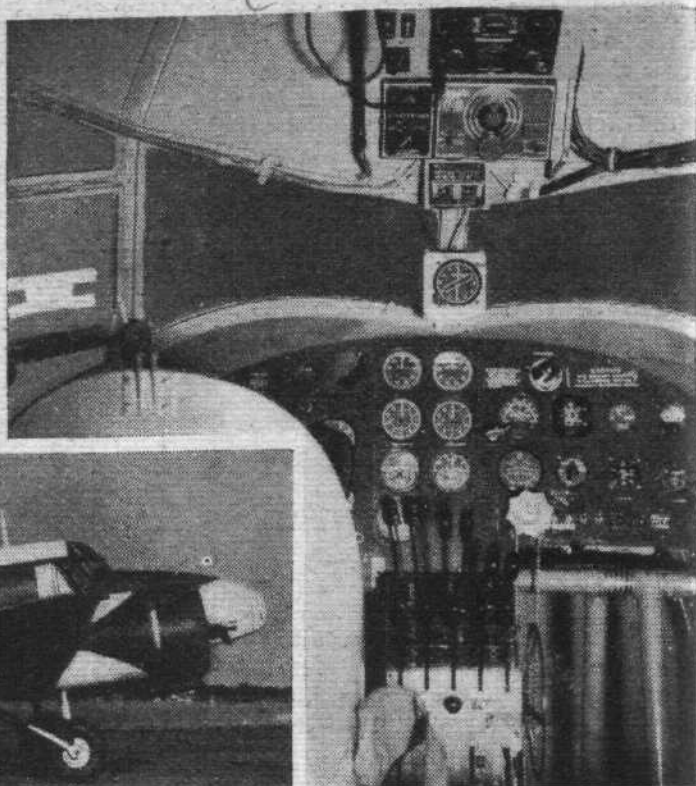
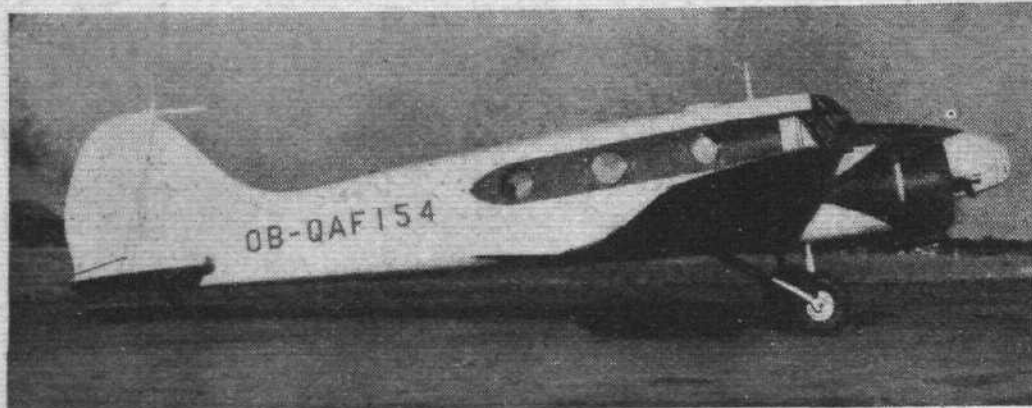
Not all alightings are exciting, but some are memorable. Normally, aircraft from Armed Merchant Cruisers operate only in the hours of daylight, but occasionally a late returning aircraft will have to rejoin the ship in darkness. The only aids available to sight are the phosphorescence of the ship's wake and a discreet glow from a hand torch. These circumstances, in combination with a running swell fifteen feet from trough to crest, make the operation impossible, and it usually takes longer to perform. But in difficult conditions the Navy is patient
(Concluded on page 60)



The hook for "net recovery" can be seen under the nose of the Kingfisher's main float.

"FAITHFUL ANNIE" REJUVENATED

*Canadian Moulded Plywood Ansons
Converted for Light Transport
Work*



AT the time of writing, a feeder-liner conversion of a Canadian-built Anson Mk. V is expected to arrive in this country for a series of European demonstration flights. Yet another version of the evergreen "Faithful Annie" will therefore be seen over the British Isles. The Anson V is converted by the Aircraft Industries of Canada, for the Viking Air Service, which company selects the aircraft personally from available war surplus stocks. The Ansons are given a complete overhaul and are converted on a sub-contract basis. Hitherto, the European market for these aircraft has remained untouched, owing to the considerable ferry flight involved in effecting delivery of the machine. Only one Anson V has been sold to a European country as yet, and this machine, the first Anson of any mark to fly the Atlantic, was delivered in June, 1946, to Loftleider H/F, in Iceland. There are now signs that the Canadian and South American markets for these aircraft are drying up, and the Viking Air Service Company is hoping to obtain orders during the European demonstrations of this type.

Payload and Performance Improved

The Anson Mk. V is the Canadian-built development of the earlier Avro Anson models. Designed in 1943, to Royal Canadian Air Force specifications, as a navigational and bombing trainer; it began to replace the Marks I and II early in 1944 in the British Commonwealth Air Training Schools. By the end of the war more than a thousand of these aircraft had been produced and, consequently, when they were offered for sale as war surplus, most of them had seen very little flying time since new. The Anson V embodies numerous improvements over the Mk. I which make it considerably more attractive from the point of view of the feeder line and charter flight operator. Most important among these are the greater payload which it is

A side view of the Anson Mk. V and the control cabin, showing part of the instrument panel, the A.D.F. recorder and the radio panel overhead.

capable of carrying and its higher cruising speed. The moulded plywood construction of the Anson V simplifies maintenance problems and, at the same time, gives the Anson considerably improved lines. In addition, a huge supply of spare parts is available in Canada, thus, one of the main difficulties besetting the present-day operator using war surplus aircraft would be absent in the case of the Anson V.

The Anson V is powered by two 450 h.p. Pratt and Whitney Wasp Junior R 985 AN-12B or 14B supercharged air-cooled radial engines driving Hamilton Standard hydraulic constant-speed airscrews. The fuselage structure is composed of five sections built of moulded veneer and bonded by synthetic resin glues. Mainplanes have a plywood covering, and front and rear mainspars, of laminated wood, continue from wing-tip to wing-tip, passing through the lower section of the fuselage. The trailing edge flaps and ailerons are of metal construction, the latter being covered by fabric, but the single fin and rudder are of moulded veneer, the fin being an integral part of the rear section of the fuselage. The tailplane, elevators, and rudder are all plywood covered and have trimming tabs which are adjustable from the pilot's cockpit.

Hydraulic operation of the main wheels, which retract into the engine nacelles, is a feature of the Mk. V. The adoption of powered retraction was welcomed by Anson crews who had previously taken turns at winding the handle! Each main wheel is mounted between two air compression struts and is held in position by twin radius rods attached to the rear spar. Hydraulically operated brakes are also fitted.

Cockpit Layout

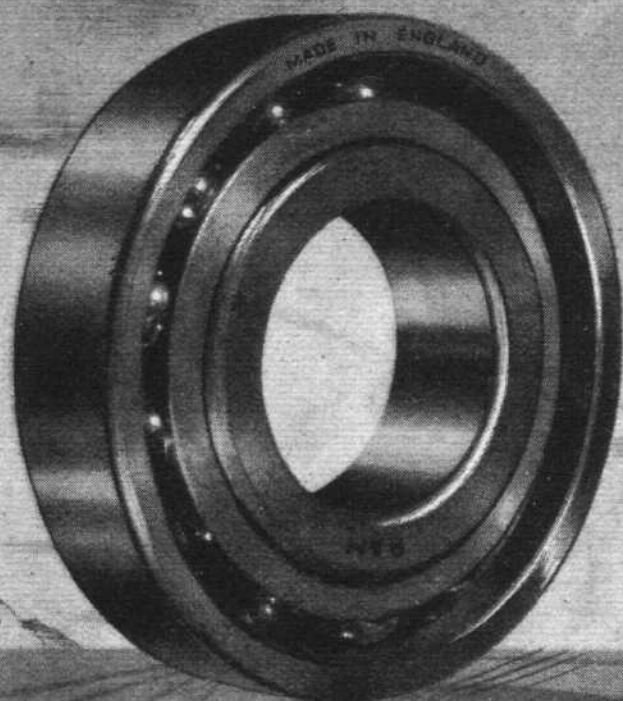
A wheel type control column is employed, and dual controls are available if required. Engine controls are mounted centrally so as to be available from either front seat. A standard blind-flying panel is installed and complete radio equipment may be fitted. However, owing to the present shortage of all types of aircraft radio equipment in Canada, the manufacturers cannot specify any particular

CONVERTED ANSON V

Performance Data			
Max speed (3,500ft) ...	194 m.p.h.	Service ceiling ...	20,500ft
Cruising (58 per cent power) ...	150 m.p.h.	Climb to 16,000ft ...	25 min
Stalling (flaps down) ...	50 m.p.h.	One engine ceiling ...	5,100ft
Normal range ...	650 miles	Gross weight ...	9,450lb*
Long range ...	1,100 miles	Empty weight ...	6,750lb

The **RACE** *against time*

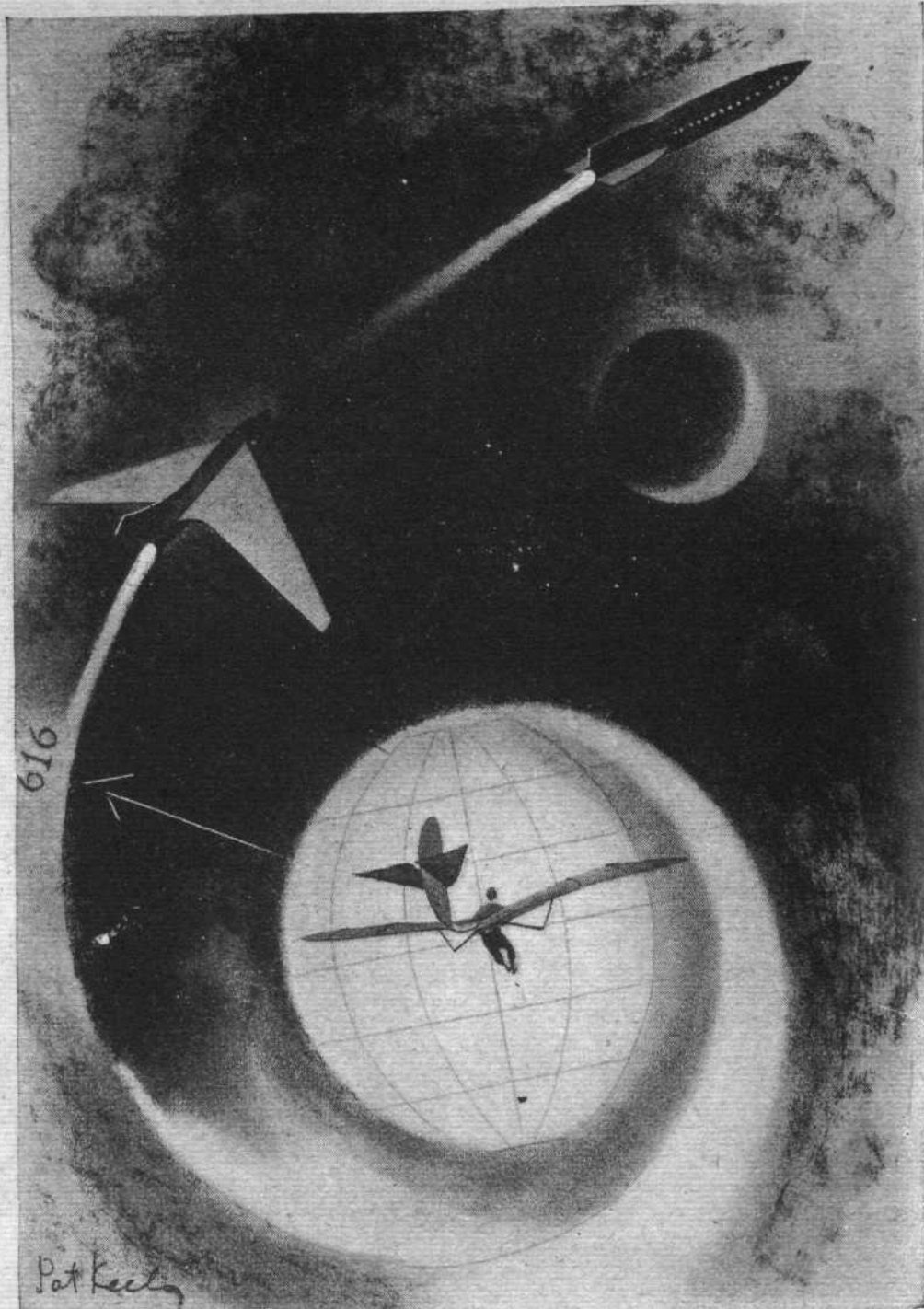
Perfect Bearing Design—Finest Materials—
Unequalled Workmanship—these are proved
by the test of Time



BALL AND
ROLLER
BEARINGS

RANSOME AND MARLES BEARING CO. LTD., NEWARK-ON-TRENT, ENGLAND

R/RM 10



"FLYING FOX"

ELECTRIC STEELS

Just as electrically melted steels are, of all steels, acknowledged to be superlative in their properties, so "Flying Fox" Steels excel even amongst electric steels. "Flying Fox" is the designation given to the standard electric steels after they have been certified as passing the most rigorous Air Ministry Inspection. For highly stressed mechanisms they are supreme.



SAMUEL FOX & COMPANY LIMITED

Associated with The United Steel Companies Limited

STOCKSBRIDGE WORKS Nr. SHEFFIELD · ENGLAND

"Faithful Annie" Rejuvenated

type, but to keep delivery time to within the specified thirty days, the best equipment available at the time of the conversion is being installed.

The conversion carried out by Aircraft Industries of Canada includes:—

- (1) The installation of an extra cargo door on the port side of the fuselage, 32in wide and 42in high.
- (2) The installation of radio equipment.
- (3) The addition of long-range tanks in the bomb bay and wing roots.
- (4) The installation of a bulkhead fitted with a door and

positioned between the pilot's and passengers' compartments.

- (5) The relocation of the electrical panel from its original position in the main cabin to the forward side of the bulkhead.
- (6) The fitting of deep window frames.
- (7) The fitting of dual controls if required.
- (8) The strengthening of the cabin floor.
- (9) Repositioning of the rudder trim control to the right-hand side of control pedestal.
- (11) Repositioning of the battery box to the right-hand wing fillet to make it accessible from outside the aircraft.
- (11) Insulation and upholstering of the passenger compartment, and the fitting of seven individual seats.

Rendezvous for Fuel

A Brief Account of the Second Operational Trial of Refuelling in the Air: Long-distance Non-stop Flying from the Pilot's Point of View

By Captain R. C. Alabaster, D.S.O., D.F.C., F.R. Met. S.

TWELVE dress rehearsals of refuelling in the air on an operational route have been asked for by the Air Registration Board and the Ministry of Supply and it was decided that I should captain the second of these trial flights.

It was a wet morning at London Airport on the day of the proposed take-off for Bermuda, and after studying the Met. forecast, it was decided to follow the existing scheduled route and refuel over Santa Maria, in the Azores.

The Met. forecast is particularly important for this type of operation, especially for the area of the tanker's base, and the decision must be taken on a forecast which will be anything up to fifteen hours old by the time the actual refuelling takes place. That is a definite limitation of the system and means that the passenger aircraft cannot leave unless airfields are available for diversion in the event of the tanker being unable to operate.

We took off at 1034 G.M.T. with No. 2 and No. 3 tanks full and sufficient in No. 1 tank and the fuselage tanks to reach Santa Maria without drawing on Nos. 2 and 3. Only No. 1 tank and the fuselage tanks could be refuelled in the air, their capacity being 2,300 gallons. On entering the Santa Maria control zone, we requested a confirmatory Met. forecast for the flight from the Azores onward and we amended our flight plan as necessary.

