



# REPORT

November  
2010

**ONLINE!**

Issue  
292

**Happy**

**Turkey Day**

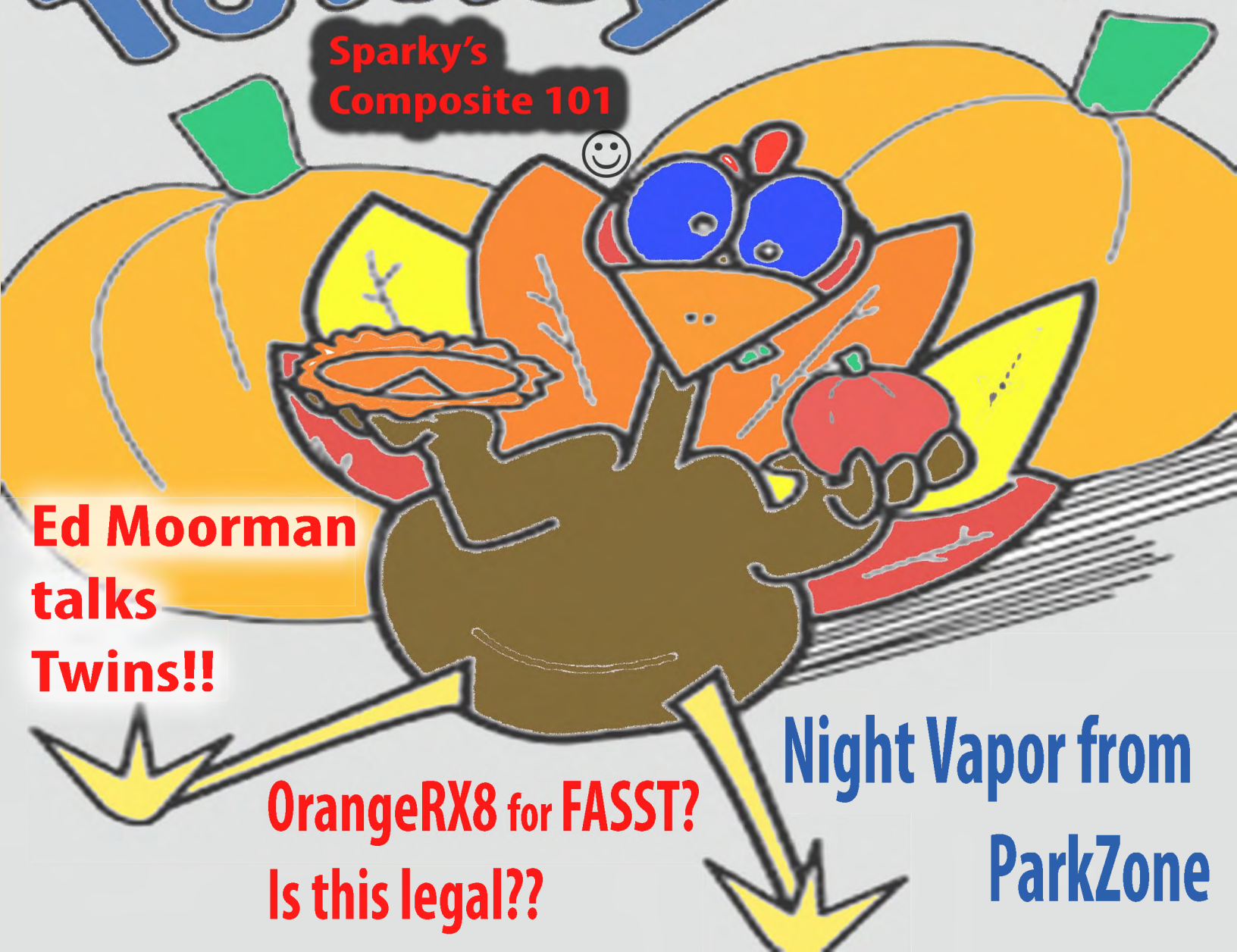
**Sparky's  
Composite 101**



**Ed Moorman  
talks  
Twins!!**

**OrangeRX8 for FASST?  
Is this legal??**

**Night Vapor from  
ParkZone**



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## OFFICE NOTES

First this month, I want to take a minute to wish a happy belated birthday to our resident combat guy, Chris Handegard! His birthday was October 11! 😊

Chris was recently involved in an automobile accident. He has recovered enough to write for us this month, but is only working part time when we last corresponded. Please keep him in your prayers.



By the time many of you read this, I (and Tony, since we share the same birthday) will be another year older. Sadly, times marches on and if I recall some long-ago movie reference; it marches across your face. Steel Magnolias, maybe? Anyway, at the moment, time is marching across my back. A couple of Sundays ago, I just started to hurt. Cass would say, “Sad day.”

Last month, RC Report Online joined Facebook and I have been able to recognize the names of a few of our “fans”. Thanks for your support!

Suggest us to your Facebook friends and help to get our name out there! Post pictures of your

recent events and tell us what been happening in your part of the RC world!

Don’t forget that RC Report Online is now available in Kindle format. Please email the office if you would like to receive the magazine in the Kindle version. Like the magazine itself, this is a work in progress, so bare with us and we take this journey to improve RC Report Online for all of you.

You all will notice and difference in the Smiley Face contest this month. We have fallen behind with sending out prizes, so until our situation stabilizes, the prize for the Smiley Face contest will be a free premium subscription. Hope you will still play and have fun looking for those little devils! You can use it for a renewal or gift it to someone. We will still honor all past winners with the motors of their choice. Just please be patient as it is taking some time to get the motors out to you since these are not donated by the distributors. We pay for them out of our general account, which is low at the moment. Sorry for the delay. We hope it doesn’t hinder your current projects too much.

With the American Thanksgiving fast approaching, I would like to take a moment to say thanks you to all of our subscribers and advertisers. We are grateful for your past and continued support. Without you, we would not be here.

Until next month,

Julia



# THE OILY HAND

## BRIAN WINCH

THE OILY HAND: Covering engine topics and working with metal for models. Send your comments or questions to: [oilyhand@bigpond.net.au](mailto:oilyhand@bigpond.net.au) or write to Brian Winch, 33 Hillview Pde, Lurnea NSW 2170, Australia. International Response coupon (Post Office) required if you want a written reply.



### HOMELAND MUFFLER

Are you aware that a modeler with an engineering company is manufacturing an excellent range of mufflers and 90° adapters for four stroke engines? Jim Coppit, the very obliging owner of the company, RC Specialties, LLC contacted me and asked if I would like to see a sample of his wares, so to speak. Being a bit keen on engines and exhaust systems I jumped at the chance, and quick as it takes to fry an egg; I had a muffler and a 90° adapter sitting on the table being studied as I ate my meager breakfast (A simple concoction of uncooked rolled oats, cinnamon, apple sauce, yogurt, walnuts, evaporated skimmed milk and sliced banana...I wonder what the rich {or poor} people are eating?). *(You know, I enjoy all those things, excluding the evaporated milk. I'm just wondering if you mix that all together...Julia)* Anyway, by the time my bowl was licked clean I was ready to fit the muffler to a Saito 82 and give it a blast...not that I am in any way keen to run and enjoy an engine running (LOL).

Before we get to the running bit and my hands are oily, how about we closely examine the construction of this muffler. CNC machined in several parts - front section, baffle, rear section - from heat treatable aluminum alloy (tough stuff), assembled then welded together leaving the neatest aluminum welded seam you will see in a long time. As can be done with the particular alloy used, the muffler is heat treated for maximum toughness and thermal stability. To finish it off the entire assembly is highly polished then clear anodized for a very durable finish. The thread for the exhaust manifold is clean and sharp and it is secured with a black oxidized, generous width locknut (most common spanners will fit without burring the corners). A point of notice here. Being as how the muffler is manufactured from an aluminum alloy very similar to that used for the engine case/barrel, the coefficient of expansion (amount of expansion in simpler terms) is extremely close to that of the engine case alloy. Both the



**Photo 1: Here the TurboHeader muffler is mounted to a Saito .82**

exhaust manifold of the engine and the threaded manifold of the muffler will expand almost identically. "So what?" you ask. Unlike the steel or stainless steel manifold headers commonly used that have a quite different expansion rate than that of the engine case alloy, the thread is much less inclined to work loose...no more mufflers flying off and hiding in long grass until found by the grass mower. You don't have to lean too heavily on the locknut with this muffler. Nip it up to prevent its own weight dragging it down and that's about all that is needed. In any case, due to the design and manner of attachment, even if it did come loose, it would have to swing around like a propeller before it would come off the engine.

Okay, one very nice job of design and manufacture, but as you are asking, how did it perform? Well, it performed quite well, but the performance is not the main attraction for me as I will explain in a minute or so. First the testing, and yes, it did increase the RPM a little - the amount would vary according to the engine used - and the final sound was down from the original Saito 80 muffler supplied with the engine. From a range of positions I averaged



**Photo 2: As seen from the rear.**

out a difference of 2 dB overall. I cannot give you a field figure as all my engine testing is done in a large steel workshop and the engine test area is closed in with three hard faced walls. However, from experience, I can tell you that the sound from the muffler would be quite acceptable at most fields and an average drop of 2 dB (dB is measured exponentially - e.g. - 2 dB is considerably more than double 1 dB) is very good. As to the RPM - here again, not possible to provide a positive figure, as again, there will be variations with different engines depending on their peak RPM and the back pressure of the exhaust. I found that I had to re-tune the engine when I fitted the Turbo muffler. I ran the engine with the supplied exhaust assembly - recorded readings as required then changed the exhausts within about 4 minutes of the previous run so not even the weather would affect the readings. A little re-tuning of the main mixture needle and the maximum RPM was, again, recorded. With the supplied exhaust assembly I recorded 10,054 RPM using a 13 x 7 APC propeller and a 10% nitro fuel mix. With the Turbo muffler I recorded 10,300 RPM with a rock steady 2,200 idle. As I said, not of a great importance to me, the gain of a couple of hundred RPM, as you would never notice the

difference in use. The reduced sound is of great importance and something I strongly encourage as it is excess sounds annoyance that loses us our flying fields. The catch phrase that should be adopted by all clubs and modelers is 'LOSE THE NOISE OR LOSE THE FIELD'. Okay, I'm happy so far, but now we come to what to me is the main attraction and that is the size and close fitting proximity to the engine. So many times I receive requests from modelers to make them a close fitting muffler (in cowl type) or a 90° bend for an exhaust system. Almost every time I have to refuse or send them to an alternate source as I do not have the time, and making efficient mufflers is not a task you just simply do at short notice. I know that builders of scale models want hidden mufflers as often do the builders or fliers of sport or near scale models. Often the final concoction used is a dreadful cat's breakfast (*Does the cat eat the same thing you do for breakfast?* ☺ Julia) of badly bent and terribly welded or brazed metal that sounds awful and/or stifles the engine. Well, I'm telling you that you would be hard pressed to not be able to fit this TurboHeader muffler in a cowl and, if needed, the assistance of the 90° adapter would put the muffler in places you never considered for a muffler and the same for the final exhaust. Add to that that you can fit a silicon exhaust extender to the tailpipe which, incidentally, has provision for this and you could have the exhaust blowing out your left ear - if that is how you need it. (Some modelers are a bit strange at times. LOL). One other point here, the 90° adapter is a male/female fit which means you can fit it to the engine and then fit your original exhaust to it if you want to go that way. Okay, you are now aware of the mufflers so now for the good news - they are being manufactured in your own

back yard - yes - in good old US of A at Zachary, LA. Full postal address is Post Office Box 154, Zachary, LA 70791. Phone: 225-975-8072. Examine the full range and specifications on the Web site at: [www.rcspecialties.net](http://www.rcspecialties.net). Please tell Jim Coppit where you read about his mufflers and who told you about them.



**Photo 3: Compare the total width with the TurboHeader and the supplied standard muffler.**

## PLUG AND PLAY

I would place a fair bet that the two most common topics discussed, asked about or misunderstood in relation to model glow engines would have to be fuel and glow plugs. I receive so many requests for information on those topics, my dear wife Shirley, who is most times within earshot of the phone, could quite well repeat the information for callers as she has heard it so many times over the years. As a point of fact, during the writing of this article I have had 2 phone calls (so far) on both topics and I answered two letters during my coffee break, and yes, both were about fuel and glow plugs. I was prompted to write a few words on the topic of glow plugs by Peter Stapleton, faithful RCREPORT ONLINE reader, who wrote:



*Brian, just wanted to let you know, I really enjoy your column in RCREPORT ONLINE. (Definitely a true gentleman - few of us left, Peter)*

*I have a suggestion for a future article. How about an in-depth article about glo plugs?*

*Heat ranges, if there is such a thing in a glo plug. How do you tell if the plug is hot or cold? It's tough to tell if a plug is hot or cold - tough to tell from the manufacturer's markings.*

*How do you select the correct plug for a given engine? Different types etc., two stroke versus four stroke plugs. Why is high RPM a plug killer?*

*Regards,*

*Peter Stapleton.*

*My initial reply to Peter:*

*Thank you for your good support.*

*Glow plugs are a constant source of inquiry to many modelers, but life is getting easier in that respect with most of the manufacturers now using the Standard Heat Rating (SHR) as a guide. This started with the Model Technics Company in the UK some years back. They bought out a full heat range of plugs and made the claim that the correct choice of a glow plug could mean a difference of 2,000 RPM to your engine. They copped a lot of flack over the claim as many people misread the claim as being that you could make the gain JUST by using THEIR plugs. What the company inferred was, by choosing the correct heat range of ANY type of plug. The company contacted me and asked if I would conduct an independent test for them using their range of plugs. I did some very*

*intensive testing with various engines and confirmed (as I knew it to be) that the difference between an incorrect heat range plug and a correct heat range plug DID amount to, no less than, 2,000 RPM.*

*I have, quite recently, carried out some tests with the newly numbered (and the new #7 plug) plug range for O.S. and this was quite interesting. I certainly will write an article for RCREPORT ONLINE as you suggest, but I won't be able to include any USA plugs as they are not so common here these days. I have some of my own, but I will report on the most common plugs and address the heat range selection topic.*

*Thank you for your idea.*

*Brian*

**HOT OR COLD?**

We are now seeing quite a few plugs classified according to the Standard Heat Rating, and in time, most modelers will become quite conversant with this reference and I feel sure that engine manufacturers will also use the reference when recommending a suitable range of plugs for their engines. It would be along the lines of, 'For low nitro fuels - below 10% - use a glow plug within the range of 6 to 8 SHR. The Standard Heat Rating range starts at 0 which is excessively cold to 100 which is excessively hot and most glow plugs will be within the range of 1 SHR to 10 SHR with the most commonly used range from 3 to 8. At this stage the popular range of four stroke plug brands - plugs specified as four stroke plugs - are not included in the range for general applications as they are, simply, specialized four stroke plugs. I would consider them to be within the range of 7 to 8

with 7 being the closest figure as you need a hot plug for an aircraft type four stroke. Maybe the four stroke engines for car use require a bit of plug experimentation as those engines run in the range of 21,000 to 22,000 RPM, and being small capacity engines running at very high RPM, maybe a colder plug is called for in some circumstances.

