

PITTS S-2B

# FIFTY YEARS AND STILL SPINNING

## Ride the Wally World Express

BY ALTON K. MARSH

**A**ileron rolling continuously, the Pitts S-2B is also making a 180-degree turn from north to south—half of a maneuver called a rolling 360. My neatly ordered view of the world—blue color on top, green at the bottom—is severely challenged by what Aviat Aircraft test pilot Greg L. Poe is doing. Logically, I should see blue-green-blue-green, as the ranch land below changes places with white-capped mountains to the north and the big sky over Afton, Wyoming. Instead, it is one continuous stomach-churning bluegreen blur. ■ Poe, sitting in the rear cockpit, seems to know where he is—or, in technical terms, has maintained his situational awareness. “There’s 45 degrees of the turn,” he says. “There’s 90.” Never mind that we are head over heels all the while, the engine generating a clattering roar in the cockpit. It sounds like we’re in a drag racer. A

PHOTOGRAPHY BY MIKE FIZER





brown smear goes by, the Aviat plant 4,000 feet below. Poe refers to it as Santa's Little Workshop because his favorite toy, this 260-horsepower Pitts S-2B aerobatic trainer, is made inside.

While the S-2B still carries the Curtis Pitts name, Pitts sold his interest in the Pitts Special in 1977 before the S-2B was designed. The S-2B was actually designed by Herb Anderson, chief engineer of Pitts Aerobatics (now the Aviat plant), in the early 1980s.

What better way to celebrate the fiftieth year of the original Pitts design than to spin ourselves crazy at a roll



rate of 240 degrees per second? Yes, some of the new monoplane muscle machines like the Russian Sukhoi and Extra roll faster. But "The Pitts rolls as fast as anyone should want to or need to," says Aviat's new design engineer (and aerobatic competitor), David Pilkington of Australia. The Pitts continues to finish "in the wood" (a reference to wooden plaques given to aerobatic contest winners) at national competitions, reinforcing Pilkington's assessment of the roll rate. That's not to say it's as docile as an old lapdog—it's more like a hyperactive terrier.

Poe hands the playful puppy over to me once my stomach has stabilized from the rolling turn, and I do the International Aerobatic Club's Basic competition routine—a spin, loop, and slow roll. The controls prove extremely responsive: A quarter-inch of stick movement that would do little in a





Cessna 172 produces a 20-degree bank in a Pitts. It's clear while entering the spin that the pilot's wish is the Pitts' command, and it comes out of the spin instantly on the desired heading. (Some trainers require pilots to lead the recovery well ahead of time with anti-spin control inputs in order to stop on a desired heading.) The down line following the spin is easily drawn by aiming the prop spinner maddeningly straight at the ground. (Again, in some trainers the cockpit is actually reclined a few degrees positive when on a correct down line.)

A 4-G pull-up to a loop requires less control movement than some aerobatic trainer aircraft, and only a few ounces of pressure need be released to round out the top of the loop. Most students who have learned in slower, less responsive aerobatic aircraft find the Pitts simply requires less work to perform maneuvers accurately. Put another way, Pitts pilots have more fun. The slow roll feels

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almost fluid in motion. That's not fair to non-Pitts pilots; it's too easy. Spade-like attachments to the ailerons on the lower wing keep stick forces light. Just keep an object ahead—a cloud or whatever—framed by the cabane (the triangle-shaped wing braces ahead of the pilot) to avoid gaining or losing altitude.

Following my maneuvers, the controls are returned to Poe. He pulls vertical, adding a little right aileron to prevent a torque roll, up and up until the Pitts can go no farther. Then it's quiet, and we are tail-sliding backward—he says—but I can't tell. "It's gonna be violent," Poe warns. I am looking at the left wingtip's position relative to the horizon, concentrating on detecting motion, watching but not seeing any, when the Pitts swaps ends, slapping its nose downward and swinging it like a ringing bell. The pilots, especially if their seatbelts are loose, become the clappers. A gorilla is shaking us by the tail. It just might be time to end this first



demo flight, my stomach indicates.

When Poe hears that I didn't really detect the slide, he promises we'll work on that tomorrow, along with a maneuver with an intimidating name—the Wally World Express—named after a fictional theme park in the movie *National Lampoon's Vacation*. "It's the E-ticket ride," Poe promises, a maneuver he performs in his airshow routine. I can't wait—or maybe I can.

**A**fter the demonstration there is time to sit in the back cockpit of an S-2B still on the production line and get familiar with the aircraft systems and controls. The aircraft is soloed from the rear cockpit, the only one to have a trim lever, fuel gauge, and other essential instruments. The trim lever is mounted on the left cabin wall and looks like a small flap handle, and is just as easy to use.

