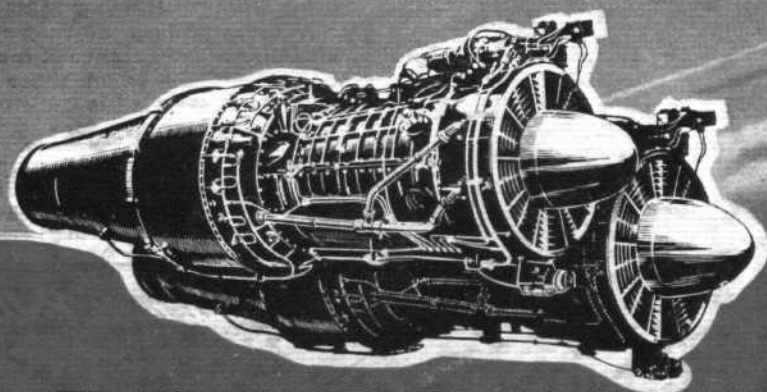
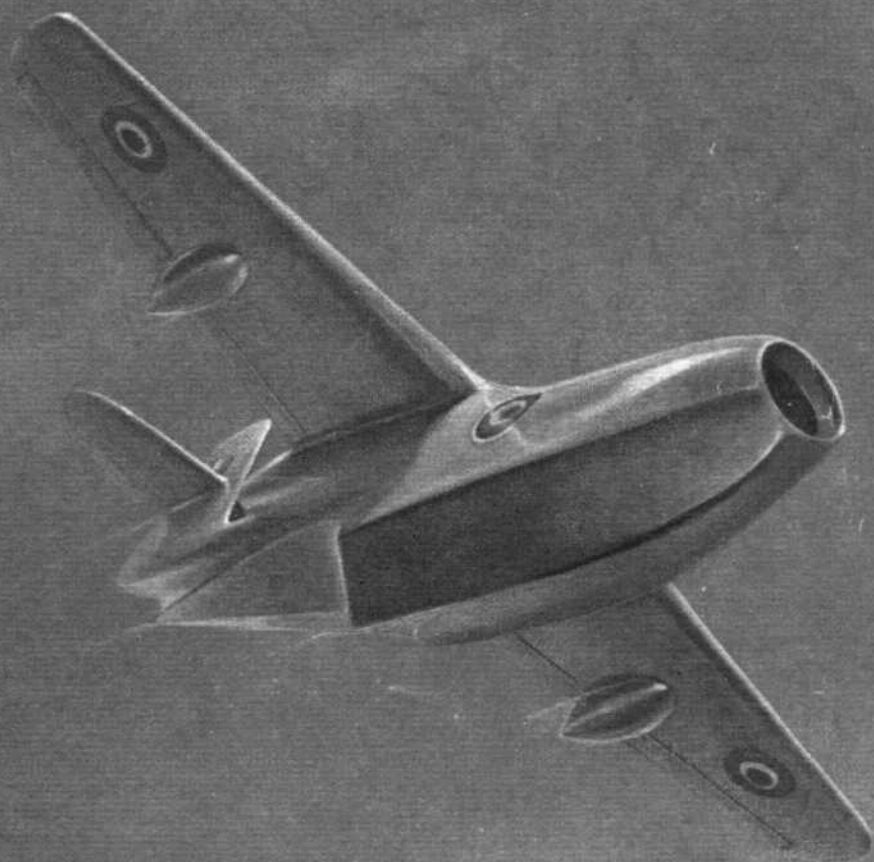


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The Outlook

Discriminatory Restrictions

THE abolition of the basic petrol ration for motorists has been heavily criticized in all quarters. The dislocation of transport, and the genuine hardships it will cause, have been pointed out; its futility has been indicated, and there is still no sign that alternative schemes suggested for the conservation of petrol will even be considered. Most of the arguments raised by car owners would be equally true of aircraft. It should be realized, in addition, that pilots in flying practice are an asset to the country, and they become more important daily as the flying hours of the Services, and now the Corporations, are gradually restricted by cost, demobilization of aircrew, the increasing shortage of ground staff, and so forth.

It appears that clubs are to be allowed a small quantity of fuel for flying instruction, and we must be thankful for the little which is better than none at all. It is to be hoped that keen members will be able to find a way of getting to their airfields, and that the aircraft petrol allowance will be sufficient to enable clubs to carry on at least at weekends. Whether the ration will be large enough to permit the occasional cross-countries and pilot navigation flights which are essential to a pilot's training remains to be seen. The cutting down of fuel allocations to charter companies, alone of commercial operators, is discriminatory and even spiteful. However, a cut in fuel consumption by some of the Corporations will, it seems, be involuntary. In this connection, the official refusal to allow a charter company to try to run, as a private venture, a useful service which a Corporation has abandoned as uneconomical, is not only a miserable dog-in-the-manger attitude but seems to indicate also a fear of being shown up.

Even engineless flying will be severely handicapped, although it has recently received plenty of official encouragement. Not only do the tug and winch launchings take fuel, but more particularly the transporting and re-

trieving of the gliders requires the aid of road vehicles.

This fuel rationing has gone too far. It is as stupid to chain up and muzzle an industry, fighting in every way to make good in the international market, as it would be to chain and muzzle dogs fighting a bear.

An Expensive Experiment

ANYONE who likes to be shocked, and who is prepared to pay the modest sum of 6s for the privilege, should obtain from H.M. Stationery Office a copy of the Sixth Report of the House of Commons Select Committee on Estimates just published. In these days of national near-bankruptcy, the fantastic figures for expenditure on civil aviation since it became nationalized disclosed in the Report are almost unbelievable.

So vast is the range of subjects covered by the Report that it is impossible to comment in one issue on more than a few of the many aspects which demand attention—very close attention. One is the appalling muddle for which the door is at present left wide open with the system of ordering now in force. If there is one thing which, more than any other, could help towards greater efficiency and more rapid improvement in aircraft, it is the closest possible collaboration between manufacturer and user. Under the present scheme there is only a complicated contact between them, and the interposition of too many departmental middlemen makes rapid and clear decisions almost impossible to achieve. Small wonder, therefore, that the word most frequently heard in relation to civil aircraft is "delay." The unfortunate manufacturer has to cope with the idiosyncrasies of two Government departments: the Ministry of Supply and the Ministry of Civil Aviation, and with the three Corporations which are the ultimate users of his product.

The Report adds nothing new to the subject of British civil transports but merely reiterates the old story of the handicaps imposed by the fact that manufacturers were busy on military types during the war, and that the Corporations consequently are having to operate com-

mercially uneconomical types of aircraft. The period during which this has been and will be necessary could have been shortened if the various Government departments could have made up their minds more quickly, and refrained from changing them afterwards.

Decision Wanted

THERE is one particular aircraft type in a different category the fate of which is at present uncertain, and the adoption of which would confer very great benefits. We refer to the Airspeed Ambassador. Orders for two prototypes were placed by the Ministry of Supply, but so far no decision seems to have been taken concerning quantity production. Obviously, the firm itself cannot be expected to finance this.

Nobody will blame the Corporation most directly concerned if, in all honesty and despite their considerable enthusiasm for the aircraft as an aircraft, it is decided that this quite outstanding British civil transport cannot conveniently be fitted into any plan for the future. In these days, when the Corporations are being almost daily bludgeoned by the Press for the fact that they are out of pocket, not one of the three can be expected to back any particular aircraft merely for the sake of the country's general prestige and export trade. All we can do is to hope that the decision is a favourable one. For the Ambassador is undoubtedly an aircraft which, if put into production and allowed to develop, would not only increase our prestige but also our business abroad. The interest shown by overseas operators in this aircraft has been very considerable—but these operators can hardly be expected to trust their future to an aircraft which does not have full backing in its country of origin.

Judging from the tone of the confidential test bulle-

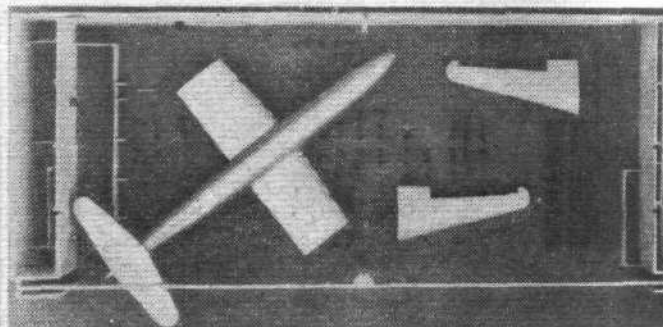
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tins which are being issued by its makers to a small circle of operators and others, the Ambassador is an unusually good aircraft. No doubt there are a few minor snags to be overcome, but its fundamental characteristics are apparently as sound as might have been expected from a designer with Mr. Hagg's background of successful experience. Indeed, a well-known and unbiased technician, after a trip in the prototype, is reputed to have delivered himself of the opinion that no other prototype in his long experience had shown so many good characteristics at such an early stage.

It would seem that we have a winner in the Ambassador; surely we cannot permit it to disappear after the very great promise of development possibilities shown by the first prototype. If we do, there is quite a possibility that in a few years, when the Ambassador is dead, operators will discover that they badly want aircraft of this class. They will then probably have to go to America for Martin 2-0-2s or Consolidated 240s.



MOVING SCENES: The 177ft long fuselage and centre section of the Bristol 167 being moved from the hangar in which they were built to the big new assembly hall; this has an area of nearly eight acres. The diagram inset shows the small clearances available. The tailplane is less than 2ft 6in from the wall, and at a later stage the nose had a maximum clearance of only 1ft 3in.



A Halifax of the 21st Heavy Bomber Wing, stationed at Bordeaux/Mérignac, over Paris.

Part I.—The Diary of a Ten-day Tour of Industrial, Scientific and Military Centres

By H. F. KING, M.B.E.

September 23rd.

THE comfort of the 8 o'clock B.E.A. Viking, ex Northolt, was fair compensation for a bleak 5 a.m. arising. A ground speed of 224 m.p.h. brought us over Le Bourget well on time and on breaking cloud at 400 feet or so we saw an R.A.F. York standing, John Bull-like, among the sleeker craft of many nations. As our bus swung out of the main gates Mr. Ernest Bevin arrived in his black, bullet-proofed car.

A taxi from the airways terminus at the Gare des Invalides brought us to the Air Attaché's office at the British Embassy, in the Rue du Faubourg St. Honoré, on time for an appointment. We were made welcome by S/L. G. G. A. Davies, D.F.C., Staff Officer to A.V.-M. R. A. George, C.B.E., M.C. The Air Vice-Marshal, who received us later, carries a treble responsibility as British Air Attaché, A.O.C. France, and head of the R.A.F. Delegation. Air Marshal Douglas Colyer, the Civil Air Attaché, was sick, and Mr. Hartshorn was absent on his business as Scientific Liaison Officer. As for ten days we were to witness France's own aeronautical effort, we were prompted to request from the Air Attaché's office some details of the aid already provided by Great Britain. France is receiving, for the use of *l'Armée de l'Air*, 242 Spitfire IXs, 238 Mosquitoes of various marks, 64 Halifax VIs, 141 Ansons, and 185 Wellingtons, in addition to a great quantity of ground equipment and armament. The French naval air arm is taking

over 48 Seafire IIIs, 13 Sunderland IIIs, 32 reconnaissance Wellingtons, and 65 Spitfire, Anson and Wellington trainers. Furthermore, to assist in the reconstruction of France's own industry, technicians from Rolls-Royce, Armstrong-Siddeley, de Havilland, Vickers, Handley Page, Bristol and Rotol are attached to the Hispano Suiza, Marcel Bloch, Voisin, Aerazur, S.N.C.A.N., S.N.C.A.S.O., and A.I.A. organizations.

AT the invitation of the French Air Ministry, the writer has lately been touring French aircraft and engine factories, research establishments and units of *l'Armée de l'Air*. The first part of the day-to-day record of his experiences is given here. He describes his reception by the French Air Minister, his visits to the S.N.E.C.M.A. and S.N.C.A.N. factories and to the O.N.E.R.A. research establishment at Chalais-Meudon.

Our conducting officers—Captains Renaud and Mouzels and Sub-Lt. Maurin now arrived to accompany us to the French Air Ministry, where we were met by M. Romain Frugier, chief of the civil cabinet of the Air Minister, Colonel Garde, who holds a post corresponding to our D.P.R., and M. Vignaud, of M. Frugier's department. All these gentlemen, except Col. Garde, were to come on tour with us and the party was to be completed by S/L. Davies. Lunch was provided at the "Maridor" (*Cercle Interallié de l'Aviation "Jean Maridor"*) in the Avenue du Président Wilson. This beautiful club was founded by the family of Jean Maridor who was killed

over England in shooting down a flying bomb after achieving great success against these missiles.

Our next call took us back to the Air Ministry, where we were received in his apartments by the Air Minister, M. André Maroselli, and where we met General Piolet, Chief of the Air Staff, General Domino, G.O.C. 2nd Air Region, and other high-ranking officers, including Mlle.

A View of France

Maryse Bastie, head of the *Force Feminine Aérienne*, whose achievement is equalled by her charm. From the balcony we overlooked the airfield used by communication aircraft, among them Ju 52s, production of which has been continued in France.

For dinner we returned to the Maridor, where General Domino received us on behalf of General Piollet. Here we talked with Commandant Troussier, of the Deuxième Bureau (Intelligence), whose post corresponds to our A.C.A.S. (I). An electricity cut failed dismally to mar an evening of great cordiality.

February 24th.

OUR visit this morning was to the Kellermann plant of the Société Nationale d'Etudes et de Construction de Moteurs d'Aviation S.N.E.C.M.A. (or "Sneckma," for short) on the outskirts of Paris. This organization succeeds the Gnôme-et-Rhône concern, which was nationalized two years ago, and is directed by M. Marcel Weill. Our guides included M. Racine, Chief Project Engineer, and M. Nojac, Technical Works Director.

The configuration of the plant, due to space limitations, has greatly increased manufacturing difficulties; as a member of the organization put it, some of the departments are "more like gangways than workshops." Nevertheless, production has been so planned as to allow a monthly output of forty 14R engines of 1,700 h.p., forty B.M.W.132 (700 h.p.), and the overhaul and testing of various units of 70-700 h.p. The Research Department has been busy during the past three years on both piston engines and gas turbines, and we were shown examples of the new 14R1000 radial and of the Atar 101 turbo jet, which the plant will manufacture. The "1000" series is distinguished from earlier 14R engines in having a one-piece cylinder, stiffer master rod, and detail refinements.

Single-cylinder units have been run successfully and powers of 2,000-2,500 h.p. are expected. We saw a Ratier contra-rotating airscrew for the new engine and watched the testing of an earlier 14R with a water-methanol injection system which may eventually be applied to the "1000." A pair of the new engines, driving contra-rotating airscrews, should be on test in a LeO45 by next June, and installations in new types of transports are foreseen. When the B.M.W.132 passes out of production in 2-3 months the "1000" will be the only—and probably the last—large piston engine to be produced in the Kellermann works. In one of the shops, however, we saw the mock-up, complete with cowling, of a 36-cylinder unit, designated 36T,



Cowling of the S.N.E.C.M.A. 14R. The new "1000" series will use a one-piece cylinder and have provision for a counter-rotating airscrew.



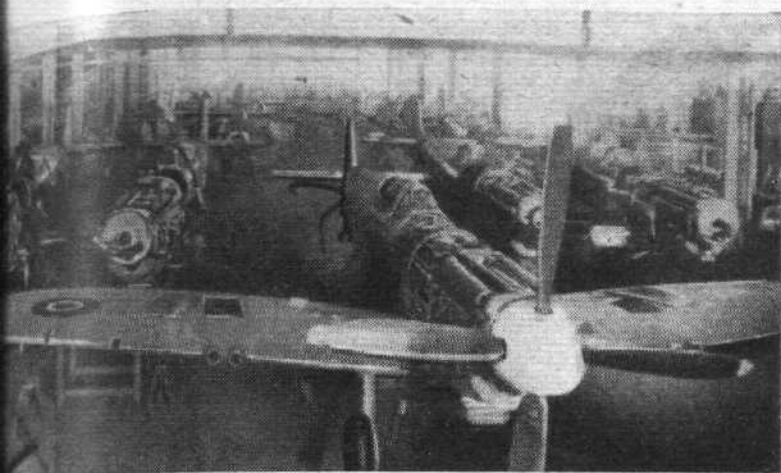
Plans are in hand for the production of 1,500 of these three-seater Norécrins. The price is about £2,300.

of 3,000-4,000 h.p. Development is understood to have been abandoned, despite the current need for large engines in this category. Possibly it is felt that the Arsenal 24H liquid-cooled unit and, later, airscrew turbines of S.N.E.C.M.A. design, will meet France's needs in this respect.

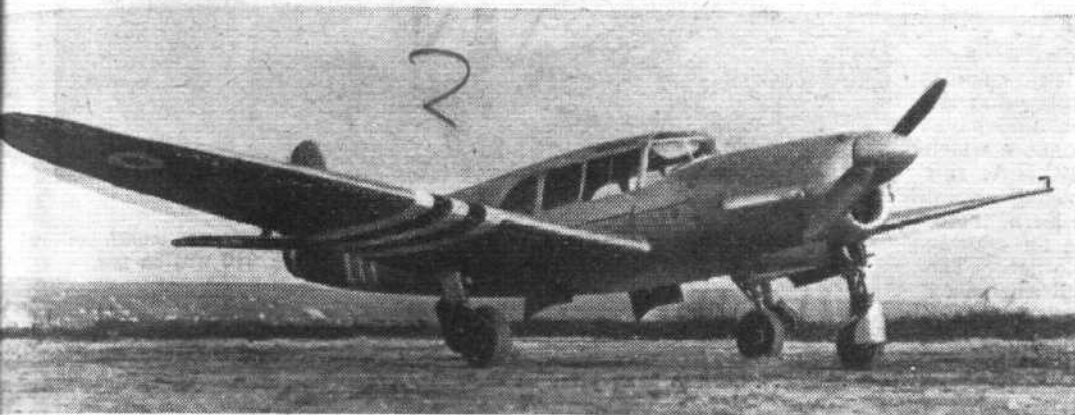
The Atar 101, our inspection of which was all too brief, is basically of German (B.M.W.) design, originating—hence the name—in the Ateliers Technique Aéronautique Richenbach, near Lake Constance. In France the technical development of the unit is being studied by Voisin, S.N.E.C.M.A.'s responsibilities being mainly the manufacturing and testing. A hundred Germans are employed in France on Atar development. The prototype engine should be running on the bench at Melun within a



A promising new feeder-liner is the Noreazur (Nord 2100), the second prototype of which will have Béarn engines.



Spitfires of l'Armée de l'Air in the repair shops of S.N.C.A.N. at Les Mureaux, near Paris.



The four-seater Noralpha is basically the German Me 208. Production of a batch of two hundred is finishing.

few weeks, and the first units of an order of fifty should then be coming through the Kellermann shops. A larger order is expected and after six months' production should be at the rate of fifteen a month. The Atar, after development for 5,000 lb s.t. (the initial rating will be 4,000 lb) may become a strong competitor of the Hispano-built Nene and comparative trials of the two units will decide which shall be installed in new types of fighters, bombers, attack machines, and, later, transports.

No specification of the Atar was available, but one gathered that the weight is about 1,760 lb, the diameter 39in, and the r.p.m. for the 4,000 lb rating, 7,000. The unit features a seven-stage compressor, an annular combustion chamber, nineteen burners and hollow turbine blades formed from Sirius sheet. As on the German turbo jets, there is an adjustable cone in the tail pipe.

In conversation with Colonel Badré, who is in charge of all flight testing for S.N.E.C.M.A. (at Villaroche), we learned that a Marauder is being adapted by Marcel Dassault as a flying test bed for the Atar and that the Rateau A.65 will be similarly air-tested. Rights for the Rateau are held by S.N.E.C.M.A., who regard it as a more promising unit than the Atar, though in need of longer development. The tie with Rateau is, in

fact, much closer than this, for Rateau engineers form the nucleus of the S.N.E.C.M.A. turbine staff, now engaged on original designs for straight-jet and airscrew-turbine units.

S.N.E.C.M.A. is the only nationalized organization for the production of aero-engines and embraces Renault and Regnier. Renault are continuing at Billancourt with their 12S unit and Regnier, at Le Mans, with the 4L, 4J, 4K and 4P series. Components for the 12S and 4P are made in annex shops of the Kellermann works, together with miscellaneous components, e.g., separators and compressors, some of which are on sub-contract.

Our tour of the shops completed, we were given some figures relative to labour and equipment. Of 2,090 workers, 530 are engaged on indirect production work and of 1,472 machine tools, 1,213 (for production work) average 8½ years in age, and 250 (for tooling) average 10 years.

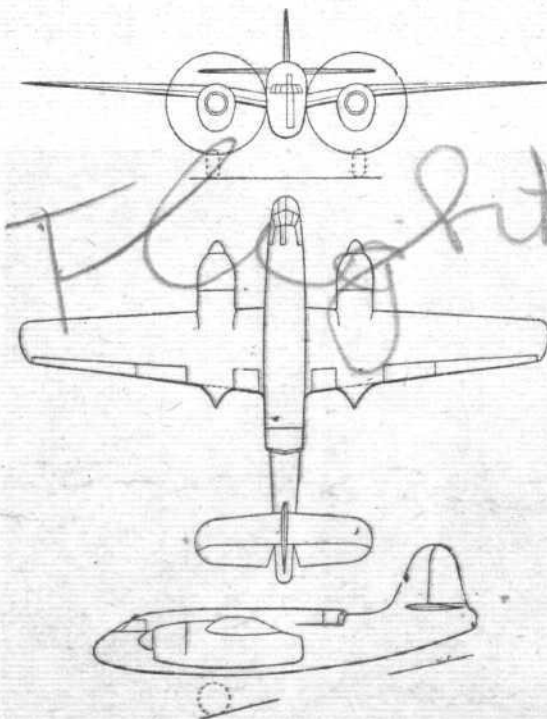
On leaving S.N.E.C.M.A. we drove again to the Maridor, where French journalists waited to entertain us. They included M. Fevrier, of *L'Aerophile*, M. Roche d'Estrez, of *L'Air*, and M. Cortier, Air Correspondent of *Liberation*. Time was all too short to talk shop with our French colleagues in view of an appointment at the Mureaux plant of the Société Nationale de Constructions Aéronautiques du Nord (S.N.C.A.N.) in the Seine Valley, N.W. of Paris. Here, on the steps of the fine executive block, waited M. Gateau, the Sales Manager, who wel-

comed us in impeccable English. In company with M. Abrassard, Works Director, M. Vellutini, Production Manager, and M. Péan, in charge of the Flight Testing section, he told and showed us something of the history and activities of his organization.

Just prior to the war the output from the Mureaux plant was thirty Potez 63s a month. A German bombing raid in June, 1940, caused no appreciable damage but major productive activity was suspended during the occupation, the Germans being content with Me 108 airframes and Me 109 and Henschel spares. Five Allied raids, however, did widespread damage, and on March 3rd, 1944, the R.A.F. scored 1,200 hits, eighty of which were on the shops, the remainder being on the airfield. On the day of liberation the plant was 70 per cent destroyed.

These facts are given not solely for their historical interest but as an indication, in conjunction with the following notes on current activity, of the tremendous reconstructional effort put in hand when freedom came. In a month or two it was possible to resume Me 108 production for the French Air Force. Later a Renault 6Q was substituted for the Argus and the designation changed to Nord 1000. At present the monthly output is about twenty-five aircraft—principally Norécrins and Noralphas. The repair of Spitfires is also in hand, and parts are made for prototypes, two of which we were later privileged to see.

The Noralpha, or Nord 1100, is



General arrangement of the Nord 1500 (Noreclair) deck-landing torpedo dive bomber. A later version will have a Nene in the fuselage.

