

MONOPLANE v BIPLANE TRAINING

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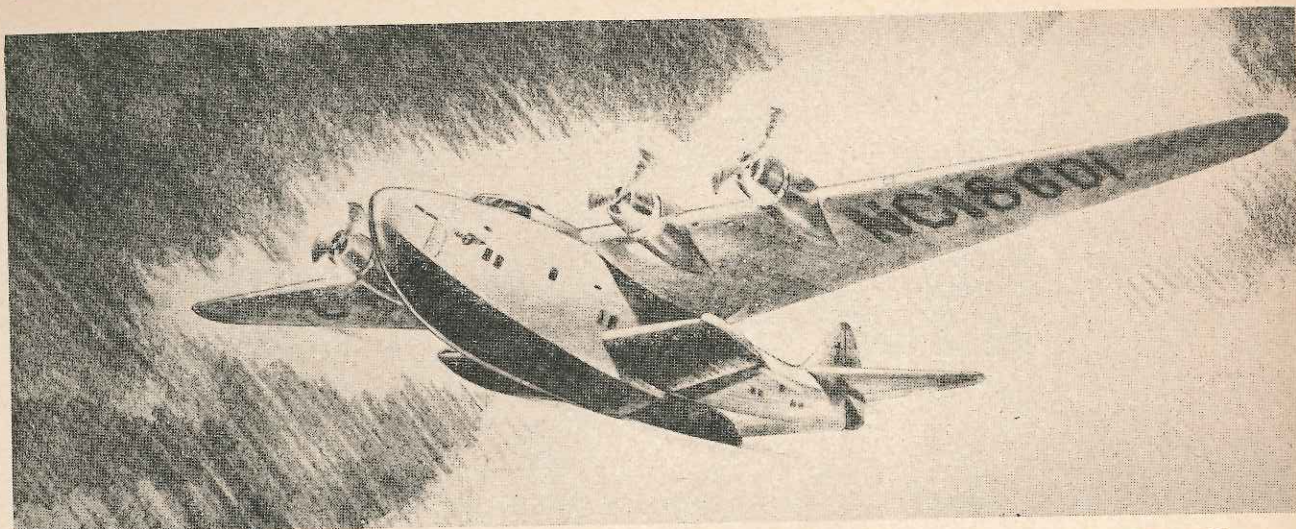
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How the Boeing Model 314 Clippers, for Pan-American Airways, will look when completed. They will carry 72 passengers and weigh 42½ tons. From the original drawing by Lawrence Kronquist.

UNCLE SAM'S SKY CLIPPERS

By

ALFRED CELLIER

RAPIDLY nearing completion at the plant of the Boeing Aeroplane Company, at Seattle, are the first of six Model 314 giant flying boats. These Super Clippers, built to augment Pan American's excellent fleet of aerial transports, are nearly twice the size of the Martin flying boats, namely, the renowned China Clipper, Hawaii Clipper and Philippine Clipper.

Dwarfing many a yacht, the new Clippers will weigh 42½ tons and have a wing span of 152 feet. Their length is 109 feet and their height 28 feet. Power is to be provided on each by four 14-cylinder double row Wright Cyclone engines that will give them a top speed of 200 miles an hour and a cruising speed of 150.

Accommodation will be provided for 72 passengers and a crew of eight or nine. It is expected that the number of passengers will be reduced to 50 on overnight hops to allow for sleeping accommodation. With a full load of 72 passengers it will still be possible to carry 2½ tons of cargo with a cruising radius of 5,000 miles.

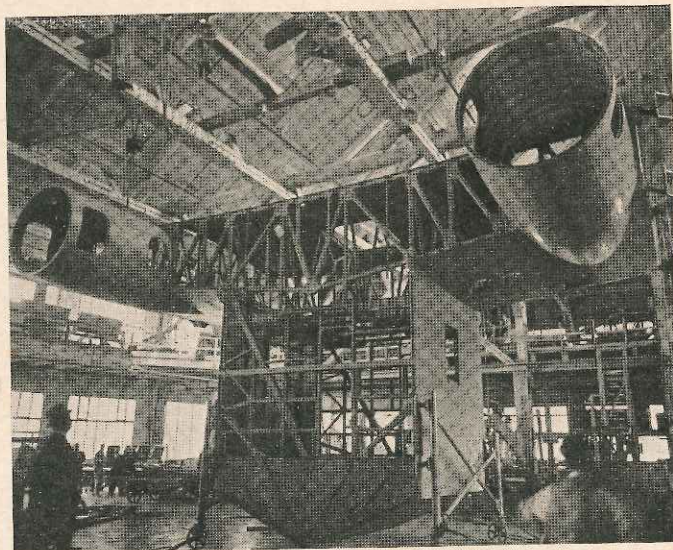
Fitting enough, the first two of these will be christ-

