

Can soaring and aerobatic capability be designed into the same sailplane? Czech designers gave it a try some years ago, and a U.S. soaring pilot reports on the results...

Flying the Lunak

by TED JANCZAREK

A recent item in *Soaring* reported a soaring aerobatic contest in Germany last summer as being something new. Actually, there is an aerobatic sailplane that's been around since 1950! It was designed and constructed in Czechoslovakia and was called the *Lunak*. Seventy were built; they were the pride of the Czechoslovakian flying elite (high-ranking air force officials and aero club members *only*.) The 49-ft. span sailplane was stressed for plus or minus 9 *g's*, weighs 410 lbs. empty, had a maximum L/D of 24, and was redlined for 217 mph (350 kmph).

Recently I had an opportunity to fly one of these unique sailplanes when its present owner, Mira Slovak, wanted to tow the craft from his home 'port at Santa Paula, California, to Rosamond Airport in the Mojave Desert. I welcomed a chance to fly it long enough to become familiar with its flight characteristics. Slovak had gone through the *Lunak*, rebuilding it where the need existed, and then painted it in a striking decor that attracted notice at the numerous airshows where he flew soaring aerobatic routines.

I'm sure both Slovak and I secretly shared inner feelings of apprehension toward the flight; mine were because I had never flown nor even really seen the inside of the *Lunak* before and now was about to embark on a tow out of an airport unsuitable for glider flying into a stable mass of maritime air. I knew that for the first few minutes of flight there would be very few choices

of landing sites to put the glider in safely should the towline snap or the engine on the Bucker-Jungmann quit. Slovak's concern surely must have been weighted with the responsibility as owner of such a unique one-of-a-kind museum piece and then entrusting its welfare to someone else under circumstances not exactly to either of our liking.

It was getting late in the day and the luxury of a thorough cockpit check was waived as Slovak's time schedule became more pressing. The checkout lasted one sentence: "The long handle is the dive brake and the other is the flaps . . . let's go!" Scanning the panel and cockpit, I found everything else self-explanatory . . . *except* it was printed in Czechoslovakian! . . . and it read in the metric scale!

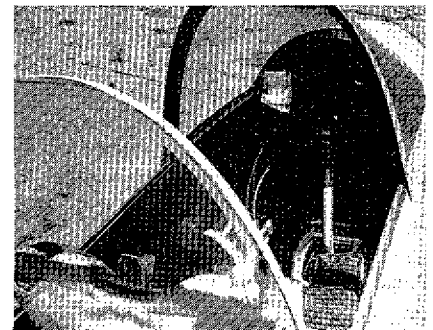
After climbing in and getting seated, the first thing that didn't particularly strike my fancy was the metal windshield brace. It looked as if my head would constantly bounce against it—especially during inverted flight. I found out later that my worry was groundless; the cockpit actually had plenty of room. In fact, there was so much room I was even concerned that my extra long legs might have difficulty in reaching full rudder (which was adjustable, but with much effort). Strapping in, the typical European harness-ware first seemed like a Turkish strap-and-buckle puzzle. Yet, once solved, it was found to be more than adequate in any maneuver.

While lining up for the launch, I ran a pre-takeoff visual cockpit check.

Starting from the left bottom I saw two large, similar-looking lever-type handles situated at the knee position. The larger of the two was the spoiler handle which now rested locked forward in the full-out notch. One other notch to the rear locked the spoiler in the full raised position. The smaller of the twin handles positions any of four choices of flap settings simply by pulling in and back on the handle into a similar notch, thereby locking a particular selection. The instrument panel displayed the usual instrumentation, and on the upper right side of the cockpit a sliding knob served as a trim handle and indicator.

Just before sliding the canopy closed, I remembered to ask Slovak one final and important question and yelled, "How are the brakes?" Turning around while he was walking away he coolly answered, "No brakes," without even bothering to see my surprised reaction.

On takeoff it was interesting to note that the towplane, an over-powered Bucker-Jungmann, and the *Lunak* left the runway about the same time. It





was the first indication of performance which I stashed in my mind for future reference. Once airborne, to my pleasant surprise, the control response of the *Lunak* was sheer delight. Perhaps the fast acceleration of the towplane with the ensuing tow at 80 mph (130 kmph) had something to do with the positive feel of the controls. But whatever it was, it was the beginning of a growing respect for a new acquaintance.

