



The Lockheed 14 Super Electra

As an airliner, "Old Boomerang" won Howard Hughes the Collier Trophy, but its fame came when it wore war paint.

BY PETER M. BOWERS

In the past, some established bomber designs have been converted to civil transports simply by removing the military equipment and adding windows and passenger seats. There also have been a few bomber designs that were redesigned in the factory before being put into production as transports. Far more rare is the case of a major transport aircraft being adapted into a bomber and then being produced for the military in far greater quantities than it ever was for the civil sector.

Such was the case of the Lockheed Model 14, the Super Electra.

The original Lockheed Aircraft Corpora-

tion of Burbank, California, became famous for its line of slick, all-wood, speedy single-engine transports between 1927 and 1931. As did many other aircraft firms of the time, Lockheed became involved with the aeronautical conglomerate buildups of the "Lindbergh Boom" and became the Lockheed Division of the giant Detroit Aircraft Corporation in July 1929. When Detroit Aircraft became a casualty of the Great Depression—it fell into bankruptcy in October 1931—Lockheed fell with it.

Some dedicated Lockheed employees,

and others, pooled their resources and bought the plant and the inventory of unfinished airplanes for \$40,000. On June 21, 1932, they formed a new Lockheed Aircraft Corporation in the California facilities.

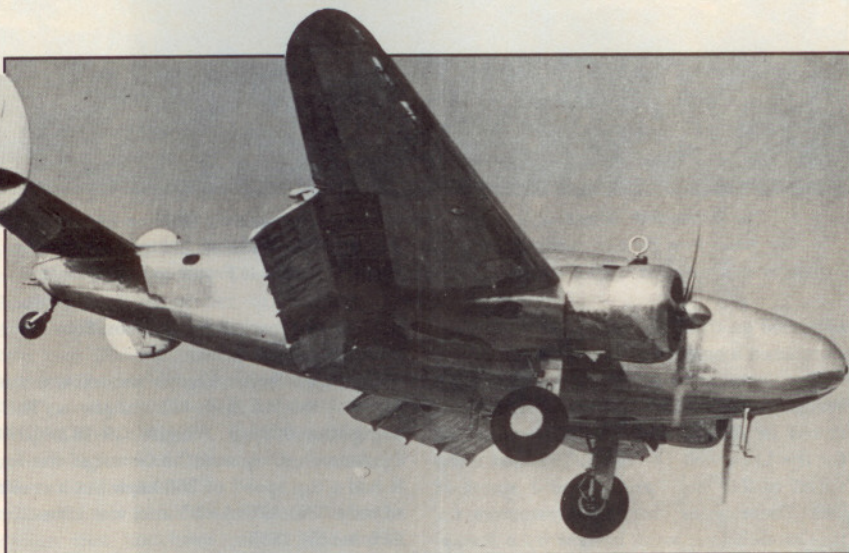
The new team maintained the old Lockheed reputation for fast transports, but with two significant differences. The new Model 10, introduced in 1934, was an all-metal, twin-engine, 10-passenger transport for short routes. Named the Electra, it was an instant success. The Model 10 was followed by the 12A, a smaller executive model and then by the bigger and faster Model 14.

The Model 14 was not simply a stretched Electra; it followed the structural and aerodynamic concepts of the Electra but introduced some new design features.

Structurally, the new Super Electra was very similar to other American and European transports that used the technological and design advances introduced on the Boeing 247. (See "Yesterday's Wings: The Boeing 247," September 1981 *Pilot*, p. 71.) It was a twin-engine design with the main landing gear retracting aft into the engine nacelles but leaving part of the wheels exposed (à la 247, Lockheed 10 and Douglas DC-2 and DC-3).

Where the Boeing and Douglas used single vertical tails, the Lockheeds used twin elliptical vertical fins and rudders. The taper of the Model 14's cantilever wing was much sharper than any of the others. This introduced wing-tip stall problems; but they were resolved by building slots into the leading edges of the wing tips to delay the stall.