Four hours before the estimated time of interception, we sent signals including the E.T.I., and repeated the signal with revised times at hourly intervals until the last half-hour, when a final signal was sent to the tanker, which was by that time airborne.



Capt. R. C. Alabaster.

CAPTAIN R. C. Alabaster is a Senior Pilot in British South American Airways and was the first Corporation pilot to fly on the operational trials of flight refuelling after the initial flight by A. V-M. Bennett and Sir Alan Cobham. He is also the Engineering Captain of the Corporation. An account of flight refuelling in the air from the passenger point of view appeared in Flight dated July 3rd.

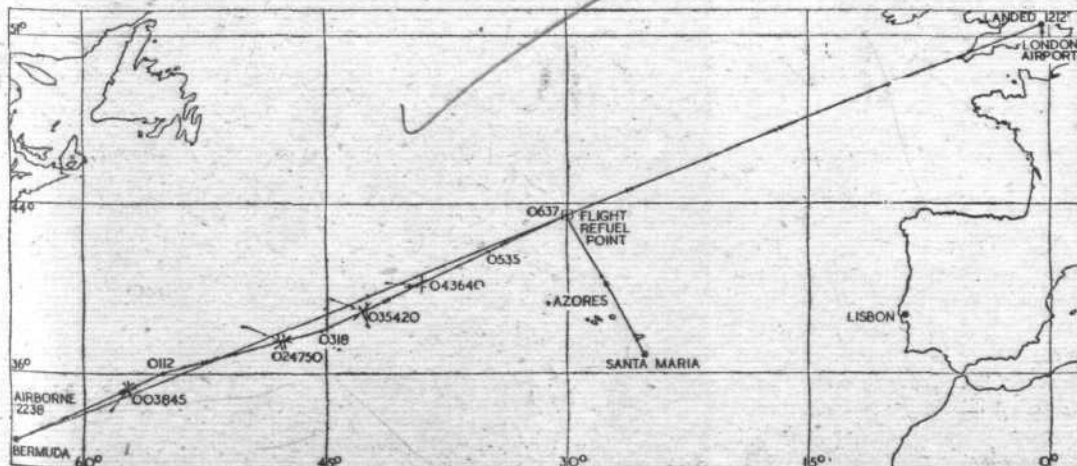
Over the Island we altered course for Bermuda, reduced speed to 140 knots and trailed out line and grapnel. Our height was 11,000 feet, "George" was engaged, revs were 2,600 and we had throttled back to -1 boost. On VHF came "ready for contact," from the tanker, and at 1732 G.M.T. on intercom from the back of the aircraft the engineer announced "contact made." There was a short wait while our grapnel was wound up to the tanker and then came the quiet announcement "pipe line coming out," followed by

"pipe line connected—ready for fuel."

Very slowly the petrol gauges increased their readings while we advanced our throttles in $\frac{1}{2}$ lb boost stages to maintain height and airspeed until the tanker pilot reported that he had passed the required 1,800 gallons. The

first officer, busy with pencil and paper, confirmed this, and the tanker pilot was told to prepare for break-away. The connecting line was then flushed with nitrogen, followed by methyl bromide, and our operator wound out the line, still attached to the pipe-line, until the weak link in our line was outside the aircraft, and we gave the order on VHF—"break away." The tanker turned away, trailing 250 feet of pipe-line and the last 240 feet of our trailing line. We did not feel the weak link snap!

With boost and revs back to cruising we continued our



This reproduction of the chart for the homeward flight showing the necessary alterations of course illustrates the need for accurate astro navigation for ensuring a rendezvous in areas not covered by navigational aids.

Rendezvous for Fuel

way to land at Kindley Field, Bermuda, at 0428 G.M.T. after 17 hours, 54 minutes flying.

The Homeward Flight

For the return journey, it was thought desirable to fly as far north of an anticyclone as possible to take advantage of the westerlies. This would also prove the tanker's powers of interception. The direct rhumb line track was, therefore, our choice, with the rendezvous at 43 30N 30 00W, 450 miles NNW of Santa Maria, just after dawn. Flight plan time worked out as 14 hours 02 minutes with a required uplift at the rendezvous of only 700 gallons. A possible complication was forecast, however, in the form of a cold front over the rendezvous.

Efforts to remain right on track were prevented by a series of weak fronts obscuring the stars, and at 024750 G.M.T. our first astro fix put us in position 37 36N 47 39W. 30 minutes later we altered course for the rendezvous, and followed this by two 3-star fixes at 035420 and 043640 G.M.T. right on our new track. The sky then became obscured again by the forecast cold front and we considered the advisability of changing the rendezvous, but 20 minutes before E.T.I. the cloud became stratified and the rendezvous was made at 0637 G.M.T. between two layers of cloud. Eureka/Rebecca was used for the last 10 minutes to complete the interception.

The Pilot's Reaction

The refuelling went perfectly as before, but took only 22 minutes from "contact made" to "contact broken"

GOOD ATTENDANCE AT THE DEAUVILLE RALLY

AUSTERS, Proctors, Whitney Straights, Hornet Moths, Messengers and Consuls were amongst the wide variety of light aircraft which left Britain last week-end to participate in the private air rally organized by the town of Deauville, France. Over seventy aircraft made up what was probably the largest contingent of British civil aircraft to attend an air rally abroad since the war. The British visitors were entertained by the Municipality of Deauville and accommodated in the Royal Hotel. Principal host at the rally was Monsieur F. Andre, President of the Société des Hôtels et Casino de Deauville. The Shell and Intava companies, in collaboration with the Royal Aero Club, simplified fuelling arrangements for the rally by issuing petrol carnets to all members and associate members of the Royal Aero Club flying to Deauville.

A report by our representative, together with *Flight* photographs of the Deauville Rally, will be published next week.

GALA DAY AT LANGLEY

NEXT Sunday, July 20th, is the great day for the Northern Heights Model Flying Club. As was the case last year, the directors of Hawker Aircraft have placed Langley airfield, near Slough, at the disposal of the club, and model flying competitions will go on throughout the day from 10.30 a.m. to 7 p.m. Many prominent people have signified their intention of being present, including the Minister of Civil Aviation, Lord Nathan. The Hawker company will have on view an interesting range of their full-size aircraft types.

In addition to the usual contests there will be demonstrations of a form of model flying which is new to this country.

"SLICK" ALIGHTINGS

(Concluded from page 57)

and resourceful. In heavy swells the aircraft cannot remain hooked to the towing net, and direct contact must be made with the crane hook. This means that the pilot must maintain course and station within a few feet of the ship's side and at the same time manipulate his aircraft so as to engage the crane hook which is describing wild parabolas above his head. In the end success attends the patient efforts of those engaged in the operation, and the ship's crew heave a sigh of another disappointment and retire in the hope that next time they will see Johnny-Head-in-Air fished from the drink.

and we were again on our way, to land at London Airport 13 hours, 34 minutes after leaving Bermuda.

Our first reaction after landing, both ways, was to find that we did not feel nearly as tired as we have done in the past over shorter flights which involved an intermediate landing. This was obviously because whilst in the air we were not being molested by the many officials who require one's signature on numerous documents, clearances, flight plans, load sheets, etc., during the short time allowed for a refuelling stop. Moreover, there is no landing (which may mean an instrument descent and approach through cloud or poor visibility) or take-off.

No extra flying skill on the part of the airline pilot is demanded for refuelling in the air, and "George" can fly during the transfer. (I had one hand on the clutch lever—just in case!) and the tanker should never come closer than 150 feet. Extra navigating skill is required, however, to rendezvous at a position outside the range of navigational aids. With Eureka/Rebecca or some such system, the two aircraft must navigate to within about 40 miles of each other to ensure meeting.

Finally, it would appear that greater reliability of schedules for the operator is possible, since all those tiresome delays "waiting for the weather to clear" at an intermediate stop can be borne by the tanker, provided it can take-off and have sufficient fuel to delay landing until the weather improves. Thus only the long, heavy "clamp" at an intermediate station can delay the scheduled airline.

If we leave the financial side of flight refuelling to the economists, and consider only how it affects us, we find there is much to be said for it. We enjoyed our experience of refuelling in the air.

The models are controlled from the ground by the manipulation of wires and are made to perform various evolutions.

Members of clubs, associations and societies will be particularly welcomed, and should write to the Hon. Sec. of the Northern Heights Model Flying Club, Mr. H. R. Turner, 61, Avenell Road, Highbury, London, N.5.

LUCAS JOINS DE HAVILLANDS

MR. PHILIP G. LUCAS, G.M., F.R.Ae.S., R.A.F.O., is joining the de Havilland Aircraft Co., Ltd., as technical sales manager, taking up his duties at Hatfield early in August. It is of interest that he learned to fly at the original de Havilland School of Flying at Stag Lane.

MORE THAN ITS OWN WEIGHT

RECENTLY a Miles Aerovan carried as disposable load 1.32 times its own weight. The weight empty was 2,683 lb and the disposable load 3,545 lb, giving a loaded weight of 6,228 lb. With a payload of 3,188 lb there was enough fuel for a flight of 150 miles. The payload was, of course, in the form of lead ballast, and few commercial loads would have that density.



Mr. George Miles and Mr. Ken Waller superintend the loading of the Aerovan with 3,188 lb of lead ballast.

D O V E

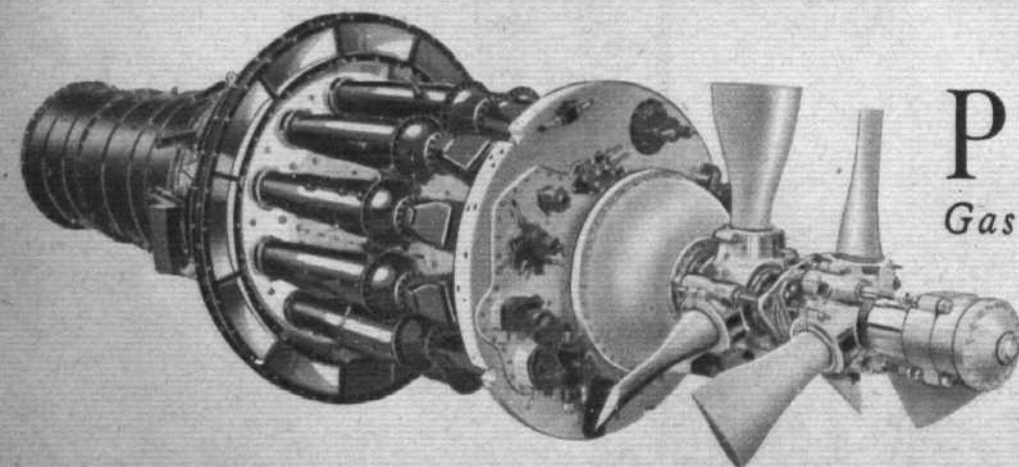
in increasingly rapid production
to fulfil nearly five million pounds'
worth of orders—more than three-
quarters of them for export

D E H A V I L L A N D



Flight, July 17th, 1947

POWER FOR THE PLANES OF TO-MORROW



PYTHON

Gas Turbine Propeller Engines

ARMSTRONG SIDDELEY
MOTORS, PARKSIDE, COVENTRY

BRANCH OF HAWKER SIDDELEY AIRCRAFT COMPANY LIMITED

INTERNAL AIRLINES SYSTEM

THIS week and in subsequent issues of *Flight* the internal air services of the United Kingdom and the airports under the control of the Ministry of Civil Aviation will be reviewed. By courtesy of the Ministry and British European Airways, a tour has been made by two members of *Flight's* staff of the main airports being used for scheduled services, and some interesting data have been collected and impressions formed.

By ROY PEARL

BEFORE attempting a survey of airports and air communications in the United Kingdom, it is important to review briefly the present position. The Civil Aviation Act, 1946, placed upon the Ministry of Civil Aviation full responsibility for providing air traffic control and telecommunications in the United Kingdom, and airports suitably equipped for scheduled services, the latter to be organized by British European Airways. The airport situation is delicate because many were owned privately before the war by operating companies or municipalities, some of which were requisitioned by the Air Ministry for use by the Royal Air Force, and others of which were neglected owing to the prohibition of private flying during the war years. Most of the requisitioned airfields were developed to a high degree by the construction of runways and the installation of communication equipment.

Generally speaking, it is the intention of the Ministry to take over the control of all airports in the United Kingdom to which scheduled services will run, and in most cases the ownership as well. A general statement on the future policy has not been made, as each airfield is being considered on its own merits from the point of view of potential service to an area and the facilities already installed. In fact, the ownership of airports is a subject discussed with bated breath within the walls of the Ministry.

Nevertheless, there are more than fifty airports already under the control of the Ministry for air traffic control, telecommunications and administration, which includes the staffing of airports with police, porters and other officials, and the provision of transport and emergency equipment. Other Government departments are responsible for providing Customs, immigration and medical officials. Each airport is to be placed under the supreme control of an Aerodrome Commandant, with an airport manager responsible for all the business activities.

The inheritance of the Ministry, therefore, is a mixed bag of airfields and airports, added to which there is still the problem of finding suitable sites for those cities or areas not already provided for. The West Country is an illustration of such a situation.

Development must depend almost entirely upon the services which are planned by the British Corporations; for example,

cities which require direct overseas connections will obviously receive earlier attention than airports situated at a junction of internal routes. British European Airways is, therefore, deeply concerned with the future requirements of the United Kingdom, and the English Division is responsible for the internal routes and for routes from provincial cities to important centres in Europe.

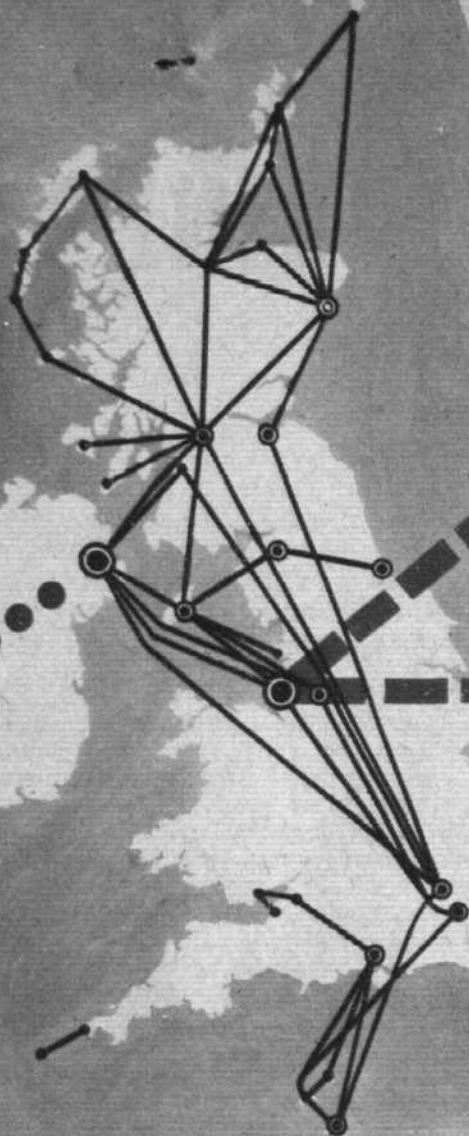
Our recent tour of airports necessitated flying over a number of routes in the English and Scottish Divisions of B.E.A.C., and it was interesting to compare air transport with surface transport on different routes, and to observe the popularity of the services. The first leg flown was from Croydon to Liverpool in a Rapide, and the total time from Airways Terminal, London, to Liverpool city was nearly three hours, which does not compare favourably with the train journey of slightly more than 4½ hours. That is a strong point in support of re-equipment with faster aircraft on those legs on which there is an efficient train service in competition.

B.E.A.C. English Division

While on the subject it would, perhaps, be interesting to record the reaction of a colleague at the sight of the Rapide for the first time. It was with some apprehension that he climbed into the aircraft, but it is only fair to say that by the end of the tour, having flown in several other B.E.A. aircraft, he was full of praise for the Rapide, and nothing pleased him more than the prospect of another flight in the type. I mention this because it is quite probably the reaction of many other first-time B.E.A. passengers.