A View of France

a four-seat liaison or communication aircraft differing little from the Me 208, an excellent type which the Germans themselves were never able to use. A contract for 200, for the French Air Force, is being completed, and a few, by special permission, have been diverted to private owners. British visitors to Continental meetings will know the Noralpha as an elegant four-seater, with nose-wheel undercarriage.

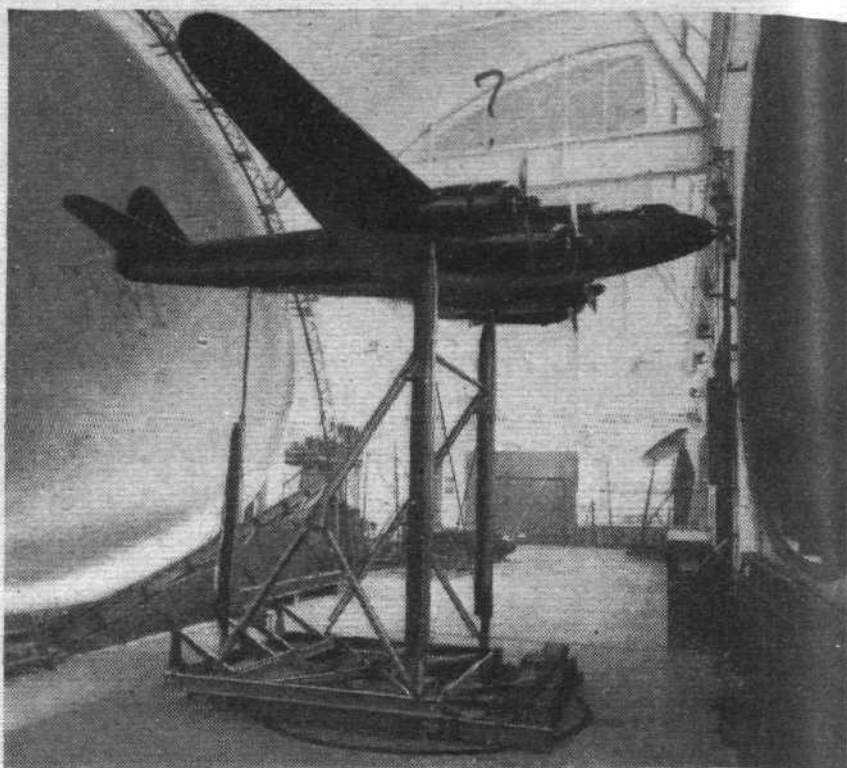
Smaller, and much less costly, the three-seat Norécrin, or Nord 1200, is an original design, planned for large-scale production. Work has been started on the first series of fifty, and production of 1,500 will be undertaken. By next month Norécrins will be coming off the line at the rate of one a day and it is hoped to double that figure by December. The price is 1,165,000 francs (say £2,300). With a Regnier 145 h.p. engine (one saw the first machine to be fitted with this unit) the cruising speed, at 65 per cent power, is 143 m.p.h. Construction is of metal throughout, major components being pressed.

White, in the darkness of its hangar, we came upon the Nord 1500, or Noreclair, twin-engined deck-landing torpedo dive-bomber displayed at the last Paris Salon. The thin wing of this naval prototype suggests a potential performance which could not be realized by the S.N.E.C.M.A. 14R 258, with which it has now completed several hours' flying. One was interested to learn, therefore, that a project exists for using an entirely new fuselage, housing a Nene turbo jet. The Nene would be cut in for take-off and emergency combat performance and with all three power units a speed of about 480 m.p.h. should be attained.

Also in the flight-test hangar was the very new Noreazur (Nord 2100) feeder liner which has completed 15 hours' flying with twin Potez engines. A second prototype, with Béarns, has not yet flown.

Back in Paris, at the dignified Aéro-Club de France (President, M. Lioré) we met—again, all too briefly—some leading aeronautical figures, including Messrs. Morane, Bloch, Pissavy and Valensi, who told us something of the present organization of their country's aircraft industry. About 20 per cent of the airframe, 30 per cent of the engine, and all the accessory business remains in private hands.

Cocktails awaited in the offices of *L'Air*, which up-to-the-minute publication later gave us dinner at the Maison de la Résistance Alliée. Here we were able to discuss Radlett and other matters of current interest with M. Charriou, the technical editor, and make the acquaintance of General Chassin, Air Force representative in the Ministry of National Defence, and editor of *Forces Aériennes Françaises*. The General is further noted as the man whose Goeland caused the sirens to sound in London on the first day of the war, and as the



A large-scale model of the Bloch 161 is shown in the Chalais-Meudon tunnel, but at the time of "Flight's" visit a model of the new SE2010 was on test.

recipient, on behalf of his country, of the Britannia Trophy. He has very advanced views on air power and we were to enjoy his company later in the trip.

February 25th

THE morning of this day was devoted to a visit to the Chalais-Meudon research establishment of O.N.E.R.A. (Office National d'Etudes et de Recherches Aéronautique). Many readers will already be familiar with the great wind tunnel—the "Grande Soufflerie"—of this establishment, which has been under O.N.E.R.A. control since that organization came into being last year. The tunnel is old (it was designed before 1932) but Professor Rebuffet, in charge of all O.N.E.R.A. tunnels, emphasized that it is still doing valuable work, particularly on high-lift devices. As he put it, it is a paradox that as aircraft travel faster there is an increasing need for a good low-speed tunnel. Some interesting trials have been made with various high-lift schemes on swept-back surfaces, but at the time of our visit a 1:4.5 scale model of the SE2010 transatlantic air liner was in place, complete with "pilot" to move the controls. A fortnight previously half

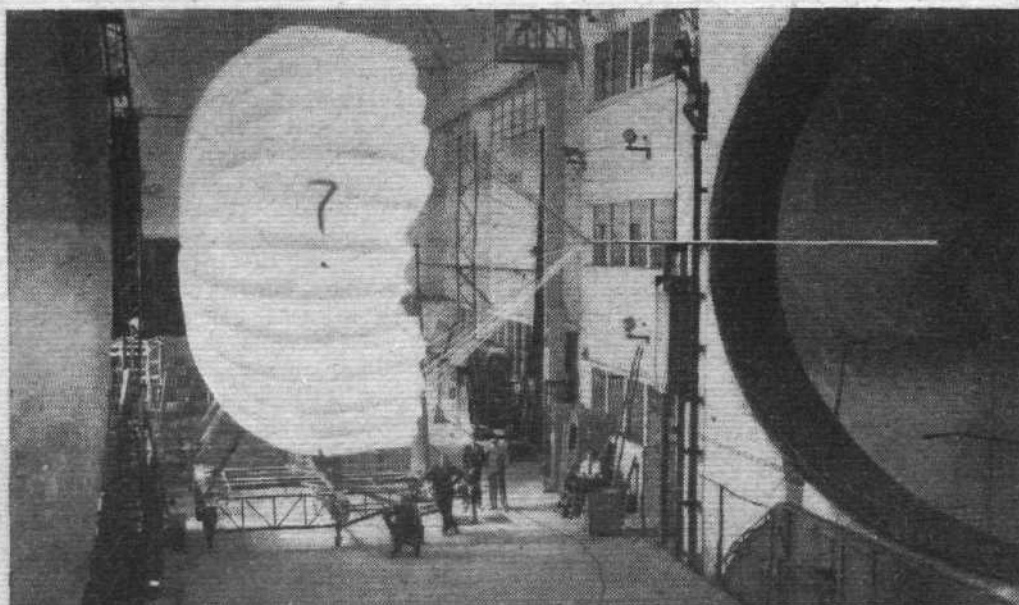
the tail unit of the full-scale aircraft (the complete empennage being too large) had been tested. Other experiments had lately been completed with French and British parachutes.

Under the direction of M. Girerd, new tunnels are being built at Chalais-Meudon for spinning, sonic and supersonic studies. We were to see more of the work of O.N.E.R.A. later in our trip.

LORD NATHAN RETURNS

THE Minister of Civil Aviation returned to this country on Monday, October 6th, from his tour of Australia and the Far East, for which he set off with Lady Nathan and his son the Hon. Roger Nathan on August 1st.

With the exception of several flights in Australia in Mr. Drakeford's own aircraft, the entire route from the U.K. through Cairo to Karachi and Singapore to Australia, and returning through Hong Kong, Nanking, Bangkok, Ceylon, Karachi and Cairo to the U.K. was flown in a Lancastrian lent by B.O.A.C.



Tests of new French and British parachutes have lately been conducted in the "Grande Soufflerie" at Chalais Meudon, as seen here.

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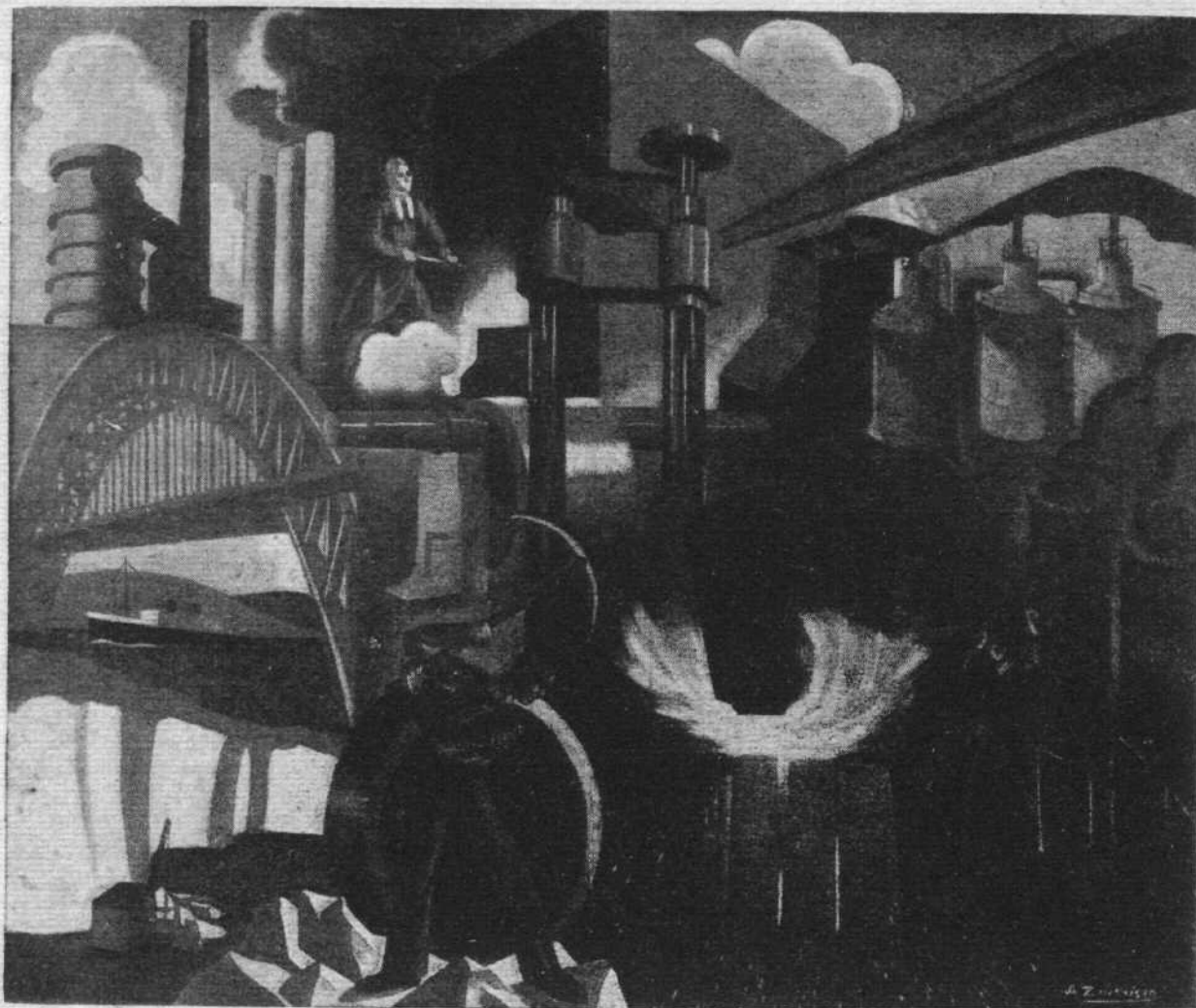


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about 35,000 citizens of our Nation, each of whom, with his dependents, has a vital stake in the prosperity of our undertakings. The whole enterprise is an intricate relationship of human personalities and qualities. It is an integration of the varied combinations of administrative faculties, technical attributes and manual skill. Nature does not bestow the same talents on each of us, but within the organisation there is ample scope for the development of initiative and aptitude. Without distinction, every encouragement and help is given to those who possess the intrinsic endowments of character, diligence and intelligence. Social progress depends upon a just appreciation of widely differing human characteristics, freely co-operating to achieve a common purpose,



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Aviation a Political Football : Sales Value of World's Records : Preparing the Way for the DC-9

By "KIBITZER"

NOT long ago one of the government officials in civil aviation over here made some rather startling statements regarding the unsound condition of the British civil aircraft programme. Almost the next day another member of the American aircraft trade came out with a contradictory report. To a visitor to the United States, and probably to the layman over here, such wide discrepancies are very puzzling, and it might be as well to try to give some sort of explanation for them. They are, unfortunately, nearly always political both in conception and design.

Aviation is one of the major political footballs here. It is a subject which has always held the imagination of the public and is, therefore, a valuable asset to any public figure who wishes to put over a point of view. Aviation can be made to serve many political masters. It can help the progress of one or other of the political parties in their election campaigns, or it can be used to block their opponent's path. It can get publicity for politicians who may need it—or think they need it—and past mistakes can be hauled out of the skeleton cupboard and be rattled in front of the voting public.

It is all a great pity, but that's the way it is here, and so far as domestic aviation goes it is their affair. Only when British aviation is used as the bogey are we entitled to comment on what is said. For an authority to state before one of the many aviation committees in existence here that, in his opinion, our civil types have "had it" for the next six years, and that no adequate competition from the United Kingdom can be expected, makes one very angry. But when the next witness says that in his opinion our lead in jet and turbo-aircrew engines will make us dangerous competitors in three or four years' time our wrath is quenched and we look smug again. All very silly; and perhaps avoidable if people would give a little thought to the extreme importance of British-American understanding. Good international relationships are largely founded on mutual esteem, and we need good relationships right now. Badly.

By the same token the aviation press over here—some sections of it anyway—could give such matters a second thought. After a rather stupid article in one of the weekly papers saying, in effect, that most of the European lines sacrificed operating efficiency for the frills of passenger service, I was glad to see some immediate and adequate replies from the airlines mentioned. B.O.A.C. was merely included in an "efficiency" list (fairly far down, be it said), and it is a pity that the staff of the paper in question didn't consult some of the actual B.O.A.C. figures for hours flown per aircraft and passengers carried. For some months now they have had a higher aircraft utilization than any other Atlantic service, and, as recorded in *Flight* of September 25th, carried more passengers per flight during the rush of June and July than anyone else did. For June the figure was 39.6 passengers to their nearest competitor's 37, and for July it was 33.1 to the other's 32.7.

THE U.S. Navy has put up a wonderful effort in their capture of the world's speed record with the Douglas D-558. It will be some time before either the U.S. Army or the British can get it back again. In the latest record of 650.6 m.p.h. the speeds for the four qualifying runs were 652.642, 649.358, 652.579 and 648.730, but at the time of writing, the outside air temperature ruling at the time has not been published, so that the Mach number achieved is unknown. I should imagine that this particular machine has probably been flown up

to about .85 and that any higher speeds will be approached very gradually. This record does, however, eliminate any possibility of being able to get the record back with a purely military aircraft. Prior to the war the speed record was nearly always obtained by a special machine—which was itself the forerunner of a new fighter. We are apparently back in that stage again and, so far as America is concerned, I should think that it will be a long time before a military fighter—as opposed to a research aircraft—regains the record.

The U.S. Army, however, can congratulate itself on two other international records—the "closed course" record and the "triangular course" record. Both of these were captured by their long-distance B-29, the *Pacusan Dreamboat*, which took the former from the French with a distance of 10,000 km at an average speed of 277 m.p.h., and the latter from the Italians with a distance of 8,954.8 miles. A considerable number of world records have now been captured in this country, and the American export trade is using this fact to the utmost in their sales drive, particularly in South America. One hopes that every endeavour will be made to try to recapture the long-distance record for Britain, and it might be worth while to make the terminal point a town in Brazil or the Argentine, rather than in one of the Dominions. It would be good for trade.

AS Douglas announce the delivery of the 1,242nd and last DC-4, they also have sent out data on the proposed DC-9. The method employed in introducing this type may well be that which will have to be adopted in the future. The specification has been circulated to all the operators, and their detailed reactions are awaited. It is quite obvious that no manufacturer can possibly afford to produce an aircraft of over 25,000 lb on the off-chance that he can procure orders. He must be more certain of a market before he can go to the enormous expense of designing, building and test-flying a prototype. If, on the other hand, he can issue an attractive specification and on the basis of that, and his past reputation, obtain firm orders (subject to fulfilment), then he can go ahead on a new type. And the specification of the DC-9 sounds attractive enough to make the operators very interested indeed.

At the risk of repeating figures that may well have been widely published in England already, the following is the specification of the DC-9, which is to be a tricycle-undercarriage aircraft powered by two Wright Cyclone 1820 engines:—

All-up weight	30,000lb.
Landing weight	29,000lb.
Disposable Load	10,406lb.
Capacity	28 passengers + 2,380lb.
Range	1,000 miles at 10,000ft.
Cruising speed	264 m.p.h. at 17,800ft.
Cruising speed	257 m.p.h. at 11,600ft.
Take-off run at 30,000lb	3,640ft.
Stalling Speed with 55 deg. flap	73 m.p.h.
Single-engine ceiling	15,800ft.
Pressurization available if required.	
Reversible-pitch aircrews.	
Water injection if required.	
Price (Approximately)	\$280,000 to \$285,000.

All of which adds up to a nice-sized aircraft, with the type of load and performance that is ideal for routes that cannot handle machines as big as the DC-4. Whether Douglas will build it remains to be seen, but my feeling is that a machine of this size and type will always be required, and it only remains for them to make something as good as the DC-3 for it to be a very successful project.

The Flying Boat

Some Problems in Fitting it into the Transport Picture : The Question of Bases

By CAPTAIN DAVID BRICE, A.R.Ae.S.

LOSING causes have always had their champions, and flying boats are no exception. Right now Capt. Neville Stack and *Flight* are raising the flag, but in doing so are rather obscuring many of the almost insuperable problems which confront this type of aerial carriage.

May I, as one who has spent quite a few years flying marine craft of all shapes and sizes, from Boeing A314s and "G" boats to Catalinas and Calcuttas, point out just a few of the snags?

To begin with, you can always build an airfield where you want to, or, in other words, where the traffic demands one. It has yet to be proved that you can construct an artificial marine base. Thus, the flying boat has always followed the lakes and rivers; and the passengers have followed in buses and trains.

This fact eliminates most of the capital cities of the world from convenient flying-boat services. The landplane, on the other hand, is amply supplied with airfields.

Apart from this, there are very few good flying-boat bases in the world. No greater fallacy exists in aviation than the one which insists that, since the greater portion of the world is covered by water, the flying boat has an infinite number of alighting areas to choose from. To begin with, you cannot land a large flying boat in the open sea, except on the few occasions when the sea is calm; and, believe me, the open sea is seldom calm.

Those who really believe that the mammoth flying boat will be able to ignore the swell and twelve-foot seas should watch a 1,000-ton ship coping with such conditions at a steady ten knots, and then visualize a 200-ton aluminium flying boat doing the same thing at 100 knots. No flying boat could stand it.

As an example of the sort of sea with which a normal flying boat can safely contend, the 87,000 lb Boeing A314 had a swell limitation of about 3½ to 4ft, and Freetown (which was adequate for Catalinas and Sunderlands) was banned to Boeings because the alighting area was in a river, which was open to the sea and consequently had frequent swells.

Sea Unusable

The sea, therefore, must be excluded from all considerations of all-year-round flying-boat bases, except in a very few cases such as Athens, Singapore and Southampton. This leaves us the rivers, the lakes and the harbours.

For the large boat the harbour is obviously "out." As for the rivers, in most cases they would be quite inadequate because they seldom possess the necessary width in which to turn round. True, reversible airscrews will greatly increase the manoeuvrability of flying boats, but you still can't just back up, like a goods train, because you can't see where you're going. Similarly, turns in a narrow river would not be practical. And apart from this, the bow wave put up by a 200-ton boat would drown all the local inhabitants who were unfortunate enough to be living on the banks.

This leaves us the lakes and the inland or sheltered waterways, such as Rio de Janeiro or Kasfereit, on the Suez Canal.

Just to prove how many headaches this would give an airline operator, let us look at the suitable bases from here to Singapore. Southampton is O.K. except in strong northerly or southerly winds, and then Southampton Water might do, provided a south-westerly swell wasn't running. Marseilles (Lake Marignane) is O.K. Augusta (Sicily) is O.K. Rod-el-Farag, at Cairo, is on the Nile and would be too narrow, but Kasfereit, sixty miles away, would be all right.

The next good base is Habbaniya, in the Iraq desert, which is not very near anywhere. Basra is no good, since it is on a river, but Bahrein would be all right. In India things are bad. Korangi Creek at Karachi might just do, but elsewhere there is not much. The Hooghly river, at Calcutta, would not be suitable, but Bangalore, in Southern India, has a good inland lake, and Madras is a "possible." Any passengers, then, on a mammoth flying boat to India would have a lot of connecting travel to do, because I've listed *all* the bases suitable for a 200-ton flying boat for all the year-round operation.

East of India, the Irrawaddy, at Rangoon, might just do. Akyab, farther north is a possible, and Penang and Singapore would be all right. Bangkok would be no good.

At first glance it seems like a lot of bases; until you learn that these are the *only* bases. No others exist. So you're a bit short on alternatives, and

very short of bases near to where people want to go.

Take the North Atlantic. Foynes is all right; Botwood and Stephenville are all right. New York and Baltimore are good, at least in the summer. In the winter everywhere north of New York is iced-up, including New York on many occasions. In the hey-day of the boat, when it was the only aerial machine operating across the Atlantic, they stopped the service in October and re-opened in May.

No Facilities

All these bases, except Baltimore, have another very serious snag. There's nobody there! So an operator who reverted to boats would have to provide launches, dock facilities, personnel, control, housing, engineering facilities, night-flying equipment, radio equipment and communications.

Compared with a £12 12s landing at London Airport for a more fortunate York, with S.B.A., control, tarmac, telephones, radio, met. and refuelling bowlers all thrown in, the boat operator is going to find life expensive.

True, if there *were* enough airlines operating boats, they could all share the expense, or at least make it worth the while of the appropriate State to provide the facilities. But there aren't any airlines, except B.O.A.C., D.N.L. and possibly Air France, who are operating boats, or even intend to, so it is an expensive hobby for an operator to indulge in wishful thinking, and modify his balance sheet with overheads borne by fictitious competitors.

The plain fact is that B.O.A.C. has, almost entirely unaided, to provide the facilities for its flying-boat operations.

Then there is the problem of blind approaches. No successful blind-approach system is in operation which permits a flying boat to land safely in ¼-mile visibility and 100ft ceiling. With S.B.A., SCS.51, G.C.A. or I.L.S., an ex-

THE attitude of this journal towards the flying boat is well known, but we are always willing to listen—and give space—to "the other fellow's point of view."

Capt. Brice paints a gloomy picture of the handicaps suffered by the flying boat. His logic, however, does not always appear faultless. For instance, the flying boat has, as he admits, done good work in spite of the absence of proper bases. The landplane could not have done that. And why assume that the operator must always continue to foot the bill for marine bases?

There are other points which can be challenged, but doubtless our readers will not need to have them pointed out.

The Flying Boat

perienced landplane pilot can land with safety under these conditions.

