

A nonstandard pilot report on an  
aerobic standard

BY ALTON K. MARSH

This isn't a typical airplane review. Our usual test flights for articles such as this consist of some airwork, including stalls, slow flight, takeoffs, and landings. There is also the crucial true-airspeed test to see just how rapidly the steed will get you to your favorite beach, restaurant, or entertainment destination. But more about the standard flight test at the end of this article. This test of a new Super Decathlon at the American Champion Aircraft factory in Rochester, Wisconsin consisted of loops, spins, inverted flight, and a maneuver called the *Avalanche*.

Once in the air, National Collegiate Aerobic Champion Ty Englehardt—brought in especially for the flight—suggested that I dive the Super (meaning 180-horsepower) Decathlon to 160 mph before attempting the *Avalanche*. But no, let's let *you* do it. Dive to 160 mph while I keep talking, and I will tell you more when you hit that speed. You'll need to put the nose down about 15 degrees.

Now then, about Ty. Our nation hasn't always had a college aerobic champion—in fact, Englehardt is the first. The collegiate competition is a new program launched under the banner of the International Aerobic Club by Englehardt's father, airline pilot Allen Englehardt. In addition to the individual championship, Ty's Southern Illinois University aerobic team won the team trophy in that same competition—the IAC Collegiate National Championship. Englehardt flew a Pitts S-2C while his two teammates, Matt Boehm and Sean Roarty, flew a Super Decathlon. Earlier in his career—and we're talking about

PHOTOGRAPHY BY MARK SCHAIBLE

# Avalanche!

American Champion Super Decathlon



his teen years now—Englehardt captured the American Champion Aircraft award—a separate honor—for best Decathlon pilot in regular IAC competition. Englehardt's career appears to be off to a good start.

Since graduation last December Englehardt, who turned 22 in August, has established a strong aviation career: He is an aerobatic instructor and a corporate pilot for Klein Tools of Chicago (one of the sponsors of the college competition). His work provides him with an interesting variety of aircraft to fly (a Cessna Citation Ultra business jet and an Extra 300L aerobatic airplane are part of the Klein Tools fleet).

Did I mention that he is also an airshow pilot using a Pitts S-2C? He makes appearances throughout the Midwest.

#### Back to the dive

So how are you doing—hit 160 mph yet? Normally a loop can be done from a recommended entry speed of 140, but this one has a twist, literally. An *Avalanche* combines two basic aerobatic maneuvers that most beginners are taught: a loop and a snap roll. The snap roll is done at the top of the loop, while you are upside down. Not even the world-famous roller coasters at the Cedar Point amusement park near Sandusky, Ohio, can do that.

During my flight, I realized that I had been doing the *Avalanche* for several months in a rented Cessna 152 Aerobat without realizing it, and had shown the maneuver to fellow AOPA staff members. It had been tough to perfect at first, given the limited speed and maneuverability of the Aerobat.



The Super Decathlon, now back in production at American Champion, has shorter wings than the company's Citabrias, and that increases roll rate—about 180 degrees per second. Spades on the ailerons act like power steering on a car, using scoops to catch and take advantage of relative wind. Other advantages of the Decathlon include a semisymmetrical wing that is curved on top and bottom to improve inverted flight capabilities, and inverted oil and fuel systems that allow the Decathlon to fly upside down for two minutes. The Aerobat

The Super Decathlon not only looks sporty, but it is easy to fly as well. The nose is low enough that S-turns are not necessary to see ahead while taxiing. The cabin door opens wide and facilitates getting in and out while wearing a parachute. Its aerobatic capabilities are good enough for it to serve not only as a trainer but also as an advanced aerobatic performer.

