

New England Combat News

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THE CONTROL LINE COMBAT NEWSLETTER OF NEW ENGLAND



Now Celebrating our 30th year of Publication



Chris Sarnowski-October 2018

2018 Wingbuster Spring Championships held May 6th



Joe Fustolo and Paul Kubek



Bill Bishop and Chris Sarnowski

FROM THE EDITOR: New England Combat News exists, not to make a profit, but rather, to promote control line combat in New England. It is distributed without charge to those readers who participate in New England combat contests or who support these contests through donations to the New England contest fund. It is also distributed no charge if you can accept an email attachment and it is available as a free download from our website, as well. The subscription rate is \$20.00/year for people who do not meet the above criterion. If you have information you would like to see in this newsletter please call or write:

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If you make a donation or if you subscribe to this newsletter make the check payable to NEIL SIMPSONDonations go into the New England Contest Fund and are used to cover the cost of running New England control line combat contests. IF YOU WANT TO RUN A CONTROL LINE COMBAT CONTEST IN NEW ENGLAND AND YOU NEED HELP (FINANCIAL OR OTHERWISE) CALL OR WRITE NEW ENGLAND COMBAT NEWS. We want to continue to help make New England a "Hot Spot" for control line combat. New England Combat News is your newsletter-USE IT. Control line combat is your sport-PROMOTE IT.

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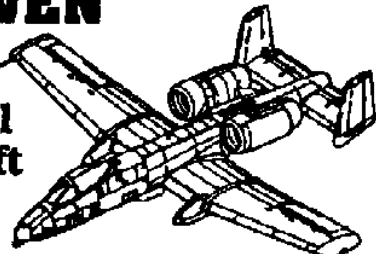
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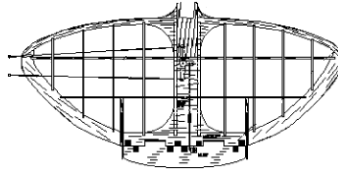
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THE BETTER MOUSE TRAP By Neil Simpson

One of the intriguing aspects of our hobby is our never-ending quest to build a better mousetrap. In an effort, to gain a competitive edge, most of us, if not constantly then at least, from time to time, find ourselves in search of a better airplane design. Typically, we find a design we feel is competitive, but even then, constantly make subtle changes seeking to improve performance, save weight, add strength or improve ease of construction. This constant evolution typically lasts a season or two or three until something dreadful happens. You lose a match, however, you don't just get out flown, but in the process, realize your opponent had an equipment advantage. The airplane design, that has served you well, isn't competitive any longer. It's time to go back to the drawing board and start with a whole new concept. Your goal is to come up with something that, at a minimum, will stay with your opponent or in a perfect world lay all other designs in the shade. Here in no particular order are some design criteria and talking points this writer feels are worthy of consideration as you design your next speed limit airplane. Remember my standard disclaimer, this is only one man's **opinion**. Also, please know this discussion applies to speed limit airplanes and not, necessarily, to airplanes designed for higher speed events.

Airfoil and Planform: For the most part, this subject is best left to aeronautical and would be aeronautical engineers. I have an airfoil cross section I prefer, however, in practical application I'm not sure that any of the conventional airfoils used, in the various popular combat designs, offers a big advantage, one versus the other. I feel the same when it comes to planform, besides, I could confuse myself if we start considering aspect ratio, sweep angle, sweep ratio etc. I prefer a straight or mild lead edge taper and a mild taper in airfoil thickness as you move from root to tip. Again, the approach used in most of the conventional combat designs works. Later, in our discussion of Center of Gravity, we will see how the amount of lead edge taper changes the CG location. Due to this, lead edge taper is a design consideration as we attempt to make our new design balance properly. Enough, on this subject, as this writer believes the following talking points are much more important considerations.