Liverpool airport is at Speke, situated on the south bank of the River Mersey some seven miles from the city. The airport is also the home of the B.E.A. English Division, and it would be opportune to explain briefly the organization. The offices are situated on the airport, and the Corporation has established, in the spacious well-lighted geodetic hangars,



INTERNAL AIRLINES SYSTEM**ENGLISH DIV. H.Q.**

shared with the Continental and Scottish Divisions. I was given to understand, however, that Vikings will soon be operating on several of the routes.

After B.E.A. took over internal operations in February of this year, 2,988 passengers were flown in that first month, and the airports to which the Division operated handled 9,501 passengers, involving 2,919 aircraft movements. The figure for passenger movements increased in March to 3,742, and then in April, when the weather improved, the number increased to 13,548. In June the average number of passengers carried weekly was more than 6,000.

The Corporation has approached the Ministry of Civil Aviation for the installation of Gee chains in the Midlands, Scotland and Ireland for use by the internal services. These will undoubtedly aid navigation in the larger aircraft, but so long as the English Division is using Rapides the chains can be of little use as these aircraft are not even fitted with S.B.A.

Liverpool Airport

The terminal building at Speke is imposing, probably the most imposing building at any airport in the United Kingdom. The buildings and hangars were completed in 1939 by the Liverpool Corporation, and ample accommodation was provided for the sightseeing public, and for maintenance in large, well-lighted, geodetic hangars. Runways were built during the war, and at the present time the airport is under the control of the Ministry of Civil Aviation on some form of compensation basis. The Airport Manager (Mr. J. Chadwick) is a municipal appointment, but the Air Traffic Control Officer and the Signals Officer are Ministry of Civil Aviation appointments, and their departments are manned by Ministry of Civil Aviation employees. It is generally accepted that one day the Ministry will own the airport.

There are three runways, the longest, from east

the chief maintenance base for the whole Division under the Divisional Maintenance Engineer, Cdr. A. L. Low, with Mr. H. Campbell as the Divisional Inspector and Mr. T. Harriman as the Base Engineer. Mr. Harriman will be remembered for his wing-walking stunts in Sir Alan Cobham's circus many years ago.

The flying organization is under the control of the Chief Pilot, Capt. A. S. Johnson, who has three Flights based at strategic positions in the Division. No. 1 Flight, under Capt. G. T. Greenhalgh, is based at Speke, with detachments at Manchester and Belfast; No. 2 Flight was stationed at Croydon, but has now been disbanded; No. 3 Flight is in the Isle of Man, under Capt. J. C. Higgins; and No. 4 Flight is in the Channel Islands, under Capt. Jordan. There are also detachments at Land's End and Cardiff with senior captains in charge. It was impossible for the headquarters to say how many aircraft are operating in the English Division, as the Dakotas and Rapides are

M.C.A. and B.E.A. officials at Nutts Corner. (L. to R.) A. E. Slocombe (A.T.C.O.), J. W. Dunn (Tels. Officer), R. Thurley (B.E.A. Stn. Supt.), S. Harvey (Met. Officer), W. Coen (Airport Manager). On the right a Ju 52 of the Scottish Division is parked on the tarmac at Belfast Airport.





G. O. Walters.



G. Eridge.

General Manager of the English Division is Cdr. G. O. Walters. The Deputy Manager, Mr. G. Eridge, is also the Staff and Services Controller. In the top group are (L. to R.) G. P. Hayward (Traffic Controller), D. J. Platt (Traffic Supt.), Capt. A. S. Johnson (Chief Pilot), T. H. A. Christie (Chief Accountant), D. J. H. Morgan (General Services Supt.). In the lower group are G. N. Coward (Nav. Tels. Supt.), C. N. Harding (Supplies Supt.), N. I. B. Harrison (Sigs. Supt.), H. Campbell (Divisional Inspector).

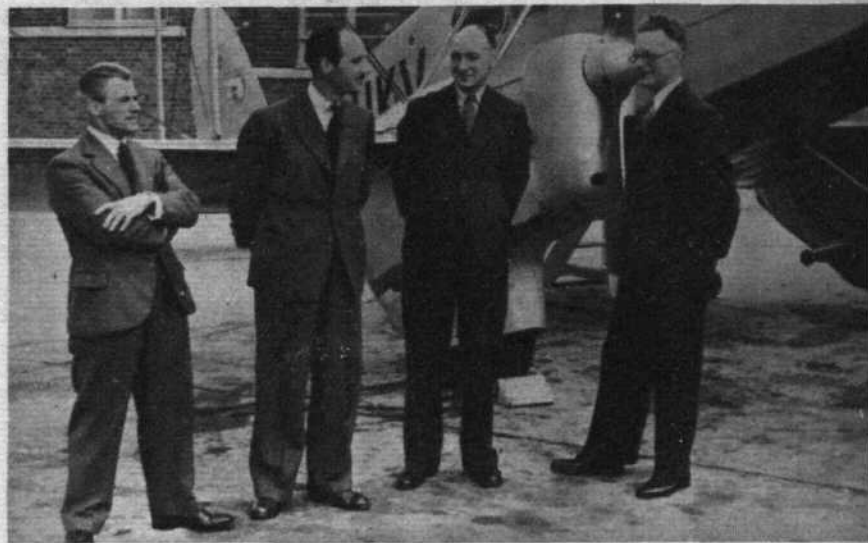
to west, is 1,600 yards, the south-west to north-east is 1,450 yards, and the north-west to south-east 1,040 yards. As may be imagined, the prevailing wind is westerly, and the only extension possible is on the E/W runway, which happily is the one most used; such an extension will be necessary if regular Viking services are to be run into Liverpool. The airport is bounded not only by the river but also by large factories and built-up areas, making other extensions impossible.

In 1935, the Liverpool Corporation installed a medium-frequency beam-approach system, which is identical in presentation with S.B.A., but operates at frequencies which are available on all aircraft equipped with MF communication equipment. This set, which is the only one in operation in the country, is now maintained by the M.C.A. The beam will be affected by any runway extension, as the marker beacons would naturally require re-siting, and the inner would automatically be sited in the river. Experiments are going ahead on a bent-beam system, which would not at first impression appear to be a satisfactory solution. All runways are equipped with sodium approach lights.

Air Traffic Control

Speke control has MFDF on 3,482 Kcs., a tower frequency of 345-348 Kcs., and R/T on 6,440 Kcs., but there is no VHF. On an area frequency of 339-341 Kcs. for the North-West Flight Safety Region, Speke is responsible for the control of all aircraft flying through that region and advising aircraft flying outside the region but within the DF range. Carlisle, Ronaldsway in the Isle of Man, and Ringway at Manchester, are the DF collaborating stations.

The routes covered by the Control are from Liverpool to the Isle of Man, Belfast, Croydon and Dublin, the routes between the Isle of Man and Blackpool, Ringway and Carlisle, and those from Northolt to Belfast and Dublin. There is an average of 140 aircraft passing through the

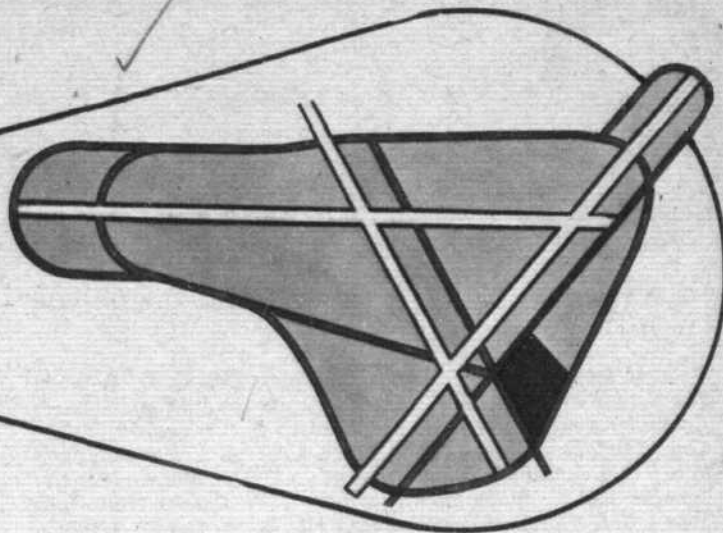
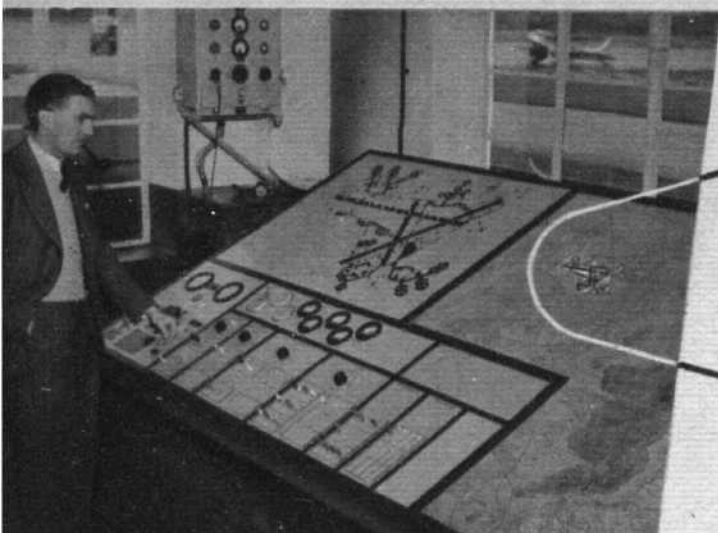


A B.E.A.C. Dakota on Check 4 at Speke. Aircraft inspections are known as checks in the Corporation. Check No. 1 is equivalent to a daily inspection; Check No. 2 is made after 50 hours; Check No. 3 after 100 hours, and Check No. 4 after 500 hours.



Controlling aircraft in the N.W. Flight Safety Region and in the Liverpool approach area from the Control Tower at Speke. The group of officials at Liverpool Airport are (L. to R.) J. Chadwick (Airport Manager), H. W. Hill (B.E.A. Stn. Supt.), J. Middlemass (A.T.C.O.), T. D. Adams (Chief Traffic Officer), T. Harriman (Base Engineer).





The Air Traffic Control Officer at the airfield lighting control panel in the Tower at Nutts Corner. Lights on the taxi tracks are controlled in sections, which enables the controller to light up any desired taxi-track pattern. The pattern is duplicated on the left half of the control panel. The unusual taxi-track design can be seen in the accompanying drawing.

area each day. As a matter of interest, there were 221 aircraft handled on the day of the Senior T.T. race in the Isle of Man this year. Scheduled services into and out of Liverpool airport number 42 daily. These are confined to B.E.A. and Aer Lingus, and the number of passengers handled exceeds 7,000 per month and freight and mail more than 32 tons. The airport is a regular calling place for charter companies, and the total number of daily aircraft movements is about 85.

Undoubtedly there could be a great future for Speke airport but, at present, there is little sign of organization and, in fact, little sign of activity in the vast terminal building. The passengers' assembly hall is large and furnished with but one settee and two armchairs. In one corner there is a bookstall, which appears to be seldom open, and in two other corners there are B.E.A. weighing bays. The whole presents a dismal picture except, of course, when a service is held up and passengers are kept waiting in the entrance hall without seating accommodation. On the first floor there are more spacious rooms

designed for refreshment and dancing, and it would be an understatement to say that we were anything less than dumbfounded at the inadequacy of provision for passenger comfort. One can forgive austerity furniture, but the poor quality food and service seemed quite inexcusable. We heard also that a licence had been applied for, but as only normal opening hours had been granted, the licence had not been accepted, and in consequence no drinks can be obtained on the airport. It seems regrettable that Speke, with such an excellent start in having already terminal buildings and civilian hangars, is not making more rapid progress. Not only could it be improved for passenger handling, but it could also be made a centre of attraction for the public. The wide tarmac in front of the terminal immediately beneath the visitors' gallery is convenient for loading and off-loading passengers and freight, and eliminates tedious coach journeys to and from aircraft.

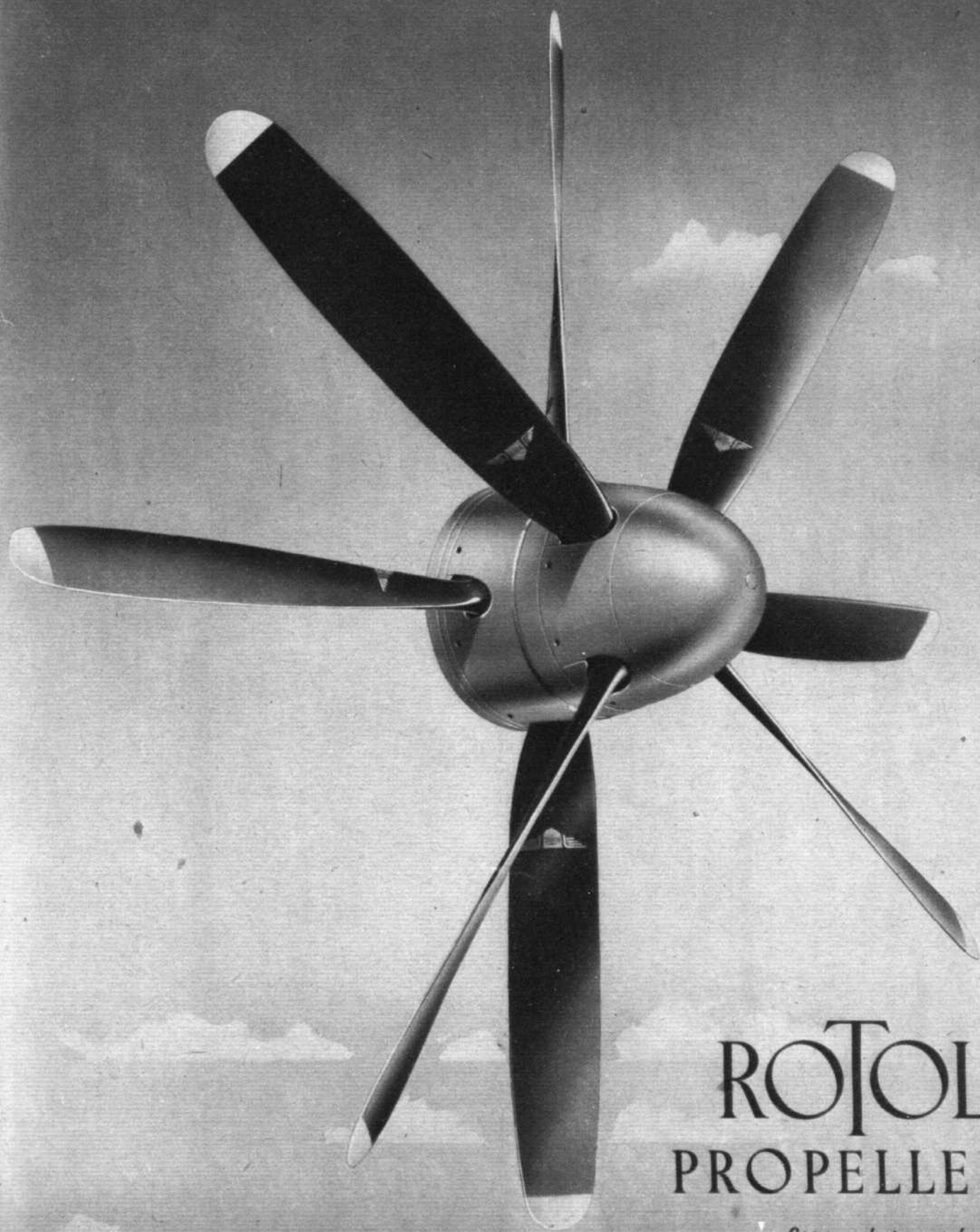
Belfast Airport

B.E.A. figures show that up to date the Belfast-Liverpool route has been the most poorly supported in the whole of the English Division, and yet we found the journey in the Dakota pleasant, and the length such that, with refreshment, there was certainly no boredom. The time from Belfast to Liverpool, being only 2½ hrs., is far better than the tedious boat journey. The normal industrial haze hung over the estuary and city of Liverpool as we left, and served as a sharp reminder that airfields near industrial cities are somewhat of a problem for operating regular schedules, and of the necessity for equipping them with good approach and blind-landing aids. The same remark might apply to Northern Ireland where, although industrial haze is not the cause of poor operating conditions, there is invariably a considerable amount of precipitation. The weather was clear for our flight across the Irish Sea, but when within a few miles of Ireland we ran, as usual, into 10/10ths cloud.