The snag is that any device on the water is an obstruction, and whilst a landplane can safely run over a runway light or a guiding line, a flying boat might be badly damaged if it hit a similar obstacle moored on the water. Remember also that the points of contact of a landplane are few, and that oleo legs lift the fuselage clear of most obstructions. A flying-boat hull provides a lot of area both below and directly above the water. Anyone who could construct a line on the water which pilots could follow in bad visibility would be doing B.O.A.C. a great favour.

So it's not so easy as the uninitiated and the fanatics would have us believe. To talk of indiscriminate landings on any likely water as a suitable alternative is crazy.

Many's the time when, with some snag developing in a flying boat, I've thought enviously of the luck landplane pilot with alternatives all over the place, and me with none at all except a piece of water near the coast, for which I

have no large-scale chart, and which is probably stiff with submerged rocks and sandbanks, and where, even if I effected a safe landing, I would have to swim ashore for assistance, walk fifty miles to the nearest telephone, and then find that there was no road or rail communication, and the nearest supply of 100-octane fuel was 200 miles away in a bowser on wheels.

No one can deny that flying boats have done a useful job, least of all I, because I helped to do some, or that they are doing good work now and will continue to do so. But anyone who seriously contends that boats will compete on equal terms with landplanes of the future has never sat at Poole because the sea was too rough; or at Baltimore because of a sea fog; or at Cairo waiting for the mist to lift; or in some puddle in India because the monsoon closed-in on Gwalior; or has had to put up with any other of the innumerable snags which inconvenience flying boats, whilst the landplanes gaily circle the world with alternatives, blind-approach aids and smooth runways galore.

And don't tell me that passengers prefer flying boats; an awful lot of people just love a sailing ship, but that doesn't bother the Cunard Shipping Company!

Televised Testing

AS an elaboration of the current system of employing automatic ciné cameras to record the readings given by test instruments during an aircraft's flight trials, a system has been developed for the U.S. Navy which is known as television telemetering. Essentially it consists of what may be termed a television theatre in the aircraft together with a television transmitter and, on the ground, a mobile television receiving unit.

Although in giving notice of this development the United States journal *Electronics* does not specify the type of aircraft in which the equipment was fitted, it would appear that the machine must have been reasonably roomy.

The equipment transmitted and received 54 channels of data. In the aircraft dial-type instruments, rows of small galvanometer light-beam indicators and breakage indicator lights formed the television theatre. The dial instruments included an air speed indicator, altimeter, normal accelerometer, longitudinal accelerometer, pitch-rate indicator, and angle of dive indicator. Forty-eight light beams indicated pressures, strains, positions of control surfaces, voltages, currents and rates of roll, pitch and yaw. Fifteen breakage indicator lights warned of possible structural failures in flight.

The strongly-lighted panel was faced by a 23-valve television camera/transmitter. A complete image of the panel showing all movements of its dial hands and light-beams was picked up by a Farnsworth image-dissector tube for transmission to the ground station.

The television theatre and camera transmitter units, were

locked together in a sealed aluminium pressure-box, inside which a temperature control system operated to keep the temperature as constant as possible while the outside reading was varying between 75 and -67 deg. F. The pressure box was designed to operate at an altitude of 60,000ft.

The transmitting antenna of crossed di-pole type had four half-wave radiators phased to give a spherical field and projected straight back from the tail of the fuselage. In this position it was relatively unaffected by shadows caused by the aircraft in a dive or spin. The average power of the transmitter was 25 watts and the signal radiated had an approximate limit of 25 miles.

The receiving station was mounted on a 30-cwt. truck. This vehicle contained a receiver which provided a 380-line picture, a recording unit to film all transmissions, and equipment for 2-way phase radio communications with aircraft in flight. Folding antennae were mounted on the roof.

The only advantage that this seemingly elaborate system would appear to have over the normally used automatic ciné recording system is that in the event of a complete break-up of the aircraft and possible destruction of the film recording, the television record made at the ground station would still be available. Certainly an extremely useful advantage. Unfortunately, it seems at the moment (although this may well be a transient phase) that aircraft which are likely to suffer complete disintegration are the very small, very high speed types in which space is at a premium, whereas the larger types are not so likely to suffer total loss in this sense.

BRITISH AIR RECORDS

FOUR national aircraft records established at the Lympe flying meeting on August 31st were confirmed last week by the Royal Aero Club. They are:—

100 kilometres closed circuit record for aircraft of any power. G.C. John Cunningham, Chief Test Pilot of the de Havilland Aircraft Company, who averaged 496.88 m.p.h. (799.644 k.p.h.) in a D.H. Vampire, powered by a D.H. Goblin engine;

100 kilometres closed circuit record for aircraft with an engine of 6.5 to 9 litres. Mr. Pat Fillingham, de Havilland test pilot, who averaged 178.33 m.p.h. (286.97 k.p.h.) in a T.K.2 fitted with a D.H. Gipsy Major engine of 6.124 litres;

100 kilometres closed circuit record for aircraft with an engine of 4 to 6.5 litres. Mr. Pat Fillingham, for the same flight;

100 kilometres closed circuit record for aircraft with an engine of 2 to 4 litres. S.L. R. L. Porteous, a Derby Flying Club instructor, who averaged 123.72 m.p.h. (199.115 k.p.h.) in a Chilton monoplane fitted with a Train engine of 2.005 litres.

Three single-seat and three multi-seat national glider records passed by the British Gliding Association were also confirmed by the Royal Aero Club. The single-seat records were:—

Distance. C. J. Wingfield, in an Eon Olympia from Sheppard Field, Texas, to Buffalo Lake, 216 statute miles (347.6 km), on July 13th last;

Out-and-return. C. J. Wingfield, in an Eon Olympia from Sheppard Field, Texas, to Quanah, Texas, and return, 147.2 statute miles (236.9 km), on July 16th last.

Goal flight. P. A. Wills, in a Weihe, from Yeovilton, Somerset, to Ratcliffe, Leicestershire, 140 statute miles (225.3 km), on July 17th last.

The multi-seat records were:—

Distance. Commander C. Nicholson, R.N.V.R., and Lieutenant-Commander (E) G. P. Blake, R.N., in a Kranich II from Yeovil, Somerset, to Bramcote, Warwickshire, 118.2 statute miles (190.2 km), on July 17th last;

Goal flight. Commander Nicholson and Lieutenant-Commander Blake for the same flight;

Height. Flight Lieutenant R. M. Williams and A. C. Kahn in a Kranich at Oerlinghausen, Germany, 8,399ft (2,560 metres), on June 2nd last.

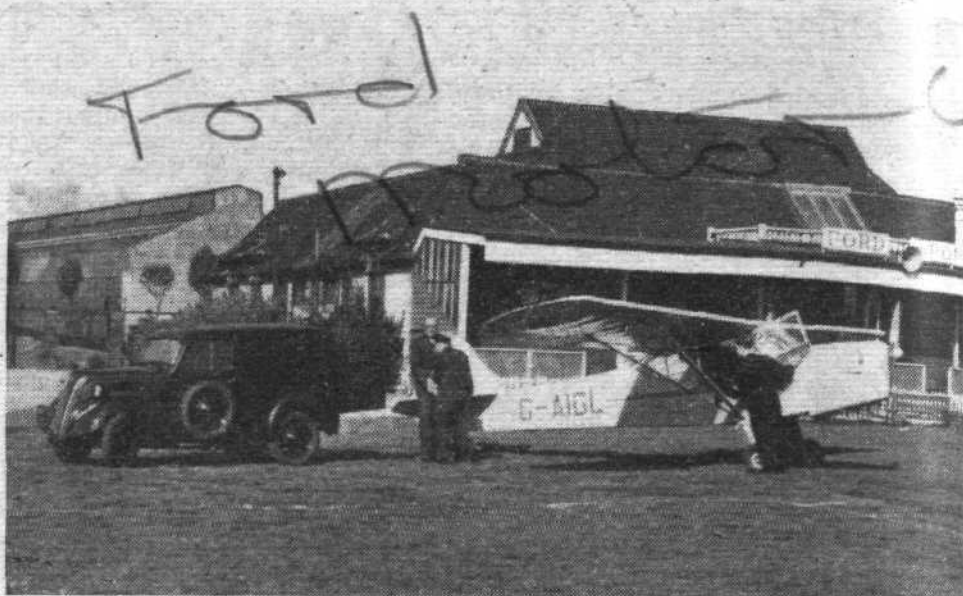
SQUADRON BADGES

IN the same way that Army units take pride in their regimental colours, C.O.s of R.A.F. units are encouraging pride in their unit badges. There is, however, a major drawback, namely, finance. The cost of reproducing the badges on aircraft is not recoverable from public funds, and the present unsettled state of many squadrons makes the raising of £20 to £50 very difficult. Here, surely, is a praiseworthy object for a wealthy friend of the squadron, or a parent who has lost a son in the R.A.F., to provide part, if not the whole, of the necessary sum. The idea may also appeal to aircraft and component firms who might "adopt" an R.A.F. unit.

Comment has already been made in *Flight* on the beautifully reproduced badges on the Lincolns of 617 Squadron. These were printed by the British Transfer Printing Co., and any potential benefactor is recommended to get in touch with Mr. R. E. Wright of that Company at Quinton Works, Quinton Road, Coventry.

HERE AND THERE

FEEDER LINE: An Auster aircraft was used last week to rush bearings from Birmingham to the Ford motor factory in London to feed the assembly line of the Fordson Major tractor. Delivery by road would have meant a stoppage of production with a subsequent loss to our agricultural drive. Our picture shows bearings being unloaded.



Unique Venture

TED THOMPSON and Nelson Brown, two American airmen, were expecting to start this week on an ambitious, private-venture air exploit. They have planned to fly around the world non-stop in a single-engined Piper Super Cruiser (NX4478M) picking up petrol, oil, food, etc., from pre-arranged points around the world, and to complete their journey in 240 hours. Field's Aircraft Services, Ltd., have arranged a pick-up point in England at Stanstead airfield.

Paris Show

IT is understood that the U.S.S.R. is making arrangements to exhibit at next year's Paris Aero Show. No definite date has yet been fixed for the show, but it is probable that it will be held during the last week in May and the first week in June. It is also expected that American manufacturers will be more strongly represented than last year.

Increased R.-R. Capital

AN extraordinary general meeting of Rolls-Royce, Ltd., is being held on October 16th to propose a resolution to increase the capital to £2½ million by the creation of a further 1,350,000 ordinary shares of £1 each. The new capital is needed for the great programme in hand, and the directors intend to obtain it by borrowing. By increasing the nominal capital, and borrowing powers are automatically increased. The fixed assets of the company exceed the present nominal value of the share capital.

Time is Money

DUE to arrive in Singapore by air last Sunday was a ship's 17ft propeller-shaft weighing 5½ tons for the stranded s.s. "Lake Chilco." It was being delivered by the Lancashire Aircraft Corporation at the request of Western Canada Steamships, Ltd., who made the arrangements through Lambert Brothers, Ltd. The charter is estimated to save £300 per day and as it would take 60 days to deliver the shaft by sea it represents considerable economy for the steamship company.

Britain Loses Tourists

ONE outcome of the restriction on the use of petrol has been that the British Gliding Association's International Gliding Championships planned to be held in Britain next year to coincide with the Olympic Games will now be held abroad. S/L. E. A. Spence, Secretary of the B.G.A., has explained Britain's difficulty to the F.A.I. and it is possible that the contests may be held in Switzerland or Sweden.

Wireless Booklet

A REVISED and enlarged edition of "Broadcasting Stations of the World," a booklet compiled by Wireless World and first published by Iliffe and Sons, Ltd., in January, has been produced. This, the third edition, renamed "Guide to Broadcasting Stations," gives details in both geographical and frequency order, of 300 European medium and long-wave stations and 1,000 short-wave stations of the world.

Fuel Supply

TO ensure an adequate supply of petrol for aircraft using London Airport in the future, Shell-Mex, Ltd., and the Anglo-American Oil Company have agreed upon a plan which will involve the construction of a special siding at Ashford, Middlesex, a storage depot south of the airport, and pipe lines to the main loading apron on the airfield.

Ministerial Literature

A LEAFLET entitled "Britain's Civil Aviation" prepared by the Central Office of Information has been issued by the Ministry of Civil Aviation. With a foreword by the Rt. Hon. Lord Nathan, the leaflet describes the work of the Ministry of Civil Aviation and has something to say about state-controlled airports, the three corporations and careers in civil aviation. The pamphlet mentions that detailed information about civil aviation matters can be obtained from the Information Bureau, Ministry of Civil Aviation, Aerial House, Strand, London.

Year Book

WHILE we are on the subject of literature, a very useful addition to Australian publications has recently been produced. It is the first edition of the Australian Aviation Year Book, 1947/8. The book contains a comprehensive survey of the industry, the R.A.A.F. and those associated with the industry.

Achtung!

THE U.S. Military Government Authorities have announced through Hamburg Radio that the Messerschmitt underground aircraft works at Augsburg in the U.S. zone of Germany was among several underground plants which have been destroyed. Over four tons of reparation deliveries were sent recently from the U.S. zone to Belgium, Holland, France, Czechoslovakia, Yugoslavia, Greece, the Soviet Union and Poland.

Helicopter Demonstrated

FLYING a Sikorsky S.51 helicopter owned by Pest Control, Ltd., of Cambridge, Jimmy Harper, ex-test pilot at the Airborne Forces Experimental School, recently demonstrated over the Guinness sports ground at Park Royal how effectively helicopters may be used in combating crop parasites. Pest Control, Ltd., are expecting to be able to operate a prototype of the Cierva three-rotor helicopter, which has been designed to their specifications, early next year. A description of this machine,



which will be known as the "Spraying Mantis," appeared in *Flight* of July 4th, 1946. It will be the first aircraft in this country specially designed for agricultural work and will be capable of lifting a 3-ton payload.

Helicopter Town

AT an exhibition opened last week in Hemel Hempstead, Herts, the preliminary plan for a modernized Hemel Hempstead was on view. Included in a model of the future town were an artificial lake, several waterways and two helicopter parks.

Hisso-Nene Type-Tested

GOOD results have been obtained by the French Hispano-Suiza company from the prototype Nenes built under licence from Rolls-Royce, Ltd. Recently the third of these prototypes passed the French Air Ministry type tests. Not all the components were built in France, but it is expected that the seventh prototype will be made entirely of French materials. French metallurgists claim to have evolved materials as good as the original British.

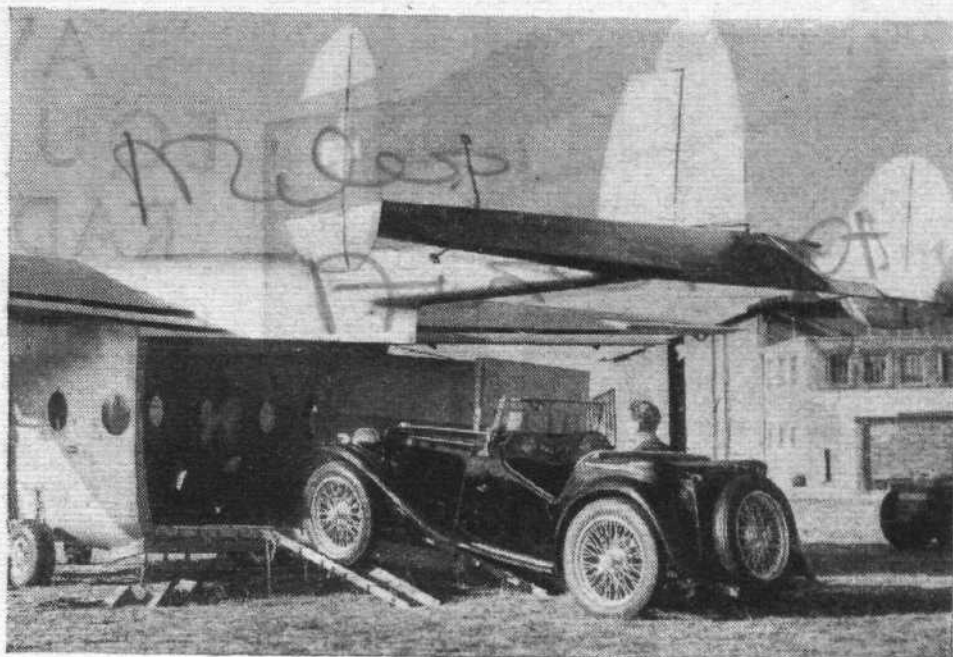
On type test the French Nene gave a fuel consumption of less than one kg. per kg. of thrust per hour. Static thrust was 2,270 kg. (5,000 lb.).

Flying Volkswagen

MEMBERS of a French light plane club have recently completed the construction of a Mignet H.M.-290. That is not so remarkable, as several of these have been built, but what distinguishes this particular Flying-Flea successor is that it is fitted with an engine from a German Volkswagen, adapted by the ground engineer of the club. It now remains to be seen if the engine is powerful enough.

New Auxiliary Engine

TESTS with the prototype of a new auxiliary engine for gliders have been begun by the Walter company of Czechoslovakia. Known as the Walter A, the new engine is a two-cyl. two-stroke inverted aircooled type, expected to develop some 20 h.p.



FOR EXPORT: The first Aerovan to be purchased by Aerotaxi Ltd., of Zurich, left Woodley airfield last week piloted by Monsieur A. Villard. Our photograph shows the pilot driving on board the aircraft an M.G. car which he later delivered to the Nuffield distributors in Switzerland.

Giant's Move

STEADY progress has been maintained on the production of the 130-ton Bristol Brabazon at Filton. Last Sunday the aircraft was towed by tractor from the Bristol workshops to its new hangar in preparation for its christening by the Minister of Supply, which was due to take place yesterday. The Brabazon is expected to make its maiden flight early next year.

Flying Educationist

SASKATCHEWAN PROVINCE in Canada has probably the only flying educationist in all the North American continent. He is Mr. Chesney H. Piercey, Administrator of Education for Northern Saskatchewan, whose territory stretches for 650 miles. Mr. Piercey uses either a Moth, Waco or Norseman aircraft depending on his load, and makes periodical visits to a score of school districts.

News in Brief

ENGINEERS from nine countries are attending a gas turbine technology course which began on Sunday, October 5th, at the National Gas Turbine Establishment School at Lutterworth, Leicestershire. The course, lasting three weeks, has been organized by Power Jets (Research and Development), Ltd.

On Nov. 5th at the Reading and district branch of the Royal Aeronautical Society, Mr. W. G. A. Perring, Director of the Royal Aeronautical Establishment at Farnborough, will lecture on "The place of the model in aeronautical research."

Mr. Leslie Irvin, managing director of Irvin-Bell Helicopter Sales, Ltd., and Capt. Alan B. H. Youell, left England recently for a European tour in a Bell helicopter.

The directors of Blackburn Aircraft, Limited, announce that they are recommending a final dividend on the ordinary shares of 6 per cent actual (7.2d per share), less income tax at 9s in the £, making 10 per cent actual, less tax, for the year ended March 31st, 1947. Net profits for the year, after charging all taxation, are £104,585 (against £115,196 for the previous year).

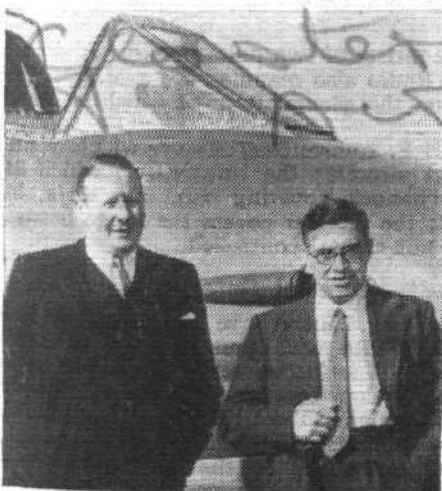
The Royal Aero Club of New South Wales, in co-operation with the R.A.A.F., is to stage an air pageant at Bankstown, Australia, on October 11th.

Mr. H. Knowler, F.R.Ae.S., A.M.I.C.E., chief designer of Messrs. Saunders-Roe, Limited, is repeating, before the Isle of Wight branch of the Royal Aeronautical Society to-day, Thursday, October 9th, a slightly condensed version of the Thomas Lowe Gray Lecture entitled "Recent Developments in Flying Boats" which he presented before the Institute of Mechanical Engineers in January, this year.

The King's Flight, including two helicopters, left Dyce airport, Scotland, and returned to the South of England last week. During the King's stay at Balmoral the experiment of carrying official mail from Dyce airport to Balmoral Castle by helicopter has been described in official circles as an outstanding success. Every day 200 lb of mail was carried each way.

Mr. John Elstob has left his post as Deputy Chief Superintendent of the Ministry of Supply Rocket Propulsion Department at Westcott, Bucks, to return to Imperial Chemical Industries, where he is Assistant Chief Engineer of the Metals Division.

Captain W. Odom, who made a record three-day solo flight round the world in August, flew the Atlantic last week delivering a Flying Fortress to the French Air Ministry. It is one of four being delivered to the French authorities. Captain Odom is proposing a trans-Polar flight next month.



STAFF CHANGES: Two new appointments at the Gloster Aircraft Co., Ltd., are (left) Mr. R. Fitz-Gibbon Carse to Sales Manager, and (right) Mr. F. Turton, who becomes Manager of the Service Department.

AVIATION EQUIPMENT AT RADIOLYMPIA

*Communication Sets, Navigation
Aids and Radar
for Commercial
Users and Private
Owners*

A view of the M.C.A. stand taken from the wings. A plot was kept of aircraft movements in the S.E.F.I.R. as at Uxbridge, but the representation was of an airport control room. The public had difficulty in either understanding the procedure or even viewing properly the exhibit.

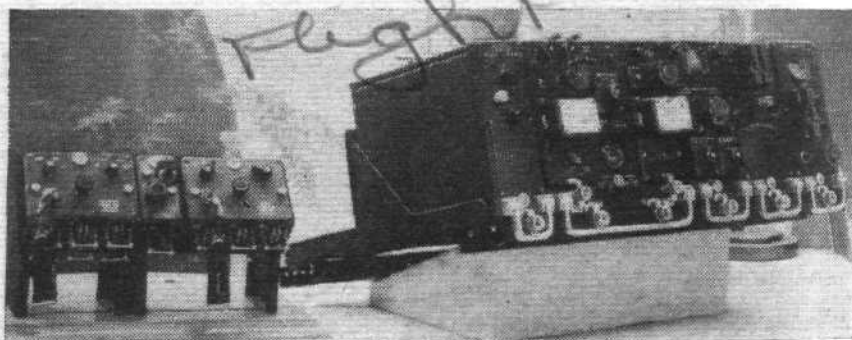


AFTER the S.B.A.C. exhibition at Radlett, the civil aviation enthusiast will probably find Radiolympia a little disappointing. This is inevitable in an exhibition which has to cover such a wide field even when there is a special section devoted to electronic applications. However, for those who were not lucky enough to visit the S.B.A.C. show, there are quite a few items of interest.

The Ministry of Civil Aviation have an exhibit showing the way in which air traffic is controlled over the South-East Flight Information Region of the United Kingdom. Unfortunately, the stand is so arranged that it is extremely difficult for more than a few visitors to see at one time what is going on. The Ministry of Supply have a stand demonstrating some of the wartime developments in Radar which may find application in peacetime. There is a skiatron tube which is used for daylight viewing, and a simulated H₂S airborne Radar is demonstrated. There is no airborne search Radar on show in the exhibition although a set is under development by one manufacturer, but the Ministry of Supply exhibition will give an idea of the results which can be obtained from this type of equipment.

