

De Havilland's are centred at Bankstown, where a change-over from Mosquito to Vampire production is in progress.

Senior Aircraft Manufacturers

For 20 years De Havilland's have sold, serviced and manufactured aircraft in Australia, from Gipsy Moths to Vampire Jet-propelled Fighters. This is the story of their enterprise.

by STANLEY BROGDEN

IT all started because a young engineer asked grandpa for money to build an aircraft. He had already built a motor car, which was still a thrill in 1908, and he had explored the possibilities of making an aero engine by actually making one. So grandfather had few qualms about giving the lad £1000—which he was going to leave him in his will, anyway. Two years later, Geoffrey De Havilland was the world's outstanding constructor of private aircraft, and his second personal machine held the height and speed records.

The first DH aircraft was not a great success, the engine and airframe disagreeing about the laws of flight; but the second was one of the most famous machines ever built before the First World War. It took off for its first flight in 40 yards in a dead calm, and later was 20 mph faster than anything else in the sky (more than 90 mph), as well as setting an altitude record of some two miles.

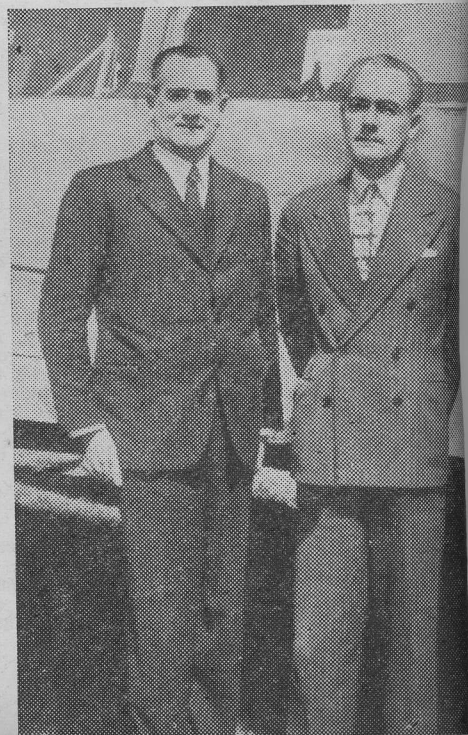
De Havilland went into the big Aircraft Manufacturing Co., a colossus of the First World War, making BE's such as the Australian Flying Corps used in France. After the

war he felt he wanted to get away from the giant and start out on his own.

The chief engineer was C. C. Walker, who is still on that job, W. E. Nixon, F. T. Hearle, and F. E. N. St. Barbe were other young men who joined the enterprise. All are still directors, St. Barbe having visited Australia early this year in his capacity of business director.

To start the wheels of DH aerial commerce going, De Havilland had a RAF contract to complete two half-built DH 18's. There was £1875 working capital, a factory site and airfield at Stag Lane, and the date was October 1, 1920. Twenty-eight years later, DH's have 200 Doves (worth £5½ million sterling), an undisclosed number of Vampires, plus Devons, Mosquitos, Hornets, and experimental aircraft on order, and with one thing and another DH is not only one of the world's out-

A. Murray Jones, managing director of De Havilland's in Australia (left), with J. A. Kerr, manager of the New Zealand branch.



standing aircraft manufacturing firms, but it is also one of the happiest.

It is obvious that the DH team was a most enterprising group of young men, who worked with an horizon in their minds. De Havilland's were the first overseas aircraft company to open a branch or subsidiary company in Australia. In 1928, they opened their Australian end at Melbourne, to sell aircraft and service them. Geoffrey de Havilland sent out his brother Hereward to take charge of the Australian development.

The Australian company developed just as quickly as the parent firm in London. By 1930 Australians were engaged in partial manufacture of DH aircraft, producing wings for several of the earlier types. Engines and fuselages were imported. For various reasons connected with development and supply, the firm moved to Mascot in 1930, beginning an association with that Sydney district which has lasted until today. It will not be long now, however, before the whole DH organization will have moved out to Bankstown, and today only the servicing and repair shops are left at Mascot.