The fuel gauge is almost too simple, a clear plastic fuel tube that runs down the instrument panel with marks along its length to indicate tank quantity—but it disappears beneath the panel before the "E" for empty marking shows. The tube runs all the way to the cabin floor, and the "E" is down there by the pilot's feet. More than one Pitts pilot has run out of gas—many, if the truth be



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known—with some pilots even repeating the error. In fact, this writer has experienced—at another time and place—what it is like to be riding as a passenger in a Pitts S-2B when the fuel runs out. The Pitts glides little better than a rock, or perhaps a brick. In fact, Pitts owners joke that to establish the proper Pitts glide attitude, they throw out a brick and follow it down. (The Pitts is good at climbing, though, with a vertical climb rate of 2,700 feet per minute, or the equivalent of going straight up at 30 mph.)

Doug Partl, a Pitts aerobatic instructor and FAA aviation safety counselor in New Lenox, Illinois, has a solution to the gas gauge problem. Partl, who is also an airframe and powerplant mechanic with inspection authorization, got FAA approval to install a sight gauge directly on

the outside of the tank. He routed a clear plastic tube down the left side of the tank. The quantity can be seen through a slot Partl cut in the aircraft skin. The gauge is calibrated from half full to full. "You wouldn't want to take off with less than a half tank anyway," Partl said.

Generally, owners report few serious problems with the Pitts, but a few suggest an irritating stream of minor squawks that keep the aircraft in the shop too much. Loose tailwheels,



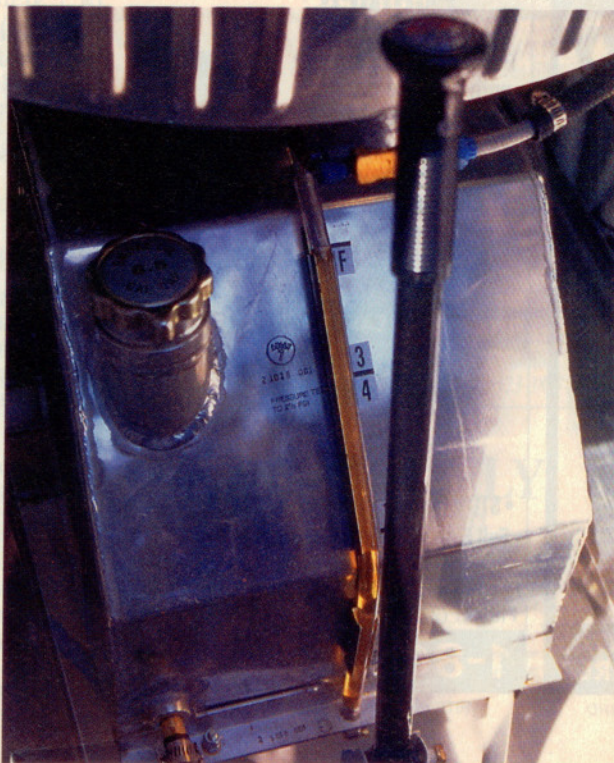




*The smoke oil tank (below) must be nearly empty for aerobatic flight with two people aboard. With one pilot on board and a full oil tank, however, the Pitts can put on quite a show.*

aileron spades that crack or break off, and fragile hinge pins on the canopy seem to lead most pilots' minor gripe list. Diane Hakala, now on the U.S. Aerobatic Team, had a Pitts but found it was constantly suffering from cracks in the cowling, the seat, or the fabric.

It used to be said that a Pitts has never failed structurally while in flight, and that was true until May 1994. Since then, there have been three incidents of longeron failure in S-2Bs—the major structural tube that passes from the tail to the nose. The first was in Florida, where the pilot was jokingly given an award for being “the first pilot to break a Pitts.” The second incident occurred in July 1995 in a Pitts S-2B with almost 800 hours on it. Maryland aerobatic instructor Nancy Lynn made a



successful landing on a farmer's grass runway after throttle cables were stretched and jammed by the weight of the engine as it slipped downward several inches.

Most of the evolutionary changes that have led to the Pitts S-2B are welcomed by its pilots. Even with a parachute on, there's plenty of room to move around in an S-2B cockpit, despite the popular belief that any Pitts is a tight fit. Some models are, but not the S-2B. The back cockpit design looks as though the decks have been cleared for aerobatic action. Fittings are tight, controls have no slack, and the canopy has no play.

All Pitts aircraft (Aviat also makes the single-seat S-1T and S-2S models) are fine-tuned at the factory for aerodynamic performance. As I complete my self-



guided tour of cockpit controls and aircraft systems in the production-line S-2B, craftsmen Blair Orvin and Kelly Jaspersen are rigging an S-2B wing that was squawked during a test hop; it had a slight left-wing-low tendency. It is like watching piano tuners; Orvin adds a standard washer under the left I-strut while Jaspersen simultaneously removes one from the bottom of the right I-strut. (I-struts join the upper and lower wings.) The resulting change in wing angle will make this particular Pitts fly level, hands off.