Dealing first with the communication equipment, there are several items of interest both to the private flier and the airline operator. Murphy Radio and the G.E.C. are showing their single channel V.H.F. lightweight transmitter/receiver, both of which are compact enough to

be stowed away in a light aircraft. The specification of the two sets is very similar, the transmitter output being of the order of $\frac{1}{2}$ watt and the receiver having a sensitivity of a few microvolts. Tests on these sets have shown that ranges of 20 to 30 miles or more can be obtained in suitable circumstances. The G.E.C. model is made up into a single unit



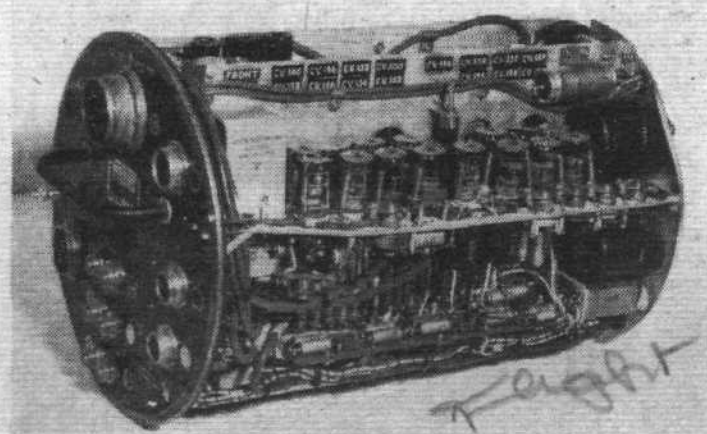
Marconi A.D. 97 low-powered HF/MF communications set which was originally designed for the Dove.

while the Murphy set consists of two units, making it slightly more bulky. Murphy Radio also manufacture a M.F. set for light aircraft application the general form of which is similar to the V.H.F. model.

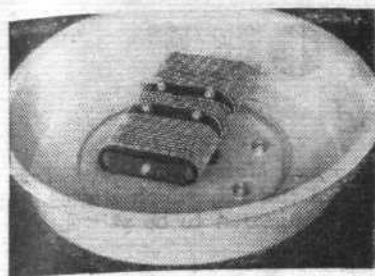
The G.E.C. have a H.F. transmitter/receiver which is suitable for civil transport aircraft; the transmitter, which has six crystal-controlled channels covering band 2-9 Mc/s, has an output of 25 watts; the receiver covers the range between 2 and 20 Mc/s but is not crystal controlled.

Multi-channel Sets

Standard Telephones and Cables have on view their two multi-channel sets, the STR9 with four channels, and the STR12 with 12 channels. The former set is an adaptation of the TR1520 which was developed for the Royal Air Force and is fairly conventional in design. The STR12 is a new development using bandpass circuits, for which no retuning is required when changing channels. All the necessary crystals, which are miniaturized, and associated apparatus are contained in the pilot's control unit and channel selection is reduced to the turning of a single switch. The appropriate crystals, 24 in all (12 transmitter, 12 receiver) are plugged in and no further adjustment is necessary. The power output of the STR9 transmitter is 4 watts, and of the STR12 $2\frac{1}{2}$ watts, both adequate for communication over ranges likely to be required.



Rebecca Mk IV as shown on the E.M.I. stand. It is suitable for homing and blind approach with Babs Mk II.



On the right is shown the control and indicator units of the G.E.C. radio compass, with above it the torpedo housing for the loop. The dish type housing for future installation is shown above.



There is, of course, a number of high or medium power ground transmitters, both H.F. and V.H.F., which are highly essential to the safe operation and control of aircraft.

Of the navigational aids, the most interesting is probably the new G.E.C. radio compass which has been developed for the R.A.F. but will also be available for civil aviation. The most radical change from earlier equipment is the provision of an iron-cored loop. This enables a very much smaller "torpedo" housing to be installed on existing aircraft, but what is more important on future aircraft, it can be mounted in such a way that there is no projection outside the skin of the aircraft. This, of course, with the development of high-speed aircraft, is an extremely desirable feature. Other interesting details are the optically projected scale, which is very easy to read, and the Desynn tuning. The latter feels a little strange when compared to a normal direct tuning device, as the speed of operation is proportional to the amount of movement of the control knob, but the operator should soon become accustomed to it. Another detail is that the two motors driving the loop are running continuously, so that there is no error or lag due to starting and stopping.

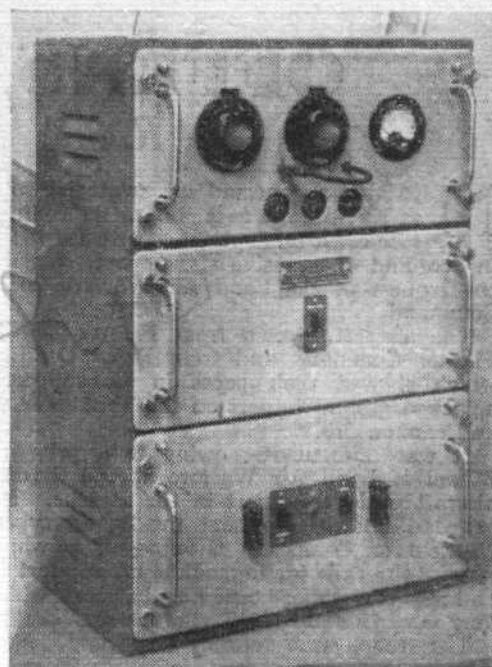
Ground Equipment

Marconis have concentrated mainly on ground equipment, and have included on their stand the DFG26 HF/DF with cathode-ray presentation. This set incorporates a spinning goniometer and gives an instantaneous visual indication of bearing when the signal is received. They also show a model of a Consol transmitting station. This system, which has been fully described elsewhere, is now under test by the M.O.S. and M.C.A. to determine its usefulness as a navigational aid. The well-known Marconator may be seen, but apart from the single-channel V.H.F. transmitter/receiver, which is an airborne version of the police radio telephony set, the only other airborne set is the AD97, a low-power H.F./M.F. transmitter originally designed for the Dove.

Metropolitan-Vickers have a M.F. Beacon with a power output of 10 watts for use on airports. The set is very simple



In two units, the Murphy V.H.F. set is compact and light in weight.



The compact MF airport beacon manufactured by Metropolitan-Vickers. A number are being supplied for use in Eire.

and compact, in fact a toothed-wheel cut to the required code merely bears on a spring-loaded contact.

The glide-path receiver section of the complete airborne Instrument Landing System is on show at the G.E.C. stand. The development of the localizer receiver has been completed but a model is not yet available. This set is designed to work as part of the blind approach system which has now been standardized by the I.C.A.O. The first localizer receiver will be for the amplitude comparison system; the phase comparison system which is due to be introduced in a few years' time will be catered for in a later model. The glide-path receiver has eleven channels available, each having its own crystal, these channels corresponding with the appropriate channels in the localizer. The channel selection for both receivers is carried out by a switch available to the pilot on a small control box.

The Cossor Radar Co. are showing this year the new GEE Mk. III miniaturized airborne equipment, which is considerably smaller and lighter than the R.A.F. type which is at present in use by British European Airways and other air operators. From the navigator's point of view, the main improvement lies in the reading of the GEE co-ordinates which appear on a speedometer-type counter and can be read off immediately. Further developments are expected eventually to lead to the introduction of an automatic computer. The Ferranti Company are working on this computer, which will still further reduce the navigator's work. In the GEE Mk. III a 1½ in diameter cathode-ray tube is used, the screen being viewed through a lens. As the required angle of view is small, the limitation imposed is no disadvantage, and the advantage of a larger screen is obtained without extra bulk.

A Rebecca Mk. IV miniaturized airborne set is being demonstrated on the E.M.I. stand. This is the latest form of this type of equipment and has been developed for the R.A.F. It operates in the 200 Mc/s band but will eventually be superseded by the 1,000 Mc/s band as the result of the last I.C.A.O. conference in Montreal and subsequent discussions between the U.K. and U.S.A.

An example of the Eureka beacon with which the Rebecca Mk. IV will operate is to be seen on the Murphy stand. Both the transmitter and receiver are crystal controlled and there is an automatic monitor which sends a signal back to any desired point if the performance drops by a predetermined amount. A coder for identification is incorporated in the transmitter and the maximum repetition rate of 10 kc/s should allow interrogation by a large number of aircraft without saturation. The coder unit is shown separately on the stand.

The Decca Co. are not showing any apparatus in the exhibition but they are giving a film show of the Decca Navigator.

The exhibition gives a fair cross-section of the work which the radio industry is doing for aviation, although the number of items on show is rather limited. In spite of the growing complexity of all the airborne equipment every effort is being made to reduce the load on the operator, and miniaturization is helping to cut down the space and weight requirements.

B. I. O'K.

OFFENSIVE AIR SUPPORT

R.A.F. Display for Army in Scotland

NEARLY a thousand representatives of the Army, as well as Naval units gathered on the rolling sand-dunes of the Fife coast on September 30th for the first demonstration in Scotland of offensive air support, staged by the R.A.F. at the request of the Land/Air Warfare Committee of Scottish Command.

The aircraft, drawn from No. 12 and No. 11 Groups of Fighter Command and from B.A.F.O., included jet fighters which showed their paces in air support roles when they attacked ground targets on the Tentsmuir ranges with rockets and cannon fire.

It was unfortunate, owing to a prior engagement at the School of Land/Air Warfare at Old Sarum, that no bomber aircraft could take part in the attacks. But the aircraft engaged did fairly represent the fighter types employed in the Tactical or Composite Groups—those which, in war, would answer the calls for immediate air support for ground forces—and also the carrier-borne naval aircraft which would cover any long-range assault until shore strips could be provided.

The troops were suitably impressed. Many of these young recruits had never seen jet aircraft in action; and their reactions were very interesting, as they inspected a motor lorry in fragments after a direct hit from a 60 lb rocket, a tank with holes punched through its armour, and concrete emplacements shattered.

Major General Neil McMicking, Chief of Staff, Scottish Command, expressed himself as "very impressed," adding "the pace of it astonished me." Rear Admiral C. Lambe, Flag Officer (Flying Training) Donibristle, commented that he thought the cannon fire "particularly effective."

The flying display opened with ground strafing by a Vampire I from Odiham, flown by F/O. Holland. Next came four Tempest V aircraft, flown over specially from Wunstorf, near Hanover, led by S/L. Walmsley in spectacular dive rocket

attacks. These were followed by four Meteor III "jets" from Horsham St. Faith, led by S/L. Otterwill, which strafed the targets repeatedly in dives which appeared to be at well over 500 m.p.h.

The remainder of the display consisted of individual items by a Meteor III (F/O. Milne clocked 555 m.p.h. in one run above the beach), a Tempest V (F/L. MacIntosh), a Hornet I (F/S. Young from Linton-on-Ouse) and a Vampire I, magnificently flown in his celebrated aerobatics by F/O. George ("Nick") Carter, from Odiham. It was a pity that this had to be curtailed by a hydraulic failure. This officer, by the way, will be leaving the Service on "demob." within the next few weeks, and this may well have been his last appearance. His Vampire "show" before the Soviet and Norwegian delegations earlier this year will be remembered.

Naval aviation was represented by a Firefly IV (Lt. Cdr. Bartlett) and a Sea Fury (Lt. Cdr. Hunter), from Eglinton, a Sea Hornet (Lt. Nation), from Donibristle, and a Seafire 46 (Lt. Cdr. Richardson), from Lossiemouth. The Sea Fury's aerobatics were particularly good.

The display concluded with a demonstration of rockets fired out to sea from a shore installation—extremely impressive.

In the static exhibition on Leuchars airfield, visitors saw, in addition to the aircraft used in the flying demonstration, a Mosquito XXXVI night fighter, a Lancaster III bomber and a Halifax A IX transport.

During the flying display, which was in charge of W/C. H. F. O'Neill, D.F.C., from 12 Group Headquarters, a running commentary was provided from a "contact car," which is part of the G.C.A. equipment at Leuchars. Commentators were W/C. L. A. Lewer (Land/Air Warfare Officer, 66 Group) and S/L. Wootten.

It is hoped to make these Air Support Demonstrations annual events in Scotland where they will be particularly welcome.

WOODFORD DISPLAY

ABOUT three thousand people crowded the Avro airfield to watch the Manchester air display held at Woodford at the end of last month. There was a large variety of civil and military aircraft including Tudors Mk. I and IV in the aircraft park and a static exhibition of aeronautical equipment with R.A.F. personnel in attendance.

The display opened with a demonstration of glider flying



The Tudor VII was on show at the Woodford Display, and from this angle the clean installation of the Hercules engines is seen to advantage. Power-plant change is the only difference between the Mk. VII and the Mk. II, the latter having Rolls-Royce Merlin 600 engines.

staged by Nr. 183 A.T.C. Gliding School followed by three Lincolns of the R.A.F. carrying out formation and individual flying; one of these machines later showing what it could do with only two of its engines operating. Before this performance had finished, three Spitfires of No. 613 A.A.F. Squadron were airborne for conventional formation and aerobatic manoeuvres and then, after an Auster interlude, the audience saw one of Britain's latest civil airliners, the Tudor VI, demonstrated by S/L. Cooke. The Nene Lancastrian came in for much comment when it was put through its paces by S/L. Hayworth, but the event which appeared to create the greatest impression was a "beat up" by a Gloster Meteor flown by W/C. MacDowell.

Civil light aircraft were represented in the display by an Auster and Proctor, each aircraft portraying its characteristic flying qualities individually. The display which ran smoothly throughout was organized by A. V. Roe, Ltd., in conjunction with the Manchester branch of the A.T.C.

INTERIM TRANSPORTS

IN our feature article dealing with the York and Halton, contained in *Flight* of October 2nd, the artist's name was omitted in error from the cutaway drawings. These were the work of Major R. P. Hutchinson, of B.O.A.C.

FRENCH LIGHT PLANE COMPETITION

WHILE we in this country are hoping for the revival of the pre-war Permits to Fly to take effect, France has been holding a competition for light two-seaters limited to an engine power of 75 h.p. Although side-by-side seating was stipulated, a slight staggering of the seats was permitted. Safety was the chief aim of the competition, and any machine which stalled violently, or went into a spin, at maximum lift was disqualified. A cruising range of 500 km (310 miles) was demanded, but competitors were at liberty to achieve it either by clean aerodynamic design or by carrying a lot of fuel.

Only three engines were recognized for the competition: the Regnier 4Jo four-cylinder in-line, the Mathis G4F flat-four, and the Minie.

Nine machines took part, but at the moment of going to press the competition seems to have ended in a close fight between the Starck AS-57 and the S.I.P.A.90.



1. Only the top cowling panel need be removed from the power plant. The engine is at a conveniently low level for easy access, a factor which perhaps contributes as much as the practical provisions of detail design to the speed and economy of manpower in this operation

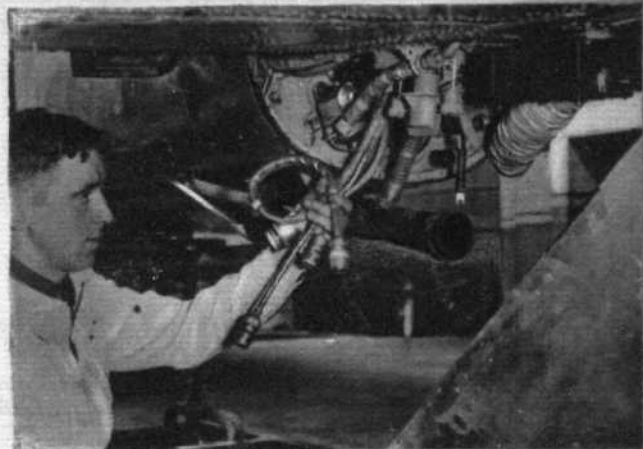
2. The engine sling is next hooked into the four hoisting eyes provided, and the load is taken up by the crane preparatory to the removal of the bearer bolts.

3. The hinged sections of leading edge give access to engine controls with quick-coupling fittings:

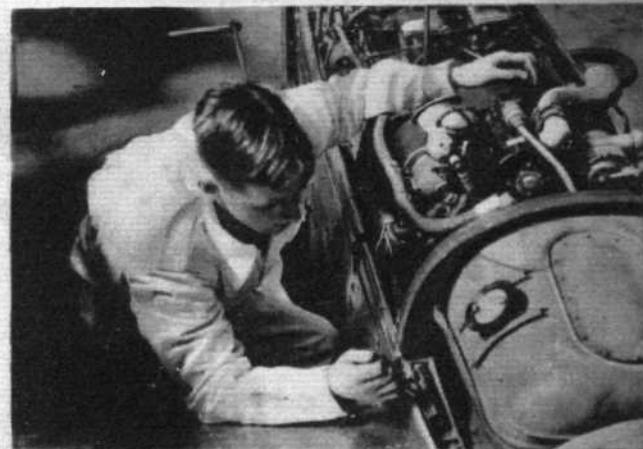
throttle, mixture, propeller, slow-running cutout and carburettor-air controls are uncoupled, together with four pipelines and the air intake, which swings down with the hinged leading edge.

ECONOMY THROUGH MAINTENANCE EFFICIENCY

Each Gipsy Queen 70 engine of the Dove can be changed by two men in seventy minutes. This economy in man - hours contributes effectively to the reduction of maintenance costs and has a direct bearing on the utilisation attained



4. The remaining pipelines and electrical services are disconnected at the rear face of the firewall. The exhaust tail pipe and the lagged warm-air supply line (seen at top right) are uncoupled at this stage. The hinged rear under-panel of the nacelle cowling gives ample accessibility, without the disadvantages of cowling panels which must be completely detached.



5. Top bearer bolt removed. The oil tank is a part of the power plant group and is removed with it.



6. The power plant is then mounted on a stand, and the airframe is ready to receive a replacement unit. The outstanding accessibility provided by the hinged panels can be judged from the picture.

DOVE



*The power of the big piston engine
— without the drag !*



MAMBA

Gas Turbine Propeller Engines

ARMSTRONG SIDDELEY MOTORS LIMITED

Purkside, Coventry, England

BRANCH OF HAWKER SIDDELEY AIRCRAFT COMPANY LIMITED

AUTOMATIC CONTROL



The Skymaster at Brize Norton.

"Flight" Photograph

Operational Sequence of the Transatlantic Flight : Importance of Landing

WE have no desire to be captious and it is with complete sincerity that we accord the Americans their every due in making the recent automatically controlled flight across the Atlantic. It was a fine achievement. But too much sensational interpretation has been placed on the event. Admittedly it is easy to regard the flight as the herald of a new era in flying, and also easy to see in it a step forward in mankind's progress toward doing his neighbour injury without incurring risk to himself in the process. Yet neither of these surface impressions is truly accurate: the first is too long-sighted and the second too short-sighted.

This whole achievement must be seen in undistorted perspective. Fully automatic control of aircraft as a normal operating procedure is by no means with us as yet nor is it likely to come for quite some considerable time. As for the military side, automatic control is far more likely to be eclipsed by the remote control of expendable missiles.

Essentially, the greatest single factor in importance

in the Americans' recent flight lies in the automatic landing made at Brize Norton. Interesting and impressive as are the other aspects of the flight, these pale in significance beside the landing feature. We in this country are not behind the Americans in automatic control—at least not in essentials—and in point of fact a Lancaster at the Blind Landing Experimental Unit, Martlesham, has already executed some 200 automatic approaches, many of which have embraced automatic landing. In this connection the availability of the new British Smith electric autopilot (*Flight*, September 25th) is expected to expedite matters considerably for it is officially regarded as the most advanced automatic pilot in the world. The business of feeding the requisite information into an automatic pilot is not essentially difficult; in fact, had a sufficiently good autopilot then existed much of what was done in this spectacular transatlantic crossing could have been accomplished before the war. Not so expeditiously, of course, since to-day much is done by electronic means which, two years ago, had not been developed.

Although not intended to be a faithful representation of the actual track, this map does give the essential geography of the flight.



AUTOMATIC CONTROL

Briefly, the Skymaster installation is perhaps best visualised as a sort of glorified electrical alarm-clock which, according to a series of preliminarily made settings, "rang" appropriately and, in so doing, channelled requisite input to the autopilot to make the aircraft do what was required, and, in addition, actuated services such as landing gear, flaps, throttles and engine speed. The several functions were divided—not equally—into twelve "sequences" which, starting with pre-take-off setting as No. 1, controlled the aircraft right through to the landing. We will follow these primary functions in the order in which they occurred, but first it should be recorded that the aircraft was a normal C-54 Skymaster fitted, in addition to the various items of automatic control equipment, with extra fuel tanks—two huge light alloy cylinders carried on the port side of what is normally the main cabin—in order to give it the required safety range.

Flight Planning and Pre-Setting

The All-Weather Flying Division of the U.S.A.A.F. Air Material Command is based at Wilmington, Ohio, and the aircraft was ferried normally from that base to Stephenville, Newfoundland, from where the overseas flight was made. At Stephenville the very latest meteorological information was obtained and the flight planned accordingly, the navigator evolving two courses, one directed to the radio ship in mid-Atlantic and the second from that position to Brize Norton in Oxfordshire. All the necessary flight data having been set into the automatic controller, the skipper of the aircraft, Captain Thomas J. Wells, ran through the normal take-off checks, then taxied the aircraft out to the end of the runway, lining it up there for take-off. Everything having been checked as correct, the master switch button was then pressed to initiate take-off. From that moment no human control action was taken until the aircraft landed in England.

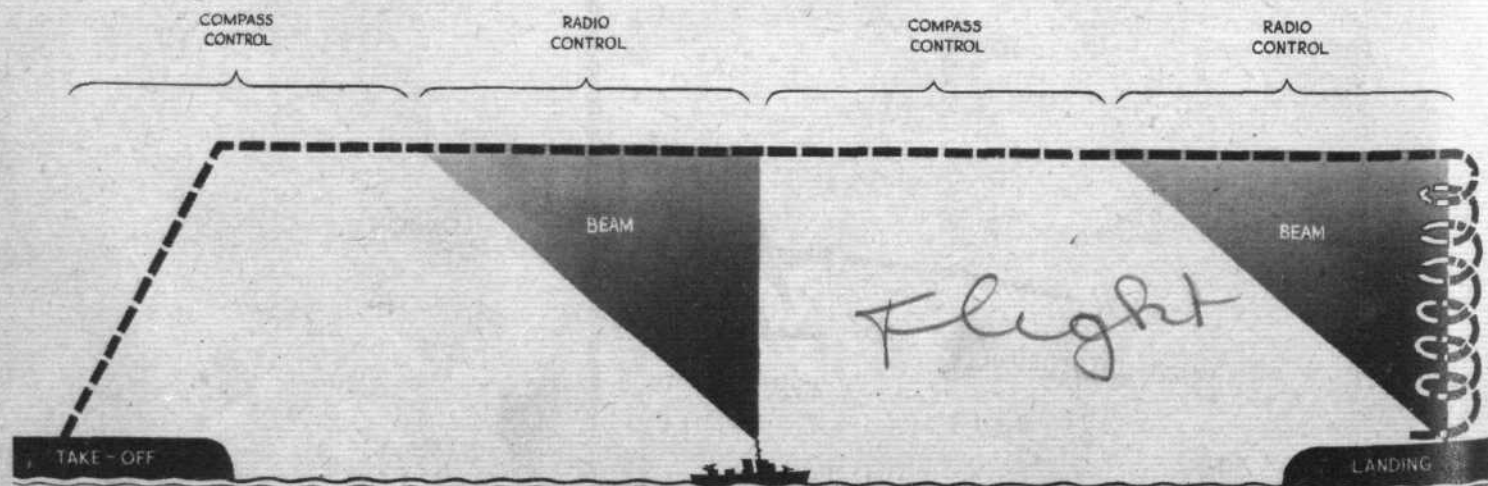
The master button having switched the controller from seq. 1 (pre-take-off) to seq. 2 (take-off), the engines were opened up to take-off rating, the brakes released and, the autopilot having been lined up with the runway and the "up" signal introduced to the elevator section, the aircraft was kept directionally stable and took off. Direction and climb being held steady, seq. 3 was introduced at a height of 50ft by response of the radio altimeter, this sequence function being to raise the undercarriage. Similarly, at 1,000ft, seq. 4 was automatically introduced by the radio altimeter to initiate a whole series of operations, viz., raising of flaps, reducing engine power to normal climb rating, changing directional reference from flux-valve of the autopilot to a pre-set magnetic heading fed into the automatic pilot by the Gyrosyn compass, and energizing an air-miles counter. The latter, having had a pre-computed mileage set into it, was operated by a pump sensitive to pitot pressure and "ran backward" steadily ticking-off the air-miles flown.



