



FAM 14

Prepared by the SAN FRANCISCO AERONAUTICAL SOCIETY

Trans-Pacific 75th Anniversary Special Edition

November 2010

CHINA CLIPPER

On the afternoon of November 22, 1935, an event unfolded on the waters of San Francisco Bay that would cast the world in a new light. A Pan American Airways four-engine transport plane—the twenty-six ton flying boat optimistically named *China Clipper*—lifted off the surface and strained into the sky threading its way under and over two partially built bridges as thousands cheered from shore. It soared through the Golden Gate and slowly disappeared from land as the ship's seven-man crew set a course for the Far East and opened the age of regular oceanic commercial air service.

Pan American Airways was formed in 1927 by a group headed by Henry H. Arnold, the future Commanding General of the U.S. Air Force, and run by its long-time, visionary president, Juan T. Trippe. Starting with a mail contract for the one hundred-mile route to Havana, Cuba, across the Florida Straits, Trippe was determined to develop Pan American into an international carrier. Transport flying any distance over water on a reliable basis was challenging, and the few airlines of the day were primarily focused on over-land operations. Trippe shared the dream of building an air transport system across entire oceans with fellow Pan American founding principals



Pan American Airways Martin M-130 *China Clipper* flying under cables and guy wires of the San Francisco-Oakland Bay bridge on the inaugural flight November 22, 1935. Clyde H. Sunderland. SFO Museum. Gift of Thomas A. Northrop.

such as John A. Hambleton, a World War One combat pilot, and the financier Cornelius V. Whitney. Charles A. Lindbergh, also an early consultant, became technical advisor in 1929 as Pan American expanded throughout the Caribbean and Latin America. The airline developed advanced flying boat operations across the Caribbean Sea, and by 1931, its five



Pan American Airways President Juan T. Trippe and Technical Advisor Charles A. Lindbergh c.1929. SFO Museum. Gift of the Pan Am Association.

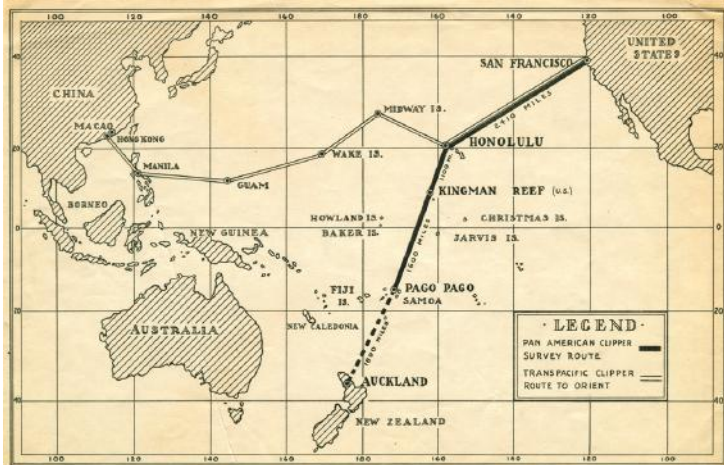
hundred-mile Kingston, Jamaica, to Barranquilla, Colombia, service became the world's longest over-water passenger route.

Leading individuals in the fields of aeronautical engineering, airline operations, government relations, international diplomacy, and finance organized an unprecedented business model, the Pan American Airways System. With entrepreneurial zeal and persistent methodology, they achieved the goal of ocean air transport by 1935—just thirty-two years after the Wright brother's first flight. This great leap forward by the company that would become the legendary Pan Am was first achieved in the more challenging Pacific. The Atlantic would not be crossed for four more years.

FAM 14 is the abbreviation for the world's first transoceanic Foreign Air Mail route, which originated in San Francisco and linked the East and West by air. The *FAM 14* masthead photograph, on page one, was taken by Clyde Sunderland and shows the Pan American Airways' *China Clipper* over the city of San Francisco on November 22, 1935, departing on the first trans-Pacific commercial flight to Manila, Courtesy of Pacific Aerial Surveys.

THE PACIFIC ROUTE

By the early 1930s, Pan American began planning for service across the oceans. In the Atlantic, however, Great Britain would not permit a U.S. carrier to use Newfoundland, part of its Commonwealth, as a base for the first segment of a route from New York to Europe until a British airline was also able to fly the Atlantic. As negotiations continued, Pan American turned its attention to the Pacific.



Pan American Airways Pacific route system map c. 1936. SFO Museum. Gift of the Pan Am Association.