One factor of plug choice is quality and this is extremely important. I use only the very best grades of plugs. Is the few measly dollars difference between the cost of a high grade plug and a super low priced economy plug worth the value of your engine or model? A plug failure can do serious damage to an engine if the element melts or breaks and falls onto the top of the piston. The metal ball or shards will bounce around spreading the crown of the piston and damaging the head as the engine is stopping. The modeler checks why the engine has stopped, notices the glow plug has spat the dummy so another one is fitted and...the broken element bits are still in the engine. The engine is re-started and the merry dance begins until the engine overheats - due to the expanded piston crown - and stops or breaks the conrod and stops. For some reason the head cannot be removed. This is due to the metal bits peening the underside of the head so much that the hot aluminum alloy has been expanded by the constant hammering and is now a permanent fit in the liner. You heat it up but that exacerbates the problem as the aluminum head expands tighter into the liner which does not expand as much as the head. I won't paint a picture here as the results are often too terrible to see but...in certain ways (moan) the head is removed. The top of the piston is like a moon surface - lots of little craters - and, if it is a ringed piston, the

ring is jammed so tight into the groove from the hammering of the piston crown that it will stay there forever but, it will not be of any use again as it cannot expand in the groove. All of that due to the saving of a few dollars on the cost of a plug. Silly thing about it is that the high quality plugs last so long they way outdo the extra cost over the shorter life cheap plug by a great cost saving margin. Here's one way I did some checking a few years back. As most of us know, a plug element maintains its glow due to the effect of the methanol on the platinum alloy element combined with the residual heat and engine cylinder pressure. Every so often from way back an engine appears on the market with two glow plugs fitted. Really, it has little if any influence on the power performance of the engine, but...it can increase the reliability of the engine which is handy for any model and especially so for high cost scale models. A new or spare plug in your toolbox is absolutely no use if an engine loses a plug (plug fails) in the air. On the other hand, if the spare plug is FITTED to the engine it can take over if the main plug fails....maybe. Generally, the instructions supplied with the engine indicated that there was no need to heat the second plug as it would 'light up' automatically when the engine was running. This created a lot of controversy amongst modelers as to whether the plug would actually automatically ignite, so to speak. On the request of an engine company I was asked if I could carry out tests to put the matter to rest. I used a .60 two stroke engine that I was prepared to sacrifice if something went wrong. The engine was quite okay and almost new so the test would be given the best chances. I machined up a new head and put two plug holes in it reasonably close together. On test the engine ran quite well and the same RPM



as with the original head. Now came the problem - how to stop one plug from glowing to see if the other plug had self ignited?????? After a bit of thinking I came to the painful deliberation that the only way was to kill one plug and the only way to do that was to apply more voltage to it. I calculated that I would need no less than 12 Volts as I wanted to, virtually, vaporize the plug element so metal bits would not cause damage as mentioned previously. Yep...that 12 Volts sure did the trick - exit one plug element instantly. In all the testing (quite a lot of plugs) the simple answer stood out in big red letters. A quality plug kept the engine running (it auto ignited), but the 'economy' or 'no brand name' plugs just sat in there waiting for action that they would not instigate. An interesting experiment and several other side factors were evident apart from the need for quality elements in the plugs. A quality plug will maintain heat for quite a long time even when the engine is cooling on a slow fly-by for example or a long landing approach and be ready to ignite a fresh charge of fuel if you open the throttle to accelerate out of the maneuver or a miscalculated landing approach. A lesser quality plug will lose interest rather quickly and will often quench due to a fresh charge of fuel if it has cooled off a bit.

Okay, that's a pretty good start to the topic, and as there is too much information still to go for one article, I will leave it here and continue on next month.

## HANG HIM HIGH

Out the front of my little property I have a monstrous eucalypt tree (We call them 'gum trees'). You have them growing in places on your island as we sent a load over many years

ago. This is 'Ghost Gum' and it is about 60 feet high. Up in the top branches - way above the koalas (deadly drop bears) and possums, the workshop fool is perched - shaking in his boots. Around the base of the tree is an angry crowd - a very angry crowd and some of them have large pails of tar, some bags of feathers, some are carrying a large pole, and, quite a worry, several have large coils of rope with a strange knot and loop on one end. There is a terrible din of angry voices calling for him to come down and take his medicine, some are calling for a lynching and others for tar and feathering and 'riding' the pole out of town. I find it quite upsetting as it is disturbing the poor little possums and koalas and even an old goanna lizard that has been sleeping in a hollow branch for years. Shame really, I wish he would come down and they could then all go home after they did whatever they want to do to him. This all started with his great idea for a business venture. He decided that his efforts to fly unassisted were coming to nothing so he considered his best bet would be to buy an old Tiger Moth (from the aircraft junk yard) and rebuild it (heaven forbid). As the junk yard wanted money for the old wreck and the 'fool' had spent all his savings on his stupid ideas, he decided to go into business to make many fast bucks by some 'clever' sales that required little outlay on his behalf. He was able to beg or borrow enough for an impressive advertisement in the local newspaper where he set out all his wonderful bargains and money making ideas. Well, for a little while the money rolled in then came the knocks on the door by angry customers who demanded a full refund. This became quite serious and he saw the situation was hotting up rapidly so he took to hiding - up the tree. Unfortunately he was spotted by a heli

pilot flying over the area and the word was passed where he was hiding. Hence - the large angry mob. You be the judge when you read the list below of the 'deals' he advertised and the tricks he pursued.

**MAGIC INSECT ELIMINATOR:** Kills every dangerous and annoying insect without the use of dangerous chemicals and poisonous concoctions. Anybody can use it - guaranteed results.

For this he supplied two small wooden blocks marked 'A' and 'B'. The supplied instructions were, 'Catch the offending insect, place it on block 'A' and squash it with block 'B'".

**INVISIBLE INK:** Straight water in old ink bottles.

**3D MAPS OF THE SAHARA DESERT:** Sheets of very course grade sand paper.

**ABSOLUTELY ACCURATE WEATHER GAUGE:** (Piece of string on a stick.) Instructions: Hang string out of window. If string moves - windy. If string is wet - raining. If string turns white - snowing. If string is warm - sunny.



**Photo 4: Special deal on BUBBLE BATH beans.**

**SELF GENERATING BUBBLE BATH:** A can of baked beans - beanz meanz fartz.

Instructions: Eat beans, wait two hours, sit in hot bath, bubbles will occur naturally.

He sold hundreds of tickets at \$10 each for a raffle to win a fine race horse. When the winner complained that the horse was dead (and smelly), the Workshop Fool gave him his \$10 back.

He placed a notice in the local paper worded, "ABSOLUTLEY LAST CHANCE TO SEND \$5 TO PO Box ###. Offer will definitely not be extended beyond the 31<sup>st</sup> of this month."

He advertised 'DESIGNER KITCHEN CONTAINER SETS WITH WELL KNOWN PRINTED COLOUR MOTIFS'. For each order he sent half a dozen empty breakfast cereal packets.

Well, the din of the angry mob is getting too much for me, so I am off to my underground workshop to fondle my new engine - the O.S. 7 cylinder radial which I will be reviewing and you will probably see it next month. I might even send a photo of it to Julia's (the editor) dog, Isabelle so she can enjoy it - or chew it up. *(I'm sure Belle would appreciate that! Julia)*

I will leave you with this word picture of an outback farmer I met few years back. He never shaved or cut his hair, but the biggest attraction was his eyebrows. They were so thick they were prone to infestations of rabbits and occasional small bushfires.

Another startling effort from WINCH - THE WHITEWALL WIZ.

# PROPR CUTS

## CHRIS HANDEGARD

FOR THE COMBAT ENTHUSIAST and  
FIGHTER PILOT WANNABEE

Hi gang, and Greetings from Florida, the Sunshine State! At last, fall and more comfortable temperatures are here! Some of the combat events this year have been real swelter endurance tests!

Sadly my trusty 2000 Ford F-150, a great all around vehicle well suited to carrying lots of combat equipment to the fields of battle, was totaled last week in a pretty horrendous accident. I'm okay, but unfortunately suffered some neck injury that will prevent me from flying for a while. I'll do my best to attend the last two local (Cocoa Beach) events here in November and December even if I'm not competing and give you a report on them.

### BE THERE OR BE SQUARE

Events for November are: 11/13 "Duel Over Malta 2" Open B, SSC, Exeter, CA. 11/13 "Fall Street Brawl" SSC, 2948, Street, MD. 11/14 "IRKS Fall Classic" SSC, 2948, Cocoa Beach, FL. 11/20 "North Dallas Fall Combat" SSC, Open B, Aubrey, TX.

Events for December are: 12/11 "Texoma Winter Wonderland" SSC, Sherman, TX. 12/11 "Pearl Harbor Classic" SSC, Open B,



Fallbrook, CA. 12/12 "IRKS Winter War" Open B, 2948 Scale.

As you can see, things slow down in the winter months and you have fewer opportunities to cut some streamers before the snow flies, so don't miss out! Sign up, suit up and show up! Here's the link to go to the RCCA's event calendar and sign up:  
<http://rccombat.net/events/index.asp>

Signing up online prior to the contest date should be done as soon as possible. This helps the event coordinators and contest directors get all the needed supplies, manpower and club resources to make the event run smoothly. Also the scores of those who pre-register are recorded more easily by the National Points System (NPS) score keeper, Randy Hodges, when you sign up online before the contest. Seeing the names of other pilots you may know or want to compete with is a good draw to



encourage participation, so don't be shy! Sign up early!

Be there or be square!

## EVENTS DEBRIEF

### 5<sup>th</sup> Annual Bushwhacked "Fall Furball"

This two-day event was held in West Palm Beach, at the home field of the RC Bush Pilots, the Phil Wherry memorial flying site. Like many clubs these days the Bush Pilots are located on a former landfill (dump) that is now a public access park which features soccer field, equestrian trails, bike paths, picnic grounds and water areas as well as the long time flying facility overseen by the club.

No club membership required, just a current AMA card. Many flying sites are adapting this format, and are required to do so due to the nature of them being on public property maintained by the taxpayers of a given county. This allows spectators free access to the site as opposed to locked gate "exclusive" sites that try to keep the public out for the most part.

As the contest took place on 9-11 we felt it appropriate to remember those innocent victims who lost their lives nine years ago before beginning. A group of several Cub Scouts and their Scout master, Craig Buttery, who is also an avid combat pilot, presented the American and Scouts of America flags after which a few words of remembrance and a prayer were offered followed by a few moments of silence.

The contest was graced with near perfect weather, but the humidity was so high that we had to use forestry tape in place of crepe paper streamers for the faster Open B class. We have found it to work very well in these situations

when modified with a simple slice across the roll with a razor knife. Just cut straight across the flat side of the roll about halfway through the width of the tape. This places a nick halfway through the tape about every foot or so. Works like a snake charm!



**Photo 1: Flag ceremony presented by the Cub Scouts**



**Photo 2: Remembering the victims of 9-11**

A pattern I am not pleased to report on was evidenced again at this event: low numbers of competitors turning out to fly. Try as we might, times are tough and it is becoming harder for those who are interested in combat to make it to

every event with the result being seven pilots registering to compete in Open B this time.



**Photo 3: Open B Group R-L Standing; Nick Windsor, Jim Nadaskay, Chris Handegrd, Don Fourson, Craig Buttery, Kneeling: Bob Loescher, and Kenny Clements.**

Nick Windsor, from Naples, FL., who I believe is age 14, was the “man” to beat from the early going. With father, Sam, on deck to launch and pit, young Nick had an outstanding day scoring in excess of 3,000 points in the 10 rounds of competition and winning the class by a huge margin. Well done Nick!

Having only seven pilots meant that we flew all up every round and the Open B segment was completed in record time thanks to club volunteers and everyone pitching in to help.

We flew 8 rounds of Open B before lunch, took a break and finished with two more rounds before moving into 2948 Scale class. Always my favorite featuring replicas of WWII fighters, we had 6 pilots registered for battle and got under way after a short break to change things over.



**Photo 4: Flight Line during Open B competition on Saturday.**



**Photo 5: Scale 2948 Group Photo L-R; Kenny Clements, Craig Buttery, Chris Handegard, Bob Loescher, Jim Nadaskay, Don Fourson**

A number of different fighter planes were modeled as seen in the group photo from L-R Grumman “Hellcat”, Republic P-47N “Thunderbolt”, Nakajima J1N1 “Gekko”, P-40 “Warhawk”, another P-47N, and a Ki-43 “Oscar”.



The Gekko is one of my own designs, as are the P-47 and Oscar, and you are looking at the first prototype to see if it has any promise as a combat platform. I am very pleased with the way it handles and will definitely build more of them, as I am one of those just crazy enough to sport a twin in combat. There is nothing equal in the “cool factor” to a twin! Sadly, on day two, Craig Buttery sheared the tail section off just behind the wing in a spectacular midair.



**Photo 6: The final resting place of my J1N1 “Gekko” prototype after a fatal midair with Craig “BigDog” Buttery.**

Craig was flying another of my designs, a replica of the P-47N “Thunderbolt”, also nicknamed the “Jug” for the way the fuselage resembled a milk jug when stood up on end. The P-47 is the second design from my unofficial garage business, “BulletProof Models” and is an outstanding flier when equipped with a good .25-.29 size motor.