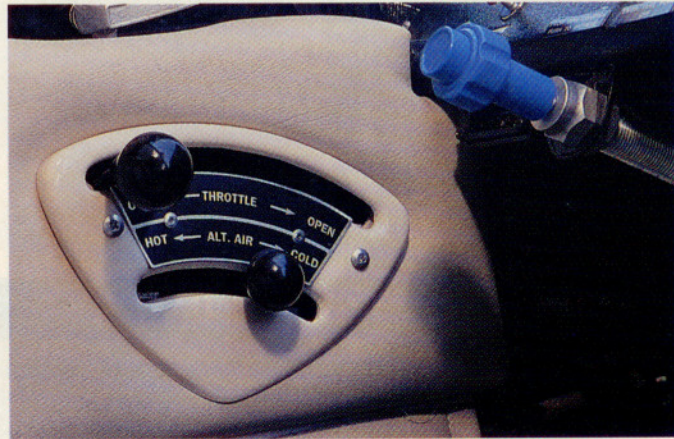
engine, lacking an inverted fuel system, quits from fuel starvation after a few seconds of inverted flight.

The Decathlon is the next step up from simple positive-G aerobatic airplanes like the Aerobat or the Citabria. It has what country and western stars call *crossover*, the ability to please more than one crowd at a time. It can be a trainer and Sunday fun airplane, or it can do serious airshow work. Patty Wagstaff is among the many pilots who have thrilled crowds using a Decathlon.

#### **But about the *Avalanche***

Ah, yes, I left you in a dive, the airspeed indicator winding up to 160—a higher speed needed to perform a snap roll on top of the loop. (The airplane was certified years ago using miles per hour rather than knots.) But you're going to need to know how to perform a loop and the snap roll, so here is a quick lesson.

A loop is simple. Once you have the recommended entry speed, pull straight back on the stick (no roll input, please, or you will go off course and the loop will look messy) with enough force to register around 3 Gs on the G meter. It can be slightly more or less. From that point on, just hold the



pressure. Don't worry about the finer points for now, such as holding right rudder in the climb and left rudder as you come down—we'll make this one simple. The fact that you have a constant-speed prop means that you don't have to bother with the power setting during the loop the way you would in an Aerobat or Citabria. In less capable airplanes, you need full power going up, but you must be careful not to overspeed the engine coming down.

OK, that's the loop. You're nearly at 160 mph now. Let's cover the snap roll quickly. A snap roll is simply a horizontal spin. Remember how to get into a vertical spin? Stall the airplane and, as it stalls, use full rudder in the desired direction of the spin, holding the elevator up to keep the aircraft stalled. A snap roll is the same thing, only it is done while fly-

**The cockpit features an orderly panel layout, an ergonomically comfortable throttle position (above right), and sight fuel gauges for each tank (above left).**

ing horizontally. The procedure is nearly the same: Just slow to the suggested entry speed—one that is well above the stall speed, by the way—depress one rudder quickly to the floor and an instant later apply full-up elevator. The airplane will wallow for a second, as if to say, "What the....," enter an accelerated stall, and flop upside down as it begins a lively roll. If you want to recover in your previous attitude—and that will be upside down in this case—release control forces halfway through the roll. Ready?

#### It's show time

You have the speed. Pull straight back on the stick firmly, not a jerk but a very

firm pull. The nose is coming up past a 45-degree angle and is now blocking your view—look to the wing tips for visual information. Now the ground is becoming visible through the skylight on top of the cabin. Release a tiny bit of stick pressure to avoid *pinching* the loop, making it pointy on top. We want a nice round loop. You're floating over the top now.

And now get ready for the *Avalanche*. Englehardt prefers snapping to the right—that is, pushing the right rudder to the floor; almost simultaneously, the stick is brought back briskly. For comparison's sake, at this point the Aerobat would need a little help, like releasing all the G force momentarily, quickly depressing the *left* rudder so that engine torque helps the aircraft rotate, and then suddenly reapplying

full elevator pressure. But the Decathlon doesn't need any help.