Pan American had considered a way to Asia through Alaska and formed Pacific Alaska Airways in 1932. Weather conditions and political issues, however, refocused study on the middle latitudes. San Francisco, which is 160 miles closer to Hawai'i than Los Angeles, was the chosen terminus for a Pacific route that required careful calculation and geographic study. The 2,400 miles from San Francisco to Honolulu represented the world's greatest water gap along any viable aerial trade route. Finding a tiny island chain at that distance also required far greater navigational ability than locating a continental landmass. This Hawai'i Sector was well beyond the range of transport planes of the day and was the barrier to a global air system. If conquered, islands with lesser distances between them could be surveyed across the rest of the Pacific. Hawai'i, Guam, and the Philippines were suitable choices. Midway Island, a coral atoll with a central lagoon and a U.S. territory, lay 1,300 miles northwest of Hawai'i. Tiny Wake Island became the vital link as it broke the 2,690 miles from Midway to Guam into manageable segments.

When first established in 1935, the route terminated in the Philippines capital of Manila. It was extended to Macao and Hong Kong in 1937 making the total flying distance from San Francisco 8,746 miles. The U.S. Post Office Department designated it FAM-14, for "foreign air mail" route. Pan American surveyed a South Pacific route, FAM-19, through Hawai'i to New Zealand beginning in 1937 by way of Kingman Reef and Pago Pago in American Samoa. When regular South Pacific service began in 1940, the route was shifted through more permanent bases at Canton Island—after a jurisdictional dispute with Great Britain—and Nouméa in the French territory of New Caledonia.

AIRWAY TO ASIA

Pan American established a Pacific Division in January 1935 with headquarters at Alameda, California, across the bay from San Francisco. By December, an organization of 221 employees had converted Alameda's land based facility into a seaplane harbor to serve as the eastern terminus of Pan American's Pacific route system. To build bases at Honolulu, Midway, Wake, Guam, and Manila, the 15,000-ton steamer ship *North Haven* was chartered and docked at Pier 22 in San Francisco. The ship sailed on March 27, 1935, carefully loaded in sequence with two pre-fabricated villages, five air bases, a quarter million gallons of fuel, motor launches, barges, tractors, generators, and fifty-foot timbers to build radio towers. On board were forty-four airline technicians and seventy-four construction engineers. The unloading, particularly at Midway and Wake, was dangerous and difficult. While surveying and construction parties remained on the islands to complete the installations, the *North Haven* was reloaded in Manila for the return voyage and sailed back through the Golden Gate on June 30th. A second *North Haven* expedition in January 1936 built hotels on the islands for overnight passenger accommodations and delivered station managers, hotel superintendents, and other Pan American personnel who took up residence on the new mid-Pacific bases.

Life for these engineers, radio technicians, meteorologists, and hotel employees was an adventure. Chamorro men, indigenous people of the Mariana Islands, were hired in



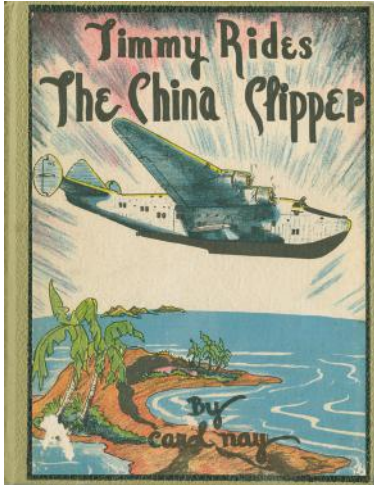
Freighter *North Haven* at Pier 22, San Francisco 1935. SFO Museum. Gift of Thomas G. Dragges.

Guam to work at the Midway and Wake hotels. Community activities centered on the weekly arrival of the east and west bound Clippers. Off-hours were spent swimming, fishing, gardening, and socializing. The Midway construction crews started a Goofy Gooney Club, named after the gooney bird, a Laysan albatross whose awkwardness on land and behavioral antics entertained residents and visiting passengers.

Membership required living on Midway for one month or seven Clipper trips. For Club business, One Case or Two Case meetings were held depending how much beer was consumed. Three Case meetings were for elaborate initiation rites, and new members received certificates and pins from the Supreme Goofy Gooney. The club grew to over 150 members by 1937. Residents of Midway also produced a Gooney Gazette and made souvenir globes from Japanese blown glass net floats collected on the beach to sell "Clipper through" passengers. Movies were brought in by Clipper, and KGBM in Honolulu dedicated songs to the "boys and girls on Midway, Wake, and Guam" on its weekly Goofy Gooney Club radio program.

