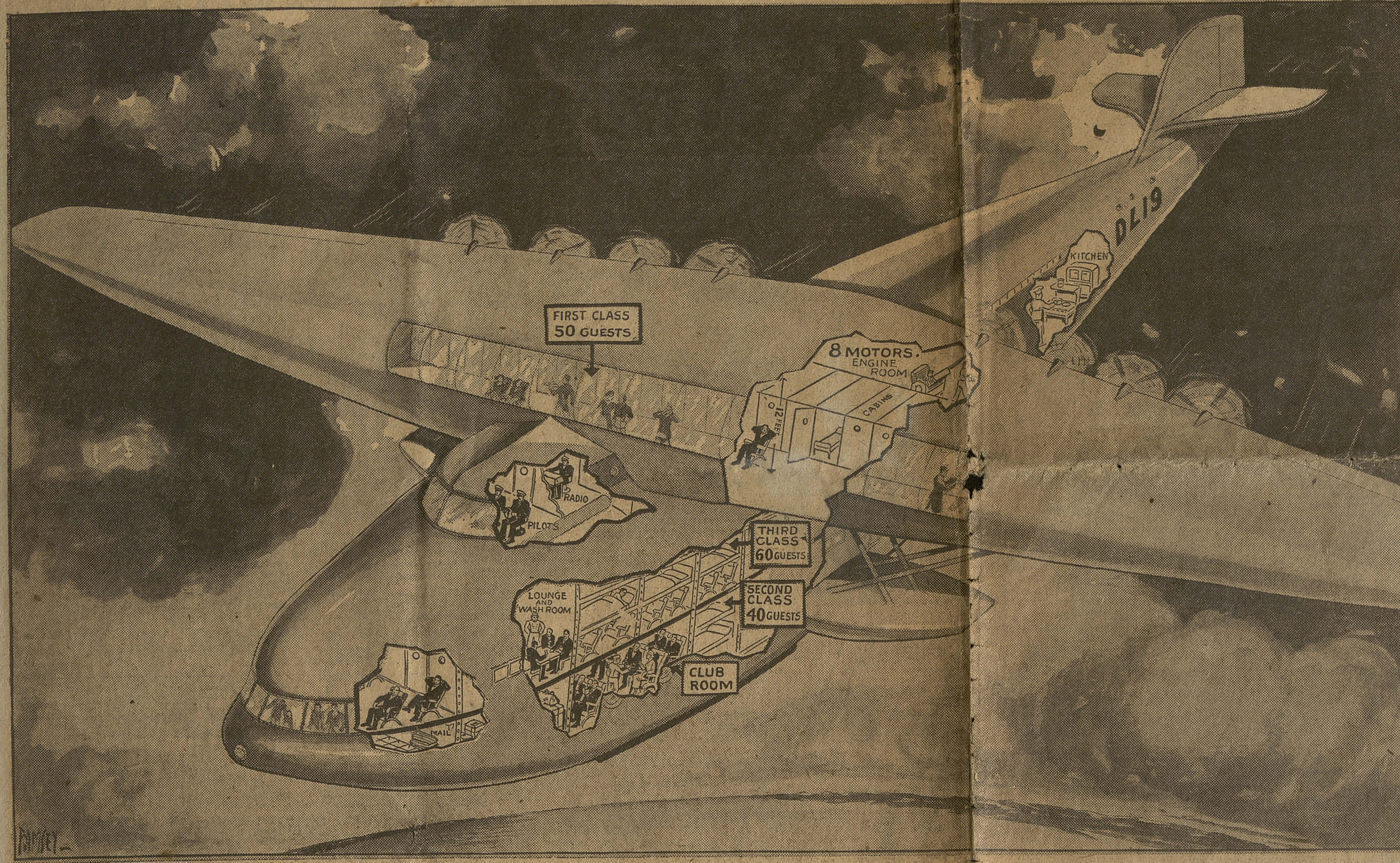


150-Passenger Airliners to Cross Atlantic in a Day NOW Possible—Martin



JUST BEYOND THE HORIZON—An artist's visualization of the giant 150-passenger airliner for cross-Atlantic travel in a day which Glenn L. Martin, in the accompanying article, declares it is NOW possible to build. Such a flying-boat would provide Pullman-like accommodations with comfort, even luxury, for its passengers, and bring Piccadilly "twenty-four hours from Broadway."

