CIAMFlyer
The Introduction to the Modelaircraft World
FAI AEROMODELLING COMMISSION
No. 5 - 2012

Flying with Solar Power

Solar Impulse of flight pioneer Bertrand Piccard wich its huge wingspan equal of an Airbus A340. Foto http://solarimpulse.com

When the days in the Northern hemisphere shorten and the sun becomes more elusive, we like to remember the wonderful light and warmth of the sun. Solar energy is one of the foundations of life and humankind's most important energy source - both in the past and in future

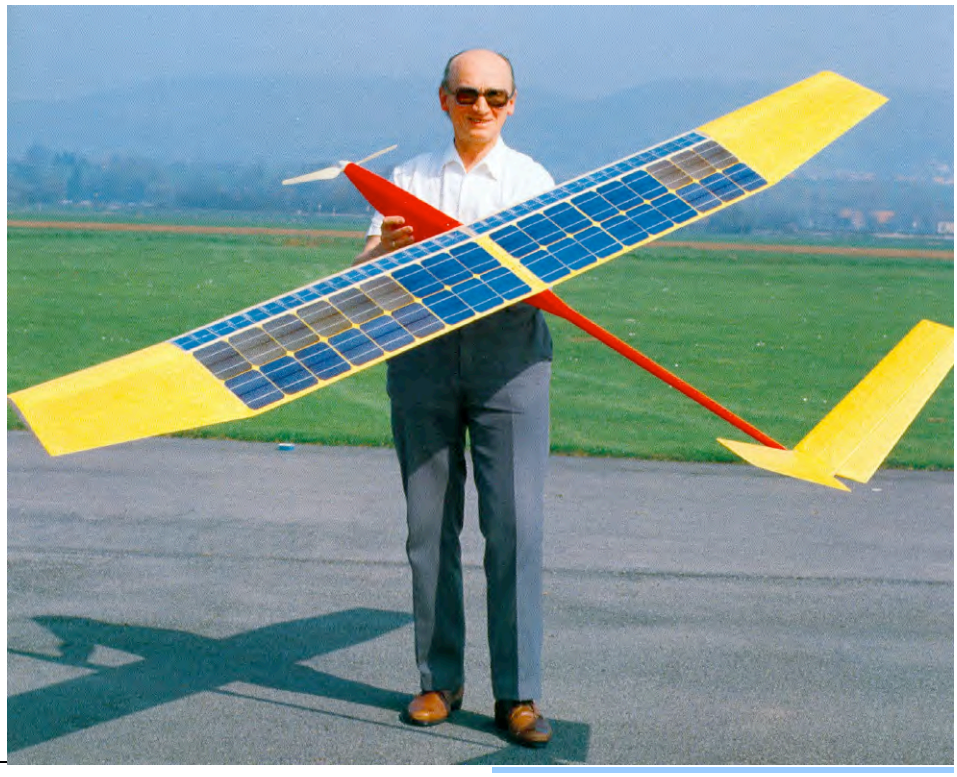
Flying with solar power – it's not new

Even the wind that makes leaves swirl through the air, lets birds circle above us and helps gliders achieve rapid climbs is produced through the sun's heat. When viewed this way, flying with solar power goes back to the beginnings of flying. First attempts to supply electrically powered aircraft using photovoltaics date back to the mid-1970s. Today, flight pioneer Bertrand Piccard is even planning a circumnavigation of the world with his manned aircraft "Solar IMPULSE".

The first pioneers of solar powered flights were model flyers

In sunny California, "Sunrise I", designed by R.J. Boucher, flew at an altitude of 100 m for 20 minutes as early as 1974 and later for three to four hours. The two solar model aircraft "Sunrise I" and "Sunrise II" were huge, with wingspans of around 10 m. At the same time, the two German pioneers of electric flight, Helmut Bruss and Fred Militky, were engaged in designing and building much smaller solar models. In 1976, Fred Militky achieved three flights of 150 seconds and altitudes of up to 50 m with his model SOLARIS. At the 5th International Militky Cup in Switzerland in 1978, Helmut Schenk demonstrated his radio-controlled solar-powered model. It operated without a storage battery but could only climb in a cloudless sky.

Helmut Bruss was a major pioneer and sponsor of solar aeromodelling. As a physics teacher, he was able to inspire numerous youngsters to become enthusiastic about solar flying - both inside and outside school. He also wrote several successful technical books and reports on the subject of electric and solar-powered model aircraft.



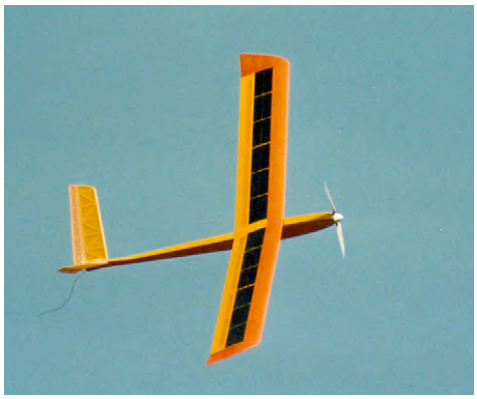
Solar powered model aircraft of Fred Militky 1976

Flying with solar powered model aircrafts gains popularity

Whereas the specialists – not all of them named above – were limited by the technical capabilities of the time and were initially rather alone with their developments, the early 1990s saw the beginning of an actual boom in solar aeromodelling. Helmut Bruss, a physics teacher, built solar-powered model aircraft at school and also gave courses. Solar flight events and competitions were held throughout Europe. In 1990, the Graupner company launched the "Solar Uhu" as a model kit. This model used the solar generator to charge the storage battery, a concept that made solar flying possible even when using cheap solar cells. Solar aeromodelling courses for young people were held in Austria, Switzerland, etc.

Solar Flight Workshop for young people 1993

Solar Uhu of Graupner 1991. Kit of a solar powered model aircraft



What will the future bring?

Lately, the solar aeromodelling euphoria has died down a bit, despite the latest technical capabilities such as more efficient generators and electric motors, miniaturisation of electronic components, modern building materials, etc., that would provide interesting perspectives. In contrast to those involved in model flying as a sport, remarkable developments have been made by scientists in the last few years. For example, the unmanned British solar aircraft "Zephyr" spent 14 days circling the skies of the US state Arizona. However, a flying machine with a span of 18 m can hardly be called a model airplane. The "Sky Sailor", built at ETH Zürich, is much smaller, with a span of 3.2 m. This lightweight plane, weighing only about 2.5 kg, flew for 27 hours at an altitude of 200 to 400 m.

Wolfgang Schaeper is holder of several records. For international scientific studies he uses electric and solar powered model aircrafts.
Foto www.mfg-markdorf.de

Rules for solar powered model aircraft competitions see http://www.fai.org/ciam-our-sport/f5-electric-flight

CIAM Flyer 5-2012
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