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# Forbes

# 1

## JEDNOROŽEC

ČEŠI ZATÍM NIKDY NEMĚLI HODNOTNĚJŠÍ STARTUP  
NEŽ PRODUCTBOARD. TEN MÁ CENOVKU 37 MILIARD KORUN  
A PODLE ZAKLADATELE HUBERTA PALÁNA  
SE TEPRVE ROZJÍŽDÍ.



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# HOW I FALL

When an aircraft falls from the sky, it has very few chances. One of the most proven is a parachute rescue ballistic system, or an aircraft parachute from the Liberec company Galaxy GRS. Development is ongoing, and this family business does not end with aircraft. It is also developing clusters of parachutes for the flying machines of the future.

DAREK ŠMÍD, FOTO: JAN MUDRA



# P



**Imagine** the hypothetical situation where you are flying an ultralight from Venice to Salzburg, and your wings become twisted in thick rain clouds 3,000 meters above the Slovenian mountains. This is exactly what happened some time ago, when a pilot lost his bearings in rain clouds, because his plane was not equipped with an artificial horizon, which is an essential device for flying in cloudy skies. However, the crew was lucky because the aircraft was equipped with a parachute, which allowed the ultralight to land vertically close to a Slovenian pub.

"And what happened next?" I ask the man, who without that particular parachute would not be here today. "Next?" Mr. Bábovka raises an eyebrow. "Well, we got out the aircraft and went straight to the pub for a stiff drink."

Milan Bábovka is the founder and head of the family company Galaxy GRS, whose parachutes for aircraft have already saved 107 people's lives. Galaxy GRS, with a history dating back to 1984, is located in the very center of Liberec, in a multistorey building, where parachutes are designed, sewn, and pressed in specially developed hydraulic presses. "We have everything under one roof", says Mr. Bábovka. Each parachute has its own number, and each material is tried and tested. "We're growing, but we don't allow ourselves to grow more than 20 percent a year, because we don't want to overdo it and lose track of quality."

## SKYROCKETING GROWTH

Fifteen years ago, the company was based on only one floor, but over time it has grown to take up the whole building, which has now been raised by the addition of a roof extension, where the parachutes are sewn by Liberec seamstresses.

Likewise, the company has grown from an originally partisan firm operating illegally under deep totalitarianism, to a European leader with an annual turnover of two million Euros and a production capacity of more than 400 new aircraft parachutes per year (parachutes with a thirty-year lifespan

are revised every six years), not to mention a new range of parachutes for drones.

Rescues involving parachutes from Liberec occur all around the world, e.g., a rescued aircraft in Canada, a rescued aircraft in Germany, an Indian Air Force plane in Baghpat, Uttar Pradesh.

Cooperation is no more local: Galaxy GRS, which employs 25 people from in and around Liberec, including technicians, developers, and seamstresses, is in step with Europe's largest sports aircraft manufacturer, the Slovak company Pipistrel, as well as the Swiss Excellence Airplanes, the Californian Flying Sport Shop, the Turkish company TAI, as well as Inpaer in Brazil. The list of entities with which Milan Bábovka is somehow associated includes both the Brno University of Technology, the Department of Aircraft at the Czech Technical University in Prague, and the Czech Aerospace Research Centre.

At the same time, it all started many, many years ago, not with a plane ... but with a hang glider.

Specifically, with a hang glider that Mr. Milan Bábovka flew with - shortly after he started making them himself. According to the photo, "My father threw his communist ID card at the comrades' heads, so they would have never officially let me do it", says Bábovka, who was a model aircraft maker until he was in his twenties, and then set up his company in the same way as he started flying his own hang gliders.

Flying hang gliders first began in the Czech Republic sometime in the 1970s, and Milan Bábovka was the epicenter of the idea of how to ensure the better safety of hang glider pilots.

"With no parachutes, there were fatalities, so I acquired rescue parachutes for paratroopers from the head of Svazarm and adapted them for hang gliders", he says. These parachutes were attached to the belly of the hang glider, where the "lid" of the parachute container opened, and the parachute saved the hang glider along with the pilot.