Early Moth Production

In 1935-6 three wooden DH60G's (Moths) were constructed at Mascot, the engines and metal fittings being imported from England for assembly with the Australian-made wooden fuselage and wings. This was a great advance, and it was closely watched by the Government of the time. It fitted in very well with the overall DH policy, as DH companies had also been opened in Canada, India and New Zealand for similar development. Wooden airframes could be made locally in these

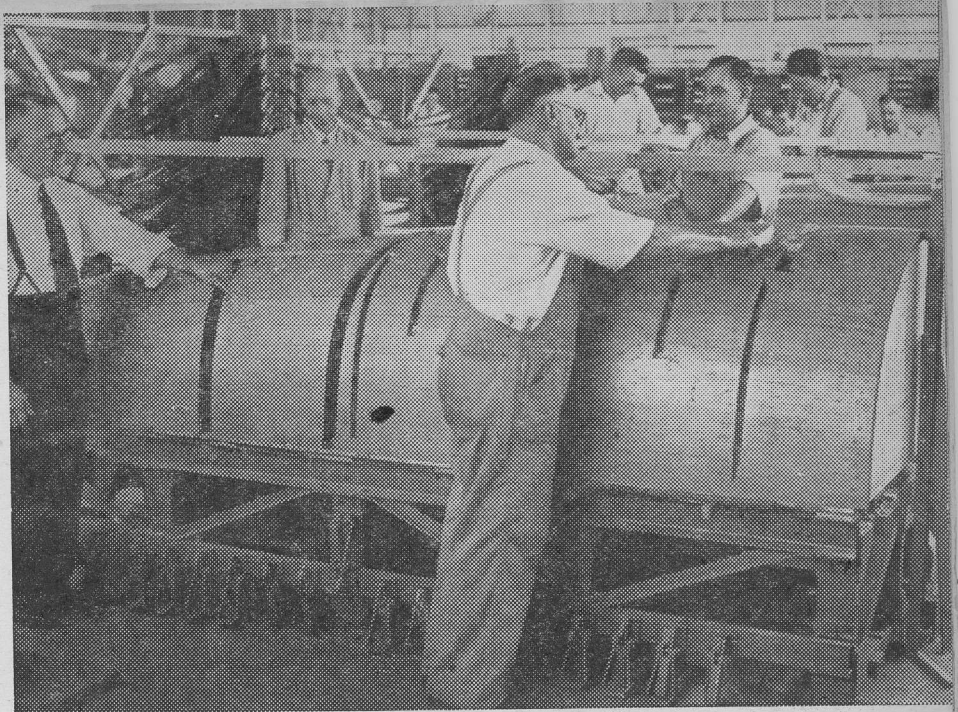
countries without big-scale training of labor, while the more difficult parts (metal fittings and engines) were exported from England.

The next step, in 1937, was to produce two DH83A's (Fox Moths), one for the Bush Church Aid Society, and the other for the Darwin Flying Doctor as an air ambulance. Dr. Clyde Fenton was the flying doctor concerned, and his recently-published autobiography has a photograph of himself with the Fox Moth and Murray Jones at Mascot. Alan Murray Jones, of Melbourne, had

commanded No. 2 Sq. Australian Flying Corps in France, winning the MC and DFC. He succeeded Hereward de Havilland as general manager of the Australian firm in 1931.

