



The Flightline



Volume 38, Issue 9

Newsletter of the Propstoppers RC Club

AMA 1042 September 2008

President's Message

It seems like everyone wants to learn how to fly these days, which is great for our hobby and the club.. there is just one thing MISSING [AMA] insurance. It **has been brought to my attention** that not all new flyers have this coverage. This is our field, the **Propstoppers** and no one else. We are the ones covered with the club's insurance so we are the ones to enjoy flying. Remember it's your field, so lets protect it. You may have guests [3] times but they **MUST** have AMA coverage. Please make sure your guest has this coverage.

Well I would like to thank all who came to the Walt Bryant fly in. The more that I think of it, Walt was there. *That was more than wind gust, it had to be Walt just checking in and seeing how we are doing.* This was another great turn out and everyone had a good day.

Well the days are getting shorter so you will have to go to the field earlier after dinner. If your going over and want company put it on the **Yahoo Group**.

Just a reminder Nominations for club Officers will be held in Oct.

The September meeting will be at the Christian Academy so come early and fly [sorry no fuel] maybe I'll have some news about a field by then.

Dick Seiwell

*Agenda for September 9th Meeting
At Christian Academy Field;
Fly from 5pm, Meeting 7:00pm.*

1. Approval of August Meeting Minutes
2. Membership Report
3. Finance Report
4. Flying Field Situation
5. Continued Flying

INSIDE THIS ISSUE

- 1 **President's Message**
- 1 **Monthly Meeting Minutes**
- 1 **September Meeting Agenda**
- 2 **Calendar**
- 2 **Letting the Smoke Out**
- 3 **Run What Ya Brung**
- 5 **Learning to Scratch Build**
- 6 **Building a Fuel Tank**
- 8 **Club Loses Sleighton Field**
- 8 **Up and Coming Activities**

Minutes of the Monthly Meeting

August 12th, 2008 at Sleighton field on a calm sunny summer evening

The meeting was called order at 7:00 p.m. by President Dick Seiwell A roll-call by membership chair Ray Wopatek found 15 members and two guests present
The treasurer's report was given by the president in the absence of the Treasurer

Old Business:

President Seiwell reiterated that we are responding positively to noise complaints at Sleighton field. We will enforce our engine limit of 50 size for fuel engines and the noise limit of 90 dB at 90 ft.. This should be quiet enough to minimize noise in the area.

The President reminded members to be careful of the electric fence horse enclosure on the back side of Sleighton Field. We have good relations with the horse owner but she has asked us to be sure to put the fence back in position should we need to enter the enclosure.

New Business:

The president reminded us that August 23rd will be the Walt Bryant fun fly for electric models at Christian Academy field. The contest honors Walt Bryant the club's first electric flyer. The club will supply and lunch and snacks for all flyers present.

Adjournment took place at 7:30 p.m. to allow everyone to fly in the calm evening air.

Richard Bartkowski, Secretary

Letting the Smoke Out

It is not long after we start practicing the electric flight portion of our hobby that we find, to our amazement, that electrical components like motors and controllers, and even batteries, are made of smoke. You don't believe me? Let me tell you of a recent experience.

Some years ago the few brushless motors that were beginning to enter the market used very special and expensive controllers. Brushless, or A/C motors don't have brushes but they do have poles on their armatures and electro magnets with multiple poles. So how do you arrange for the current to be switched at just the right moment so the two poles attract each other, time after time? In the early days the motor designer installed an electrical trigger that did the same thing as the brushes and commutator on a DC motor.

The device most commonly used is known as a Hall Effect device. They are used on modern automobiles in place of the old points and cams. Here is a vintage Aveox brushless motor and controller with a separate Hall effect trigger, like the one buried in the motor case.



