

Soaring

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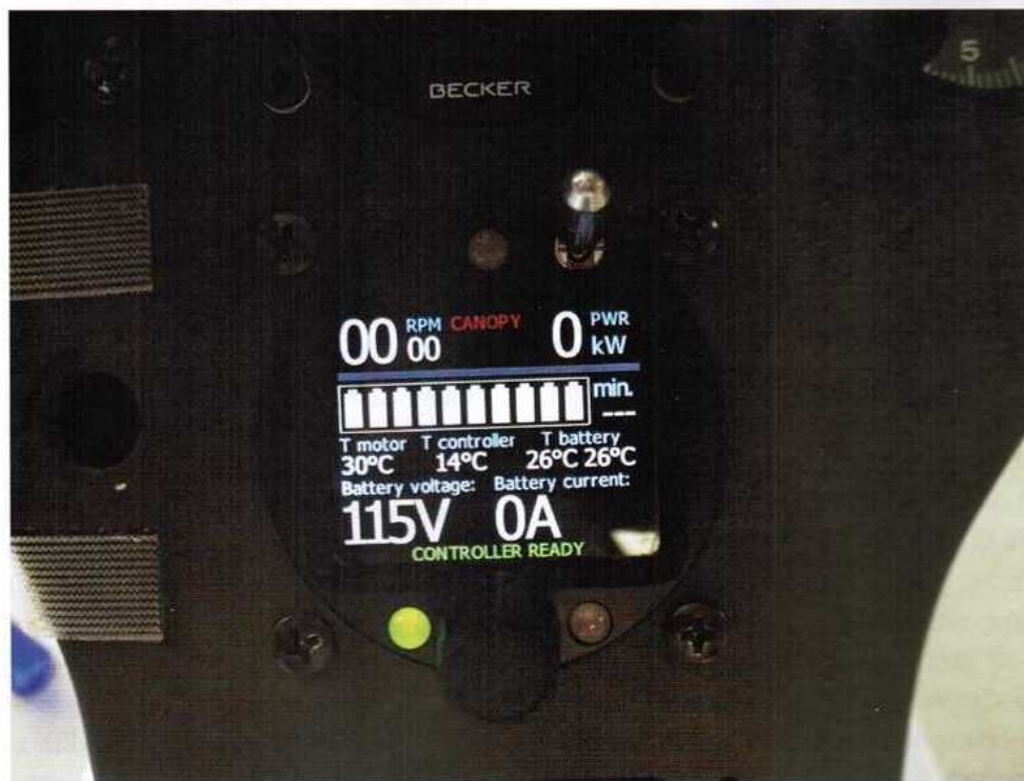
FES Update

By Renny Rozzoni
(Photos by author)

Five years ago, a tractor trailer arrived at the CAT dealer in Albuquerque carrying a container from Lithuania that we would soon unload at their dock. Inside the shipping container was the LAK-17B FES that I had ordered, sight unseen, just a few months before. Robert Mudd and I would soon be on the road trailering it to Reno for the 2012 SSA Convention. This was the first LAK-17B FES brought into the U.S. and was also the very first glider imported into the U.S. with a front electric sustainer (FES). After that first year of flying the LAK, I wrote an article for *Soaring* that was published in the March 2013 issue.

For those of you not familiar, the FES was developed in Slovenia by Luka Znidarsic and Matija Znidarsic. They installed the first FES in their LAK-17A and it flew for the first time in late 2009. The FES is produced by LZ Design and since those early days the use of the FES has really expanded and today it is offered as an option by many sailplane manufacturers.

So, after five years of flying the LAK-17B FES, how has the FES performed?



FES control unit.

First, the FES has never let me down (knock on wood). I start it before every flight and I have used it in flight on perhaps 10 occasions. It has always started when needed and it has performed as advertised.

The most common use has been tow related. In the past I would tend to stay on tow to perhaps 1,700 or 1,800 ft AGL or more in order to try to ensure that I had a reasonable chance of connecting with a good thermal. I would stay on to 2,000 ft or even higher, if there were some doubts about the lift. With the FES, I now tend to get off tow earlier knowing that the FES can be easily started if needed. I now commonly get off tow at 1,300 or 1,400 ft if decent lift is encountered. Again, the FES helps ensure that a relight is not going to be needed.

Related to getting off early on tow, another scenario that I have experienced is usually within a few miles of Moriarty. What has happened on occasion is that I have failed to connect with a thermal and have found myself down to 1,000 ft AGL and about to enter the downwind for runway 26. Instead of having to land for a relight I am able to simply turn on the FES, and usually within a few minutes I have been able to locate a thermal, begin climbing out, and then simply turn off the FES.

