



Soaring

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Mini and Me

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We met on an Internet gliding site. She called herself Mini LAK FES, and I was instantly taken with her. After losing my access to aerotows with the closing of Crazy Creek, my home gliderport in Northern California, I was looking to change my relationship with my trusty and delightful LS6 for someone with the capacity to get me into the air on her own hook. Mini's Front Electric Self-Launch motor seemed the perfect answer. I'd been flirting with motorgliders for more than ten years, but always considered them to lack sufficient technical maturity. Who wants to hang out with someone who depends on an open hatch, a mast with a windmilling prop that is driven by a gasoline engine hidden in her bowels to get anywhere? Mini's elegance and simplicity appealed to me.

We began corresponding. She sent me pictures of herself. She was truly beautiful with slender shapely wings and delicate winglets. And she was willing to share her most intimate details with me: her glide ratio, her wing loading, the weight of her non-lifting parts, and other personal matters. I confess that while we were getting to know each other, I was also casting an eye on other self-launching FES ladies in her 13.5 meter class. But I was taken with her willingness to carry water, which none of the others could do, and also with her pedigree. She comes from an accomplished family. Her older brother, the LAK 17B, has amassed a distinguished record of competition wins, and her family has been raising innovative children for almost 50 years.

However, Internet relationships are by definition critically limited. In the online community, there's always that temptation to exaggerate one's attractiveness and accomplishments, and as



Above: Matt in Mini LAK, Pociūnai, Lithuania. (Photo by Onute Valkauskiene.) Below: Matt in LAK 17B FES.



anyone who has thrown himself into the world of Internet dating knows, electronic schmoozing must eventually lead to the reality of a face-to-face meeting. Unfortunately for me, only two of Mini's twin sisters resided in the U.S., one in Texas and the other in parts unknown, so I had little chance to know what she might be like, let alone to interact with her. And even staring at one's potential beloved in

her trailer, or over a cup of coffee, doesn't get very far. To learn whether such a romance might have legs, one must get out of the coffee shop and go dancing in some nice thermals.

But how to move forward? I began to correspond with Mini's family at her birthplace in far off Lithuania. Vytautas Maciulis is the father figure of the LAK glider factory, Sportine Aviacija, near Prienai, Lithuania, and



I asked him if it would be possible to visit him and date his daughter. Vytas agreed to a meeting, and the possibility of my flying with Mini.

Some formalities ensued. Europe requires an actual medical exam before U.S. glider pilots can fly there, so I underwent a Class II FAA medical and faxed the results, plus my Private – Pilot certification, and the final page from my logbook to Vytas, who passed them on to the Lithuanian CAA. The CAA agreed I could fly there if I passed a checkride with a Lithuanian CFI-G. Next came airline tickets, a 20 hr endurance flight from San Francisco to Vitnius, Lithuania, and a nightmarish 3 hr drive along dark freeways, with unfamiliar route signs flashing by to the Hotel Pusyne, not too far from Mini's airfield.

Pociūnai Aerodromas boasts a grass field at least a mile in both directions with a paved strip and a skydiving operation along its far side. A massive hangar and a charming clubhouse/restaurant with guest rooms completes the picture. I slept at the clubhouse and took most of my meals there. Pociūnai has hosted seven FAI International Soaring Competitions, and a number of regional competitions as well. These guys clearly know what they're doing.

Despite serious jetlag, I was on deck the next morning for a CAA certi-

fication flight in a two-place Polish Puchacz. I must have done OK because Vytas Sabeckis, the Pociūnai CFI-G, who also manages the soaring club and restaurant, signed me off, and Lithuanian CAA issued that all-necessary certification.

Day 2 saw four more flights in the Puchacz with Vytas Maciulis, who was now quite obviously trying to decide whether my flying skills gave him the confidence to entrust one of his expensive gliders to my hands. Apparently, I passed, because I went on the next day to fly an experimental self-launch version of the LAK 17B FES, an 18 meter ship that I took a tow to about 3,000 ft, released, and only then started the engine once I felt comfortable with the glider.

FES engine starts are dead simple. A master switch is activated, and the engine is started and controlled by simply twisting a knob on the instrument panel. The panel reports engine rpm, current voltage, battery condition, and temperature readings for the battery pack, the engine controller system, and motor. The propeller winds up swiftly to a climb rate of about 4,500 rpm or whatever you set. Turning off the engine is another matter. The propeller must dock with the blades folded correctly alongside the fuselage, and the docking mechanism depends on

the prop windmilling to at least 1,500 rpm. It took me a couple of tries to get that right.