Continued on page 2

Calendar of Events

Club Meetings

Summer Monthly Meetings at Sleighton Field, Second Tuesday; gas flying ok. Fly 5 till 7. Meeting 7, fly till dusk. 9 September

Fall and Winter meetings at the Middletown Library on the second Tuesday of the month

**Tuesday Breakfast Meeting
The Country Deli, Rt. 352 Glenn Mills
9 till 10 am. Just show up.
Flying after at Sleighton Field 10 am.**

Regular Club Flying

**At Middletown / Sleighton Field
Monday - Friday;
10 am until dusk - Electric Only
Saturday
10 - 3pm-for FUEL PLANES and
10 - Dusk for Electric
Sunday - 12 - Dusk - Electric Only**

**At Christian Academy; Electric Only
Monday through Friday after school till dusk
Saturday 10 am till dusk
Sunday, after Church; 12 pm till dusk**

Special Club Flying

**Saturday mornings 10 am Sleighton Field
Tuesday mornings 10 am Sleighton Field
weather permitting after breakfast.**

Beginners using due caution and respecting club rules may fly GWS Slow Stick without instructors.

Eventually some smart person realized that on most electric motors the current varies a little as the motor rotates, the so called back electro magnetic force sends this hit back down the line and this hit occurs exactly timed to the magnets passing the coil. They realized that this hit or ripple on the operating current could be used as the trigger to drive the A/C voltage in time with the motor's needs. It took a while to get the software sorted out and some early attempts had the motors starting backwards as often as forwards. You see there is no trigger when the motor is stationary, so the software in the controller must very quickly figure out at least the rudimentary timing to get it started after which it can settle down to do it exactly.

These early "sensorless" controllers as they were called, were also expensive in the beginning but they were lighter and they obviated the need to put the extra Hall effect device in the motor.

Aveox made such an early controller and I bought one for use with my Aveox motors and other brushless motors that were beginning to look attractive. It has done sterling service over the years but I think I abused it flying my Hanger 9 Cub at the AMA Electric Nats some years ago. It was then that I learned if you prop a motor to a current level beyond the rating of the controller you can't save your self (or your controller) by flying at part throttle. I described the reasons for this in a previous tech note.

Suffice to say, the controller got very hot. "How hot" you ask? Well the shrink wrap molded itself very closely to the components, or worse. Anyway, I recently picked it for some application or other and lashed it into a system for a test run. In fact I didn't drive it with a transmitter and receiver, I used my Astro Flight servo stimulator to drive the controller so the whole thing was laying in front of me on the workbench. Yikes, where is that smoke coming from?

I snapped the "throttle" closed and examined things more carefully, this time cutting the shrink wrap and label from the unit so I could see the components more clearly.



To my horror I discovered that the solder holding the components to the mother board had melted, running between connections in places. What to do? Can this be salvaged? So the first thing I did was to clean up the solder traces between junctions then thinking about the smoke it seemed like it was local to one or two components so I carefully brought the throttle up again and verified that was the case. Now what?

Well, this thing may be useless so just try something. I decided to remove the smoking component. Now before you think me completely crazy for amputating the brain or the heart let me tell you a little more about motor controllers.

Our variable speed controllers work by chopping the battery voltage into time-wise bits and in each bit the current is switched on then off; the amount of on vs. off determining the throttle setting. All-on is of course full throttle and off is off! All this magic is done by a digital controller turning on and off some big faucets. Imagine a small person

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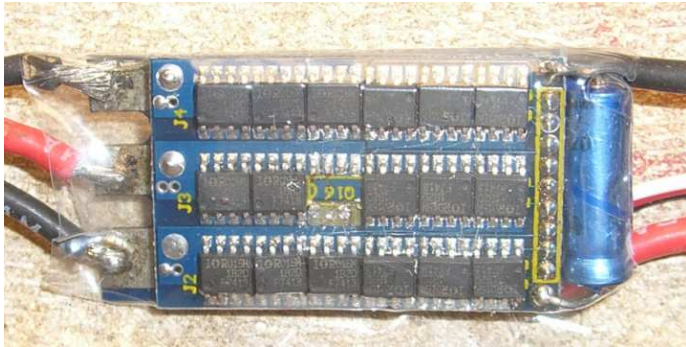
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cranking on the valve of a 20-inch oil pipeline and you have the idea. There is a digital controller and some circuitry driving an electrical faucet called a Field Effect Transistor; the big faucet. But big is a relative term and in our cost constrained world the big currents aren't handled by big faucets but a gang of smaller ones. Look closely at a controller without the shrink wrap and you will see, usually three rows of these devices.

