

Safety in F2D Combat

Summary and Evaluation of the Answers to the Questionnaire

We have received 57 answers from 22 countries including most of the countries with active combat pilots. Many of the answers are from groups of people indicating that the views and remarks represent at least 90 pilots and others engaged in this safety matter. Most answers give remarks on almost all of the items in the questionnaire while a few only have opinions about the shut-off. There are also suggestions of other things to do or to investigate more. These suggestions can be found under the item **Other**.

In the questionnaire the introduction of a warning system was mentioned but not listed as a separate item. Due to conformity reasons in this summary it has been included as an item of itself.

Summary

Shut-off

An overwhelming majority of the answers are positive to the introduction of shut-offs provided that they get a sufficient time both to learn how to handle them but also for developing them for use with F2D models including how to start the reserve model when there is no line tension. Answers from those used to shut-offs in other Combat classes indicate problems that need to be solved.

Compared to a Fast Combat model and the type of shut-off used there the F2D model have less line tension (as well in the air as at take-off), bell-cranks built into the wing, two models per heat and matches that normally last for four minutes. Opinions also indicate that effort should be used to investigate if there are other types of shut-offs that can be used instead of the types using line tension.

Concerning the rules and how these should be formulated to deal with shut-offs and the different types of situations that can occur have no clear indication from the answers. Matters to be dealt with includes how to test the shut-off, what will happen if it not works at a line break (damaged or not damaged by a midair collision), if it shut-off due to no or little line tension (but with the lines intact), if the pilot cuts his own engine or if the engine is cut by a tactical move from the opponent.

Increased line diameter

Everyone agrees on the fact that almost all kinds of lines can be cut by any propeller but that thicker lines can keep together better in a line tangle. A majority are negative to an increased line diameter as the lines would have higher weight therefore causing a need for more tip weight but also for introducing new problems with less drag and more collisions/line tangles.

Decrease the power of the engine

The answers only gave remarks of the three suggestions we brought up to discussion with no new ideas given. Many believe that changing the diameter of the venture is obsolete as this can't be done in an easy way on a lot of engine types. Introduce a minimum diameter of the propeller would also cause problems as the engines normally are made to have a quite high rpm.

The easiest way due to the answers would be to decrease the output of the silencer. This will also reduce the noise (but that is another matter!). The overall conclusion is that taking down the speed of the model will take away the heart of the class as speed is one of the fascinating sides of F2D.

Change the characteristics of the model

No one really believes that changing the models will have any influence on fly-aways. It is also an economical matter as there are a lot of models in use.

Change the size of the engine

Almost no one believes this to be realistic due to the cost.

Increase the 150 N pull test of the lines

Divergent views among the answers. One group claim that it is ok to increase the pull test to 200 N as both carefully built models and proper lines easily will stand the test. Others claim that they have to build new models. One answer indicates that an increased pull test can stress the lines and damage them.

A majority are positive to a better visual inspection and giving the organiser a right to ask a competitor to change the lines although they passed the pull test.

Quality of lines

Also divergent views. Some claim 4 strand lines to be better than 7 strand. Others claim the opposite. Some claim that stainless steel lines should be banned and others that they should be mandatory.

One of the answers suggests that effort should be made to look at new synthetically materials and if they could be used as there are products on the market that may withstand cuts from a propeller.

One answer propose that the lines should be “reinforced” or thicker where they are most likely to break, i e near the handle or near the model.

Fuel. Change or delete the nitromethane content

Most answers says that deleting the nitromethane would make the engines both harder to start and make them more critical for a good needle setting while a few have no objections to deleting this component.

The common opinion seems that changing the nitromethane content will have no influence on the number of fly-aways.

Having no nitromethane in the fuel makes it easy to test (with an indicator paper/stick) if someone tries to cheat.

Reduce the radius of the centre circle

Also diverging opinions of this have any effect on the number of fly-aways although the majority is saying they can accept a smaller pilot circle.