Here we go. Check the airspeed—if you enter the snap roll at more than the recommended 90 mph IAS you could damage the plane. Most of the time, however, climbing into the loop bleeds off airspeed to 90 or less. As the snap begins, Englehardt suggests reducing the elevator pressure to increase the speed of the roll. Slight forward movement of the stick means the nose travels in a smaller circle during the snap roll, and thus a faster, more violent roll. Since the nose is the heaviest part of

the airplane, that is the part you want to keep closest to the center of rotation. Violence, or at least the appearance of it to viewers on the ground, is good. In an instant the Decathlon has flipped from upside down to right-side up, and you can now release the control forces used to enter the snap. The aircraft stops in the previous inverted position, just minding its own business with nothing to do but dive down the back side of the loop. Oh, yes, I forgot to brief you on what to do next.

As the airplane dives to vertical, begin adding back-pressure on the stick—



National collegiate aerobatic champion Ty Englehardt (left) tells author Al Marsh what he just did during the demo flight.

no aileron input once again—until you have the same G force used to get into the loop. Airspeed is increasing, so as the nose reaches the horizon, push forward slightly to stop the climb created by the higher airspeed and fly away level as if nothing ever happened.

That was fun.

### Take a break

"How are you doing?" Englehardt asks, wondering if you feel the least bit queasy. You answer optimistically that you are only 10-percent queasy—that's 90-percent normal. "Time to knock it off," the experienced instructor says. He knows that once it starts, it's time to get back down.

So land and talk about the airplane a little bit. The worst thing about any tailwheel airplane is that it is difficult to land; the best thing about a Decathlon is that it is among the easiest tailwheels to land. The center of gravity of any tailwheel airplane is behind the main gear—once the pilot allows side-to-side excursions to develop during the landing or takeoff rollout, the center of gravity compounds the problem and makes recovery more difficult. If a skilled pilot keeps the airplane tracking straight ahead, though, the airplane wants to comply.

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The Decathlon, like the Citabrias, offers terrific visibility from the front seat during landing and taxi—no need to S-turn. (For the pilot in the *back* of a Citabria or Decathlon, however, visibility is minimal. The Decathlon and Citabria are soloed from the front seat.)

You'll three-point the landing today—that is, land all wheels at the same time; approach at the correct airspeed, 70 mph in no-wind conditions, and keep it exactly at that speed. Get the airplane within a few feet of the runway, power off, pull back on the stick to hold the airplane off in a tail-low three-point position, and wait, slowly increasing back-pressure on the stick as the aircraft sinks. If the airspeed was correct to begin with, you'll settle softly to the runway with both mains and the tailwheel touching at the same time.

This particular Super Decathlon that you have just landed is well equipped—so well equipped in fact that it has only a 200-pound payload with full fuel. Obviously, carrying a passenger and baggage means leaving off fuel. It cruises at between 125 and 128 KTAS (most of us are used to thinking in knots), fast enough to provide real transportation on days when you only need to go straight and level.

By today's pricing standards this particular luxury-pricing-equipped \$138,000 Decathlon is a bargain. Company demonstrator N64AC has been decked out with electronic engine instruments (a

\$4,295 option), a Garmin GNS 300XL GPS/com with a Garmin 327W solid-state Mode C transponder (\$6,295 for both), and an electric attitude/directional gyro package (\$6,800). A PS Engineering PMA 7000MS stereo audio panel was added for \$2,295 (yes, this aircraft has a CD player, but there is no word on whether it continues to play during a loop). Other options include a rear-seat heater (\$320), aileron spades (\$550), a speed fairing kit (\$455), and a deluxe paint scheme (\$3,295).