So my thinking on the repair of my Aveox ESC was I could do very well with just one less FET; so I cut the smoking part off the motherboard and tried again; magic, it works!



I hope it really does work when I get around to using it.

Dave Harding

Run What Ya Brung

Every two years us SAM guys are drawn to the AMA Muncie site to fly at the Champs. One good thing about Muncie is it is only a day's drive from Philly and we can pack the van with big models and their support equipment. For the last few years this has included flying Old Timers powered by equally old spark ignition engines. Of course we can't fly such models with un-muffled engines from our fields so we don't get to sort them out very well. This year I plan to fly the new Giant with a Forster 99 and also fly the Lanzo Bomber with an Ohlsson 60.



I have two Forsters from which to choose for Muncie, a reproduction from RJL loaned to me by SAM president Mike Myers and an original sold to me by former SAM president and champion flyer Don Bekins. I had run neither and was getting worried about the chances of everything working in Muncie. Furthermore, I had problems with my original Ohlsson 60 small port in Claremore Ok in 2003 and Muncie in the two successive

Champs there. The engine was and is still tight after reconditioning by engine specialist Don Blackburn. To cover this problem (and because old engines in good condition are decent investments ... it says here) I bought another in excellent condition, in fact a prior SAM winner from Ed Hamler. But I hadn't run it myself. Then in a final sign of weakness while wandering around the flea market in Lebanon back in the Spring I saw a pair of Ohlssons in superb condition, a small port for Texaco and a big port for who knows what. They were offered at a bargain price and I snapped them up. So now I have three new Ohlssons and my original small port too.



Small Port Ohlsson takes off in the Lanzo Bomber for a Texaco flight in the 2003 Claremore OK Champs

Oh, I guess I didn't mention the big port I bought four years ago to fly in my Trenton Terror. That engine gave me one good run and a max in its initial flight at Muncie four years ago, then two poor flights due to airframe problems. The next time we flew it was two years ago and it had gone off song developing a leak in the cylinder to crankcase joint; a weakness in the Ohlsson design particularly because only one guy in the World has figured out how to repair them; 80 year old George Tallant. George told me this engine was not worth repairing, but it was still in my stable and I was curious as to how it would compare to the others.



Big Port Ohlsson's first flight at Muncie

What to do? Well Ed Goretzka has a flying buddy in Reading, Doug Koch, who just loves to run ignition engines. Indeed, Ed had him run the RJL Forster for me a couple of months ago and Ed also has an Ohlsson 60 big port that he wanted to run. So I suggested to Ed that maybe the three of us could spend a day running engines and this we did. Here are the Ohlssons we ran.



Doug is a meticulous type and everything is arranged neatly and to hand for his engine running sessions. He runs them in the back yard of his suburban home with no neighbor problems. His setup uses a stout surface made from two four by sixes and a heavy plywood top to which he has attached the usual wood engine mount. This affair just sits on a log. It works quite well although you have to watch it for wandering a bit when the engine or prop balance is not just so. He mounts the entire ignition system in a small box with a loose lid and a large ON switch on the side. Protruding from the box are the HT or plug lead, the ground that is clamped between the engine and the mount and the points lead with a croc clip on the end. Doug has two of these systems ready to go complete with batteries.



Propstoppers and SAM 76 Ed Goretzka watches the master Doug Koch tune the Ohlsson Small Port

Here Doug is tweaking one of the Ohlssons. These old sparkers run best on unleaded gas and 70 weight oil and this is the mix Doug had prepared for our session. With a spark ignition engine you have to adjust not just the mixture but also the spark advance to get them running just right. Even then we found that various spark plugs often made the difference between a labored run and a sweet one so things are quite fiddly to get right.