CLIPPER CULTURE

The news of Pan American's launch of ocean air service flashed the *China Clipper* name in headlines, radio, and newsreels around the world. The flying boat became instantly famous and the best-known individual airplane since the *Spirit of St. Louis*. The bold enterprise of putting a commercial airline across the Pacific and the precision and organizational mastery Pan American demonstrated in its successful execution inspired a nation struggling to break free from the grip of the Great Depression. While breaking down barriers of time and distance



Timmy Rides the China Clipper children's book 1948. SFO Museum. Gift of Jerry O'Donnell.

made the earth seem smaller, the world of opportunity for commerce and cultural exchange between nations was now greater. As the fleet of streamlined silver flying boats came to symbolize hope, progress, and the arrival of a new era, the word Clipper entered the mainstream of popular culture. Large crowds gathered to see the departures and arrivals at Pan American bases. When the airline moved its operations from Alameda to the newly created Treasure Island in 1939 for

the beginning of the Golden Gate International Exposition, the San Francisco World's Fair, Clipper operations became a huge attraction, and tickets were sold to watch maintenance work from a balcony in the hangar.

Pan American's flying boats captured the imagination of a generation. They became the subject for popular young reader publications and appeared on numerous magazine covers. Clippers were recreated as mass-produced toys and model kits. Commemorative medallions were struck with their image, and *China Clipper* pins were offered as premiums by cereal makers. Many furnishings and desk top items were modeled on the Clippers, and the typewriter manufacturer Smith-



Life Magazine 1937. SFO Museum. Gift of Barnaby Conrad III.

Corona produced a popular Clipper model well into the 1950s. Willys-Overland Motors introduced its Clipper automobile in 1937, and a stream of consumers goods were branded with

the Clipper name, as its likeness was used on labels from motor oil to beer. Restaurants and diners also took the name, and a *China Clipper* float was featured by the City of Los Angeles in the 1936 Tournament of Roses Parade in Pasadena, California. The same year, Hollywood paid tribute to Pan American's achievements with the release of the Warner Brothers movie *China Clipper*. The romanticized drama starred Pat O'Brien with Humphrey Bogart as the veteran Pan American pilot, Captain Edwin C. Musick.

END OF AN ERA

The outbreak of war in the Pacific at Pearl Harbor on December 7, 1941, was telegraphed to all stations. Three Pan American flying boats were now behind enemy lines. The Sikorsky S-42A *Hong Kong Clipper II* was sunk at Hong Kong. The Pacific Clipper, a B 314, was ordered to return by flying west. Captain Robert Ford and crew reached New York seven weeks later. While Imperial Japanese Navy planes destroyed Pan American's base at Wake, the M-130 *Philippine Clipper* was strafed with machine gun fire. Still



Seaplane harbor at San Francisco Airport with moored Boeing 314 flying boats c.1946. SFO Museum. Gift of the Pan Am Association.

airworthy, however, Captain John H. Tilton evacuated thirty-six passengers and personnel to Midway and then on to Hawai'i. The crew reached San Francisco on December 10th. Twenty-six bullet holes in the *Philippine Clipper* were repaired at the Treasure Island maintenance hangar. Pan American's entire Pacific fleet was contracted to the Defense Department, painted camouflage gray, and assigned to the Naval Air Transport Service. Their crews trained and transported military personnel and flew special missions throughout the war. New long-range, land-based airplanes like the Lockheed Constellation and Douglas DC-4, however, started to replace them. Pan American moved from Treasure Island to the seaplane harbor at San Francisco Airport, now SFO, in 1944. The last flying boat flight—Hawai'i to San Francisco—arrived here on April 9, 1946, and within days, the War Assets Administration placed ads to sell the salvaged fleet. All of the surviving flying boats were eventually scrapped.

FLYING CLIPPER SHIPS

Pan American's Caribbean experience had proven the effectiveness of seaplanes for coastal bases where runways did not exist. Charles A. Lindbergh and airplane designer and manufacturer Igor I. Sikorsky helped devise a new class of four-engine, long-range transport aircraft. The airline listed requirements for an airliner to overcome the challenges of ocean flying. By 1932, bids from both the Sikorsky Aircraft Corporation and the Glenn L. Martin Company were accepted by Pan American. The Boeing Company was also hired in 1936. All three manufacturers designed and delivered aircraft made exclusively for Pan American under the watchful eye of its chief engineer André A. Priester. Each was a flying boat, a hybrid design capable of taking off and alighting only on water. All were fitted with luxurious passenger accommodations. Pan American named them "Clippers" in tribute to maritime tradition and the merchant sailing ships of the nineteenth century. These three aircraft pioneered ocean air travel.