I have yet to try an electric setup and have no plans to do so as I have a large number of .25 glow motors to put to use, but I would venture to say with the right electric equipment it would also be a superior flier for combat or sport use.



**Photo 7: Craig Buttery doing a war dance to celebrate his “Kill” of my twin engine Gekko with the sheared off tail section feathering his cap for decoration, Oh the horror! Back on the reservation you savage!**

Craig was the leader of the pack after 10 rounds of all up Scale combat and after a short break to switch gears we went into the final event of the competition, SSC. This event is restricted to .15 size glow motors using a MA 8-3 that is limited to 17,000 rpm and electric power that is restricted by weight and the same prop/rpm restriction. Aircraft must weigh a minimum of 2-1/2 pounds (glow) and a couple ounces heavier for electric to simulate fuel weight.

## **PRECISION CUT KITS**

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**Photo 8: SSC Group photo L-R; Craig Buttery, Chris Martindale, Chris Handegard, Kenny Clements, Bob Loescher, Jim Nadaskay, Ted Cwikel.**

For an event that literally means Slow, Survivable, Combat, SSC can be a real carnage fest and this year's Bushwhacked Fall Furball was no exception! I never saw so many pieces of so many airplanes go flying in so many different directions after being removed from the airplane they took off being attached to in all my born days! Now that's what I call Fun?!?!

Once again Craig Buttery came out on top flying his way cool new design he calls the "ZAPDOS" which can turn on a dime and give you 9 cents change! At one point it seemed everyone was getting so frustrated not being able to catch him they resorted to the old "Dog Pile", or in this case the old "BigDog Pile" method of retribution and landed on top of his plane after it finally quit moving on the ground! All's fair in love and combat they say!



**Photo 9: "Dog Pile on "BigDog"**

For this and other event debriefs with more photos go to <http://rccombat.net/forum/viewtopic.php>.

And also be sure to check out the Palomar Flyers Combat Forum at <http://pfcombat.hyperboards.com/index.php> for some cool combat tips, event debriefs and discussion forums.

#### FROM THE BENCH

Any of you who have been flying combat for any length of time are familiar with the renowned O.S.25FX glow motor. Like the rest of us; you may have been, as I was, horrified to learn some months back that they were discontinuing this mainstay of Open B, Limited

B, and Scale combat with very little else on the market that could take its place.

I have recently learned that O.S. is producing the motor again, but for a substantial increase in price. Retailer's list was around \$90 before the end of production, but the new offering is priced at around \$140, YIKES! As near as I can tell it is the same engine with no modification so for those who have to have it, the .25FX should be just as good as it used to be. One can only speculate how long O.S. will continue this run if the sales are sluggish as one might expect with that price tag.

Fortunately for us the makers of Magnum Engines have not been asleep at the wheel and after hearing from the combat and modeling community that depends on a hot .25 have released their own contender for the .25 glow market, the .25 XLS.

At first glance it appears to be the spittin' image of a .25FX. I have just received two of them and will put them to work soon to see for myself how the XLS compares to the FX. I've heard good things about the Magnum and they both have an X in their part numbers so I hope to see some Xtremely good performance! The really good news is the price of the Magnum which at \$80 makes it the obvious first choice for many of us.



From a short distance away or at first glance they would seem identical but upon closer inspection a few prominent differences become obvious. While the O.S.25 FX has a remote needle which is an integral part of the motor back plate, the Magnum .25XLS comes



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furnished with a standard carburetor/needle valve and an optional remote bracket that enables the user to choose front or rear mounted needle valve positions. One location has fewer parts (front mount) and thus fewer places to leak air or otherwise fail, but is in a forward and possibly more vulnerable location in event of midair and places fingers closer to prop when adjusting a running motor. Not that a rear mount needle valve is safe either as I have broken plenty of them off too and you can get a finger in the prop no matter where the needle is if you are careless.

At first glance it appears the FX has more cooling fins, but upon closer inspection they both have the same number (8) fins. The XLS has cooling fins that start lower on the cylinder and are spaced slightly farther apart.

There are minor differences in carburetors, but both look to be the same venture size and overall design. I'm not going to get technical about porting or timing although there looks to be some outward differences between them. They are virtually identical in weight and output specs.

The bottom line for me after the obvious price disparity is simply how a motor performs under actual use. Does it start easily and reliably? You only have 90 seconds to get airborne in combat and a finicky starter is a no-no. Is it a strong and consistent runner? One that is easy to find a good needle and sucks the tank dry without missing a beat is a must.

Is it able to stand up to some rough handling and still keep going? Are parts readily available? Longevity: can it withstand multiple years of combat without undue wear internally

and pull as good as it did when new (within reason)?

The O.S.25FX has always been one of my engines of choice so it is with great interest that I'll be testing the Magnum .25 XLS to see if it can fill that spot in the combat inventory. Unless ☺.S. comes down on the price of an FX, I'll bet I won't be the only one comparing engines!

Well, that's it for this month gang; I hope you enjoyed it and am looking forward to hearing your comments at [chandegard@peersonaudio.com](mailto:chandegard@peersonaudio.com). Don't forget to clear your guns before you engage and check your six o'clock frequently!

**THANKS FOR THE  
INFORMATION THIS  
MONTH, CHRIS! AND  
THE GREAT PICTURES!  
GODSPEED TO YOU AND  
HOPE TO SEE YOU  
FLYING AGAIN REAL  
SOON!**



# FUN AEROBATICS

ED MOORMAN

## MANEUVER OF THE MONTH: CUBAN-8

**History:** The Cuban 8 maneuver was accidentally invented by Len Povey, an air show pilot, in 1936. Earlier, in 1934, he had flown in an air show in Miami, Florida. After the air show, a representative of the Cuban government who was impressed with Povey's flying, asked him to inspect Cuba's air facilities and pilots. After the inspection in Cuba, Povey was asked to lead and update the Cuban Air Force, the Cuerpo Aereo del Ejercito.

Two years later, representatives of the Cuerpo Aereo del Ejercito again attended the Miami air show. This time Povey was flying a Curtiss Hawk II biplane in Cuban national markings. One of his planned maneuvers was a loop with three aileron rolls at the top. When he attempted it, he found his speed on top was not high enough to complete the three rolls, so he continued partway around the loop, rolling out. He followed this by doing the same impromptu maneuver in the other direction.

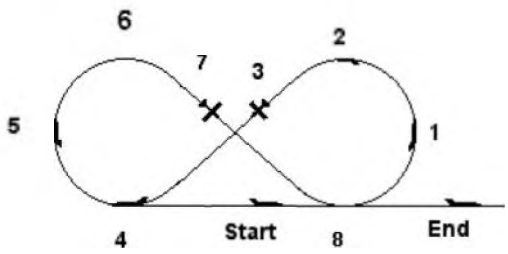
After he landed, one of the judges, Jimmy Doolittle, already an aviation icon, but who would go on to fame and glory in World War II, asked Povey what was the name of the maneuver he had done. Povey answered off the cuff that it was a "Cuban 8." And that's what we still call it to this day.



**DESCRIPTION OF THE CUBAN-8:** The Cuban 8 is a maneuver shaped like an eight lying down on its side with rolls at the cross over point in the center. See the drawing on the R/C Report Online maneuver card. The Cuban-8 is a good-looking maneuver that can easily be done with just about any airplane, including most trainers.

Many people can do a Cuban 8, but they have trouble making it look good. Probably what they are doing wrong is flying it in the wrong direction. Loops and looping type maneuvers looks best when they are started into the wind. Eights look better when you start them flying down wind. If you start into the wind like you

do a loop, it will be hard to get the second half back where you want it and the maneuver looks

RC REPORT MAGAZINE	
TEACH YOURSELF AEROBATICS CARD	CUBAN-8 By Ed Moorman
The Cuban 8 was accidentally invented in 1936 by Len Povey while representing the Cuban Air Force, flying in a Miami air show.	
The Cuban-8 has a low-to-middle level of difficulty. Trainers can usually do Cuban-8s.	
Cuban-8s should be started with the plane flying DOWN WIND.	
Cuban-8s should be done "by the numbers."	
DOING THE CUBAN-8	
Start with the Standard Set-up. 1. Full power. 2. Parallel to the runway. 3. One mistake high.	
	
The Steps in the Cuban-8:	

all stretched out and hard to recognize as an eight. Always start it flying down wind.

**KEYS TO DOING THE CUBAN-8:** Keep the straight line portion where you roll over at a shallow angle until you are comfortable doing the maneuver. Then you can steepen the lines up. Just about every plane can do a Cuban 8.

### DOING THE CUBAN-8

**STANDARD SET-UP:** 1. Full power, 2. Parallel to the runway, 3. One mistake high.

The Cuban 8 should be started flying down wind.

What to do: The Cuban 8 is done "by the numbers." Remember when I taught several of the easier maneuvers and I said they were to be done "by the numbers"? The Cuban-8 is also one of those maneuvers. You use one control, elevator for example, then release the elevator and use aileron. You don't blend the two together. If you do, the maneuver won't look very good.

### The Numbers:

1. FLYING DOWN WIND, PULL UP LIKE YOU ARE STARTING A LOOP. You've done loops before and you've done Immelmans before and the Cuban 8 starts exactly the same except you need to be flying down wind. On a windy day, try one starting into the wind and you'll see what I mean.

2. WHEN THE PLANE HAS PASSED THE TOP OF THE LOOP AND IS HEADING SLIGHTLY NOSE DOWN, RELEASE ALL THE UP ELEVATOR. We are not flying pattern here, so don't shoot for a 45 degree dive. About 20-30 degrees nose low is great for starters. At this angle, release all the elevator. One of the reasons you start shallow is to give you some time to get a feel for the maneuver so you won't be rushed. Stop on the angle and release all the elevator.

3. USE AILERON TO ROLL TO UPRIGHT. If your plane has a normal roll rate you can use full aileron. If your plane pulls off to one side during the roll, you did not release all the elevator. If you have a bad habit of doing this. You may need stiffer springs on your transmitter sticks like my buddy Ugo Ferrari had installed. You can really tell when his sticks are centered.

4. AFTER THE ROLL OUT, CONTINUE THE SHALLOW DIVE UNTIL YOU ARE DOWN TO THE ABOUT SAME ALTITUDE THAT YOU STARTED FROM. If you are diving at 45 degrees, your plane will pick up speed in the dive so the altitude to pull up for the second half comes up really fast. This is another reason to start shallow until you get the maneuver down.

5. PULL UP INTO A SECOND LOOP. Same song, second verse. Try to make the top of the loop about the same height as the first one.

6. WHEN THE PLANE HAS PASSED THE TOP OF THE LOOP AND IS HEADING SLIGHTLY NOSE DOWN, RELEASE ALL THE UP ELEVATOR. As Han Solo said to Luke Skywalker in Star Wars, "Don't get cocky, kid." Release ALL the elevator.

7. USE AILERON TO ROLL TO UPRIGHT. Does it matter which way you roll? No. Make it your easiest direction. I generally roll left because I fly left handed and left is toward the edge of the transmitter case. Most right handed people tend to roll right.

8. LEVEL OUT AT THE BEGINNING ALTITUDE. This completes both halves of the Cuban-8

Errors:

1. Plane pulls off to one side during the roll-you didn't release all the up elevator before rolling. You have to do the Cuban-8 "by the numbers."

2. Plane dives excessively after the roll-Two things cause this, first, you stayed in the loop too long, pointing the nose too far down

before releasing and rolling. Start with a shallow dive at first. When you get to steep, 45

1. Pull up into a loop.
2. After the plane has passed the top of the loop and is heading slightly nose down, release all the up elevator.
3. Use aileron to roll to upright.
4. After the roll out, continue the dive until you are down to the same altitude that you started.  
✓Your speed will build up during this dive and your elevator will be more sensitive due to the speed. Watch it!
5. Pull up into a second partial loop.
6. After the plane has passed the top of the loop and is heading slightly nose down, release all the up elevator.
7. Use aileron to roll to upright.
8. Level out at your initial altitude.

#### Keys to the Cuban-8

1. Always start the Cuban-8 going WITH THE WIND.
  2. Use a SHALLOW ANGLE to start with. Increase the dive angle as you gain proficiency.
  3. RELEASE ALL THE UP ELEVATOR before you roll right side up. If you don't you'll pull the plane off to the side during the roll.
- ✓If your plane is very fast, you may want to throttle back to idle after you pass the top of the loop, before rolling to upright. Add power back in before starting the second loop.

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degree dives, try reducing power to idle before rolling. Second, if your plane rolls too slowly, it will continue to increase the dive during the roll. This can happen when you do a Cuban-8 with a trainer. Increase your aileron movement if you can and use a shallow dive. If you have a radio with dual rate, use high rate aileron for the Cuban-8, then switch back to low rate afterwards.

FEATURE OF THE MONTH: Ed Moorman's Rules For Flying Twins

After building 25 twin engine airplanes, my ancient flying buddy, Carl "Flaps" Laffert, and I



have made just about every mistake there is. I have compiled all of our notes and errors into rules we use to build and fly twins. If you think you will ever want to try a twin engine airplane, you might want to print these rules out and save them. Here they are.

#### GENERAL AIRPLANE RULES FOR TWINS:

Twin Airplane Rule #1: Do not start off with a heavy, scale twin. You will just be looking for trouble. Start with a good flying, sport twin and learn how to handle a twin first. There aren't many ARF sport twins. One good one is the Hobbico TwinStar, available from Tower Hobbies. The TwinStar is made for .25s, but OS .40 LAs or Thunder Tiger .42GPs will work with a little shoe horning. No, there is no way to cram in a larger fuel tank.



**Photo 1: Ed and his Hobbico TwinStar that is powered by two GMS .32 engines. The TwinStar is an excellent first twin.**

Twin Airplane Rule #2: Consider using out thrust. When you lose one engine, the power of the good engine on one side and the drag of the bad engine on the other cause massive yaw and the resulting roll. Out thrust on both engines will help you keep control during an engine out.