Install a safety net around the circle

Mostly positive answers to this question even if some answers put the finger on the fact that regional contests will have an economical problem with nets/fences.

As an alternative to have a 3 or 5 meter high net around the flying circle (which would be the best..) there are suggestions of fenced off spectator areas in addition to signs warning for flying models. Another brilliant idea is to use the football goals as protective cages for time keepers, other officials and spectators. Normally the contests are held at a football ground and the goals will therefore be easily available without any costly investment.

Personal protection – Helmets

Most find it strange that not all people (Jury, Team Managers etc) being close to the circle are mandated to wear helmets just like the pilots and the mechanics. A few claim that this should be voluntary for the persons involved.

Introduction of a warning system

A lot of different views have come from the answers. Most agree on the fact that stricter judgement to make the pilots abandon the rough flying style will have an influence on the number of fly-aways. Opinion goes from using the current rules more strict and DQ everyone not behaving at once to introducing a warning system with yellow and red cards.

Some suggests that both pilots should be disqualified if there is a fly-away while others leave it to the discretion of the Jury to punish one or both of the pilots with a DQ in case of a fly-away. Another suggestion is not to give a reflly to a pilot that is on the way of loosing at the time of the fly-away as this will prevent loosing pilots from using a fly-away to get a reflly. Another thing to do would to ask both pilots to land when a line tangle occurs (maybe also stop the watches and continue the match after untangling....).

Other

Here you will find a short summary of different views mentioned in all the answers.

Most answers express a worry that hastily taken rule changes might ruin combat. As the problem with fly-aways have existed for many years (and not increased and not caused any serious accidents so far) they don't see the need for a quick decision instead of well thought-off rule changes. The problem with fly-aways can be divided into two parts where one is how to make it safer when a fly-away occurs and the other of how to minimize fly-aways (we can never eliminate them!).

To make it safer when a fly-away occurs one can use shut-offs, net or fence at the contest site and helmets for all involved. A hemispherical net around and above the circle would naturally be the best but this is not feasible due to costs. Also a net around the circle would cause high costs (although you have it in T/R and Speed without protests).

A better way to go would be to have fenced off areas for spectators etc in combination with shut-offs. As pointed out there is still a lot of work to do before shut-offs can be used in F2D. Not to forget is the fact that a shut-off will take about 2 seconds to cut and that the model will travel at least 40 meters in this time. Therefore people near the circle must be protected in other ways as the shut-off will have a small or none effect in this area.

The general opinion is that changing characteristics of the engine, lines or model will have small or no effect on the number of fly-aways. Some answers implicate that new problems can be brought into F2D with if some of these changes will become reality. The most effective way seems to get pilots to change tactics and use a “cleaner” flying style. This can be achieved by stricter rules and by stricter judgement from the Jury.

One opinion express that introducing shut-offs will have a huge influence of making F2D more complicated and reduce the number of competitors in the class, also making it more difficult for new pilots to enter. A comparison is made with what happened in the USA when shut-offs were introduced. Instead it is proposed to change to smaller models and an engine size of 1.5 cm³ as these models will have a smaller mass and a lower speed thereby making it safer without the need of a shut-off.

One idea suggests the use of one or more horns. When dangerous situations occurs in the bout someone will blow the horn indicating to people around the circle to be alert as a model can come loose.

Another thing that should be addressed is the increased tactics to use people standing outside the circle signalling to the flying pilot that he is on his way to loose and therefore need to “take out” his opponent either by a crash or a fly-away. This is unsportsmanlike behaviour and should be dealt with.

To make it easier for the Jury to make decisions an official video could be used.

One answer put the finger on the fact that many pilots use an open-loop safety strap at the handle instead of a self-locking construction as shown in the rules. This open-loop system can in some situations cause pilots to drop the handle (and model) as it opens up.

One answer likes the rules to be simpler and that the power of the Jury should be reduced.

