

Pilot Flight Check:

Production

Model Pitts

*It's love at first flight
for evaluator who earned his aerobatics' spurs many years ago.
Two S-2As per month are rolling off a mini-assembly line in
the hills of Wyoming, and the customers' line is steadily growing*

by DON DOWNIE / AOPA 188441

All photos by Dana Downie

"Don't fight her, make love to her," the voice crackled in my headset. I was manhandling the new production model Pitts S-2A into a snap roll, using the same piloting techniques (more-or-less) that had survived five classes of USAAF Cadets from the front pit of a Stearman PT-13.

But the S-2A, the first aerobatic biplane to be certificated for production in 30 years, is no Stearman. She likes firm but gentle hands on her controls.

Our goal for the flight, however, was a comparison of the Stearman of World War II vintage and the new two-place production Pitts, the most sophisticated licensed aerobatic airplane in the free world. (All seven members of the world championship 1972 U.S. aerobatic team fly versions of this ship because of its precise design.)

The Pitts is a single-purpose airplane. It's designed to do just one thing—aerobatics—and it does them superbly. There's been no compromise in design; everything was sacrificed for aerobatic performance. Visibility is less than perfect. Cockpits are barely big enough for a six-footer with chute.

Whenever you see someone climb out of a Pitts' cockpit, and that person has been doing all the flying, you can generally be pretty sure that you're watching a man or woman who really knows how to fly.

Aerobatics in the Pitts S-2A are a sheer delight. And now that production models of this classy biplane of home-built fame are being made available, we're just liable to see more of them around. Before you ask, the cost is \$24,395, faf, Afton, Wyo., where Aero-tek, Inc., is now putting the two-placers together in the old CallAir aircraft factory building. Two S-2As come off the mini-assembly line each month. All of the employees, with a single exception, previously worked on the wood, steel tube, and fabric CallAirs before that

company was sold to Aero Commander and moved to Albany, Ga., in 1966.

Pitts officials report that a production model of the single-place version of the Pitts will probably be certificated in the foreseeable future by Curtis Pitts (AOPA 166534) in Homestead, Fla., where the company's engineering and sales are handled. The single-seater reportedly will be available to homebuilders in kit form, similar to that for the Schweizer 1-26. Officials "guesstimate" that plans and complete parts for the single-seater may be about \$9,000, while a new engine and prop will cost another \$5,000.

Aerobatics in a gung-ho bird like the Pitts S-2A is true sport and can be classed as thrilling. But the know-how that comes from mastering this 20-foot stick of dynamite will give any pilot the confidence required to win out over almost any unusual attitude, including those caused by wake turbulence. Aerobatics in the S-2A may not be for every pilot, but it's certainly a stimulating experience for those who try it.

Rather than flight demonstrations of the lomcevak and a series of "outside maneuvers" to prove the +9 and -4½ G capability of the Pitts, I asked G. W. "Robbie" Robinson, former U.S. Air Force lieutenant colonel with 25 years and "over 10,500 hours," for a chance to compare the new Pitts with the older Stearman. Robbie is chief pilot for Aeronautics Unlimited, Inc., which is located at Corona Airport, near Los Angeles. He's flown "everything except a balloon and a rocket" and he tolerantly went along in the back seat of the S-2A, so that I could compare the "front hole" with the instructor's normal station in the Stearman.

When Robbie said, "Don't fight her, make love to her," we were inverted in a snap roll where I had full rudder, full back stick, and an entry speed of 120 mph. The Pitts snapped and would have gone right around in a second snap if I

hadn't punched opposite rudder—clear to the stops—and applied forward stick as the horizon approached level. I used too much forward stick and the S-2A pitched 30 degrees nose low. (The S-2A will complete a snap roll in 2½ seconds. A "slow roll" can be done in the same minuscule period of time, because with a 160 mph entry, you can't get full aileron deflection in that short a time.)

We had lifted off earlier at full gross weight (1,575 pounds) and had a climbout of 1,000 fpm at "26-squared" (2,600 rpm and 26 inches of manifold pressure.). After an air-to-air photo session with daughter Dana in a Cessna 172, our S-2A was down to the aerobatic gross weight of 1,500 pounds. Small differences in weight make a great difference in a tiny airplane.

Following our predetermined plans, I went through most of the old primary maneuvers. We did a couple of loops from a 130 mph entry speed and the S-2A felt unloved as I hurried the top of the loop. You could feel the subtle shudder of an accelerated stall entry while we were inverted. If you're familiar with the Pitts (and I wasn't), you can use the accelerometer and maintain a constant 3Gs throughout your loop. Mine were not that neat and at the end of our flight my "G-meter" showed +4½ and -2½.

