

FORUM OF FLIGHT

THE EARLY AIRLINES

Special Edition
By ROBERT L. LAWSON
and MAUNO SALO



The airplane as a paying passenger-carrying vehicle got its start directly after WW I generally using war surplus equipment experimenting with short hops especially to island resort centers. And as mail contracts were let, passengers often rode as ballast on top of mail bags. These were uncomfortable, cold rides with not much chance to view the scenery and quite often dressed in airmen's leathers. Many of the engines in use were surplus Liberty's until the Wright Whirlwind revolutionized the radial engine concept.

Past the 1925's we moved into the 8-10 place wooden-winged Fokkers. But it was Lindy's solo flight across the Atlantic that gave air transport one of its biggest boosts—people became instantly air-minded. Corrugated all-metal Fords with wicker seats were the vogue and creature comforts were demanded. Night flying was an irregularity with cross-country not only using the "iron compass" but the passengers rode partway at night behind the Iron Horse. Some airlines used biplanes—safety factor being the theme. Beacons waved their shafts of light across the skies, but bulky, crackling radios were anything but reliable.

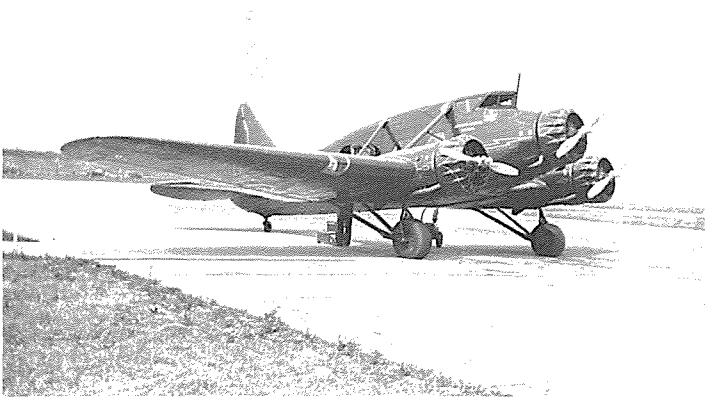
Despite the fall of the stock market in October 1929, airline traffic continued to gain. There were Bach's, Fleetsters and Stinsons, on the shorter hops and Consolidated and Sikorskys on the longer routes. Genius John Northrop perfected his multi-cellular wing and stressed skins. Boeing had the B-9. Then came the crash of the wooden-winged Fokker F-10A NC 999E bearing Knute Rockne. The public cried for safer aircraft. It became a race for metal airliners, Boeing first with the 247 followed by the Douglas DC-1 and a bit later Lockheed's Electra. Curtiss had an interim biplane, the Condor, but it was the DC-1/2 that completely changed the concept of airline travel. Soundproofing, full instrumentation, controllable pitch props, retracting landing gears and single-engine safety became standard items. The wide-bodied DST brought on the eternal Gooney Bird and the race was on. It was just a question of more powerful engines to propel larger airframes. The most important instrument of communications of the 20th Century had reached a pinnacle in less than 35 years from the first flight.

1. 3908 Fokker F.VIIA/3m s/n 602 was Western Air Express' lone hybrid C-2 purchased in 1928 with a wing from NC-55. One of 7 assembled at Teterboro from Dutch-built airframes. Airplane originally as 2195 (see AAHSJ Vol. 16 No. 4 pg. 259). Originated from single engine F.VII's built in Holland that featured British liquid-cooled engines. Wright J-4's added to first F.VII introduced to this country and entered in the 1925 Ford Reliability Tour, which it won. About 25 examples built as the C-2, mostly for the military. C-2A "Question Mark" made history with its 150-hour endurance hop. Span: "A" 63'-5", "B" 71'-2". Engines, Wright J-5, 220 HP. Also used by Colonial Airways and PAA. Photo taken at Salt Lake City 1928. D.E. Drummond