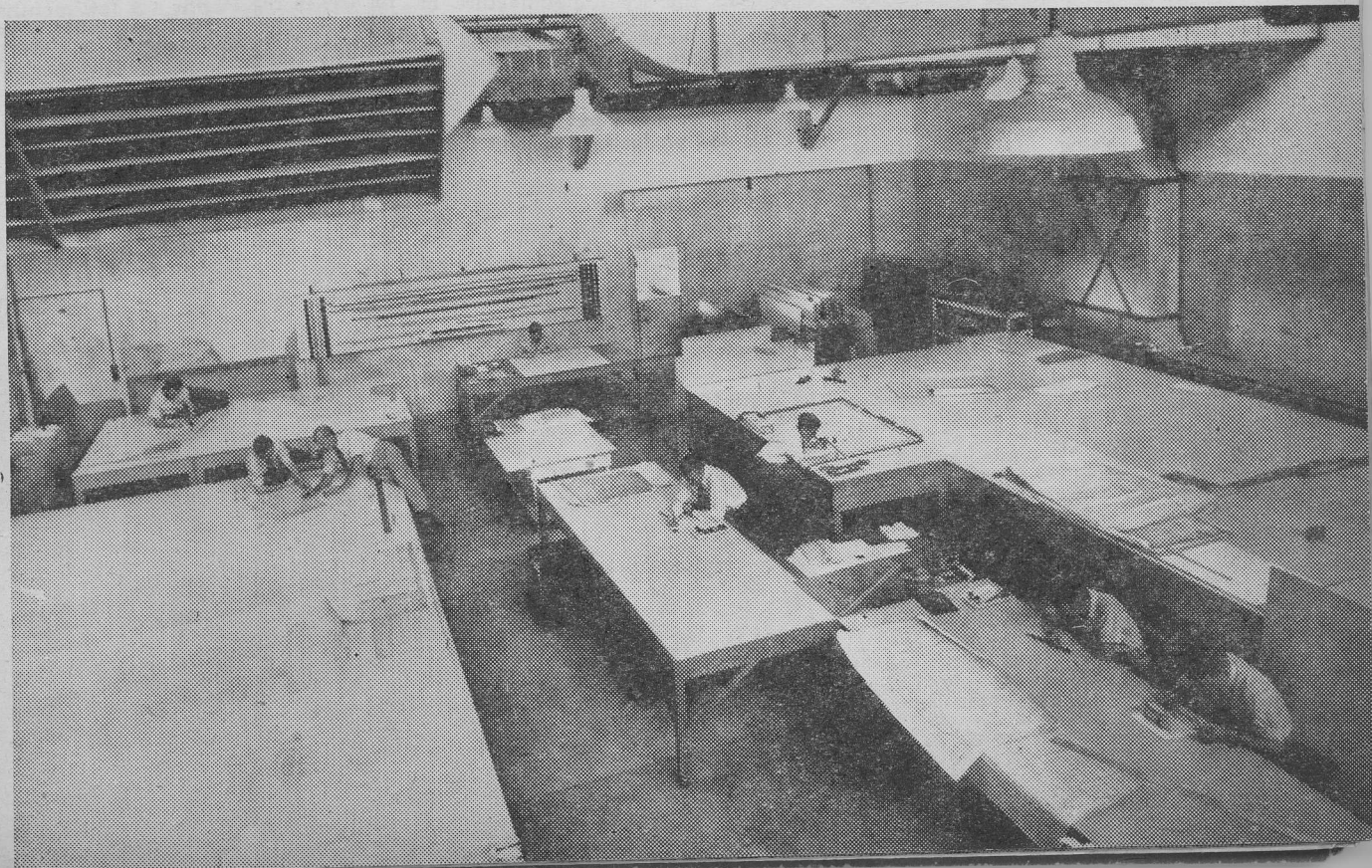
Still importing the engines and metal fittings, DH's now set out to produce two-seat dual training Moth Minors for Australian Aero Clubs. Unfortunately this project was developed too late, the outbreak of war in 1939 stopping it. Instead, the RAAF came in with an order