The S-2A does all the aerobatic maneuvers so smoothly that even your intestinal tract relaxes a bit and you attempt a number of "flip-flops" that you hadn't really programmed before the flight.

Main reason why there's little tendency for "mal d'aire" with the Pitts is that almost all aerobatic maneuvers are completed quickly. With the exception of variations of a loop, your maneuvers are usually completed by the time you (or your stomach) have figured out which side is up.

Our rock-and-roll session with the Pitts S-2A was in an aerobatic area over Lake Mathews, just outside the control zone at March AFB near Corona. We leveled off at 8,500 feet where full throttle gave us about 22 inches with the rpm set at 2,600 and locked. Power settings were constant because of the constant-speed prop; so score another one for the S-2A over the Stearman which required a power reduction during all nosedown maneuvers to keep the tachometer under redline.

There's a placard in the S-2A cockpit that shows entry speeds for the various maneuvers. Robbie came in on the intercom: "Do anything you want, just as long as you don't exceed the 203 mph redline or snap above 140." Recommended entry speeds, in mph, are:

	Inside		Outside	
	Maximum	Minimum	Maximum	Minimum
Loop up	180	130	180	130
Loop down	100	70	100	70
Slow roll	180	100	180	100
Barrel roll	180	130	180	130
Snap roll	140	90	110	90
Hammerhead	180	130	180	130
Lazy "8"	180	140	180	130
Chandelle	180	140	180	140
Stalls and spins	Slow deceleration		Slow deceleration	



"There I was. . . ."

The S-2A operations manual also states, "For spin recovery, put ailerons neutral, apply full opposite rudder briskly, then apply nosedown elevator."

The S-2A is completely controllable in both roll and yaw axes throughout any stalled maneuver. After a series of stalls, I tried spins both from a straight-ahead entry and out of a climbing turn. The first turn was normal but the nose came up to level attitude after one full turn. Since flat spins were not included



"Well, now, I don't know. . . ."

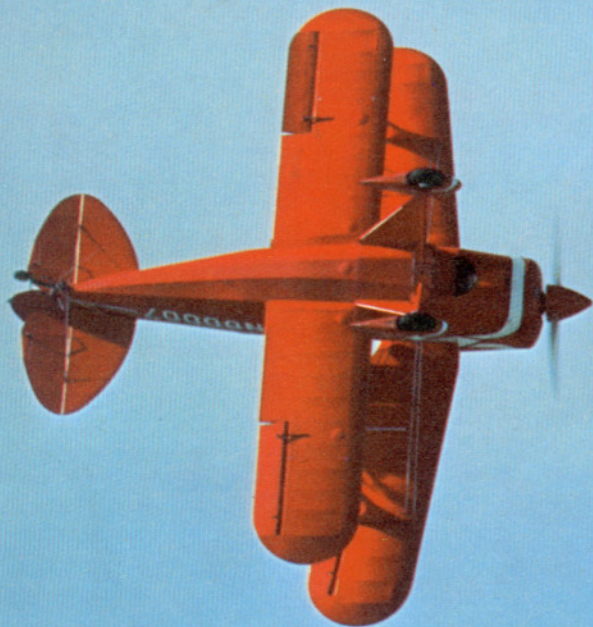
on my flight plan, I "punched out" with recovery rudder and forward stick. (Robbie later commented that I wasn't holding full back stick throughout the spin.)

Reverting to Stearman techniques, I made a 90° clearing turn in each direc-

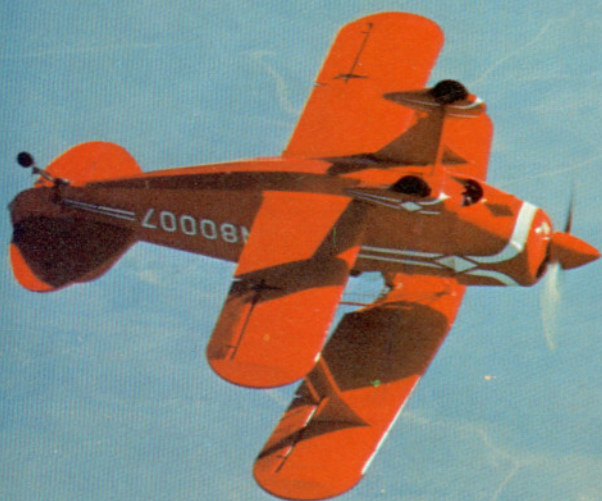
tion before starting a spin, roll, vertical reversal, half-roll or whatever. A dull gray World War II AT-6 was also using the practice area and we spent considerable time keeping track of his location.

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Pilot



"... your maneuvers are usually completed by the time you (or your stomach) have figured out which side is up," says author.



