



The Flightline



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Newsletter of the Propstoppers RC Club

AMA 1042

October 2003

Editorial: Summer Flying

This summer we have had all the ingredients that make a club thrive. Naturally it starts with flying which has been excellent at both Sleighton and Moore fields. With our new regular Tuesday breakfast and flying sessions we have found that if the weather is questionable at the weekend it has usually been excellent on Tuesday. On a few occasions the prior wet weather has made it too slippery to drive into the Sleighton field so we just drove to Moore. What wonderful choices. Another good thing about the Tuesday activity is that it opens up an opportunity for a group of members who find it difficult to fly at the weekend.

We have seen a number of new potential members turn out, several of them quite accomplished modelers, and the new junior member, John Drake has us on our toes answering questions and giving advice. A number of these new members have found us via our web page, emphasizing the importance of keeping it current and attractive. Bob Kuhn does such a fine job of responding to the club's web needs that we forget to periodically assess the material we should post to it. All "wired" members are encouraged to study the web page and suggest improvements. If you have some pictures that should be posted send them to Bob. Perhaps we should post Items For Sale on the web page too.

We need new members. At about the current

level of 50 or so the finances will be tight in maintaining two fields and at this year's dues of \$80 we are close to the level where some people will be driven away. So, we should pay attention to all the means available to attract new members.

Tuesday Breakfast Flyers regular Charlie Storm with his Thunder Tiger Sparky 400 at Moore field one fine Tuesday. In an interesting comparison Charlie also flies a Sparky powered by Norvell 07. Both fly well.



Things have been so good with our fields that we have begun to develop bad habits again: noisy airplanes.

One of our senior members informs me that some people have been flying with unacceptably noisy airplanes at Sleighton. How soon we forget the critical importance of establishing and maintaining a low noise operation at our fields. Remember that it took only one persistent complainer for us to lose Dallett Field. At Sleighton we may think we are in a remote area but the fact is there are a number of very expensive houses just over the Northeastern tree line and a huge new one just over the northern tree line. We have a noise standard; 94 db at 9 ft., and we have several noise meters with which to measure and control noise, however we have not been vigilant. Get with it guys, there are countless articles on how to control noise starting with prop selection and muffler selection. Do you know your current noise level? Get measured and equip yourself with some of the tools with which to control the noise of your planes, we like Sleighton very much and could be there for some years under the right circumstances.

The key activity of a healthy club is the involvement of the members in the club organizing functions. Mike Black led us for several years and John Zebuski has done a fine job this year, but his circumstances necessitate his stepping down. So we are looking for a volunteer to take us forward for the next year. October is the meeting where nominations are placed for the November election. Last year Jess Davis eloquently explained to the assembly the fairly limited commitment in time required of the club President, hark his words and throw your hat in the ring. Next year is going to be even better.

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Agenda for October 7th Meeting, Marple Newtown Library, 7:30 pm

- Approval of September meeting minutes
- Finance report
- Membership report
- Field report
- Officer Nomination
- New business
- Indoor Flying Plans
- Show and Tell

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Calendar of Events

Club Meetings

Regular meeting 7:30 pm
Tuesday 7th October
Marple Newtown Library

Flying Events

Tuesday Breakfast Meeting
And Flying
The Country Deli, Rt. 352
Glenn Mills
9 till 10 am
Just show up
Flying afterwards
Weather permitting at Sleighton or Moore
Inclement weather indoors at the Chester
Salvation Army Gym
Call Dick Klekotka 610-692-4527

Rotorfest 18th and 19th October
Flying, rides, exhibits at the American
Helicopter Museum in West Chester.

Regular Club Flying

At Moore and Sleighton Fields

Daily	10 am til Dusk
Saturday	10 am til Dusk
Sunday	12 p.m. till Dusk
	Electrics 10am till Dusk

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Propstoppers Web Site; www.propstoppers.org
Check the web site for back issues of the
newsletter, pictures of club events and the calendar
of future events.

Pictures courtesy of Bob Kuhn and Dave Harding

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The President's Message



Dear fellow Propstoppers:

I hope everyone is well and has made it through last month's round of extreme weather unscathed. Not a great way to end our summer flying season!

I want to reiterate that nomination for club officers will be held during our October meeting.

As stated at last month's meeting I will not be running for a second term. Please consider running for office, this is a great way to meet more of our fellow members and also a way of giving a

little bit back to the club. Being a club officer is not that difficult and you will have a chance to help shape the future direction of the Propstoppers. Take some time and consider running for office, remember Bob Crowell has a way with twisting your arm!

John Zebuski

Minutes of the Meeting,

September 2nd, 2003 at Marple Library

The meeting was called to order at 7:30 p.m. by Vice President Dick Seiwel

The roll call taken by membership chair Ray Wopatek showed 23 members and 2 guests present.

The treasurer's report was given by Treasurer Al Gurewicz and accepted by the membership.

Minutes of the August meeting as published in the newsletter were accepted by the membership.

Old Business:

Dave Harding reported that the Walt Bryan electric fun fly had a good attendance with a large variety of planes. The event however, was cut short by weather.