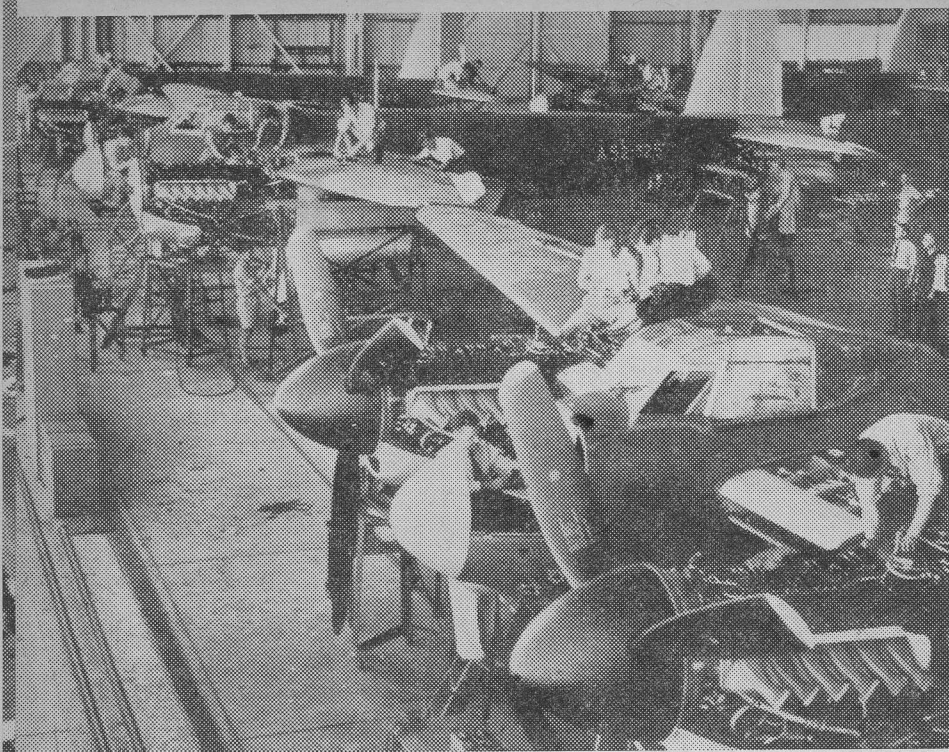
AIRCRAFT, May, 1948 13



Half-shell jigs for the fuselage of the Vampire are nearing completion.

The Lofting Department. This is a method adapted from the shipbuilding industry and facilitates jig production.





The last four Mosquitos in the final assembly stage. The total order for 228 Mosquitos will be concluded this month.

for 20 Tiger Moths, DH82A types with Gypsy Major II engines, of which the wings and empennage were to be manufactured at Mascot. There was also an order for 350 Tiger Moths with GM-H engines.

The first of these was delivered in May, 1940, and production was increased to one a day by the following August, two a day by March, 1941. With successive orders, the total Tiger Moth output grew to 1035, which was completed by August, 1942. A number of these was exported to India, New Zealand, and other parts of the British Empire, and to the Netherlands East Indies. Eight hundred engines were produced in Australia by General Motors-Holdens following the famous Beaverbrook message of 1940, which informed Australia that further engines and airframes could not be sent to Australia. Hundreds of these Moths are still flying about Australia or rotting on RAAF airfields.

In October, 1941, the RAAF ordered 87 DH84A's (Dragons). These had to be redesigned for RAAF purposes, and were used as air ambulance and for radio and observer training. The first was flown on September 29, 1942, and delivered to the RAAF on October 10, 1942.

1941 Overseas Mission

In late 1941 the Australian Government sent a mission overseas to advise on the most suitable types of modern aircraft for production in Australia. This mission returned with a recommendation that the wooden Mosquito, which was then the wonder aircraft of its year, should be produced out here. The Government gave its approval early in 1942, and the Mosquito project, which is being completed this month as the 228th Australian-made DH98 rolls out of the hangar, began.

As Canadian birchwood ply, as used in Britain, was not available here, local coachwood ply had to be used. There were difficulties; but, in conjunction with the CSIR, DH engineers redesigned portions of the wing to employ thicker plywood

than was used overseas. This had to be done because the local coachwood ply was too weak in the shear. It was this redesigning, probably, which led to sinister rumors in the RAAF after two of the first "home-made" Mosquitos had crashed in testing.

Plywood was only one of the hurdles. DH had to develop a technique of local casting for the production of high tensile heat-treated aluminium alloy castings to higher specifications than had previously been seen in Australian industry. To secure the effective glued joints with wooden members, there had to be developed the local manufacture of a fabric of reinforced bakelite with a wooden veneer. Urea formaldehyde cement, to be used in the

wooden construction, had to be made here for the first time. As the RAAF had different ideas on electrical and oxygen systems, the RAF specifications were dropped and the two systems had to be redesigned, a task which to the outside observer seems to have been rather unnecessary, but which is understandable when one recalls the RAAF outlook. The oxygen system, for example, had to be changed from high pressure to low pressure, while the RAAF did not like the fluorescent lighting of instruments, either. And this at a time when the Japanese were in New Guinea and points north, east and west.

