

## Innovations in aircraft safety

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The BRS parachute and rocket launcher unit mount behind the passenger seats in the cargo area.

The idea of parachutes as a last resort for light-aircraft safety had been around for quite a while; however, it never reached the stage where it could be truly commercialized.

Larry Williams, CEO and President of **Ballistic Recovery Systems** (BRS), said the initial concept for the BRS parachute system came about when company founder Boris Popov had a near-death experience when his wing glider collapsed.

The development of ballistic rocket technology was a key to making the safety system a viable reality. "The advantage of the ballistic rocket is that you can deploy the system extremely fast. From the time that you pull the handle to the time the rocket deploys the parachute is about 1.6 seconds," said Williams.

Alan Klapmeire, CEO, **Cirrus Design**, had a midair collision in 1985, thus, "I was very interested when BRS came to us with the parachute system," he said.

The success of the BRS/Cirrus alliance led to an agreement between BRS and **Cessna**, making its parachute system available for the entire family of Cessna piston singles.

John Gilmore, Vice President of Sales at BRS, said that they prefer working with designers to incorporate the parachute system with the original design as they did with Cirrus. "But, we can do a retrofit," he said. "The Cessna 172 and the 182 are supplemental-type, certificate-approved installations that can be done aftermarket."

Cirrus decided not to make the parachute system an option. "This was a key safety feature. When you run out of options, you still have the parachute. It took four more years to certify the airplane, but it was worth it," said Klapmeire.

Whether built into the design or as retrofit, the parachute/ballistic launcher is installed behind the passenger seats in the cargo area. The activator is in the cockpit. Upon manual pilot activation, the rocket fires and the parachute is released. Then the plane floats down under the canopy, which ranges in size depending on the plane. Gilmore said that they have had 212 documented lives saved using the system.

The cost is typically about 5 to 10% of the aircraft. For retrofitting a Cessna, it might run between \$22,000 to \$25,000 with full installation and training.

**Aviation Safety Resources** (ASR) has an eye on larger aircraft in the six- to eight-passenger range. Dario Manfredi, President, said its tri-chute system takes over where the single-chute system leaves off.

Bob LaFrance, team member at ASR, said that while the initial concept of the tri-chute system was approved in the 1960s, the development of the newest technology is currently preparing to go through the **FAA** approval process.

As with the single-parachute system, activation is basically the same; however, this system separates the wings from the fuselage of the aircraft. A parachute is deployed for each wing and also for the fuselage. Each segment lands independently, slowly drifting to rest under the canopy of its own parachute.

"Separating the wings from the fuselage eliminates both the weight and the danger of the fuel," said LaFrance.

“Currently, this technology is in the large model simulation of the sequencing stage,” said Manfredi. “We have partnered with **Scion Aviation** and **PI Research** to build a large-scale, radio-controlled model aircraft equipped with ASR’s patented TriChute Landing system. Scion is a specialist in the manufacture of advanced composite parts for aircraft. PI designs flight-test-instrumentation systems.”

The newest BRS systems will go up into the range of the D-jet and some heavier airplanes. They are also looking at parachute systems for UAVs used for border patrol and homeland security and to coordinate air drops in forest fires.

“UAVs have a very high accident rate,” said Williams. “A parachute system on board is much safer for the craft and for anyone on the ground below.”

For TriChute systems, Manfredi noted that the future ASR target will be six-passenger planes, starting with the Cessna T-210.

As for Cirrus, its new “The Jet” personal jet recently took its first flight and is currently going through all FAA certifications. The Cirrus Airframe Parachute System by BRS is, of course, integral to The Jet.

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