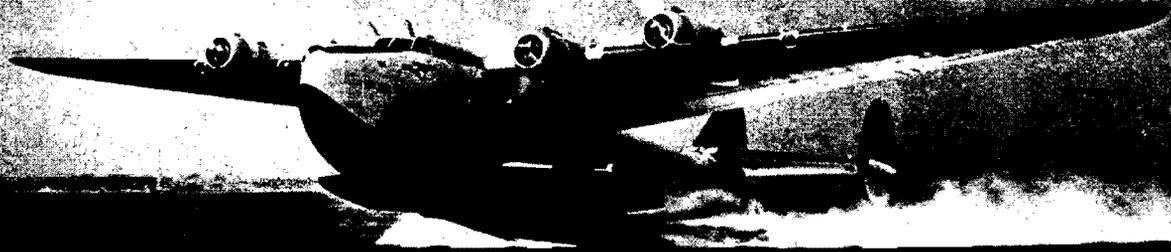


3145 in war service.



TAKE-OFF—A Pan American Clipper on its maiden air voyage. One such Clipper set a mark of over 1,000,000 miles of transocean flying—more than any other commercial airplane on a scheduled route in the World.

## CLIPPERS — ACROSS THE OCEANS

### Pan American Air Giants Travel 100,000 Miles Daily

SWATHED in mottled camouflage to blend with the night and the clouds through which they now do most of their flying, the big Clipper ships of the *Pan American Airways System* are doing a yeoman's job of Wartime transport all over the World.

The comings and goings of these famous flying boats are carefully veiled secrets. They fly under sealed orders as to the exact air lane route they are to take to their destination.

Just about every ounce of load and foot of space aboard the transports are reserved for the swift movement of men, materials and mail vital to our war achievements on every battle front. From supply stores assembled at various points, a sizable mountain of material moves across oceans and wide lands between the dusk of one day and the dawn of another. Quickly the Clip-

#### TRAVEL THE GREAT CIRCLE (after Victory comes)

Seattle to Moscow . . . . .	\$100.00
Chicago to London . . . . .	76.00
New York to Calcutta . . . . .	160.00
San Francisco to Melbourne . .	160.00
Los Angeles to Buenos Aires . .	125.00
New York to Shanghai . . . . .	150.00

pers are relieved of their precious cargo, and are on their way again.

They are veritable *forty-two* ton trucks of the air! The wing spread is 152 feet!

They are capable of carrying 74 passengers with a crew of 11.

#### 6400 HORSEPOWER PER CLIPPER

They have four 1600 horsepower engines . . . a total of 6400 horsepower. They can span the ocean with only three of these engines going, if that were necessary. If the load is not too heavy, they could make it with two. A runway behind the engines permits minor repairs even while in flight.

They cruise along at the average speed of 160 miles an hour, although they are capable of doing more.