ened the South Seas Clipper and the Atlantic Clipper. Due for delivery about the middle of 1938, the South Seas Clipper will be placed in service between the west coast of America and Australia, while the Atlantic Clipper will inaugurate the Atlantic service.

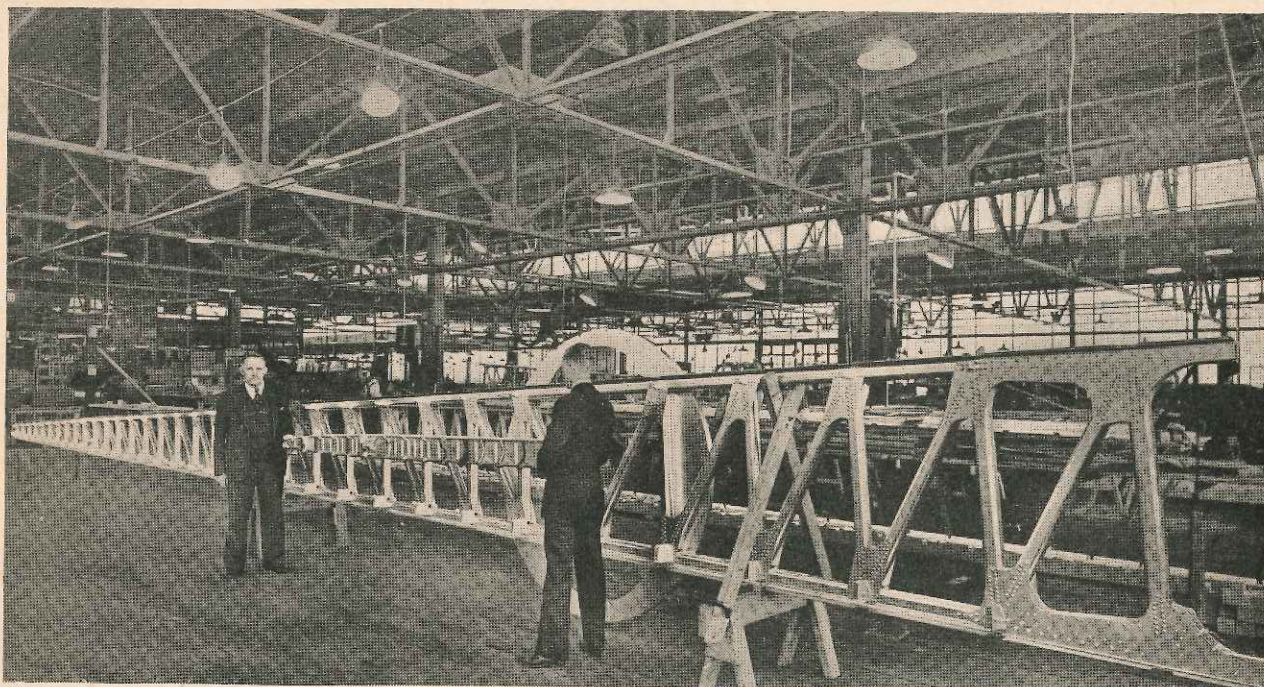
The new Clippers, of customary all-metal construction, will have two decks; the top deck, on which the flight bridge is situated, will be reserved for the flying officers.

Directly aft is the navigator's compartment, from which protrudes a turret where he will take sun and star sights with the sextant. Behind this is the Captain's cabin and living quarters for the crew. Here the wing commences, and it is in the wing that the five thousand pounds of cargo and baggage will be stored. To give you an impression of the size of this cargo space I would explain that it actually measures the same as that provided by the entire cabin space of a Douglas DC-2 air-liner.