Eight (8) degrees is the magic number. I know it looks like a lot. It looks like so much angle you'll swear it can't possibly work. Trust me on this one. The math says the 8 degrees is correct.

For those of you with a scientific calculator, if you have it set for degrees and enter 8, then press COS (cosine), you get .99027. This means that even with 8 degrees of out thrust, you still get over 99% of your forward thrust. Enter 8 and press SIN (sine) you get .1391. This indicates you are getting just under 14% side thrust. The side thrust, pulls the plane away from the dead engine stopping the yaw and roll that usually kills your plane.

For those of you who don't actually trust the math, I am a practical engineer, so I decided to test. [Nah, it was more like, "Who's going to believe this goofy looking out thrust if I don't do a test and prove it?"] Flaps and I bought a Goldberg Tiger 2 ARF and two OS .46AXs to use for power. I knew that two .46 engines in a plane meant for a single .46 for power would be a bit much. It also meant that if one engine quit, I would get a big yaw and roll. If the engine out thrust of 8 degrees worked, I should have no trouble controlling the plane.

Flaps built 2 nacelles and mounted the engines. The weight was a tad over what we figured at 8 ½ pounds, giving it a 32 oz/sq ft wing loading, again rather high. I felt this would really be better for the test. [Nah, that's not what I really thought. It was more like, "Good heavens, Flaps, what'd you do, line it with lead!"] Heavy of not, the test had to go on.

The next Saturday we were out for a test flight. The initial test flight was to trim and see how the plane handled. The Outsider, as I had named

it, took off well and I trimmed it out and did a few maneuvers to feel it out. The OS AXs were singing and I had plenty of power. I found I actually had enough power for a vertical climb. Then I thought about it. It was like having a single OS .46AX in a plane weighing 4 ¼ pounds. After a little more playing around, I lined up for landing. I let the plane set its own landing speed. I throttled back and set it up on a descending glide path. The speed was a good bit faster than for a single engine Tiger 2. It did land safely and continued to land this way throughout the life of the plane, until I sold it, I never had even one bad landing.

For the next flight, I filled the left tank full and the right tank half full. I cranked both engines and took off. I made sure I had plenty of witnesses. The idea was to start flying maneuvers and keep doing them until the right engine ran out of fuel at some unknown time and quit.

I had someone on either side of me when we heard the sound of the engines change. The plane also slowed down, but there was no appreciable yaw and no roll. The plane was still under control with one engine out and one full power and no rudder being used. It worked! Out thrust on both engines worked to help keep the plane under control when one engine of a twin fails.

Next, I filled the right tank full and half filled the left tank. I went up and flew maneuvers until the left engine quit. Same thing. Very little yaw, no roll and full control. The bottom line here is: Out thrust can save your plane. It doesn't look good, but it can save your plane if you lose an engine.



**Photo 2: The Outsider, a modified Goldberg Tiger 2 ARF by "Flaps" Laffert with two OS .46AX engines. Each engine has 8 degrees out thrust to counter yaw if one engine or the other fail in flight.**



**Photo 3: Ed brings the Outsider in for a landing on one engine during the "prove that out thrust will work" engine out testing. Notice: No rudder is being used.**

**Twin Airplane Rule #3:** A twin fuselage design generally flies better than a twin nacelle design. This is my opinion with only two test cases. Flaps and I took two World Models Sky Raider Mach II kits and made a twin fuselage twin. He added a 15-inch extension to one wing and used both fuselages. He lopped off the stabilizers and elevators that were between the fuselages so the ends butted up against each other. The ends of the stabs were connected together for flying with plastic landing gear clips and #2 screws. It was a very simple method, but it worked well.



**Photo 4:** Ed and his T-Raider, a twin fuselage airplane build from two Sky Raider Mach II ARFs. The power is two GMS .47 engines with some out thrust, but not 8 degrees. The GMS .47s were later replaced with two OS .46AXs. The T-Raider was an excellent flying plane, probably my best flying, sport/aerobatic twin.

We did the same thing with a pair of Sonic .25 kits. This twin was powered by a pair of OS .46LAs. This was a good flying twin, also, just not as good as the twin Mach II.

Twin Airplane Rule #4: Twins are heavy. No matter how carefully you build them or no matter how good the ARF is, a twin is more than likely going to be heavier than a comparable single engine plane and it will have a higher wing loading. In our experience, if you kit bash a .46-size plane into a twin, figure on adding 2 ½ up to 4 pounds to the overall weight. Don't forget that in addition to an extra engine, there is the weight of the nacelle with firewall and covering, the fuel tank, lines and filter, engine mount, bolts to firewall and



**Photo 5:** Ed showing his Double Sonic which was built from two Sonic 25 ARF kits. Wider ailerons and rudder were also installed. The power was two OS .46LAs. The Double Sonic was a good flying twin, but not as good as the T-Raider.

engine, prop and spinner. We also went to 3/16" wire for the main landing gear since the 5/32 wire one kept bending backwards even on good landings. These little weight additions just keep adding up. Our Outsider (Tiger 2 twin) came in at 8 ½ pounds instead of a little over 5 pounds for the single. Our T-Raider (twin fuselage Mach II) came in lighter at 7 ½ pounds.

#### CONSTRUCTION RULES FOR TWINS:

**Twin Construction Rule #1:** Keep the throttle servo arms and carburetor arms accessible. When you build your twin, make sure you don't bury the throttle servo arm and the carb throttle arm. You will need to get to them to make adjustments. If you must cowl, then make hatches so you can change or fix the clevis and also adjust the low end mixture setting.

**Twin Construction Rule #2:** You'll probably need a stronger landing gear. If you are scratching a twin from a single engine kit, the landing gear probably won't be strong enough



because of the extra weight. You'll probably need 3/16" wire or a sturdier aluminum gear. We ended up changing out the landing gear of every one of our scratch built twins.

**Twin Construction Rule #3:** Use a strong servo for rudder. I prefer a digital servo since it has greater holding power compared to even a strong analog servo. If one engine quits you want a servo strong enough to be able to hold the rudder against air loading. I like a rudder servo with 75 to 90 in-oz of torque.

After you have made the rudder servo installation and set up the radio, hold full rudder stick and try to straighten out the rudder. Do this in both directions. If you can move the rudder by hand, I would consider 1. changing your servo to a stronger one, or 2. changing the pushrod to a stronger one, or 3. adding braces along the pushrod. You may have thought that rudders were optional before except for takeoff. Not so on twins.

**Universal Truth:** When you start flying twins, you'll end up needing the rudder and when you need rudder on a twin, you need it really, really badly.

**Twin Construction Rule #4:** A pull-pull set-up for rudder is recommended. Beware of long, unsupported rudder pushrods. If I can, I use a pull-pull set-up for rudder. If you already have the rudder pushrod installed and have virtually no way to change to pull-pull, here's a trick. Leave the pushrod in place. Add another horn on the other side of the rudder from the original horn. Run a cable from this horn to your servo arm. This will effectively give you a pull-pull set-up without redoing the whole rudder control.

## ENGINE RULES FOR TWINS:

**Universal Truth:** Engine reliability is number one with twins.

You won't have any fun if your engines don't keep running. Use the most reliable engines you can find. Call me picky, but I want engines that I rarely have to adjust and ones that never quit in flight.

The rest of the engine rules are corollaries to the Universal Truth of reliability.

**Twin Engine Rule # 1:** Break in your engines first. Run them on a test bench and/or fly your engines in a single engine plane before installing them in a twin. If they are fully broken in, you'll have both the high end and the idle needles set. I cannot emphasize this rule enough. Do not put a brand new engine in a twin unless you just love trouble.

**Twin Engine Rule # 2:** Use a fuel filter. I have a filter in my fuel jug, but especially on twins, I have a fuel filter in the fuel line to the engine. This goes along with reliability. Get a little trash in the carb on a single and you throttle back and land. Get a little trash in the carb of one engine of a twin and you may not hear it until that engine leans out and quits. The good engine will mask the sound of the bad engine.

**Twin Engine Rule # 3:** Don't run inverted engines in a twin. Ask yourself of all the RC engines you have seen, which mounting direction has the most problems and the highest engine failures percentage-wise? Of course, a greater percentage of inverted engines have trouble. My opinion: If you really want to shoot yourself in the foot, mount your engines inverted.

Twin Engine Rule # 4: Stick to lower nitro fuel. Fuel with 30% nitro may make your engine scream, but it also may not keep going. Higher nitro fuel runs hotter, it's more expensive and makes the needles more sensitive. Fuel with 5%-10% nitro has a much better chance of running reliably.

Twin Engine Rule # 5: Do not peak the engines out. One will quit in the air. Set them to leave a nice smoke trail. If you normally peak, then back off 2 or 3 clicks, that's probably too lean for a twin. Peak, then back off 4-6 clicks. If you are a person who compulsively tweaks the needle every flight, go fly electrics.

Twin Engine Rule # 6: Do not adjust one engine with the other engine running. You will invariably set it too lean. Set each engine by itself. Hold the nose up to check for leaning out. Shut down, crank and set the other engine. Crank the first engine back up and go fly or shut both down, top off the tanks, re-start both and fly.

Corollary: Do not let your buddies tweak your engines for you. Engines on a twin need to be set slightly richer than they would on a single engine plane. Your buds will lean the engine out too much and it'll probably quit in flight.

Twin Engine Rule # 7: Do not bother to synchronize your engines. I don't, but I know that some people will faint or froth at the mouth over this rule. When I first started flying twins, the experts kept telling me if I didn't sync my engines it would vibrate my plane apart or foam my fuel or any number of other bad things. My experience is to "forget this." If the engines are the same brand, same size and approximate

same age and running time, they'll be close enough.

I had a Twin-Air 45 with two Magnum .52XLS 2-strokes. I noticed that it yawed a little when it broke ground. Probably the wind, I thought, except it was a no-wind day. I decided to check and there was nearly a 1,000 rpm difference in the rpm. The plane flew well, did acro and landed with both engines running. All this with a top end rpm difference of nearly 1,000 rpm. So why should I worry about a 100 rpm difference?

This got me to thinking about testing rpm difference, so Flaps and I broke out the old Outsider and installed two engines of different sizes that used different size props. One was a ball bearing Thunder Tiger Pro .46/11-6 prop on the left side and the other was a plain bearing Thunder Tiger .42GP/10-6 prop installed on the right side. I flew the plane for 3 or 4 months this way and I couldn't tell the difference. No one else noticed they were two different sized engines and props until I told them. I even took the plane to a twin meet in another state and no one noticed. Hey, you can tweak your engines to within 50 rpm of each other, but I'm not going to bother.





**Photo 6: The Outsider with two different size, unmatched engines. On the left nacelle is a Thunder Tiger .46Pro with a Tower muffler for a little extra rpm and an 11-6 prop. On the right side is Flaps' well run, plain bearing Thunder Tiger .42GP with the stock muffler and a 10-6 prop.**

#### RADIO SET-UP RULES FOR TWINS:

**Twin Radio Rule #1:** You really need a computer radio. Flying a twin with a 4-channel is really tough. It can be done, but it takes a bunch of work to do it. If your radio has at least one free, programmable mix, it makes set-up a bunch easier.

**Twin Radio Rule #2:** The worst two throttle set-ups for a twin are: 1. A single servo and belcranks or dual pushrods, or 2. Two servos and a Y-connector. It can be done, but it is really hard to get both engines adjusted evenly. If you absolutely have to use a single servo or a Y-connector, set your engines to be the same at idle and take what you get for the top end. The last quarter of throttle movement changes the rpm very little, so you probably won't notice any difference at full power. If the engines are off at idle, you'll have a harder time taxiing, taking off and landing.

**Twin Radio Rule #3:** Recommended set-ups for using two throttle servos:

-Two servos and mixing. You use one channel for the right engine and a different channel for the left engine and you mix the two together. This works very well, especially if you are comfortable with using the mix on your radio. When Flaps and I first started flying twins, this was the set-up I used.

-Two servos and a JR Matchbox or Smart-Fly Equalizer. Either of these will work great. As soon as I discovered these little guys, I quit mixing and went to a Matchbox. They are like a very smart Y-connector with a microprocessor at the junction. You plug the Matchbox or Equalizer into your throttle channel, and then plug your two throttle servos into it. They allow you to use one channel, but individually reverse the servos, adjust different center points and end points as well as use a separate battery pack, if desired. These gadgets are expensive, but I have used both types several times and they work extremely well.

-Two servos and a twin engine program in the transmitter on some radios. I consider this the easiest and best twin engine set-up. The JR 9303 transmitter I use has a twin engine menu that makes doing a twin very easy. You tell it which channel you want for the second engine and the menu shows right engine and left engine. You can opt for combined or separate trims. It also has dual throttle curves that allow you to match your engines all the way up and down the range. The twin menu is the real reason I bought a 9303.

**Twin Radio Rule #4:** Setting up the throttles. Here's my procedure:

-Before you hook up the throttle pushrods, take both engines, rotate the carbs fully open and



check the angles of the throttle arms. If they aren't the same angle, loosen the nut or set screw on the throttle arm and adjust the angle. You should do this at full throttle since most all carbs will stop at full open and they might not stop at the same place at the low end.

-Turn your radio on and set the throttle stick in the middle. You still have not hooked up the throttle pushrods. Set both servo arms as close to 90 degrees as you can, then go into your Sub Trim function and blip the arm to exactly 90 degrees. If you are using 2 channels and mixing, you can set both midpoint Sub Trims.

-Hook up the throttle pushrods with the transmitter stick at half power and the carb halfway open. What all this does is give you a preliminary throttle set-up. It also tends to equal out any adjustments for top end and idle and make them smaller.

-Go to full throttle on the transmitter stick and adjust the end point to get the carbs fully open. Do this for each engine.

-Go to idle, set your trim to wherever you like it for starting your engine. Use End Point Adjust to get both engines together at idle. You may need to adjust after running the engines.

-You should now have the engines together at 3 points, idle, mid range and full power. You'll need to run the engines to check the settings, but if they are together at these three points, I'll bet they will be together all through the throttle range.