Belfast's airport is now Nutts Corner, as British European Airways have made a firm stand in condemning Sydenham airport on the east side of Belfast docks for operating Dakotas. The Corporation made it quite

Looking across the tarmac towards the Control Tower at Nutts Corner. The two buildings on the right are on the site of the proposed semi-permanent passenger-handling block. The present arrangement involves a coach drive of several hundred yards around the perimeter.





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clear that unless alternative accommodation could be provided, air services to Belfast would have to be cancelled; consequently Nutts Corner was selected.

The airport lies nine miles west-by-north of the centre of Belfast and only three miles from the shore of Lough Neagh. The Lough consequently provides an excellent area for letting-down in bad weather. It is rather interesting to note that the weather in the area, although invariably wet, seldom clamps down completely, and there is usually a sufficiently high ceiling to allow of descent through cloud over the Lough and a visual approach to be made. The Rapides flying into Belfast do a normal Q.G.H. in these conditions, as they are not fitted with SBA; in fact, only a few are so fitted, and they are on the London services. The Dakotas, of course, are equipped with SBA. I was given to understand that Trans-Canada Airlines have already surveyed the airfield for possible diversion of transatlantic traffic.

Nutts Corner is an ex-R.A.F. airfield, but has several peculiarities and is certainly well equipped with flying facilities, but the accommodation is quite inadequate. The flying facilities include SBA, MF/DF, HF R/T, VHF R/T; VHF DF is being installed, and there is the possibility that SCS 51, VHF Cathode Ray DF, GCA and a second channel on MF/DF will be installed. There are sodium approach lights to all the runways and full contact lighting on the main runway in the east-west direction of 2,000 yards. The north-east south-west runway is 1,600 yards and the south-east north-west runway 1,250 yards. The airfield has been built with special taxiing tracks with lighting controlled in sections from the tower. The taxi tracks are designed to allow aircraft to follow different

routes to reach the same destination. The result is that at night-time only the route which the aircraft is to follow need be lighted, and if there is an obstruction on one section the alternative section may be used.

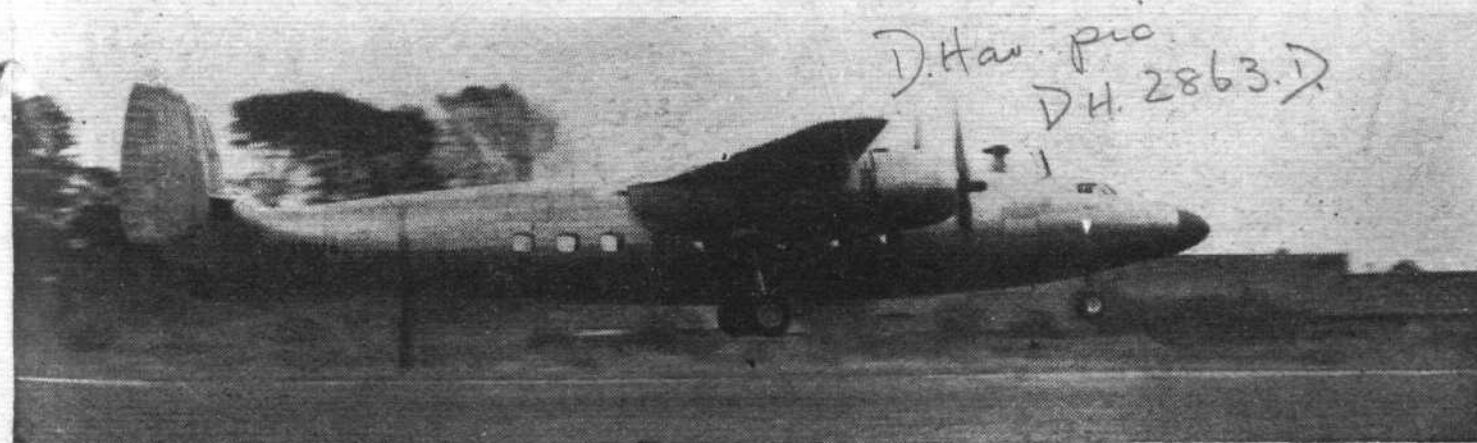
There are now fifty British European Airways scheduled services passing through Nutts Corner each day. These are summer schedules, and by August there will probably be more than sixty, owing to the additional Aer Lingus service which is starting up on August 1st and will fly from Dublin through Belfast to Liverpool. During May 6,346 passengers were handled at the airport. As already mentioned, ex-R.A.F. buildings are in use for passenger handling and office accommodation; there is, however, a plan to build a semi-permanent hut near the tarmac.

All the buildings used by the Ministry and B.E.A. have been painted white with red roofs, and one's first impression is rather that of a National Fire Service headquarters, especially with the three bright-red fire tenders and three ambulances outside the control tower; the whole effect, however, is clean and tidy, and although accommodation is cramped, the organization is most certainly efficient. The coach run to Belfast takes about twenty minutes.

The new British European Airways' premises in Imperial House, Donegal Square East, were opened on May 15th by H.E. the Earl Granville, Governor of Northern Ireland. They comprise a large double-fronted office and booking centre on the ground floor, and a waiting room in the rear of the building. On the ground floor there are additional offices, including the office of the Area Manager, who is responsible for B.E.A. operations in Northern Ireland.

Since going to press with this article the Minister of Civil Aviation has announced the names of those airfields which will be acquired by the State. A map showing these airports appears on page 66.

THE AMBASSADOR FLIES

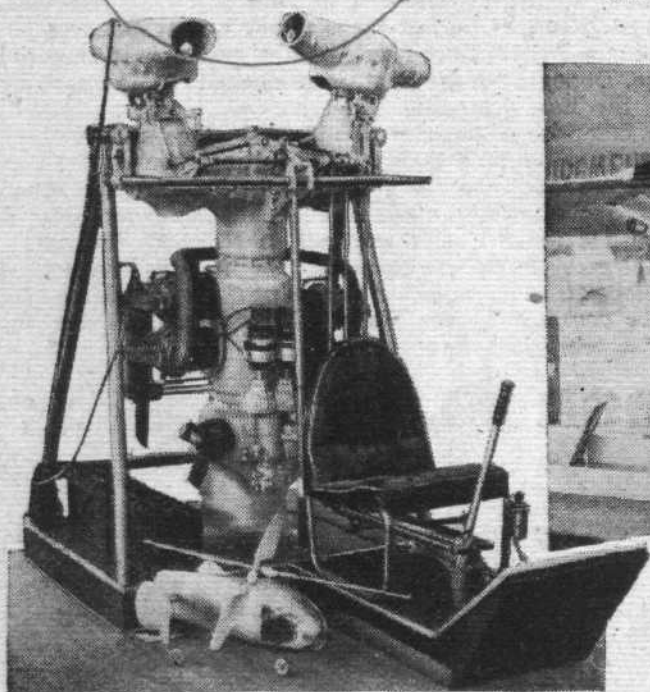


THE GREAT MOMENT: Scenes at Christchurch on July 10th, when Mr. G. Errington took this large 40-seater for a test flight lasting 45 minutes. The lower picture shows the Ambassador airborne, while in the upper it is well away above the airport. The discussion between Mr. A. E. Hagg, chief designer and technical director, and Mr. Errington relates to nothing more serious than the minor troubles always encountered during a first flight. The machine behaved well so far as general handling was concerned.

STYLES AT BRUSSELS

*Existing and Projected
Types for the Private
Owner : A Four-Rotor
Helicopter*

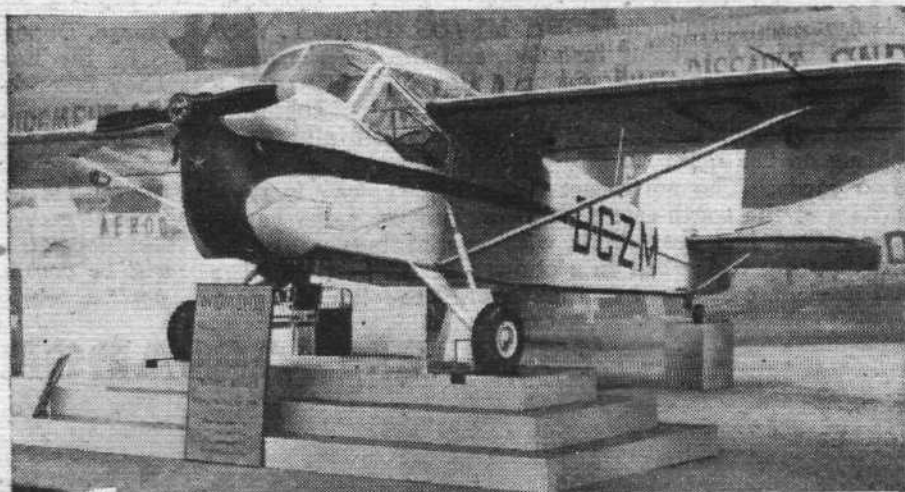
"Flight" Photographs



The rotor drive assembly of the Czech Praga E.1 helicopter, together with a model of this project. An M. 107 engine is fitted.



A trim French two-seater, the S.I.P.A. S. 91, offered with the 75 h.p. Mathis engine, or, for export, with a Continental.



An example of the N.C. 850 "Club," seen here in the Salon, was demonstrated effectively at the Evere flying meeting.



A model, with a cut-out figure to scale, of the tiny Florinne Project 4 helicopter.

On the left is the remarkably successful Lark, or KZ VII, four-seater built by Skandinavisk Aero Industri of Copenhagen.

SPECTRAL DEVELOPMENT

The
McDonnell
Banshee,
Successor to
the
Phantom



THE story of the development of the McDonnell FD-1 Phantom jet fighter which appeared in the April 10th issue of *Flight* ended with the words "The rest of the story is still being written." Now that details of the McDonnell XF2D-1 Banshee have been released another chapter can be added.

A straightforward development of the Phantom, differing little in general layout, the Banshee is an altogether faster and more formidable fighter, profiting from McDonnell's and the U.S. Navy's experience with the Phantom and incorporating many new and interesting features. The major points of difference between the two aircraft are: the Banshee's two Westinghouse 24c Yankee engines give about twice the power of the 19B Yankees fitted in the earlier machine; the wings and tail surfaces have a considerably thinner and more efficient aerofoil section; about twice as much fuel is carried; surface finish has been further improved; larger guns are fitted; a great many other things such as pilot's visibility and maintenance features have been improved.

The Phantom's twin 19-inch axial-flow engines make it the most powerful and fastest fighter yet adopted by the U.S. Navy; but a naval fighter needs a long range and must consequently carry a heavy fuel load. In addition it must carry a great deal of operational and deck-handling equipment not needed by shore-based fighters, all of which take toll of its performance. As a result, although it is one of the cleanest and neatest "twins" ever built, the Phantom is not as fast as the U.S. Army's standard jet-fighters.

Now, by fitting the larger 24-inch diameter Yankee 24c engines in a very similar airframe, McDonnells have produced the most powerful fighter yet flown in America. Exact engine and performance data are still restricted, but it has been stated that at high speeds the Banshee's engines develop more power than the four engines of a Superfortress. They are claimed to give it a top speed of around 600 m.p.h. and a rate of climb of over 9,000 ft/min. In addition the Banshee has long range, its fuel being carried in five internal self-sealing tanks. It has the usual tricycle undercarriage for normal take-off, and hooks are provided for catapult-launching. The deck-landing arrester

The Banshee bows to the power of the Press at her first public demonstration. The ability to curtsey facilitates carrier stowage.

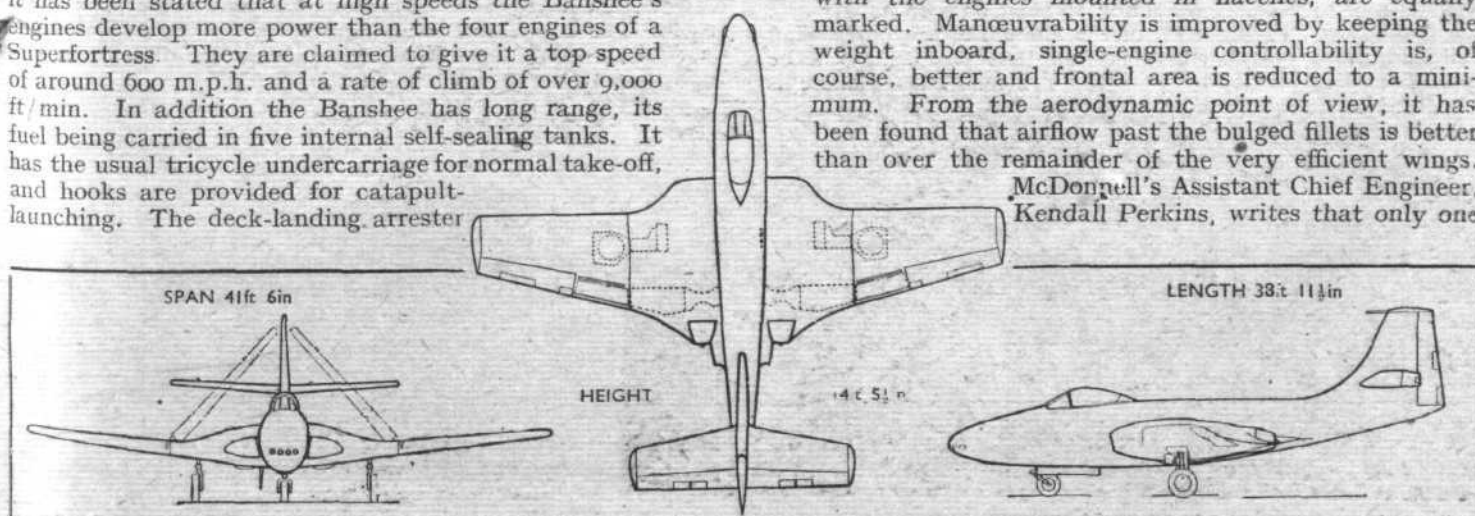
gear consists of a standard Navy-type hook, housed in a well in the lower part of the fuselage. With a wing-span of 41ft 6in the Banshee is 39ft long and has a loaded weight of just over 14,000 lb. The folded width is 18 ft and an interesting feature is that, together with flaps and undercarriage retraction, the wing folding is done electrically. "All-electric" aircraft are not very popular in this country, but there is undoubtedly a substantial saving in weight and space compared with hydraulics, as well as reduced vulnerability in combat.

• Deep-Rooted Preference

It is hardly surprising that McDonnells have retained the unorthodox wing-root engine layout evolved for the Phantom, as it has proved highly efficient in service. Its advantages over more conventional arrangements were dealt with fully in our article on the Phantom, but are worth recalling briefly. Compared with a single fuselage-mounted engine, the wing-root installation permits a straight-through flow of air past the turbines, with a minimum loss of power due to friction. There are no snaking intakes or long tail-pipes and it has been proved that, by exhausting the jets at the wing-roots, both controllability and stalling speed are greatly improved. Also, quite apart from the asset of twin-engined reliability, McDonnells found that, as these engines are most economical when operated near their maximum power, better range could be obtained by fitting two engines and shutting off one of them for cruising than by using a single larger engine at half power.

The advantages over a conventional twin-engined layout, with the engines mounted in nacelles, are equally marked. Manœuvrability is improved by keeping the weight inboard, single-engine controllability is, of course, better and frontal area is reduced to a minimum. From the aerodynamic point of view, it has been found that airflow past the bulged fillets is better than over the remainder of the very efficient wings.