The first Australian-made Mosquito was delivered to the RAAF on March 4, 1944. By August 5, 1945, 103 had been delivered and doing a wonderful job in the Islands, particularly as photo-rece aircraft in the Netherlands East Indies. Full production was, of course, late for the war, as the atom bomb era began just as Australian-made Mosquitos were becoming familiar to the SWPA forces.

Mosquito Production Range

Three types were produced, Marks 40, 41 and 43. Mark 40 was the fighter-bomber, 41 the present familiar survey type with cameras, and 43 the trainer. The Mark 42 was actually the 40 with the higher powered Merlin, only one being produced. The first Mosquito with the Merlin 69 two-stage engines (A52-90) was flown in November, 1945, and all PR Mark 41 Mosquitos have been powered with these engines. At the end of the war, of course, production orders were cut, but the usefulness of the Mosquito as a survey machine still kept the overall production order to 228.

A little-known DH order was for Mark VI Mosquitos for the RAF in 1945. A dozen of these arrived here in cases from England in March, 1945, and were erected for the RAF for use in the Pacific. A few months later 100 metal drop tanks for Mosquitos were produced on order for the Indian Government.

Final assembly section in the de Havilland Propeller Division, which is now producing propellers for the Mustangs, Lincolns and Mosquitos.



Organisation grew amazingly in the 1941-5 period, until, in August, 1945, DH were employing 4258 men and women. (This has now dropped to about 800.) In 1943, production was decentralised among some 15 establishments, offices scattered all over Sydney, aircraft and servicing going on at Mascot, Camperdown, Annandale, Waterloo and Bankstown, while the Propeller Division was divided between three establishments at Alexandria and one at Brisbane.

As Australians had not yet been trained for the high-precision work demanded by aircraft manufacturers, skilled personnel had to be brought from England to aid managers in training local staff. Among the imported staff were W. W. Holman, now controlling the Propeller Division, and M. M. Waghorn, now in charge of the Aircraft Department. Waghorn came out for the Mosquito project, as he had taken part in the planning and development of the original Mosquito and had flown in one of the first.

The Propeller Division started from absolute scratch. The firm had decided in 1939 to produce metal controllable pitch props out here at the rate of two a week—not the entire production, but everything except the intricate hub. There was an immediate order for 100 airscrews for the Bristol Beaufort project to be used with Taurus engines. However, only 45 of these were produced, being sent to the UK; the other 55 were adapted for Wellingtons.