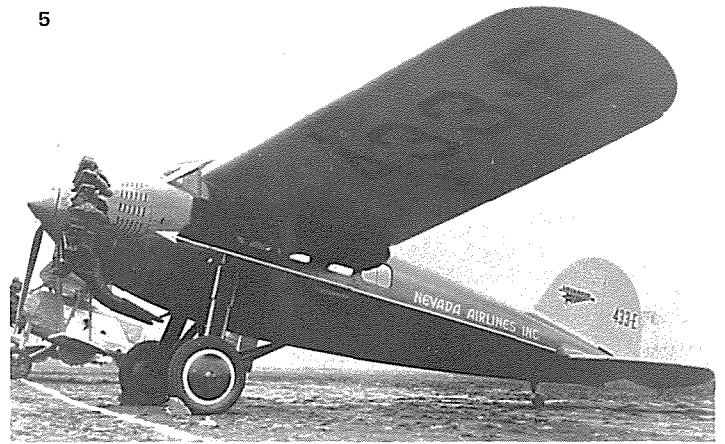
2. NC 12390 Condor AT-32A s/n 42. AA's first sleeper version. Suffered from vibration problems. Rebuilt by Robertson A/C Corp. Mo. and shipped to Burma 1940. Other aircraft in line-up: L to R, Vultee V1A, Stinson R, and original Lockheed L-10 Electra in Mexicana registry. D.E. Drummond
3. Stinson "A" Trimotor, 10 place. One of 15 sold to American AL as feederliners. Designed by Robert W. Ayer. Thirty constructed. Also used by Central AL (5) Australian airlines (4) and Delta (3). One in use during WW II as UC-91. Span: 60'. Engines: Lycoming R-680-5, 260 HP. Sherwood H. Brown
5. 433E Lockheed Vega 5-C s/n 49 of Roscoe Turner's Nevada AL. One of four used in 1930. Seven place. Originally purchased by William and Lil Boggs, Condon AL, Alameda CA. Sold to Braniff AL in 1931. Some 130 Vegas constructed. All wooden airplanes designed by Jack Northrop. Fuselage halves formed in cement mold. These speedy airplanes were involved in all sorts of record-breaking flights by adventurers, explorers and speed merchants. Largest airline fleet operated by CAT (Mexico) which had 10, followed by Alaska-Washington AL with 7, Braniff had 5. Ten mfg'd. with metal fuselages as the DL-1 series, including military Y1C-12 (31-405) and Y1C-17 (31-408). One impressed into WW II service as C-101, s/n 210. Span: 41'. Engine: P&W Wasp C. Harry Gann Collection
4. NC 14716 PAA's majestic Martin M-130 (Span—130') "sweet 16" better known as the CHINA CLIPPER. First of 3 delivered, s/n's: 558, 7, 6. Carried 32 passengers on short hops and 15 on long hauls. This ship sabotaged on take-off ripping open its hull running over a submerged concrete block imbedded with spikes. Inaugurated Trans-Pacific mail service 11-22-35. NC 14714 HAWAII CLIPPER disappeared 7-28-38 between Guam and Manila. NC 14715 PHILIPPINE CLIPPER* ran into mountain near Ukiah CA 1-21-43. NC 14716 lost in landing accident at Port of Spain, Trinidad 1-8-45. 715 & 716 were briefly in use with USN as #48230 & 231. Wide stripe across top wing was painted in international orange. Original engines: P&W Wasp R-1830 S2A5G 800 HP. Later fitted with 950 HP mills and hydromatic props.
*PHILIPPINE CLIPPER although punctured by 97 bullets by Jap air attack on Wake Island, 12-7-41, flew on to Midway with 70 on board. PAA via R.L. Kruse



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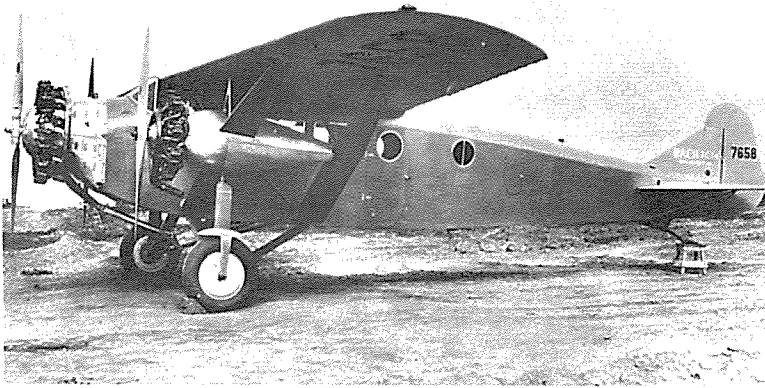
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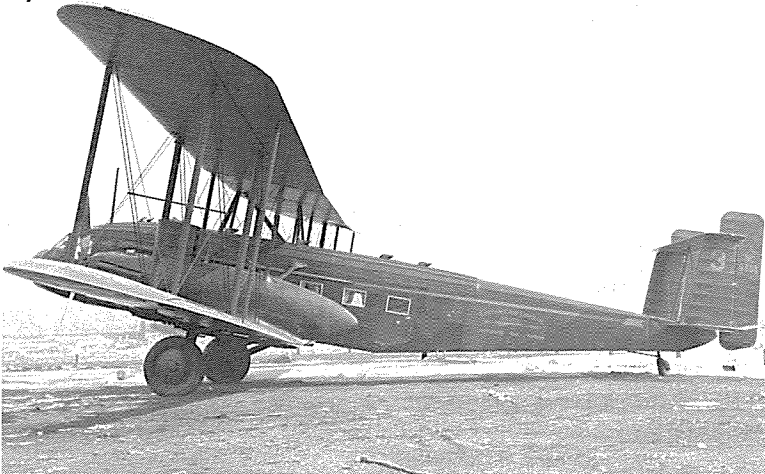