Matt and Vytas discussing the new SS battery carrying cases, developed in response to battery damage reports. Experimental Lak 17B FES in background showing open battery hatch. (Photo by Ramune Hermann.)

The next day I made a second flight in the LAK 17, this time a self-launch from a paved runway. Again, the launch was dead simple: rotate the knob and take off. I flew for about 30 minutes with multiple engine starts and stops, then landed.

The LAK 17 flights were necessary because my Mini sat on the factory floor in many pieces while workers filled her insides with various monitoring systems. I was convinced they would never have her assembled by Monday, and normal Baltic fall weather (rainy) also made any romp with Mini highly questionable.



Factory floor showing spar molds. (Photo by Matt Herron.)

FES Safety

The FES system has been with us for about 8 years now. During this time, some 180 gliders have been fitted with the engine, either as self-launch or sustainer. While FES gliders have been remarkably free of most flight problems, there have been three fires involving the lithium polymer battery packs at the heart of the FES system. One happened during a landing in the U.K. and was extinguished after the pilot exited the glider safely. The pilot reported that one of the battery packs had previously been dropped, which could have damaged one or more of the lithium cells. Another fire occurred in a trailer where the batteries had been stored with the units still connected, a big “no-no” according to FES maintenance manuals. While the exact cause of the fires has not been determined, any fire involving lithium batteries can be extremely serious – these units pack a lot of energy and must be handled with respect.

In response to the fires, LZ Design, the Slovenian manufacturer of the FES system, recalled all the battery packs for disassembly, inspection, and refurbishing. It proved to be a huge effort – the safety and reputation of the FES system was at stake. Schempp-Hirth, HpH, and LAK worked with LZ Design to contact all the owners and ship the batteries to Slovenia. All the work was completed by Christmas 2017.

About 5% of the battery packs LZ received were mechanically damaged, and 80% had been shipped fully charged, a procedure recommended against in the battery manuals. LZ suspected the presence of small metal shards, a possible byproduct of machine work on the interconnecting plates. Since the individual lithium cells are housed in plastic bags rather than hard cases, if a shard were present it would be possible for it to migrate during battery usage and penetrate a lithium cell, potentially causing a short and a resulting fire. LZ replaced all the plates with anodized aluminum ones, and checked for the presence of shards.


They also concluded that the root cause could have been galvanic corrosion at pouch cell edges, so they installed additional isolation material between the cells and a new non-conductive, high temperature resistant housing. They tested the new arrangement with intentionally created internal short circuits at different charge levels. No fires resulted from any of the tests, and the new housings withstood the pressure of the intentionally damaged cells.

In accordance with a Modification Bulletin issued by the European Aviation Safety Agency (EASA), LAK, Schempp-Hirth, and HpH reinforced the battery pack housings with high temperature resistant fiberglass, installed independent fire warning systems, and added safety valve smoke vents to the battery compartment covers. And everyone, including Alisport, updated their FES manuals.

life, but we also began sharing evening backyard feasts brewed in a cast iron pot over an open fire by his charming wife, Ramune. Plus, more vodka than I am accustomed to! And we also began to share our life stories.

Vytas has amassed a long history of competition flying, a valuable asset for any director of a glider factory. He began flying during Russian times at age 16, and soon was invited

to join the Lithuanian team, and then the Russian National Team where he took a second in the Soviet National Cup in 1985. From there he moved to European contests and then competed in his first World Championship in Austria (1989), where he met and became friends with the U.S. pilot, Karl Striedieck. A year later, as Lithuania

continued on page 43 

During those days, I visited the LAK factory and photographed many of its operations. The factory was started nearly 50 years ago during Russian occupation of Lithuania, and it turned out gliders for Russian military and civilian use. When Lithuania declared independence in 1990, the factory was taken over by a local family, new buildings were erected and its current life began. Over the years LAK has produced 20 different gliders, motor-gliders, and modifications. Its recent production includes the standard class LAK 19, the much-celebrated LAK 17B, the MiniLAK 13.5 meter, and the flying wing, Genesis. The LAK 17, 19, and Mini are all available as pure gliders or with FES engines.