Eventually we ran all of the Ohlssons, even my wounded one, all the others performing well. My objective was to sort out the various engines to find the best one for the Texaco event. Here you need an engine that can turn a very large prop as a speed just high enough to allow you to climb slowly to the highest altitude. At the last Muncie Champs my still tight Ohlsson would not hold a setting on such a big prop so I had to fly with a smaller prop and more oil. This meant I climbed to altitude in five minutes vice ten or more for the good guys. However, I ended up at the same altitude at the others and since it was a thermal day the shorter time of climb did not play in the results. But you can't rely on those conditions so picking the best engine is important. In the end there was not much to choose between them, they all ran well. Maybe my tight engine is finally loosening up.

The wounded big port is indeed down on power and Doug's advice was to sell it as a collectors item! Oh well, e-bay here we go again.

Now for the Forster. This is what Doug was looking forward to. His eyes sparkled when he saw it and he asked if I really wanted to fly it as it was an excellent example of an original version. He said I should just admire it and fly the RJL replica. However, we proceeded to set it up and attempt to run. I say attempt because it looked for a while that it would never come to life, starting backwards time and again. It did not seem to respond to changes in mixture and advance in a logical manner. And Doug, who had hand started all the engines up till now, had developed a blister on his flicking finger. But undeterred he managed to get a few promising bursts and then a really sweet and strong run turning 6200 rpm on a 16 x 6 prop.

But curiously we were unable to repeat this sweet run and Doug thought perhaps the ignition batteries were running down. So we declared the day well and truly done. A great success and good fun too.



Ed Goretzka tachs the original Forster 99 during it's excellent 6200 rpm run on the 16 x 6 prop

Dave Harding

Electric Motors

Want to know how electric motors work? Want to know about the physics and how the various elements play. Check out the Mabuchi website. They have all kinds of animated descriptions.

http://www.mabuchi-motor.co.jp/en_US/technic/t_0100.html

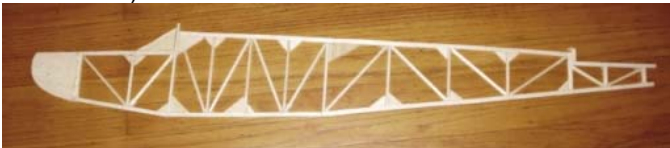
Learning to Scratch Build

New member Joe Secunda has built a couple of airplanes at this point and was so encouraged by the flight performance of his kit built Cloud Ranger aerobatic trainer that he wanted to build a bigger one. So he went to Kinko's and got the plan enlarged 150 % and went to work. Each step of a scratch build is new to him but he is determined and is making great progress.

We have a regular dialog on the design and how it might be simplified, lightened or improved. And then there are the construction discussions.

Here are a few of his accomplishments;

Here is the first fuselage side. (He then proceeded with the second side).



No I didn't build them over each other. Does that work, I mean how do you get them apart, I have a hard enough time getting the wax paper off. Next Time I will try it. Build one over the other, <Shrugs>. No one ever told me that. I'm just about finished the second side.



By the way I did get a Master Airscrew Balsa Stripper. It works great. Thanks for that. Only cost five bucks.

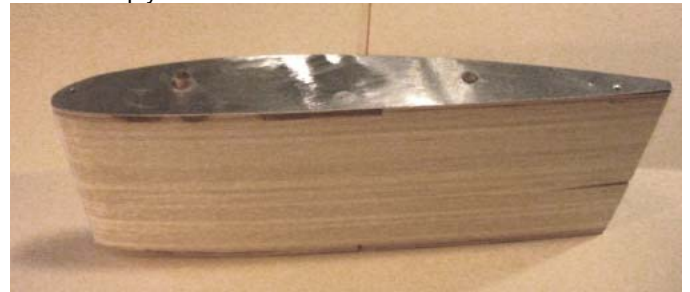
I still can't believe this is going to be strong enough. I sanded down the first side lightly. It did get rid of the glue bumps. By the way I'm using CA medium, seems to be working okay. Once I get some time on this second side to cure. I'll start making this three dimensional. I'll build the formers as you and Mick had suggested. I still think this is going to end up in a pile of sticks on the first landing. Should I think of sheeting this fuselage? Say with sixteenth balsa. Build on.