Noted Airplane Builder Describes Giant Sky Greyhounds, Weighing 125 Tons, and Fitted with Luxurious Cabins, That Will Bring Piccadilly "24 Hours from Broadway."

By GLENN L. MARTIN, Famous Aeronautical Pioneer and Designer and Builder of the Largest Seaplanes in Transport Service, the Pacific Clippers.

AMERICAN aeronautical science, and designing and engineering capacity, today have reached such an advanced stage that a trans-Atlantic airliner to carry 150 passengers can be built whenever there is demand for it.

An ocean airliner of this type would be a flying boat having a gross weight five times that of the largest present "Clippers," the planes which were designed and built in our plant and which now are spanning the Pacific on weekly schedule. With full load, this plane would weigh 125 tons, or 250,000 pounds. This is a "plane of tomorrow" only because the Atlantic will be "pioneered" with much smaller planes. It would be possible to start "exploration" flights and preliminary service now, with existing equipment. We do not have to wait upon the answers to any unsolved riddles. We have the knowledge and capacity for the construction of such a giant today. It would provide, for the world's busiest seaplane, a crossing which would make London "twenty-four hours from Broadway."

The decision will rest with the airlines and will be based upon what they think the traveling public wants. The 150-passenger ship which is now in reach would have a wing spread of approximately 300 feet and a hull about 200 feet long. In a plane of this size the wing thickness permits us to use the wings for passenger accommodations; and to establish within it also the "engine-room," flight engineer's office, some of the storage tanks for gas and oil. Thus it becomes possible to design a plane having three passenger decks; two extending the length of the hull, and having about seven and a half foot head-room; and the third, and top, transverse deck being within the wings. The exact form of allocation of passenger space probably would depend largely upon what the public wants in air-travel facilities. Tentatively, this might be a "three class" ship, accommodations varying in spaciousness. Thus: **FIRST CLASS:** Within the wings, twelve feet at their thickest point where the wing joins the hull, twenty-four cabins, twelve on either side. These would contain twin beds and toilet facilities. This transverse cabin area would be in the center of the wing. In front of it there would be a long observation room or lounge, extending perhaps twenty-five feet beyond the hull on each side. This salon, of course, would be in the leading edge of the wing; and it would be "glazed in" with a new material which is forty-five per cent lighter than glass; which is not brittle, but resilient; and which permits the passage of ten per cent more light. Passengers could thus sun themselves as they looked forward upon the sea's far horizon; or upon the verdant hills and hedges of the Irish and English country-side, or the spires of New York's approaching skyline. **SECOND CLASS:** For this, on the lower deck, there would be accommodations similar to those of a Pullman stateroom; with upper and lower berths and washroom facilities for each. Forty passengers could be accommodated thus, and there would be

a common "club room" for them forward. **THIRD CLASS:** This would be generally similar to Pullman car accommodations, alongside a central corridor of the middle deck, with wash-rooms like those upon railway trains. Except that it is possible to have beds by night and individual chairs by day, these being reversible. So equipped, this deck would accommodate sixty passengers. Within the hull, behind the passenger section, there would be located the kitchen and steward's department. Ten stewards and stewardesses probably would be carried, meals being served on tables set up for four. Incidentally it has been estimated that it would be necessary to carry nearly 1,300 pounds of food, water and ice. An interesting—and, to the reader, perhaps surprising—comparison can be made between this type of transportation and others. Airplane construction is costly. Such a plane would represent an original investment of around \$20,000 per passenger carried. The Queen Mary, most modern of ocean liners, costing between thirty-five and forty millions, represents about the same investment per passenger. (Incidentally, the Queen Mary would have cost nearer sixty-five millions, if built in this country.) But the seaplane, having five times the speed, can "turn over its capital" that much faster. It can make five times as many trips per year; or possibly even more, when a ship's lay-over in port is counted. Again, a new Zeppelin probably will cost five million dollars and carry about seventy passengers. The investment here would be \$70,000 per passenger carried. But the average cruising rate of a Zeppelin is about seventy miles an hour, the seaplane being two and one-third times as fast. The Zep is three and one-half times as costly, per passenger carried. Therefore—considering this

