

The Once and Future Queen

*One day soon, the Star
airworthy Lockheed Super*

BY SET

Deep within the polished cowl, the starter motor introduces its quiet overture, and the big propeller begins, slowly, to turn. The crew watches anxiously, counting. Eight blades pass by, the ignition is



*One day soon, the Star of America may be the last
airworthy Lockheed Super Constellation in the world.*

BY SETH B. GOLBEY

Deep within the polished cowl, the starter motor introduces its quiet overture, and the big propeller begins, slowly, to turn. The crew watches anxiously, counting. Eight blades pass by, the ignition is

switched on. A gout of oily smoke envelops a nearby lineman, standing ready with a large, dolly-mounted fire extinguisher. The huge, 3,400-horsepower, 18-cylinder, geared, turbosupercharged radial engine bursts into



PHOTOGRAPHY BY MIKE FIZER

life, spitting flame as raw fuel is burned out of the exhaust stacks. The engine note stabilizes, the ground power unit is disconnected, and the crew fires up the second, third, fourth engines. Throttles are advanced, one by one, in a crescendo of power, and each time the 74,000-pound airplane leans forward, straining against brakes and chocks, rising up on its massive main gear like a dancer going up on point. The writer and the photographer are awed as the very air hums in sympathetic rhythm; they have never heard—felt—this before. But for the ground and flight crew, their faces now wreathed in smiles after thousands of hours of rehearsal, these sounds are the opening measures of a sweetly familiar old song, a song of the sky, a symphony for piston engines. Lockheed Super Constellation N6937C, the *Star of America*, one-time Queen of the Sky, has awakened from her long sleep.

In mid-1939, Transcontinental and Western Air, forerunner of today's Trans World Airlines, recognized the need for an airliner that was faster and larger than the Boeing 307s it had on order. TWA's

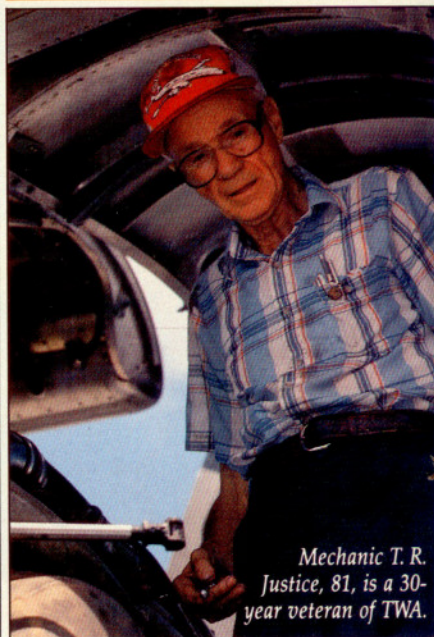
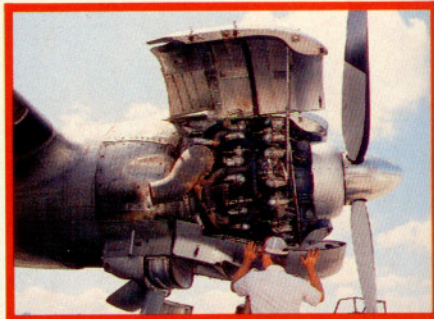
Howard Hughes and Jack Frye approached Lockheed with a requirement for a pressurized airliner with a payload of 6,000 pounds, a speed of at least 250 mph, and nonstop coast-to-coast range. Lockheed, realizing that Pan American Airways would also be interested in such an airplane, put chief engineer Hall Hibbard, chief aerodynamicist Kelly Johnson, and project engineer Don Palmer on the job of designing what would come to be called the Model 49 Constellation.

The design they submitted later that year would accommodate 44 passengers in double seats on both sides of a central aisle or 20 sleeping berths. It was to be powered by four 2,000-hp Pratt & Whitney Double Wasp or Wright Double Cyclone engines (called "Double" because the cylinders were arranged in two rows), giving it a predicted top speed of 360 mph, a cruising altitude of 20,000 feet (with an 8,000-foot cabin altitude), a ceiling of 35,000 feet, and a two-engine ceiling of 10,000 feet. The elegantly sculpted fuselage shape was chosen for aerodynamic efficiency and to lower the nose to allow shortening and strengthening of the nose gear. The distinctive

triple tail resulted from a TWA requirement that the airplane fit into existing hangars designed for conventional-gear airplanes (the Model 49's maximum height was less than 24 feet). By the time a production go-ahead was given in 1940, Lockheed had 84 orders, including 40 apiece from TWA and Pan Am.