Model Pitts

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One entry that I particularly enjoy is a 90° peel-off into the dive preceding a loop. Line up on a road intersection (hard to do over a lake) and turn 90 degrees while the airspeed picks up. In this way, you have a better chance to assure yourself that you're alone in the sky before coming up into whatever maneuver you plan.

A favorite maneuver of mine is one that imposes absolutely no stress on the airplane or pilot—the hammerhead stall. Pull straight up and hold it there until you almost come to a complete stop. Just before a tailslide (approved in the Pitts), nudge in a little rudder to start the 200 hp fuel-injected Lycoming off to one side, so its weight pulls the little 20-foot airplane off into a smooth cartwheel, from straight up to straight down. The hammerhead feels wonderful and almost erases some of the gray from the hair. (From our practice area, I could almost see the desert where I'd taught similar flip-flops in 1943–1944.)

Half loops, with a period of inverted flight followed by a half-roll into level flight, are routine with the full inverted fuel and oil system. The S-2A is licensed for a minimum of three minutes of inverted flight without loss of oil or fuel pressure.

One of the great things about the world of the Pitts is that you can do any maneuver you wish since the ultimate stress loads go to +9 and -4½. Most pilots, including this reporter, aren't stressed that high. When you pull +5 or +6 Gs for over a few seconds, things will "gray out" as the blood is forced away from the brain—just as they did in Stearmans when we were much, much younger. Inverted, if you carry negative Gs for any period of time, things "red out." The S-2A is such a tiny, short-coupled airplane, however, that it completes the various high G maneuvers in a fraction of the time required in a Stearman. Consequently, there's less time to develop "red out" or "gray out" conditions.

Unless you're flying competition or teaching aerobatics almost every day, there comes a time when the spirit is willing but the flesh gets a little tired. Robbie later told us on the ground that for any one day he schedules only two instructional flights if they both involve "outside" maneuvers. With a stable of five aircraft, Aeronautics Unlimited, Inc., can start students with a simple wake-turbulence-survival course in a Citabria (\$25 per hour), step them up to sustained inverted maneuvers in the Decathlon (\$40 per hour), and then put them in the Pitts (\$85 per hour).

We finally headed back for home in a series of tight descending turns to give the best possible visibility in the smog. Fortunately, N80007 (made me feel sort of "James Bond-ish") was painted a showcard red that really stood out in the murk.



Afton, Wyo., home of "Pitts Haven," where the new production model S-2As are lovingly put together.

Did you ever go to an air show and watch the "derring-do" of the aerobatic pilot as he completes his routine in his tiny biplane—perhaps a Pitts—and then comes in from base leg to final approach in a full forward slip. Did you think this was part of the show-off program? It isn't!

Visibility around the S-2A's rugged center section truss and over the bulbous nose is just fine, as long as you have the nose kicked out to one side. After you cross the runway numbers and actually prepare to land, though, you have to kick the nose back down the runway and hope that your memory (Continued on page 89)



Slightly disheveled, but reportedly exhilarated, author Downie (right) and aerobatics instructor "Robbie" Robinson launch into critique of flight almost immediately after shutdown.

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is good. During flareout, all you can see from the front pit is a small section of the runway edge and boundary lights in your peripheral vision. Blind, it's really blind, but there just isn't any other compromise that will give S-2A its superb in-flight handling qualities.

Landing the production model Pitts is completely straightforward (it had better be) with payoff at about 58 mph from an 85 mph across-the-fence speed. There is adequate margin for a normal flare, followed by careful use of rudders and brakes during deceleration. (If I were instructing in a Pitts, I'd arrange to have the rear seat's brakes set up so they were only about half as effective as those up front where the instructor usually resides.)

Pitts' owners comment that tire pressure is important. If the tires are too hard, it's like trying to land a ping-pong ball. Once you get the ship on the ground and roll about 150 feet, however, everything tames down. The demonstrated crosswind component is 20 knots.

Ground handling on takeoff and landing is completely predictable, but quick, and it presents a constant challenge. Ventilation, quite naturally, is excellent. With a 24-gallon fuel capacity, the 200 hp Lycoming will stay in the air for nearly three hours (but you'd need help to unfold from the cockpit after that long a flight). Incidentally, the earlier S-2 model of the Pitts is no longer available. It had a 180 hp engine.

Taxiing the S-2A requires a continuing series of "S" turns to make sure

there isn't a plane, car or pedestrian up front. We finally shut down the smooth Lycoming, unhooked the five-point aerobic harness plus the extra lap strap, and climbed out. When you first climb aboard the S-2A and "strap it on," you feel as though it's a cute little thing. After flying it from takeoff through aerobatics and landing, you climb out with respect and affection. (If you follow Robbie's directions, you love her.)