Also that the increased cost should be considered as there are a lot of people who might not afford to continue or start with combat if models become more complicated with shut-offs etc.

Evaluation (57 answers from 22 countries representing +90 persons)

Shut-off

41 answers more or less agree to a shut-off rule but states that enough time must be given to develop them before an introduction. There is a clear indication that it will not work just by using the Fast Combat shut-offs. Effort should be put into the question if there are other constructions that can be used. Great consideration should be taken when writing the rules dealing with situations that can occur when using shut-offs. An acceptable date for mandatory shut-offs seems to be for the World Champs in 2008 (1st of January 2008).

11 answers says no to shut-offs. Arguments are that they complicate things, don't work well enough or just will cause problems.

5 answers express no opinion.

Increased line diameter

24 answers are negative to increase the line diameter in. One argument is that it would introduce new problems like less line tension etc.

21 answers are positive to increase the line diameter in. Some answers suspect other problems to be introduced. Even a plastic prop will cut thicker lines but thicker lines will stay together better in a line tangle.

12 answers express no opinion in.

Decrease the power of the engine

18 answers don't want any changes at all. They claim that these changes will have no effect at all regarding fly-aways.

2 answers are positive to an overall change.

2 answers are positive to change the venturi diameter.

5 answers are positive to have a minimum propeller diameter.

1 answer would like pressure tanks to be prohibited.

2 answers just express the opinion to slow down the speed of the model.

10 answers are positive to reduce the outlet of the silencer. It is pointed out that this also will reduce the noise.

18 answers express no opinion.

Change the characteristics of the model

32 answers are negative to any changes at all. They claim that these changes will have no effect at all regarding fly-aways. There is also an economical matter if models become obsolete.

2 answers are positive to changes.

23 answers express no opinion.

Change the size of the engine

33 answers are negative to change the size of the engine. One argument is that it isn't realistic due to the cost involved.

1 answer says maybe.....

1 answer is positive to a change.

22 answers express no opinion.

Increase the 150 N pull test of the lines

23 answers are positive to an increased pull test. Arguments are that both the models and the lines easily could stand a higher pull test and that bad lines will be sorted out.

10 answers are positive to stricter inspection.

11 answers don't like any changes in the pull test. Arguments are that new models have to be built and it could stress the lines (damage them).

21 answers express no opinion.

Quality of lines

Very diverging opinions.

10 answers prefer a change to higher demands on the lines.

9 answers indicate that more effort must be made to find out the best material or type. Even look at other materials as synthetically ones.

8 answers prefer no change at all.

5 answers prefer 4 strand to 7 strand.

1 answer prefer 7 strand to 4 strand.

24 answers express no opinion.

Fuel. Change or delete the nitromethane content

22 answers would like to keep the fuel as it is. Deleting it will have little influence on the flying speed but make the engines harder to start and more critical on the setting.

5 answers want to delete the nitromethane. It will make the fuel cheaper and one (poisonous) component less to handle.

2 answers want to reduce the amount to 5%.

28 answers express no opinion.

Reduce the radius of the centre circle

20 answers are positive to reduce the radius of the flying circle.

13 answers are negative to a change.

24 answers express no opinion.

Install a safety net around the circle

22 answers are positive to have some sort of net/fence at the contest site. If not around all of the circle so at least a partial one for spectators.

7 answers are negative to have net or fences. One argument is that it would increase the cost for the organizer, especially at regional contests.

28 answers express no opinion.

Personal protection – Helmets

24 answers think that helmets should be mandatory for all people around the circle.

5 answers are negative to a rule and think it should be voluntary.

28 answers express no opinion.

One answer wants Ice-hockey helmets to be banned as they are unsafe.

Introduction of a warning system

14 answers are positive to some sort of a warning system. There are also an opinion that there should be a more strict judgement against pilots with a rough flying style.

5 answers are negative to a warning system.

2 answers express an opinion that it will have no influence to decrease the number of fly-aways.

36 answers express no opinion.