America's entry into World War II put a stop to the manufacture of commercial aircraft, but the Constellation was just what the U.S. Army Air Forces believed was needed in a fast, long-range transport, and AAF ordered 313 C-69s, as the Model 49 was designated, powered by 2,200-hp Wright R-3350 Double Cyclones. (The 3350 designation referred to the engine's displacement in cubic inches.) In 1943, Hughes and Frye flew the prototype—destined for Wright Field, Ohio—from Burbank, California, to Washington, D.C., in a record-setting 6 hours 57 minutes 51 seconds. Only 15 C-69s had been delivered by the end of the war, but the backlog of military orders allowed Lockheed to retool in time to begin delivering airline versions in November 1945.

Pan Am inaugurated commercial Constellation service on February 3,



Mechanic T. R. Justice, 81, is a 30-year veteran of TWA.



1945, on its New York-Bermuda run, with TWA following on February 6 on its Washington-New York-Paris route. On April 1, TWA extended this route to Cairo and on May 1 began New York-Lisbon-Madrid service. Meanwhile, the airline had begun domestic New York-Los Angeles service on February 15. Other foreign and domestic carriers swiftly placed orders.

Seventy-three commercial Model 49s were delivered before Lockheed switched production to the Model 649, with 2,500-hp Wrights (no airline ever ordered a Constellation with anything other than Wright R-3350 engines, although alternatives were offered), and the 749, a long-range version of the 649 with additional fuel capacity. All told, 233 of the 49/649/749 series, including military variants, were built. From the beginning, maximum allowable takeoff weights had been increasing, from 86,250 pounds for the Model 49 to 102,000 pounds for the 749.

Lockheed was not alone in the commercial marketplace, however. Airlines flying the Constellation were able to beat by two or three hours the schedules of competitors flying the unpressurized Douglas DC-4, but the new DC-6 looked like a real contender. In January

1950, therefore, Lockheed decided to proceed with development of a stretched (by 18.4 feet) Super Constellation, to be powered by the 3,250-hp Wright Turbo Compound engine. In this development of the R-3350, three "blow down" power recovery turbines converted the heat energy of the exhaust gases into more than 400 additional horsepower per engine; the PRTs were geared through fluid clutches to the crankshaft. The Turbo Compound reduced fuel consumption by 20 percent as well, partially as a result of its direct fuel injection (the Double Cyclone was carbureted). The new engine could not be readied as quickly as the new airframe, however, so the first Model 1049 Super Constellations entered service in December 1951 with 2,700-hp Double Cyclones. With these engines, the 120,000-pound Super Constellation was sluggish and no match for the DC-6B.

One change was made that immediately distinguished the 1049 from the 49: the switch to rectangular windows from circular ones.

The 133,000-pound Model 1049C, with Turbo Compounds, entered flight testing in February 1953, three months before the new DC-7, which used the same engines. (The Turbo Compounds

were to prove troublesome, and the Super Constellation and DC-7 were sometimes referred to as "the world's best trimotors.") A 135,400-pound convertible passenger/cargo Super D model with main-deck cargo loading doors followed. The most successful of all the Model 1049s was the Super G, with 3,400-hp engines. This model could be fitted with 600-gallon wing-tip fuel tanks, bringing total capacity to 7,750 gallons, two-thirds more than the original Model 49. Maximum takeoff weight of the Super G was 137,500 pounds, but some were modified for weights as high as 140,000 pounds. The final Super Constellation model, the H, was similar to the G but included the D's convertible features. In all, 623 Super Constellations, including military models, were built, and production ended in 1958.

Lockheed also offered the 1649A Starliner, an extra-long-range model derived from the G but with an entirely new wing (with an aspect ratio of 12, compared to 9.12 for the 49/1049 series) capable of carrying 9,600 gallons of fuel; MTOW was 156,000 pounds. Designed to compete with the DC-7C, which could fly nonstop either way across the Atlantic, the Starliner was too little too late, even though it could fly nonstop

from Los Angeles to London (in 19 hours 10 minutes) and return to San Francisco (in 21 hours 5 minutes). But deliveries began in 1957, a year after the DC-7C and just 16 months before the Boeing 707 entered service. Only 44 were built. It was Lockheed's last piston-powered airliner.