McDonnell's Assistant Chief Engineer, Kendall Perkins, writes that only one



Spectral Development

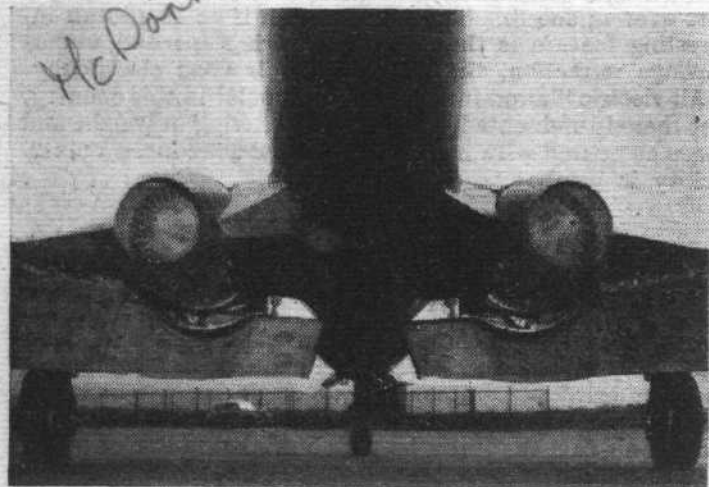
arrangement seems to offer more aerodynamic advantage—mounting the engines right out at the wing-tips like the Shooting Star's drop fuel tanks. But, apart from "plumbing" problems, nobody has yet discovered a way of preventing the whole aircraft from acting like a helicopter if one engine fails.

From the maintenance point of view the Banshee offers all the usual advantages of the jet aircraft's simplicity and low overall height. In addition it incorporates a new feature which makes possible the storage of some 30 per cent more aircraft on a carrier's deck. Its nose wheel can be partially retracted individually, enabling the aircraft to "kneel" down on to a small nose dolly, with its tail high in the air. The nose of the next aircraft behind can then be tucked under its tail, and so on down the line, making for a big saving in deck space.

On the restricted deck of a carrier the warning "Beware of Airscrews" becomes even more significant than elsewhere and there have been several most unpleasant acci-



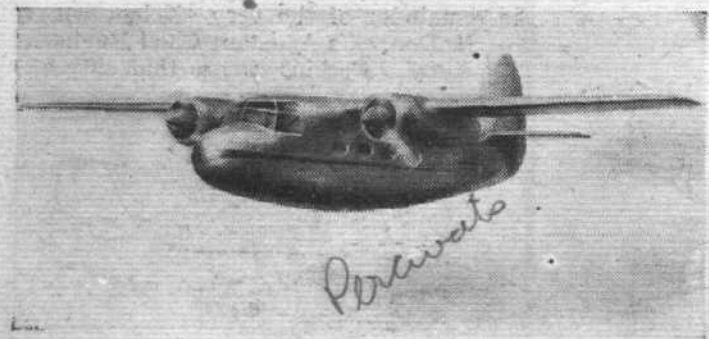
The Banshee with its smaller and lower-powered predecessor the Phantom in the background.



Short tail pipes contribute to efficiency. This view also shows the flap formation.

PERCIVAL PRINCE

THE Percival Prince, details of which were given in *Flight* of March 6th, has now reached the assembly stage. Components have been coming through steadily for the first model, and it is the Company's intention to create a flow of components and so permit production to start as soon as the first one is finished. Flying tests of the Merganser are progressing well and much of the experience on that prototype will be applied to the development of the Prince. The machine is scheduled to fly late this year.



An impression of the Percival Prince.

dents in the past. Consequently, when the possibilities of operating jet-fighters from carriers were first considered, there were many lurid descriptions of what would happen to any unfortunate deck-hand who walked in front of or behind the engines when they were running. Kendall Perkins adds that the risk of serious injury has been proved to be less than with airscrews: "The suction of the air inlet is enough to tug pretty hard on a man who approaches too near, but serious injury is unlikely. The jet-blast at the rear is warm, but fortunately it is also fast enough to ensure that a man walking into it too close to the engine will be blown away before he has time to be burned. And at a sufficient distance it is perfectly safe and not too uncomfortable to walk through the jet-blast."

There is little doubt that the carrier-based jet-fighter is now a highly practical proposition. It has the advantages of a propeller-driven fighter, with the exception perhaps of a low landing-speed, and a very much better performance. McDonnells admit that they have encountered compressibility effects with the Banshee and remark that future jet-fighters will probably have to change their appearance rather radically before these obstacles can be surmounted. Bearing that in mind, it will be interesting to watch for further developments from this progressive American company.

THE MACCHI MB 308

AN interesting little two-seater high-wing monoplane which has recently made its appearance on the Italian market is the Macchi MB308. It has a cruising speed of 100 m.p.h. and is powered by a 60-75 h.p. Continental engine. The aircraft is of wooden construction throughout and has a useful load of 484 lb. The new tourer has a good pedigree—it was a Macchi Castoldi 72 which raised the seaplane speed record (class C) in 1934 to 440.41 m.p.h.



The new Macchi MB 308 two seater.



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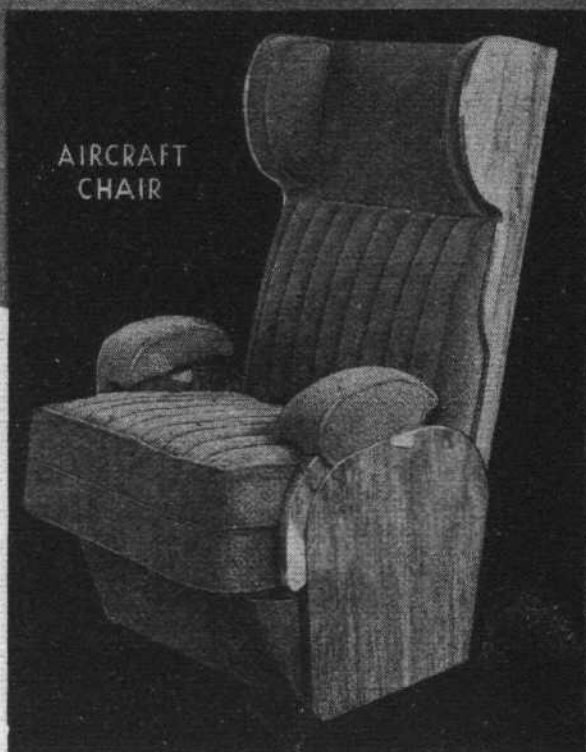
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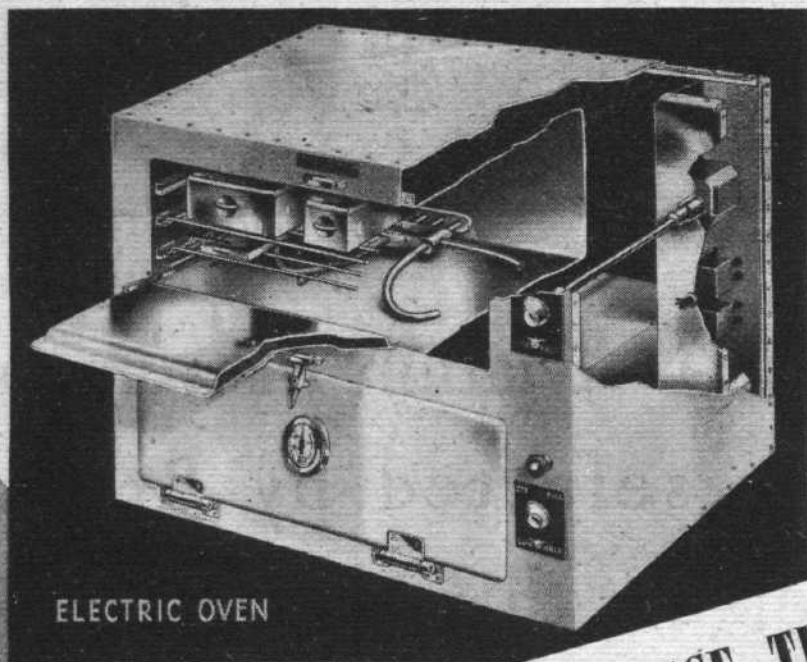
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CIVIL AVIATION NEWS

*Three Accident Reports :
M.C.A. Airport Plans :
Drastic Safety
Suggestions in U.S.A.*

SIESTA: A B.O.A.C. Hythe class flying boat at moorings in Augusta harbour. The photograph was taken from the garden at Airways House.



TWO CRASH REPORTS

REPORTS from the Chief Inspector of Accidents have been published on those accidents involving a K.L.M. Dakota which crashed in Surrey on November 6th last year; and an Aeronca which crashed near Newtownards, Northern Ireland, on March 2nd, 1947.

The Dakota was on a scheduled flight from Amsterdam to Croydon, and entered the London Control Zone when Q.B.I. conditions were in force. The pilot was flying on the Croydon M/F. beacon and steering by radio compass. One minute after E.T.A., whilst descending, the pilot estimated that he flew over the beacon, but the actual time of passing over the beacon was more likely to be two or three minutes earlier. He continued to fly on a westerly course for three or four minutes until receiving instructions that he was next to land, and that the landing direction was 120 degrees M. The aircraft then began to descend again and after receiving several Q.D.M.s the pilot turned on to the course for Croydon. At a height stated by the pilot to be 1,200ft the aircraft was levelled out and preparations to land were then made. The undercarriage was lowered and almost immediately after, whilst still flying in cloud, the aircraft struck the tops of trees and crashed.

Examination of the records and documents found everything to be in order. The altimeters were sent for pressure testing and detailed strip examination, from which there was no evidence to show that either the pilot's or the navigator's instrument was not operating correctly up to the time of the

crash. Further enquiries showed that whereas the pilot stated that he intended to set his altimeter to read zero on landing at Croydon he did in fact set it to the sea level pressure instead of airfield pressure. In consequence, the aircraft's height above Croydon airport would be about 230ft lower than that indicated by the altimeter. The conclusions of the Inspector were that a descent was made over high ground and in more adverse weather conditions than those at Croydon, and the aircraft struck the ground at a place 637ft above sea level. The Inspector considered that the pilot was mistaken in the belief that he stopped descending at 1,200ft. He knew the cloud base to be 1,000ft at Croydon and it was reasonable to assume that having made all preparations to land he continued to descend in order to get below the cloud. In the opinion of the Inspector the accident was the result of flying into high ground which may be attributed to errors on the part of the pilot.

The Aeronca Accident

The Aeronca was the property of Mr. W. S. S. Henry, the pilot, who was killed in the crash. Eye-witnesses on the shore of Strangford Lough saw the aircraft just before the crash make two gentle dives from about 200ft over themselves and over a rowing boat about 100 yards off the shore. On each occasion the aircraft descended to about 20 to 30ft and then climbed away. It next approached an anchored motor boat and dived in a similar fashion but afterwards went into a steep climb from which it stalled and crashed into the lake. Examination of the wreckage failed to reveal any defect which could not be attributed to impact, and there was no evidence to substantiate a statement that the engine had cut out. In the opinion of the Inspector the accident was the result of the pilot losing control following a stall at low altitude from which he was unable to recover.

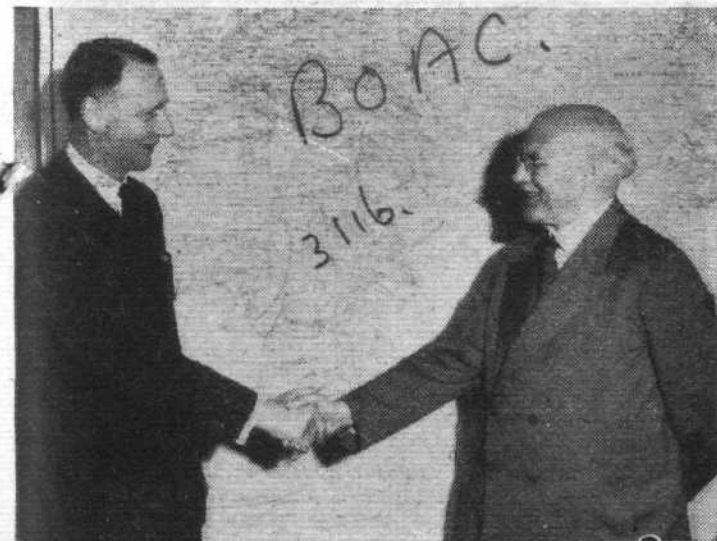
[There seems to be little doubt that the pilot was indulging in a little "shooting-up" and overdid the subsequent climb. —Ed.]

B.O.A.C. MEDICAL SERVICE

THE B.O.A.C. medical organization is under the direction of A.V.M. Sir William Tyrell and consists of ten full-time medical officers, eighteen nursing sisters and thirty-one medical orderlies. Medical superintendents have been appointed to the Eastern Division and to the Middle East and African Divisions and medical officers to London, Bristol, Aldermaston and Cairo. By periodical inspections at all the bases, airports and staging posts on the routes in their Divisions, the medical superintendents are able to supervise aircrew health under varying climatic conditions and organize medical facilities in flight and on the ground.

The medical service is considered by the Corporation to be essential for safe and efficient operation, and among its varied activities are the practice of the new science of aviation medicine, the study of the medical aspects of aircraft design and construction with a view to increasing the safety and comfort of passengers and aircrew, research on aircrew fatigue and on various physiological and psychological questions associated with flying and inspection.

The clinical section of the service is in charge of Air Cdre.



TAKING OVER: Lord Knollys, on the left, shaking hands with Sir Harold Hartley when the latter took over chairmanship of B.O.A.C. on July 1st. Lord Knollys has resigned in order to resume his activities in the insurance world.

Civil Aviation News

J. Kyle who is responsible for the medical examination and assessment of fitness of aircrew and ground staff for service in the Corporation. He is also responsible for first-aid facilities at factories and airports and the general health requirements of the staff and passengers and the provision of bases with equipment and supplies. The hygiene and administrative sections are in the charge of Dr. R. H. Barrett, whose responsibility lies chiefly in the high standard of hygiene in Corporation premises as well as international quarantine regulations.

Aviation medicine is the responsibility of Dr. K. G. Burgin. Recommendations from the medical point of view are made to him in connection with aircraft design, structure and lighting, with particular reference to passenger comfort. One of

the most important problems is that of aircrew fatigue, and research includes investigation into the maximum hours of any one flight, provision of "slip" crews, facilities for crew resting in aircraft and amenities at ground stops, cockpit lighting, the elimination of glare, noise and vibration and the questions of heating and ventilation.

Dr. J. E. Gabb is in charge of the Medical Training Centre at Aldermaston, which is designed to give medical services to aircrew and ground staff as well as provide a school for training personnel in aviation medicine. Crews receive first-aid courses which are comprehensive. The aim of the courses in aviation medicine is to train as far as possible all B.O.A.C. personnel responsible for the safety and comfort of air passengers, not only to recognize an emergency but to deal with it whether in flight or on the ground in the absence of a qualified medical practitioner.

STATE AIRPORTS

A PRELIMINARY list was issued last week by the Minister of Civil Aviation of the cities and areas in the United Kingdom which are to be served by air transport and the airfields which are to be acquired and operated by the Ministry in accordance with the White Paper on British air services published in December, 1945. The London area has been omitted, as that is a separate consideration.

It was pointed out by the Minister that many of the airfields would be operated on a joint basis with the Service departments and aircraft manufacturers. A great deal of

development work would be necessary, he said, on many of the airfields before they could be ready for regular air services, and where it has not already been done air traffic control and telecommunication services would be installed. The Minister also stated that, generally speaking, those airfields which filled a social and commercial need that other forms of transport did not satisfy would be developed first, but it would be unwise to indicate a date by which all the airfields would be brought into use, but development would be pressed ahead on a properly integrated plan.

Air services were contemplated, Lord Nathan said, to the Highlands and the Islands of Scotland, including inter-island services, but surveys of the sites provisionally selected were necessary before their suitability could be determined. Some of the landing grounds used before the war were now too small for medium-type aircraft. Additional sites would be announced from time to time as their acquisition became necessary for the further expansion of air services. On the accompanying map those cities and areas already in use for regular services have been especially indicated, and the airfields situated outside the immediate neighbourhood of the cities they serve have been named.