"But it wasn't perfect, the parachute could get tangled in the structure", says Milan Bábovka. "So, I came up with a way of ejecting the parachute so that would unfold further away from the hang glider". A hang glider falls like a beech leaf, spinning, which poses a risk to a parachute near it.

So that's how the first parachutes for hang gliders were created, and they went on to win first prize at the

inaugural Sport Praha exhibition in the 1990s. "I calculated the energy needed to eject a 27 m<sup>2</sup> parachute so that it would unfold four or five meters from the falling hang glider and open safely."

It worked manually for a normal hang glider without a motor; however, a larger parachute was needed for a motorized hang glider, and it could no longer be ejected manually. There was no other option than to use a basic ballistic system, in which the parachute was pulled from the container by a cable with a weight (a modified system for stabilizing seat parachutes directly from the MIG 15), ejected by two blank cartridges.

At the same time, Bábovka's company was starting up, whose barter beginnings are described by its boss as "I give you pipes, you give me cloth", because private enterprise was not allowed under Communism.

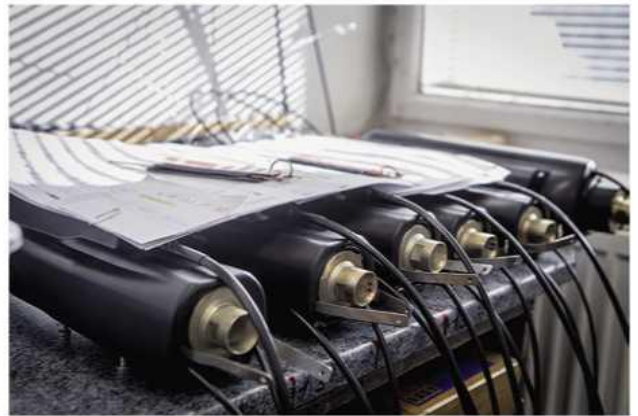
It could only start after the revolution. After that, Bábovka's company had enough momentum to step into the post-revolutionary world in full flow and with much larger parachutes.

## CZECH MINDS, CZECH HANDS

"Everything we do is patented. From the first idea to the last cable, it's all Czech", says the head of today's Galaxy GRS. From the two cartridges ejecting the parachute to a safe distance from the hang glider, with the help of great designers, a technology was developed for parachutes for the whole aircraft, i.e., a ballistic system in which the parachute is ejected by a rocket engine. "Whatever happens to the plane, no matter how it rotates, and bits fall off it, it must not endanger the opening of the parachute", says Bábovka about the technology with which Galaxy GRS started in 1992 and still honors today.

Production still remains in the Czech Republic: rocket fuel is produced by Explosia in Pardubice (the creator of the famous Semtex plastic explosive), Hedva supplies a unique parachute fabric, and the Czech company Euronita supplies the thread.

"We had a special fabric developed at Hedva", says Bábovka. For comparison, an ordinary parachute carries a paratrooper with a box of ammunition, and that's it. Now imagine a 100-meter rescue parachute that can carry a 600-kilogram plane. This is it, a parachute made from a unique fabric from the Czech company Hedva. Galaxy GRS now buys one hundred to one hundred and fifty kilometers of this special new fabric every year in its characteristic pink color,



which ensures good visibility even for the purpose of finding the rescued crew. The engines are manufactured by Charvát AXL, a company that manufactures engines for Galaxy GRS ballistic systems on one line and engines for L-39NG Aero Vodochody military training aircraft on another.

In addition to the production of ballistic parachutes for hang gliders, Milan Bábovka's former business start-ups also include a post-revolution travel agency (with which he took his clients to the French Air Show when he needed to demonstrate one of his parachutes and negotiate the necessary cooperation), as well as the production of wings for paragliders.