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6. 7658 Bach Air Yacht, 3 CT 4, an all-wooden airliner of 8-10 place. Prototype built at Santa Monica in 1927. Designed by Mort Bach. Factory established at Metropolitan Airport. Van Nuys in 1929. Waldo Waterman was manager of airport and Bach's test pilot. Established American altitude (20,820') and payload (2220#) record 7-26-29 in one of the Air Yachts. Types ranged from 3 CT 2 to 3 CT 9 with three ATC's issued; 114,172,271. Utilized a variety of underwing engines including Comet, Ryan-Siemans, Kinners & Wrights. Center engine remained P&W Hornet. Some 20 airliners built before company failed in 1931. In use with Pickwick Airways and West Coast Air Transport. Span: 58'-6". Salo Collection

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7. NC 985Y Curtiss Condor I. Better known as B-20. This 18 passenger airliner was one of three originally leased to TAT. It had high-cambered wings which affected its speed. D.W. Tomlinson Western Region Operations Manager turned the airliners down and they were sent to St. Louis facility where tail sections were rebuilt along with the engine nacelles to stabilize oscillating flight characteristics before returning to airline service with Eastern. Curtiss Conqueror V-1570 600 HP. Clay Jansson

8. NC 432M Stinson "U" Prototype s/n 9000, 12 place trimotor designed by Art Saxon. Twenty built of which 16 went to American AL. Lycoming R-680 BA 240 HP. W. Faison

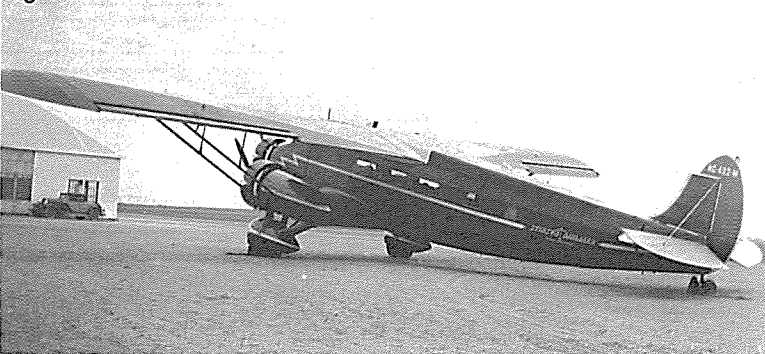
9. Boeing 80 at Salt Lake City with supersized fin. 80A followed with ten airplanes, eight 18 passenger versions, one became 80B with open cockpits and tenth became Model 226, a deluxe oil company exec transport. 80A was known as "Pullman of the Air" with its leather seats and veneer interiors. Power: 525 HP Hornets. Modified to 80A-1 with increased fuel capacity and engine cowlings, and triple fins. Total production, 16 planes. D.E. Drummond

10. C/225M Boeing Model 80 for Boeing Air Transport. The success of the Model 40 as a passenger-carrying aircraft brought on this 12 passenger luxury airliner, the first four delivered in Aug. 1928. This one with enlarged rudder. Span: 80'. Three P&W 410 HP Wasps. Photo at Salt Lake City. B.A.T. pioneered use of RN's for stewardesses. D.E. Drummond

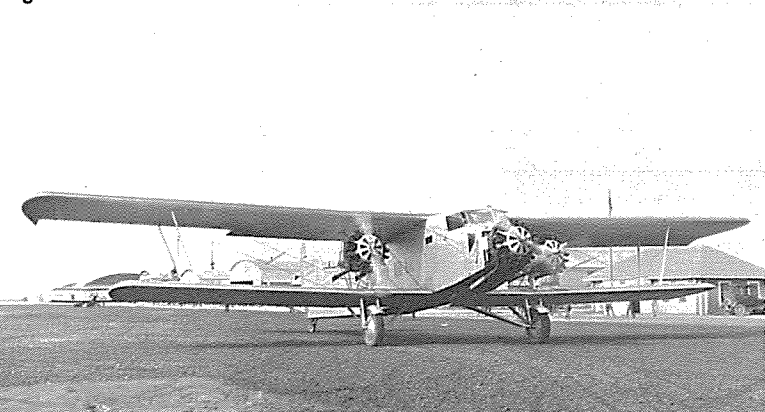
11. NC 943M Sikorsky S-38B s/n 314-1. Ten place. One of nine used by NYRBA, christened HAITI. All sold to PAA in 1930. One of the most versatile airplanes in its day that put Sikorsky A/C on a firm footing. Much route survey flying performed with the "Model T," i.e., Lindbergh's flights around the Caribbean. 125 examples built with PAA as the biggest fleet owner (39). Used by Inter Island Airways, Northwest Airways, Colonial Western Airways, Canadian Colonial Airways, Curtiss Wright Flying Service. Explorers Martin and Osa Johnson did extensive flying in Africa with their S-38. Developed from smaller S-36 (one built) followed by larger S-41. Structure all metal but with fabric-covered wing and tail feathers. Army versions as C-6 (1), C-6A (10), Navy (8) as RS 2/3. Unusual s/n series beginning with 14-1, 114-1, 214-1, 314-1, 414-1, 514-1. Span: 71'-8". Engines: P&W Wasp R1340-7 420 HP. Sikorsky via Mitch Mayborn