In this photograph of the Skymaster's cockpit Capt. Wells is shown indicating the master switch button of the automatic controller. This is surrounded by a ring of twelve indicator lights, one for each of the successive elements of operational control. Thus any particular stage of the flight can be seen at a glance.

Between the boost and speed-control levers on top of the central pedestal can be seen the master power lever whereby any required combination of supercharge and engine speed can be selected for all four engines simultaneously.

The schematic diagram below serves to illustrate the primary sequences of directional control reference throughout the flight. It is, of course, not to scale.



At the desired cruising altitude for the crossing—9,000ft—seq. 5 was automatically selected to reduce engine power to normal cruise rating, and the "up" reference fed to the automatic pilot gradually diminished to zero so that the transition from climb to level flight was smoothly accomplished. The Skymaster then continued its flight, directional reference being made by the Gyrosyn compass monitoring the automatic pilot, whilst the cruising altitude of 9,000ft was maintained constant by the aneroid height-lock device incorporated with the Sperry A12. The "passengers" watched the various instruments, read, played gin-rummy and slept.

When the air-miles-flown counter had run down to zero the controller was automatically stepped to seq. 6, this deleting the directional reference to the autopilot from the compass in favour of beam homing on the beacon carried by a U.S. Coast Guard weather ship stationed in mid-Atlantic. Locked in the beam the aircraft flew out of it directly over the ship and as the needle of the radio compass flicked round to a 180 deg reciprocal it made an electrical contact to energize seq. 7.

Homing on Brize Norton

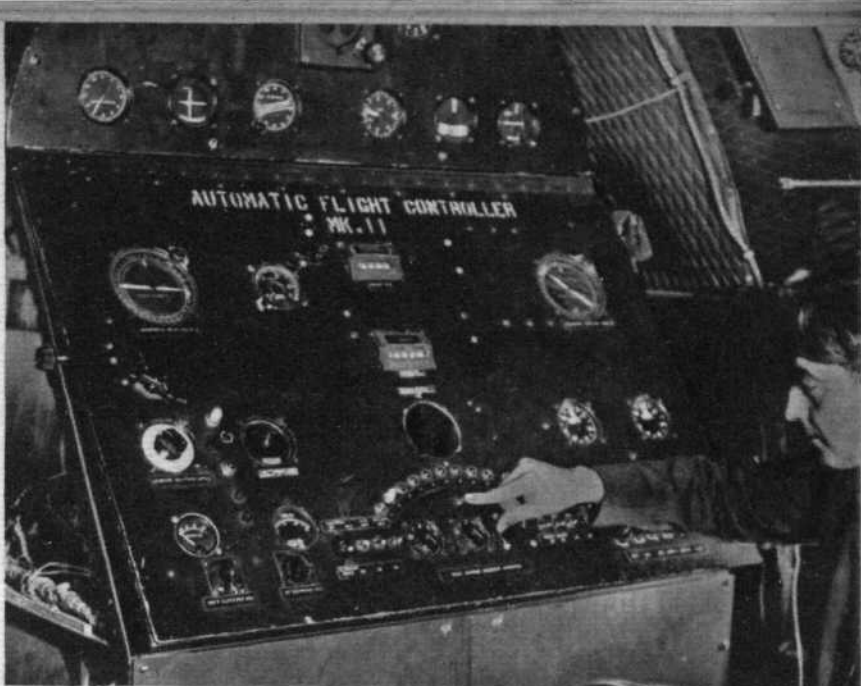
From this point a fresh magnetic heading was automatically set into the autopilot and, at the same time, a second air-miles counter was started. This latter continued to run down until, with zero, seq. 8 was selected to bring about change of directional reference control from compass to give beam homing on the Brize Norton beacon—in actual fact this beacon was situated approximately 15 miles from the airfield. On passing over the centre of the beacon the radio compass needle, as in the case of the ship-borne beacon, again swung round through 180 deg to make the necessary contact to engage seq. 9.

With selection of this sequence the height-lock in the automatic pilot was cut-out and in its place a "down" signal was fed-in so that, the directional control reference still being the Brize Norton beacon, the aircraft made a descending spiral orbit with the beacon as its centre. Sequence 9 also initiated lowering of the undercarriage and flaps, and reduced engine power to that pre-set for initial approach. The orbiting spiral descent was made steadily until, at 2,000ft, the radio altimeter selected seq. 10. This cut-out the homing beacon for directional control in favour of the Brize Norton SCS-51 localizer beacon, selected the second phase approach power, and re-engaged the autopilot height-lock. Thus the aircraft was flying with undercarriage and flaps down on its correct final approach heading at a constant height of 2,000ft at approach power. This condition obtained until the centre of the SCS-51 guide path was intercepted, which action brought in seq. 11.

Approach and Landing Control

At this point control of the engines was taken over by a constant air-speed control to hold the aircraft at a steady 115 m.p.h.; direction was still maintained by the localizer beam and the rate of descent controlled by the glide path beam which, in this case, had a sufficiently low angle to allow direct fly-on touch-down. A micro-switch on the port undercarriage leg closed as the Skymaster landed and thus cut-in seq. 12 to throttle back the engines to idling power; and then, for the first time since the aircraft was lined-up for take-off, the controls were taken over by the human pilot. It was left to Capt. Wells to apply the brakes. Even this, however, could have been—indeed, has been—done automatically, but in this instance it was not incorporated.

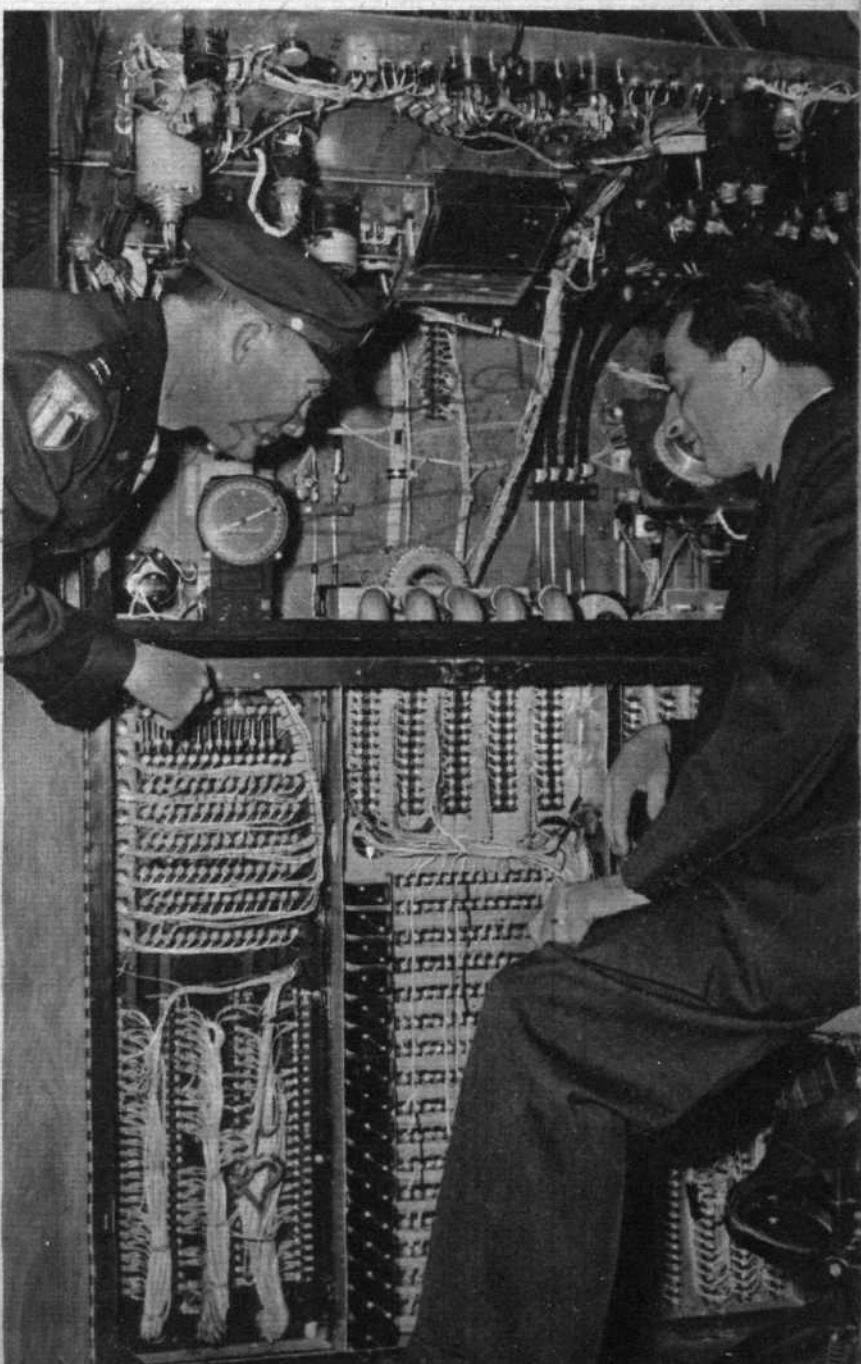
One of the chief features embraced by this automatic control system is government of the engine controls. As may be seen in the cockpit photograph, set centrally between the throttle and speed-control levers is a white-handled control. This is a master power lever which integrates r.p.m. and boost requirements and controls all four engines simultaneously. Should one engine fail, however, control is not affected. All four engines are, of course, synchronized, and the power lever is actuated by electrical means from the automatic controller; thus any



Mr. James Anast, the chief engineer of the project and the man mainly responsible for the physical existence of the automatic controller, is here shown at the main panel.

Above it are the flight instruments duplicating those fitted in the cockpit and showing the flight condition obtaining at any given moment. On the relatively simple-looking panel are set in all the necessary flight data prior to take-off, and clearly to be seen are the radio-compass dials at upper left and right, the two air-mile counters, upper centre, and the automatic pilot sequence setting controls at the base.

Behind and below the main control panel is a bewildering maze of "electrics" reminiscent of the interior of a modern automatic telephone exchange.





Capt. T. J. Wells, pilot, and Col. J. M. Gillespie, flight commander.

required power rating can be pre-set into the controller and, when the appropriate circuit is energized, the master engine control will be actuated to bring about the requisite power condition. Supplementing control of the master power lever by pre-set automatic means is a rotatable knob in the centre of the port control wheel. By means of this the captain may "dial" the power required by turning the knob to a given index, whereupon the master lever is electrically moved to the appropriate power position.

Landing Technique to be Improved

We stated in the forepart of this review that the most important aspect of this whole scheme is the automatic landing. It will have been noted that the landing at Brize Norton was a fly-on type at a constant rate of descent at fixed speed down a straight, low-angle beam. This, good as it is, is not good enough. The ideal is for the aircraft to be brought down in an exponential curve of descent as is done by a human pilot. We in England are working on this problem at the present time, and the Americans, who devised the automatic control system just described, are also working on the problem. Quite what lines our own people are working on we cannot divulge, but we were told that the Americans intend to use a new radio altimeter of ultra-high sensitivity which, with a recording range of 100ft is accurate to ± 6 inches. It is likely that only the last 50ft range of the instrument will be used, this being fed into the autopilot in place of the vertical component of the glide path beam, and, accordingly as the aircraft nears the ground, the engine throttles will progressively be cut-back so that the landing flight path will approximate to an exponential curve.

When this is successfully accomplished with 100 per cent reliability it will mark an achievement in man's conquest of nature's forces paralleled, in the world of aviation, only by the Wrights and the successful development some years ago, of the British radio-controlled Queen Bee target aircraft.

Further developments in automatic control envisaged by the All-Weather Flying Division are concerned with directional control obtained by reference given by radio zones—this being not dissimilar to our own basis of radar control; they are also concerned with maintaining a constant air-speed control throughout flight rather than the constant-power system at present used; again, and this does not seem to be of quite the same degree of importance, it is thought that directional control of the aircraft after landing might be left to the localizer beam, the nosewheel steering control being linked-up for this purpose. They would, however, leave the application of the wheel brakes to a human pilot.

Graphical Photo-Union
LIGHT

October 9th, 1947

The purpose of the whole system is to provide a means of all-weather flying. It is a tremendous task. But if that vitally, pre-eminently important function of 100 per cent reliable automatic landing can be accomplished, then the task is as good as done, for the other aspects of the system are, by comparison, completely subsidiary.

There is no question of the pilot being supplanted. The automatic controller is a means of affording relief to the pilot from the multitude of tasks which, at present, are his responsibility and which can easily, and perhaps better, be done by automatic means. It should, however, dispose of the necessity for carrying navigators, radio operators, and flight engineers. But a pilot there must always be if only to watch the various clocks and indicators and see that everything is going satisfactorily, and to correct any discrepancy if it happened to arise; he should also be able to take over manual control if necessary.

Bulky Equipment

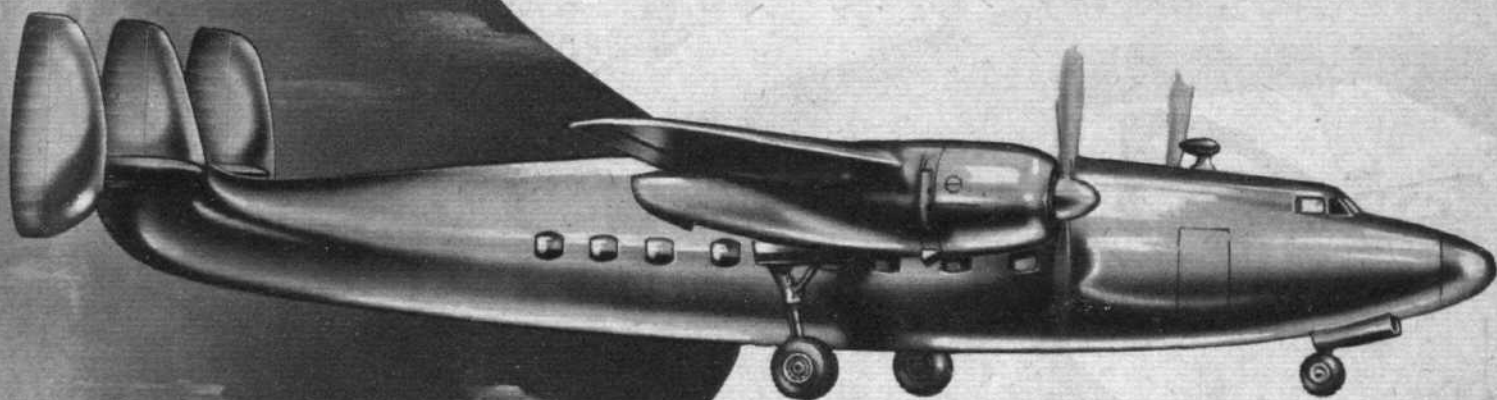
The equipment packed into the Skymaster is bulky and heavy. It is experimental and, naturally, for ease of access and maintenance every unit is far larger than it would need to be in a regular system. In this connection, whereas the present installation weighs about 450 lb and takes up a goodly number of cubic feet, work is going on at the moment to install the whole thing, excepting the autopilot, in a cabinet about 5ft 6in high $\times$ 4ft wide $\times$ 1ft 6in deep; which is to weigh under 100 lb inclusive of everything. An impressive undertaking.

One of the tremendous advantages enjoyed by our friends in America is the—to our minds—seemingly limitless amount of money and man-power they can devote to any given task. We have sterner conditions to contend with over here. It is no use trying to decry the effect that money and technical effort can have on research and development. But, presumably, we are spending as much on these things as we can afford, and that is that. We have no need to be ashamed of our efforts. A good deal of matter embraced by the Automatic Controller Mk II had its genesis in this country, and we have no doubt that our own technicians are learning lessons from the American equipment. Fair enough. We can look forward to fully automatic landings as accepted practice becoming a reality within, at most, five years—if enough effort and money can be spared this might be reduced to two years. The important thing is that it is in sight and that this country is keeping abreast of developments.

Tech. Sgt. W. W. McKie, Mr. J. N. Anast, chief engineer, Capt. Wells, and Sgts. R. Cental-
lella, and J. C. Nimon.



The Airspeed AMBASSADOR

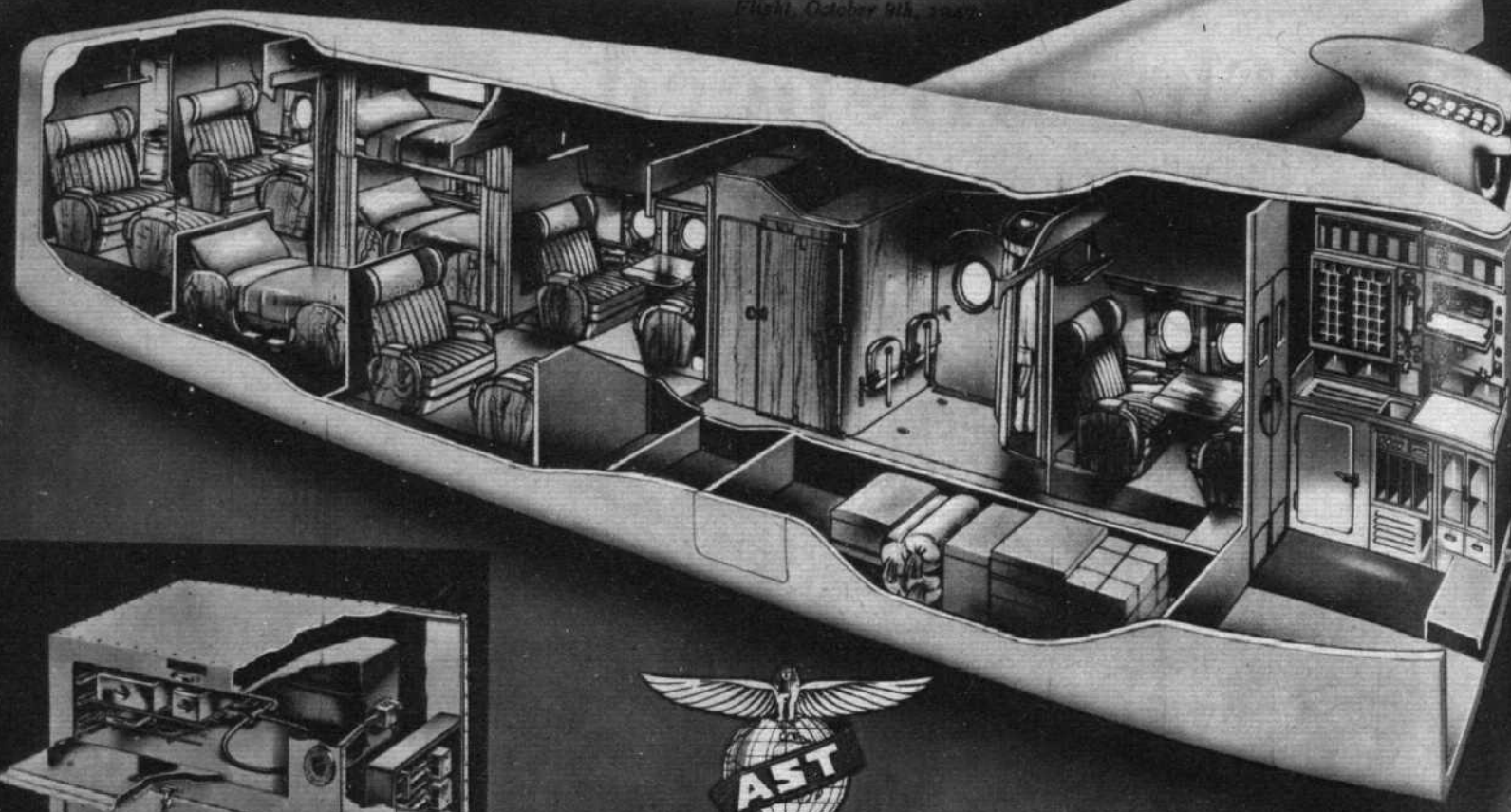


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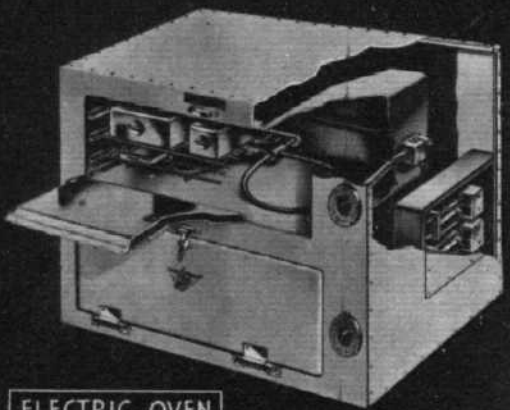
DOWTY EQUIPMENT LIMITED, CHELTENHAM



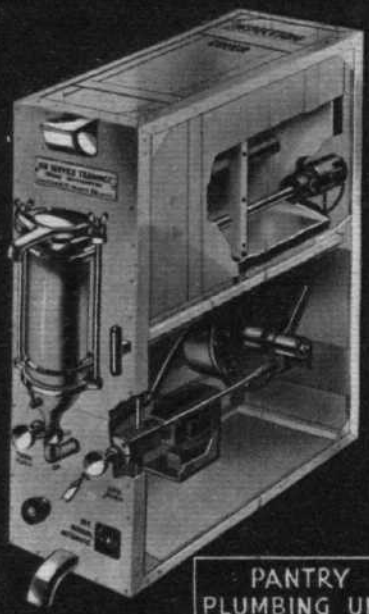
AIRCRAFT DIVISION

Conversion of the Avro "YORK"

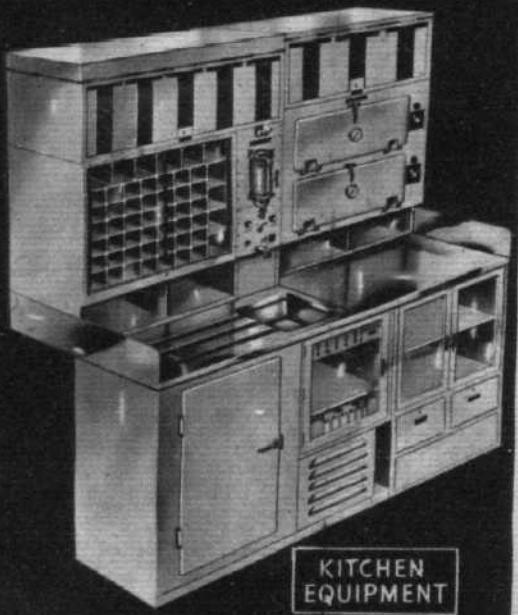
The interior was designed and installed by Britains' foremost Aircraft Repair and Service Organisation



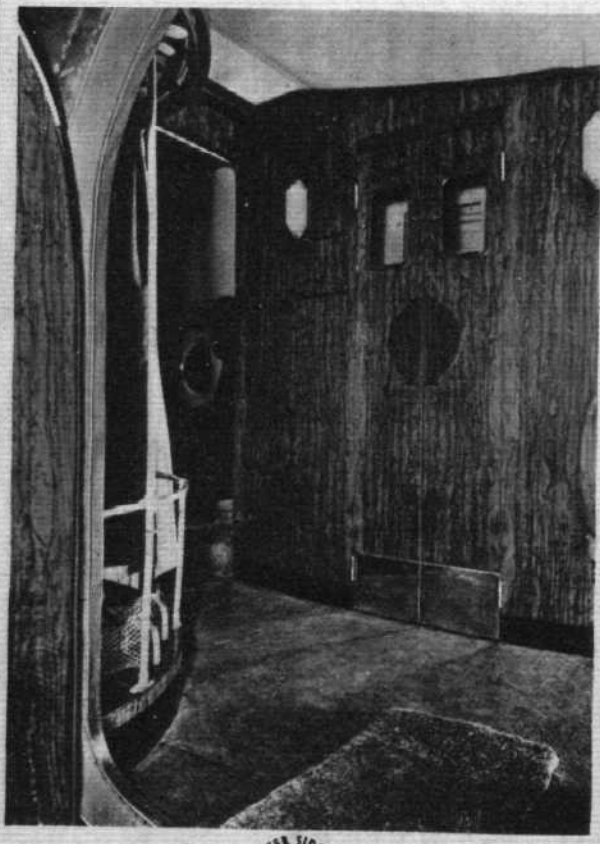
ELECTRIC OVEN



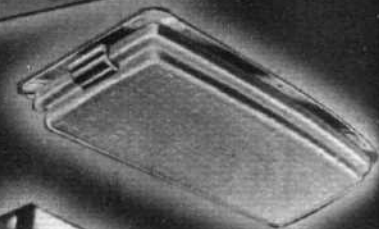
PANTRY PLUMBING UNIT



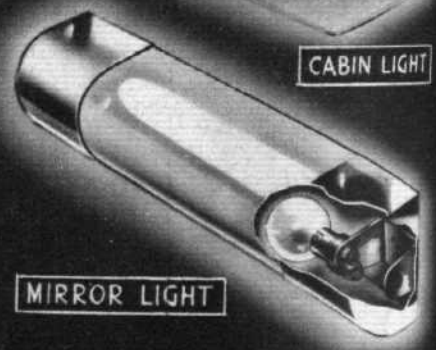
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MIRROR LIGHT



AIRCRAFT CHAIR
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AIR SERVICE TRAINING LTD.
Aircraft Division
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A BRANCH OF THE HAWKER SIDDELEY GROUP



Foothills of the Kyber Pass, site of the range for air firing.