Through the length of the entire wing runs a passage-way that will enable mechanics to check any mechanical troubles while in flight, since it



The central portion of one of the Boeing Model 314 Clippers. This part of the hull will contain the dining saloon and, above it, the centre section, which will be used for cargo space. On the outer ends of the section are the two inner engine nacelles, which stand twenty-five feet above the assembly floor.



Contrast between wing spars for the giant Boeing Model 314 Clipper for Pan-American Airways and one used in an Army Boeing P-26A single-seater pursuit plane. The Clippers will carry 72 passengers and a crew of 8.

will provide entry to each of the engine nacelles. Each nacelle will likewise be fitted with a telephone and electric lights and is large enough to accommodate three men at a time. The front wing spars to which the outboard nacelles are fitted are 59 feet long.

Below the top deck is the "main deck," where the passenger cabins are located. Private staterooms are also on this deck, located in the nose and in the tail, and each is provided with running water, both hot and cold. The dining cabin and a spacious lounge are between these staterooms on the main deck. Altogether there will be seven passenger compartments. Dressing-rooms for ladies are located aft, while those for male passengers are in the bow on the opposite side of the galley.

In the bottom of the hull, or hold, will be a series of watertight compartments designed to provide buoyancy while floating on the water. In this hold will be a large petrol pump which will pump the petrol up from the sponsons to the wing tanks. The sponsons, or sea wings, which provide stability when on the water, carry seven tons of fuel, while another eight tons will be carried in the wing tanks. This total of fifteen tons of fuel is just three tons heavier than the total gross weight of a Douglas DC-3 transport and plainly illustrates the immense size of the new Clippers.

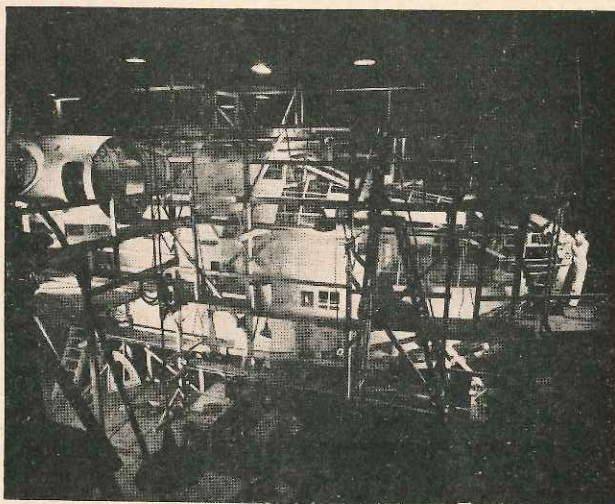
As to their construction, the central portion of each hull is being assembled separately. This part of the hull will contain the dining saloon, and above it the centre section of the wing structure will be used for cargo space. On the outer ends of this section are the two inner engine nacelles standing twenty-five feet above the assembly floor. As each hull is completed it will be taken to an outside dock, where the wings will be attached.

In working on the nearly completed hulls at the Boeing factory, a scaffold was erected which allows craftsmen

to work at five different levels simultaneously. Altogether three and a half cartloads of heavy lumber are involved in the jigs and scaffolding framing the South Seas Clipper and Atlantic Clipper, the latter being only slightly behind it in stages of construction.

Figures generally mean little to the layman, but when one considers that the plank walkways encircling the two hulls at various levels total half a mile in length, it seems more impressive and shows what remarkable engineering ingenuity was provided by Boeing engineers in its design.

The assembly jig in which these two hulls are being constructed is 115 ft. long, 26 ft. high and 36 ft. wide
(Continued on page 522)



The South Seas Clipper being skinned-in while in the jig. As soon as the hulls are completed they are moved to a dock for further fitting out.

MONOPLANE v. BIPLANE TRAINING ?*(Continued from page 501)*

that the machine was almost a write-off and that I was still, fortunately (to my mind at least), more or less intact. Imagine my chagrin when a few days later, under similar weather conditions, a Cirrus Hawk was seen to do a circuit of the field, land to our horror on the wrong side of the aforesaid ditch and plough its way through it in exactly the same spot with no visible damage whatsoever. To add insult to injury another Hawk, apparently in company with the first, then proceeded to land on the identical spot, 10 feet from the ditch, lurched sickeningly through it and also finished right side up and still intact alongside its fellow.