Eastbound, and with a few thousand feet of cushion, the gap between the smooth coastal air and the hot Mojave Desert closed. I felt much better knowing that I had a wider selection of landing spots plus the bonus possibility of finding a thermal should the old and frayed towline decide to part. Much to my surprise, we flew on for almost 20 minutes before we felt the first signs of convective air. The towline held, which was fortunate, because there were no fields below large enough for an aerial retrieve, and there was no trailer for the *Lunak*.

After releasing over Rosamond, I was astonished at the high rate of sink showing on the variometer of which there are two in the cockpit. It was then that I reached the conclusion that the *Lunak* was not a sailplane with good soaring potential and that its designers must have had something else on their minds! Even after locating some lift and then trying to center it, the variometer refused to show any signs of positive results. My curiosity as to why both vario pellets were colored *red* was now satisfied. One-

fourth flap setting is recommended for thermal soaring, but flaps or no flaps, it took a lot of work and concentration to climb or even maintain altitude (in the small-cored thermals—the only lift to be found). Several different airspeeds were experimented with in an attempt to find the ideal thermaling airspeed. The lack of good results only added to my impatience and flap settings proved a matter of choice. However, an airspeed between 82 and 86 mph (100 to 110 kmph) seemed to feel the best, judging from the averages of varied sink rates.

Rather than gradually lose all the precious altitude I desired for aerobatics, I gave up trying to sustain and went right into my series of altitude-consuming maneuvers. The agility of this Czechoslovakian glider was unsurpassed. Roll control compares to that of the highly maneuverable Backstrom *Plank*. It was also reminiscent of aerobatic airplanes, and rudder control was outstanding! Usually during aerobatic maneuvers, trying to combine proper aileron inputs in what ordinarily might be called aerobatic sailplanes (so as to have sufficient rudder control) is a tough proposition. Not so in the *Lunak*. It has rudder to spare! It is one sailplane in which hesitation (eight-point) rolls are a cinch. However, 100 mph (160 kmph) entry speed *must* be maintained throughout the roll, otherwise control effectiveness is lost and the "dish-out" at the end of the roll is just as common here as in poorly executed rolls in any aircraft!

After being accustomed to reading airspeed indicators graduated in knots and then getting used to flying the *Lunak* with airspeed read-outs in kilometers, I found it most annoying particularly in not anticipating the faster acceleration and then the following rapid decay of airspeed. It only takes one maneuver or two to become familiar with this type of foreign gauge.

The desert air was its usual enigmatic self—continually unpredictable! For minutes at a time the air was perfectly smooth. Then, without warning, hard sharp jolts of gusting air were encountered. Even though the *Lunak* is stressed for plus and minus 9 *g*'s, I shuddered to think just how much of a *g* load might suddenly and unexpectedly be imposed on the sailplane about the time I would be pulling max *g* loads at high speeds and then unexpectedly flying smack through a severe gust. A nagging question in the back of my mind kept constantly cropping up: "Just how many times before has this *Lunak* been overstressed or exposed to punishing *g* loads?" The idea of a nylon letdown in a borrowed parachute amid the confetti of what was once Slovak's prized and cherished *Lunak* somehow didn't appeal to me at all. It could be an untimely end for a glider whose future is destined for better things. Exposure to this brutal treatment was kept to a minimum by deciding on and performing only one set of loops, inside and outside.

Air noise at normal glide speeds is rather loud as sailplanes go and at

112 mph (180 kmph) the *Lunak* sounds out with a hearty "whoosh." When pulling up with constant back pressure, the sound tapers off rapidly to practically an almost dead silence as the ship gracefully arches up and over the top and starts its way down again in a building crescendo of wind noise.

Even though the entry airspeeds are the same for both loops, it seems strange that the outside loop sounds are more amplified. Pulling up from level flight into a 20-degree pitch-up attitude and then pushing in full forward trim and simultaneously pushing over, 180 kmph was reached much sooner than I expected. In fact, I overshot my target speed a little. I was now feeling the sharp bite of the restraining harness cutting into my shoulders as I reached far ahead showing the stick full forward with my fully outstretched arm. The rush of blood to my head and ears combined with the wind noise and accentuated the rising cacophony of sound, but it didn't take long to subside, dying to a whisper as I struggled over the top to complete the inverted loop. It was a rare delight in finding not one particle of debris or speck of dirt being flung into my face in inverted flight as is often experienced in closed cockpits during violent inverted maneuvers. Then I remembered that this aircraft had been thoroughly shaken clean many times before in numerous other aerobatic flights by Slovak himself.