The outstanding feature of the new



This view of the underside of a Lockheed 14-N shows the Fowler flaps, the wingtip slots and the wheel wells. The direction-finding loop antenna is visible on top of the fuselage.

continued

wing, however, was the first production use of the Fowler flap. This served the same purpose as the standard flap then in use, but it was mounted on tracks so that it rolled aft as it was lowered, actually increasing wing area, lightening the wing loading and reducing the landing speed. Fowler flaps are still in wide use today.

Internally, the 14 was a conventionally designed transport. The pilots sat at full dual controls in their forward cabin; the main cabin had 11 passenger seats in two single rows and a seat for a stewardess. A galley and lavatory were at the rear of the cabin, behind the door, which was on the left side of the fuselage. The space beneath the cabin floor was used for baggage and cargo that was loaded from the outside through two hinged doors below the wing and one hinged door ahead of the wing. Another baggage compartment was built into the nose ahead of the pilots.

A transport such as the Model 14 invites comparison with the Douglas DC-3. It was not logical for the Lockheed 14 to compete with the solidly established DC-3—a 21-passenger design that dominated the major trunk routes of the United States and Europe. Lockheed stayed with a smaller design (at a lower cost—\$85,000 compared to the average DC-3's \$110,000) but made it much faster. Powered by two 750-hp Pratt & Whitney Hornet radial engines, the Super Electra Model 14-H (H for Hornet) was considerably bigger than the Electra, but carried only one more passenger. Its big gain on the DC-3 was in speed—its top speed was more than 247 mph, and it cruised at 215, compared to 212 and 188 for the DC-3. The 14-H beat the DC-3 on range, too—1,500 miles at 75-percent power, compared to 1,260 miles for the 1936 model DC-3. An improved 14-H2 model with two 800-hp Hornets cruised 230 mph at the same weight.

On some 14-Hs, the loop antenna for the direction-finding radio was mounted internally to reduce drag instead of outside on the fuselage. To avoid shielding by the metal skin, the antenna was enclosed in a molded plastic nosecone.

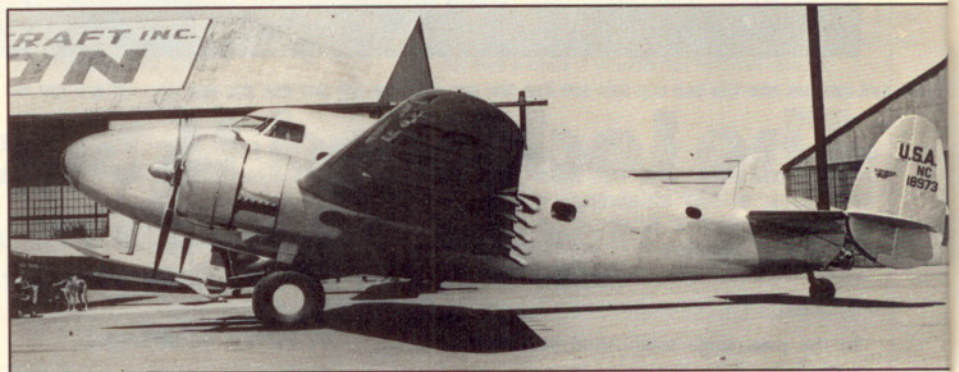
The Super Electra made its first flight on July 29, 1937, and received Approved Type Certificate A-657 on November 15. As with the original Electra, Northwest Airlines purchased the first Model 14, and orders soon came in from other airlines. Altogether, 52 units of the 14-H and 14-H2 models were sold.

Since the Hornet engine was at the end of its development, Lockheed offered alternative powerplants. Under the approval policy of the time, a different engine in the same airframe required recertification. The Model 14-F62, powered with the 760-hp Wright R-1820-F62 Cyclone engines, received ATC A-666 on October 30, 1937. (Note the oddity of a higher ATC number, but an earlier approval date.) Of the 21 units built, not one 14-F62 Super Electra

