

## Trans-Pacific Airway Bulletin Number Four: Organization of the Service

*In November, America will swing into action an airway to the Orient—a 9,000-mile aerial trade route across the vast Pacific Ocean that bids fair to affect the course of world affairs by changing, from twenty-eight days to sixty brief flying hours, the interval between the Western World and the far-off Orient; that will give American commerce a high road to the billion-dollar markets of the teeming East, and make neighbors of peoples half the world apart.*

*This is the fourth of five articles which tell, for the first time, of the remarkable organization and planning behind this ocean-bridging airway; of its pioneering; the ships and men that are to be geared to the task; what the service is to be, and some of the effects of this new, dynamic link between the hemispheres.*

Within a few days huge Pan American flying "Clipper" ships will be speeding American air mail—and soon thereafter passengers and express as well—on regular schedules across the vast Pacific Ocean to the Orient.

In accompanying articles we have traced the four years of effort, the \$4,000,000 of resources that have gone into the making of this great 9,000-mile bridge for American commerce and American travelers.

Here let us summarize the descriptive features of the accomplished task.

The first of the giant flying-boats which will be used for the actual scheduled operations is on a 6,000-mile shake-down cruise to San Francisco by way of the Caribbean and Panama. Two of its sister ships stand ready outside the factory hangars to follow soon in the wake of the first.

Great all-metal high-wing monoplanes, these three twentieth century "Clippers" are larger than any airplanes ever built in America. With a ton of mail or express cargo they can cruise 4,000 miles non-stop at a speed of over 150 miles an hour. They can make the longest stage of the new

trans-Pacific route, 2,410 miles, with thirty per cent of reserve fuel, several tons of cargo and eighteen passengers. On shorter hops their passenger lists can be increased. There is room in their cabin compartments and lounge rooms for 48 passengers to be seated comfortably, and such loads are practical up to 1,200 miles.

Ever since last July bases have been ready for the service all the way across the Pacific to Manila. Docking floats, fuelling equipment, shops, offices, elaborate radio, living quarters—a set of five complete ground stations have been set up at a cost of more than \$2,000,000. The eastern terminal will be in Alameda, on San Francisco Bay. The second station in Pearl Harbor, on the Island of Oahu in the Hawaiian group. Then Midway Island islet, 1,380 miles to the westward but still in the Hawaiian group, makes the third. The fourth stop on tiny Wake Island, westward of the date line, 1,252 miles from its nearest neighbor, Midway. Then Guam, 1,560 miles further; Manila, 1,580 miles more, as a last break in the long journey before the China coast, 700 miles further, is reached.

At each base a permanent crew of manager, agents, radio men, mechanics, has been stationed since early summer. Hand-picked from the whole Pan American organization, every one of these ground crew men upon whom so much depends has had years of thorough training behind him. Each crew, too, has held endless rehearsals of its routines under Pacific conditions. The radio men have stood watch constantly since the erection of their sets some months ago. Weather observations go on hourly.

On four great pioneering flights a nineteen-ton flying-boat, "Pan American Clipper," has been used throughout the summer to test bases and ground crews in actual aircraft handling and to give a final increment of training to flight crews.

The "Pan American Clipper's" first flight went as far as Hawaii, then returned. The second reached Midway before the ship was headed back. The third reached Wake. The fourth, Guam.

Steadily, without a single untoward incident to mar even one of its 40,000 miles of Pacific test flights, the aerial pioneering has gone steadily forward with its exhaustive program. Nuclei for five crews have been trained aboard her. Its trips have confirmed a thousand calculations and estimates made by Pan American weather and radio experts, maintenance specialists, and have filled in great gaps in the types of data that can only be secured by direct test. With completion of the Guam flight, there is no more experimental flavor left in the problem of flying an airliner across this particular trans-Pacific route than there is in running a locomotive from New York to Boston.

Planes, bases, training, are finished. So, too, is the fourth major element in this 9,000-mile bridge—radio. Shore or ship radio that spanned almost any distance desired has, of course, been commonplace for some years. But to develop light-weight, low-powered ultra-reliable equipment to cover the whole Pacific from an airplane has been one of the major tasks faced in this whole project.

Radios for straight communication were comparatively simple. Each of the big "Clipper" boats carries two sending sets, two receivers, a dual antenna system. Even when on the water, with engines still, batteries insure that all sets may be used for days on end to send position reports, get weather data, dispatch instructions to and from almost any spot in the entire Pacific. In the air the range is even greater. From far beyond Wake, for example, the "Clipper's" radio operator has kept in constant touch with Pan American's Miami station, a half a world away.

The project's real radio triumph, though, has been its extension of aircraft radio direction-finding devices to unprecedented ranges.

The normal type of radio beacons serve well enough for overland lines. But their short ranges of a hundred miles or so make them obviously impossible for trans-oceanic use. Pan American early standardized on the international routes a telegraph-signal type, then extended it in power. On

each of its flights the "Pan American Clipper" was able to keep a constant running-fix of its position to the fraction of a mile by radio bearings it could take on ocean vessels and a half dozen shore stations. It can then check those readings with bearings taken by its base stations on its own signals. Gone forever is the great hazard that once faced fliers crossing great expanses of ocean.

Gone, too, are the hazards that once existed when unexpected fog obscured objective harbors. A well-tried, perfectly proven procedure of using the radio direction-finders in conjunction with the plane's flying instruments enables the big ships to land smoothly and accurately in any of its base harbors.

All summer long, piece after piece has been fitted into the picture. Base after base has taken shape. Stage after stage has been flight-tested. The ground flying crews have topped off years of training in the Caribbean with actual proof flights over the Pacific. The radio is ready and efficient beyond the most optimistic expectations.

Early in November the first flight on regular schedule will begin. At first with mail alone, the "Clipper" will, before many weeks, be carrying passengers and express as well.

And what a schedule it will be. A take-off in late afternoon from San Francisco Bay. A landing at Honolulu seventeen hours later in the early morning sunshine. Then only four daylight flights to Manila. Easy flights these four, with nights spent on the tiny base islands now sprung into new world prominence. A final half-day flight from Manila into Macao, near Canton, on the China coast.

Bi-weekly frequencies are planned for the first flights, with air mail only. Then weekly service with mail, passengers and express. As traffic builds, and it should build swiftly, schedules will build in speed and in frequency.

Then Hawaii will be the forty-ninth state in fact as well as claim—and the age-old dream of a new golden passage to the Orient achieved at last.