-Obviously, if you don't have enough travel to get the carb fully open or closed, you'll need to move the clevis on either the servo arm or the

throttle arm. Move both clevises to corresponding holes.

-If you are using only one channel, get the idle positions together first, then worry about the top end. Most throttles are non-linear and you can pull back to three quarters throttle and lose very little power. You want the idle settings together so you can taxi and so you can slow down for landing without killing one engine.

## RULES ON FLYING TWINS

Flying twins Rule #1: As long as both engines are running, twins fly just like a regular airplane. A sport twin will fly like a slightly heavy sport single. A heavy twin warbird will fly like a heavy single engine warbird. If both engines are running, they sound great, they're fun, so enjoy yourself.



**Photo 7: Flaps Laffert with his Britten-Norman Islander. Two Magnum .28s for power. This was an excellent flying sport scale twin.**

Flying twins Rule #2: Twins land faster. Since they are usually heavier, twin tends to land slightly faster than a comparable single engine plane. Don't get me wrong, they aren't dangerously fast to land, but they aren't going to ease down like a trainer or a Stick.

I have never needed flaps on a sport twin, but I strongly recommend them on a scale twin. If the kit comes with flaps, plan on using them for landing. I test flew two B-25s for fellow club members. First, I flew one from NitroPlanes B-25. As usual, I got the plane at altitude and trimmed it out. After getting a feel for how it flew, I headed into the wind and throttled back for a stall check with the flaps up. I kept adding up elevator, waiting for the stall to break. In a heartbeat, it snapped over into a steep spin. I recovered, settled down and performed a stall check again, this time with flaps full down. There was no snap roll and spin this time. The plane mushed down and finally stalled gently. When I landed I used the same flap setting and it touched down nice and normal.

A couple of months later I tested a Top Flite B-25. This time I didn't even try a no flap stall series. It had excellent stall characteristics with flaps down, just like the NitroPlanes B-25. Landing was normal. I would not recommend a no-flap landing with either plane. With flaps, they are pussycats. If you are going to fly a big, heavy scale twin, use the flaps.

Flying twins Rule #3: You are going to lose an engine. Learn how to handle it because I can guarantee you are going to lose an engine sooner or later. Handling an engine out means using the rudder. You must learn to use your left hand on the rudder.

Flying twins Rule #4: If your plane rolls over on its own, you have more than likely lost an engine. Starting an uncommanded roll is a very good indication that you have lost an engine and are getting roll due to yaw. Instantly chop the power, get your plane under control. This is paramount. Do not fight the roll until you have

reduced power. Once you have throttled back, roll upright, level off and slowly increase the power, adding rudder as you do. You may not be able to use full power on the remaining engine. Not enough rudder control may mean you can only use partial power from the good engine and still control the plane.

Flying twins Rule #5: Engine out: TRPR (pronounced "tripper") Throttle back first, Regain control, Power up, use Rudder. When you lose an engine, don't get tripped up. TRPR-tripper. Throttle the other engine back immediately so you don't lose complete control. If your plane started a roll, it's a lot easier to roll level if you aren't fighting a big yaw. With the power back, regain control. The plane should be basically straight with very little yaw. When you get things sorted out then you can ease the Power back in and add Rudder to control the yaw. I know that I have said practically the same thing twice, but if you violate this rule, it can be a killer. THROTTLE BACK, REGAIN CONTROL, POWER UP, USE RUDDER. TRPR-tripper

Flying twins Rule #6: Know your airplane. Some planes will fly on one engine and some won't. If the plane is a big heavy scale plane, hold rudder and steer for a nice flat area to set it down. Do not try to stretch the glide, you'll only stall, drop a wing, crash and really tear the plane up. It's a lot easier to repair a plane that has scratches and dings from landing in the brush than it is to rebuild one that has gone straight in. On a big scale twin, get the nose down, keep the speed up so you don't stall and land as safely as you can. If the plane is a good flying sport plane, get it back under control, hold some rudder and, if possible, fly back to

the runway or the best alternate landing spot and sit it down.

## RULES FOR FLYING A TWIN ENGINE SEAPLANE:

I added this section after thinking that some people like Flaps and I, might want to try their twin on floats. I will admit that I have owned and flown exactly two twins on water. I don't claim to be a twin engine-float expert. Flaps and I have done 25 twins and over 20 seaplanes, so we have paid our dues in both areas, just not with the two types combined.

Our first twin engine seaplane wasn't planned. It was a "let's try it and see if it works" float conversion. I had a .32 powered, Hobbico TwinStar that wasn't very exciting, so one day Flaps and I decided to try it on floats. The floats were a pair of balsa sheeted foam floats I already had. At first I used the same pair of .32s that I flew the plane with on land. Later, I switched to a pair of Thunder Tiger .42GP, plain bearing trainer engines. Good and easy flying plane, both on land or water and a good first float twin.

Our second twin engine seaplane was a semi-original delta wing. Flaps and I had taken a Diamond Dust kit, widened it and installed two engines. We used a single fin with a rudder. I never have liked planes that didn't have a controllable rudder. We used OS .25FXs with Jett tuned mufflers for power. We got tired of flying it and I had just acquired a pair of fiberglass floats, so rather than hang it up we went for a seaplane. For the water version, I pulled the .25s with tuned mufflers and installed two OS .46LA, plain bearing trainer engines. It



**Photo 8: Our TwinStar on floats. During the time I had it, it was necessary to recover the wing. I used fluorescent yellow Ultracote for visibility and installed larger ailerons. The struts are U-Can-Do-3D landing gear ordered from Tower. The floats are balsa sheeted foam with lightweight fiberglass cloth applied with water based polyurethane and then sprayed with blue Lustrekote.**

was a little hard to get off the water, but a good flying plane with or without floats.



**Photo 9: Ed and his Sea Delta, a twin engine, delta wing, seaplane. It was built by Flaps Laffert. The power is two OS .46LA's. Fiberglass floats that were given to me.**





**Photo 10: The Sea Delta in flight. Good reliable engines. Good flying plane. Very different looking.**

Universal Truth: Do not make a twin your first seaplane. Likewise, do not make a seaplane your first twin.

Twin Engine Seaplane Rule #1: Learn to fly a single engine plane on water first. This is an absolute must. Taking off and landing on water is slightly different from on land. You need to learn these techniques first before trying a twin on water.

Twin Engine Seaplane Rule #2: Don't make a seaplane your first twin engine plane. Learn about twins first. Learn about seaplanes. Then you can put them together.

Twin Engine Seaplane Rule #3: All of the engine rules apply doubly, especially reliability. You really need well broken-in, well tuned, reliable engines for a twin seaplane. Notice the engines I used on my twin seaplanes. Both are relatively cheap, plain bearing engines normally used for

trainers and second planes. Say what you will about the OS .40-.46LA and the TT .42GP. These engines are made to be mistreated by a beginner and keep on trucking. They are simple and very reliable, just what you need for a twin and for flying over water.

Twin Engine Seaplane Rule #4: Never, never, NEVER use a wood prop on a seaplane. The water will break it. It'll look like someone tossed a can of marbles through your props. Stick to the reinforced plastic props.

Twin Engine Seaplane Rule #5: Use a water rudder, preferably two; one on each float. Try taxiing a twin with one engine out and only one or no water rudders.

Twin Engine Seaplane Rule #6: Always have a recovery boat.

Twin Engine Seaplane Rule #7: You have a big runway, use it if needed. If something goes wrong in flight, throttle back, set the plane down and call for the pick-up boat.



Well, I tell ya, Mom coming on board has really lightened my load on this side! I can just jump right into what's happening out there! If only, you good folks would send in some information on your events!

The first weekend of December, head to Mesa, AZ, for WINGS OVER ARIZONA. Paul Goldsmith, CD, can be reached at: [wiinger@aol.com](mailto:wiinger@aol.com). Visit:

[www.azmodelaviators.com](http://www.azmodelaviators.com). IMAA membership available at the event. NO overnight parking due to flood control restrictions. Trailers may be left overnight as the club will provide security. Pizza party Saturday night w/pizza, wings and soft drinks. Limited RV parking 1/2 mile away at \$10 a night. Please call ahead.

On December 3 and 4, 2010, visit Andersonville, GA, and attend SOUTHERN DAWN PATROL. You can email Dale Cavin, CD, at [dcavin@earthlink.net](mailto:dcavin@earthlink.net). Visit: [www.chipolarcaviators.com](http://www.chipolarcaviators.com). Scale WWI warbird fly in. Open to all RC models of warbirds produced through 1918. Limited RV hook ups and other camping on site. Plaques and awards for various categories. Landing fee \$20.

The BLACK SHEEP INDOOR RECORD TRIALS will be held on December 10, in Burbank, CA. Contact Tony Naccarato, CD, at [aeronacc@aol.com](mailto:aeronacc@aol.com). Events 206, 212, 218-219(JSO)



Take a pre-Christmas trip to North Las Vegas, NV, on December 11, and donate a toy for TOYS FOR TOTS. Greg Clemensen can be emailed at [electricgreg@cox.net](mailto:electricgreg@cox.net). Visit [www.rebelsquadron.org](http://www.rebelsquadron.org). This is a charitable fund raiser for the United States Marines Toys for Tots. Pilots requested to donate an unwrapped toy.

Ring in 2011 in Palm Bay, FL, for the KING ORANGE INTERNATIONAL. Joe Clawson has your party hat and you can claim yours by emailing him at [claw3132@bellsouth.net](mailto:claw3132@bellsouth.net). Events 101, 102-3C, 142(J)(SO), 102, 103, 104, 105, 101C, 104-5C, 106, 122, 124, 128, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160-161, 501, 503(JSO).

Guess Old Man Winter is getting a grip on all of you out there! Let's see if there is anything going on in the non-sporting area!

On December 5, in Mt Vernon, IL, the REND LAKE RC CLUB SWAP SHOP AND AUCTION will be taking place at the Roland Lewis Bldg. John Manion, CD, can be reached at [jjmanion@charter.net](mailto:jjmanion@charter.net). Hobby shop owners admitted at 8AM for set up. All others admitted at 8:30AM. Admission is \$5, which includes one table. Extra tables are \$5 each. Food and drink available.

The following weekend, December 11, in Cedarville, IL, the FREEPORT RC

Email questions to Charles Krempin at [charleskrempin@gmail.com](mailto:charleskrempin@gmail.com). Come and enjoy our swap meet. \$5 entrance and free tables. Open 7AM to 1PM. Open flying afterwards, weather permitting.

Beat the Christmas traffic and get to West Leechburg, PA on December 19, for the TAILSPIN HOBBIES FLEA MARKET AND HOBBY SHOW taking place at the West Leechburg Fire Hall. Leo Rodriguez has all the Christmas CDs, so send him an email with your musical requests. His email is

[lrodriguez44@verizon.net](mailto:lrodriguez44@verizon.net) Visit:

[www.tailspinhobbies.net](http://www.tailspinhobbies.net)

Admission \$2, children under 12 free with adult. Indoor race track demo, indoor rock crawler demo, indoor demos of planes, helis, trucks, model trains. 20,000 sq ft of indoor exhibits.

Let me hear from you! Send in your event information by email,

via the office: [juliac@rcreport.net](mailto:juliac@rcreport.net), with information concerning upcoming events that you are aware of – no matter how big or small! Attach a flyer, too! If you don't tell the RC world about it, the RC world will never know to visit and fly with you in your part of the country! And don't you want to make new friends?

Happy Thanksgiving!

Isabelle

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MODELERS will be hosting their swap meet. Come see them at the Cedarville Community Center. Jeffrey Burd can be reached at [jburd1250@hotmail.com](mailto:jburd1250@hotmail.com) for more information. 17<sup>th</sup> annual swap with set up 8:30AM. ☺ Open 9:30AM to 2PM, auction at noon. Raffle, table rent is \$12 in advance and \$15 at door (includes admission). General admission is \$5.

That same day in Hico, TX the 8<sup>th</sup> ANNUAL BUZZARD BUSTERS RC SWAP MEET will be held at the Hico Junior High School Cafe.



Wow! Can you believe it's November already. With the weather getting colder and the days getting shorter; it's time to spend some time in the garage and do some building. This month I want to talk to you about conversions from glow to electric using the Yak 54 I reviewed

inventory from Steve Neu. NEU motors are ultra efficient and have been used a lot in the past with the addition of a planetary gearbox. Now, personally I never have liked the idea of a gearbox because it's just another piece to worry about. A gearbox for a high-powered motor has