SIKORSKY S-42

First used in the Caribbean, ten S-42 types were delivered to Pan American between 1934 and 1937. In 1935, the *Pan American Clipper* was modified for extended range to survey the Pacific route and was later used for regular service on the Manila–Hong Kong leg. An S-42B flew South Pacific survey missions. Distinguishing characteristics included the high-wing configuration mounted atop a "cabane" to extend the height between wing and water, outboard pontoons, a tail section with two vertical stabilizers, and portal windows.



Sikorsky S-42 c.1934. SFO Museum. Gift of Barnaby Conrad III.

Gross weight: 38,000 lb
Dimensions: span 114 feet; height 17 feet; length 69 feet
Power plant: four Pratt & Whitney Hornet engines, 750 hp each
Performance: cruising speed 150 mph; service ceiling 16,000 feet; modified range 2,800 miles
Seats: 32
Cost: \$242,000 (\$3,854,000 in today's equivalent)

CHINA CLIPPER STORE

Airline Memorabilia, Aviation Books, Posters,
China Clipper Model Airplanes and more!

Open Monday, Nov 15th - Monday, Nov 22nd
9:00am - 5:00pm

Louis A. Turpen Aviation Museum
San Francisco International Airport
or you can visit our online store at www.sfaero.org.

MARTIN M-130

Designed under chief engineer Lassiter C. Milburn and the largest commercial airplane when delivered in 1935 and 1936, only three M-130 flying boats were built. They were named *Hawaii Clipper*, *Philippine Clipper*, and *China Clipper*. When the *China Clipper* inaugurated service to Asia, the name became synonymous in the public's mind with all of Pan American's Pacific flying boats. Its distinguishing characteristics were sleek lines and the stabilizing seawings, or "sponsons," at the waterline braced by cross struts.



Martin M-130 1935. Photograph by Clyde H. Sunderland. SFO Museum. Gift of Carla B. Bos in memory of Abraham Bos.

Gross weight: 52,000 lb
Dimensions: span 130 feet; height 25 feet; length 91 feet
Power plant: four Pratt & Whitney Twin Wasp engines, 900 hp each
Performance: cruising speed 130 mph; service ceiling 17,000 feet; modified range 3,200 miles
Seats: 41
Cost: \$417,200 (\$6,644,000 in today's equivalent)

BOEING 314

The largest and most luxurious of all the flying boats, the B 314 was called a flying hotel by journalists of the day. Pan American ordered six of the original version and six more B 314A variants, three of which were sold before delivery to the British. The B 314 was introduced to Pan American's Pacific Division and used to open its Atlantic service in 1939. Designed by Wellwood E. Beall, it distinguished itself by sheer size, three vertical stabilizers in the tail, and cantilevered seawings that doubled as fuel tanks. A flight crew of up to ten was required to operate the "Super Clipper."



Boeing 314 c.1940. SFO Museum. Gift of Carla B. Bos in memory of Abraham Bos.

Gross weight: 82,500 lb
Dimensions: span 152 feet; height 28 feet; length 106 feet
Power plant: four Wright Double Cyclone engines, 1,500 hp each
Performance: cruising speed 180 mph; service ceiling 13,400 feet; modified range 3,500 miles
Seats: 74
Cost: \$668,900 (\$10,652,000 in today's equivalent)

MASTERS OF OCEAN FLYING BOATS

Pan American pioneered the multiple flight crew concept for long-range ocean transports under the head of flight training, Clarence H. Schildhauer. Requirements were based on six areas of need: expert direction of the flight; piloting; navigation; control and care of power plants; maintenance of communication; and passenger service. This called for a cross-trained crew of up to ten. Captains qualified as Master of Ocean Flying Boats. A First Officer was second-in-command, while the Second Officer, a senior pilot-in-training, assumed navigation duties. Advances in navigation were largely responsible for successful ocean flying. Navigators used dead reckoning, celestial observation, and Pan American's own radio compass. Dead reckoning involved dropping a glass or ceramic drift marker overboard. Filled with metallic powder, it created a highly visible slick on the ocean surface. This fixed point was viewed through a drift meter to measure ground speed and sideways diversion from crosswind that could then be calculated for a heading correction. A bubble sextant was



Boeing 314 crew at Treasure Island 1940. Photograph by Phil Stroupe. SFO Museum. Pan American World Airways Archive.

used to sight stars from an observatory in the ceiling. Once a fix was determined, star charts were consulted to determine position. Pan American installed radio stations on the California coast and at island bases for its new Adcock Direction Finder, developed under chief communications engineer Hugo C. Leuteritz. Its 1,800-mile range was a major technological breakthrough and gave Pan American great advantages in air safety.