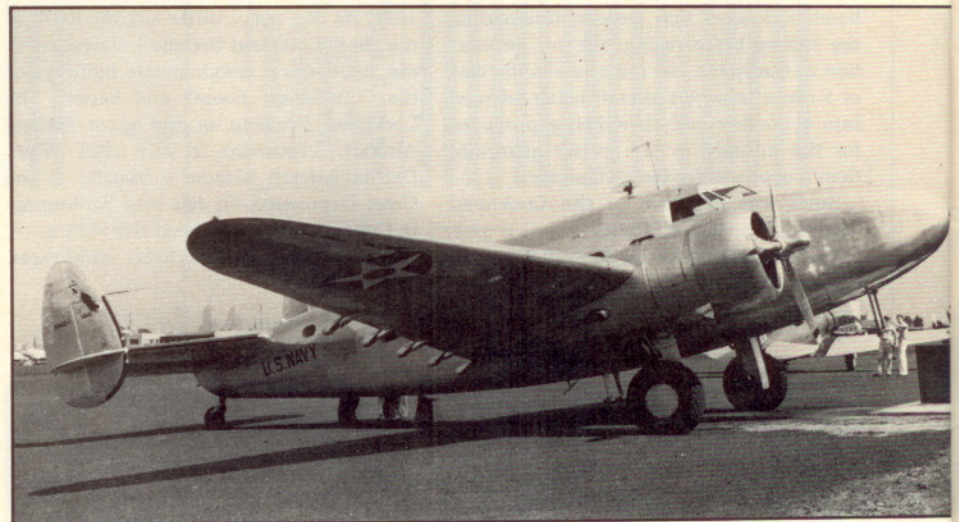


The model 14-WG3B with Wright Cyclone engines had only two customers. A Rumanian airline purchased four of the airplanes, and Japan purchased 30, plus a manufacturing license.

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In 1938, Howard Hughes used this Super Electra 14-N2 to set a new around-the-world record of three days and 19 hours. Hughes's N-2 had a clear plastic nosecone but it was painted silver.



The U.S. armed forces bought only one Super Electra before World War II—a 14-H2 purchased from the civil market to be used as a transport. The Lockheed 14 began its official career as a warplane in 1938 with the U.S. sale of military aircraft to France and Great Britain.

appeared on the U.S. civil register; all were purchased by overseas customers.

The installation of the geared 850-hp Wright GR-1820-G3B Cyclone engines resulted in ATC A-673, also of October 30, for the Lockheed 14-WG3B. This had a top speed of 248 mph and a cruise speed of 240. There were only two customers for this model; four were bought by a Rumanian airline, and 30 were sold to Japan, along with a manufacturing license. It is

not known how many were built in Japan by the Kawasaki firm.

The final Super Electra model was the 14-N, with -N2 and -N3 variations. This, using the 900-hp Wright GR-1820-G104 Cyclone engines, was the fastest of the lot. It had a top speed of 260 mph but a cruise of only 235. ATC A-683 also was issued on October 30, 1937.

The principal users of the civil Super Electras were airlines, but a few were sold

to private owners and corporations. One of the 14-F62 units purchased by British Overseas Airlines was used to transport Neville Chamberlain to his historic meeting with Adolf Hitler.

But the most famous by far was the 14-N2 used by Howard Hughes and four crewmembers to set an around-the-world record of 91 hours 17 minutes for the 14,824-mile trip. The flight started from New York City on July 10, 1938, as a tie-in with the World's Fair and was made with only five stops: Paris, France; Omsk and Yakutsk, Russia; Fairbanks, Alaska; Minneapolis, Minnesota; and back to Floyd Bennett Field on July 14. Extended range was obtained with long-range tanks that increased the gross weight from 17,500 to more than 25,000 pounds. Of course, the aircraft required an Experimental license.

