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Pitts pilots gathered on Boeing Plaza for a group photo. Their baseball caps signify their special place among an elite group of pilots.





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# The Pitts Replicas at EAA AirVenture 2015

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# A 70th anniversary celebration

BY FRANCOIS BOUGIE

## The Pitts Replicas at EAA/IAC AirVenture 2015

At this year's EAA AirVenture Oshkosh, the IAC Pavilion was "Pitts-centric." Celebrating the 70th anniversary of the biplane first flown by Curtis Pitts in 1945, an exhibit retraced its history, from the first flight of the original Pitts Special, NX52650, up to the current Pitts super biplane derivative, as flown by Sean Tucker and Skip Stewart. Dated August 28, 1945, the first Pitts flight entry in Curtis' logbook indicates that the flight lasted 20 minutes. In the remarks column he inscribed, "Test Hop (What a Day)."

This first flight would eventually change the aerobatic landscape in the United States and spread worldwide.

The only way one can really understand Curtis' first logbook entry is to build a replica of a Pitts from that era.

During the convention, displayed outside the IAC Pavilion were replicas of Pitts No. 1 and Pitts No. 3. Inside was housed the replica of Pitts No. 2, appropriately described by IAC President Mike Heuer as "the crown jewel of our Pitts exhibition."

Pitts replica No. 3, N8M, represents the aircraft flown by Caro Bayley in 1951. It won the award for Best Homebuilt Pitts IAC AirVenture 2015. Pitts replica No. 2, NX86401, replicates the configuration built by Curtis before being modified into N22E by Betty Skelton. Pitts replica No. 1, NX528, represents the first Pitts biplane NX52650, flown by Curtis in 1945.

Pitts replicas around the IAC Pavilion.



Caro Bayley with the Pitts S-1.

These replicas represent the earliest Pitts DNA. They were built by passionate individuals or groups, who each have their own story and degree of obsession with research and details.

### **N8M: Pitts No. 3 and Caro Bayley**

Born in 1922, Caro Bayley was originally from Springfield, Ohio. After graduating from Saint Mary's College in Raleigh, North Carolina, her father encouraged her passion for flying by paying for her initial flight training. When the Women Airforce Service Pilots (WASP) program was put into place, she joined Class 43-W-7 and trained in Sweetwater, Texas. She flew the SBD Dauntless, SB2C Helldiver, AT-6, AT-7, AT-11, BT-13, PT-17, P-47, B-25, and B-26...all between the ages of 21 to 23!

In 1945, when she started flying aerobatic competitions in Florida, Jess Bristow noticed her skill and made her part of an All Women's Air Show by flying a glider routine. This was when she first had the opportunity to fly

Betty Skelton's *Little Stinker*.

"It was a dream to fly from the very first takeoff," said Caro, and she persuaded her father to make a deal with Curtis.

This third Pitts was specifically built for Caro in 1950, and the horsepower race was *on* from the very beginning. Pitts No. 1 was powered by a Lycoming O-145 65-hp engine; Skelton's Pitts No. 2 by a Continental C-90 (95 hp at 2625 rpm); and Caro's Pitts by a Lycoming O-290-D 125 hp, fitted with an Ex-Cell-O fuel-injection system.

"I had a hard time keeping Curtis and Phil [Quigley] working," Caro once recalled. "I sat with them, brought water, food, and promised if they got to a certain point, they could go fishing on Sunday. Phil and I had an argument of who got to fly it first. When he laid down his tools and walked away is when I finally agreed that he could go first."

From her first flight, Caro and N8M became one.

Commenting on her appearance at the 1951 Women's International Aerobatic Championship, Bill Sweet ("They call me Mr.

Airshow") announced, "You're watching Miss Caro Bayley, one of America's greatest precision aerobatic fliers. She's flying like magic. . .yes. . .*Black Magic*."

"A perfect triple snap roll at the top half of a loop," he boomed over the public address system. Later, he would describe the event: "The trim, high-performance swept wings flashed in the brilliant Florida sunlight as the pilot 'triggered' the screaming machine into a fury of rolling, snapping, flying action."

Having competed against Betty Skelton in the past, Caro Bayley believed that not only did she need a Pitts to beat her in competition, she also needed more horsepower! "I never won until I had Curtis Pitts build me a Pitts Special," said Caro.