#### Pitts S-2B

Base price: \$119,265

Price as tested: \$130,207

#### Specifications

Powerplant	Lycoming AEIO-540-D4A5, 260 hp
Recommended TBO	1,200 hr
Propeller	Constant speed; Hartzell metal two-blade or MT-Propeller composite three-blade
Length	17 ft 9 in
Height	6 ft 5 in
Wingspan	20 ft
Wing area	125 sq ft
Wing loading	13 lb/sq ft (aerobatic category) 13.6 (normal)
Power loading	6.25 lb/hp (aerobatic category) 6.54 (normal)
Seats	2
Cabin length	6 ft 11 in
Cabin width	2 ft 4 in
Cabin height	3 ft 11 in
Empty weight	1,150 lb
Empty weight, as tested	1,185 lb
Gross weight	1,625 lb (aerobatic category) 1,700 lb (normal)
Useful load	475 lb (aerobatic category) 550 lb (normal)
Useful load, as tested	440 lb (aerobatic category) 515 lb (normal)
Fuel capacity, std (w/5-gal. wing tank)	29 gal
(28 usable); aerobatic flight, 24 gal (23 usable)	

#### Performance

Aerobatic flight load limits	+6 G, -3 G
Endurance with 30 minutes fuel reserve	1.4 hr
Takeoff distance, ground roll	557 ft
Max demonstrated crosswind component	17 kt
Rate of climb, sea level	2,700 fpm
Cruise speed/endurance w/45-min rsv, std fuel	
(fuel consumption)	
@ 75% power, best economy	
	151 kt/ 1.2 hr (14.5 gph)
Landing distance, ground roll	1,054 ft

#### Limiting and Recommended Airspeeds

V <sub>X</sub> (best angle of climb)	71 KIAS
V <sub>Y</sub> (best rate of climb)	83 KIAS
V <sub>NE</sub> (never exceed)	184 KIAS
V <sub>S1</sub> (stall)	52 KIAS

For more information, contact Aviat Aircraft, The Airport, Box 1149, South Washington Street, Afton, Wyoming 83110; telephone 307/886-3151, fax 307/886-9674.

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.

The following day it is time for another demonstration flight—and the Wally World Express. While I would like to fly from the rear cockpit for landing practice, most pilots agree it takes 10 hours to fully check out in a Pitts. After all, word on the street is that the Pitts is difficult to land, isn't it?

As it turns out, the word on the street needs to be updated. That's not to say it is easy to land a Pitts, because forward visibility is lousy. Some pilots joke that the Pitts is landed by the Braille system: All the pilot sees in the flare are wings and struts, but no runway. Even the pilot's peripheral vision is blocked. The preflight briefing had called for me to make approaches only, then turn it over to Poe for the flare and landing. For best forward visibility Poe suggests a curving, 180-degree side approach from downwind. Each time, I add power to go around, relaxed in the belief that there will be no dreaded Pitts landing.

"Why don't you bring it on down?" Poe suggests after the last curving approach.

"You're flaring a little high," Poe warns. My touchdown is followed by a small hop back into the air. "Stick full back," Poe instructs. The aircraft makes an acceptable but rather firm arrival.

During the rollout the Pitts veers five feet right of centerline (or rather, the pilot overcontrolled), then darts eight feet left.

"I'm coming off the rudders," Poe says.

"I wouldn't do that," I advise.

Poe thinks that's funny, adding, "I'm off." With smaller rudder movements, the aircraft tracks straight from there on. Directional control takes practice, but the Pitts just isn't as difficult to land as the rumors would indicate. Practicing approaches first without touching down was definitely a good idea, however.

Then Poe adds power and we take off to ride the Wally World Express.

"Put one hand on your headset, or it will leave," Poe warns matter-of-factly as we reach 4,000 feet agl. Does he mean the headset will leave my head, or leave the airplane with my head still attached? The answer comes soon enough.

A 240-degree-per-second roll to the left (the stick fully deflected) stops abruptly on a left knife edge, leaving us lying on our left side. That was just the windup, like a baseball pitcher, and here comes the pitch: two consecutive snap rolls (horizontal spins) to the right. The



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maneuver looks spectacular to people on the ground, and feels as violent as it sounds in the cockpit. Hanging on to the headset proved necessary.

Following that, and discovering I am still of good stomach, Poe enters a tail slide once again. Although the smoke oil tank between my knees was nearly empty prior to flight—as it must be for aerobatic flight with two people aboard—the stick-mounted smoke button is pressed anyway as we ascend. There is just enough oil left. This time, I can tell we are sliding

backward as smoke appears to rush up from below to envelop us. Fumes fill the cockpit as we back through our man-made cloud before slapping nose-down to a recovery.

The S-2B is obviously capable of highly advanced maneuvers, yet is easy enough to fly for pilots just beginning their aerobatic training.

Beautiful to look at, it can teach you about the beauty of flight about the axes, too, unless you're aboard the Wally World Express. That's a lesson in pure excitement. □

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