Wing Loading: Wing loading is the relationship between total weight and total wing area usually expressed as a ratio between the two numbers. I've seen this ratio expressed in various ways, however, the formula I'm most comfortable with is total square inches of wing area divided by total weight in ounces. As an example, 480 square inches of wing area with a total weight of 24 ounces would yield a ratio of twenty to one or twenty square inches of wing area per ounce of total weight. By the way total weight equals the airplane ready to fly including engine, prop, tank etc (everything but the fuel). The ratio of twenty to one is a magic number. Airplanes with a twenty to one ratio will perform very well. At twenty one or twenty two to one they will perform marginally better. After that the law of diminishing returns takes over and any improvement, in my opinion, is hard to recognize.

Line Tension: Proper line tension is extremely important in a speed limit ship as the opportunity to stall and lose line tension presents itself much more often than in higher speed events. At these slower speeds violent control input, line wraps and upwind maneuvers can all cause problems. I believe engine offset, outboard wing weight and line rake are all a means to fight loss of line tension. I use all three and, in particular, I use a lot more line rake than most experienced combat pilots would think is appropriate. It is really helpful, with respect to line tension and the bad effects associated with it do not seem prevalent at these slower speeds.

Line Tension vs Weight Reduction: Wing loading improvement through weight reduction is a means by which we improve performance. Performance, that is, as it relates to turning tighter and maintaining air speed through maneuvers. You've no doubt heard the expression "life is a series of compromises". Designing a competitive airplane is also a series of compromises. Here is one worth considering. If you take two airplane designs, with the same wing loading, for purposes of our discussion let's say a 480 square inch 24 ounce airplane and a 420 square inch 21 ounce airplane; both ships would have a wing loading ratio of twenty to one. Assuming no other variables, then the heavier airplane, because it's the bigger rock on the end of a string, would have better line tension, while still giving the same performance in terms of tight turning and air speed maintenance. In this example heavier is better. This writer believes that line tension, in a speed limit ship, is a very important consideration. Remember, it always seems to be windy on contest days.

Center of Gravity: The infamous balance point is both a design consideration and a trim adjustment. We want our design to be close to having the proper CG right off the building board. The target CG location, I've always used, prior to flying the first prototype, is the average quarter chord. This is a starting-point, the optimum CG, on most designs, will be slightly aft of this location. If your design has a straight lead edge the quarter chord is twenty five percent of the average chord measured back from the lead edge. As an example, an airplane that has a twelve-inch root chord and an eight-inch tip chord has an average quarter chord or target CG of 2-1/2". If the lead edge is tapered, then the target CG moves aft of this location by one half the amount of lead edge taper. As an example, two inches of lead edge taper moves the CG back an additional inch. This is a starting point. When you test fly your machine each individual airplane can benefit in performance by fine-tuning the CG with either tail or nose weight. If your target CG is right a few grams of nose or tail weight should make things perfect. If your design has metal mounts the engine can be moved forward or back in lieu of adding weight.

Turnability vs Pointability: I may have just invented two new words, however, you all know what I mean. If you've designed an airplane with a favorable wing loading and then either through design or by trim adjustment gotten the CG right you have maximized its ability to turn. If your design is so touchy that it doesn't go where it's pointed then you need to slow up the controls. You can do this with bellcrank and or control horn spacing, however, this writer believes it is less problematic to make this adjustment by closing the control handle spacing. Make the airplane match your skill level. Make it point able. Make it so you can fly it without looking at it. If you can't fly it without looking at it, if it doesn't go where it's pointed then an otherwise good design is junk.

This was not intended to be the definitive work on toy airplane design, but rather, a discussion of some design criteria that this writer feels are worthy of consideration, before you design and build your next killer combat ship. I hope it can be helpful.

Rumors, Facts Etc.

CONTEST FUND: Please know we received an unsolicited and very generous donation from Mister John Glennon (Hog Heaven Hobbies) since the last issue was e-mailed. John has been a great supporter of our group for many years now and while I know the geography is difficult for many of you our support of his hobby shop would be a good way to repay his generosity. Hog Heaven carries just about everything still manufactured for the control line community along with everything radio control, as well.