No Sheeting. <Sigh>. I guess I just don't trust the strength of balsa and the rigidness of the construction. I'll get past this sooner or later. As you said the two half's are not exact. I'll glue them to each other and either add balsa to thicken the short edges or sand away the slightly bigger areas. Next time I will build them over each other, maybe with wax paper between them.

The fuselage came out to be 42" inches long, by 7" high and 4¾" wide. What's interesting is it only weighs 6½ ounces. I still think it's going to end up as a pile sticks. I'm beginning to work on the tail feathers. The Balsa stripper is working out very well. I'm still a little confused as to what you're suggesting for landing gear. I suspect it's not commercial gear. Do you think a tail-dragger or a trike is best?



I worked on the airfoil. Used a Boeing 106 airfoil. The profile looked like a good trainer shape. I used your instructions. I cut out two sheets of 1/4" regular plywood alone with two pieces of tin. Sandwiched them, and fastened them with brads. Then cut to shape, sanded and drilled two quarter inch holes through them. After which, I separated the stack and glued a piece of tin to each plywood airfoil.



Then I cut my balsa into rough shapes and stacked them along with one of the ply airfoils. Next I duct taped the stack and using the holes on the one airfoil as a guide, drilled the stack.





A quarter inch dowel was pushed through the stack and out the other side, where I slipped on the other tin sided ply airfoil. CA was used to hold the dowels in place. This acted as a small vice. Using the band saw I trimmed the whole stack closer to the finish shape. After trimming to about an eighth of an inch of the final shape I took the whole thing to the belt sander and sanded even closer. Finally I used a file and sandpaper to get everything trimmed tight. These pictures are the result of this technique. It makes for more consistent and uniform airfoils. I will remove the templates and file in the grooves for the spars. I can use the dowel holes to keep the airfoils true to each other.

Way to go Joe. Keep us informed on your progress.

Dave Harding

Building a Fuel (yuck!) Tank

Haven't done this in a long time, but, as they say in England "needs must". Not sure what it means but it seems to apply to my situation. It is one week to go to the SAM Champs and I haven't yet finished the ignition engine installation in the Giant. The event for the ignition engine is called Classic Texaco, and it is similar to the events sponsored by Texaco in the mid to late 1930's except we now fly this with RC.

We are allowed 4 cc's of fuel per pound of model weight and in this form the Giant will weigh twelve pounds, so I am allowed 48 cc. The event rewards long efficient engine runs so it is good to ensure the fuel feed is even throughout the run. If you just chuck fuel in a tank the mixture will vary throughout the flight, starting rich and slowly leaning out as the carburetor has to draw the fuel from the reducing level. In U/C racing we suffer even more from such effects as the fuel head is affected by the centrifugal force acting on it. Nevertheless you still see it in RC and freelight so I am applying a common U/C fix by using a Uniflow tank.