"Flight" photograph.

Recollections of Some Hot Work and Humorous Incidents at a Wartime O.T.U.: Hawker "Dodo"

By F/L. N. EDWARDS

Instructing in India

IMAGINE yourself in furnace-like heat, every movement causing such a deluge of perspiration that you feel like a human shower-bath. Then imagine that instead of being able to cool yourself you have to climb into an oven and sit in it for an hour. If you can do this you will have a fair simile of the conditions under which flying training was carried out during the summer months at the Indian fighter O.T.U. at Peshawar on the North-West Frontier.

THAT the life of an O.T.U. instructor in India was not without its excitement and humorous moments, even in wartime, is indicated by F/L. Edwards' reminiscences. The days of which he speaks are now passed, though not forgotten, and India and Pakistan will in future be responsible for training their own pilots. Squadrons of the Royal Indian Air Force (fighter and transport) have been divided between the two dominions, and at present a second Pakistan fighter squadron, equipped with Tempests, is forming at Peshawar, formerly the base of 151 O.T.U. and the scene of most of the incidents described herewith.

"Dodo" was an old Hurricane transformed for the purpose of teaching pupils to operate pneumatic hand brakes in the correct manner. Previously they only had experience of the hydraulic foot brakes used on Harvards.

"Dodo" boasted three seats!—the extra two being fastened on either side of the cockpit. An instructor was supposed to sit on one of the outside seats while the pupil, in the cockpit,

endeavoured to master the mysteries of taxiing an aircraft with hand brakes. In order to prevent the machine from going over on its nose "Dodo" was fitted with a nose wheel, and there were large spoilers fitted to the leading edges of the wings, presumably to prevent over-enthusiastic pupils from becoming airborne. As a last word in refinement, when the engine became overheated from constant use on the ground, it could be cooled by a spray of water!

Instructing at Peshawar was not without its moments. I remember when I first flew with pupils on air firing exercises, we used Harvards fitted with a reflector sight offset to the left in the front cockpit; and an Aldis sight offset to the right in the back. Unless the pupil, sitting in front, kept his head well over to the left all the poor instructor could see through his sight was a close-up picture of the pupil's helmet.

I was flying one day with a rather nervous pupil carrying out dummy air to air practice on a drogue. He seemed to be coping quite well provided he was left to himself with only an occasional word of correction. Consequently, when his head came in front of my sight during an attack I refrained from howling at him to remove it, in order not to make him more nervous and so spoil his performance. I began to become nervous myself, however, when an unreasonable length of time passed without the curve of pursuit developing into a breakaway. At last I demanded

During April the temperature begins to rise, and by June or July it may reach 120 degrees in the shade. The aircraft, sitting out in the sun all day long, are toasted to an even higher temperature, and those unfortunates who had to fly at midday used to return feeling more like an item for the mess menu—"roasted pilot"—than anything else.

The main work at the O.T.U. right up to the end of the war was carried out in Hurricanes. Old, oil-streaked and slow, they none the less provided excellent training for the Indian pilots. The O.T.U. did boast a Spitfire flight, but only the best pupils were accorded the honour of flying a Spit.

On arrival at the station the pupils carried out a six weeks' course on Hurricanes with Squadron Training Flight, during which time they were taught formation flying, aerobatics, and were given their first general experience of a fighter machine. They then moved on to Air Firing Flight, where for a further six weeks they were trained in gunnery and bombing. Finally, a few selected pupils went on to the Spitfire Flight, while the others carried out Army co-operation work and photography with Fighter Recce. Flight.

Some of the pupils had flown Hurricanes for a short while at Ambala, the Indian S.F.T.S., and had also received training on "Dodo," one of the most fantastic creations ever devised by the minds of engineering officers.

Instructing in India

that he move his head over to the left. He did, and I was confronted with the huge rear end of the drogue completely filling my sight! I pushed frantically on the stick and we managed to scrape underneath, but it was a lot too close for comfort. From then on I always made sure of a complete view of everything that was going on, no matter how many times I had to remind the pupils about their head position.

There was another pupil who proved far too obliging in this head matter. I could not at first carry out my attacks because his large skull completely blocked my view. I pleaded with him, I cajoled him, I bellowed at him, and finally he looked round at me with a great light in his eye. He had gathered what I wanted. His head was in the way. Very well, he must remove it. Without a further moment's delay, he dropped his seat to the lowest position in the bottom of the cockpit, disappearing completely from view. There he stayed, unable to see through his own sight and indeed unable to see out of the cockpit at all. Try as I would I could not persuade him to come up again.

The air to ground firing range was set in the foothills of the Khyber about 30 miles away from the airdrome. The instructor who was sent out to it, or to the nearby bombing range, as range safety officer, frequently had a somewhat difficult time with local tribesmen who insisted on standing dangerously close to the target area in order to collect cartridge cases, spent shells and bomb fragments. On the bombing range they had been known to stand right on the target waiting for their precious scraps of metal. But after all, judging by some of the results, they were perhaps on the safest spot for miles around!

I have particularly fond memories of the pupil who apparently wanted to add to the mass of dials already in the cockpit. After being briefed for air to ground firing he was seen to be wandering around the flight office with a very puzzled look on his face. Finally he plucked up enough courage to approach the flight commander. "But, sir," he said, "there is no indicator in the cockpit to show you when your ammunition is finished!" When the flight commander had recovered his power of speech he assured the pupil that he need not worry unduly about this defi-

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A bouquet should also have gone to another of the pupils for knowing how to squeeze just that extra ten to fifteen miles an hour out of an aircraft. He was on a low-level tactical reconnaissance with an instructor acting as his number two. The instructor, despite fine pitch, wide open throttle and much cursing, only just managed to keep the pupil in sight, and on return to the airdrome desired to know why the pupil had roared round the countryside at such enormous speed. The pupil looked puzzled for a moment, and then brightly responded, "Oh, I know, sir, I was flying slightly nose down!"

But the palm for ingenuity must go to one of the Sikh pupils. On a dual aerobatic check he flicked while doing a roll, and commenced to spin down towards the ground. He made an effort to recover from the spin, and finally the instructor took over and pulled the machine out. "What did you think you were doing?" he bellowed down the inter-com.

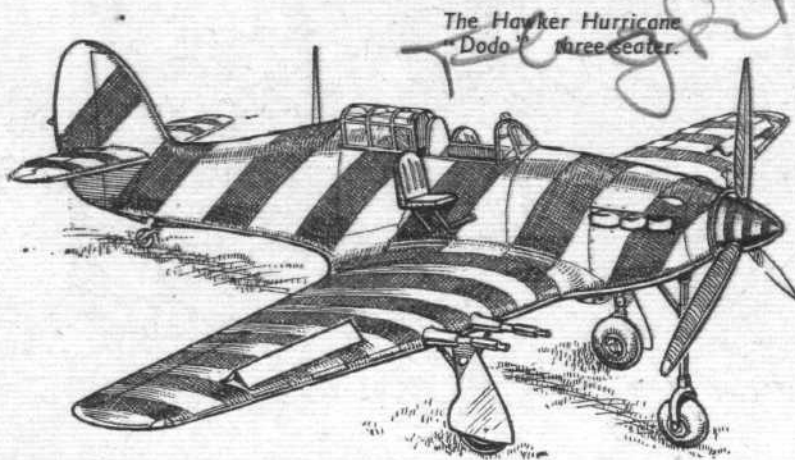
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On another occasion a bright young flying control man answered an enquiry on the 'phone about the arrival of two Expeditors. "No," he said, "they haven't come in yet—but hang on a moment, old man. There's a Dakota coming in now. Perhaps they'll be on it!" Presumably he thought Expeditors were high-ranking officials, coming in to stir things up a bit at the station.

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Flying Control probably did not appreciate the move for it increased their problems immensely. They were faced with the prospect of pupils carrying out solo experience on Harvards, being chased round the circuit by pupils airborne for the first time in Spitfires. As a solution, it was decided that the runway should be used only by the Spitfires, and the grass only by the Harvards, and although at first it was somewhat frightening to find oneself turning inside a Harvard making a "bomber" approach, the two-channel system worked quite well. There were occasional pretty firework displays from the A.C.P., but on the whole flying continued smoothly.



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Instructing in India

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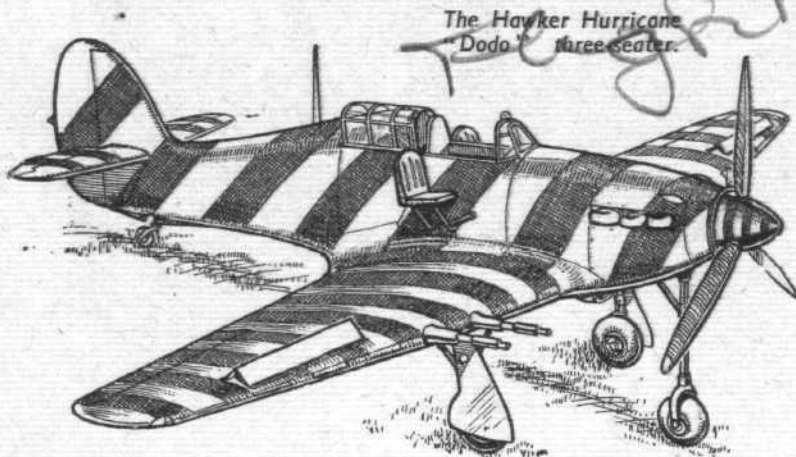
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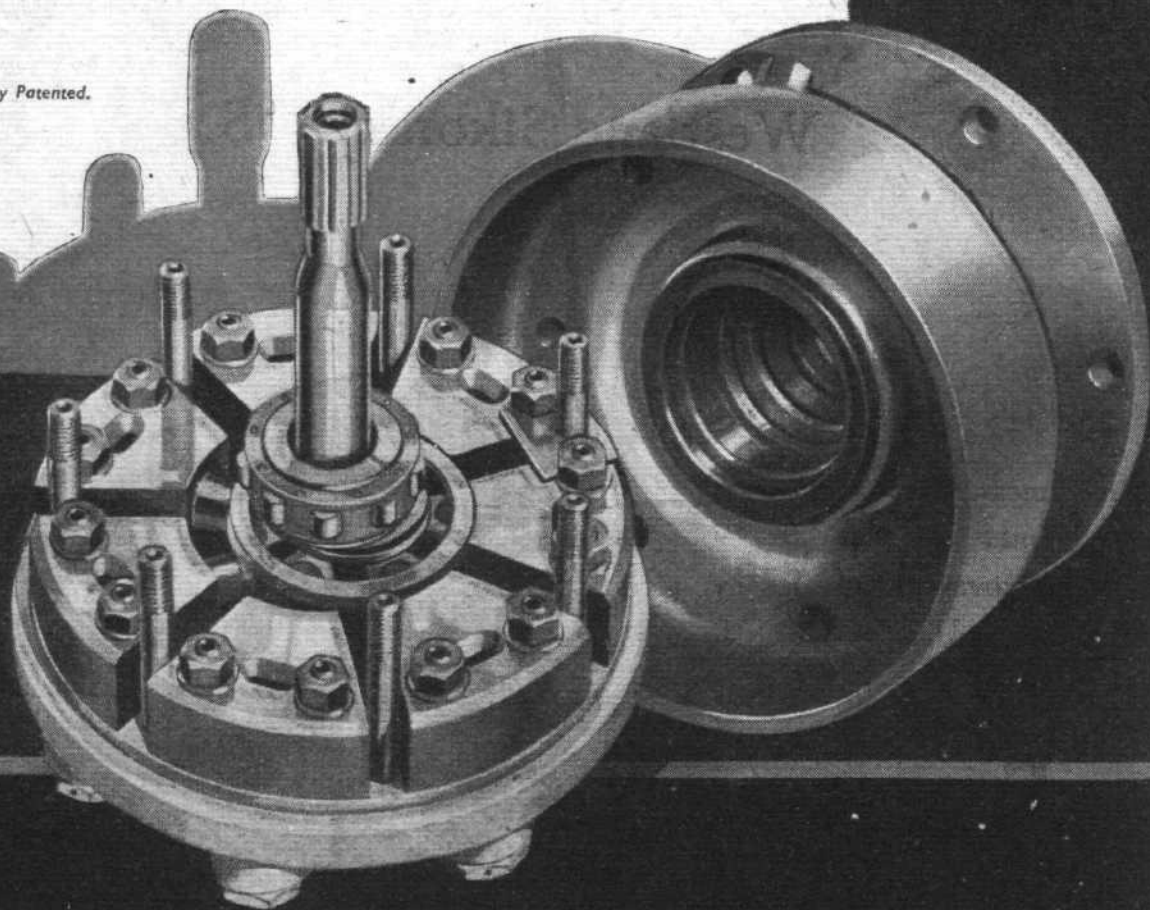
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CIVIL AVIATION NEWS

CHOCKS AWAY: The B.S.A.A.C. Tudor IV "Star Lion" taxiing out at London Airport on Tuesday, September 30th, for a goodwill tour of South America. It was the first Tudor to carry fare-paying passengers, but did not follow a scheduled route. It is expected back in London to-day, October 9th.

Australian-built Aircraft for Feeder Lines : B.E.A. Curtail Services and Economize on Staff : Travel Ban Concession

Report on Civil Aviation Estimates

THE Sixth Report of the Select Committee appointed to examine estimates presented to the House of Commons is connected solely with civil aviation and was published last week. The history of Government organization for civil aviation in the United Kingdom was reviewed and the present system, established under the provisions of the Civil Aviation Act, 1946, was also reviewed and criticized. It was revealed that in August, 1939, the staff of the special Department in the Air Ministry numbered 273, whereas in May, 1947, the staff of the Ministry of Civil Aviation amounted to 4,950, consisting of 1,450 at headquarters and 3,500 at outstations. It is estimated that the implementation of the airport programme will involve an increase to 6,900, followed later by a further increase to about 11,000. The headquarters establishment will be increased to 2,250. The Ministry was criticized for delegating insufficient financial authority to Divisional Controllers and Airdrome Commandants.

Government Indecision

The organization of the three British Corporations was closely examined, and it was found that there had been a delay in deciding upon the programmes to be adopted by the Corporations and upon which depended the grants which should be provided. Such delay had been occasioned by uncertainty of types of aircraft to be available for their use owing to Government indecision. B.O.A.C. had, in fact, prepared three different programmes based on varying assumptions. Government indecision on the acquisition of airports had also affected British European Airways, since no announcement on an airport programme had been made until July 9th, 1947, and even then no indication of development priority was given. The Committee found that the Corporations had endeavoured to effect reasonable economy and had sought to reduce the cost on the servicing and maintenance of aircraft. It was found, however, that there was some overlapping between the Corporations and the Ministry, particularly with regard to passenger handling, police duties, marshalling of aircraft, teleprinter services and in the provision of other similar facilities. On the subject of airports, the estimated expenditure for the year on radio equipment and installations amounted to £857,000, and that was only a portion of the technical services provided. At present the only considerable income at airports was derived from landing fees and rents payable for the use of buildings, and such income was less than half of the expenditure. Again, the Committee criticized the indecision of the Government in stating the amount of importance which was attached to the development of amenities at airports, and there was a consequent hold-up in the development of such amenities for providing an income.

Expenses for ground services on Empire and other routes

showed an increase of £1,315,000 above last year's figure, over £1,000,000 of which was attributable to capital expenditure and was necessary for the development of airfields on the trunk route through Africa to make it suitable for the Tudor II and similar types. Such expenditure was borne by the U.K. as it was not essential for local requirements. B.O.A.C. considered that its financial deficit was partly due to the dispersal of bases in this country, and the Committee expressed the hope that the building of hangars would be given some priority.

Uneconomical Aircraft

Commenting upon the Corporation's fleet of aircraft, the Committee found that for well-known reasons the types were generally uneconomical and slow and gave foreign operators an advantage. It did mention, however, that B.S.A.A.C. had an arrangement whereby some Yorks and Lancastrians were procured on a hire basis from the Ministry of Civil Aviation and others had been purchased outright.

The operating costs have already been mentioned, but the Committee made a special point of drawing attention to the cost of petrol, and estimated the amount of petrol duty paid by B.E.A.C. for the current year on internal services as being £150,000. In reaching conclusions and making recommendations, the Committee observed that it had become increasingly clear that the new organization provided for civil aviation was still at a stage of its development too early for the Committee to formulate any decisive conclusions. Improvements would continue to be made largely as a result of trial and error, but, generally speaking, it had noticed that both the Ministry of Civil Aviation and the Corporations were endeavouring to provide, with reasonable economy, services as efficient as circumstances would allow.

The conclusions, which are printed below, were therefore to be considered as provisional.

(1) *Delay in Governmental Decisions.*—Both the Ministry of Civil Aviation and the Corporations have been hampered by the Government's delay in announcing their decisions on the purchase of aircraft and airdrome development. These delays have caused much work which might otherwise have been avoided.

(2) *The Establishments of the Ministry of Civil Aviation.*—Your Committee accept the assurance that the establishments of the Ministry are under review and that care has been exercised in expanding these establishments to meet current needs. Nevertheless, they emphasize the necessity for strict and constant scrutiny and recommend that, not only the advice and assistance of the Organization and Methods Division of the Treasury should continue to be sought, but also the Ministry should institute their own Organization and Methods Branch. The possibility, owing to inadequate salaries, of limiting appointments to applicants already in receipt of pensions should be avoided and generally the present procedure for making appointments should be reviewed. The delegation of responsibility to Divisional Controllers and Aerodrome Commandants, which is to be revised in the light of experience, also needs special attention. It is important that the interests

Civil Aviation News

of efficiency and economy should not be sacrificed to uniformity and that the Ministry of Civil Aviation should seek to achieve the maximum flexibility in their commercial activities.

(3) *Exchequer Grants.*—Your Committee noted with satisfaction that a grant formula is being agreed and believe that such a formula can simplify consideration of future programmes.

(4) *Demarcation of Functions between the Ministry and the Corporations.*—It appears that any duplication of the services provided by the Ministry and the Corporations can best be avoided by discussion at the airports. Again, however, it is possible that assistance might profitably be sought from the Organization and Methods Division of the Treasury.

(5) *Maintenance of Aircraft.*—Although Your Committee appreciate that each Corporation feels a particular and individual responsibility for the maintenance of its aircraft, nevertheless the Corporations should endeavour to obtain the utmost co-operation and collaboration between their technical and maintenance staffs.

(6) *Acquisition of Land.*—The possibility of transferring to the District Valuer the agency work done by the Air Ministry Lands Branch on behalf of the Ministry of Civil Aviation should be examined.

(7) *Aerodrome Development.*—Whilst it is appreciated that the work is of a specialized nature, the transference of the civil aerodrome construction work of the Air Ministry Works Department to the Ministry of Works should be carefully considered.

(8) *Airport Amenities.*—To reduce the heavy adverse balances shown in the accounts of the larger airports, the immediate development of revenue-earning amenities, even of an improvised nature, which may also help to popularize air transport, should be considered. The Director of Amenities should submit his report without any delay.

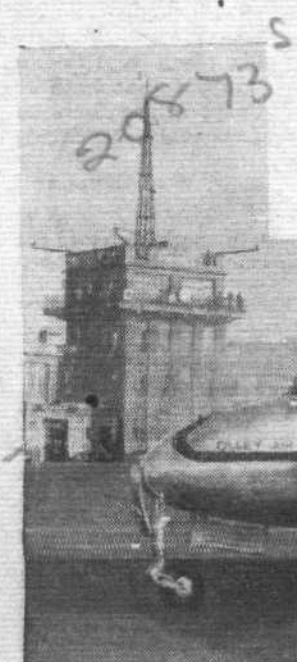
(9) *Landing Fees.*—Your Committee noted with some concern the difficulties caused by high landing fees, especially to B.E.A.C. on internal lines. Whilst the Ministry's endeavour to make airports self-supporting is appreciated, their scale of landing fees should be reviewed where they amount to such a proportion of the total operating costs as to deter services on routes well suited to air transport.

(10) *Petrol Tax.*—Your Committee observed that the cost of petrol duty to B.E.A.C. for the current year on internal services is estimated at £150,000. The suggestion that internal air lines should receive relief from petrol tax, of course, involves fiscal considerations, but Your Committee call attention to the fact that the Report of the Cadman Committee,* presented in 1938, stated:—

"In view of the fact, however, that this tax bears far more heavily on aviation than on motor transport, owing to the much higher-powered engines necessarily employed, with correspondingly increased fuel consumption, there is, in our opinion, justification for re-examination of the matter."

(11) *Hangar Construction.*—The absence of adequate hangar accommodation adds to the maintenance costs borne by the Corporations. It was maintained by the Ministry that, owing to unsuitable hangar accommodation, it is at present impossible to service Constellations in this country. Exceptional priority in labour and materials should, therefore, be afforded to ensure the early completion of the accommodation necessary to enable Constellations and the new types of British aircraft to be accommodated and serviced in this country. The use of Dorval is clearly uneconomical. During their enquiry, Your Committee learnt with satisfaction that the Ministry have set up a joint working party to expedite the transfer to this country of the Dorval servicing organization. Presumably, this working party will also examine

* Report of the Committee of Inquiry into Civil Aviation, Cmd. 5685.



Olley Air Service Ltd., took recent delivery of their first de Havilland Dove, a standard eight-seater. Further deliveries are expected shortly, and the next model will be more lavishly equipped and have seats for only six passengers.

the possibility of utilizing accommodation already available. It is desirable that it should present its report at the earliest opportunity.

(12) *Prestwick.*—Every effort should be made to conclude the protracted negotiations between the Ministry and Scottish Aviation Ltd., and to complete the survey to determine the future development and status of the airport. Your Committee consider that in the final arrangement made between the Ministry of Civil Aviation and Scottish Aviation Ltd., endeavour should be made to provide for the utilization of the skill and experience at present engaged.

(13) *Aircraft Construction.*—Your Committee are satisfied that the Ministry of Supply are now playing a useful part in promoting research and development of aircraft construction. On financial grounds alone, it is necessary that the Ministry of Supply should continue their responsibility for ordering prototypes of aircraft of new design. Your Committee, on the other hand, were impressed with the need for close co-operation between the Corporations and the constructors in the exchange of information and in the provision to the constructors of as much operational information as possible. It was suggested by the Society of British Aircraft Constructors, Ltd., that at present the Corporations are not able to supply the technical information required.

