

ACRO SAT NAV

Calin Popa has developed a computer that can help train acro pilots. Andy Pag in Nepal finds out more

At first glance you'd be forgiven for thinking it's a suicide bomb strapped to the Ava Sport Acro F1 harness, but what full time paraglider pilot and part time mad scientist Romanian Calin Popa has actually built, is the world's most extreme sat-nav.

The grandly named VTR1000 is an on-board aid to timing brake inputs for rhythmic SATs, Tumbles, Esferas, Ballerinas, Misty Flips, Wingovers and Stalls.

After two years of failing to nail the timing on rhythmic SATs, Calin, 29, came up with the idea for the device, and after a further two years of prototyping and developing he says it's finally working perfectly. The proof? His machine has now taught him the elusive rhythmic SAT and all the tumbling related manoeuvres, he says.

"If you're just a couple of 100 milliseconds out on the timing you lose it," he explains while showing me some graphs on his computer. "Even on radio it's hard to get it right, and the pilot's reaction time can make all the difference."

Just like an in-car satellite navigation system tells you when to turn, Calin's recorded voice emits through headphones followed by a sharp timing tone: "Pull [beep], release [barp]..."

"The main unit has an accelerometer, gyroscope, and 3D compass," he says, "Together they make up the Inertia Measurement Unit." Calin has an infectious excitement and will talk for hours about the development process to get the device calibrated. "Then there is the barometric pressure sensor, and a GPS unit." He

launches into a discussion about the years of work to decipher the enormous volumes of data which the device produces, and finally discovering the crucial correlations between the perfect brake input timing and the glider's forces, inertia, and position.

With his partner, I.T. geek Ovidiu Ban, they built software to synchronise video of the pilot actions to the data logged by the device. Strapping the gizmo and a GoPro on to acro star Pál Takáts for a couple of flights in Ölüdeniz, they collected enough data to keep Calin busy for six months creating the algorithms that now sit in the hardware of the device and allow it to tell you precisely when inputs are required.

"You enter your wing loading, the glider, the manoeuvre you want to do, and also the pilot's reaction time," says Calin. "Not only


◀ WAVE MACHINE

The machine uses data collected from flights flown by Pál Takáts to model 'perfect' manoeuvres.
Photo: Andy Pag

can it teach new pilots the right timing, it can re-train pilots that have picked up bad habits and are struggling to progress.

"My guess is that you learn five times faster with this, and you're probably five times safer too."

When the first version is released in time for the 2013 Acro season, Calin expects it to be used as a teaching aid by SIV/Acro instructors. But what started as a hobby project has turned out to have an even wider potential. Its logging function could also become the basis for judging competitions, and for an online Acro league. Competitors could upload their flight logs to a website that would measure the neatness of their moves and score them objectively.

The device and the analytical software have given Calin an insight into the energy and dynamics of his U-Turn Thriller 17 which has lead him to conceive of new manoeuvres, like the Infinity Tumbling Ballerina; a sphere of tumbles made by introducing a 45-degree turn at the top of each one, and another one he calls The Devil's Whip, a figure-eight version of the Esfera, with alternate tumbles to the left then right of vertical. He's pulled it off a couple of times, but like the VTR1000 itself, he says he wants to get it a bit tidier before he shares it with the world. 

Calin Popa
www.youtube.com/user/monkbaaz



YES. IT'S THIS SMALL



SHOWN ACTUAL SIZE
2.13" X 3.28" X .63" - 3.28 OUNCES
83.4MM X 54MM X 14.9MM - 93 GRAMS

AND YES. IT DOES THIS MUCH:

- GPS/VARIO, 50-HOURS MEMORY
- DOWNLOADABLE TRACK LOGS
- GROUND SPEED
- GLIDE RATIO
- HEADING



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