question of first costs, and the problem of getting returns on it—the ratio of advantage for the seaplane investment dollar is about eight to one, as compared with the Zeppelin. The margins of speed, of gain over ocean surface transport, and of original cost all favor the plane, when compared with lighter-than-air craft. A question of the day is: How fast will planes fly? Unquestionably, in planes for war use we will see much higher speeds; just as quickly as engine-power and plane design can produce them. That will be soon. All governments are reaching for new speeds in war planes. The speed step-up recently has been constant, and will be increased.

14,400 Horsepower
A probable luggage allowance would be fifty pounds per passenger. Behind the first class cabins and in the wing's rear section the engines would be housed, propeller shafts extending backward to the trailing edge of the wings. This represents a departure from present practice; the plane would be pushed, rather than pulled, through the air. Motors and all vital parts of the plane's mechanical equipment thus become accessible to constant servicing during the passage, as are the engines of an ocean liner. If construction were started now on such a plane as this it would have a "power plant" of eight engines. These would have what is known as a "normal rating" of about 1,800 h. p. For take-off they would develop about 2,000 horsepower—or a total of about 16,000 h. p. Once in the air, one of these engines would be cut out and remain in reserve. At not much over fifty per cent of their total available power, seven engines would give this giant two and a half miles a minute cruising speed. Obviously, any of the engines can be cut in or out as needed; and within the long engine room those which are idle can be serviced. This represents not only a huge gain in reserve power, but also an advance in reliability of operations. The total useful load such a plane could carry—including fuel, oil, water, food, crew, passengers, mail and express—has been estimated at sixty-six tons. Of this, 40,000 pounds would be "pay load."

Increases of Speed
For the carrying of passengers, I believe, speed increases will be much less. We will not need war speeds for passenger planes. Speeds now in sight will provide trips that are "quick enough" between the earth's great population centers. Quick enough—for the present—because they are so much faster than other forms of transportation. Economy of operation, competitive conditions, the probable desire for more spacious and luxurious passenger accommodations—such considerations as these will be the limiting factors. Engineers will be able to provide passenger speed, though it is costly; but operators are likely to want, instead, to spend more of tomorrow's airplane dollar on passenger comfort. The biggest speed gain immediately in sight is through the use of sealed "sub-stratosphere" planes. We can have now giant seaplanes such as have been described in this article. We can also begin now, if we wish, to shuttle passengers over the earth in long, swift journeys which will be traveled in air-lanes which are five or six miles above the surface of the land or sea. These PRESENT possibilities illustrate vividly the great advance strides which "aeronautical engineering and design have made in the single decade since Lindbergh started us with his flight to Paris. Therefore—considering this

U. S. Difficulties
Great Britain owns naval and commercial bases in many parts of the world. These are located advantageously at focal points along the trade routes enabling cruisers, large detachments of fighting ships and even the grand fleet itself to obtain repair facilities, supplies of fuel, ammunition and essential stores to give her war vessels and merchant ships mobility and enable the fighting ships to operate aggressively in vital areas against an enemy. On the other hand the United States has no such chain of naval bases. When the latter's fleet moves into a distant area it must carry these vital base facilities, figuratively speaking, in its back. United States warships, due to this absence of well-stocked permanent bases from which to operate, must carry within themselves a greater supply of fuel and stores than need British ships. The last London treaty limits the size of battleships to 35,000 tons and cruisers to 8,000 tons. In consequence United States ships will have of necessity sacrificed either speed, armor or gun power to obtain the space needed for these additional weights of fuel and stores. As long as displacement is thus limited and no allowance is given this