Propeller Production Grows

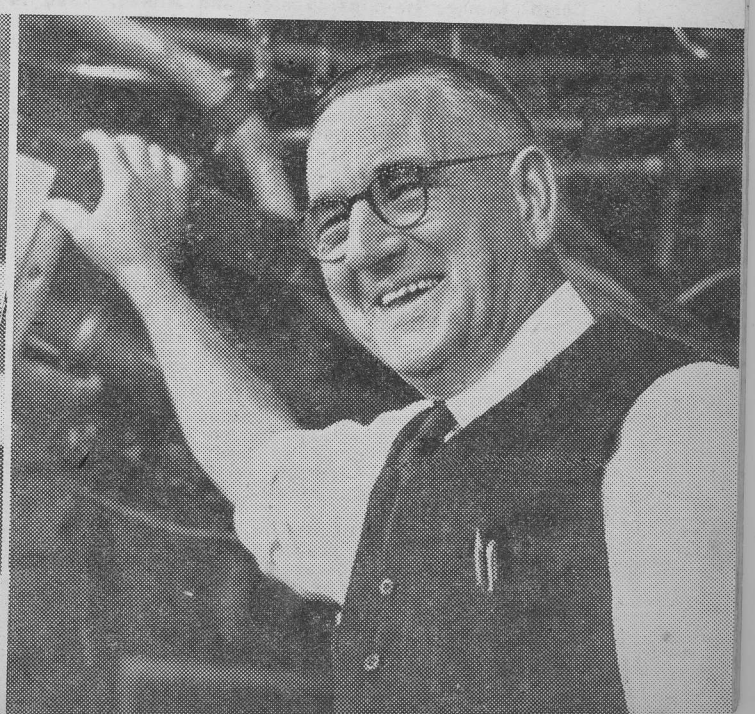
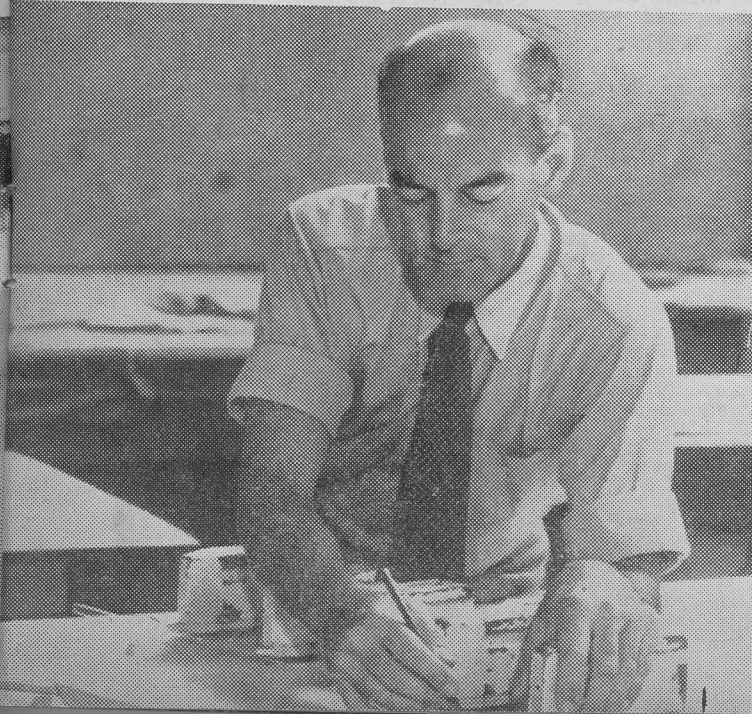
In June, 1940, the Aircraft Production Commission ordered DH to open a factory to produce 100 airscrews a month. Ian Spittle, who had just arrived from England, was sent to the USA to buy plant. In the following year the first Australian-forged propeller blades were in use on Wirraways—3D40's. By 1945, the Division was producing highly intricate propeller governors that were formerly imported from the USA. The 1943 world shortage



Work on the second Drover is now under way. Claud Starr and Ben White are shown above assembling the second fuselage.

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Wal Pryke (left) of the Loft Department, drawing cowling lines for the Vampire. On right is assembly superintendent Dick Aldred, who commenced working on aircraft in 1911, later joining Airco, from which de Havilland was formed.





These de Havilland employees have worked on the Mosquito project since inception and will soon be finishing the last. L. to R., 1st row: Messrs Cahill, Clarke, Hawkins, Teasel, and Aldred. 2nd row: Messrs Darke, Griffiths, Taylor, and Dollohan. 3rd Row: Messrs Broe, and Pike.

of aluminium brought a DH plan to make wooden propellers from laminated compressed wood: these were fitted to Wackett Trainers and Wirraways. A four-bladed propeller was developed for the Australian Mustang, made of wood, and 100 lb. lighter than the metal job.

Propeller Division now produces propellers for Mustangs, Lincolns, and Mosquitos, and also repairs any metal airscrew for any aircraft owner or operator. Wooden propellers are farmed out. The familiar Propeller Division brick building on the road to Mascot, by the way, has now been sold to Consolidated Press, and the other building will soon be evacuated as the entire DH set-up is moved to Bankstown. This move has been developing ever since the DH construction plan was commenced at Bankstown in 1942.

The latest development in the DH Australian organisation has been the production of the prototype of the DH Drover, a three-engine all-metal seven-seat replacement for the

Dragon, Rapide and Anson types. The decision to use three engines has interested the entire aviation industry in this country. An interesting angle on it is that Lee Murray, who joined the Australian company in 1946, after many years with DH in England, tells me that when the British company set out to plan a Dragon and Rapide replacement in 1939, it came to the same decision. The three-engine set-up was twice proved ideal as an economic aircraft type. Selling at about £14,000 Australian, this aircraft will interest not only Australian operators, but also foreign buyers—at £11,000 sterling it should be an attractive buy.