The next scenario where the FES has been a real benefit has occurred

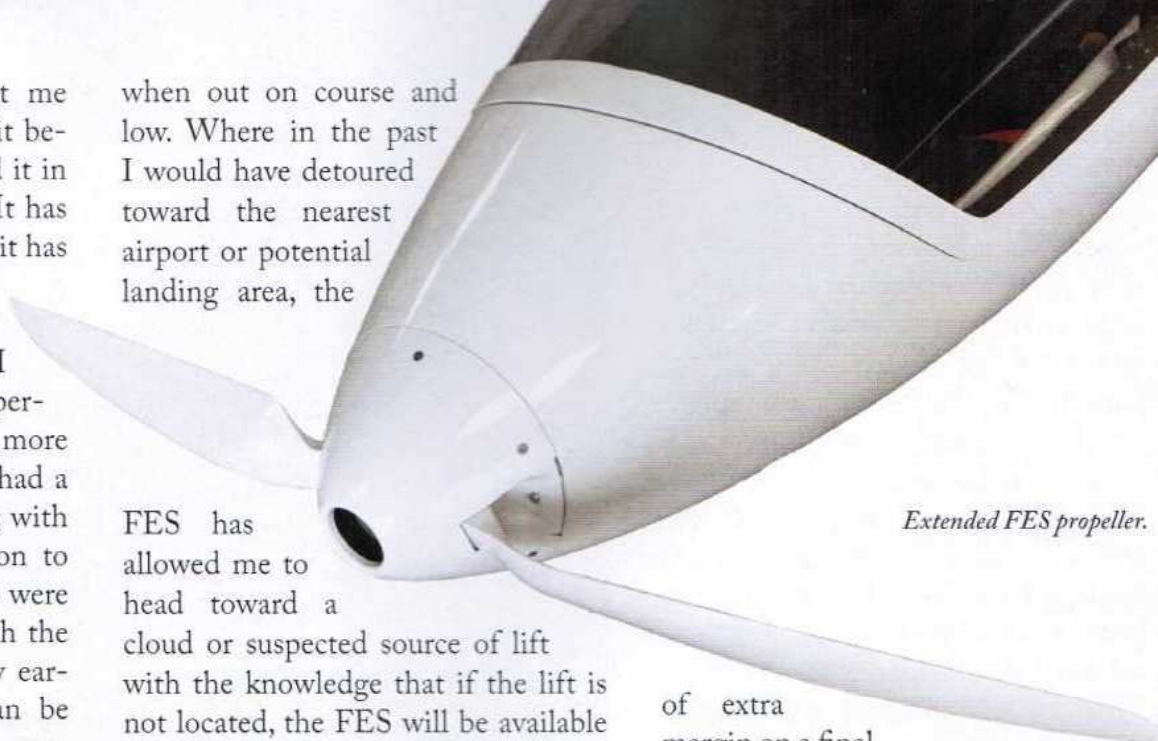
when out on course and low. Where in the past I would have detoured toward the nearest airport or potential landing area, the

FES has allowed me to head toward a cloud or suspected source of lift with the knowledge that if the lift is not located, the FES will be available to allow me to motor on to an airport or perhaps to another thermal. This capability allows me to minimize the chance of a potential landout. Knowing that I have the FES available has allowed me to push the envelope a bit knowing that the FES can get me back to Moriarty or perhaps to another airport. Even in this scenario I always do ensure that I have a landing spot in mind should the FES not start. This is always extremely critical regardless of the type of sustainer in use.

Finally, the FES also provides a bit

of extra margin on a final glide. I have been fortunate that I have not had to use the FES to make the airport on a final glide, but it does allow me to make final glides, with minimal stress, knowing it is available in case I need it to get me home.

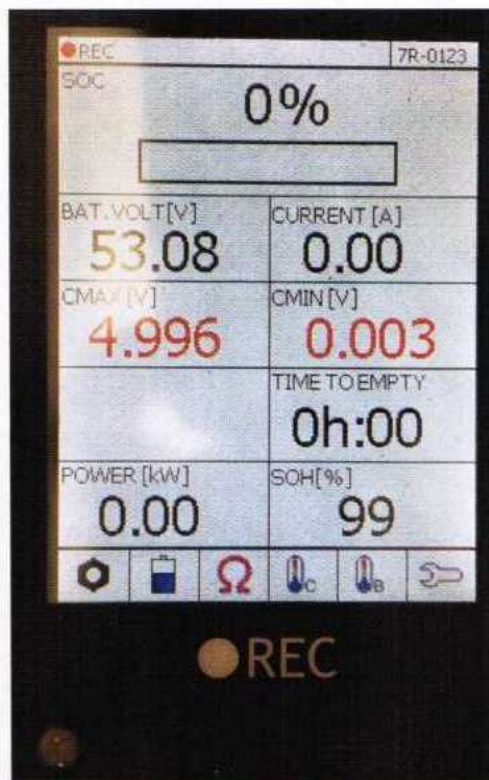
Since the beginning, LZ Design has always worked on making improvements in the design of the FES and its various components. Several improvements have been made since I took delivery in early 2012. For example, the Li-Po batteries now have an in-



