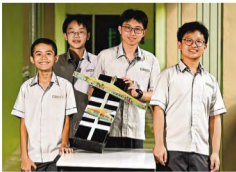


Flying towards success

NISHALINI SARALATAN talks to two teams who topped their categories in Singapore's largest flying machine competition using innovative designs



Team Star Flyers is made up of Wan Muhammad Izz Rusyaidi, Jasper Ang, Jaden Siu and Tay Bing Hern. ST PHOTO: SEE NISHALINI

A team of first-time participants landed the top spot in the unpowered gliders category of the Singapore Amazing Flying Machine Competition (SAFMC) on March 21.

Four students from Compassvale Secondary School designed and built a small, unpowered "bungee-launched glider" that achieved the farthest and most precise flight. Teams were required to launch their gliders into scoring zones to see how far they could glide.

SAFMC is Singapore's largest flying machine competition. It is an annual event, jointly organised by DSO National Laboratories and Science Centre Singapore.

Sin Yong Xuan Jaden, 14, said: "We just started learning about planes last year in the Aeronautics Club CCA and Applied Learning Programme in Aeronautics. Our teacher and some of our seniors encouraged us to join this competition, as they believed it would be a great experience for us."

His teammate Tay Bing Hern, 13, added: "We wanted an opportunity to gain more knowledge about planes. We have a great interest in how they work, so we wanted to challenge ourselves through this competition."

The team's unpowered glider was made from balsa wood in the Aeronautics Club CCA by Jaden and his teammate Wan Muhammad Izz Rusyaidi, 13, last year. A senior schoolmate guided them when they cut the wood to make the glider and showed them how to launch it.

They made another glider after this.

However, after testing both, they decided to stick with the first one because it performed better, though they added an ice cream stick on each side of the glider's nose and some Blu Tack.

Jaden said: "The purpose of the ice cream sticks was to reinforce the glider's nose so that any impact with a surface would not cause it to break. The Blu Tack was added to balance the glider's centre of gravity."

Jasper Ang Yu Kai, 13, added: "Adjusting and flattening the Blu Tack on the nose contributed to the increased aerodynamics of the glider."

The team believes that its glider won because of its wing design. Rusyaidi said: "The glider's huge wing span enabled it to generate the most lift so that it could glide farther."

Jaden added: "Also, we used sandpaper to sand the wings to create a special shape, called an aerofoil, which contributed to pushing the glider upwards."

Jaden, who was in charge of launching the glider, said: "I was nervous that it would tilt to the left or right."

"My strategy was to ensure that, when rubber-band-launched, it was stable first. It landed in the highest scoring zone of 100 twice, making us best performers." The team was also awarded a Best Performance Award for attaining the highest score in its category's flight challenge.

On the changes they would make if they were to participate in the same category again next year, Jaden said: "We would make dihedral wings, which are wings angled upward, to reduce tilting, adding to its stability."

For the second year running, siblings Koh Nann Tyr, 19, and Koh Tze Wang, 17, emerged as champions of the Semi-Autonomous (Man to Machine) category in the SAFMC on March 27.

But when they designed and built their drone, which is controlled by wearable technology, they did not stick to their previous successful blueprint.

The duo changed up their design this year to avoid repetition and to maintain their innovative edge.

Nann Tyr said: "My brother designed the drone with its magnet at the front this year. Our 1.1kg drone would naturally be nose heavy with the weight of the payload in front. To resolve this, he printed a battery support to put our battery farther back to counter the nose down moment."

The graduate from Singapore Polytechnic with a diploma in aerospace electronics was the designated pilot this time. She said: "We were doubtful this year. At first, we had difficulty bonding the controller to the drone. When we could eventually fly it, the drone was like a headless horsefly. I was not used to flying (it) using my fingers."

In the competition, teams can use up to three drones to pick up and precisely drop five 85g bean bags as fast as possible.

Mr Koh, who is a year 2 student pursuing a diploma in aerospace electronics in Singapore Polytechnic, flew the drone last year. This time round, he took on a different role, managing the crucial tasks of preparing the drone, testing its connectivity, and ensuring a constant charging cycle for its batteries, among other things.

Building drones is a Koh family tradition and bonding activity. "The siblings' father is a drone enthusiast who owns 10 3D printers. The siblings used them to custom print some parts of the wearables, like switch holders and hooks. To them, sourcing for the exact parts, and modifying them based on the dimensions they want, is difficult."

However, they chose to use mass-produced parts for their drones this year. "Previously, we 3D-printed (the) frame. This year, we used a store-bought carbon-fibre frame. The advantage is stability as there is less flexing, which creates a lot of wasted energy," Nann Tyr said.

She added: "I think I did pretty good. I managed to survive the entire competition and get a happy result. I outdid myself. (My ambition) is to be a research engineer in the areas of defence and drones. In the defence aspect, I think the drone we used this year can be used to drop first-aid medical supplies."



Siblings Koh Tze Wang and Koh Nann Tyr have been participating in SAFMC events since they were in secondary school and have achieved success in various categories. ST PHOTO: SEE NISHALINI