12. NC 841M Boeing 40B-4 carried 4 passengers and 1000# mail. P&W Hornet 525. Gross weight upped 1400#. A total of 82 Model 40 built. Span: 44'-2". A's were modified to B's with P&W Hornet. Ten Model 40C built, with nine to P.A.T. using P&W Wasp. 39 B-4 series built including B-4A as P&W test plane. Five Model 40H built at Boeing-Canada were 40B-4's. Photo taken at Salt Lake City 1930. D.E. Drummond

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13. NC 12366 Curtiss Condor II T-32 s/n 28. An interim 15 place transport designed to reopen CW St. Louis facility after a 2-year shutdown. First use of electrically operated LG and rubber bushing shock mounts for engines. Also produced as: AT-32A, B,C,D,E, CT-32, YC-30 and R4C-1. More foreign use than domestic US. 45 built. Wright Cyclone F 700 HP. See AAHSJ Vol. 12 No. 1 for more complete details. Span: 82'. Clay Jansson

14. 5093 Ford 4-AT-B s/n 20, 12 place, Rapid Air Lines, Rapid City, So. Dak. 1928-30. To Ben Gregory 1930-40. During this time period it sported large lettering THE SHIP FROM MARS on its fuselage sides. First Ford Tri-motor flew June 1926. Right side entry in contrast to later airliners. Series 4-AT-A through -F amounted to 78 airplanes; 14 A's, 39 B's, 24 E's, a single F. "C" was s/n 47 and s/n's 24,37,40 were "D's". The "A's" and some "B's" had exhaust manifolds up through the wing. Maddux and Stout were the leading buyers. Military production, Army; one C-3 and seven C-3A. The Navy had three JR-1/2. Span: "A" 68'-10", "B" 73'-11". Engines: Wright Whirlwind J-4,5,6-9 of 200,220,300 HP. Photo: FoMoCo #5571 3-15-28 via Hudek/Carter.

15. NC 9607 Ford 5-AT-B s/n 5, delivered 11-8-28 to NAT. Sold to TAT May 1929, then to TWA 1931. First of this series was a 4-AT-B with a larger wing and Wasp engines. Series A to E. Production: three A's, 42 B's, 51 C's, 20 D's. The "D's" had the square-cornered entry door. E was a converted B. Many with mail compartments outboard of wing mounted engines. Extensive use by 95 airlines and airways throughout the world. PAA had in use 24, and TWA up to 24. Much selling back and forth. Its use as freighter even more important than airline service. The Ford Tri-motor did much to introduce the concept of airline travel and safety to the public. Military production: Army, one C-4 and four C-4A. Navy had three as JR-3 and three RR-4/5. One "D" model modified as a bomber (XB-906-1) was a private venture. Unfortunately the company's Chief Test Pilot, Leroy Manning and his mechanic, L.H. Garriott were killed when it crashed 9-19-31. Initial cost as airliner—\$55,000. Span: 77'-11". Engines: P&W Wasp C, 420 HP. Photo: FoMoCo #6067 11-22-28 via Hudek/Carter.

16. NC 16736 Sikorsky S-42B "Flying Clipper" designed in 1932 to PAA's requirements as a successor to the twin-boom 17-ton S-40 as an oceanic flyer. First Sikorsky to feature variable pitch props and flaps. First flight March 1934. Established and returned numerous flying boat records to the USA during the summer of 1934 under the pilotage of Capt. Sergievsky and Col. Lindbergh. First Clipper across the Pacific to Hong Kong and New Zealand 1935. Regular service to England and Portugal established 1937. NC 16736 was the 10th and last built of the series, all for PAA. Christened PAN AMERICAN CLIPPER III. Delivered 1937 and used as survey plane for North and Mid-Atlantic runs. Fitted with 19 gas tanks. Later named BERMUDA CLIPPER. C/n 4209. Lost at Manaus, Brazil 7-27-43. There were three S-42's, four "A's" and three "B's". Sister ship NC 16735 lost at Manila Dec. 7, 1941. Last four scrapped July 15, 1946. Span (B): 118'-4". Engines: P&W Hornets SIEG 750 HP. Initial cost of airplane—242K. PAA's pioneering chief pilot Capt. Edwin C. Musick lost near Pago Pago Jan. 11, 1938 in S-42B CLIPPER II NC 16734 in midair explosion jettisoning fuel. Clay Jansson