After three days of "exact-ing" competition, Caro Bayley was crowned winner of the 1951 Women's International Aerobatic Championship, a yearly feature of All-American Air Maneuvers staged in Miami, Florida. Caro won the crown only hours after her altitude record-breaking flight...in a Piper Super Cruiser.





Ted Teach and N8M.

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She described her flight: “I took off, had oxygen and a barograph, was up for about four hours, came down, then did my aerobatic act. The temperature was 90 on the ground and was 34 degrees below zero at altitude. The Cub went up to 15 [thousand feet] nicely, but up to 20 it was a bit draggy. By the time I hit 30, I stayed at one altitude for a long time.”

The Miami paper reported “Blonde Sets New Altitude Mark,” at an actual altitude of 30,203 feet. The Fédération Aéronautique Internationale (FAI) recognized her achievement as a world record for Class 11 aircraft (gross weight between 1,102 and 2,204 pounds). Her record held until 1984, when it was broken by a 210-hp Mooney.

### The Design of N8M

Each early Pitts incorporated modifications and refinements over the previous airplane. Although the original drawings for Pitts No. 1 don’t seem to exist

anymore, it would seem certain that Curtis made some sketches and drew detailed plans before attempting the construction. Plans dated September 11, 1945, in the title block came **after** the first flight of Pitts No. 1 but must have been drawn for Pitts No. 2. Further modifications making Pitts No. 3 unique (such as the aileron extending to the wing tip) haven’t surfaced yet, and were apparently destroyed in a shop fire.

In addition to photographs of Caro and N8M, the May 1951 issue of *Air Trail* magazine published a detailed three-view of the airplane.

This three-view drawing is, to the best of my research, very accurate, representing the size and color of N8M, except for the misspelling of Caro’s last name!

This three-view compares to the early set of plans drawn by Curtis Pitts on September 11, 1945, with some drawing sheets traced by H.A. Megary.

- Upper wing is 17 feet 6 inches, compared to an S-1C plan that is 17 feet 4 inches.

- Lower wing is 15 feet 4 inches, compared to an S-1C plan that is 15 feet 6-3/4 inches.

These differences are very small and could be attributed to the actual measurement of the airplane.

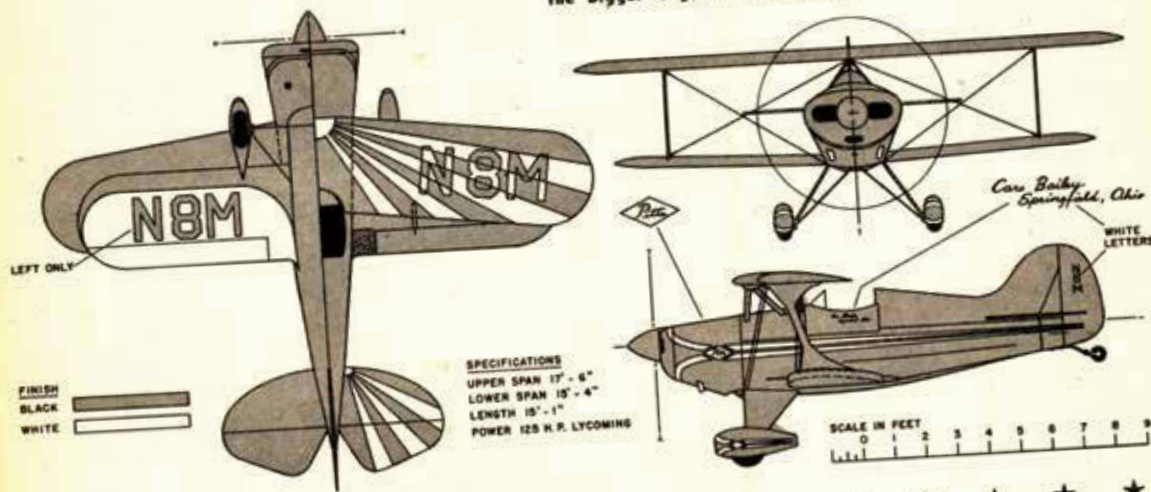
- Length, at 15 feet 1 inch compared to an S-1C that is 14 feet 3 inches (short fuselage) and an S-1S that is 15 feet 6 inches (long fuselage), is different. But this measurement of the S-1C side view is from the edge of the rudder to the tip of the spinner. A measurement of the fuselage is more comparative.