2019 SCHEDULE: As many of you know the Wingbusters have lost their flying field effective the end of 2018 . They are actively in search of a new location. Assuming they secure a new location and that location includes a control line circle we will schedule our 2019 contests at their facility as it has been an excellent relationship for us and I hope for them, as well. With that in mind we will hold off for as long as possible before scheduling our 2019 contests this in attempt to let their situation sort out. If nothing comes to fruition by late spring we will find an alternative sight or sights at that time. This could be on a contest by contest basis if necessary. If any of you have suggestions for alternative sights now would be a good time to send me an e-mail.

New England Contest Fund

11/1/2017 through 3/20/2019

2/20/2019

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Date	Description	Category	Amount
BALANCE 10/31/2017			231.00
11/26/2017	Turkey Day Shootout	Entry Fees	60.00
11/26/2017	Turkey Day Shootout	Trophy Expense	-6.00
11/26/2017	Turkey Day Shootout	Permit-Sanction Expense	-25.00
11/26/2017	Brian Stas	Contribution	100.00
11/26/2017	2017 Streamers (84 Qty)	Streamer Expense	-16.00
1/26/2018	Will Rogers	Contribution	100.00
5/6/2018	Brian Stas	Contribution	50.00
5/6/2018	Joe Fustolo	Contribution	50.00
5/6/2018	Wingbuster Spring Championship	Entry Fees	60.00
5/6/2018	Wingbuster Spring Championship	Permit-Sanction Expense	-25.00
5/6/2018	Wingbuster Spring Championship	Trophy Expense	-51.00
5/25/2018	Len Thibault	Contribution	50.00
6/3/2018	Eastern Mass Invitational	Trophy Expense	-4.00
6/3/2018	Eastern Mass Invitational	Permit-Sanction Expense	-25.00
6/3/2018	Eastern Mass Invitational	Entry Fees	40.00
7/1/2018	Wingbuster Summer Champion...	Entry Fees	-70.00
7/1/2018	Wingbuster Summer Champion...	Permit-Sanction Expense	-25.00
7/1/2018	Wingbuster Summer Champion...	Trophy Expense	-51.00
8/5/2018	Central Mass Championships	Permit-Sanction Expense	-55.00
8/5/2018	Central Mass Championships	Trophy Expense	-8.00
8/26/2018	GX Shootout	Permit-Sanction Expense	-25.00
8/26/2018	GX Shootout	Trophy Expense	-51.00
8/26/2018	GX Shootout	Entry Fees	80.00
8/26/2018	Ken Hargreaves	Contribution	50.00
9/15/2018	Permit Ex-canceled Contest	Permit-Sanction Expense	-25.00
9/15/2018	Trophy Ex-canceled Contest	Trophy Expense	-48.00
9/30/2018	Fall Finale	Permit-Sanction Expense	-25.00
9/30/2018	Fall Finale	Trophy Expense	-51.00
9/30/2018	Fall Finale	Entry Fees	80.00
9/30/2018	Wingbuster Model Airplane Club	Donation Expense	-250.00
10/14/2018	Permit Ex-canceled Contest	Permit-Sanction Expense	-25.00
10/14/2018	Trophy Ex-canceled Contest	Trophy Expense	-48.00
10/28/2018	Fall Fly Off	Entry Fees	60.00
10/28/2018	Fall Fly Off	Permit-Sanction Expense	-25.00
10/28/2018	Fall Fly Off	Trophy Expense	-12.00
10/28/2018	Bill & Cody Bishop	Contribution	50.00
11/11/2018	Turkey Day Shootout	Permit-Sanction Expense	-25.00
11/11/2018	Turkey Day Shootout	Trophy Expense	-12.00
11/11/2018	Turkey Day Shootout	Entry Fees	70.00
12/22/2018	Hog Heaven Hobbies (John Gle...	Contribution	100.00
11/1/2017 - 3/20/2019			17.00
BALANCE 3/20/2019			248.00
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TOTAL OUTFLOWS			-983.00
NET TOTAL			17.00