I was curious how the *Lunak* would react in a near vertical (inverted) stall. The intentionally and precisely designed cg limits left no doubt about which way the craft would go! From the always eerie silence of a zero air-speed situation, the glider vigorously whipped straight down through the inverted attitude. Thus, the resultant maneuver allowed immediate control (as soon as the nose fell through), for a comfortable dive recovery with minimum altitude loss.

It was growing rather warm and altitude was getting marginal for comfortable aerobatics. Besides, I had now become sufficiently acquainted with the *Lunak's* aerobatic character to satisfy my curiosity. It was time to head for a landing at Rosamond Airport.

In a straight glide trying to find just the right speed (100-110 kmph) for

best glide, I found the sink was much higher than I had anticipated. I found difficulty in finding and locking full down flaps in their respective notch but finally managed this trick. Then I pulled the spoiler handle activating both upper and lower spoilers. If I was surprised at the high sink rate before, I was alarmed at the veritable plunge now! In order to maintain a minimum of 100 kmph, the nose had to be lowered well below the horizon. Next, a full-effort forward slip was introduced. The *Lunak* then literally fell out of the sky. Deciding to ease out of the slip, I tried relaxing rudder pressure. Much to my surprise, the rudder simply remained where it had been originally placed—full in! It was *locked in full deflected position*. It took more than normal foot pressure on the opposite rudder to release the hang-up. I shrugged it off as an idiosyncrasy, a peculiarity of design, and filed it in my memory bank as something not to do at low altitude.

The warm, unpredictable, and always shifting desert winds had the Rosamond windsock flapping and swinging through 180 degrees of arc. Consequently, it didn't appear to make much difference in the choice of landing direction. I chose a landing to the east as the sock seemed to have favored that direction more consistently. But wouldn't you know, on base leg. . . . Shortly after committing the *Lunak* to a landing, the wind sock veered again. Now, it stood erect, stiffly directing a landing to the west. Too late! But no sweat; I still had flaps to lower. However, in selecting full flaps, try as I did, I could not get the handle to seat properly and every time I let the handle go in reaching for the spoiler, the flaps popped up. It reminded me of the first time I flew Len Niemi's prototype *Sisu*. Every time I entered a thermal and lowered flaps, my knee somehow dislodged the flap handle causing the flaps to spring up forcing the *Sisu* and me to stagger out of thermals in post-stalled recoveries. Today, the landing profile must have looked as ridiculous as it felt while I porpoised down the final approach. It was an uncomfortable sensation zipping down the runway for a rather hot touchdown and landing and knowing there was no brake to depend on!

Using a little more runway than I normally like to use, the *Lunak* and

I came to a stop without the usual skid grinding sounds that accompany a braked stop and still within reasonable safety margins and room to spare. I now felt the *Lunak* and I had a pretty good understanding!

The *Lunak* has served its masters well. It has been tried, tested, and even tortured far beyond its expected longevity. Slovak feels it has now earned a well-deserved resting place. Its destiny is a museum, but not without at least one more fling at a record shot and a place in the Hall of Fame. Only time will tell! Should you encounter the *Lunak* in flight, you can bet your Badge it'll be on the quest of a record-breaking venture.



Author Ted Janczarek soloed in power at the age of 16. As before, he continued to hang around the airports and had his first taste of gliding at Triangle Airport in Plymouth, Michigan. Later he helped form the Vultures Soaring Club at Utica, Michigan, where he served as President before he found himself an instructor in the USAF. Following the Korean war he began his career as an airline pilot and now serves as a Captain for Continental Airlines. Here he met Mira Slovak and was introduced in due course to the *Lunak* aerobatic sailplane with the results recounted in the accompanying article.

Janczarek has always been interested in aerobatics and feels they are a good measure of pilot skill. "An aerobatic power pilot who has the prop wash available to cover his mistakes and misjudgments is like a poor piano player who holds down the damper pedal to hide his lack of technique. Sailplane aerobatics require a tighter discipline because the sailplane aerobat must manage the available inertial energies without recourse to the supplemental power of an engine. . . ."