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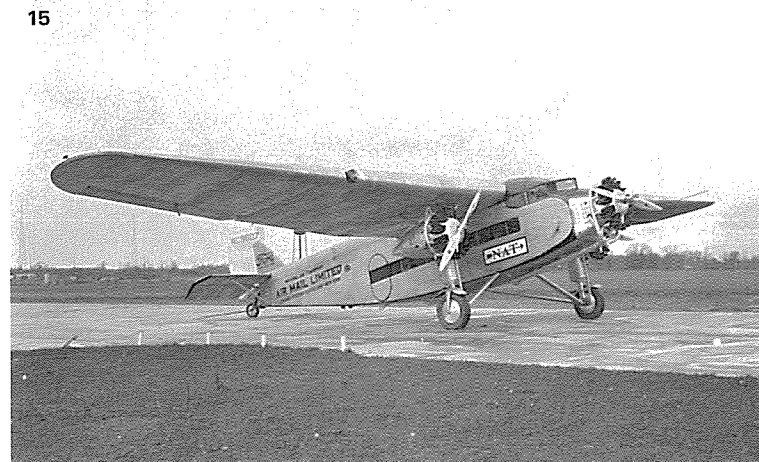
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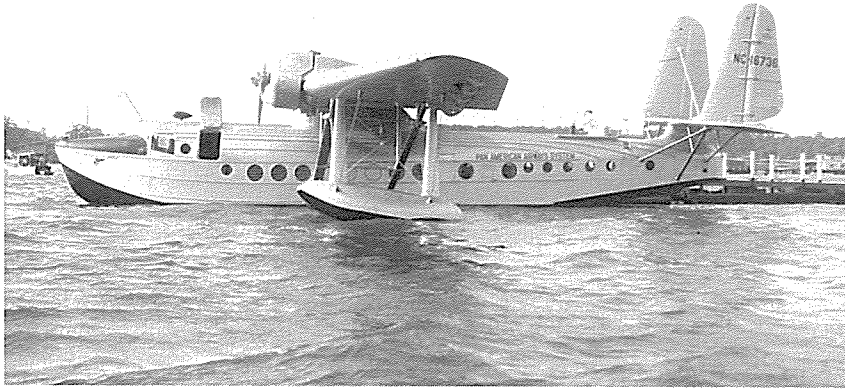
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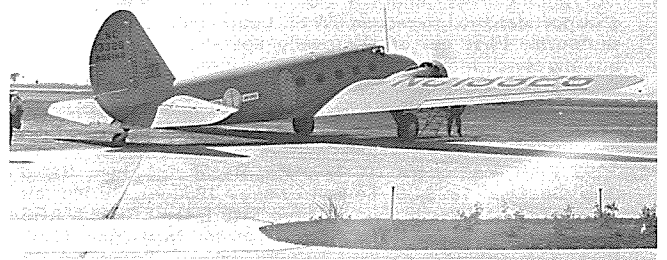
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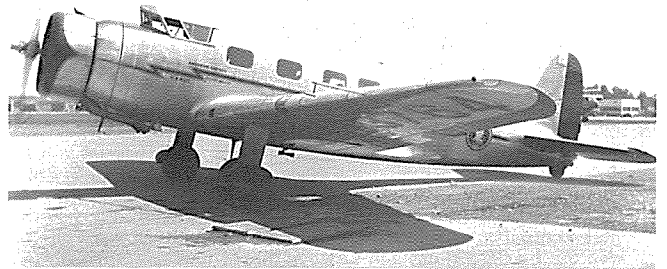
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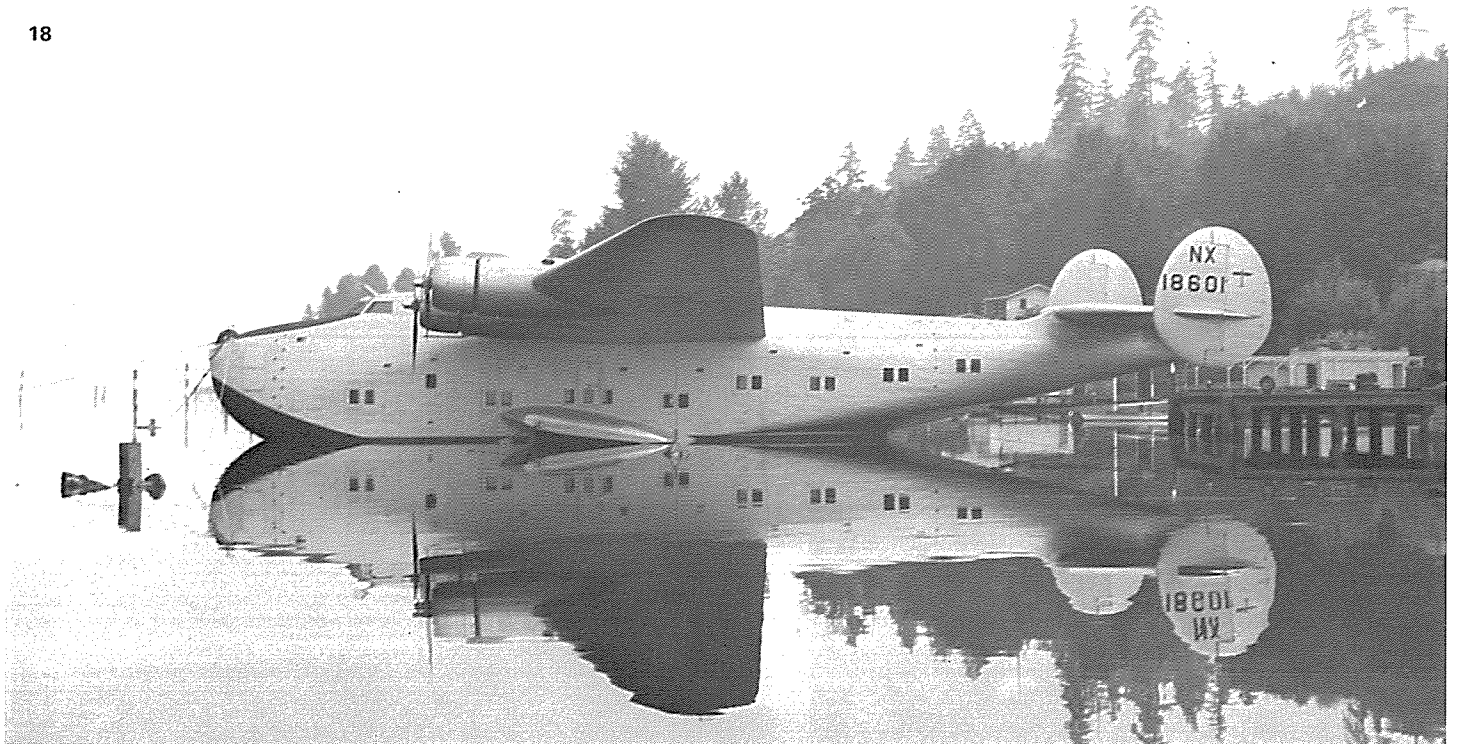
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17. NC 16934 Sikorsky S-43 "Baby Clipper" s/n 4325. Delivered to Inter Island Airways 1-19-37. This 19 place amphibian was IIA's third purchase out of a total of four. Inter Island was also the first customer (ships 1 & 2) of the S-43, first delivery late in 1935. PAA had the largest fleet (12). 53 constructed of which 26 to airlines (8 to foreign), 22 to military (5 to Army and 17 to Navy), one to Vanderbilt, one to H. Hughes, one to the Soviets as H 207, two to the Chilean gov't. Army version as Y10A-8 and Navy as JRS-1. Span: 86'. Engines: P&W Hornet R1690-23 750 HP. Photo: Taken at Hilo T.H. Clay Jansson