53. In conclusion, Your Committee emphasize the preliminary nature of their present enquiry. A useful purpose has undoubtedly been served, but, in view of the importance of ensuring that the formative development of civil aviation shall be conducted with all reasonable economy and efficiency, Your Committee recommend that a further enquiry be made next Session and that, in particular, a special examination be made of the Estimates for the Brabazon I prototypes and the construction of London Airport.



"Flight" photograph.

DIRECTORIAL APPROVAL: Captain G. P. Olley, on the right, talking enthusiastically to his co-director, Mr. John Elliot, about their newly acquired Dove.

AUSTRALIAN FEEDER AIRCRAFT

THE de Havilland Aircraft Pty., Ltd., the Australian company, have disclosed that the prototype of the *Drover* is now complete. This aircraft has been designed by the company to meet the requirements of Australian feeder line operators, and will be powered by three Gipsy Major engines. The span is 57ft, fuselage length 38ft, and a cruising speed of 135 m.p.h. and range of 500 miles in still air are expected.

"Flight" photograph.

The fuel consumption will be 22½ g.p.h. Seating will be provided for six to nine, and the all-up weight will be about 6,500 lb. It is understood that the structural design is based on the Dove principles, but no further details, especially in connection with deliveries or price, will be released until the prototype has been flown and the estimated performance figures verified. The *Drover* will have a tailwheel undercarriage and will conform to I.C.A.O. requirements for safety during take-off.

B.O.A.C. ATLANTIC DIVISION

DISCUSSIONS are taking place between B.O.A.C. and the Ministry of Civil Aviation on the possible transfer of the Corporation's North Atlantic base

from Dorval, Montreal, to an airfield in the U.K. The Corporation have found it convenient to use Dorval as a maintenance base owing to the shortage of hangarage for very large aircraft in this country, and also to economize in the transport and storage of spare parts. The dollar situation has, however, made investigation necessary, and if economy reasons demand a change, then hangar accommodation will have to be found in this country.

It is understood that whilst the B.O.A.C. Atlantic Division has been stationed in Montreal the Canadians have given every possible assistance and have made many of their own facilities available to the Corporation.

B.E.A. SCHEDULES AND CUTS

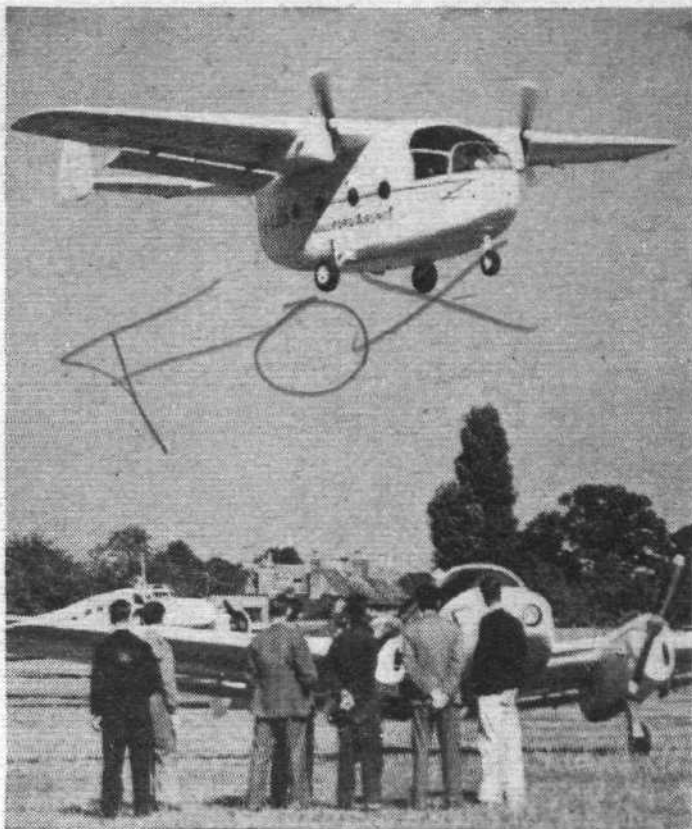
IN addition to the normal reduction in schedules which would be made at this time of the year, British European Airways have had to take into consideration the effect of the ban on travel overseas for pleasure purposes. On October 6th the winter schedules came into operation on all services except those to the Channel Islands, which although reduced will not feel the full effect of the reduction until November 2nd.

When the full effect of the travel restrictions on the volume of traffic have been felt, still further cuts may be necessary, or the Corporation may switch aircraft at present flying on some routes to others more profitable. It may, on the other hand, be possible to increase internal services if the effect of the ban has been to stimulate the demand for air transport in the U.K.

Services from Paris have been reduced from 35 to 20 services per week. This compares with 21 services during last winter with Dakota aircraft. Services from Brussels have been reduced by half from 14, but there have been no other major reductions, and the service from London to Vienna will be the only one not flown with Viking aircraft. There has been a slight adjustment on routes to Scandinavia, however, and the service for Stockholm will stop at Copenhagen en route; that for Oslo will stop at Gothenburg, and the service from Glasgow to Copenhagen will stop there also. In future, Stavanger will not be used. There have been drastic cuts on some of the internal services, including cancellations of the London-Prestwick service, and the services from the Isle of Man to Blackpool and Carlisle, between Cardiff and Bristol, from Bristol to Southampton, from Belfast through Carlisle to Newcastle, from Prestwick to Belfast and the popular service from Cardiff to Weston-super-Mare.

The Corporation have also announced that owing to the economic crisis and the curtailment of pleasure travel there will have to be a cut in the number of staff. The announcement states that after careful consideration of all relevant factors and a detailed analysis of present requirements, a cut of one-third of its present staff must be made. This will affect between 2,000 and 2,500 personnel. The selection of staff is being given the most meticulous consideration and the general principles governing their release have been discussed fully and agreed in detail with the trade unions at the Joint Council for Civil Air Transport. B.E.A. have undertaken to advise the other Corporations of any staff being released in order that full consideration may be given to the possibility of their being absorbed by either B.O.A.C. or B.S.A.A.C., who have promised to co-operate. They have also undertaken to deal individually with each case so that full weight may be given to any special circumstances and so to avoid exceptional hardship.

The Treasury announced last week that the restriction on



NEW CHARTER COMPANY: Culliford Airlines, Ltd., has been started by the steamship company Culliford and Clarke. The new company took delivery on September 24th of a Gemini and an Aerovan from A. & A. Ltd. The same company later delivered another Aerovan and a Merchantman.

travel by non-British means of transport had been withdrawn, and travellers are now permitted to buy return passages to their destinations by the normal direct route irrespective of the "flag" of the means of transport and of the object of the journey, provided they pay in sterling to an agency in the U.K. No foreign exchange will be issued for use outside the scheduled territories except for approved purposes.

SIGNIFICANT SAFETY WARNING

IT is surely a reflection upon the operations and training organizations of the major airlines flying scheduled services into the U.K., that the Ministry of Civil Aviation have found it necessary to issue an urgent warning to pilots on the subject of landings in poor weather conditions. The Notice states that at London Airport recently, during bad weather conditions, a number of pilots experienced difficulty in making a satisfactory approach with the available instrument-approach aids, probably because they were out of practice as a result of the recent exceptionally long spell of fine summer weather. It will be apparent to all, the Notice continues, that unsuccessful attempts to let down may give rise to a dangerous situation and may also cause considerable dislocation of air traffic. It concludes by drawing the attention of pilots to the need of maintaining themselves at a high standard of competence in that aspect of their flying duties.

One of the major European lines has recently lodged a protest with the Ministry of Civil Aviation against a delay in landing of 2½ hours, during which time the company's twin-engine aircraft was circling the airport to the consternation and bewilderment of its passengers. Although the Notice draws the attention of all pilots to the necessity of maintaining a high standard of instrument and blind-approach flying, the main responsibility must rest with the operating companies since during the good weather in the summer months the only practice available would be on the synthetic trainers. It would seem, however, that in the case of the incident at London airport, where G.C.A. is installed, either the aircraft



PERCIVAL DEVELOPMENT: A model of the Prince. This development of the Merganser will be powered by two Alvis Leonides. It will have a wing span of 56ft. and the fuselage will be longer than the Merganser's by 8ft. The maximum speed is expected to be about 227 m.p.h.

Civil Aviation News

causing the initial delay, was not fitted with V.H.F., or it was being flown by a pilot unable to understand English, or he had no confidence in the equipment. In such cases it would seem necessary to allow only two or three unsuccessful attempts to be made and then without hesitation to divert the aircraft elsewhere.

B.E.A. HELICOPTER DEMONSTRATION

RECENTLY, at Hampden Park, Glasgow, B.E.A. demonstrated to the public the Westland Sikorsky S.51 helicopters with which the Corporation will shortly fly experimental dummy mail operations in the West of England. Mr. J. G. Theilmann, Senior Pilot of the Experimental Helicopter Unit, and Mr. Alan Bristow, Chief Helicopter Pilot of Westlands, made the demonstrations. About 15,000 people watched from the public stands while the two helicopters flew about 70 Scottish dignitaries out of the stadium for short flights. During the afternoon Mr. Bristow showed the extreme versatility of the helicopter with precision horizontal and perpendicular flying. The crowd appreciated the highlight of the demonstration when the helicopter "rescued" the occupant from a dinghy floating in a water tank.

Helicopter trials have been made from time to time in the United States, and an American operator recently secured approval for a mail service in Los Angeles. The B.E.A. experiments are, however, the first of their kind in Europe, and will explore all the operational aspects as well as problems peculiar to the delivery of mail. Mr. Theilmann will be in charge of the experiments and will be assisted by four pilots of the Helicopter Unit.

A.R.B. NOTICES

THE Air Registration Board have re-issued Notices Nos. 2, 6 and 10, and issued new Notice No. 21.

Notice No. 2, issued for the fourth time, deals with aircraft engineers' licences and the supervision of licensed aircraft engineers. Notice No. 6, issued for the fifth time, is in connection with British airworthiness requirements. Notice No. 10 states the categories of aircraft engineers' "M" licences. Notice No. 21 refers to recent fires in engine bays caused by the saturation by inflammable liquids of the lagging of flexible pipes. It calls for regular inspection and replacement.

AUSTER ACCIDENT

THE Chief Inspector of Accidents has reported on the accident to Auster G-AGWZ which occurred at Haddington, East Lothian, on May 20th, 1947. Mr. Morrison, the owner and pilot of the aircraft, had arrived at Amisfield Farm about 1415 hours on the day in question after a delivery flight from Brough. About three hours later he attempted, accompanied by a Mr. Seaman, to take off from the same field. The field allowed a take-off run of 360 yards on a surface which was

firm and fairly even, but covered with thick, long grass. During the take-off the aircraft had almost reached the far corner of the field when it rose about four feet and crashed into the top of the wall. It fell on to its back in the next field and burst into flames. Both occupants extricated themselves, but Mr. Morrison died of burns. The Inspector considered that the accident was the result of an attempt to take off from a small field in unfavourable conditions without using the flaps and that the pilot committed errors of judgment and flying technique which were attributable to his inexperience, and inability to appreciate the hazards involved. It is understood from the report that since this accident, there have been three others under somewhat similar circumstances, i.e., light aircraft taking off from fields, and the attention of all pilots is drawn



SKY HOOK: During the B.E.A. helicopter demonstrations the Westland Sikorsky lifted supplies in a mesh container and loaded them gently into a waiting truck.

to the necessity of assessing carefully the prevailing conditions before attempting to take off.

SOUTH AFRICAN CONTRACTS

IT is now some months since Mr. F. C. Sturrock, Minister of Transport in South Africa, requested that tenders be submitted for the operation of feeder services in that country. Most of the South African charter companies—of which there are over 40—and the State-operated African Airways submitted proposals. The Minister has lately announced four contracts awarded to private companies, Air Trans Africa are to operate services covering 5,000 route miles over most of the country; Northern Cape Flying Services of Kimberley will serve ten towns in the Kimberley area; Karroo Flying Services will provide local routes to fifteen towns in the Karroo area, and will also operate a schedule to Port Elizabeth; and Commercial Air Services of Johannesburg will operate services circling Basutoland with extensions to the Rand, Durban and East London.

BREVITIES

The revised boundaries of Flight Information Regions in the United Kingdom as announced in Notice to Airmen No. 270/47 and as described in *Flight*, September 11th, became effective on October 1st.

Lord Nathan, who is discussing civil aviation problems with Siamese officials, announced that a British Mission will shortly visit Bangkok to negotiate a civil aviation agreement with Siam. He predicted more air links with Bangkok.

T.A.A. started a service from Adelaide to Darwin on October 1st and the Guinea Airways' licence for the same route lapsed on that date. The Prime Minister of South Australia has lodged a protest in view of the previous assurances that Guinea Airways would be permitted to run in opposition to T.A.A.

Details of Hong Kong Airways appeared in *Flight*, July 31st, and so far two aircraft have arrived out there. When formalities required by the bi-lateral agreement with China have been completed the company intend to operate three services each

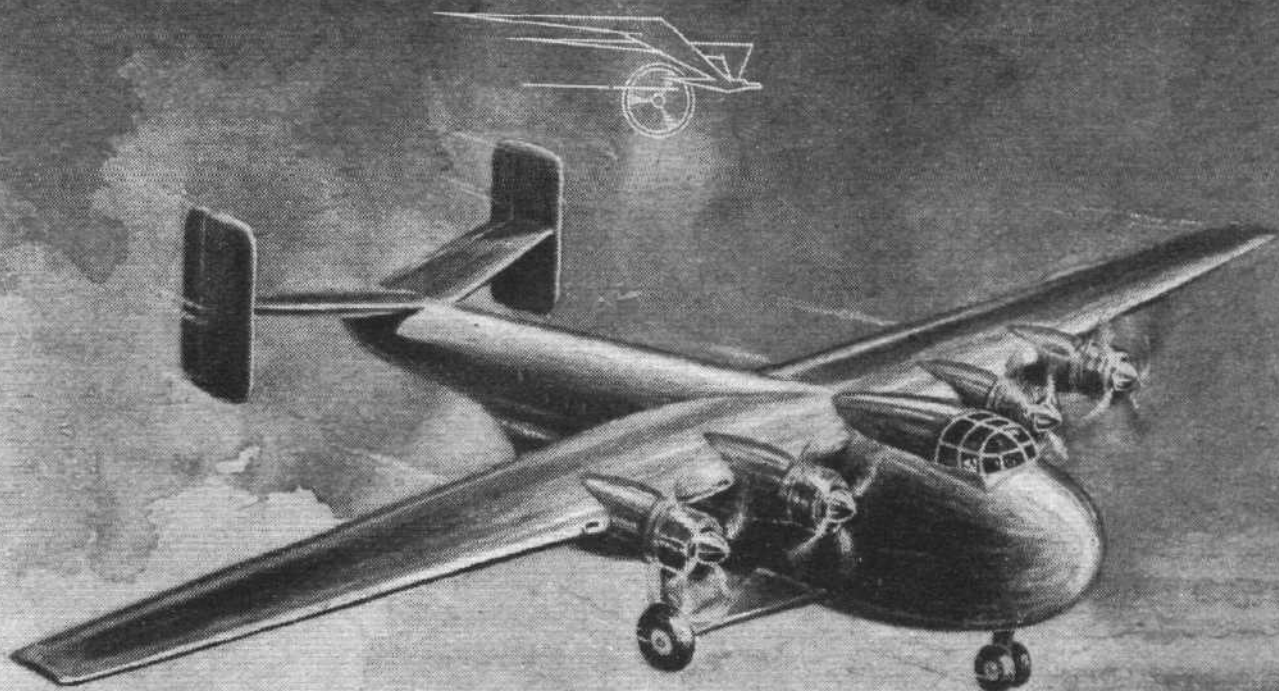
week to Shanghai and three services each day to Canton. The company's agent for Hong Kong, China and Japan is Jardine, Matheson, Ltd.

Subsequent to the announcement that Swissair would operate a transatlantic service between Geneva and New York with Skymasters, it was announced that K.L.M. would be responsible for all phases of the Swiss company's operations in North America. Swissair will operate three more flights this year, but in 1948 one scheduled flight will be made each month and the frequency will be increased if warranted. Stops will be made at Shannon and Gander.

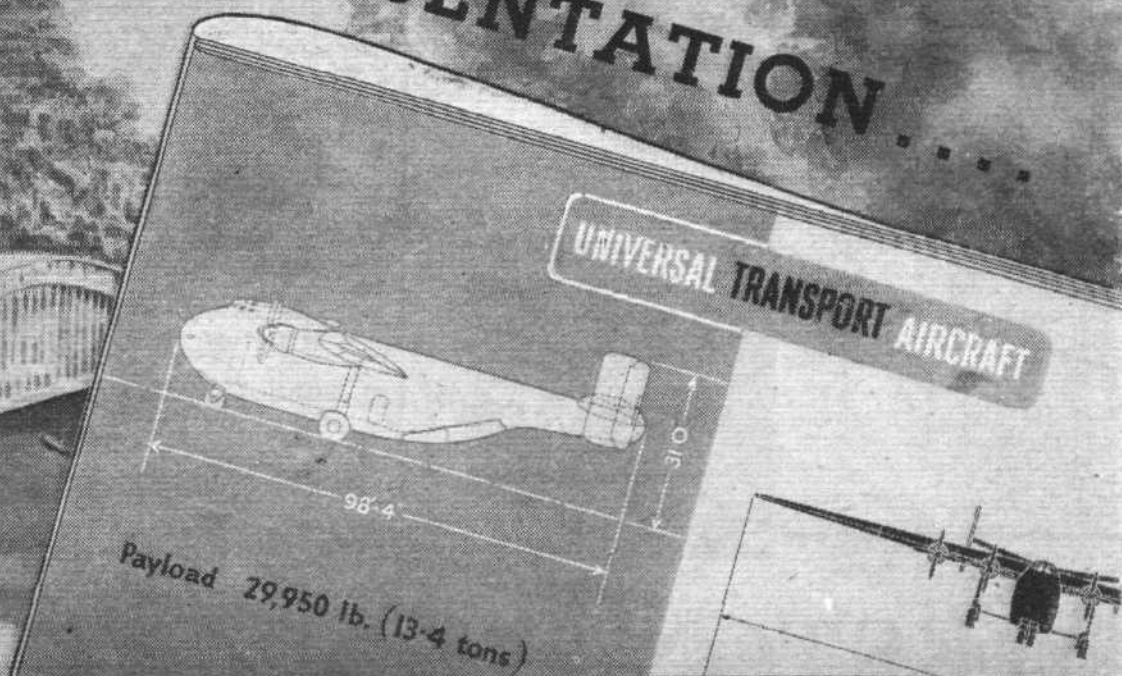
A plan for the purchase of five Lockheed Constellations for use in their overseas air service has been submitted by the Czechoslovak Ministry of Transport.

From Wednesday, October 1st, the Divisional Controllers of the London and South-Eastern Division Air Marshal Sir Roderick Carr) and the Scottish Division (Air Commodore J. G. Murray) commenced to function fully in the technical and

WINGS ARE THE WHEELS OF **TO-DAY**

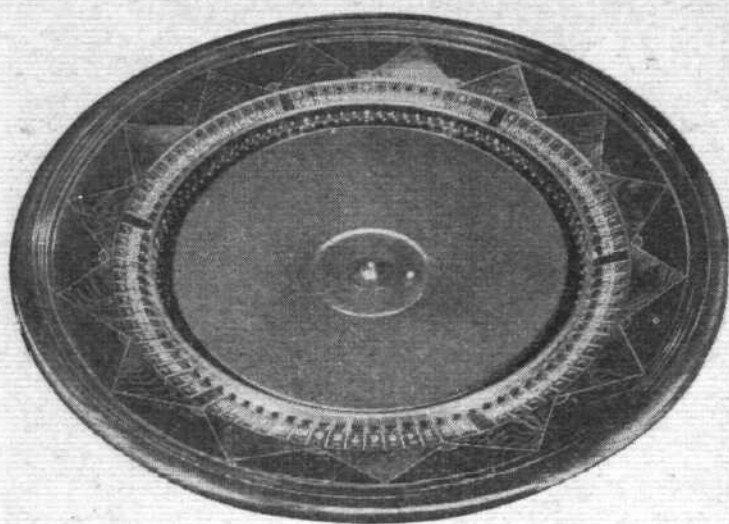


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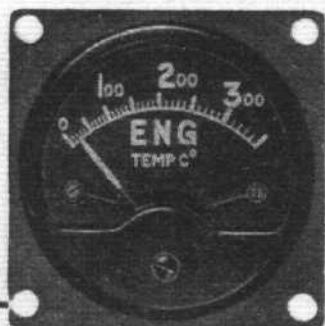
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Civil Aviation News . .

operational fields. The existing organizations dealing with Air Traffic Control and Telecommunications in these areas have already been absorbed and operational staff have been posted.

Representatives of B.O.A.C., K.L.M., Pan American Airways, Philippine Airways and the Siamese Air Corporation attended a recent conference called to consider aviation problems relating to East Asiatic countries.

Pan American Airways will start on October 11th a service to bring Buenos Aires, Argentina, and Washington within 24 hours of each other. The company plan to fly a service taking 20 hours from Miami, stopping at Balboa, Panama and Santiago.

The Ministry of Civil Aviation announce that a civil aviation agreement providing for the reciprocal grant of facilities in their respective territories for the operation of scheduled air services, was signed between the U.K. and Uruguay on September 26th.

Hunting Aviation, who were responsible for the passenger handling organization over here of the Ontario air emigration scheme, have arranged to fill the east-bound Skymasters with Beechcraft Bonanzas in crates, for assembly in this country and distribution to buyers on the Continent. Field Aircraft Services—a member of the Hunting Group—are responsible for assembly of the Bonanzas at their aircraft repair and service division, Croydon Airport. No arrangements have yet been made for sale of these aircraft in the U.K.

Field Aircraft Services, Ltd., announce the appointment of Paul Godfrey as their Sales Manager following the transfer of David M. Bay to Percival Aircraft, Ltd.

It is understood that New Zealand Railways wish to buy two Bristol Freighters to operate the Cook Strait air freight service, at present flown with Dakotas borrowed from the



AIRMINDED HOLIDAYMAKERS: One of the Fairchild's owned by Butlins holiday camps' air division, flying over Crickieth Castle, N. Wales, giving joy rides to campers. The recent withdrawal of basic petrol for pleasure flying will ground, at any rate temporarily, such aircraft of which there are many, and which were assisting in making the public air-minded.

National Airways Corporation. The railways consider that since cargo is carried by rail to the airfields it would simplify matters if the railways were responsible for the entire journey. The N.A.C. are reluctant to allow the development of private commercial flying, and in all probability the present arrangement will continue.

The C.A.B. in Washington announced recently that the U.S. mail ton-miles flown by the 16 domestic trunk air lines from June 30th, 1946, to June 30th, 1947, was 31,384,363 as against 49,946,860 for the previous twelve months; revenue miles flown for the same period increased from 254,777,415 to 314,067,218; revenue passenger miles from 4,491,162 to 6,161,818; express ton-miles from 18,222,638 to 28,038,566; and freight ton-miles from 5,065,786 to 22,832,216. Revenue Passenger Load Factor (per cent of seats occupied) was 71.29 as against 85.96 last year.

FROM THE CLUBS

FOR the Luton Flying Club the month of September has been rather disappointing. High winds and poor visibility have restricted flying training from Luton airport, and many members who took advantage of the August sunshine to make their first solo have had little opportunity to further their flying experience. However, five members of the Club accomplished their first solos in spite of the unfavourable conditions. It is hoped that the recent petrol restrictions will not unduly hamper operations, as the airport is served by an adequate bus service and, in an emergency, the Club may be able to supply transport for members.

Successful monthly dances were held at the Derby Aero Club at the end of August and September and it is planned to hold the Annual Ball during the latter part of November. The Club has been well represented in recent events at Lympe, Rednall, Bridlington and Pwllheli, and lately three more members have reached the solo stage.