U. S. Delinquent
All possible bases in Alaska waters should be effectively denied an enemy. A first-class naval base and numerous air bases in Alaska waters seem mandatory. In the Far East the United States Fleet has an anchorage in Manila Bay, but there exist no facilities for a vast fleet such as would be necessary to carry war into that area. Great Britain on the other hand has the new naval base at Singapore, with a chain of bases at almost equally spaced intervals back to England via either the Suez or the Cape of Good Hope route. In the Orient parity by type would not give the United States fleet equality with either Great Britain or Japan. Great Britain can well be willing to grant parity by type to the United States for the naval experts know that parity will not mean equality. In almost all parts of the world, with the exception only of the American areas, the British fleet will be superior ship for ship to that of this nation. Admiral Mahan attempted to drive home the fact that seapower consists of naval ships, bases and a merchant marine. Great Britain ever has maintained all three in correct proportion for her empire needs. The United States has not. In consequence the United States fleet, even should it become type for type as numerous as Britain's, is yet tied hand and foot to the American continent, venturing as far out into the Pacific as Hawaii. For this nation to own such a war fleet and be incapable of using it effectively and safely for the purpose of safeguarding its empire is not only a waste but in some ways a menace, for it gives to the people of this country a false feeling of security. It is no secret to the great sea powers how weak this nation is on the seas in areas outside of its own home waters. The seizure of the Panama Canal, Hawaii, Guam or the Philippines by a powerful nation would arouse the people to a white heat and this peace-loving people would instantly demand the fleet take the offensive to regain them. True, the nation's foreign policies are wholly defensive, yet it seems the better part of valor to give the fleet striking power wherever it may be needed in the nation's interest to operate on the offensive. Two omissions: A lack of strategically located naval bases and an inadequate merchant fleet, nullify the parity the nation appears to seek in its avowed policy of a navy second to none. Copyright, 1937, by American Newspapers, Inc.

COMFORTS OF HOME—Glimpses of the dining and sleeping facilities provided aboard the big Martin airliners of the China Clipper type now operated across the Pacific by Pan-American Airways. These give an idea of the facilities that would be found on the 150-passenger cross-Atlantic giant planes described herewith by Mr. Martin.



Admiral Stirling Warns: Equality in Warships Will Not Give U. S. Parity with Britain

By REAR ADMIRAL YATES STIRLING (Ret.)

Noted Naval Expert and Former Commandant of Brooklyn Navy Yard. NEW naval race has begun. Great Britain's great naval construction program is aimed to meet the formidable threat of the autocracies. A navy and air force mightier than any possible combination of powers must be held by Great Britain otherwise she will become a second rate naval power and lose her empire.

Now, if the scepter of the sea is shaken from England's palsied hand and grasped by one of the autocracies or by a combination of them, the British dependencies, colonies and commonwealths may find themselves forcibly severed from their allegiance to the British Crown. The navy, heralded by the United States for a navy second to none, if interpreted to mean only parity in ship types and not to parity in sea power, the British will ever have the fighting edge, for in any consideration of naval power the ownership of bases for the fleet and a merchant marine to serve it will always be a most vital factor in war. The United States relative to Great Britain may not seem to have so many dangerous menaces confronting it. The British Isles are no longer secure from attack by an enemy, especially from the air. The Empire would find itself far more secure if the citadel of power could be moved to Canada, but that of course would take years to accomplish. The American continents are well stocked with raw materials, foods and other supplies. The United States is indeed fortunate in not having powerful military nations at arms length, so to speak. Two wide oceans separate the long coast lines of this country from the sore spots of the world—Europe and Asia. Parity in types of ship may enable this country to guard the lines of communication between the American continents. It might be difficult for any seapower now existing, or that might appear in the next few years, to challenge successfully the United States fleet in its home waters. The defense of the coast and the security of the lines of communication between the Americas is of great importance, but that is not all that the navy in war will be called upon to perform. When localities far afield are considered the difficulties to be encountered by the United States Navy become very much more complex and menacing. The United States is virtually an empire just as much as is Britain and with responsibilities as important if not as vast. To maintain that empire and resist aggression the United States must consider very seriously the actual fighting ability of its fleet. Even though many honestly believe that war with England is unthinkable, nevertheless, the power of the British fleet can not be left out of the calculations of the general plans in this country. Wherever this nation has vital interests to protect the striking power of the United States Fleet must be measured there with the striking power of any other nation whose interests conceivably might some day clash with those of this nation.



ADMIRAL STIRLING

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