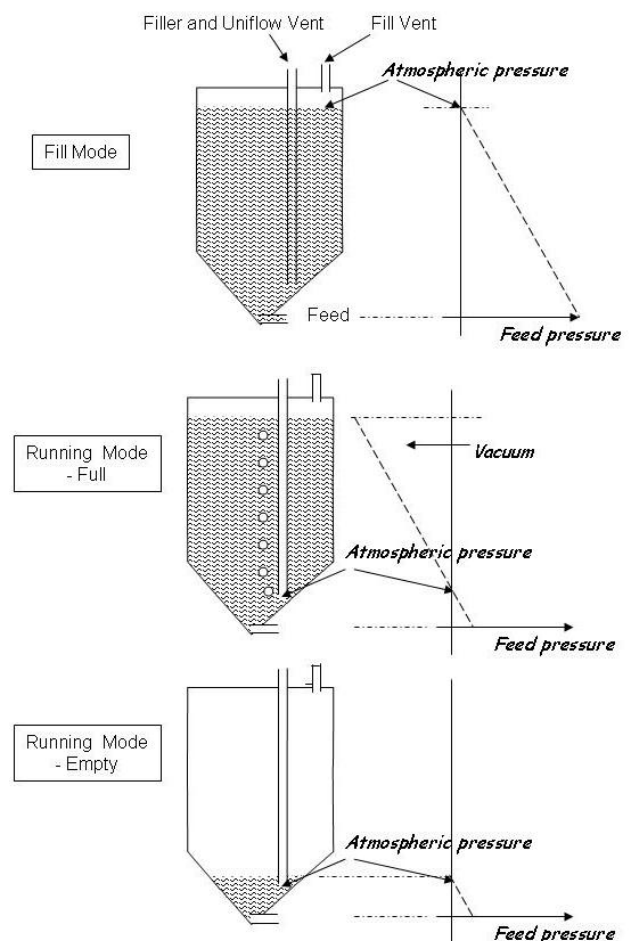
Furthermore, it is advisable to make a tank to the exact size allowed for the event so you can easily fill with the correct amount by completely filling the tank. Otherwise you must drain the tank then fill it with a pre-measured amount; a messy and time consuming process. When the engine is hot and tuned you just want to stop it, fill the tank and go. So I dragged out the .005 inch brass shim stock and laid out a tank.

I usually design a tank with a simple geometric shape that allows easy volume calculation. The volume usually turns

out fairly accurate to the intended (although this time it turned out oversize and I had to squeeze it down to size!) I make them from sheet brass shim stock, it is easy to cut and solder. One feature that is important to me at least, is to make the feed tube and exit port as a unit in the lower corner. Normal tank design has a feed tube that dips into the lower corner. This approach does not guarantee that every last drop will be drawn and the last dregs are subject to a combination of fuel and air.

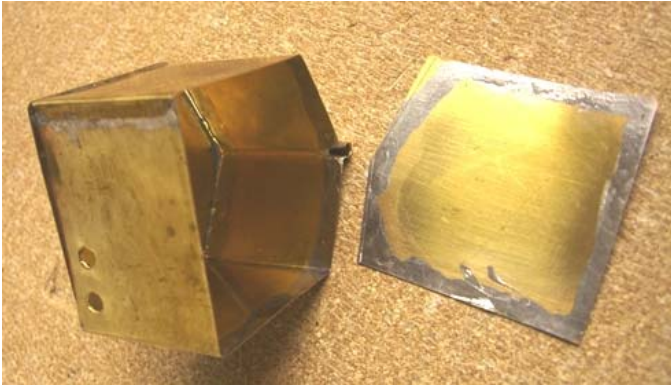
The uniflow tank principle is depicted below. The tank has a feed from the bottom and two vents; one dipping to the tank bottom and the other just at the top. The tank is filled through the deep vent allowing the air to displace through the top vent. Once the tank is full you cap off the top vent.

