

What's Needed?

It's already here!

Allistair Wilson, EAA 860077

Now, more than ever, is the time to produce a low-cost, high-tech, efficient, and economical 254-pound fixed-wing aircraft that will enthruse a new generation of aspiring pilots without breaking their bank accounts.

Larry Mauro's article in the August 2008 issue of *EAA Sport Pilot*, "The 254-Pound Fixed-Wing Machine—What's Needed," made a number of valid points. The introduction of sport pilot did not produce results the way a lot of folks expected. The market for new two-seat aircraft that previously fit the "fat ultralight" category has contracted rather than expanded. There are a lot of new aircraft available if you spend \$100,000 or more, but there are many

Hamburgers don't have to cost \$100, and we are capable of building aircraft that can exceed 50 mpg, so why not?

aspiring pilots who simply cannot afford the price tag associated with these new machines.

The answer to maintaining and growing a healthy pilot pool, who move upward from sport pilot to private



The Stellar Solo ultralight is built in Bulgaria and currently powered by a Czech-made engine.

and commercial pilots, is to produce something close to what Larry specified: a modern, high-tech Part 103 starter aircraft that costs a lot less than \$100,000. I know a number of commercial and private pilots who started out in ultralight aircraft and eventually moved up the ladder to more advanced aircraft and ratings.

Like Larry, I have a strong interest in very light fixed-wing aircraft, although I'm perhaps better known in the trike world for designing and building Astra weight-shift trikes. About two years ago, I teamed up with a progressive and innovative design team in Bulgaria. We set out to design, develop, and produce an easy-to-build-and-fly, 21st century Part 103 aircraft. The result of that work is the Stellar Solo, and it's in the flight-testing phase right now. This is a single-seat aircraft that weighs in at an impressive 210 pounds. It is a pod and boom-type aircraft constructed of aluminum and composite. The wings are aluminum, each weighing 30 pounds, for a total of 60 pounds (10 pounds less than the 70 pounds Larry mentioned). The fuselage and boom structure consists of a specially developed carbon composite—very light and strong. Wing loading is a little more than 5 pounds per square foot fully loaded. The low stall speed requirement of Part 103 is achieved through the use of full-span slotted flaperons.

The Powerplant: Where We Differ

Larry's design parameters call for a twin-cylinder, 25-hp, four-cycle engine. He wrote that such an engine was not available for mass production. To some extent that is true, but in specifying his ideal engine, he overlooked a major source of low-power, lightweight aviation engines. These have been doing sterling work in foot-launched paramotors for the past 10 or more years.

Paramotor engines have been developed to cope with high-drag, slow-speed aviation, and since these engines have to be carried on a person's back, they have to be light.

Modern paramotor engines developed for tandem flying produce nearly 30 hp. They are reliable and fuel-efficient. Most of them are two-cycle, but they are not the thirsty two-cycle engines of the past, as they burn less than a gallon of gas per hour.

On the Stellar Solo, we are currently testing the F200 engine from the Czech Republic, which is rated at

27 hp from a single 200cc cylinder. It comes with electric start and a propeller speed reduction unit that has been designed to allow us to spin a 55-inch diameter propeller in the tractor configuration. It is developing 200 pounds of static thrust in testing. The bonus is that all this weighs a mere 33 pounds, well inside Larry's 75-pound design allowance. This light but powerful engine has

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helped keep the empty weight of the Solo well within the Part 103 weight limit. We are also testing the Hirth F33 engine. It develops 28 hp and has more torque than the F200 engine, and we are observing that both engines are proving reliable and efficient in use.

We are also examining other aviation powerplant options. One of these is a 35-hp, twin-cylinder, four-stroke from Japan weighing in at 70 pounds complete. This would add an extra \$5,000 or so to the aircraft package, so it will probably be made available as an option for those who must fly four-strokes. The Solo will still be less than 254 pounds with this engine. Other engine options under consideration are a German single-rotor Wankel engine and the Hirth F23 engine, both rated at 50 hp. If someone wanted to build an experimental hot rod version, we are confident the HKS 700E or Rotax 503 would fit, but that would take the



The Stellar Solo, which is currently undergoing flight testing, uses a specially developed carbon composite for the fuselage and boom tube, while the wings are aluminum. The airframe weight, less the engine, is 210 pounds.

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Electric power is also an option. We are actively investigating this as a power source and eagerly await any allowances the FAA might make for the power pack in a Part 103 electric-powered aircraft.

Sign on the Bottom Line

How soon can you get a Stellar Solo? How much will it cost? We have yet to finish the test flying, and depending on how that goes, we are hoping to produce kits for sale in spring 2009, with the first production machines available in June 2009. The price for the easy quick-build comprehensive Stellar Solo kit will be \$13,495, which includes the airframe, engine, propeller, and instruments. Ready-to-fly aircraft should be less than \$20,000, but that price has yet to be set.

Furthermore, it would be nice to produce an aircraft for under \$10,000, as that was one of our initial design goals, but that has not proved possible due to the increasing costs of transportation, aluminum, and high-tech composite. Having said that, in reviewing Larry's article, I think we have achieved his requirements for a safe, strong, 21st century Part 103 fixed-wing aircraft.


Once we have the Solo up and running, we will produce a two-seat experimental or E-LSA version, the Stellar Prio. Our goal is to have this available as a complete airframe and four-stroke engine package for less than \$20,000. That should be available in about 12 months' time, so there is hope on the horizon for those pilots who want to fly an aircraft without the substantial price tag of a new LSA or the high maintenance costs of a 30-year-old Cessna.

Catalyst for Growth?

America needs a continual injection of new pilots as a foundation for the future of recreational and commercial aviation. I am sure there are many able designers with new plans on the drawing board right now, and I look forward to seeing those designs

develop over the next few years. A crop of new, safe, modern, low-cost, lightweight aircraft could act as a catalyst and steppingstone for recruiting new pilots and retaining the fun element for existing pilots.

I've seen a drastic reduction in general aviation activity at my local airport this past year. Existing pilots who are experiencing significant wallet pain would benefit from an aircraft

that costs less than \$5 an hour to fly, and the opportunity to sustain and encourage the current pool of trained pilots must not be lost. Hamburgers don't have to cost \$100, and we are capable of building aircraft that can exceed 50 mpg, so why not? 

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