18. NC 18601 Boeing B-314 s/n 1988, delivered 1-27-39. This HONOLULU CLIPPER along with the CALIFORNIA CLIPPER (602) assigned to Pacific service. Spacious double-decked flying boat built to carry 74 passengers on short runs and 35 on long trips. B-15 wing adapted to boat hull by Wellwood Beall. Six 314's delivered in 1939 were followed in 1941 by six "A" series which had increased fuel capacity, new engine/prop combination giving better take-off performance and short haul passenger capacity raised to 77. All 314's converted to "A's". 602,606,611,612 used by War Dept. as C-98, then to Navy. NAT used 601,603,604,605,609;607,608 and 610 went to

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BOAC*. 601 was sunk by gunfire following landing at sea 11-4-45. 603 lost 2-22-43 in River Tagus accident on landing at Lisbon. Singer-actress Jane Froman survived with broken back. Initial cost—\$550,700 each, second series \$696,400. Span: 152' Engines Wright Cyclone R-2600 1550 HP. Harry Gann Collection
*G-AGCA (BERWICK), G-AGCB (BANGOR), G-AGBZ (BRISTOL).

19. NC 13325 Boeing 247 s/n 1706 with UAL 5-1-34 to 4-30-38. Converted to 247D Sept. 1935. Served with Penn-Central A L. White Pass Awys Skagway, Alaska, British Yukon Nav. Co. Yukon Southern AT, Canadian Pacific AL, Columbia AL to J.H. Wentworth (Long Beach) to Mexico in 1948. 247 series developed from B-9 bomber with 2' shorter span—74'. P&W Wasp 550. 75 airplanes built. For more details, see AAHSJ Vol. 9 No. 4. 10 passenger. Photo taken at Salt Lake City, May, 1933. D.E. Drummond

20. NC 13764 1934—Vultee V1-A s/n 2 of 27 produced by Vultee Aircraft Division of Aviation Manufacturing Corp. 10 place, span: 50'. AA received first 7 of series with #1 as NR 12293. S/n 8 was Merrill's "Lady Peace." #10,11,16 to Canadian Colonial Airlines. #17,19 to Bowen Airlines. #27 as V1-AS to Russian Amtorg Trading Corp., NYC as URSS-H-208. Sole survivor is s/n 25 N 16099 belonging to Harold Johnson, Pueblo, Colorado. Series was progenitor of a line of attack aircraft. Engine Wright Cyclone SR-1820 F-2 735 HP. Clay Jansson