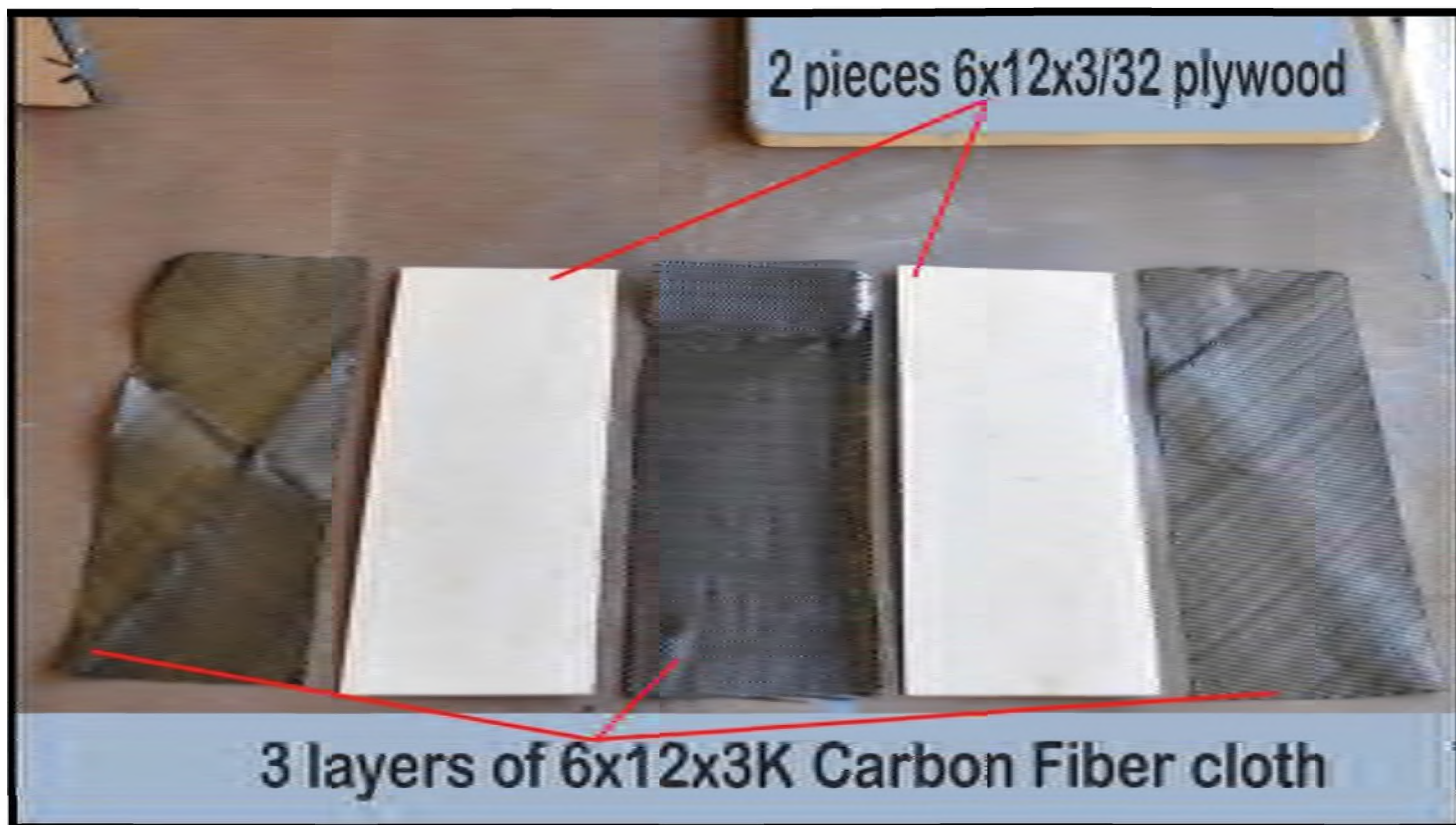


to be greased on occasion and it just another maintenance item that I did not want to have. Well Steve came up with a new version of his runner motors that have been touted as outrunner killers. The NEU 1915 series of motors are capable of a continuous 1800 Watts with a short-term burst current of 3600 Watts. The 1915 series of motors has a KV range from 680 KV to 225 KV. These motors have 24 slot stators and 8 pole rotors. In order to get an eight pole rotor, the magnets are attached to a machined aluminum cylinder and then wrapped with a carbon fiber tape.

last month. Then add in one other item this month; doing some work with composite materials. The use of composite materials can greatly reduce the weight of an aircraft, but still provide amazing strength and durability.

For my conversion I will first need to replace the Evolution 1.20 engine that I installed in the Yak 54 kit review last month. I decided to use one of the two motors that I have in my

I will be using the NEU 1915 2.5Y 268KV motor on the Yak 54. Now NEU motors do not come with any mounting hardware, so I need to make some kind of mount for this motor. The motor mounts from the front with four 3 mm metric screws. I looked through my collection of old motors to see if I perhaps had a motor mount that would fit this motor, but nothing I had was adequate. I decided I would have to make a firewall mount



for this motor. I have several pieces of plywood on hand, but they were all very soft, so a trip to the hobby shop was in order. I came back with a piece of 3/32in plywood that had four very tight layers. Now, of course, a 3/32 firewall is nowhere near strong enough for 4 Hp, so we are going to strengthen it by laminating with some additional carbon fiber cloth reinforcement. Now don't be afraid and scared of the scary "carbon fiber" word. You could use fiberglass cloth, but carbon fiber is stronger for this application.

Carbon fiber cloth is readily available on the internet from hundreds of manufacturers, but I tend to use [Soller Composites](#). They have the best prices on carbon fiber and allow you to buy smaller quantities. I will be using 1.5 ft.<sup>2</sup> of 3K 12.5x12.5 plain weave 5.7 ounce per square yard carbon fiber cloth to reinforce the laminations of plywood. From Soller Composites, this 1.5 ft.<sup>2</sup> cost about eight

dollars! Now that I have thrown in some new letters, let me explain a few of them for you. I referenced 5.7 ounces per square yard carbon fiber earlier. This means that that particular piece of cloth weighs 5.7 ounces for a piece that is 36" x 36". That's very simple, but I also said 3K carbon. Generally there are different weights associated with carbon fiber: 1K, 3K, 6K, 12 K. etc. The number reference is the number of thousands of strands in each piece of the weave. So 1K carbon means each strand has 1000 smaller pieces of carbon fiber in it, whereas 3K carbon fiber means there are 3000 pieces of carbon fiber in each strand. The higher the number of K, the denser each strand is therefore each strand is larger and larger. Now one final reference is the 12.5 x 12.5 plain weave. This means in one square inch there are 12.5 strands and the horizontal axis and 12.5 strands in the vertical axis. Remember with 3K, each strand has 3000 individual pieces of





resin; I am using an epoxy from Aircraft Spruce called MGS laminating resin. This epoxy resin is very thin and has amazingly high tensile strength. For this MGS resin I'm using a slow acting hardener for a 24-hour cure time on the epoxy. Now this MGS resin is a specialized glue and is what I have on hand, but you can use any thin slow

curing epoxy like West Systems or Z-poxy finishing resin from ZAP. The key here is you want a very thin consistency so it can penetrate the fibers of the carbon and soak into the wood very well. We are looking for consistency somewhere in the vicinity between a thin CA glue and a medium CA glue. I've got everything cut and ready to begin the process of laminating everything together.

carbon fiber in it. Now this is a whole bunch of information, but this is just a starting point. Here is a link to solar composites FAQ area in the website. Jon Soller has put together a very informative page on everything you need to know about carbon fiber. ([More carbon fiber information.](#))

Okay, now that we have carbon fiber cloth and the plywood; let's get to the laminating process. I plan to use three pieces of carbon fiber cloth and two layers of plywood to make my firewall. I's starting with an outside layer of carbon fiber, then a plywood layer, another layer of carbon fiber, another plywood layer and one final layer of carbon fiber on the back. For laminating, I'm going to use epoxy resin, but not just any epoxy

- Step one: Make sure to mix the resin thoroughly with the correct ratio as listed on your resin. MGS resin is mixed two parts resin to one part hardener by volume. I recommend you mix the resin



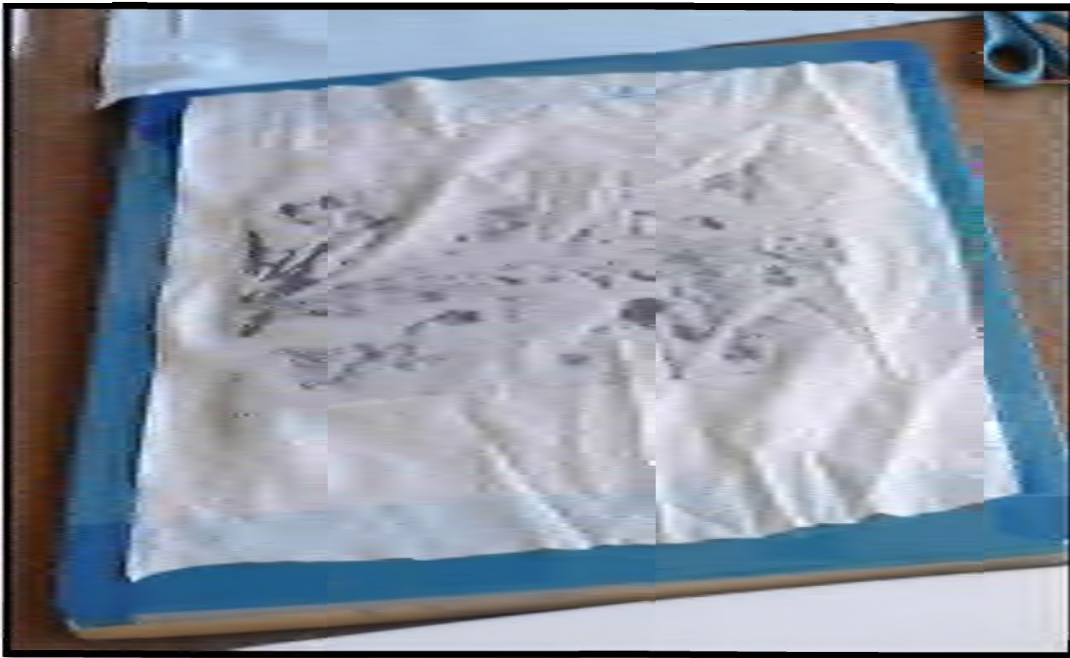


for at least five minutes to ensure everything is mixed completely.

- Step two: we are going to build this like a cake, so we're going to start with the bottom and that is the first layer of carbon fiber. We need to thoroughly saturate (or wet out) this piece of carbon fiber with the resin. You can use a small bristle brush or even a foam roller for this. I like to use a top from a plastic storage box for this. It is easy to clean up and has a slight bowl shape to keep from spilling excess epoxy.
- Step three: remove the first layer of wet out carbon fiber cloth and lay it on a flat

surface protected by a double layer of wax paper. I use a flat board like a wooden cutting board. The epoxy will probably stick to this wax paper, but can be sanded off later.

- Step four: place the first layer of plywood on top of the wet out carbon fiber. If you wet out the carbon fiber enough, there's no need to put any additional resin on the actual piece of plywood.
- Step five: repeat steps two through four, alternating the carbon fiber and plywood



air conditioning repair work. This pump can draw down to just over 29 inches of vacuum pressure when properly sealed. To make sure that we draw a good vacuum and get all the air out of the bag, there are a few more items to add to our epoxy/plywood carbon fiber cloth sandwich of materials.

Now you have keep everything secure while the epoxy resin dries. The first option is very simple. Just add another double layer of wax paper on top and then apply some weight via boards, books, bricks whatever and then leave it overnight. You need to make sure you have enough weight to squeeze out the excess epoxy as well any air bubbles that may have formed between the sheets of plywood and carbon fiber cloth. The second option does require a bit more hardware and a few specialized goodies: vacuum bagging.

Vacuum bagging is a process where we cycle the air out of the bag and negative pressure squeezes everything with a lot of force. If you remember back in the infomercial days of the “seal a meal”, where you would put your leftovers in a baggie and suck the air out of them! This is basically what to do, but we will use a vacuum pump that is considerably more powerful than any found in a seal a meal kit! Since I brought up the term vacuum, we need a vacuum pump. I'm going to be using a Yellow Jacket brand vacuum pump that is designed for

The first thing to add is a piece of peel ply material. This nylon peel ply material goes on top of the last layer of carbon fiber and extends over and beyond the edges of our sandwich. Peel ply allows air and epoxy to pass through it as we pull the vacuum down on the piece. On top of our peel ply were going to add a double layer of breather fabric. Breather fabric is nonwoven polyester that keeps our vacuum from getting sucked down to a single point. We need a slight gap to allow a path for the air to flow into the vacuum pump. Without this you would have a situation very similar to taking your shop vac and sticking it to the side of trash bag. It would immediately be sucked to the bag and stop any airflow. This fabric maintains a very small negative area where the air within the bag can move to as the vacuum is generated. The second thing this breather fabric does is soak up



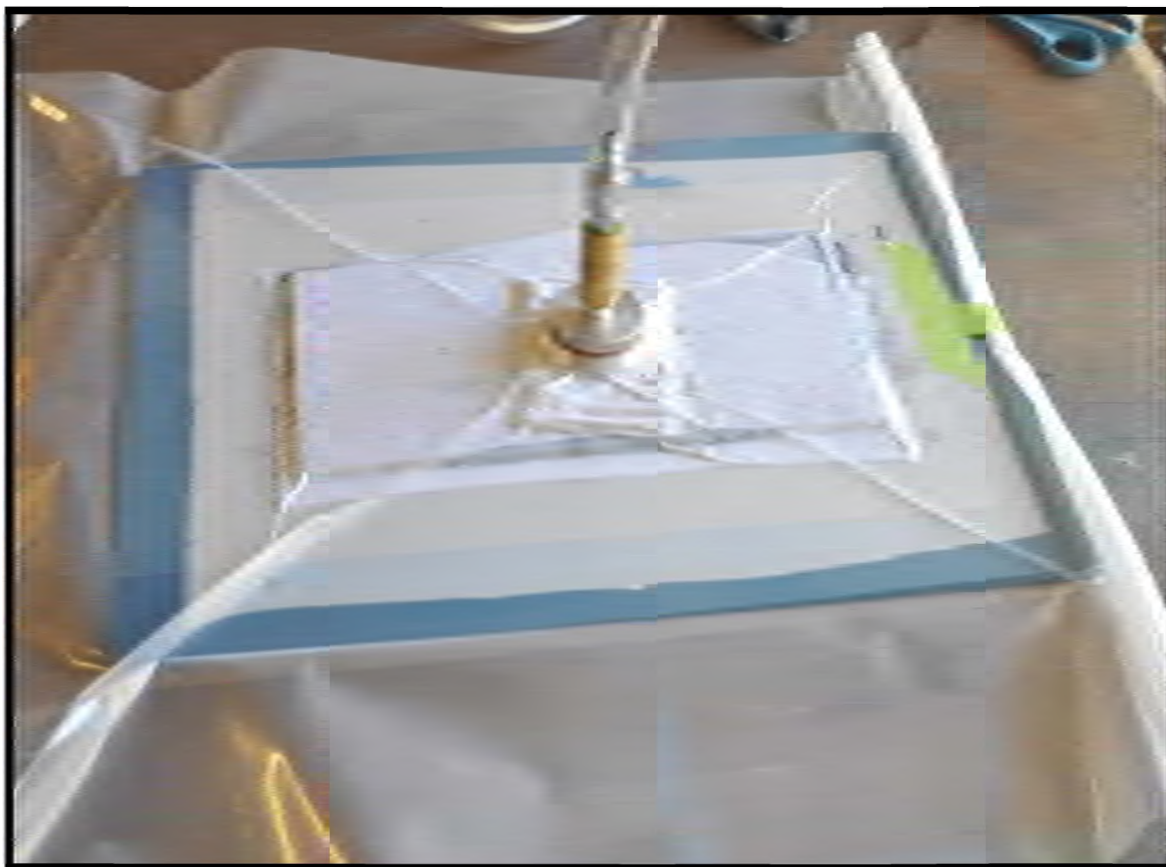


excess epoxy resin as it is squeezed. Now with everything ready, I can now slide the entire sandwich, and board that it is built on, into the vacuum envelope. This vacuum bagging envelope material is also available online at [FiberGlast](http://FiberGlast.com). This polyethylene film will completely encase the part, once both ends are sealed up. We still have to draw vacuum the part somehow. Now, finally we can add what's called a through the bag vacuum puck. A through the bag vacuum connector is a two-

piece connector that pierces the bag to allow the vacuum to be pulled on it. A small flat puck goes in the bag itself in the center of the part. A small cut is made above the puck and the second piece of the connector is installed exterior to the bag. Now we have a way to hook our pump up to the bag. Our bag is currently still open on both ends. We need to seal these ends up somehow, so generally we could use a heat sealer or even a bagging tape. Bagging tape is kind of a sticky putty like tape that just sticks







