Wild ideas for new F2D rules

By Henning Forbech, July 18, 2009

No streamer left – bonus for new streamer:

Some pilots try to make their opponent take the whole streamer in a single cut.
A successful "give away the streamer" will enhance the pilot's chance of winning but it will also reduce the fun of combat. If both pilots succeed in this "give-away-the-streamer" tactic the result will be a very boring 1-1 match where both pilots are just flying around with no streamers for 2-3 minutes. Combat would be more interesting if the number of "give away the streamer" events could be reduced.

One idea for reducing this give-away-the-streamer tactic could be a bonus (e.g. 50 points) for having the streamer left at the end of the bout. By giving away your streamer you then also lose this bonus.
The bonus would also intensify the end of the bout. The last and final cut will make a difference of 150 point (100 points for the cut and 50 points lost in bonus).

Another idea could be to allow a model with no streamer to land and put on a new streamer. The pilot should be rewarded 100 points for this. A new streamer should not be allowed later than 1 minute before the end of the bout. This should give the opponent a fair chance of making cuts on the new streamer.

New streamer design:

More streamers and streamers for a longer time would give us more time with dogfights. A new streamer design with a short string and a longer paper part could be a way to go. The streamer should start right at the back end of the model and the string is just used to attach the streamer to the model. It would be preferable to have the streamers made with a tapered shape, 50 mm wide at the model and 20 mm wide at the end. This should prevent the streamer from breaking at the model if it is caught by the lines or the model.

1-1 cuts:

Some fights are very short. When both pilots take all streamers in a single cut right at the start of the bout, they must fly level for the last 3 minutes or more.

The Circle Master should have the possibility to stop the bout after a 1-1 cut. This would save time at competitions. If the pilots can stop their engines in the air it can also reduce the noise load

Tactical landings:

A “tactical landing” is when a pilot lands with some streamer left just to prevent his opponent from making more cuts. Many pilots find “tactical landings” to be bad sportsmanship.

If the pilot can use the shut-off system to stop the engine it will be easy to make tactical landings. Some shut-off systems like the electronic system by Alex Prokofiev have this feature.

If a landing can be done without any risk to the model and without breaking propellers or getting dirt into the engine the tactical landings will give pilots some new opportunities. A tactical landing can then be done as a stop and go. This will save the landing pilot some time when the bout is restarted. A defending pilot can cool down a hectic fight by stopping his engine and let his mechanics restart the model. This can be done multiple times during a bout and the landing pilot can optimize his time on the ground.
A strategy could be to land and stay on the ground for 40 seconds as soon as you get a cut. This would reduce your opponent’s chances for making cuts and it makes no difference if you win by 100 points or 10 points.

The first pilots to use this strategy will get better results in competitions but it will make the combat match even more tactical and we will see fewer dogfights in the air.

Starting period:

The starting period could be cut down from one minute to 15 seconds. This would save time at competitions and would reduce the noise load. The effect on the combat would be minimal.

Line length:

With moving bellcrank and other shut-off systems that influence the line length it can be difficult to measure the actual line length. The line length should be measured at the line tension where the bellcrank is in the normal flying position. If the lines are put under some tension during the test not only will the bellcrank move to its flying position but the lines will flex, too. This will make it more difficult to measure the line length.

The movement of a moving bellcrank is quite small and this variation can be held inside the tolerances of the line length. It seems that the problem can be solved just by pilots taking more care when they make the lines.

Swing-arm shut-off:

There are a group of shut-off systems that are all based on measuring the direction and size of the acceleration onboard the model. The swing-arm systems are well known. Both electronic systems (based on an accelerometer in the model) and the Bubble shut-off is based on the same principle.

Theoretically, this type of shut-off should stop the engine if the acceleration in the shut-off direction (tip to tip direction) of the model is less than e.g. 2 g

First problem is that this device only measure in a fixed direction. If the device is not perpendicular to manoeuvres done by the model some of the g-force from these manoeuvres will be measured as acceleration in the shut-off direction. A combat model can do very high g manoeuvres (i.e. +60 g) and just a small misalignment will result in a "false positive" reading by the shut-off. This misalignment can be a mounting problem but it can also be due to a damaged model that flies manoeuvres that are not perpendicular to tip to tip axis of the model.

Next problem is that the model is not necessarily in a stable situation. When a model is tumbling away the direction of the acceleration can change very rapidly. A swing-arm shut-off will not remain closed long enough to stop the engine.

The experience with swing-arm shut-off in American fast combat is so bad that swing-arm shut-off have been banned from some competitions.

http://flyinglines.org/O7.BG.advance.html

At the moment we see some very good swing-arm shut-offs like the one from Jacco de Ridder. For now these systems probably perform better than moving bellcrank systems that are not so well crafted or well adjusted. When shut-off systems get better I think the statistics will start to show the inherent disadvantages of the swing-arm types of systems.

Can and shall we ban shut-off systems that are based on the "swing arm principle"? Should the Bubble shut-off be legal? If not, how do we outlaw this and similar systems?

Electronic shut-off systems used as engine control

Electronic shut-off systems might be used to control the engine.

First some background info to make clear what an eShut-off can do.
For an electronic shut-off system as the one made by Alex Prokofiev the pilot has a transmitter in the handle and can send data to a receiver in the model. The electronics in the model is build around a PIC-chip (a small computer) and this chip is programmed to analyze the data from the lines and control a fuel valve.