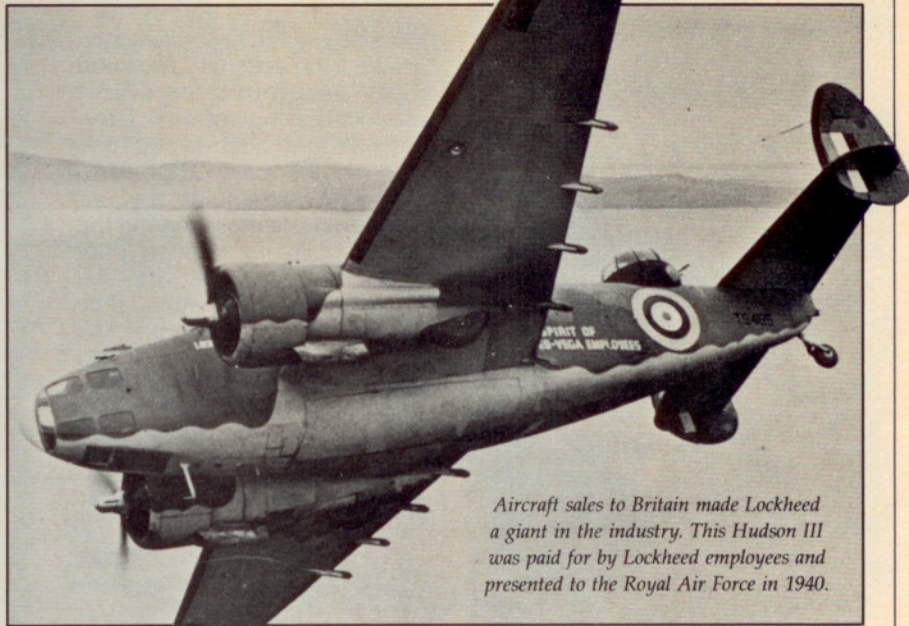
This flight won Hughes and his companions the Collier Trophy for the outstanding aeronautical achievement of 1938.

The U.S. military services were buying quite a few "off the shelf" civil models late in the 1930s. The Navy bought one 14-H2 in 1938 as a staff transport and designated it XR40-1. The Army acquired three 14-H2s early in 1944; these were former Netherlands East Indies airlines that had been flown to Australia in 1942 ahead of the Japanese invasion. They were transferred to the U.S. Army and became C-111s in the cargo series.

The career of the Lockheed 14 as a bona fide warplane began early in 1938, after President Roosevelt authorized the sale of military aircraft to France and Great Britain to support their armament buildup. A British purchasing commission in the United States in April 1938 included Lockheed in its tour. At that time, the commission considered Lockheed as a source for a twin-engine navigational trainer. In five days, during which it produced a hurried mock-up, Lockheed convinced the commission that the basic Model 14 could be adapted to something much more versatile and militarily effective.

The Model 14's generous cargo holds could be converted into a shallow bomb bay, holding up to 1,600 pound of bombs; and other stores could be carried on wing racks. The nose could be adapted to a bombardier/navigator station by removing the baggage compartment, adding side windows and using the same plastic nosecone of the civil model. The new British Boulton & Paul power turret could be added forward of the tail and could contain two .303 caliber machine guns; two fixed .303s could be carried in the nose. The powerplants would be the 1,100-hp Wright R-1820-G102A Cyclones, but the gross weight would remain the same as for the earlier models.

The British liked the presentation of the design that Lockheed called Model 214. (Later models were identified by Lockheed as 314 and 414.) After further discussion of



Aircraft sales to Britain made Lockheed a giant in the industry. This Hudson III was paid for by Lockheed employees and presented to the Royal Air Force in 1940.

details and finances, an order for 200 units was placed on June 23, 1938. This \$25 million order was the largest that had ever been placed with a U.S. aircraft manufacturer and made relatively small Lockheed a giant of the industry. The first Model 214, which the British called a "Hudson I," flew on December 10, 1938, quantity deliveries by ship began in February 1939, and Hudsons were in squadron service by May. Flyaway delivery began when the North Atlantic Ferry Service was inaugurated in November 1940. Since the power turrets were to be installed in England, the prototype Hudson was delivered with a dummy wooden turret installed.

Altogether, 2,941 Hudsons were built. Hudsons I through III had Cyclone engines, and models IV through VI had equivalent Pratt & Whitney R-1830 Twin Wasps. All but 300 Hudsons were built to

British Empire orders. After March 1941, with the passage of the Lend-Lease bill, the Hudsons and other models ordered by Great Britain were procured first by the U.S. armed forces with U.S. funds. Britain paid for 1,338 Hudsons by direct purchase and received 1,302 more under the Lend-Lease program.