In spite of numerous difficulties experienced this summer, including a disastrous fire, the Herts and Essex Club at Broxbourne are carrying on successfully, and in fact doing a record amount of flying. At the time of writing, the Club was awaiting delivery of a new Tiger, and a further Tiger is being built from "cannibalized" spares. A licence to rebuild the large hangar, which was burnt-out in the fire, has not yet been obtained, but negotiations are proceeding. In order to combat the transport difficulty, the Club is to run a car-hire service to assist members in reaching the airfield. Because of the present catering difficulties, the Club's Annual Ball this year will take the form of a buffet-dance, to be held in London at the end of November.

The Cinque Ports Flying Club at Lympe is carrying on during the winter with full flying facilities for all its members under the direction of one of its pre-war instructors, S/L. R. N. Hackney A.F.C. A Tiger Moth and an Auster will be operated for instructional purposes, and further aircraft will be added as the demand increases. Charges for dual and solo will remain for the present at £3 10s per hour in the Tiger and £3 per hour in the Auster. Arrangements have been made for twin-engined aircraft to be available for private charter-flying when required.

The flying club will be closed each Tuesday, but the Lympe Country Club, which adjoins the airport, will extend hospitality to all flying club members and travellers by air who may arrive on that day. Mr. Norman Hunt, of the Lympe Flying School (Hunting Flying Clubs, Ltd.), which ceased to operate at Lympe on September 30th, has now joined the staff of Cinque Ports Flying Club and will be happy to welcome his past and present pupils. The Club membership subscription is £1 1s per year.

The Coventry Aero Club, which has just taken delivery of its second Tiger Moth, is planning to start a gliding section as soon as possible. The Club is proving popular, and the membership figure of 140 appears still to be increasing. At the present, flying-training takes place on Mondays, Wednesdays and Fridays, in addition to the considerable amount of flying at the week-ends. On September 28th a social and informal dance was held in the Club headquarters at Whitley to welcome Mr. H. N. Woodhams, President of the Club, and Mrs. Woodhams, back from a trip to America and Canada.

Mr. Eric Franklin, who will shortly be taking the A.W. 52 Flying Wing on its maiden flight, and Mr. W. H. Else, two of Armstrong Whitworth's test pilots, are giving their services to the club as honorary instructors.

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.

R.N.V.R. AIR SQUADRON

Why is Northern Ireland Left Out?

I HAVE read in *Flight* and in the daily Press about the formation of R.N.V.R. Air Squadrons in Great Britain, and wonder why Northern Ireland has been left out of this scheme. I am sure there are many ex-members of Naval Aviation in Northern Ireland, who, like myself, would appreciate an opportunity of keeping in touch with their former Service and its latest developments. Perhaps the Admiralty would consider forming a squadron over here.

R. L. ANDERSON.

RUNWAY SIGNALS

Bells for the Colour-blind

REFERENCE Peter Croft's letter "Runway Signals—Why Not Green Lights?" I would like to bring to his notice a system that has been used for the past six years on at least one R.A.F. airfield.

The traffic on the perimeter track is regulated by traffic lights operated from Flying Control. When an aircraft is on the approach, the lights are changed and all traffic is halted at a yellow line, at least 50 yards from the runway entrance. As an additional safeguard and for the benefit of short-sighted and the colour-blind, a bell also rings when the red light is on.

Surely, this system, besides relieving the Runway Controller of an irksome task, is a far safer system.

"AIR-MINDED EX-ARMY."

NATIONAL GAS TURBINE ESTABLISHMENT

Power Jets (R. and D.) Ltd. an Independent Company

IN your review of the activities of the National Gas Turbine Establishment in the issue of September 25th, you listed as a branch of the N.G.T.E., "a London office where administrative, commercial and patent matters are handled."

I presume that by this you are referring to Power Jets (Research and Development), Ltd. When the Government transformed the company, which it had created out of the original Power Jets, Limited, into the National Gas Turbine Establishment, it retained, under the company's name, a small administrative firm to handle and exploit to the national advantage its gas turbine patents. Although wholly Government-owned and working in close co-operation with the N.G.T.E. and M.O.S., it nevertheless functions as an independent limited company.

It has already contributed, in terms of profits, some hundreds of thousands of pounds to the national revenue and following its policy of active support for British industry at home and abroad, will continue to have a useful, if separate, existence.

W. E. P. JOHNSON, Director,

Power Jets (Research and Development), Ltd.

FLYING-BOATS IN ARGENTINA

Need for Air Conditioning

AS an old enthusiast of the British flying-boat with its world-renowned qualities in the service of our Empire and foreign routes, and knowing your journal's constant plea for the Short and Saunders Roe products in this type of aircraft, I was naturally somewhat concerned to read the following report in the journal *International Aviation* for July 18th last (which has just been read by the undersigned—a trifle late, I'll readily admit).

"The Argentine internal airlines Aviacion del Litoral Fluvial Argentino (A.I.F.A.) has approached Air Research Manufacturing Co. of Los Angeles to devise a cooling system for its 45-passenger Short Sandringham flying-boats used on the route between Buenos Aires and Asuncion. With summer ground temperatures often reaching 113 degrees in the shade, cabins of this aircraft quickly become suffocating on even the briefest stops, causing extreme passenger discomfort. Aluminium sheet temperatures are said sometimes to reach 176 degrees F. in the summer months out here."

With the prestige of British aircraft in the South American republics being of the utmost importance in our industry's export drives to sell more and more of our transport aircraft in these countries, such reports as the one just quoted are not to be lightly taken by our aircraft builders, on whom so much

depends nowadays. Can it be that my old friends Short Bros. have fallen down badly in the kind of intensive research work these problems of "air conditioning plant" need in these Sandringham boats, five of which, I understand, were sold to the Argentine?

I should have thought that all the vast amount of data on this subject which could have been acquired by Shorts from the British operators of these boats, plus further data from the R.A.F. Transport Command, who operated converted Sunderlands in the tropics during the war years, would have enabled Shorts to have licked these problems, and that the boats which were sold to Argentina would have had as near as possible 100 per cent operating efficiency in the tropics. It makes it all the worse in this instance because the airline concerned has decided to let an American company do this important modification.

I should be most interested to hear any of your readers' views on this particular case.

DENNIS M. POWELL,

Cairo.

EXECUTIVE AIRCRAFT

American Comment on Sir Roy Fedden's Article

HAVING just received my August 28th copy of *Flight*, I should like to submit a few comments on the article by Sir Roy Fedden pertaining to executive aircraft.

Concerning his specification, only two comments are made. The installation of a private lavatory in a 4-5-place airplane is apt to be extremely expensive in weight and drag. In addition, if expense and performance are highly important, the use of two engines should be carefully compared with one engine of equal total power, since the added safety factor involved may not be considered enough by any business operating on a strict budget, to outweigh the additional expense.

The actual aircraft characteristics suggested in the article have been substantially met or exceeded by an American aircraft designed some ten years ago. The aircraft to which I refer is the Spartan "Executive," which is compared with the aircraft proposed by Sir Roy Fedden as follows:—

	Fedden Design.	Spartan "Executive."
Take-off weight, lb.	5,000	4,400
Wing area, sq. ft.	280	250
Wing loading, lb./ft ²	18	17.6
Power loading, lb./h.p.	10	11
Take-off power, h.p.	500	400
Cruising speed, m.p.h. ..	200	208
Range, miles	1,000	900

On the surface it seems somewhat ridiculous to introduce the added complexity of two engines with extension shafts, gear boxes, clutches and dual rotation airscrews in either of the configurations proposed by Sir Roy Fedden, when the desired performance can be obtained by an already existing lighter, lower-powered machine. Thus, the conclusion seems inescapable that Sir Roy is more interested in drumming up business for further development of his flat engine design than in designing the best aircraft with the desired performance.

Ohio, U.S.A.

M. T. HOCKMAN.

FORTHCOMING EVENTS

- Oct. 9th.—Royal Aeronautical Society: "Pressurization of Aircraft." W. M. Widgery, F.R.Ae.S.
- Oct. 11th.—British Interplanetary Society: An introductory talk, "The Interplanetary Project."
- Oct. 19th to Nov. 24th.—Royal Aero Club of Belgium: Air rally to the Belgian Congo. Brussels to Le Kivu.
- Oct. 21st.—R.Ae.S. (Graduate and Student). "Interplanetary Flight and Rocket Propulsion." A. V. Cleaver, A.F.R.Ae.S.
- Oct. 23rd.—Royal Aeronautical Society: "The Problem of High Temperature Alloys for Gas Turbines." Sir William T. Griffiths, D.Sc., F.R.I.C., F.Inst.P., F.I.M.
- Oct. 25th.—Helicopter Association of Great Britain: "Some Work with Rotating Wing Aircraft." O. L. L. Fitzwilliams, B.A.
- Oct. 30th.—Royal Aeronautical Society: Third British Commonwealth and Empire Lecture. James Bain.
- Nov. 1st.—Society of Licensed Aircraft Engineers: "Aircraft Pneumatics." H. R. Haerle.
- Nov. 4th.—R.Ae.S. (Graduate and Student). "Maintenance Difficulties in the Field." M. J. Kemper, M.B.E., A.R.Ae.S.
- Nov. 6th.—Royal Aeronautical Society. "Some Recent Developments in the Landing Gear Field." Capt. R. Lucien, A.F.R.Ae.S.
- Nov. 8th.—British Interplanetary Society: "Electronics and Space Flight." Arthur C. Clarke.



COMBINED OPERATION: Three Lancasters from Stradishall airfield formate over the East Anglian countryside. EM-D No 207 Sqn; KO-J No. 115 Sqn; CJ-A, No. 149 Sqn.

R.A.F. Appointment

THE Air Ministry announces the appointment of A. Cdre. H. J. Roach, C.B., C.B.E., A.F.C., as Air Officer Commanding No. 43 Group, Maintenance Command, with the acting rank of Air Vice-Marshal.

Since November last A. Cdre. Roach has been in command of R.A.F. Station St. Athan, and was formerly Command Engineer Officer, Bomber Command.

Fitting Out Australian Carriers

THE Minister for the Navy, Mr. Riordan, has announced that Australia will seek 90 of the most modern aircraft from Britain to man the two aircraft carriers on order. He said the type had not been selected but the Sea-fire and Firefly would be investigated. He did not expect any difficulty in securing the 4,000 personnel required to man the carriers and stated that Fleet Air Arm personnel would receive their preliminary training with the R.A.A.F.

The Peacetime R.A.F. at Work

INFORMATION has lately been disclosed which shows how the R.A.F. is becoming increasingly occupied with peacetime tasks as well as normal training commitments. In Coastal Command, for example, aircraft have been busy carrying out photographic surveys in this country and abroad. During June one squadron made 45 sorties on behalf of the Scottish Department of Health to complete a survey of Scotland, while another made 108 sorties, the tasks including surveys of towns for the Ordnance and

Survey Department and the Ministry of Town and Country Planning. In East Africa, Lancasters continued a radar-controlled survey, completing 92 sorties totalling 317 flying hours, and a Sunderland surveyed the New Romney to Herne Bay, Kent, coastline *en route* to Alesund, Scotland, for fleet exercises. Other Sunderlands searched for flying-boat landing areas along the West Coast of Scotland and England and in Northern

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Ireland, successfully surveying Stornaway, Loch Boisdale and Belfast.

The various other tasks carried out by the Command included fleet, anti-submarine and coastal assault exercises. A helicopter from Thorney Island continued its work of low altitude insect aerial-net trawling with the object of obtaining samples of insects blown across to this country from the Continent and, in particular, of ascertaining whether the "Bean Aphis" insect arrives in this way. In addition, 53 routine meteorological flights totalling some 37,000 miles of flying over the Atlantic were completed.

In the same month, Transport Command aircraft made some 7,000 sorties totalling about 13,000 flying hours. The average weekly weight of traffic handled during the first six months of the year on scheduled services in the U.K.

amounted to 1,441,100 lb. Air Command Far East surveyed 2,804 square miles of territory in Sarawak and British N. Borneo, and photographic reconnaissance sorties were made over Singapore Island, Malaya and S. Johore.

Apprentices as Aircrew

PROVISIONAL arrangements have now been announced for the selection of R.A.F. aircraft and administrative apprentices for flying duties. The scheme provides that a limited number may be selected finally for pilot or navigator normally during their second and third year after passing out of apprentice training. Ex-apprentices may be selected for signaller, engineer or gunner, normally during the fourth year after passing out of apprentice training. All apprentices may be considered for training as pilots and navigators, but only aircraft apprentices serving in the corresponding ground trades of radio mechanic, fitter or fitter armorer will be eligible to volunteer for the other aircrew categories of signaller, engineer and gunner.

Refugee Flights

FOUR York aircraft of No. 511 Squadron, R.A.F. Transport Command, are engaged in the transfer of refugees from India to Pakistan and from Pakistan to India. They make two round trips a day in all weathers and are loaded to capacity on each flight. Two are operating between Palam, near Delhi, and Chaklala; and the other two between Palam, Chakeri and Mauripur. In the past week they have taken to

Service Aviation

safety over two thousand refugees. The work is being undertaken at the request of the Governments of India and Pakistan.

Pacific Tour of Inspection

COL. COOKSON, the American Air Attaché to New Zealand, has joined Lt. Col. O. H. Rigley, Dep. Chief of N.Z. General Staff, in an air tour of the South Pacific. They are accompanied by Brig. W. G. Gentry, Dep. Chief of Air Staff; G/C. W. C. Sheen, Dep. Chief of Civil Aviation; W/C. I. A. Scott and W/C. L. S. P. Taylor, Directors of Flying Control.

Their schedule includes Norfolk Island, New Caledonia, Fiji, Tonga, British and American Samoa, Aitutaki, Raratonga and possibly the Solomons.

More A.A.F. Regiment Squadrons

EIGHT more light anti-aircraft squadrons of the Auxiliary Air Force Regiment are to be formed this year, and another eight in March, 1948. These are in addition to the four already established in Middlesex, Edinburgh, Gloucester and the West Riding of Yorkshire.

Each squadron will be a first-line defence unit, fully mobile and equipped in the same manner as a regular R.A.F. Regiment squadron with Bofors (40 mm) A.A. guns as its main armament. The principal task of the squadrons will be the light anti-aircraft defence of airfields and R.A.F. units, and the secondary role local ground defence.

First of the new units to start recruiting is No. 2611 (West Lancashire) Sqn., which began to form at Woodvale airfield, near Liverpool, on October 1st. The other seven new squadrons which will be formed on December 1st are: No. 2502 (Ulster) at Aldergrove; No. 2504 (County of Nottingham) at Hucknall; No. 2602 (City of Glasgow) at Bishopbriggs; No. 2605 (County of Warwick) at Honiley; No. 2608 (North Riding) at Thornaby, Middlesbrough; No. 2612 (County of Aberdeen) at Dyce, and No. 2616 (South Yorkshire) at Doncaster.

Temporary Commissions for National Service Entrants

UNIVERSITY graduates may be granted temporary commissions in the Education and Technical branches if accepted by an Air Ministry Selection Board during their national service in the Royal Air Force.

Their rank after initial officer-training will be pilot officer, with promotion to flying officer after twelve months' satisfactory service.

Existing arrangements will continue for doctors and dentists doing their national service in the R.A.F., except that they will be granted temporary instead of emergency commissions.

National service men holding temporary commissions in the Education, Medical and Dental branches may apply for short-service commissions. Those in the Technical branch may be recommended for permanent commissions, and will benefit by the special conditions which apply to university entrants to the branch if they hold a first or second class honours degree.



EXPERIENCED PUPIL: Although the Oxford University Squadron, now one of eleven similar university units, still depends upon Tiger Moths for flying training, most of its undergraduate pilots are ex-Servicemen with a good total of flying hours. As in pre-war days the Squadron operates from Abingdon and Manor Road.

Presentation of Wings

AT No. 1 F.T.S. at Spitalgate on September 24th, Prince Bernhard of the Netherlands presented "Wings" to the last course of Dutch aircrew to be trained in England. The first Dutchmen to be trained came to this country in 1941 and the work has gone on ever since.

H.R.H. and party were met by A.V.-M. Sir Basil Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., Assistant Chief of Staff (Training).

The course (No. 64) originally consisted of 32 Dutch cadets, but was reduced to 21 by four eliminations and seven transfers.

"All Through" Aircrew Training Scheme

A NEW training scheme known as the "all through" scheme, under which the whole of the flying training policy of the Royal Air Force has been completely revolutionized, will begin on October 29th next. On this date the first "all through" trainees will commence to receive flying instruction under the new system at No. 6 Flying Training School, R.A.F. Ternhill, which is commanded by G/C. R. F. Gandy.

The main difference between the old and the new system is that under the latter an aircrew cadet training to be a pilot or navigator, will receive his initial drill and ground training, his initial flying training and his applied flying training all at the one station. Formerly a new aircrew recruit was sent to an Initial Training Wing for drill and ground training, after which, in the case of pilots, he went to an Elementary Flying Training School for *ab initio* flying instruction, and then to an Advanced Flying Training School, where he learned to handle high-performance training aircraft before proceeding to an operational training unit. Navigators went through a similar procedure appropriate to their particular duties.

On completing this first stage of "all through" training the pilots and navigators will receive their wings and badges and will be posted to an Advanced Flying School. From there they will then pass on to an Operational Conversion Unit where they will be crewed up and familiarized with the use of operational equipment as used in fully operational aircraft. These last two stages correspond to the final stages of training given during the war at Operational Training Units and Conversion Units.

A similar system is being put into force at the Royal Air Force College, Cranwell, whose cadets will therefore join the other "all through" pilots at the Advanced Flying School stage. Other "all through" schools for pilots are now in operation at Spitalgate (Grantham), Feltwell and Church Lawford. Those for navigators are situated at Topcliffe, where flying training has just begun under the new scheme, Bishops Cleeve and Driffield. In addition to these schools there are two in Rhodesia where the same system will be applied except that in the case of these schools the pilots and navigators will train at the same station.

Reunions

A DINNER to celebrate the thirteenth anniversary of No. 825 Naval Air Squadron will be held at the Holborn Restaurant, W.C.1, on Saturday, October 11th, at 19.00. Past or present members of the squadron wishing to attend should apply to Dennis Grace, 92a, Lonsdale Drive, Enfield, Middx.

Arrangements have been made to hold the second annual reunion dinner of No. 269 Squadron Old Comrades' Association at Stewarts Restaurant, Old Bond Street, London, W.1, on December 6th, 1947. Will all ex-members who are interested, and have not yet supplied permanent addresses, contact the Hon. Secretary, F/L. M. R. B. Clift, A.F.C., 183, Lordship Lane, London, N.17.

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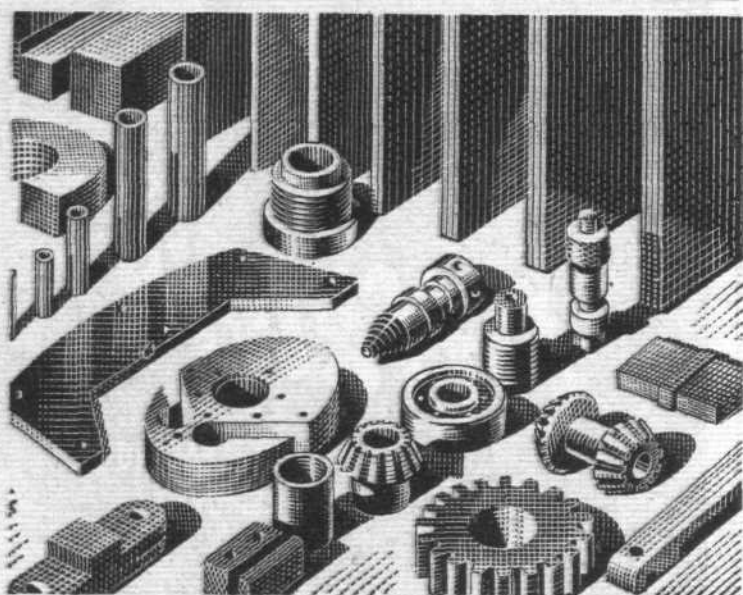
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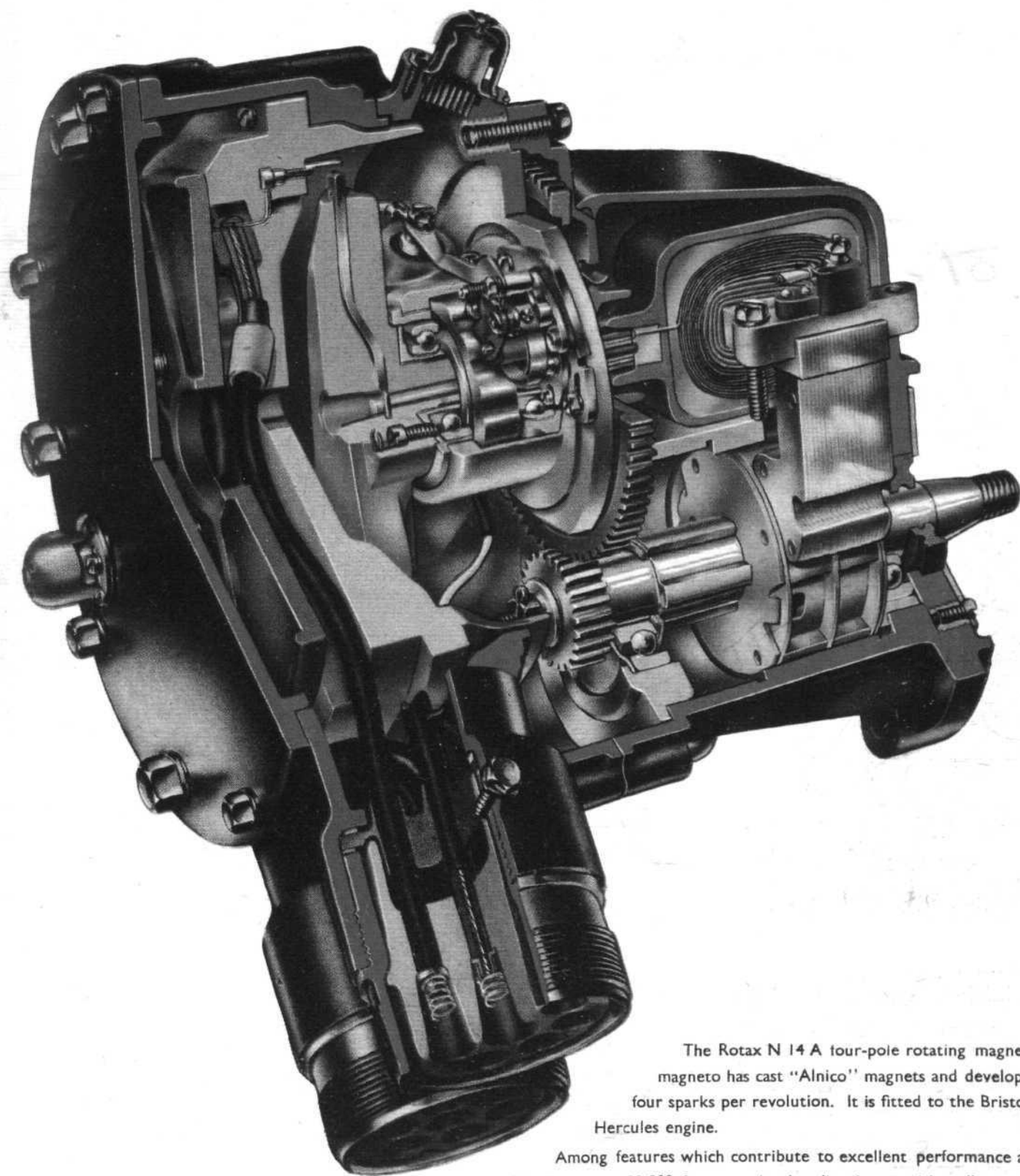
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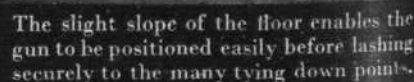
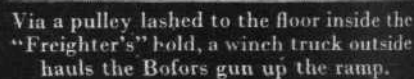
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