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Model Aircrafts F1D weighing less than 2 grammes

Record holder Ivan Treger, Slovakia

Quiet Emotions

**FAI European Championships for Free Flight Model Aircraft F1D**

This year, the European Championships in indoor flying were once more held in Belgrade. While flights in many model flying competition categories are getting increasingly faster, longer and higher, indoor free-flight is dominated by a real slow-down culture. This does not at all mean that these models' competition flights are any less thrilling and attractive. On the contrary – the silently circling small aeroplanes with their slowly rotating propellers fascinate everyone.

Basics

Indoor free-flight models are required to have a minimum weight of 1.2 grammes. The maximum span may be no more than 55 cm with a maximum wing depth of 20 cm. Power for driving the propeller is provided by a

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rubber band weighing no more than 0.6 grammes. Due to their extremely low weight, these tiny aeroplanes can only be flown indoors. The models fly freely, i.e. without radio control. To prevent collisions, models may be steered using a balloon or a pole. Flights are rated according to time with the two best of six flights entered in the ranking. Whoever has the longest flights, wins. The current FAI world record of 38:01 min is held by Ivan Treger of Slovakia.
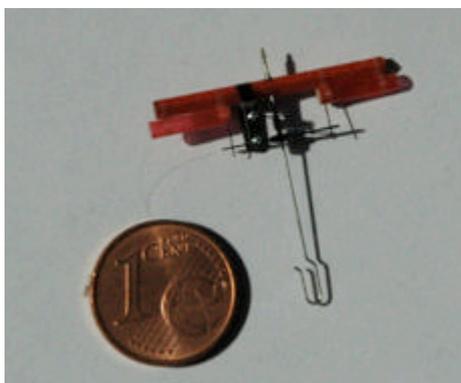
Devices for adjusting propeller pitch weigh less than one tenth of a gramme

Engineering skills at the highest level

What's particularly impressive is the very low flying speed of only 0.5 m/sec and a propeller speed of only 45 rpm. This can only be achieved with an extremely lightweight design. Building models of this kind therefore requires a lot of experience, concentration and highly developed, precise manual skill. The extremely delicate structure consists of very thin balsawood strips, reinforced with boron fibres. A very lightweight film (0.5 g/m^2) is used to cover the wings and tailplane. The fuselage and tail boom are made from small balsa tubes. The fuselage must be able to withstand 250 grammes of tension produced

Steering with balloon

by the rubber. With a diameter of approx. 45 cm, the propeller is huge compared to the plane. It is powered by a 25 cm long highly elastic rubber band. To ensure that propeller torque does not cause the model to enter an unstable flying state during the take-off phase, the wing is appropriately distorted in relation to the rubber tension. Only this highly complex compensation system enables the slow and steady circling climb. The flight circles have a diameter of approx. 10 m. Delicate devices for adjusting propeller pitch in relation to its torque weigh less than one tenth of a gramme!

Fascinating contests without any rush

These aeroplanes have to be transported and generally handled with extreme care and without any rush. The smallest of repairs and adjustments before the competition, carrying the model to the launching spot and back are actions that are performed very deliberately, carefully and slowly. Winding the rubber by about 1600 turns – and even more so, mounting it in the

fuselage – require maximum concentration and dexterity. Steering with the balloon, which reacts very sluggishly at great heights, is also much more difficult than it appears. If these directional corrections are not made with sufficient sensitivity and at the right location on the model, they can cause damage or even crashing.

Sport and art for young and old

Without exaggerating, F1D indoor flying can be described as sport and art for those aged between 8 and 80. It provides a wonderful contrast for young people who are exposed to an increasingly aggressive and noisy flood of information, to a world of monitors and ever more academic education. Working manually, developing a sense for materials and precision are excellent means of education. It is an ancient wisdom that, especially in older people, accurate manual work not only supports the coordination of the musculoskeletal system but also strengthens the brain and spirit. Indoor flying is not just a fascinating sport but also artistic craftwork at the highest level.