N6937C was one of three Super Hs delivered to Slick Airways, a cargo airline, in 1959. (Its sister ships, 35C and 36C, despite lower N numbers, actually came off the line later than 37C.) Slick used the airplanes in fulfillment of a military contract to deliver cargo throughout the Pacific Basin. As 35C and 36C came equipped with weather radar, they occasionally carried passengers, but 37C probably never did. It was, however, renowned for its reliability; in its first five years of service, it incurred but a single, 20-minute delay for mechanical reasons, according to Joe Groff, author of an informal history of the airplane.

By 1962, the Slick ships were mainly flying transcontinental cargo runs between naval air stations on the two coasts, but as America's involvement in

the war in Vietnam grew in earnest, the military needed all the airlift capacity it could muster. Slick was acquired by Airlift International in 1966 and became the latter company's West Coast division. Three additional Constellations joined Slick's Vietnam shuttle.

In June 1967, 36C was involved in a midair collision with an Air Force F-4 Phantom while on approach to Saigon and crashed four miles northeast of the city; the seven crewmen aboard were killed. (The fate of 35C is unknown; there is no known record of the airplane's eventual disposition.)

The military increasingly delegated cargo chores to jet aircraft, and 37C was sold in 1968. The airplane flew freight to Central and South America until 1971, when it was seized by the IRS for non-payment of taxes and auctioned off to a Miami firm that put it to work hauling freight around the Caribbean.

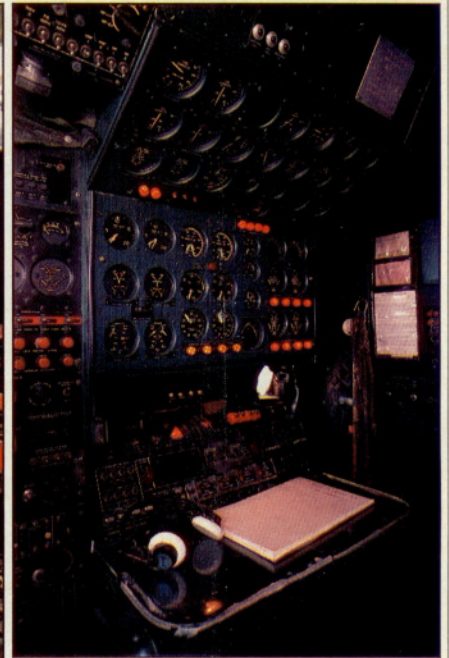
In 1973, a Mesa, Arizona, company bought 37C for \$25,000, spent another \$60,000 equipping it with spray booms along the top of its wings and a 3,000-gallon tank, pumps, and plumbing inside its fuselage, and took it to Quebec to spray for spruce budworms. But the gas-

oline crisis of 1974 made Constellations uneconomical, and they were replaced by DC-4s, so 37C was flown to Falcon Field in Mesa and grounded.

A decade passed. Globe Air, which now owned 37C, decided to liquidate inventory. In October 1985, an auction was held. The auctioneer wanted to start the bidding on 37C at \$35,000. No takers. Finally, a private pilot named Paul Pisto of Scottsdale, Arizona, bid \$4,000, just to get things rolling. "It got real quiet after that," he remembers. His was the only bid.

Enter Save A Connie, Incorporated. This not-for-profit, educational organization is based in Kansas City, Missouri (mailing address: Post Office Box 9144, Riverside, Missouri 64168; telephone 816/421-3401), and is made up primarily of former TWA pilots, flight engineers, mechanics, and flight attendants. In 1985 SAC was looking for a Constellation that could be restored into a flying museum dedicated to the preservation of the era of piston-engine airline travel. The group was not having much luck finding a restorable example, but Larry Brown of SAC had heard about 37C and entered into negotiations





The view from the captain's seat (left). The pilots have little beyond throttles, tachs, and MP gauges in the way of engine controls and instruments; those were reserved for the flight engineer (above), who was always a certified mechanic. The FE, the busiest man in the cockpit, was flanked by additional controls and indicators not visible here.

with Pristo.

In May 1986, a group of about 15 SAC volunteers traveled to Mesa. They found an airplane that—while it had been savaged by vandals, birds, and the passage of time (“Wires were just hanging together on a memory,” an electrician recalls)—could possibly be made airworthy. After 3,000 man-hours of preparation over nine weeks, including changing three of the four engines, 37C flew for the first time in 11 years on July 11, 1986. A few details remained—144 spark plugs had to be changed and a propeller governor repaired—but on July 15, the airplane left Mesa for the last time, enroute to Kansas City Downtown Airport, its new home.