Of the others the following observations are made. Valley is to be used as a diversionary airport. The airport for Bristol will eventually be Lulsgate Bottom, but Whitchurch will continue to be available for a time. Similarly, Pengam Moors will continue to be used for the Ferry services across the Bristol Channel from Cardiff, but Llandow will eventually be the airport for the city. At Carlisle, Great Orton, about five miles west of the town, is to be used, but Crosby is now the airport used for regular services. At Inverness, Longman airfield is being used at present, but the transfer to the eventual choice, Dalcross, will be made as soon as practicable. For the Leeds and Bradford area, Yeadon, equidistant from the two towns, is to be adopted subject to further technical investigation to prove that it can be developed to the necessary standard.

Although Woolsington is at present in use for the Newcastle-North-East England area, Croft is intended for temporary use pending the development of a new site, the site provisionally selected is at Boldon, south of the projected Tyne tunnel, which lies, however, on coal-bearing land, and further technical investigation is necessary before the selection of the site can be confirmed.

In the west of England, Culdrose is to serve Penzance, but St. Just is to continue to be used until a transfer is possible. The use of Harrowbeer, north of Plymouth, is subject to Parliamentary approval of Commoner's rights.



THE SPENCER CRASH

A REPORT has been submitted to the Minister of Civil Aviation by the Chief Inspector of Accidents on the circumstances of the accident to Dakota VP-YFE belonging to Spencer Airways which crashed at Croydon on January 25th this year.

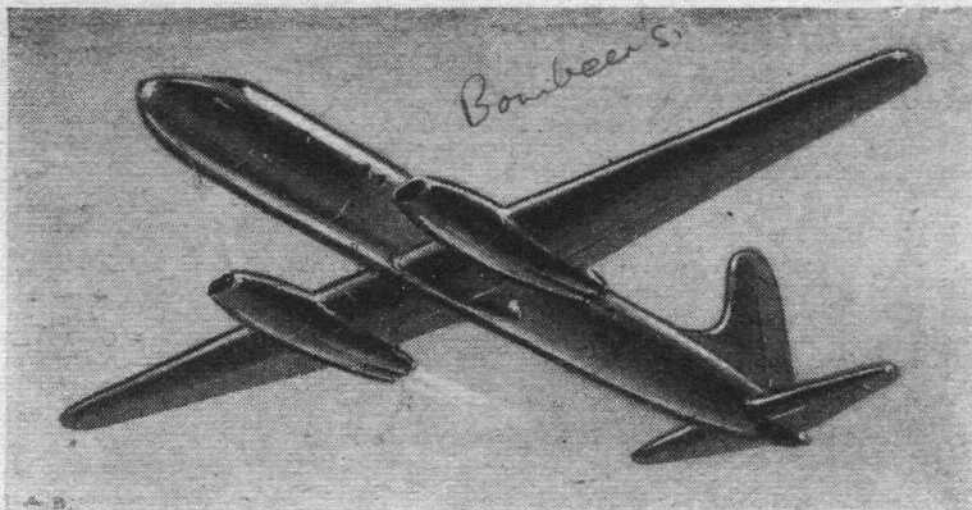
Captain E. H. Spencer, as pilot of the aircraft, was taking off with a load of eighteen passengers for Rhodesia on the morning of January 25th. During take-off, according to the evidence of the second pilot, the starboard wing dropped as the aircraft was becoming airborne and almost immediately it rolled over to a port wing attitude, at the same time turning to the left. The pilot applied full starboard aileron but the angle of bank to port increased until it approached 40 deg, the port wing tip being only one or two feet from the ground. Just before reaching the far side of the airfield level attitude was regained but the aircraft then swung to the right, the result probably of hard starboard rudder applied by the co-pilot to avoid crashing into a hangar. The aircraft bounced and ran 60 yards to crash head-on into a parked Dakota. Both aircraft burst into flames, and Captain Spencer and eleven passengers were killed.

In the opinion of the Inspector of Accidents the accident was the result of loss of control by the captain who, when attempting to take-off a heavily loaded aircraft in poor visibility, allowed it to become airborne in a semi-stalled condition. This must be attributed to an error of flying technique by a pilot who lacked Dakota experience. The Inspector considered that the adhesion of snow and/or frost to the lifting surfaces and the impairment of the pilot's judgment through fatigue were possible contributory causes.

The aircraft carried Southern Rhodesia registration letters but had not been registered in any country except U.S.A.

The aircraft had been delivered to the United Kingdom on a ferry permit only, the American C. of A. was not valid in England and the Air Registration Board had not been asked by Southern Rhodesia to inspect the aircraft on their behalf for the purpose of validation. No flight test was carried out after removal of the long-range fuel tanks at Croydon after delivery of the aircraft from America. The all-up weight and C. of G. were within specified limits. The captain and co-pilot held valid "B" licences endorsed for Dakotas and the radio operator held a P.M.G. licence. No crew member, however, held a navigator's licence neither did any crew member hold a licence which qualified him to sign the Certificate of Safety in respect of airframe or engines.

Preparation for the flight showed a lack of organization and evidence showed that on the night of Thursday, January 23rd, the captain could not have had more than four hours' sleep and on the night of Friday, January 24th, it is doubtful if he could have had even as much as that as he was working on the removal of fuel tanks from the aircraft.



TUDOR EIGHT: An impression of the pure jet Avro Tudor which is expected to fly this September. This version is powered by four Nenes in pairs and will be used for research into the operation of jet transports at high altitudes.

The visibility was such as to necessitate an instrument take-off but evidence suggests that a visual take-off was made. The aircraft had not been de-frosted and available evidence does not exclude the possibility of some snow and/or frost on the lifting surfaces. There was no reason for the Inspector to suspect either pre-crash damage to either airframe or engines or that there was power plant failure during take-off.

The Inspector recommended that consideration should be given to the extent of ascertaining so far as was practicable whether the Air Navigation Regulations had been complied with before permission was given to take-off, particularly by inspection of the Certificates or licences of the aircraft and crew, including the Certificate of Safety when required.

Immediately after this accident instructions were issued to all airfields controlled by the Ministry of Civil Aviation instituting an inspection of Certificates of Airworthiness, Certificates of Safety and crew licences, with the object of ensuring that these papers were in order in all public transport aircraft taking off from those airfields.

FAIR UTILIZATION

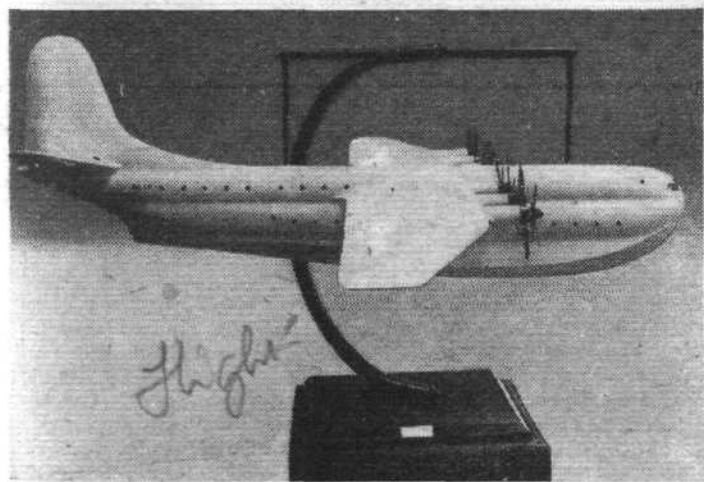
AN additional service was started yesterday by B.O.A.C. between the United Kingdom and Montreal. With the introduction of this service B.O.A.C. will be operating two services weekly on that route, making a total of eight services weekly in each direction across the North Atlantic with five Constellations. Five of the services to New York are flown through Shannon and one through Prestwick. Both of the services to Montreal fly via Prestwick. Recent increases in the North Atlantic services have made freight space available for the immediate requirements of exporters to North America.

AMERICAN SAFETY RECOMMENDATIONS

THE Emergency Air Safety Board set up by President Truman after the recent batch of airline crashes in America has made some recommendations which will affect the American operators. The first report issued by the Board dealt entirely with the crash of the United Airlines Skymaster soon after take off at La Guardia, on May 29th. Although investigations are incomplete, the Board has sufficient evidence to permit certain recommendations to be made for immediate action.

The air lines have been called upon to work out all-up-weight operating figures for take-off on every runway at present being used by 4-engined passenger aircraft, under varying wind conditions. The calculations are being made under the supervision of C.A.A., but the Board has already gone so far as to recommend that all four-engined aircraft should be prohibited from using all runways less than 4,000 feet in length. The effect of this decision may be judged by the fact that of 289 runways now authorized for use by four-engined aircraft 15 per cent of them measure less than 4,000 feet. The runway at La Guardia from which the Skymaster was taking off and which measures 3,530 feet has already been closed for four-engined aircraft.

A formula has been evolved by the Board for determining the load limits, and under that formula the safe limit for a take-off from La Guardia would be between 51,000 and 54,000 lb depending upon wind and temperature. The all-up weight of the Skymaster which crashed was found to be 60,319 lb at take-off and under the formula that aircraft should not



SARO S.45. A model of the Saunders-Roe flying boat being built to the Ministry of Supply development programme specification for a flying boat of 130 tons. The present intention is to use Proteus engines, and the first flight is expected in 1950. One mock-up and three production aircraft have been ordered.

Civil Aviation News

have carried more than 57,000 lb. United Airlines, we understand, had fixed a limit of 60,700 lb for that particular runway, and which was, we understand, the result of an erroneous interpretation of the more lenient formula now in the American

regulations. Mr. J. Landis, chairman of the C.A.B., said that although the safety margin would be considerably increased, the recommendations would have an economic effect on domestic air lines, which would slow down operations. Mr. Landis emphasized that the investigation of the crash would not warrant attributing the accident to the fact that the Skymaster was overloaded and he mentioned other possibilities.

BREVITIES

I.C.A.O. Pacific Regional Committee has recommended the air strip at Dubba as the alternative bad weather airport to Mascot at Sydney, Australia.

B.E.A. started on July 5th a direct service from London to Deanville with Dakota aircraft. The service is being run in conjunction with Air France.

The Boeing Stratocruiser flew for the first time on July 9th. The gross weight at take-off was 100,000 lb which is 35,000 lb less than the maximum all-up-weight. The aircraft remained airborne for nearly an hour and a half and using the reversible pitch airscrews used only 400 yards of the runway on landing.

Arrangements have been made to instal high-intensity contact lights on the east-west runway at London Airport. Installation work at night has already started and that runway will normally be closed from 1700 G.M.T. until 0500 G.M.T. unless weather conditions necessitate its use.

Trans-Canada Airlines announce that due to expanded activities of the company another vice-president has been appointed in addition to Mr. W. F. English who is Vice-president Operations. In consequence, Mr. A. C. McKin has been appointed Vice-president Administration. He was the Canadian representative on the I.C.A.O. Council.

A de Havilland Chipmunk is to be demonstrated around New Zealand in August. The flying clubs in New Zealand have revived activities with ex-Service Tiger Moths and are now looking for suitable aircraft in order to expand. The demonstration is therefore timely.

The Canadian Government are anxiously awaiting a decision on the dispute over the airfield at Bermuda. It is hoped that an agreement will soon be signed between the United States and Britain so that Trans-Canada Airlines will be able to use the American-controlled airfield before December 1st this year.

Early in the autumn B.O.A.C. will transfer the present West African coastal service, operated with Haltons and Dakotas, to the direct route across the Sahara via Kano to Lagos. Proving flights will be flown in the near future. West African Airways are to be responsible for providing adequate connections between the main route and the other West African colonies.

The B.O.A.C. weekly service from the United Kingdom to Hong Kong with Plymouth class flying boats is supplementing the weekly service with Hythe boats. The Plymouth leaves Poole every Monday and stops at Augusta, Cairo, Bahrein, Karachi, Calcutta, Rangoon and Bangkok.

Westminster Airways have taken delivery of a de Havilland Dove which will be in service very soon. They now have nine aircraft, the others being two Dakotas, five Consuls, and one Auster. The Auster is used mainly by the company for flying between Blackbushe, the maintenance headquarters, and the operational base at Croydon.

F.A.M.A., the Argentine airline company, has started a service between Buenos Aires and Rome, stopping at Rio de Janeiro, Natal, Dakar, Madrid and Barcelona. The service is to be run weekly leaving Buenos Aires every Wednesday night and arriving in Rome the following Friday afternoon. The return service leaves Rome on Sunday mornings and arrives back in Buenos Aires at midnight the following Monday.

Tasman Empire Airways are negotiating for four Short Solent flying boats at a cost of nearly one million pounds. Sir Leonard Isitt, chairman of New Zealand National Airways Corporation, and a director of T.E.A., says that the recommendation for the purchase has yet to be approved by the British, Australian and New Zealand governments who are shareholders in the company. The Tasman class boats now flying are on hire from the British Government.

FROM THE CLUBS

To meet the requirements of flying enthusiasts in the West Riding area, a West Riding Aviation Centre is to be formed under the auspices of the Lancashire Aircraft Corporation. The centre will operate from Yeadon airfield, and it is intended to provide flying instruction, lectures and affiliated facilities.

The official opening of the Tees-side Flying Club will take place this week-end, July 19th. The club house has been decorated and furnished and catering facilities installed. A bar licence has been applied for, and it is hoped that in the near future the club will be made residential. Although the week-end will mark the official opening, the club has been in full swing at the airport, West Hartlepool, for some weeks past. Auster Autocrats and Proctors are being used for dual and solo flying by club members.

The London Aeroplane Club, operating from Panshangar airfield, five miles east of Hatfield, is to be taken over by the de Havilland Aeronautical School, a development which it is hoped will result in a more active organization and a better service to members. The club will certainly benefit by having the backing of the school with its technical staff and facilities, and perhaps an infusion of fresh enthusiasm may be expected from the association with the introduction of a number of eager pupils, including many who have returned from flying careers in the Services. The club will retain its present premises and no immediate changes are planned, although it is hoped to improve operating economy. Three Hornet Moths and three Tiger Moths are now available for club members.

While members of the Coventry Aeroplane Club are awaiting delivery of the Tiger Moth aircraft for which the committee have placed an order S/L. C. K. Turner-Hughes, former Arm-

strong Whitworth test pilot, is conducting a series of weekly lectures on "The Principles of Flying." The C.A.C. has obtained permission for the use of Baginbun civil airport for their flying activity since Whitley, the airfield where they are at present installed, is no longer licensed for flying.