Everything about the S-2A speaks of perfection in design and construction. Within a week of our flight over Lake Mathew in Double-O-Seven, we were ferrying an aircraft west to Santa Paula, Calif. Weather was touch-and-go but we made a couple of permissible detours and landed at "Pitts Haven," in Afton, Wyo. It was here, at an elevation of 6,239 feet, that the brothers Reuel and Spencer Call began designing airplanes in 1937. They had their first plane certificated in 1944.

Aerotek President Herb Andersen went to work for CallAir in 1955 and designed the modified A-5 duster. He worked on the more than 400 agricultural aircraft that are now called "Quail" and "Sparrow" Commanders, then spent one year as Piper Aircraft Corporation's plant manager at Vero Beach, Fla. He also served five years as vice president of manufacturing with Mooney Aircraft in Kerrville, Tex.

Herb Andersen is now back home in Afton, and he loves it. He's not really one for conference rooms and a stiff collar. During our visit, he was working comfortably in a pair of overalls. He said there are 1,400 hours of labor in each S-2A, while most small production aircraft go together in from 350 to 500 working hours. The Afton area is a "natural" in which to build the Pitts

since there's a backlog of highly trained men and women who have built airplanes with wood, steel tube, and fabric for many years.

The town has a population of perhaps 1,500 people, depending on where you draw the boundaries. It's almost a "Shangri-la" and Andersen reports that "many of the people who work here have never been out of the valley." Chief products of this tranquil area are cheeses, lumber, and Pitts S-2As.

"We have no desire to increase production," explained Andersen. "We want to be able to enjoy life a little on an eight-to-five schedule. Our challenge is in maintaining a high level of workmanship. We probably have the smallest production line around (25 men and women) and we certainly have the smallest plane in production."

Twice each month, Dave Low (AOPA 203813), a pilot for the Wyoming Game and Fish Commission, journeys from Pinedale, Wyo., to Afton to test-hop the latest two Pitts to come off the production line. At the time of our visit, 32 aircraft had been delivered and the company said it had a backlog of orders that would take it up through production plane No. 55. Several of those on order were scheduled for export. Five were going to the Rothman Tobacco Company in England, where they were destined to replace aging Stamps that have been used by the company's four-plane advertising aerobatic team. Another order was headed for Australia.

When you walk into Aerotek's well-insulated shop and chat with some of the workers, you soon find out why the production model Pitts looks so good. Will Edgerton, for example, has been building wooden wings for the past 23 years (except for two 10-month periods when the plant was either closed or being used to build Polaris snowmobiles). Erric Veigen worked on the first CallAir. Dee Hinck, a welder who didn't seem to mind our watching him use heliarc TIG (tungsten inert gas), worked on CallAirs back in 1964 and Venna Martin, one of several women on the Pitts' line, has been putting fabric, dope, and paint on airplanes ever since 1958. (She's never flown, but "would kinda like to go up in one of these little planes.")

Each production model Pitts' paint job is custom-designed and the cost is included in the sales price. Dacron is used for covering, with the first coat of dope hand-brushed on to fill the pores in the fabric. The metal structure is sand-blasted and coated with epoxy resin, as are agricultural aircraft, to eliminate any possibility of corrosion.

At a plant where "production" is a rip-roaring two per month, new owners can expect—and get—the hand-built attention to detail that is required of a 20-foot biplane that sells for just under \$25,000.

When you want to "do your thing" and it happens to be full-house aerobatics, find a "two-holer" Pitts S-2A and you'll have a machine that will do everything you want, and come back for more. □

Pitts S-2A Specifications and Performance

Base price (faf) \$24,395

	Aerobatic	Normal
Engine *	Lycoming	Same
	200 hp	
Wingspan (ft)	20	20
Length (ft)	17.75	17.75
Height (ft)	6.34	6.34
Gross weight (lb)	1,500	1,575
Empty weight (lb)	1,000	1,000
Useful load (lb)	500	575
Allowable baggage (lb)	20	20
Fuel (lb) (24 U.S. gallons)	144	144
Oil (lb) (8 quarts)	15	15
Wing area (sq ft)	125	125
Two pilots (@ 190 lb each)	380	380
Rate of climb (fpm)	1,900	1,800
Stall speed (mph)	58	59
Top speed (mph)	157	157
Cruise speed (mph)	152	152
Never-exceed speed (mph)	203	203

* 200 hp fuel-injected Lycoming IO-360-A1A with inverted fuel and oil systems. Hartzell HC-C2YK-4/C7666A-2 constant-speed propeller. Standard equipment includes a 12-volt electrical system, 40-amp alternator, starter, and military-type non-spill battery for aerobatics.