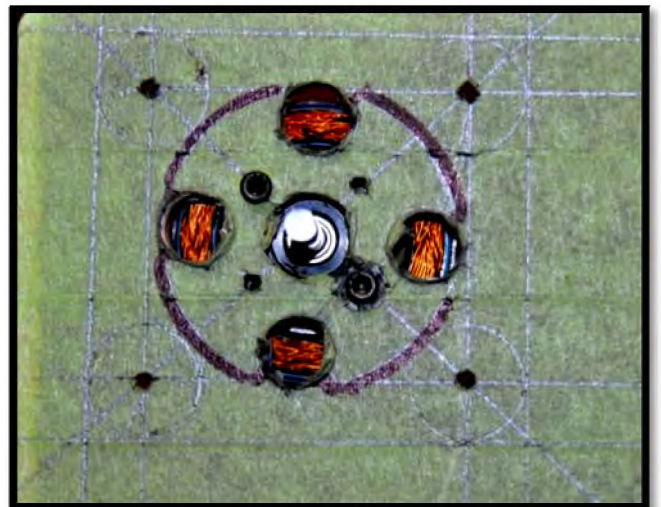
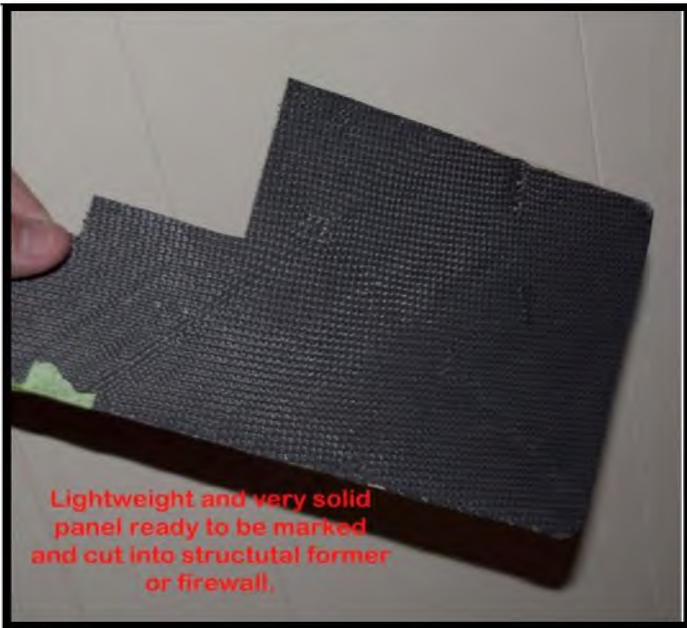
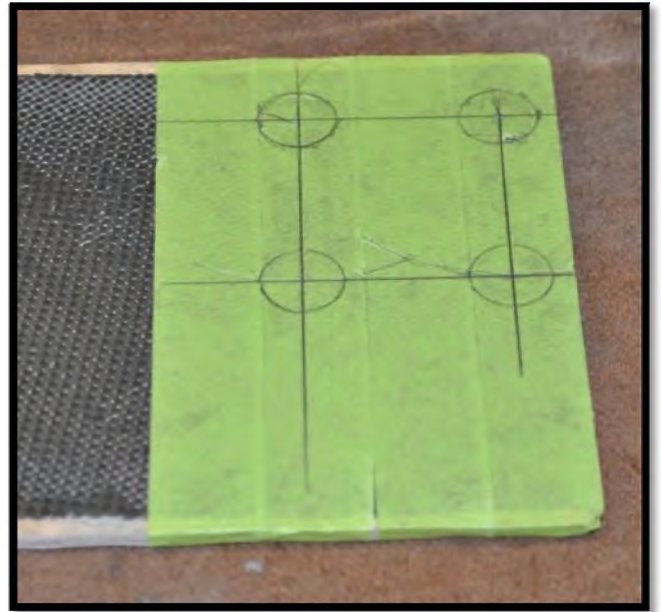
board. I checked the vacuum pump to make sure we are pulling good vacuum and it reads about 29 1/2 inches of mercury. If you don't see a good vacuum like this you probably have an air leak. To feel just how much pressure you have on this piece, you can try to pull on one of the pleats created by the

the two sides together, but in this case I have a very flat surface on both sides and plenty of excess bag on either end, so all I have to do is roll the ends up slightly and tape them in place. I turn the vacuum pump on and the pump is drawing down to the smooth surfaces of the

bag. This should be very tight and you should not be able to move the connector around very much where it is sucked down on the center of the part. Now it's time to wait. MGS resin, with the slow hardener, needs to be held under vacuum for lease 12 hours while at room temperature. A warm shop will accelerate the curing of the resin to some extent, but don't disconnect the vacuum until the epoxy is cured. After the epoxy is cured, we can disassemble everything and see what we have. Now the breather fabric is saturated with excess epoxy, as it should be, and we see the imprint of our vacuum bag connector in the fabric. Don't bother trying to pull the fabric off, but rather grab the peel ply from the corner and begin rolling it back. Almost nothing sticks to this peel ply, so just pull very hard and it will peel off of



the part. Now we can just remove the part from the board and see what we have.



The panel turned out very well and we can now get back to the conversion effort. Remember that we originally decided to laminate this panel up to be used as a firewall mount. Carbon fiber doesn't allow a sharpie marker to show up very well, so I like to cover the piece with a layer of masking tape. The tape gives a good surface to make our measurements on and prepare for cutting and drilling as necessary for mounting the NEU motor.

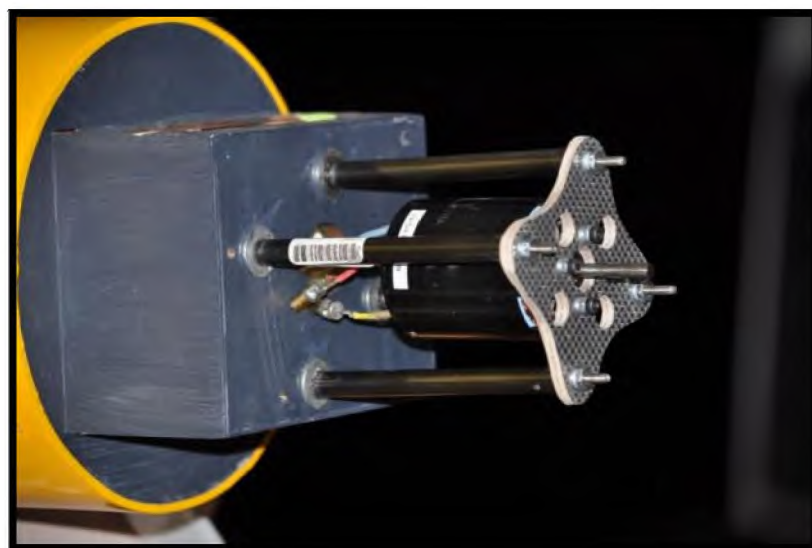




Now we can turn back to the fuselage and work on mounting the mount to the fuselage of the Yak 54. As a temporary mount, I used some carbon fiber tubing to act as spacers. These spacers will position the new firewall forward into the front of the cowling. I am using a 6/32 all thread passing from the original firewall, through the carbon fiber tube spacers and fastening onto the new, relocated laminate firewall with the NEU motor mounted to it.



Well, I hope this “laminating composite 101” session was informative and helpful. Now I don’t expect everyone to run out and buy all the hardware, epoxy and carbon fiber to be a composite manufacturing company, but I just wanted you to have some information on the steps required. If you are willing to give the laminating of composites a try, I think you will be pleasantly surprised at what you can do with a little time and know how. Not counting the time for the curing while under vacuum, it took longer for me to write this article, than it did for all the steps I described. Now if you would like some composite panels like I made in this article, just let me know, I’ll lay it up for you for a small fee!! 😊



Tony Coberly

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## ParkZone Night Vapor BNF



**Retail:** \$129.99

**Street Price:** \$99.99

**Plane type:** Indoor Ultra Micro flyer Bind N Fly version

**Weight:** 15 g w/o battery, 18 g with provided 70mAh LiPo

**Wing Span:** 14.75 inches

**Wing area:** 85.32

**Wing loading:** 1.07 oz/sq.ft.

**Included in kit:** Prop, rubber tip spinner, airframe with 6 micro LED lights, four AA dry cell batteries, and DC quick charger, manual.

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The ParkZone Night vapor BNF is the next variant of the ultra lightweight indoor flyer from ParkZone. The Vapor has been a huge seller for ParkZone because it allows most anyone to fly a great little plane in a very small indoor space. The Vapor is very easy to fly, and can be flown in an average size living room if you don't mind flying in circles. Any gym with a half basketball court can allow for hours of fun. The Night Vapor adds another

dimension to the indoor flying with a great light set. The leading edge of the wing has three micro LED's that are very bright, and amazingly tiny. I mean the LED's measure 1.5mmx2.0mm. When they are off, you don't even see them! The trailing edge of the wing had one red blinking LED on the left wing and a green flashing LED on the right wing. Finally there is a blue flashing LED on the bottom of the stick fuselage halfway back to the stabilizer. The receiver also has a small LED on it that is very bright and the light is reflected on the underside of the wing.

The first thing we need to do is get our DSM2 transmitter of choice. I first go to my Spektrum module for my Futaba 12 FG and run through the binding procedure without any problems. *(One other note here; I also used the five channel Eflite LP5DSM transmitter that came with my MCX helicopter and had to make zero changes to the transmitter. I didn't have to change any switches or anything!)* Flying the Night Vapor was exactly as expected. The first few passes I flew with the battery in its recommended location, but then I landed and made a small change. For tight indoor flying, high alpha is our friend, so I unclipped the battery from the holder, and let the battery hang down by the wire. Now the battery connector is new and very tight so it holds the battery very well; after all the battery only weighs in at three grams. The hanging battery moves the CG farther to the rear and allows me to slow down the airspeed, while keeping some power on. This rear CG and power on condition allows the nose to be kept high thus slowing the overall air speed! After several

flight sessions you may have to add a small piece of tape to help hold the battery onto the connector. The more times you remove the battery to charge it; the connector will loosen up a bit. Now we can have much more fun with spot landings on tables and chairs, and short field takeoffs from most flat surfaces the size of a piece of notebook paper!

Flying the Night Vapor outside is fun, but the wind is not an option. Anything more than a gentle wind will take your Night Vapor away so be careful. While in Tennessee at the Coffee County Airfoilers electric fly in, we had a blast at night. We had absolutely no wind and the night planes came out. I set up my Nikon D9 ☺ to take some time lapse photography of the Night Vapor. It was great fun and I think the shots came out very interesting after a bunch of test shots and setting changes. The Night Vapor has just the right amount of lights on it to keep orientation and flies slow enough that if you do loose orientation you can just wait and see what happens!

The Night Vapor is a welcome addition to anyone's hanger and can be flown by beginners and advanced pilots alike. The Bind N Fly allows you to use a DSM2 compatible transmitter, or one of the many transmitter module options out there. Everyone needs one!