21. 3/275 1927. Boeing 40A originally built for Post Office Dept. run Chicago-San Francisco. Prototype Model 40 used a Liberty engine. 40A carried 2 passengers and 1200# mail. P&W Wasp 420 HP. Radio added for the first time. 24 constructed for Boeing Air Transport. Photo taken at Salt Lake City. D.E. Drummond

22. NC 223Y The one and only DC-1, the airplane that changed the concept of air transport. Howard Hughes owned this ship for a while, then to Britain, France and Spain. Crashed Dec. 1940 at Malaga, Spain on take-off. Never rebuilt. Wright Cyclones F-3 series. 12 place. Span: 85'. Airplane came about thru TWA's inability to secure Boeing 247's. Clay Jansson

23. NC 582K Fokker F-10A s/n 1042 WAE Fleet #114. A refined and enlarged version of the F.7/3m. 65 built of which the first seven were F-10's of 14 place featuring P&W Wasps of 420 HP and three-bladed props. WAE was the first customer and had a fleet of 16 (eventually 24) PAA- -12, Universal AL -15, Standard AL -5 and West Coast Air Transport -3. TWA picked 21 second and third-hand F-10A's. The Knute Rockne crash, s/n 1063 (last to be delivered) brought an end to the Fokker era.

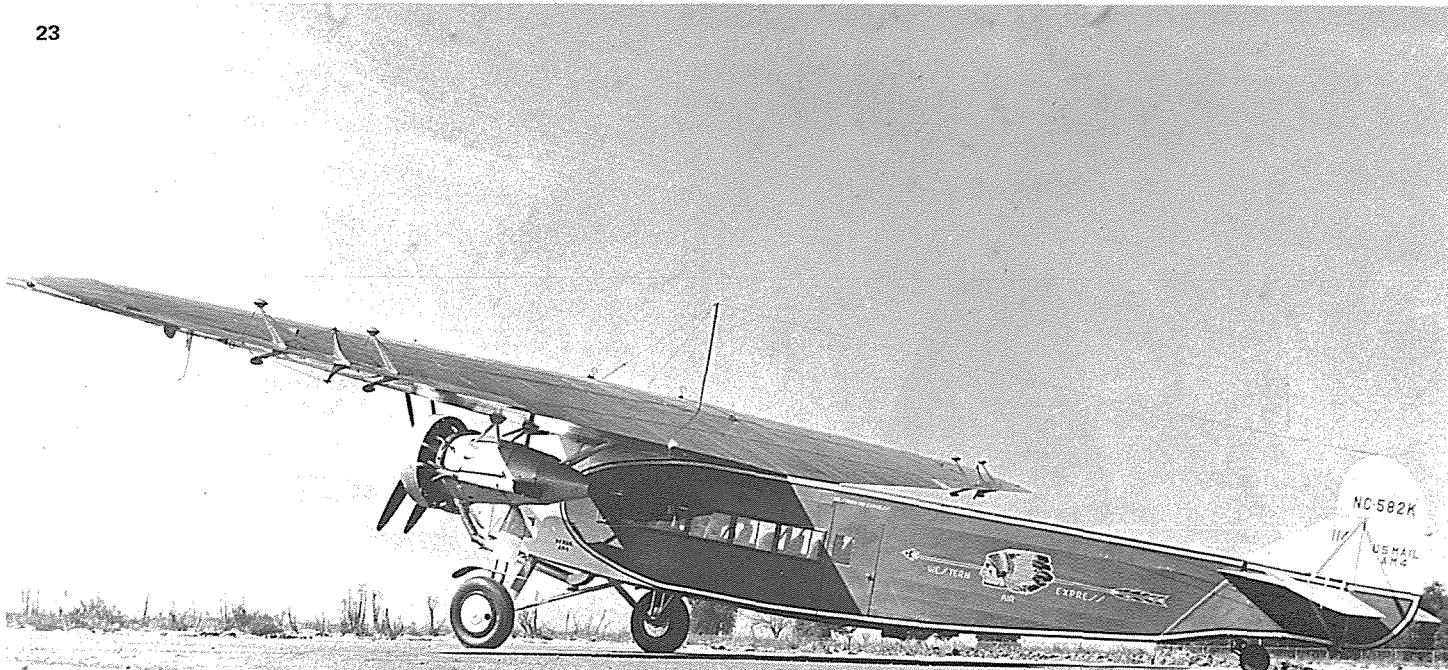
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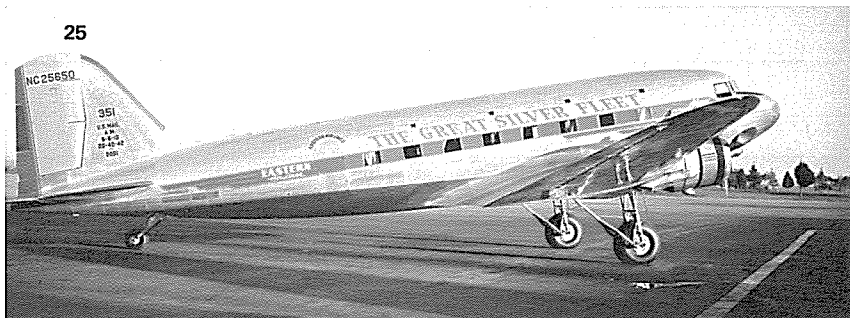
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Four were never sold! One example to the Army as C-5 (29-405). Naval transport RA-4 never accepted due to CG problems. S/n 1040 temporarily converted to twin-engine bomber. Initial cost: \$67,500 each. Span: F-10 = 71'-2" (Dutch-built F.7B/3m wings). 10A = 79'-3". Harry Gann Collection