In the years after the revolution, the company saw the almost complete collapse of the totalitarian Czech aviation industry. "We are descendants of a large aviation industry, which almost disappeared in our country", says Bábovka. "Gradually, however, thirty companies developed and made smaller aircraft", and this is where a new business opportunity for ballistic parachute systems emerged. "No new aircraft today is without a rescue system", says the head of Galaxy GRS. "Legislation and experience are pushing manufacturers to ensure that parachute systems are fitted to all aircraft."

Bábovka's company had an advantage in this matter - the addition of aircraft parachutes began at a stage when entire aircraft had to be modified to accommodate such a system. "We always had to figure out how big the

parachute should be, and where the anchor ropes and straps would lead". If an aircraft falls tail first, for example, it would break the crew's neck. "At the same time, you don't want to deface the plane with such an intervention, so it's best to be there when the plane is created".

So, the family company of Mr. Milan Bábovka is involved in the construction phase of new aircraft, and it doesn't end with planes. They are currently developing ballistic parachute systems for future eVTOL drones and aircraft (short for electric vertical take-off and landing).

Because everything that flies can fall, and what can fall needs Bábovka's parachutes.

## ROBUR THE CONQUEROR

Galaxy GRS started developing rescue equipment for drones eight years ago. In contrast to systems for aircraft, which are custom production, the GBS10 series is being created in cooperation with the Brno University of Technology as serial production. "Many companies are now starting to work with autonomous transport using drones, so demand is increasing", says Martin Moser, who is responsible for the commercial side of the company.

"It began with three-kilogram drones, then five-kilogram drones, a little later 15-kilogram drones", he recalls, "And when it got to 65-kilogram drones, we came up with another solution". The solution was nothing less than a

revolutionary system of three parachutes tied together. "Three smaller parachutes fill faster than one large one", Moser explains. Therefore, the rescue can take place even at lower altitudes, as the parachutes simply fill with air and save the drone.

If you have a drone with a camera or sophisticated sensors costing tens of millions of dollars, then your faith in a parachute system would really pay off.

This is exactly the direction Milan Bábovka's company wants to take. The largest parachute, which will rescue a plane weighing 1.9 tons, measures 360 m<sup>2</sup> and takes one seamstress a whole month to sew. But that is the maximum Galaxy GRS wants to cover with a single parachute. The next phase is to develop parachute systems with many smaller parachutes, and by no means just three.

Galaxy GRS has completed an entirely new rescue system, which is basically a cluster of many parachutes. The code name is Robur - after the flying machine in the famous Jules Verne novel, which had many different propellers keeping it airborne.

Galaxy GRS is currently negotiating with four companies that are interested in its systems for clusters of parachutes for their eVTOLs, which should in the future play the role of e.g., multi-rotor taxis. "In contrast to rescue parachutes for aircraft in these cases, our system is a structural element and contributes to the strength of the particular aircraft", adds Moser.

In the case of parachute systems for aircraft, the height and speed the parachute should open has always been an issue. Most accidents occur at low speeds during takeoff or before landing, but in such situations the aircraft is very low above the ground and the parachute may not have enough time to unfold.

"At a speed of fifty kilometers per hour, the parachute takes longer to fill with air, which also increases the height required for the rescue", says Milan Bábovka. "When you slow down a cosmic body flying through the atmosphere, you have five kilometers for the braking parachute to adjust your

speed and open the main parachutes at 160. But when you need to open a parachute on an aircraft at a speed of up to 450 kilometers per hour, that's an entirely different ball game."

A cluster of smaller parachutes naturally activates faster. Along with physics, the new system of the Liberec company is also helped by sophisticated software. When Milan Bábovka describes its function, he talks about a multi-stage braking system and partial units, connected in the aircraft by cables, and enthusiastically goes into the smallest details.

It is such a cannonade of techniques that I would need one of his parachutes to slow down the flow of thoughts in my head.

"In short, the electronics inside use the data from a sensor, to evaluate at what height and at what speed the system should be activated, and the machine will automatically fire either the first, second, or third braking system", Milan Bábovka concludes, and with reference to his historically first parachute for hang gliders adds, "That's how far we have come. It's great, isn't it? "

All you can do is take a deep breath and nod appreciatively. Yes, it is. ©