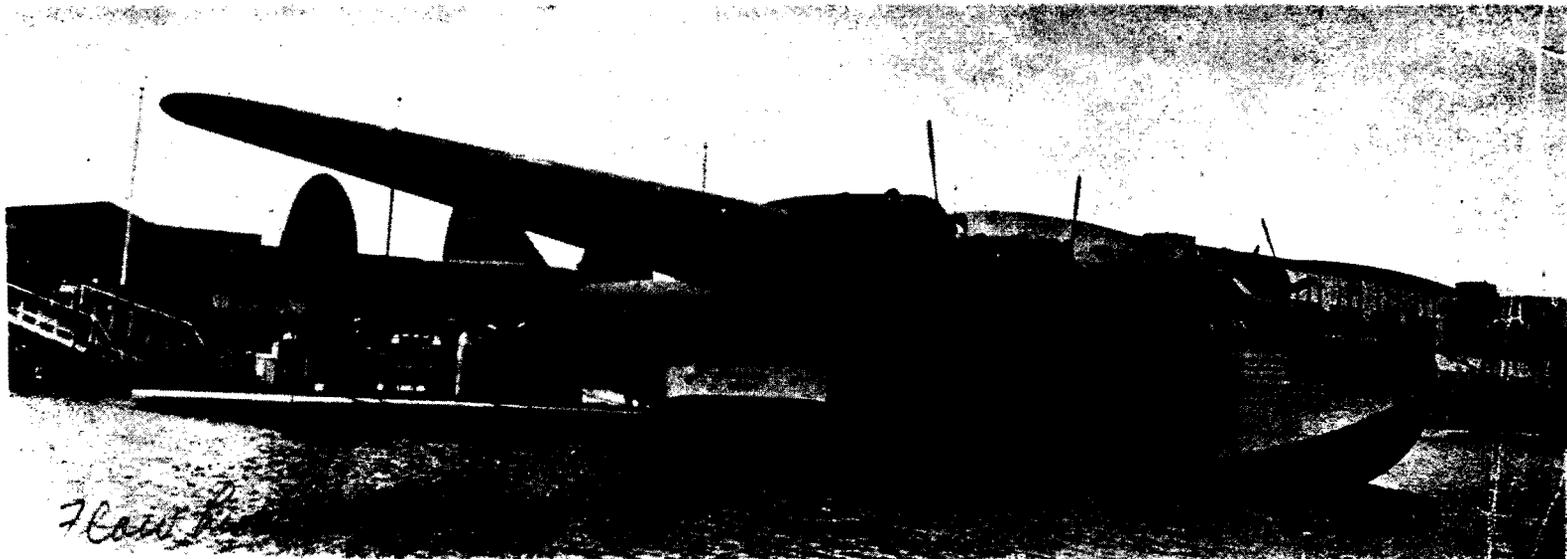
To give an idea of the time they make, you can reach Honolulu in 16½



Clipper Cuisine is the finest. Hot meals are served, even in Wartime.

PHOTOS BY COURTESY OF PAN AMERICAN AIRWAYS SYSTEM.

TAKE-ON—Camouflaged Clipper being loaded with precious wartime material to be flown to some distant continent.



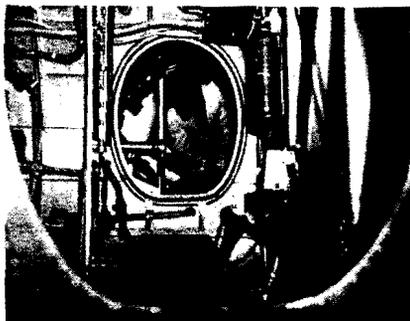
7000

hours, and with a good tail wind in about 14 hours. This hop across the Pacific, Los Angeles to Honolulu, is the longest hop of any commercial airplane—2570 miles!

They can carry a capacity of 5400 gallons of gasoline, which weighs 20,000 pounds. The better the weather, and the shorter the distance, means a lighter load of gasoline will suffice for the trip. This factor very often determines, up to the last minute, whether or not an extra passenger can go.

Nordstrom valves play a vital part in today's petroleum production and refining for just such gasoline as the Clippers use. The refineries of the world have gone along hand in hand with the pioneers of global air transport in developing a high octane fuel to fill their needs, and in supplying it to *Pan American Airways System* in all parts of the world. The equipment, the fuel, the method of direction finding, and the operation, is standard on every Clipper, and at every base throughout the world. Therein lies the reason for the successful international careers of the Clippers.