John MacMaster remembers the day. “They say an airplane doesn’t have a soul, but I think this one does because it knew it was getting away from the junkyard. The further it got away, the better it flew . . . and even the chase plane [a Piper Malibu] couldn’t keep up with it.” When it arrived at Downtown, “we must have had a couple hundred people circling this airplane, and not a one of them had a dry eye in the crowd, including some old mechanics who had worked on them years ago,” he recalls.

Pristo donated the airplane to SAC on

December 20, 1986, “for the benefit of aviation enthusiasts around the world,” but he wanted to remain involved in the restoration. “How are they ever going to do it?” he wondered at the time.

There could not be a more auspicious place and time for 37C’s restoration. Kansas City Downtown had been TWA’s major overhaul base for its Constellations (the carrier operated 146 at one time, more than any other airline). Probably nowhere else in the world could a crew with the necessary skills and experience to undertake such a venture be assembled.

“This is the only place and this is the only time,” says Willie Davis, a TWA flight engineer for 36 years, “In another 10 years, there won’t be anybody left who knows anything [about Constellations].” Frank Fitzgibbon, president of SAC, adds, “We’ve got so many guys with so much talent, everybody feels real good about it.”

Three years later, 37C is ready to take to the skies again. In the interim, it has received a fresh coat of paint (in the scheme of an early 1959 TWA Super G, complete with 48-star American flag), a refurbished cockpit with brand-new Bendix/King avionics (70 pounds of solid-state equipment replaced 700-

pounds of tube-type gear), new tires (the two nose-gear tires were contributed by TWA, the four mains—worth about \$900 apiece—by B. F. Goodrich), a new cabin floor (salvaged from another Constellation), fresh insulation, new batteries (\$500 apiece), and a multitude of mechanical repairs.

“Basically it’s coming together pretty good. There’s just so many things to do that without this volunteer group you could never get it done,” says Fitzgibbon. That group, which has been working six days a week to enact the resurrection, ranges from teenage A&P students to 81-year-old T. R. Justice, who spent 30 years as a TWA mechanic and, if asked, might admit to knowing as much about R-3350s as any man his age. “He climbs up and down this airplane like a kid of 17,” says MacMaster, who worked as a mechanic in TWA’s electric shop for more than 38 years himself.

Fitzgibbon, a TWA pilot for 32 years, explains that SAC’s plan is to fly 37C. “We just can’t be a bunch of guys building an old airplane up. There’s got to be a reason for it, and that’s so it will be a museum piece; hopefully we’ll fly it 10 years or however long we can. Eventually, what we’d like to do is have a museum here, the Kansas City Air Trans-



port Museum, with all piston-driven airplanes—this [Constellation], a DC-3, a Martin 404 maybe, a Convair 240—and have them all flyable.” In the meantime, 37C will fly about 200 hours a year visiting air shows around the country (and possibly abroad; 37C has been invited to next year’s Farnborough air show in England). “If people can’t come to the museum, we’ll bring the museum to them,” says MacMaster.

The biggest job yet to be accomplished is restoration of the passenger cabin. SAC hopes to outfit the airplane with first class, coach, and sleeper sections and make it available to film-makers as a period set (37C has already starred in a television commercial). SAC has galleys and lavatories on hand, but seats and other interior accoutrements are in short supply.

A from-scratch interior restoration will cost an estimated \$100,000. Engine and propeller overhauls are also staggeringly expensive. Parking, insurance, office and shop space, and spare parts have their price, as well.

And then there’s gas and oil. Flying 37C costs about \$1,000 an hour. The four thirsty Wrights consume about 400 gallons of fuel per hour in cruise. (The high-octane avgas they were designed to use is virtually unavailable in this

country, so the engines have been detuned to run on 100 octane. This necessitates operating at reduced power settings, with concomitant decreases in speed, altitude, and useful load.) In addition, the airplane uses oil at the prodigious rate of 2.5 gallons per hour per engine. (Each engine has a 41-gallon oil tank, which is kept filled to at least 35 gallons.) With expenses like these, checking out a new pilot would cost about \$8,000 to \$10,000. Fortunately, SAC’s membership includes 10 pilots and eight flight engineers type-rated in the Constellation, and the group’s 36

qualified mechanics have about a thousand years of experience among them.

Expenses are only partially recouped through membership dues. SAC has about 250 members, each of whom pays \$10 a month. A subscription to SAC’s newsletter costs \$10 a year. The group is also happy to accept contributions. One member, retired TWA captain Jack Davenport, who has made the largest individual donation to date toward the restoration, has been specially honored; his name now adorns the sides of the fuselage below the cockpit windows, just above 37C’s new name, *Star of America*.