The *Air Trails* issue describes a longer fuselage, bigger spinner, and square-cut pants.

Measurement of the AT three-view scale drawing is 10 feet 2 inches from the tail post to the line of the firewall/cowling. The S-1C drawing plan of the fuselage indicates 10 feet 2-1/2 inches

## CARO BAYLEY'S Pitts Special

This is the little Pitts with which Caro Bayley took third place in the 1951 aerobatic contest at Miami, Fla. For those who want to build a control liner of the wee beauty, it is basically the same plane as the Pitts-Skelton Biplane (AT Sept. 1950) with these changes: span increased by 6 in., length by 11.5 in. due to the bigger engine. It has larger spinner, square-cut pants.



Three-view from *Air Trails Magazine*, May 1951.

from the firewall to the back of the tail post. Since the rudder appears to be of similar size, the difference is in the firewall-forward (engine/engine mount/propeller/spinner) configuration.

While this can't be confirmed for all of Curtis-built prototypes, for the Model 11 Super Stinker and the Model 12, Curtis built the whole fuselage, fabric-covered with everything assembled in between, then weighed it. He would also weigh the engine with all accessories and propeller. He could then design/build an engine mount for a perfectly balanced airplane. Since it is probably hard to teach an old "redneck" dog new tricks, it is plausible that Curtis may have been doing this from the beginning.

### The N8M Replica, Ted Teach and Caro Bayley

The original N8M was completed in 1950. A young Ted Teach was taking flying lessons in Springfield, Ohio, where Caro was practicing her air show routine. She was 28, a heck of a pilot, and equally striking. Ted was infatuated with her. But like a flash

in a pan, after her 1951 title, "Caro flew her last air show the week before she got married in September 1951 at the age of 29. She quickly had four children in five years and gave up her beloved Pitts Special, something she regrets to this day," recounted Kate Landdeck after an interview with Caro. The grounded Pitts was sold to Frank Gibson in June 1953 but was destroyed shortly after by a fire caused by a gas leak.

When Curtis released the S-1C plans, Ted eventually acquired a set (232H) and began building his Pitts in 1969. Ted was also very busy with his new company. Together with Robert Studebaker, Ted co-founded LaserPlane, with the technology that uses a rotating laser beam as an elevation reference to automatically control earth-moving machines to very accurate elevations.

Ted was busy working and flying an Aerostar around the country, promoting LaserPlane. His first visit to Oshkosh was in 1967, where the idea of building a Pitts germinated. He met up again with Caro Bayley in the '70s at the Cae-

sar Creek Soaring Club and told her that he was building a Pitts. Caro supplied some photographs for reference. Around 1997-98, Ted eventually acquired the original N8M registration that was on a Pitts in Cape May, New Jersey. After listening to Ted's story about his replica project, the owner transferred the N8M registration to him.

Although Ted loved building, his progress was slow. After 29 years he contacted Kenny Blalock of Conway, Arkansas, to complete the project. Kenny's long list of ratings and accomplishments can be found on the Special Products Aviation Inc. website. An accomplished inspection authorized (IA) A&P and designated airworthiness representative (DAR), Kenny flew air shows professionally for 14 years and designed and built the Pitts Falcon that he flew for six years.

Given these credentials and a fully equipped 10,000-square-foot facility, the N8M replica was finally completed by Kenny in 1999 and flown to Oshkosh, where Curtis Pitts and Caro Bayley posed with the airplane. For this year's 70th anniversary of the Pitts first flight,



Andrew King flew N8M to Oshkosh for display.

Worthy of Best Homebuilt Pitts AirVenture 2015, the N8M replica is a Pitts S-1C wearing the color scheme of Caro Bayley's *Black Magic*. Ted installed the Lycoming O-320 (150 hp) for a powerplant with a metal prop. He opted for the convenience of an electrical system, radios, etc., standard Pitts teardrop wheel-pants, and did not extend the aileron to the wingtip edge. After 16 years, the aircraft finish is still immaculate, and Ted takes it out regularly for a typical 20 minutes of aerobatics around the sky.

