

Flying the little machine, of course by hand

F2B - Control Line Aerobatics

by Peter Germann



Competing in F2B is difficult

Imagine manually controlling a flying object travelling at 23 metres per second at 1.5 metres above ground, manoeuvring through a complex pattern as the "Square Eight". Try to maintain the described track within a tolerance of +/- 30 cm and here is what you get: Control Line Aerobatics. Considering that it takes the flying of another 13 similar



Home built F2B model

manoeuvres to complete an official flight at contests, it becomes obvious why competing in F2B is difficult and therefore remains a

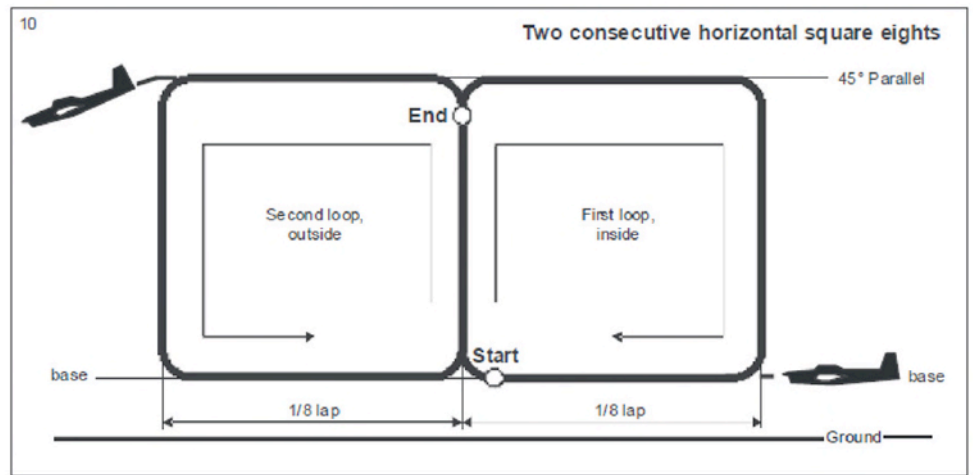
fascinating challenge for those preferring to go the extra mile.

Growing popularity

The availability of excellent ready-to-fly composite F2B models from niche market manufacturers has significantly contributed to the growing popularity of flying stunt in Control Line, both in terms of flight quality and of the number of active flyers. Traditionally, the "art" of C/L aerobatics consists of constructing the airplane by the flyer. Many competitors build their very own "world beater" again and again, in an infinite effort for to reach perfection in terms of aerodynamics, flight characteristics, lightest possible weight and beautiful paint work. It is the combination of building skills required and the endless practice flying in search for excellence making Control Line Aerobatics what it is, a lifelong love affair.

Very thin steel cables

F2B model airplanes fly on a pair of very thin steel cables of approx. 20 m length with the pilot holding the model in the centre of the flying circle, manoeuvring the airplane by actuating the elevators manually. Other than that, no further control of the airplane's flight track or the power source is permitted.



Square Eight C/L Aerobatics Manoeuvre

Consequently, IC motors, typically in the 10 - 13 ccm range, must be set to and designed for an increase of power under load. Electric motors run in constant RPM governing mode on 3-5 S 3'000 mAh batteries. Advanced power controllers automatically modulating power depending on the position of the airplane on the flying hemisphere are used, too. The seven (8 in the USA) minutes flight duration is defined by the amount of fuel on board or by an electronic timer.

Performing sharp turns

With a wingspan of approx. 1.5 metres, an area of perhaps 43 dm² and a take-off

weight around 1'800 Grams, F2B airplanes are typically made of carefully selected balsawood, covered with silkspan or film. Due to the symmetric layout of manoeuvres to be flown in competition, airfoils, too, are symmetric and need to be quite thick (such as NACA 0018) in order to generate sufficient lift at modest angles of attack. When performing sharp turns, forces resulting may reach as much as 20 G's and the wing is therefore equipped with large flaps mechanically coupled to the elevators. In F2B, a design withstanding the substantial flight loads and at the same time maintaining the very critical weight as low as possible is essential. With the wish to add an impressive paintwork, building an F2B machine may indeed become a demanding challenge...

Successful FAI World Championships

Because of the various challenges and difficulties involved, competitive F2B flying remains to be popular worldwide. In Europe, more



than 25 contests per year attract flyers often travelling far to compete. It is important to add that the social aspects of regularly meeting friends and their families are at least as strong a motivation to participate as is the competition itself. On top competition level, at time of the bi-annual Control Line World Championships, the number of participants from all nations around the globe in all classes may be as high as 350 with the F2B flyers reaching 90.

Increasing number of innovative people

With the typical flying of model airplanes being remote controlled, Control Line flying, perhaps because of being attractive for the flyer himself only, has mostly vanished from the public perception. Today, an increasing number of innovative people (re-) discover the joy and satisfaction of building a functioning miniature airplane

entirely by their own hands. Flying the little machine, of course by hand, too, adds an entirely new dimension, in particular when being done in the company of friends and just for fun. With the availability of silent and safe electric power, we now have a chance to be back on the local schoolyard where we came from. With a little help by local C/L communities, the resulting new visibility of what we are doing may well contribute to preserve the beauty of building and flying of Control Line model airplanes.



Bob Hunt's „Second Wind“ electric twin engine C/L Aerobatics model with retractable landing gear.

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<http://www.fai.org/ciam-our-sport/ciam-flyer>

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Crossfire built and flown by the author, electric