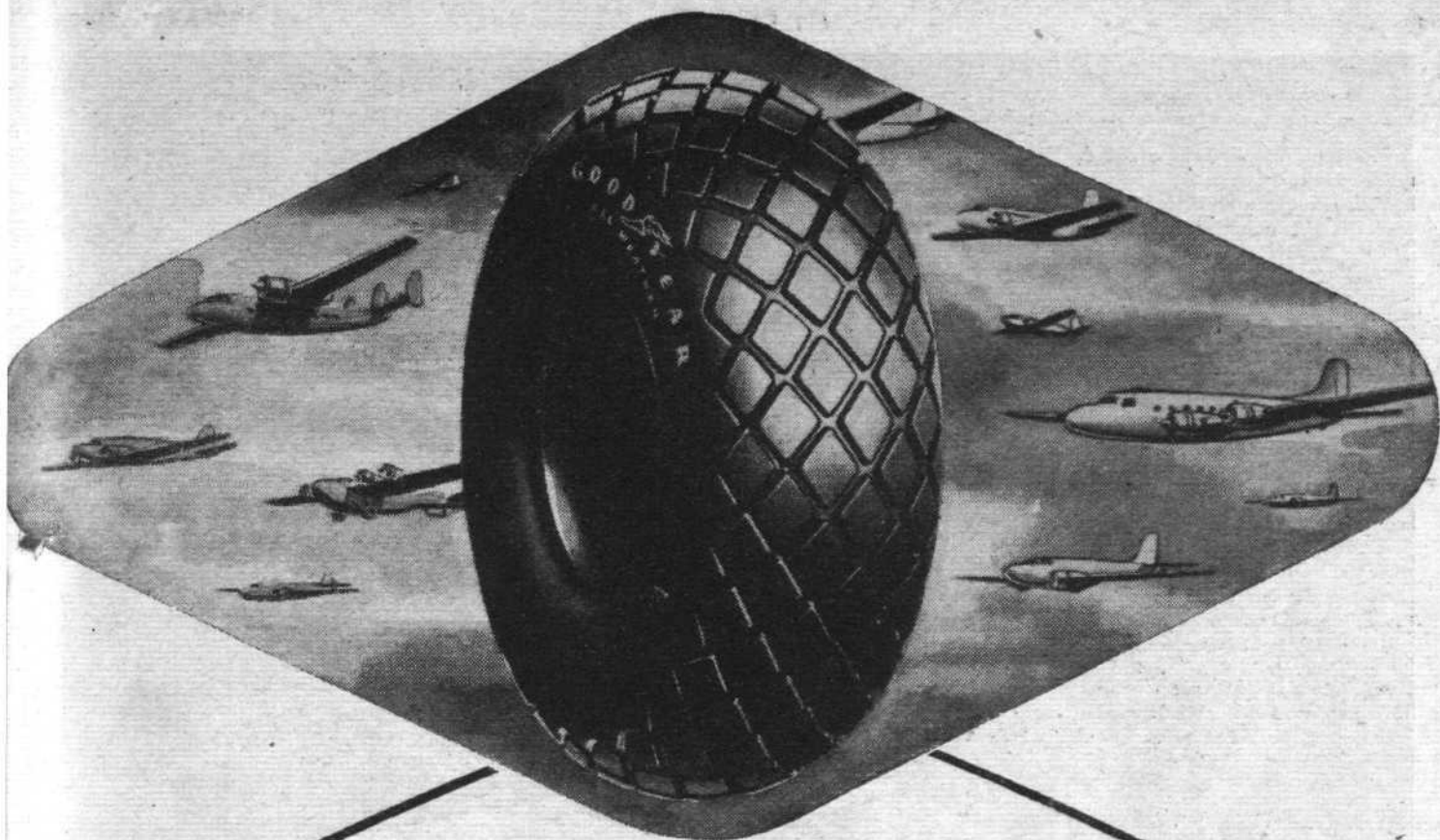
Miss June Humphries, of 14, Newlands Avenue, Gosport, is the winner of the South of England flying scholarship offered by the Women's Junior Air Corps. The scholarship entitles her to a complete free training for an "A" licence. She is a member of No. 331 Gosport Unit of the Junior Air Corps and was recently promoted from Unit Sergeant to Squadron Officer. Miss Humphries will take her flying training at the Portsmouth Aero Club.



Miss June Humphries

The municipal airport, Southend-on-Sea, is to be officially opened for civilian use on August 9th. On this day also the corporation's International Air Rally and Air Races will be held. The races will be divided into two main events, the Southend-on-Sea air trophy, a handicap race over three laps of a 22 miles course, and a class race for standard Auster Autocrats to be flown over three laps of a five-mile circuit.

Other events to take place at the rally include parachute descents by Mr. Gwynne Johns and aerobatics in an Olympia sailplane by Mr. Jack Rice. There will be the usual demonstrations of visiting aircraft, and it is expected that a fair number of Continental machines will be visiting Southend-on-Sea for the rally. The corporation are hoping to make the International Air Rally and Air Races an annual affair.



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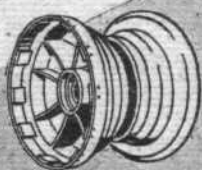
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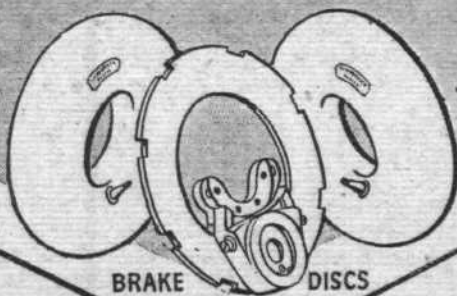


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RESEARCH · DEVELOPMENT · PRODUCTION

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers not necessarily for publication, must in all cases accompany letters

FLIGHT DEFUELLING

Getting Down to Landing Weight

UPON several occasions recently I have read accounts, both in your journal and also the daily Press, of aircraft having to circuit airfields for several hours in order to reduce fuel load prior to emergency landings.

Is there any reason why "flight refuelling" cannot be operated in reverse as an alternative to the very expensive and wasteful method known as "jettisoning"?

"6½ GALLONS BASIC."

ENGINE DESIGN

From Sir Roy Fedden

MAY I congratulate you on the excellent story on our "Cotswold" propeller turbine and the flat six piston engine in the June 26th issue of *Flight*. We are very grateful for the attention you have given to our efforts and for the encouraging comments which have been made on our designs.

There is one aspect which I would like to emphasize, with your permission, and that is the valuable and enthusiastic collaboration we have received from the N.G.T.E. in working out the design of the "Cotswold" turbine. We have received a great deal of help from them on the turbine casing and in the design of the compressor blading. Important work was also done at Pyestock on the development of our combustion system.

ROY FEDDEN.

JETS FOR BOMBER COMMAND

The Need for Operational Experience

YOUR columns have more than once drawn attention to our lack of jet-bomber prototypes. These, no doubt, are coming through, and there is every reason to expect that when they finally appear they will be superior to any of the impressive designs which have materialized in the Martin, Consolidated and North American factories. By their very nature, however, they will present new operational and technical problems and it might have been expected that large aircraft adapted for jet propulsion (e.g., a Nene-Lincoln) would be supplied to the Central Bomber Establishment for basic research.

The accumulation of experience on behalf of civil operators is provided for by the Nene-Lancastrian, and civil needs are further served by Lincolns with various prop-jet power plants. Additional operating data will be forthcoming from the Tudor with four, and from the Viking with two, Nenes, and no doubt much of the experience gained with these types will indirectly prove of benefit to Bomber Command. Even so, the total lack of jet equipment within the Command seems hardly compatible with official declarations that our aim is a small Air Force of the utmost efficiency.

R. DANIEL.

OFFICERING THE A.T.C.

Apparently a High Standard is Expected

WE sometimes read in the aeronautical press letters from anonymous gentlemen in the A.T.C. in which they moan about the alleged shortcomings of their Corps. Unfulfilled pledges and lack of competent instruction are the themes that they plug. However, at a public meeting recently in Southampton I heard the question raised as to whether these complaints are justified. A most eminent aeronautical personage who was present piped up very bluntly and said, "Yes, and the reason is that most of the officers are useless." Can you allow me a little space to refute this calumny, by quoting my own recent experience.

I have spent the last 18 months actively helping the A.T.C. I have repaired their gliders, made them instrument panels, instructed them in gliding, theory of flight, aircraft construction and spent about £100 on incidental expenses. I have two unsolicited letters thanking me for my work. I hold a ground engineer's licence, a gliding licence and am an officially approved instructor. I spent ten years in the flying services, three of which were commissioned and have ten years in civil aviation. I am intelligent, humorous, cultured and very unpopular with my wife for gadding off gliding each week-end.

In the light of this and because the Squadron is not up to officer strength, it was thought, not unreasonably, that I was just the character for the job. I applied for a commission as an unpaid pilot officer and now wish I hadn't because, to my extreme mortification and embarrassment, I was rejected.

If my qualifications don't ring the bell surely the suitability of those gentlemen who have been granted commissions as acting unpaid pilot officers is beyond question, as their qualifications must of necessity be superior to mine.

LESLIE W. CRAWFORD,
Lieutenant (A.) R.N.V.R.

NAMES FOR THE E10/44

Plea for an Onomatopoeia

WITH reference to the recent correspondence on the question of a suitable name for the E.10/44, I venture to suggest that the whole subject of military aircraft nomenclature be reviewed at this stage.

We have aircraft named after winds, insects, birds, fish, stellar phenomena, towns, and even states of mind, but in spite of this seemingly complex assortment, the types of names so far adopted appear to have been divided, roughly, into two classes, i.e., the descriptive and/or symbolic for fighters and fighter-bombers, and the dedicative for heavy bombers.

However, since the controversy has arisen over the choice of a title for a fighter, I will deal exclusively with this type of aircraft.

With very few exceptions the choice of names appears to have been vividly appropriate. For example, we have the sense of rapid destruction as suggested by "Hurricane," "Whirlwind," "Typhoon" and "Tempest"; the startling speed implied by "Meteor," and the impression of swift deadliness as conveyed by "Spitfire."

Looking back over the list of British fighters from 1939 onwards, we find that most of the names used are impressionistic, conveying an idea rather than a literal indication of the machine's use. After all, all aircraft of this class are "attackers" in the true sense of the word, so why not invent the most distinctive name for a particular machine, something which "nutshells" it and sounds right, and if it alliterates so much the better.

Therefore, I suggest the fast-sounding title—"Sirocco" for the E.10/44.

PETER WELCH.

P.S.—For the benefit of the hyper-critical, I am fully aware that the literal definition of "Sirocco" is "a sultry Mediterranean wind."

FORTHCOMING EVENTS.

July 2nd to 23rd.—Air League of British Empire : Blackpool (Squires Gate) Flying displays with R.A.F. support on 9th, 16th and 23rd.

July 4th to 20th.—Brussels International Aero Show.

July 19th to 21st.—International Air Rally at Knocke Le Zoute.

July 20th.—Prague : International air display.

July 20th.—Northern Heights Model Flying Club : Gala day at Langley airfield, Bucks.

July 26th and 27th.—United Services Flying Club : Air display and air rally. Elstree airfield, Herts.

July 30th to August 9th.—Aero Club of Switzerland : International gliding contest. Samaden in the Engadine.

Aug. 1st.—Start of Belgian "Aerial Fortnight," Le Zoute.

Aug. 2nd and 3rd.—Aero Club de Versailles: Toussusle Noble.

Aug. 2nd to 4th.—Royal Aero Club of Belgium International air rally : Le Zoute.

Aug. 9th and 10th.—Southend flying meeting.

Aug. 15th to 18th.—Strathay Aero Club : Perth air display.

Aug. 20th. to 29th.—Twenty-Second Model Engineer Exhibition. New Royal Horticultural Hall, Vincent Sq., S.W.1.

Aug. 28th. to Sept. 13th.—Engineering and Marine exhibition. Olympia, London.

Aug. 30th and 31st.—Cinque Ports Flying Club : Folkestone Air Races meeting. Lympne airport.

Sept. 3rd to 6th.—Aeronautical Society : Aeronautical Congress.

Sept. 6th.—Naval Aviation : Air display and static exhibition. Lossiemouth air station, Moray, Scotland.

Sept. 9th to 12th.—S.B.A.C. Exhibition and Display.

Sept. 14th.—Royal Aeronautical Society : Garden Party, Radlett airfield.

Sept. 17th to 19th.—Federation Aeronautique Internationale : Annual General Conference, Geneva.

Oct. 19th to Nov. 24th (approx.).—Royal Aero Club of Belgium. Air rally to the Belgian Congo. (Brussels to Le Kivu.)

SERVICE AVIATION

Royal Air Force and Naval Aviation News and Announcements

Awards

HIS MAJESTY THE KING has been graciously pleased to approve the following award:—

MILITARY CROSS.

Acting Flight Lieutenant Frank William Collard, R.A.F.V.R., Royal Air Force Airborne Central Unit.

This officer volunteered for special operations and was a member of an Airborne team which parachuted into Elephant Point, Rangoon, on May 1st, 1945, and, throughout the day, controlled the air strips. As a result of this, Elephant Point was captured. Previously, F/L. Collard had only made two parachute jumps, and his conduct, throughout the operation, was most praiseworthy. Subsequently, he volunteered to command a similar experimental team to operate with the clandestine forces in the Mawchi area of the Karen Hills in Burma. On June 23rd, 1945, the team dropped successfully into the area and operated for three months in difficult mountainous country infested by Japanese forces. Although air strikes were not possible, owing to the severe monsoon weather, the team gained much valuable information regarding training, tactics and equipment, which made it possible to form 14 additional teams to operate in Malaya and Siam. F/L. Collard participated in many ground actions against the Japanese. Despite the sickness of one of its members, he succeeded in extricating the team with all its equipment by marching to Joungoo. Throughout these two operations this officer displayed outstanding initiative, courage and leadership.

New Royal Warrant for A.T.C.

H.M. THE KING has approved a new Warrant for the Air Training Corps, incorporating a definition of the peace-time objects of the Corps.

The objects of the Corps are now:—

- To promote and encourage among young men a practical interest in aviation and to fit them to serve their country in our Air Force, its reserves and auxiliaries, and also in the Air Branch of our Navy or in our Army;
- To provide training which will be useful both in the Air Services and civil life;
- To foster the spirit of adventure, to promote sports and pastimes in healthy rivalry and to develop the qualities of mind and body which go to the making of a leader and a good citizen.

The training syllabus of the Corps is being revised to bring it into line with these new objects.

Arbroath Display

H.M.S. CONDOR (R.N. Air Station, Arbroath) will be open to the public on Wednesday, July 23rd, from 2.30 p.m. to 6.30 p.m. Rocket-firing Mosquitoes will be beaten off by Seafires, and there will be fire-fighting and model flying.

Belgian Appreciation

FLIGHT last week described the splendid flying by the R.A.F. at the Brussels Meeting. The A.O.C.-in-C., Fighter Command, Air Marshal Sir James Robb, received the following signal after the display: "The Administrative Council of the Belgian Royal Aero Club, greatly impressed by the brilliant British display at Brussels, ask you to accept their hearty congratulations and very sincere thanks.—(Signed) A. Marechal, Secretary-General."

R.A.F. Rowing Association

THE formation of a Royal Air Force Rowing Association has been announced and an eight has been selected to train for the Maidenhead and other regattas. The Association is affiliated to the Amateur Rowing Association and will hold its own regatta at Kingston on September 6th. A.V.M. P. C. Livingston has been invited to become president, and G/C. H. R. A. Edwards, an old Oxford rowing Blue, has been elected vice-president. The chairman is W/C. J. R. A. Embling, who rowed for his college at Oxford.

Ensign for Edinburgh High Kirk

A ROYAL AIR FORCE ensign will be added to the many army regimental colours and the Naval White Ensign in St. Giles' High Kirk, Edinburgh. The flag, which will be deposited on July 20th at a brief ceremony, is that which was used by No. 603 (City of Edinburgh) Fighter Squadron, A.A.F., during the Battle of Malta and later in the Western Desert. The Chief of Air Staff will be present at the ceremony, together with members of the Air Council and senior R.A.F. officers. No. 603 squadron, now re-formed, will return from camp at Woodvale, Lancs, on the previous day, and will parade for the occasion.

No. 603 Squadron is stationed at Turnhouse and is equipped with Spitfires.



"We Few, We"

WITH solemnity and pageantry the Battle of Britain Memorial Chapel was unveiled and dedicated in Westminster Abbey on July 10th. The King, accompanied by the Queen, Queen Mary, Princess Elizabeth, Princess Margaret, the Duke and Duchess of Gloucester, the Duchess of Kent and the Marquess of Carisbrooke, joined with statesmen, dignitaries of the Church, representatives of the Services, including Lord Trenchard, Lord Tedder, Lord Portal, Lord Dowding, Lord Newell and Sir John Salmon, and more than 2,500 relatives of "The Few," to pay homage. The Royal Family was received by Dr. Fisher, Archbishop of Canterbury, and Dr. Don, Dean of Westminster. A fanfare was sounded by R.A.F. trumpeters, and the procession moved to the Sacrament.