The post-Lend-Lease Hudsons were given appropriate U.S. Army or Navy designations. The Army's models became A-28s (A for attack) when powered with Twin Wasp engines and A-29s when powered with Cyclones. They still were equipped and painted to British requirements, however; and, although they were given U.S. Army serial numbers, they retained their Royal Air Force serial numbers and Hudson designations, too.

Prior to Lend-Lease, the U.S. Army had requisitioned some Hudsons from the Brit-

LOCKHEED MODEL 14 SUPER ELECTRA

14-H2 Super Electra	414 RAF Hudson IIIA U.S. Army A-29 U.S. Navy PBO-1
Pratt & Whitney Hornet S1E2G 800 hp @ 2300 rpm (875 for takeoff)	Specifications Powerplants Wright R-1820-G205A (U.S. Army R-1820-87) 1,100 hp @ 2,300 rpm (1,200 for takeoff)
65 ft 6 in	Wingspan 65 ft 6 in
44 ft 4 in	Length 44 ft 4 in
551 sq ft	Wing area 551 sq ft
10,300 lb	Empty weight 12,825 lb
17,500 lb	Gross weight 20,500 lb
31.76 lb/sq ft	Wing loading 37.20 lb/sq ft
10.93 lb/hp	Power loading 10.25 lb/hp
250 mph @ 5,500 ft	Performance High speed 253 mph @ 15,000 ft
230 mph	Cruise speed @ 75% power 205 mph
1,500 fpm	Initial climb 10,000 ft in 7.8 min*
24,500 ft	Service ceiling 26,000 ft
1,500 sm	Range on 644 gal of fuel 1,800 sm
*Military climb given in time to specified altitude	

ish order for its own use. But the Army did not give them designations or serial numbers because they did not conform to then-current Army specifications. After the passage of Lend-Lease, new specifications were written to fit them into the system.

Late in 1941, the U.S. Navy obtained 20 A-29s from the Army and designated them PBO-1s. The PB meant Patrol Bomber, and the letter O identified Lockheed in the Navy designating system.

In 1942, the U.S. Army ordered the final 300 Hudsons, 217 as AT-18 gunnery-crew trainers and 83 as AT-18A navigational trainers. The last Hudson was delivered in May 1943.

Hudsons were successful military aircraft, affectionately known as "Old Boomerangs"—they almost always came back. The Army, Navy and British models were all very effective submarine hunters. The first German U-boats were sunk by Hudsons, and one British Hudson actually managed to capture a U-boat. A British Hudson also was the first British-operated airplane to encounter a German airplane after the outbreak of World War II.

The Model 14 Super Electra had a short life as an airliner. Within three years, it was being replaced by the faster Model 18 Lodestar and by the DC-3. The militarized Hudsons fared little better in postwar U.S. sales. In spite of the airframe's similarity to the Super Electra, the bomber could not be certificated for commercial operations under the original type certificate.

Although a few Super Electras and Hudsons did find their way into transport service and a few were used as agricultural sprayers, most were scrapped after World War II. Only five Hudsons and two Model 14s were on the U.S. civil register in 1948; and all the Hudsons were operating on Experimental licenses. □

Intrigued by airplanes long before his first ride in a Travel Air at age 10, Peter Bowers, AOPA 54408, has since logged more than 4,200 hours.

Lockheed 14 Series Production

Lockheed Model	Service Designation	Number Built
14-H and 14-H2	Super Electra	52
14-F62	Super Electra	21
14-WG3B	Super Electra	34
14-N	Super Electra	4
214	Hudson I	350
314	Hudson II	20
414	Hudson III	430
414	Hudson IIIA/ Army A-29	800
414	Hudson IV	130
414	Hudson IVA/ Army A-28	52
414	Hudson V	409
414	Hudson VI/ Army A-28A	450
414	Army AT-18, AT-18A	300
Total		3,052