I am sorry indeed to finish up with such an unashamed boost for our products, but can vouch for the accuracy of this story and can, if necessary, produce unpaid witnesses to prove my statement!

From Mr. D. BROWN,

Assoc. M.Inst.C.E., A.F.R.Ae.S.

With reference to the article "Monoplane v. Biplane Training," by Flt.-Lieut. H. M. Schofield, published in the November number of POPULAR FLYING, I imagine that few would dispute the author's authority as an instructor, but may I be allowed to say a few words from the pupil's point of view?

In ten years' flying I have done just 100 hours solo on twenty-six types, mostly trainers, ranging from the Avro 504K, Genet Bluebird and Cirrus Widgeon to the Moth Minor and Miles Monarch.

When the efficient cantilever monoplane began to replace the inefficient braced biplane, I admit that I did not at first take kindly to the transition, but I realise now that the reasons were (a) conservatism; (b) affection for the old biplanes and (c) resentment at having to learn the new technique required by the clean monoplanes.

I think that (c) was the principal factor and that it accounts for 90 per cent. of the adverse criticism which one hears directed against modern monoplanes, frequently by expert pilots who should know better.

It can hardly be denied that the day of the hopelessly inefficient biplane is past for all practical purposes, both civil and service, and so why continue to train pilots on machines which differ in characteristics from those which they will subsequently be called upon to fly?

In fact, the more accustomed they become to the old biplane characteristics, the less readily will they adapt themselves to the technique of flying efficient aeroplanes.

While I can well appreciate Flt.-Lieut. Schofield's preference, from the instructor's point of view, of the privacy of a separate cockpit wherein to hide his emotions, yet, from the pupil's point of view, the side by side cabin has got everything in its favour, particularly the elimination of the intermittent and frequently inaudible instructions down the speaking tube.

Finally, diffident as I am of challenging the opinion of an authority of Flt.-Lieut. Schofield's calibre, I can only state that his remarks regarding the relative stability and structural strength of monoplanes and biplanes are not borne out in practice.

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at the centre. It is reported that because of the excessive costs of jigs and tooling involved in the construction of these six Clippers, the Boeing Company will sacrifice the profits on two ships. At a reputed cost of a million dollars apiece, Pan American may well be proud of this new brood.

In order to beach the new Clippers, beaching equipment of steel weighing 15½ tons was constructed. These gears are 22 ft. long and 16 ft. wide. They are able to pick up a load of 42½ tons while under water and bring it to land. Such a Behemoth is no small matter to transport around, and four double trucks were necessary to haul the first one to West Lake, near the Boeing factory, for its initial tests.

While the layman may have expected the ultimate to have been reached with these ships, Pan American, looking three years into the future, asked for bids from eight aircraft manufacturers for a minimum of three and a maximum of 24 even larger Clippers. These trans-oceanic planes are to be capable of transporting at least 100 passengers and likely to be twice the weight of the Boeing 314 Clippers. Capable of non-stop flights of 5,000 miles, cruising speed will be from 200 miles an hour at sea level to 299 miles an hour at 25,000 feet.

The bids are all returnable to Colonel Charles A. Lindbergh, who is chairman of Pan American's technical committee, and who emerged from semi-retirement in England only recently in order to direct the final conferences.

Manufacturers who were asked to bid on these future giants, which it is hoped to have in service by 1941, were Boeing, Consolidated, Curtiss-Wright, Douglas, Lockheed, North American, Martin and Sikorsky.

Several manufacturers have had designs on paper for at least two years for craft which was roughly similar to those requested by Pan American, but actual construction on them was withheld due to the lack of a buyer.

Other than the specified performances, all construction details being left to the manufacturers, Pan American stipulated only that "special consideration" would be given to any designs that permitted operation at 20,000 ft. altitude or higher, with cabins supercharged to afford passengers comfortable atmospheric pressures.

Having speeds two or three times that of any contemplated dirigible and with a passenger capacity and pay load of the machines substantially the same as that of the ill-fated dirigible Hindenburg, and the nearly completed LZ-130, such flying boats will no doubt be the logical passenger-carriers on all over-ocean services.

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