The Drover was designed by Martin Warner, who is in charge of the design and development. Warner is one of the crack Australian glider pilots, having made the recent Commonwealth long-distance record. His first all-Australian design was the legendary experimental glider. This was ordered by

DAP on March 20, 1942, was test-flown on June 15, delivered to the RAAF on October 5. There may be better records overseas, but it is doubtful. Known as the DHG1, this prototype was towed by a Wapiti, Fairey Battle and Wirraway successfully. The second, modified considerably, was test-flown in March, 1943. Then a third production model was produced, and six actually made. So DH altogether manufactured eight gliders.

The idea behind this project was a RAAF notion that squadron ground-crews and spare parts could be towed by the unit's aircraft whenever the squadron moved. For what reason the plan was dropped I cannot say, but it sounds excellent. The USAAF was also interested, officers visiting the DH works, to see the prototype when MacArthur's staff was still considering the employment of gliders in the SWPA. This idea also was dropped.

The DH Gliders have once again appeared after several years of collecting dust and whatnot on RAAF airfields—they are being overhauled by DH for experimental wing structure work with the CSIR. It is a pity they had to be kept idle for all these years: for four or five years the Air Training Corps could have been using them with excellent results for ATC recruiting.

Production Change-Over

When I visited de Havillands last March, there was not a great deal of activity at Bankstown, as the change-over from Mosquitos to Vampires was just then occurring. The last of the Mosquitos was being completed, to be test-flown in a few days by DH's senior test pilot, Brian Reginald (Blackjack) Walker, one of the more celebrated RAAF group captains in the war. The decision to produce Drovers had not been taken, but it was expected that the OK would be given shortly. Drover and Vampire plans filled the drawing offices and the loft—the latter a most interesting establishment. The aircraft industry has copied from the shipping industry the idea of having full-scale drawings on boards in a vast room, as is done by ship-builders. This simplifies manufac-

(Continued on Page 40)

De Havilland's senior test pilot, Brian "Blackjack" Walker, at the business end of the Drover.



MODELLERS' SECTION

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Ray Harwood, of Williamstown, who had his reliable Barker 60 powered West-erner, again stole the show. With an extra 3/4 lb. he flew only twice, and his times were 3.28 and 5.11.2/5 (OOS). Alan King was second with his diesel powered pylon model. His aggregate was 7.4.3/5. Mr A. Hull was third with 6.51.3/5. He used a McCoy 49 and the climb on his model was colossal.

One gentleman forgot to switch on the timer of his diesel. The engine had a full tank and the model was last seen heading north at a terrific height. He came back without it.

Alan King won the AIRCRAFT prize for the best under 3.5 cc. model. The plans will appear in the June issue.

WINDSOR (VIC.): The first petrol powered control liner has been built by Harry Forrest. It is a twin boom pusher with a tricycle undercarriage and a pod up the front for all the works. Powered by an elderly baby cyclone it is certainly out of the rut.

George Mallet has a twin boom job powered by an ED, which flies well. Bev Dunn has a model powered by a Frog diesel, but he has broken the crank-shaft. At this stage everyone is busy building super Wakefields.

SENIOR MANUFACTURERS

Continued from Page 16

ture of jigs and tools. The Vampire project was just then being jigged and tooled for the order of 50 for the RAAF.

All that remained at Mascot was the hangar for the maintenance and repair section, which was temporarily controlled by J. J. Byrne. A director of the company, in charge of sales, Byrne had only recently returned from England.

The Australian company has considerable independence of the English parent company, even though the Australian firm is entirely financed by English capital. Its directors are all Australians—A. Murray Jones, chairman; J. J. Byrne, sales; D. H. McLachlan, finance; L. C. L. Murray, technical; and R. J. Vicars. All but Vicars are actively engaged in the operation of the company and have spent lifetimes in aviation—Murray, for example, was in the RAAF during the 1920's before going to England. There is no brains trust, as in many firms in which knowhow forms a

main stock-in-trade, and the company, like its parent, has a considerable dislike of personal publicity for its members.