The Flight Radio Officer was responsible for the communications equipment and maintained constant contact with radio-control stations ashore and the station ships located at specific ocean quadrants. Telegraph and telephone transmitters were installed at the radio officer's workstation where telegraph keys and Morse code were used for cw, or code wireless, long-range transmission. A hand wheel for the radio direction finder was located overhead. Radio voice contact could be made within thirty miles of the air bases on the ground to guide letdown on approach. A Flight Engineer

monitored and maintained the mechanical operation of the aircraft utilizing up to forty-one instruments and the throttles, carburetor settings, and fuel supply valves located at his station. On the B 314, a catwalk inside the expansive wing even allowed the engineer to perform light maintenance work on an engine in flight. The Flight Steward, or Purser, saw to all passenger comforts, meal service, preparation of sleeping quarters, and luggage handling. Steward-to-passenger ratios were sometimes one-to-one, and Pan American quickly earned a reputation for impeccable service. A Third Officer, Fourth Officer, Assistant Flight Engineer, Assistant Radio Officer, and Assistant Flight Steward rounded out the crew.



SAN FRANCISCO AERONAUTICAL SOCIETY'S 75TH ANNIVERSARY CHINA CLIPPER RAFFLE

Grand Prize - drawing Mon., Nov 22, 2010
2 Round Trip Tickets on Cathay Pacific to Hong Kong,
3 Nights at the Peninsula Hotel,
Roundtrip Rolls Royce Airport Transfer

1st Prize - drawing Mon., Nov 22, 2010
2 Round Trip Tickets on Virgin Atlantic to London

2nd Prize - drawing Sat., Nov 20, 2010
2 Round Trip Tickets on United Airlines (48 United States)

3rd Prize - drawing Thur., Nov 18, 2010
2 Round Trip Tickets on Continental Airlines (excluding Hawaii)

4th Prize - drawing Tue., Nov 16, 2010
2 Round Trip Tickets on Virgin America

\$25 EACH OR 5 FOR \$100

TICKETS AVAILABLE AT CHINA CLIPPER STORE



Crew of the 1st Sikorsky S-42 survey flight in Hawai'i, l-r, Radio Officer W.T. Jarbone Jr., Officer Harry R. Canaday, First Officer R.O.D. Sullivan, Captain Edwin C. Musik, Navigator Fred J. Noonan, Engineer Officer Victor A. Wright 1935. SFO Museum. Pan American World Airways Archive.

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OF THE SOCIETY!



SCHEDULE OF EVENTS

China Clipper 75th Anniversary Celebration
Louis A. Turpen Aviation Museum
San Francisco International Airport

Tuesday, November 16th 5:30 pm - 9:00 pm
China Clipper 75th Anniversary Reception

Presentation of the 2010 Achievement in Aviation Award
RSVP event - SFAS members and Invited Guests

Thursday, November 18th 6:00 pm-9:00 pm
China Clipper Movie Night At the Museum

Join the Aeronautical Society for Movie Night at the Museum.
\$10/ticket (SFAS members free).

Tickets must be purchased in advance.

Complimentary parking with Airport garage ticket.

Thursday, November 20th 10:00 Am-12:00 pm
China Clipper Forum & Book Signing

Moderated discussion with three authors and historians, Robert Gandt, Jon Krupnick and Sergei Sikorsky. Book signings to follow featuring *China Clipper, the Age of the Great Flying Boats* by Robert Gandt, *Pan Am's Pacific Pioneers - The Rest of the Story* and *The Sikorsky Legacy* by Sergei Sikorsky, and by Jon Krupnick.

Open to the public.

Complimentary parking with Airport garage ticket.

CONTACT! For Society general membership and other programs, please contact:

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The San Francisco Airport Commission Aviation Library and Louis A. Turpen Aviation Museum is located at San Francisco International

Aiport, International Terminal, Pre-Security, Level 3. It is open Sunday - Friday from 10:00 am to 4:30 pm. The telephone number is (650) 821-9900. For additional information and to learn about volunteer opportunities, please contact the SFO Museum at (650) 821-6700, or email curator@flysfo.com or visit www.sfomuseum.org.

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