24. NC 13711 DC-2 TWA's first -2 of a total of 31. TWA received the first 20 ships during 1934. With the advent of the DC-3, they were relegated to shorter hauls. Some were sold to Braniff and PAA in 1937-38. Five went to RAF in 1941, others to USAAF as C-32A. Fuselage lengthened forward of the leading edge to bring passenger load up to 14 from -1's 12 and window added. 200 built with 130 civilian and 70 military. 42 went to Europe via Fokker and 1 to Russia. Japan received 6, China 3, Australia 2. American Airlines purchased 13, EAL 10, PAA 14, and GAL 4. Clay Jansson

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25. NC 25650 DST-318 s/n 2225 EAL #351 with a starboard entry! Delivered 2-40. Impressed into military as C-49F, no.? Returned to EAL 7-31-44. To R.R. Riss Sr. as N300M 4-15-52. Registered to Transport & Mfg. Equipment of Delaware 7-1-63. Back to R.R. Riss 1-1-66. 38 sleepers built at Santa Monica, 19 each Cyclone and Twin Wasp powered. UAL received 13, TWA - 11, AA - 9, EAL - 3 and AOA - 2. First seven of the wide-bodied DC's were DST's. Another strange phenomenon is that EAL was a wholly owned division of North American Aviation until divestment in 1938. And that Kindelberger and Atwood were lured away from Douglas even though they had been heavily involved with the DC-1/2 project. MD 17317 via Harry Gann

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26. NC 33677 DC-3-313D s/n 4132. Delivered 3-17-41 to Pennsylvania Central AL. Taken over by military a scant 4 months later as C-49E #42-56626 7-17-41. Returned to PCA 7-1-44. Became Capital AL "Capitaliner Philadelphia" #226B in April 1948. Then to H.J. Heinz as N157H. The DC-3 came about from specs drafted by AA as a replacement for their outmoded Curtiss Condors which introduced sleepers 5-13-34. More space was needed as the DC-2 fuselage was considered too narrow. Span was increased 10'. Prototype X14988 was tested in Dec. 1935 and AA placed orders for 13 DC-3's and 7 DST sleeper versions at \$110,000 each. 417 standard model DC-3's were produced pre-war with AA getting 72, UAL - 39, EAL - 35, PAA - 34, TWA - 29, NWA - 12, Braniff - 10. KLM was the first European carrier to order 11 with options of 13 more (12 rcd.). Russia received 17 and license to build along with Nakajima. 90% of the world's major airlines used the Gooney Bird. Span: 95'. Engines: Wright Cyclone G-102A, 1100 HP. MD/Harry Gann

27. XA-FEG DC3A. Serial No. 4180. Delivered to DSC (Defense Supply Corp.) as NC30011. Became C-48C Military No. 4238336. Operated by PAA. Transferred to CMA (Mexicana De Aviacion). CMA had five of these pre-war transports. Of total of 194 civilian DC3 impressed into military service, 16 were C-48C's. Mexicana De Aviacion

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