The Lockheed Constellation family didn’t, in the final analysis, bring the same financial success to its manufacturer that Douglas’s DC-4/6/7 line did, but it represents a significant milestone in the history of commercial aviation. It was the first airliner with reversible propellers, and the first to make schedules based on 350-mph cruise speeds a reality: Constellations set 45 major commercial aircraft speed records. The Turbo Compound powerplant represented the highest state of the art that piston engines would reach. And many people agree that the Constellation was the most beautiful air-

liner ever built. These memories are worth preserving. But the special value of N6937C, SAC's flying museum, is revealed in a story of MacMaster's:

"We had some kids out here one day. One kid was getting ready to leave, and I said to him, 'Have you ever heard these big engines run?'"

"'No, I never heard 'em,' he said."

"I told him to stick around. We fired up all four engines, and when we finally shut them down, he came back to me and said, 'I'm glad you made me stay. That's the best sound I ever heard.'" □



SAC's Super Constellation nearly matches TWA's period livery shown here.

Connie Versus Chevy

My aunt Betty worked for 30 years as a reservationist for TWA. Along with the job came a splendiferous perquisite—the privilege to fly anywhere in TWA's route structure almost free.

From a very early age I heard of her adventures, which were numerous. There were stories of shopping in London for the weekend, the great pyramids of Egypt, the Swiss Alps, you name it. And the slide shows after every trip. In the summer of 1956, my family was driving from our home in Connecticut to Pittsburgh, to visit the grandparents. Betty offered me an option to fly to Pittsburgh from New York's La Guardia Airport.

We took the train to the airport at about the same time my folks hit the road in our brand-new 1955 Chevrolet station wagon. I was 10 years old, and this was to be my first airplane ride. In those days, you had to dress up when you took the airlines. They made me wear one

of those cub-scout-style navy blue wool hats.

We arrived at the window that overlooked the ramp. There was our airplane, a Constellation, and it was the biggest piece of machinery I had ever seen. Red stripes on white. A great big "TWA" plastered on the side, along with a huge American flag. The triple tail fins. I focused on the tires, which also were huge.

There was a delay of some sort. I don't recall it bothering me much, but I do remember Betty giving a pretty good explanation for why TWA was late. Then it was time to board. No jetways here. They rolled the stairs up to the cabin door, and we climbed in.

I remember the cabin as having a soft and cushiony texture to it. Maybe it was the size of the seats relative to my then-small body. But there was something else. The headliner and sidewalls had an upholstered look to them. The crew closed the door.

A propeller turned. Then came a tremendous firecracker-like explosion from the engine, accompanied by a three-foot-long red and blue flame. Since I was the only one who seemed to notice, I assumed that this was a normal phenomenon. It was. A couple more sharp ka-pows, and all four engines were turning. What a glorious sound.

The takeoff was exhilarating and loud. Once at altitude, the hostesses broke out the food. They gave out little pillows, and you put them in your lap. Then you put the food tray on top of the pillows and ate that way. Fold-down tray tables hadn't been invented yet.

Betty decided to pull rank. She buttonholed a hostess, then got up and headed for the cockpit. When she came back, she asked if I wanted to go up front and take a look. Did I!

We walked up to the door, and Betty knocked. One of the crewmen opened the door and invited us in. I never imagined you could fit so many dials, gauges, and levers in one room. Also, I remember seeing little bits of paper with writing on them stuck in the cracks in the instrument panel. The captain said we were at 8,000 feet, and he pointed to what must have been the altimeter; to me, all the gauges looked the same. And there, out the front window, a sea of clouds beneath us, another sight I'd never before seen. We were flying on top of a cloud deck.

It wasn't long before we touched down at Greater Pittsburgh Airport. There, we learned the Chevrolet had beaten us. The delay at La Guardia had given the station wagon so much of a head start down the Pennsylvania Turnpike that the Connie couldn't catch up. This seemed to be a subject of great concern and humor among the adults. Me, I couldn't have cared less.

Betty's retired now, but she still has that perk. Instead of Constellations, she flies on 767s. Every once in a while, the subject of the Connie versus Chevy race comes up. It's become a kind of family joke, but for me it was a turning point.

My days as an aspiring pilot had just begun. Though it makes me feel old, I feel fortunate that they started in a Constellation, the pride—indeed, the signature—of the TWA fleet. —Thomas A. Horne