Since this was the only glider factory I've ever visited, I can't make comparisons, but I did wander through LAK's comprehensive production system including a machine shop, engineering division, and layup and paint shops manned by some 50 employees, many of whom appeared to be highly skilled craftsmen. The atmosphere was friendly and collegial, but businesslike, and the output seems impressive. The cockpits of the LAK gliders I flew featured well-engineered and designed control systems. For example, the spoilers locked positively but without undue effort; the flap settings were easy to read and once adjusted stayed set; the gear lever locked positively with a cam in both positions.

As the week unfolded, Vytas and I drew closer. We share a certain view of



Dinner with Vytas. (Photo by Onute Valkauskiene.)



BRONZE – \$10-\$99

Lynn Alley
Herbert D. DeYoung
DLR Deutsches Zentrum f. Luft
Kent A. Johnson
Wayne Knapp
Edith Lauber
Philip C. Marks

Tim Martin
James L. McCarthy
Leigh Old
Gary E. Peterson
Mitch Polinsky
Marita J. Rea
Howard Rohde

James R. Sartor
Mark S. Segall
Richard C. Smith, Jr.
Mark A. Spady
David Spellins
Dan Thirkill

Mini and Me *continued from page 18*

was gaining independence, Karl invited Vytas and a friend to represent Lithuania at the U.S. Nationals in Minden. Vytas continues to fly European contests to this day, and holds several national records.

In 1991, Vytas started his own company, Termikas, repairing aerobatic airplanes and gliders, and nine years ago took over directorship of the LAK factory, which was then facing financial insolvency. Today, Sportine Aviacija is a thriving enterprise, but Vytas is not finished. He wants to build a glider good enough to win the World Gliding Championship, but also intends to develop more electric sailplanes for folks like me.



Matt with first self-launch in miniLAK. (Photo by Onute Valkauskiene.)

Monday morning dawned as heavily overcast as my hopes, but by noon the sky had cleared, and when Vytas and I arrived at the airstrip, four workers were applying the final makeup to Mini's flying attire. Despite my previous doubts, she was ready for me. Vytas flew her first to make sure everything was OK. Then it was my turn to take her hand. I stretched myself into her comfortable cockpit, gave her throttle, and together we climbed into the sky.

At altitude, I killed the engine. I wanted to dance with Mini, not putter around the atmosphere. But first we tried a stall. As I pulled her back, I could feel her tremble, then give a small sigh – then a gentle nose down, and we were flying again.

Our dance continued. Could she whirl a passepied, and would her whirls be easy and natural? I suggested a 45° bank. She dropped smoothly and easily into the circle and held it lightly and effortlessly. Such fun! We turned again and again. My LS6 seems to favor left turns, but Mini was at home in both directions, spinning right and left with equal ease.

Could she climb? The Baltic autumn did not allow us to go thermaling, but a German owner had flown his Mini 530 km this past summer without using her engine. I judged that proof enough that she could thermal with the best.

But this, our first and only date, was not to be all smiles and graceful glances. I needed to know whether Mini had the stuff to carry us into the mountains. If I pushed her, would she stand up and fly, or would she flutter earthward like some of her 13.5 meter cousins? Holding her by the shoulders, I pushed Mini's nose down, and watched while her airspeed climbed and her altitude unwound. Surprise! She held her own! Vytas was right – her slender wings and substantial wing loading made the difference. And she would certainly do even better with water. Just to be sure, however, I pushed her twice again, but this test was mostly *pro forma*. I had been fatally smitten, and decided on the spot

to make her mine.

The rest was simple. Vytas and I sat down the next morning to draw up a marriage contract. He was generous with the terms of the dowry, enough so that I was sure I could provide her with a stable and happy home.

My Mini (number 29) will take her time traversing the birth canal at Sportine Aviacija, and won't taxi across my threshold until late this year. Meanwhile, I'll groom my lovely LS6 for a happy marriage to somebody else! ✈



Matt bringing miniLAK in for landing after trial flight at Pociūnai. (Photo by Onute Valkauskiene.)

Empty weight, kg	213
Max takeoff weight, kg	350
Max. wing loading, kg/m ²	41.6
Wing span, m	13.5
Wing area, m ²	8.41
Never exceed speed, km/h	250
Engine type	FES-LAK-M100
Overall propulsion system	
weight, kg	52
Max L/D	44
Ballast available	80 liters wings, 8 liters tail
Control hookups	All automatic

Factory Performance Data, mini LAK-FES.