### **NX86401 Pitts No. 2 and Curtis Pitts**

Before the World War II, several dirt airfields were located in the Gainesville, Florida, area. Starting in the early '30s, Carl E. Stengel, a former Gainesville motorcycle cop, had established his own fly-

ing service from such a field. When the U.S. Army took over and built the Alachua Army Airfield around 1941, Carl Stengel moved his training school to Stengel Field, located just southwest of Gainesville, as depicted on the July 1943 Orlando sectional chart.

The *Miami Daily News* dated November 20, 1944, had a headline that read, "Stengel Flying Service at Gainesville."

"It comprises 27 buildings at which thousands of trainees have been tutored for war flying," Stengel added. "I believe firmly in the future of private flying."

Based on that strong belief, Carl Stengel was able to convince Curtis and Willie Mae Pitts to relocate to Gainesville to be part of his fixed-base operation and to produce 10 airplanes to be offered for sale. Those "production" Pitts Specials would be based on Curtis' experience with designing, building, and flying NX52650, Pitts No. 1, with

some refinements.

A major operational refinement was the replacement of the rigid gear and 7.00-by-4 balloon tires with a center shock-absorbing bungee arrangement. This arrangement is still used on production Pitts S-2Cs 70 years later.

The top wingspan is slightly wider (17 feet versus 16-1/2 feet) with a longer fuselage. A simplified turtledeck wrapped in aluminum replaced the formed headrest built from 22 thin stingers. The turtledeck sits on top of fuselage tubing and blends the fuselage shape from the pilot's headrest back to the vertical fin.

Only a few photos of NX52650 Pitts No. 1 have surfaced so far—no drawings have survived. From these photos, only one set of flying and landing wires is visible. Pitts No. 2 would have a second set of wires added for safety.

The fuel filler neck is positioned on the fuselage centerline just be-

YEAH, WHOOHOO, YEE-HA!



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**Curtis Pitts with NX86401.**

low the top wing and is still located in the same place to this day. The Pitts No. 1 filler neck was just aft of the firewall on the top right hand side of the fuselage.

Another change in appearance was the “I” strut connecting the bottom wing to the top wing. It is made of streamline steel tubing with welded attachments and is fabric-covered. The Pitts No. 1 strut was made of plywood with a wider chord and was angled inward at the bottom.

The original Lycoming 65 hp installed for the first flight made the airplane’s nose very stubby. It was later replaced by a 90-hp Franklin engine. At that time, the rigid wires connecting the landing gear in an “X” configuration were replaced by solid tubing. Pitts No. 2 would be powered by a Continental C-85. The C in the Pitts S-1C designation stands for Continental and is part of the set of plans eventually released.

### **An Uncertain Timeline**

It is difficult to establish the timeline when Carl Stengel thought there might be a market and then made arrangements with Curtis for him to design and build up to 10 small aerobatic biplane based on Pitts No. 1.

In late 1944, Stengel leased his facilities to C. Ray Smith and Jack Frierson from South Carolina. He reacquired the operation in January 1946. Stengel Field was one of the few government-approved aviation schools for veterans under the GI Bill of Rights for the state of Florida. According to a *Gainesville Sun* newspaper report dated April 25, 1947, “The flight services and aviation school facilities at the Stengel Aviation College here have been purchased by the Gulf Aviation Schools... The repair station, with equipment valued at about \$500,000, will be operated by Curtis Pitts, master mechanic and plane designer who fathered

the well-known Pitts’ Special or ‘Flying Jeep.’ Maintenance and repair work for Gulf School here will be done by Pitts under contract,” Frierson said.

In August 1947, a column by S.B. Jones in *Skyways* magazine introduced NX86401 with a small photo and caption. “Designed by Curtis Pitts and built at the Aircraft and Engine Mechanic School at Stengel Field. . . . The tiny ship is, at present, being readied for a tour of the country with World Air Shows. Some of the maneuvers that its pilot, P.C. Quigley, will do, eight-point rolls, vertical snap rolls...”

This was followed up with a cover feature in the December 1947 issue.

An early set of S-1C plans drawn by Curtis is dated 1945 and was re-traced in 1961. It can be assumed that Curtis drew these plans in 1945 to replicate parts for sets of 10. These early drawings became a baseline of all Pitts to follow. De-