Bellanca made 670 Decathlons (with wooden spars) before production ended

in 1980. In 1992 American Champion put the Decathlon back in production using metal wing spars and has built 258. Some of the earliest Decathlons made by American Champion had fit-and-finish issues, but quality control is obviously much improved. One owner discovered some paint blemishes when he arrived to take delivery, and was delighted by the quick remedial actions of the American Champion staff. The chief differences are the metal wing spar (ribs are still made of wood) and the use of powder coating on the metal-tubing fuselage. The metal spars have not only

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eliminated concerns about an airworthiness directive (AD 2000-25-02) that requires increased inspections of the earlier all-wooden wings, but have improved aircraft performance as well. Owners report increases in roll rate and the overall speed of the aircraft.

### The official flight test

Let's see, are we forgetting anything? Oh, yes. The standard *AOPA Pilot* flight test. Never got around to it. There was far too much fun to be had during the *nonstandard* flight. True, many owners use their Decathlons for aerobatic competition, but that may not be for everyone. Instead, you may be interested in a tail-wheel airplane that is a real performer and delivers what it promises—pleasurable flying. But the next time you see an airshow featuring a Super Decathlon performing the *Avalanche* it would be pretty cool to say, "I can do that." **ACPA**

E-mail the author at [alton.marsh@aopa.org](mailto:alton.marsh@aopa.org)

**i** Links to additional information about the Super Decathlon may be found on AOPA Online ([www.aopa.org/pilot/links.shtml](http://www.aopa.org/pilot/links.shtml)).

## SPECSHEET

### Super Decathlon 8KCAB

Base price: \$107,900

Price as tested: \$137,865

#### Specifications

Powerplant ..Lycoming AEIO-360-H1B 180 hp	
Recommended TBO .....	1,400 hr
Propeller ....Hartzell constant speed, 74-in dia	
Length .....	22 ft 11 in
Height .....	7 ft 8 in
Wingspan .....	32 ft
Wing area .....	169 sq ft
Wing loading .....	10.6 lb/sq ft
Power loading .....	10 lb/hp
Seats .....	2, tandem
Cabin length .....	8 ft 10 in
Cabin width .....	2 ft 6 in
Cabin height .....	3 ft 11 in
Standard empty weight .....	1,340 lb
Empty weight, as tested .....	1,365 lb
Max gross weight .....	1,800 lb
Max useful load .....	460 lb
Max useful load, as tested .....	435 lb
Max payload w/full fuel .....	225 lb
Max payload w/full fuel, as tested .....	200 lb
Fuel capacity, std .....	40 gal (39 gal usable)
	240 lb (234 lb usable)
Baggage capacity .....	100 lb, 10.4 cu ft
G limits, Aerobatic category .....	+6, -5
Max inverted time .....	2 min

#### Performance

Takeoff distance, ground roll .....	495 ft
Takeoff distance over 50-ft obstacle .....	904 ft

Max demonstrated crosswind component .....	17 kt
Rate of climb, sea level .....	1,280 fpm
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption) .....	128 kt/3.4 hr
@ 75% power, best economy, 5,000 ft ..	(57 pph/9.5 gph)
@ 65% power, best economy .....	111 kt/4.4 hr
	(45.6 pph/7.6 gph)
Service ceiling .....	15,800 ft
Landing distance over 50-ft obstacle .....	1,051 ft
Landing distance, ground roll .....	425 ft

#### Limiting and Recommended Airspeeds

V <sub>X</sub> (best angle of climb) .....	50 KIAS
V <sub>Y</sub> (best rate of climb) .....	70 KIAS
V <sub>A</sub> (design maneuvering, normal) .....	105 KIAS
V <sub>NO</sub> (max structural cruising) .....	139 KIAS
V <sub>NE</sub> (never exceed) .....	174 KIAS
V <sub>S</sub> (stall, clean) .....	47 KIAS

For more information, contact American Champion Aircraft, Post Office Box 37, 32032 Washington Avenue, Highway D, Rochester, Wisconsin 53167; telephone 262/534-6315; fax 262/534-2395; or visit the Web site ([www.amerchampionaircraft.com](http://www.amerchampionaircraft.com)).

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.