Tony Coberly

TonyC@RCReport.net





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- FrSky TF Module:
  - (TF-8M, TF-14M)

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- Small to medium aircraft use

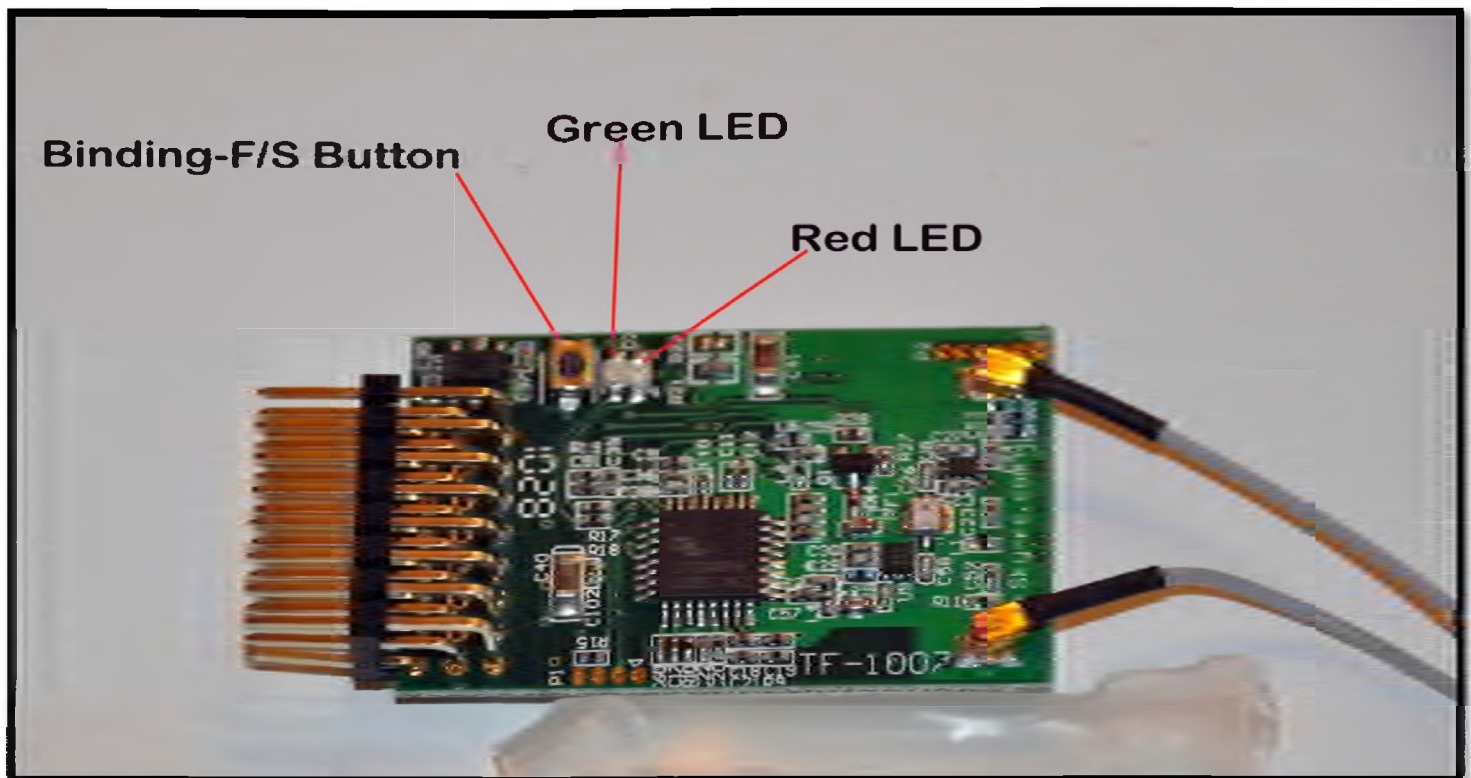
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There is a new 2.4 GHZ receiver out there that is dubbed to be Futaba FASST compatible. The eight channel OrangeRx8 from FrSky-rc.com has arrived. The OrangeRx8 is now available as a drop in receiver for “small planes, helis, parkflyers or even medium sized sport planes” to quote the FrSky.com website. Well, this statement does make a person think for a minute. If this is a Futaba FASST compatible receiver, I would be led to believe that it should be just as capable as a genuine Futaba 8 channel FASST receiver. I run my 7 and 8 channel receivers in planes much bigger than medium size sport plane, so why the limitation? Well, let’s look at the receiver itself and go from there.

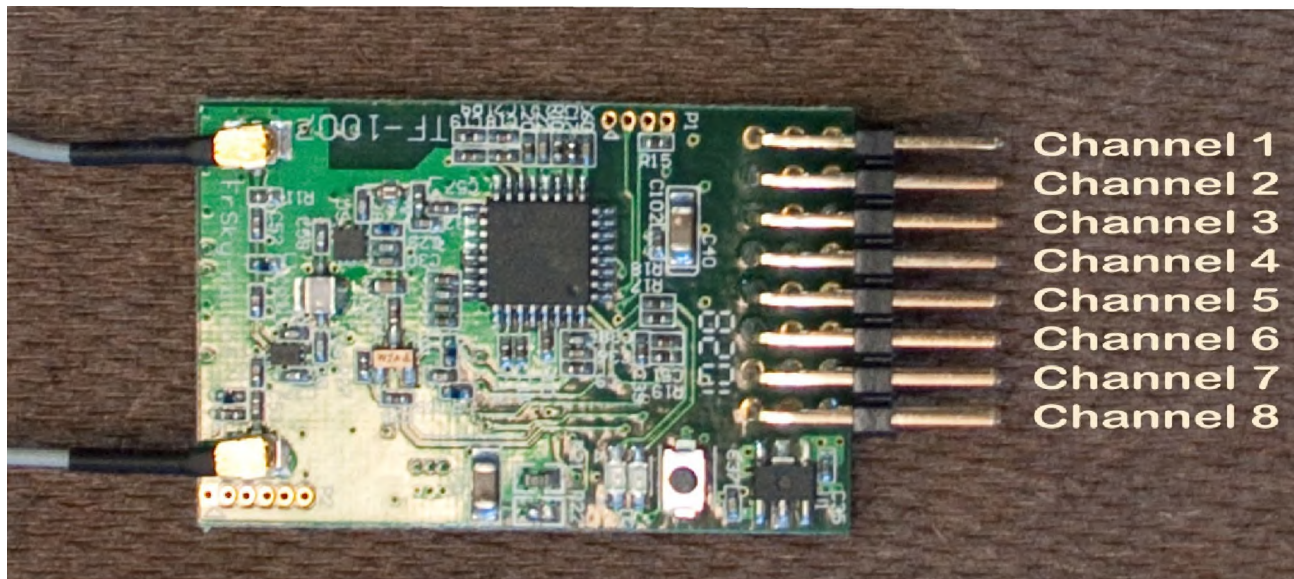




The front of the OrangeRx8 Futaba version is very simple and consists of a PCB (printed circuit board) fitted with several surface mount components with two antennas exiting one side of the receiver, and eight servo connections out the other. The PCB is simply covered with a clear heat shrink tubing. Through the clear shrink tubing there is a small button on the board that we can assume is the binding button for the receiver. The back of the receiver has a part number sticker that hides the rear of the PCB. Since I could not see the rear of the board I decided to get a closer look by removing the shrink tubing for inspection. I'll replace it later. The rear of the receiver reveals several more surface mount components. Not surprisingly none of them are labeled Futaba! All solder joints look fine with no sign of cold joints, so let's get into the how to setup this receiver.

Well, the first problem is, there are no instructions included with the ☺ rangeRx8

receiver. I will have to guess on what set of pins is channel 1 since it's not marked, or I can just check the website. The manual shows the pin outs for all eight channels as well as the binding procedure and how to set failsafe conditions. Now to bind the receiver, we just power up the transmitter. In my case I am using a Futaba 12FG. Hold the button on the receiver while powering up the receiver. The red and green LED lights are illuminated if the receiver has not been bound to a transmitter yet. When the red LED goes out and the green LED stays on the transmitter and receiver are now bound together. Now an odd reference in the manual is that of the failsafe system. We are instructed to disable the failsafe in the transmitter. Well, I generally just let the default failsafe in the transmitter take over if the receiver loses link. I just like for the receiver to do nothing at all until the link returns. I mean, if I just gave the receiver a full up elevator command,



proceeded  
to the field.  
A ground  
run test  
proved  
successful  
with no  
lockout or  
jitter out to  
50 paces.  
Now it's  
time for  
flight

then the receiver loses link with the transmitter. I want the receiver to hold that up elevator command until it finds the transmitter signal again. The OrangeRX8 has a failsafe option where you can manually set the positions of the control surfaces in the event of a link loss condition. Now depending on your needs, you can set the position of all control surfaces by powering on the transmitter and receiver. Assuming you have installed the receiver in the plane and already bound it to your transmitter; you simply position the sticks in the positions you want them to be in if transmitter link is lost and then push the button on the receiver. The green Led will flash twice indicating that it "Remembered" where your stick positions were, and at loss of signal the receiver will return the control surfaces to this position. A simple power off of the transmitter should cause the receiver to move to the programmed position. To reset this receiver based failsafe simply rebind the receiver the transmitter and you're done.

Well, now all we need to do is install and test the receiver for range. I installed the receiver in my 2 meter foam powered glider and

testing. I gave the glider a toss and off it went. I climbed out to about 750 feet and started flying figure eights in the sky. Each pass I made the eight wider and wider. I had no problems at all so I then turned off my transmitter while flying straight and level with just ¼ throttle setting. The glider passed by without issues and if you did not know the transmitter was off you wouldn't have known. Now I turned the transmitter back on and decide to climb out again and move to the far north end of the Rocket City RC field. I climbed high until I only had a dot to fly. There was little to no reference for wings, just a circling dot. I was probably approaching 1000 feet high and more than 2000 feet laterally across the ground. Calculating the straight line distance with those figures I was about 2200 feet away. I flew for 15 minutes, as high and as far as I could see without a single perceivable glitch while hunting thermals. This was a very successful test, but now I wanted to add in another real world test.

I headed up to the annual Tennessee Electric Fun Fly in Coffee County. I have heard

through the grapevine that these receivers have problems when multiple 2.4GHZ radio transmitters are in close proximity. So what better place than a fly in where there will be 50+ pilots with mostly 2.4GHZ radios? I talked to the CD of the event and told him what I wanted to do. I took off with my glider and once again climbed high and far to the north end of the field and began to fly from north to south continuously. While I was flying there were five other people in the air; flying various 2.4Ghz systems. The CD of the event then asked all pilots that have 2.4Ghz radio systems to then power up their transmitters. At a minimum, 12 transmitters were on, not including my 12FG, and no problems were experienced. I even climbed a bit higher and flew past myself to the north end once more and turned off my transmitter. The glider simply stayed in the gentle left hand bank as though it had sniffed out a thermal. While my transmitter was off I was able to count 10 transmitters to the north of me that were considerably closer to my glider than I was and still no issues at all. I powered up my 12FG again and the glider immediately came back to life and I guided it back to earth. Okay, so it flies well. Now what's the next question? Is it legal to use in the USA?

I contacted FrSky, the FCC, Tony from Radio South and this is what I found: after reading a bunch of pages on the FCC website; most of what was read was clear as mud! Additional cross referencing and definitions from Tony, the layman's terms is as follows. The FCC requires all 2.4GHZ spectrum transmitting devices to be FCC certified for use in the United States. The FrSky

transmitter module is certified and FrSky has the FCC certification certificate listed on their website. The OrangeRX8 Futaba version receiver is a 2.4GHZ receiving device. The OrangeRX8 is not a two way device like some other devices from FrSky. The OrangeRX8 receiver is designed to receive 2.4GHZ signals, not transmit, and therefore is not required to have a FCC ID. Now I cannot comment on whether or not this receiver violates any patents that Futaba may have in the books for their "Version" of frequency hopping or 2.4GHZ theory. Issues like this would be for the courts to decide should it come up.

Okay, so what is the verdict? Well I experienced absolutely no problems while flying this receiver. It costs less than half the cost of a genuine FASST Futaba 7 channel receiver and 25% the cost of a FASST Futaba 8 channel HS receiver. I plan on using this receiver (and I'll probably buy one more) just as the manufacture advertises it for "small planes, helis, parkflyers or even medium sized sport planes". I would install the OrangeRx8 in aircraft up to a .60 size plane of my own. Now anything larger than that, I will continue to use my genuine Futaba FASST receivers. This is the theory I used in the past when I flew 72MHZ. I would use Hitec and Castle Creation Berg receivers for my smaller aircraft, and use Futaba PCM in the larger ones. I will use this theory until I experience problems or anomalies that I cannot be explained.

Tony Coberly

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# Smile! You could be the next Winner!



O.S. .46 AX



O.S. .55AX

**O.S. ENGINE**



O.S. .75AX

## Smiley Face Contest #10 2010!

We are bringing back the smiley face contest. Throughout this issue we have placed five or more Smiley Face Figures like the one shown here (☺), but as before this page doesn't count. Write us and tell us where at least five are, and you'll be eligible for a random drawing in which the winner gets to chose from the three engine shown above. Winners will be selected by a random drawing from all the correct entries received no later than November 1, 2010. No entries will be accepted after this date. Entries must be sent via US mail or E-mail only, and reference the correct contest number in subject line or address. Hobbico employees, RC Report Online employees, columnist and advertisers are ineligible for prizes. No Purchase Required. Valid in USA and Canada only. [smileys@rcreport.net](mailto:smileys@rcreport.net) Subject line: Smiley Face Contest #10 2010

US Mail: Smiley Face Contest #10, 2010 PO Box 12051 Huntsville, Al 35815

*All terms subject to change without notice. This contest is void in any area, state, or locality where taxed or prohibited.*

*Still loving the smileys! The winner will be contacted and announced in the December issue. The winner will receive his choice of one of these three engines: OS .46AX, OS .55AX, or OS .75AX. Keep searching those articles and columns.*

*Total Smileys for the September 2010, issue was 8.*

***August's winner is Frank Maguire from South Portland, Maine!***

***Thanks for your submission, Frank!***

*Julia Coberly*



## Mail Call

Well folks keep your questions,  
comments and jokes coming.

Scott Watts sent in the correct answer to the brainteaser last month! Thanks for playing, Scott! Here is Scott's reply:

Disregarding the first letter, the rest of the word is a palindrome.

For those of us who need help with the word "palindrome"; here is the answer that was at the end of the email:

In all of the words listed, if you take the first letter, place it at the end of the word, and then spell the word backwards, it will be the same word.

The next one came into my inbox more than once recently:

### Ideal Husbands

While creating husbands, God promised women that good and ideal husbands would be found in all corners of the world.

And then God made the earth round.

Absolutely Brilliant Household Tip from Larry Slowiak:

Always keep several get well cards on the mantle. So if unexpected guests arrive, they will think you've been sick and unable to clean. *(This once would come in handy for me about now. ☺ Julia)*

### SOUTHERN CHARM

Two informally dressed ladies happened to start up a conversation during an endless wait in the LAX airport.

The first lady was an arrogant California woman married to a wealthy man.

The second was a well mannered elderly woman from the South.

When the conversation centered on whether they had any children, the California woman started by saying, "When my first child was born, my husband built a beautiful mansion for me."

The lady from the South commented, "Well, bless your heart."

The first woman continued, "When my second child was born, my husband bought me a beautiful Mercedes-Benz.."

Again, the lady from the South commented, "Well, bless your heart."

The first woman continued boasting, "Then, when my third child was born, my husband bought me this exquisite diamond bracelet."

Yet again, the Southern lady commented, "Well, bless your heart."

The first woman then asked her companion, "What did your husband buy for you when you had your first child?"

"My husband sent me to charm school," declared the Southern lady.

"Charm school?" the first woman cried, "Oh, my God! What on earth for?"

The Southern lady responded, "Well for example, instead of saying "Who gives a shit?" I learned to say, "Well, bless your heart"...."

*(Yep, I could use this about right now, too! Julia)*