Contact with the parent company is constant. Warner, for example, took the Drover ideas to Sir Geoffrey De Havilland for personal discussions. There is an agreement between the English, Canadian, Indian and New Zealand companies that each will co-operate. For instance, the Canadian company is making the two-seater Chipmunk, and a replacement for the Norseman in the Beaver. Neither the English nor the Australian company plan aircraft types to overlap with these Canadian types; but it is understood that, to get over the dollar trouble, the English and perhaps even the Australian companies might

AIRCRAFT AND PROPELLERS PRODUCED IN AUSTRALIA BY DH TO 29th FEBRUARY, 1948.

AIRCRAFT:

DH82A Tiger Moth	1035
DH84 Dragon	87
DH98 Mosquito, Mks. 40, 41, & 43	217
Glider (Australian)	6

PROPELLERS:

2-blade constant speed type—	
2B20 (Wackett Trainer)	220
2D30	1
2D40	57
12D40 (Harvard)	45
3-blade constant speed type—	
3D40 (Wirraway)	543
3E50 (Beaufort)	361
3E50 (Boomerang)	302
5000 (Beaufort Taurus)	45
5000 (Empire Flying Boat)	2
3-blade hydromatic type—	
23E50	244
23EX (Mosquito)	176
23E50 (Sandringham)	6
33EX (Beaufighter)	114
4-blade hydromatic type—	
24D50 (Mustang)	6
24DX (Mustang)	58
24DX (Lincoln)	162

Spares—

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Misc. components	2,810,223
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New Drover Figures

Some excellent Drover performance figures have been issued by de Havillands following recent flying tests of the prototype. Payload has again risen and now stands at 1522 lbs. This gives a new empty weight figure of 4215 lbs.

Other figures show:—

Take-off distance to 50 ft. in still air at sea level	520 yds.
Take-off distance to 50 ft. in still air at sea level with one wing engine failing at safety speed	880 yds.
Accelerate-stop distance in still air at sea level with one engine failing at safety speed	980 yds.
Landing distance from 50 ft. in still air at sea level	550 yds.

has an order for 50 Vampire jet-fighters, the engines of which are being produced by CAC, and it is starting production of a locally-designed feeder aircraft which may have a very wide sale. That is a considerable achievement in 20 years. Meanwhile, the Australian company has a very interesting human link with Sir Geoffrey de Havilland's youthful beginning. For Dick Aldred, now working on Mosquitos as manager of assembly, helped to make the first BE2 back in 1911 with the old Airco firm for whom Geoffrey de Havilland was designer. **END.**

COMMENT

Continued from Page 11

While Britain, Canada, Australia and New Zealand, imbued with the nationalisation bug, were busily legislating to eliminate private capital from the air transport industry, and sending forth Governmental flag-carriers wrapped in swaddling clothes of red-tape—and advance estimates of losses totalling millions—the American operators were winning a leadership in the international field that will be very hard to overtake.

In its recommendations for future policy the US Commission declares: "The policy of regulated competition that has assured the development of our domestic airlines should be followed in our international system. Present competition seems only adequate to provide the desired incentive to management, and a yardstick for comparison between American carriers."

"A yardstick for comparison." That phrase should be remembered by Australians in watching the operations of the new national operator, British Commonwealth Pacific Airlines, which on April 25 took over the Pacific service previously operated under contract by Australian National Airways.

The private company established and developed a service which is now a by-word among American operators because of its efficiency, its maintenance and its regularity of operations. It has set a hard standard to follow—but that standard must be maintained and, if possible, improved

if Australia is to win the place it should hold in international commercial operation.

It is, indeed, difficult to understand why this country, possessing an experienced and well-managed airline, which has the distinction—almost unique in the world—of paying its way, should be so stubborn in pursuit of a political ideal that it would deny that airline the right to fly internationally as a regular Australian flag-carrier.

It may be politically expedient, but it is very bad business.

Actually, that is the main lesson that we can learn from studying the American report. Their viewpoint, so in contrast with that of the Australian Government, is that if a thing is in the national interest—and good business—it is politically expedient. **END.**

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