Description of the eShut-off: http://www.e-shutoff.com/hiw.html

Right now the data sent from the handle to the model is just an ID to identify the handle but it could also be instructions for the PIC to run different programs. One program could be to reduce the flying speed by opening and closing the valve in a special rhythm. Another program could be to let the engine make a hiccup just to make the opponent take the whole streamer.

The problem is that this type of shut-off system has all the elements that it takes to make an electronic engine control. The only difference between a simple shut-off system and an advanced engine control system is the program in the PIC. Since this program can not be verified we have no chances of checking if an electronic shut-off is just a simple shut-off or if it also serves as an advanced engine control system.

Advanced engine control systems will give pilots a higher chance of winning against pilots with ordinary engines. A pilot will not be able to fly tight maneuvers and make small cuts if the flying speed of his opponent's model is not predictable. Engines with variable speed or hiccup functions will not make combat more interesting. But they will probably give more victories to the first pilots to use it. If all pilot start to use these systems it will not make combat more interesting, just more difficult and extremely expensive.

Since there is no way to check if an electronic shut-off also acts as an electronic engine control the best solution is to ban the use of these systems.
I understand how much effort and how many resources that have already been put into the development of these systems and I understand how exciting it must be to continue the development of these systems but I also think it would be a wrong way to go for combat in the future. A race on electronic engine control systems is not what we need to make combat more interesting.

If we do not stop this development now we risk spending even more recourse and time on a development that has to be stopped in the future. The first chance for a revision of the rules will be January 1, 2011. If we do not start changing the rules now the next chance will be in 2013. That's 3½ years from now!

A simple way to prohibit electric engine control systems would be to ban electromagnetic signals through the lines. This would outlaw the electronic communications between the pilot and the model.

You might find that all this just sounds likes science fiction.
The problems with batteries and valves are still so big that it is difficult just getting the shut-off function working. It is correct that there are a lot of practical problems at this moment but we are only half a year into the shut-off era. The first electronic shut-offs are actually working and if you follow what Alex has published on his system you will find that he is now starting to test these advanced functions of his system.
These "'James Bond functions" are much closer to being reality than most pilots realize.

Link: http://www.ramsf.ru/viewtopic.php?p=7475&highlight=#7475

но поскольку на борту теперь имеется компьютер, то ему можно поручать дополнительные задачи - к примеру саморегулировка двигателя - для вывода его на максимальные обороты, или к примеру регулировка двигателя прямо с ручки. Этот вариант в данный момент активно тестируется.
Возможно сделать дискретные режимы работы двигателя - к примеру, можно резко уменьшить/увеличить обороты двигателя и т.д., и использовать это в бою.
Некоторые преимущества электронный АО имеет уже сейчас - возможность такической посадки модели во время боя без необходимости мыть мотор и менять пропеллер.

Translated by Google:
.. But because the board now has a computer, it can assign additional tasks - for example the self engine - to display it at the maximum speed, or for example to adjust the engine directly from the pens. This option is currently active in testing.
You may make a discrete mode of operation of the engine - for example, can dramatically reduce / increase the speed and so on, and use it in combat. Some of the advantages of e-SC is now - the possibility of landing takicheskoy models in the battle without having to wash the engine and change the propeller. ..

I don't think Alex is a bad guy or that he is doing anything wrong. He has done a great job in developing and manufacturing the first electronic shut-off systems. Now he is also the first to explore what can be done with an electronic engine control on a combat model.

I hope all pilots will agree that electronic engine control on combat models is not a way to go. It will start a race on the development of more and more advanced electronic systems. A development that will make combat more complicated and expensive but not make combat matches more interesting.

Fly-away and reflights

For some years there has been a rule that a pilot can get a reflight if his model was cut loose from the lines and landed outside the fly-away area.
The justification of a reflight in this situation was to give the pilot a new chance for a fair fight. Over the years this rule has led to a situation where desperate pilots try to turn a sure loss into a reflight by causing a fly-away.

Maybe we should take this rule out of the rulebook. What we lose in fairness might be less than what we now lose by matches spoiled by desperate pilots.

A less drastic change may also help to solve the problem.
If a pilot has a fly-away, he can ask for a reflight. But he should only be given the reflight if his score is higher than that of his opponent! This would block desperate pilots from trying to get reflights by dangerous flying. We might see fewer pilots asking for reflight after "simple" accidents. If the unlucky pilot isn't sure of his position, he will probably let the fight go on instead of risking not getting a reflight.

With the 2009 shut-off rules the situation got even more difficult. The 2009 rules state that there should only be a reflight if the shut-off has been working!
It is very difficult to verify if the shut-off has been working or not. A lot of fly-aways land very close to the flying field. If a model lands just outside the fly-away area but before the shut-off have had a chance to stop the engine it will be very difficult to verify if the shut-off have worked or not.

A simple way to solve all these problems could be to say:
No reflight or DQ on fly-away - only DQ on non-working shut-off!

Pilots with less reliable shut-off systems will risk a DQ for a non-working shut-off and pilots with reliable and fast reacting shut-offs will have better chance to retrieving the streamer and be back into the fight faster.

A “no DQ on fly-away” rule will also stop desperate pilots from trying to convert a sure loss into a win by causing a fly-away in the hope that the opponent’s shut-off is not working. Even the classic tactic where a desperate pilot tries to cut his own lines to get a reflight will be stopped.

This would also make the rules simpler. There will be no need for a fly-away area and the Centre Marshall does not have to ask the pilot if he wants a reflight or not.

/Henning Forbech