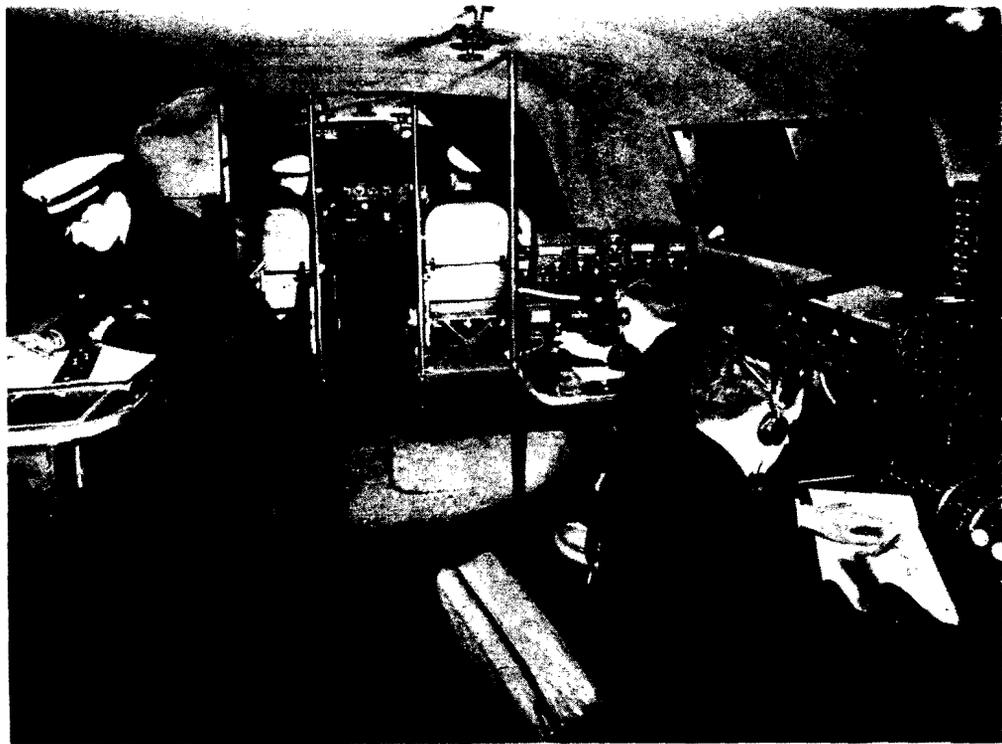
Today, they are flying over 100,000 miles of route, every day, and on schedule. One Clipper alone set a record of over 1,000,000 miles of transoceanic route, the *first* commercial airplane to ever achieve such a record. The kind of fuel, and the care given to the engines can surely take a lot of the credit for such a record.



Clipper Cat Walk behind the engines permits minor repairs and necessary adjustments while in flight.

#### RADIO FACILITIES

*Pan American Airways System* has developed its own method of direction finding. They have over 200 radio stations throughout the world, each operating over a radius of 1000 miles and more. They use code exclusively, and do not rely upon the human voice or possibilities of a misspelling. Each radio station is hurricane-proof, and has



Flight Deck of an ocean-spanning Clipper. Left to right: Navigation Officer at chart table. The Captain, left, and First Officer, right, at flight controls. Radio Officer at his transmitting and receiving sets. Flight Engineer sits at his control board. These men are relieved every four hours.

its own generating plant. Clippers take their beam every few minutes, and also fix their position regularly through the facilities of air navigation.

#### CAPTAIN, CREW AND SHIP

There is a captain, two co-pilots, two radio operators, two engineers, two navigators and two stewards in every flight crew. They work on four-hour watches, just as they do aboard ocean liners.

Hot food is served at meal times, in the spacious lounge rooms, even in war time. But, the Clippers today are a far cry from the glistening luxury liners of the air which carried thousands of passengers bound for a glamorous trip to some South Sea island, or foreign port.

They are flying to at least four continents today on their giant wartime assignment. They are looking forward to carrying regular travelers again, and at a very moderate price, comes the peace.

### BRAINTEEZER

SUPPOSE a railroad track a mile long is staked down at both ends during the winter. Assume that its ends remain fixed and that it expands a foot in length in the summer, forming an arch with the highest point in the center. Would you say the highest point is as much as a foot from the ground?

For Solution, see Page 18.

Clipper checkup by a force of 185 mechanics. In 48 hours, a complete inspection and servicing job can be done.