Dr. J. A. Jagoe, Chaplain-in-Chief of the R.A.F., read the lesson and the Archbishop gave the address, recalling those three months in which England, our enemies, and the world hung upon the actions of our young pilots and of their comrades who made and maintained their aircraft. "It seemed then," he said, "and it seems now, that they alone stood between us and the abyss. Our victory was made possible only by the splendour and the sacrifice which,

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MEMORIAL WINDOW: The Battle of Britain Memorial Chapel was dedicated in Westminster Abbey on July 10. On these pages are Hugh Easton's original drawings for his commemorative stained and painted window—a fitting tribute.

prised the Ensign Party—W/C. F. E. Rosier, O.B.E., D.S.O., W/C. J. Ellis, D.F.C., and W/O. A. W. Eade, A.F.C. Acting as ushers were 37 Battle of Britain fighter pilots holding between them 2 M.B.E.s, 4 D.S.O.s, 22 D.F.C.s and 6 D.F.M.s. They were drawn from units of Fighter, Coastal, Technical Training and Reserve Commands, and from the Air Ministry. Thirty other pilots formed a guard of honour outside the Abbey.

Sir. Douglas Evill

THE appointment of Air Chief Marshal Sir Douglas Evill as Director-General of the English-Speaking Union is announced.

Apprentices and Boy Entrants

AFTER selection tests at North Weald now a Combined Selection Centre, more than 850 boys aged under 17½ have just begun their R.A.F. careers as apprentices or boy entrants. Of the 857 successful applicants 421 have become aircraft apprentices, 378 boy entrants, and 58 administrative apprentices.

Company Freedom for Viscount Trenchard

THE Court of the Worshipful Company of Coachmakers and Coach Harness Makers have presented Marshal of the Royal Air Force, Viscount Trenchard, and Admiral Sir John Cunningham with the Honorary Freedom of the Company.

Britannia Shield President

MARSHAL of the Royal Air Force Lord Portal of Hungerford, who was Chief of Air Staff during the war, has accepted the presidency of the Britannia Shield Committee. He will present the shield at the conclusion of the international competitions at the Empire Pool and Sports Arena at Wembley on Friday, September 19th.

Reunions

THE first annual reunion dinner for all ex-members of 644 Squadron will be held in London on Saturday, August 23. For full details write to B. R. Tough, 468, Staines Road, Twickenham, Middx, enclosing stamped addressed envelope.

A reunion dinner for all officers and aircrew of 219 Squadron is being held in the Clarendon Hotel, Hammersmith Broadway, on September 27th, 1947. Tickets £1 rs. Will all those interested contact F/L. D. W. B. Farrar, Headquarters 12 Group, R.A.F. Newton, Notts.

R.A.F. Fund Representatives

THE number of honorary area and county representatives appointed by the R.A.F. Benevolent Fund throughout the country has now passed fifty. Their appointment is part of a scheme inaugurated last year by the Fund for the strengthening of the administrative and executive organization to facilitate assistance and appeals generally by keeping in closer touch with ex-members of the R.A.F. and W.A.A.F. and their dependants. It is intended to appoint a representative for every county.

"617" for the New World

A NON-STOP crossing of the Atlantic will be made this month by 16 Lincolns of No. 617 Squadron, Bomber Command, on the first stage of a training and good will mission to Canada and the United States. They will take off from Binbrook, Lincolnshire, on the evening of Tuesday, July 22nd, and will fly through the night to reach Gander in Newfoundland the following morning. Although formed as late as 1943, No. 617 is used to making R.A.F. history—the breaching of the Mohne and Eder dams, the great radar "spoof" of D-day and, with No. 9 Squadron, the sinking of the Tirpitz.

The leader of this forthcoming mission is G/C. W. J. P. Thomson, D.F.C., and the squadron commander is W/C. G. D. Milne, D.F.C., who spent five years as a prisoner-of-war, including a long spell in Stalag Luft III. Both the flight commanders, S/L. C. K. Saxelby, D.F.C., and S/L. A. G. Lang, D.F.C., were also in Stalag at the same time as the Wing Commander.

The 2,000-mile flight to Gander will be the longest hop the squadron will make, but formation flights of more than a thousand miles will be undertaken in the crossings of the United States. The squadron will arrive at Washington on July 28th and take part in a mass fly-past with the U.S.A.A.F. over the skyscrapers of New York on the occasion of Air Force Day. Subsequently, the Lincolns will go on to Detroit, Salina, Sacramento, Los Angeles, Fort Worth (Texas), and Montgomery (Alabama). Before making a non-stop return flight across the Atlantic the squadron will take part in a Dominion exhibition to be held in Toronto, and spend altogether a week in Canada.

No. 24 (Commonwealth) Squadron

THE Air Ministry announces that authority has been given for the reorganization of No. 24 Squadron, Transport Command, R.A.F., to include representation from the R.A.A.F., R.N.Z.A.F. and S.A.A.F., and for the squadron to be renamed No. 24 (Commonwealth) Squadron. The object of the reorganization is threefold—to extend the close co-operation existing between the R.A.F. and the Dominion Air Forces; to foster the development of a common technique in air transport matters; and to provide experience of flying conditions and routes in all parts of the world, thus maintaining a nucleus of highly trained personnel in the R.A.F. and in each of the Dominion Air Forces represented in the Squadron. In order that aircrews are conversant with the routes over which they may be required

py Few...."

by a narrow margin, denied hostile access across the channel to our shores, and preserved this bastion of freedom."

Having been escorted to the Memorial Chapel, His Majesty ordained that "This Chapel be set aside for all time as a memorial of the men of the flying forces who gave their lives in the Battle of Britain," and called upon the Dean to perform the dedication. The memorial, in the form of a stained and painted window, the work of Hugh Easton, was unveiled by The King, who drew aside an R.A.F. ensign. The window is composed of 48 lights and extends across the entire east wall. Incorporated in the lower lights are the badges of the 63 squadrons which took part in the Battle. The most perfect quotation possible is embodied: "We Few, We Happy Few, We Band of Brothers."

The Royal Family also saw the English walnut altar, designed by Professor A. E. Richardson, R.A., with the Royal Cipher, supported by sculptured figures representing King Arthur and St. George, the work of A. F. Hardiman, R.A., the cross of silver and crystal, the two candlesticks, the two flaming candelabra, and the chapel rail—all of silver, and designed by J. Seymour Lindsay, in collaboration with Professor Richardson.

Three Battle of Britain pilots com-

Service Aviation

to fly, training flights to the various Dominions are to be part of the squadron's training programme. The establishment of the squadron is to be 28 crews, five of which will be provided by the R.A.A.F. and three by the S.A.A.F., on an exchange basis between the R.A.F. and these two Dominion Air Forces, and two by the R.N.Z.A.F. The period of service of Dominion aircrews with the squadron will be not less than a year and a half and not more than two and a half years' duration. The post of squadron commander is to be filled by each of the Dominions and the R.A.F. in turn. The squadron is to be located at R.A.F. Station, Bassingbourn, and is to be under the operational and administrative control of Headquarters, No. 46 Group, Transport Command. It will be employed primarily on special flights and the carriage of Service V.I.P.s and those Civil V.I.P.s who cannot conveniently be carried by civil aircraft.

It is of interest to recall that No. 24 Squadron is one of our oldest squadrons—older, in fact than the R.A.F. itself, for it was formed in September, 1915, more than two and a half years before the R.F.C. and the R.N.A.S. merged to form the R.A.F. In the 1914-18 war it was a fighter squadron and in the recent war a transport squadron. One of its most notable achievements was the operation of 323 shuttle flights, in unarmed Hudsons, to carry vital supplies to the beleaguered island of Malta. Later it became a V.I.P. squadron and at one time or another it flew nearly all the members of the War Cabinet. The King and Queen have also been flown by the squadron and in company with her parents Princess Elizabeth made her first flight in one of the squadron's aircraft.

Recruiting for 600 Squadron

FIGURES on the progress of recruiting to No. 600 (City of London) Squadron, Auxiliary Air Force, have



WEST RIDING AT TANGMERE: Officers of No. 609 (West Riding) Squadron, Auxiliary Air Force, at Tangmere during their summer camp. The Squadron is equipped with Mosquito night fighters.

A.A.F. SUMMER CAMPS.

Squadron	Location of Camp	Dates	Duty	Equipment	Commanding Officer	Base
500 (County of Kent)	Tangmere, Bognor Regis	August 24—September 6	Night fighter	Mosquitos	S/L Patrick Green ...	West Malling Kent.
501 (County of Gloucester)	St. Eval, Newquay.	August 17—30	Day fighter	Spitfires	S/L. T. James ...	Filton.
602 (City of Glasgow)	Woodvale, Southport	July 19—August 2	Day fighter	Spitfires	S/L. M. Robinson ...	Abbotsinch.
603 (City of Edinburgh)	Woodvale, Southport	July 5—18	Day fighter	Spitfires	S/L. G.. K. Gilroy ...	Turnhouse
607 (County of Durham)	Leuchars, Fife	July 20—August 3	Day fighter	Spitfires	S/L. J. R. Kayll ...	Ouston.
608 North Yorkshire	Thornaby, Co. Durham	August 9—23	Light bomber	Mosquitos	S/L. W. Appleby Brown, D.F.C.	Thornaby
610 (County of Cheshire)	Hooton Park, Cheshire	August 24—30	Day fighter	Spitfires	S/L. P. G. Lamb, A.F.C.	Hooton Par.
611 West Lancashire	Woodvale, Southport	August 9—17	Day fighter	Spitfires	S/L. W. J. Leather, D.F.C.	Woodvale
612 (City of Aberdeen)	Woodvale, Southport	July 12—27	Day fighter	Spitfires	S/L. R. R. Russell ...	Dyce.
613 (City of Manchester)	Horsham St. Faith, Norwich	July 27—August 9	Day fighter	Spitfires	S/L. J. S. Morton, D.F.C.	Ringway.
614 (County of Glamorgan)	Llandow, Glamorgan	August 23—September 6	Day fighter	Spitfires	S/L. W. H. Irving.	Llandow.
615 (County of Surrey)	Horsham St. Faith, Norwich	August 3—16	Light bomber	Mosquitos	S/L. R. G. Kellett, D.S.O., D.F.C.	Biggin Hill

Above is a list of Auxiliary Squadrons which have yet to go to their summer camps. The list is further of value in indicating the equipment, duty, commanding officer, and base of each unit. Camp locations have been specially chosen for their training facilities.

just been released by the R.A.F. Reserve Command. They show that though the position with regard to aircrew personnel is satisfactory, many more volunteers are needed to fill vacancies in the squadron's ground trades. So far six pilots have joined No. 600 Squadron for part-time flying duties, and five of these are officers. A further six have either been recommended for acceptance or have applied to join. At present the squadron has nine men on its ground staff, whereas more than 100 are required. A further six men who volunteered recently are, however, due to be enrolled soon. The

squadron is asking men in North London, preferably those with wartime R.A.F. experience, to come forward in their spare time as riggers, fitters, drivers, cooks, armourers, clerks, wireless operators, etc. Details can be obtained from The Adjutant, No. 600 (City of London) Squadron, A.A.F., Biggin Hill, Kent.

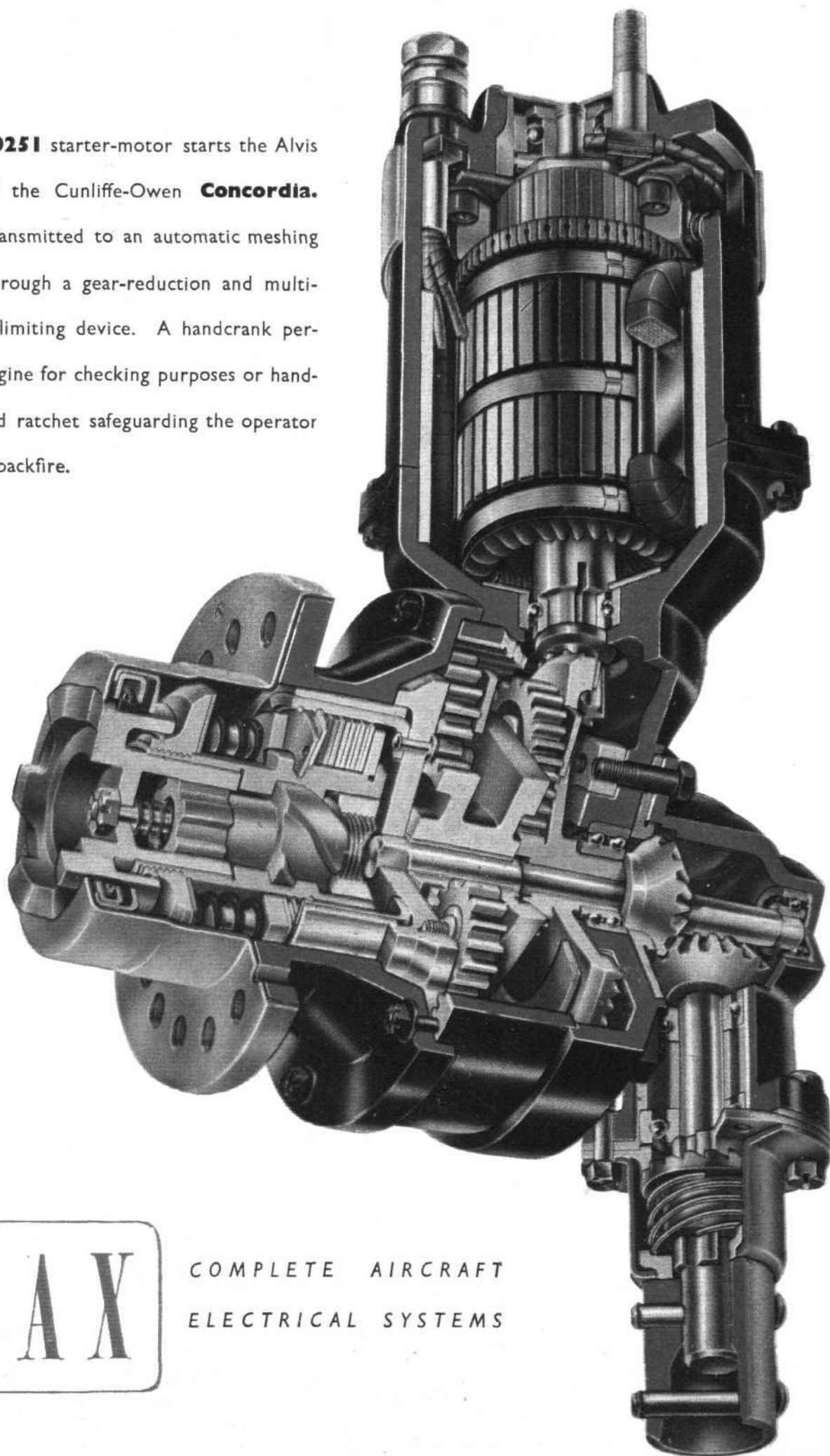
University Squadron Camps

SUMMER camps for the fourteen University Air Squadrons are being held this year for the first time since before the war. The camps, some of which are already in progress, are being held at R.A.F. stations specially chosen for their training facilities and for their suitability as holiday centres. Two Harvards are being provided at each airfield.

Oxford and Southampton University Air Squadrons are holding their camps at Chivenor, a Coastal Command station near Barnstaple, Devon. The Oxford camp, which began on June 22nd, will end on August 2nd, and the Southampton camp will be from August 15th to 31st. Shoreham has been chosen for the Cambridge and London Universities' squadrons. The London University camp began on July 1st and will end on July 31st and the Cambridge squadron, which spent a fortnight there in June, will be there again from August 6th to September 5th. Nottingham, Manchester, Birmingham, Durham and Leeds Universities' squadrons are at the Empire Air Armament School at Manby, Lincolnshire, and three camps for mixed parties from each of these squadrons are being held between July 5th and August 22nd. The four Scottish University squadrons—Aberdeen, Glasgow, Edinburgh and St. Andrews—and Queen's University, Belfast, squadron are at Perth, where four camps for mixed parties from each are being held. The first began on June 29th and the last will end on August 29th.

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