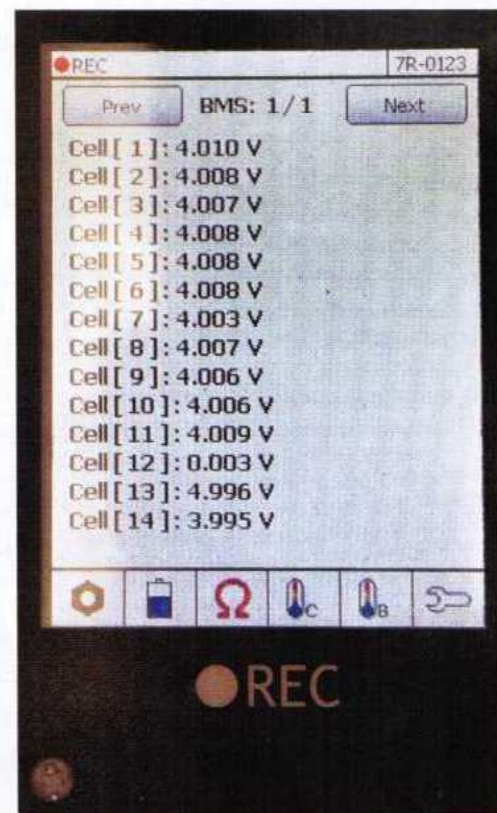
Extended FES propeller.



FES Li-Po battery with balancer.



LCD Li-Po battery monitor: Main status screen.



LCD Li-Po battery monitor: Cell charge status.

egrated BMS (Battery Management System) built right into each battery where early on the system balancer was a separate unit.

Software and sensor improvements now allow the prop to stop in the horizontal position when it is shut down. Earlier installations did not have this capability. In order to monitor the charging of each cell, a new, small LCD monitor was built which now allows one to monitor the entire charging operation. LZ Design is working to make the FES system even better and there is no doubt that there will be additional improvements in the FES system in the coming years.

The growth in the use of the FES continues as it is becoming quite popular for those desiring an electric sustainer or an electric self-launcher. In November of 2016, LZ Design celebrated their 100th FES installation. Currently there are 15 sailplanes equipped with the FES registered in the US. This consists of 10 each Silent 2 Electros and 5 each LAK-17B FES gliders.

As previously mentioned, in recent years several glider manufacturers have seen the many benefits of the FES system and have added it as an option on their new gliders. In addition to the LAK gliders like the LAK-17B and miniLAK and the Alisport Silent 2 Electro, the FES can now be ordered for the: HPH 304eS and the Schempp-Hirth Ventus 2cxa, Discus 2c, and also the new Ventus. In addition, an FES was mounted on a Diana 2 and it is now called the Versus FES. It competed at the WGC in Bernalla along with Luka Znidarsic in his Ventus 2cxa FES.

In December 2016, Jonker announced that the FES would also be available as an option for their new JS3 sailplane, and, in the not too distant future, the first new Ventus with the FES is expected to leave the Schempp-Hirth factory.

On January 8, 2017 at the OSTIV (Organisation Scientific et Technique Internationale du Vol à Voile) Con-



Folded FES propeller.

gress held in Benalla, Australia, the OSTIV Prize 2017 was awarded to Luka Znidarsic. Znidarsic earned the award for "his contribution to develop a simple electric powered propulsion system allowing easy and safe operation and usable for a wide range of sailplanes."



2017 OSTIV Prize for Luka Znidarsic and FES.

The 2017 OSTIV Prize is a real testament to the innovation and creativity that has gone into the design of the FES. One can expect many more system improvements in the coming years, and there is little doubt that the

use of this relatively simple and innovative system will grow in the future.

Over the past five years the FES has proven itself to be very reliable and easy to use. Who knows, perhaps the FES will even help create more interest in soaring and it may even help slow down the downward trend in the number of active glider pilots. Minimizing the chances of a landout may also be a real incentive for some of our pilots to continue to soar and to fly cross-country!

More detailed information and technical data on the FES can be found on the LZ Design website at <http://www.front-electric-sustainer.com/>.

About the author: Renny Rozzoni learned to fly gliders in 1974 in Middletown, NY after becoming interested in soaring as a member of the Cadet Flying Club at West Point, NY. He has flown at numerous soaring locations throughout the U.S. and holds a Diamond Badge and one Lennie Pin. He has owned six sailplanes over the years and currently flies a LAK-17B FES out of the Moriarty, NM airport. ✈