Uniflow Fuel Tank Operating Principle

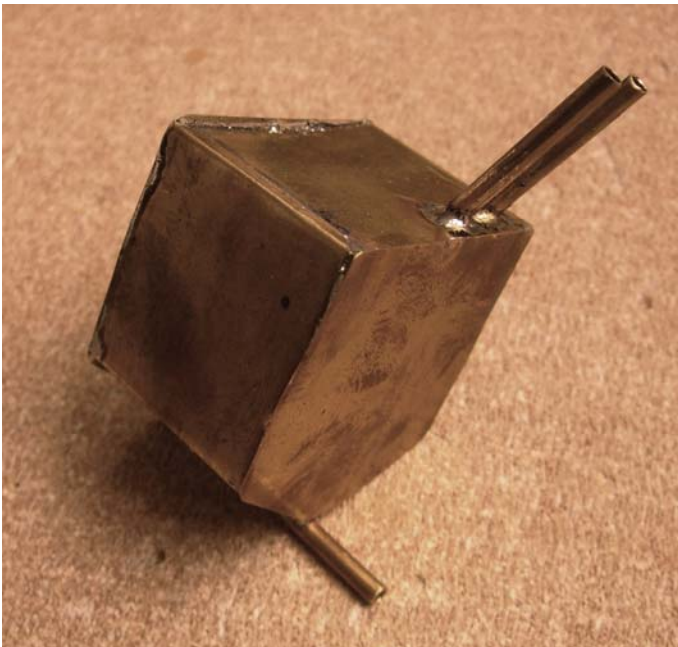


Now when the engine begins to run its carburetor "sees" the fuel pressure arising from the head of fuel. But as the fuel is depleted the pressure drops as the carb sucks against the closed vent. It pulls a "vacuum" until the pressure drops and venting is sucked through the lower vent. This condition remains until the tank is close to exhaustion and the fuel drops below the lower vent. So, the engine sees an almost constant fuel head or pressure during the whole run.

Here is the tank I built for the Giant. I made it from a band around the girth and two end caps. The feed tube is soldered to the outside bottom and I file between the tank wall and the feed tube to create the "drain" hole as shown here.



The components are tinned with solder at the location of the joints then soldered together. The vent tube holes are punched into the surface so as to provide a collar to make the joint stronger. Finally the tank is leak and volume tested.



Then a fit check is made to the final installation place. The vents will protrude conveniently next to the needle valve because you must close the top vent with a plug once fuelling is complete. I will glue the tank to the engine mount structure with silicone adhesive, an old U/C trick. This provides a mount that does not have the stress raising effect of a mechanical

mount and a degree of vibration suppression. It also provides some stiffness to the tank structure which otherwise is a rather fragile thin shell. Here is the installation fit check.



I plan to run the Forster this week before departing to the Champs. I know it runs because we did that last week (earlier article) but I want to try it with the actual ignition and fuel systems I will use in Muncie.

I have realized that I do have an ideal engine running bench in my back yard in the form of a 10 foot long, 12 inch steel C channel we use to drag our dirt tennis court. I think I will make a running bench that will attach to this three hundred pound "anchor".

Dave Harding

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Propstoppers R.C. M.A.C



The club held a wonderful Walt Brian Memorial fun fly with over 25 attendees and many airplanes of all types and sizes flying. Weather was great and the food super. I guess we know how to do these things.

Club Loses Sleighton Field

In mid September, without any warning we were informed that our use of Sleighton Middletown Field was to be terminated as of the 25th August.

We have always known that Middletown Township bought this portion of the Sleighton property for recreational purposes. They told us it is their plan to build a "World Class Youth Soccer Facility".

Apparently they have an arrangement with the heavy equipment operators union whereby their trainees will perform the necessary grading for no cost to the township. The reason we did not get a warning of this event was twofold. First the union does not have a firm schedule for their pro bono work and the Middletown manager was on vacation.

I wonder if Middletown really has the money set aside to complete this ambitious project and I further wonder at what pace this work will proceed. Perhaps when the field is leveled we may use it again until they fund the next part of the development.

Meanwhile we still have Christian Academy field although we have always known it is their plan to sell this property. One day someone will figure out how to deal with the swampy nature of the land and turn it into a development of Mac Mansions.

But our erstwhile president is on the track of another field so who knows, maybe nirvana does exist in Delaware County, we just haven't found it yet.

Stop Press Update.

As we prepared to go to press I received a report from Vice President Dave Bevan, who spoke with the Middletown Township Engineer. Two things, first an agreement of sale for the Christian Academy land fell through because of the gun club noise. Second, the grading at Sleighton Field is only on the lower south east corner of the field, far away from where we fly, and a long way from our runway area. We will continue the dialog with Middletown officials to clarify our position.

Up and Coming Activities

The club meeting will be at Christian

Academy Field;

Fly at 5 - 7, meeting at 7.

9 September

Electric and Gliders Only