New Business:

President John Zebuski reminded us that next month is the time for annual nominations for club officers. He asked the membership to consider service to the club or a nomination for one of the positions.

Al Tamburro announced that the Wildwood event on September 20th would involve only static displays and no flying.

Dave Harding announced that he is negotiating for another site for winter indoor flying.

There was a short break for coffee and discussion.

Show and Tell:

Mick Harris showed his Fairy Facula 45 inch span old-timer rubber model of English design that was converted to electric. Dick Bartkowski flew it for first place at the SAM champs in the unlimited rubber electric class.

Adjournment: The meeting was adjourned at 8:25 p.m.

Richard Bartkowski, Secretary

Propstoppers Video Library Update

Did you know we have a video library? Well we do, although it has not received much attention recently. Jess Davis is now managing it and in his first move he wants all of us who currently have videos on loan to return them. Or perhaps you have a video you want to donate. Jess brings the library to club meetings.

Remember, light is might when you're talking flight!

Editorial, continued from page 1

As the summer flying season draws to a close some of us turn our attention to the opportunities offered by the indoor season. Mike Black informs us that he has made the same arrangements as prior years to use the gymnasium at the Tincum School on the following dates:

12/05/03
1/9/04
2/6/04
3/5/04

Thanks Mike, our indoor flying provides some of the more innovative and enjoyable aspects of our hobby.

We have also made informal arrangements to use the Chester Salvation Army gym for indoor flying following the Tuesday Breakfast meeting when weather precludes outdoor flying. We tried this gym on a recent Tuesday and found it to be excellent. It is about the same size as the Tincum gym but perhaps a little higher. Also, when we used it the bleachers were folded providing even more space.

The Salvation Army gym is two blocks off Edgemont Avenue just North of the Howard Johnson hotel. Join us if you can, and park in the street in front of the main entrance.

Dave Harding

The SAM Champs Conclusion

In last month's Flightline we described the travails of Dick Bartkowski and I as we competed during the first four days of the SAM Champs in Claremore Oklahoma. You may recall that despite the overwhelming heat we had a measure of success in flying various classes including those which make up the overall electric powered champion. Good results in the first three events put me in contention with the final results dependent on the final two classes to be flown on Friday.

Friday dawned much cooler and the forecast was for a front to pass through. The weatherman predicted that rain and possibly hail would start mid morning, passing through by the afternoon. Our experience is that the weather absolutely dominates the outcome of competitive flying and the right strategy on when to fly is vital for a good result. For the models we fly wind speeds over a certain level cause the models to fly down wind and you may not be able to get them back to the landing area. Landing outside the area gets you zero points. Naturally, calm weather gets you the model's calm weather performance but most events are won by flights in which the model thermals. These occur in varying strength dependent on the weather, and to some extent, the time of day.

So, Friday's strategies needed to be decided for Dick and I to make our final flights. We both entered Unlimited Rubber Electric, where the model is an RC electric powered version of an old time rubber model. The second event that I flew was a similar event for old time Wakefield rubber models. The Wakefield Cup has been the premier international free flight competition since the early 1930's. From the mid '30's it has been flown with rubber power.

I was flying my 1939 Jack North Wakefield in both events and Dick was flying Mick Harris's Fairy Facula. Both models flew well and we were confident although this was the first competition for these classes and we didn't know our competitors performance.

When we arrived at the field the weather was dry but overcast and threatening with dark clouds on the horizon. Immediately following the pilots meeting I decided to make my first Wakefield flight. The winds turned out to be higher than the model could handle and I was challenged to complete the flight within the landing zone, however, the time was quite good. I immediately re-charged and prepared to fly again but as I was about to launch it started to rain and we waived off.

The next several hours were spent in the van while torrential rain fell on the field, which being flat, quickly flooded. The cars and vans that had not already moved to the hard stand became stuck in the mud. Eventually the rain eased up and I elected to take my second Wakefield flight.

This time I managed to extract the model's performance potential and scored an easy maximum with plenty of altitude to spare. This bode well for the Unlimited Rubber event as that max was seven minutes compared to the Wakefield's five.

So I elected to make my first flight in Unlimited. As the model gains great altitude it is important to have the climb trimmed hands off and I made a small adjustment prior to this flight. Too much as it turned out as at the top of the climb, directly overhead, the model maneuvered and my clumsy attempt to correct it caused the wing to fold! A vertical dive found the only remaining hard part of the field; the runway, and the dead center hit "shortened" the fuselage by about eight inches! End of Unlimited, score; 59 seconds!

The weather closed in again but eventually cleared and became calm in mid afternoon when Dick chose to take his flights. The first was excellent and the second even better. Dick won the event. I was, of course, nowhere in Unlimited but I found that I had placed second in Wakefield.

Now, another regular top electric flyer, Jack Hiner from Michigan, won Wakefield and placed second in Unlimited so with his good scores in the other events he just pipped me for the Electric Grand Championship. Oh well, try again next year.

At that evening's banquet I discovered that my winning time in Electric Texaco was better than the other Texaco event winners and I was declared the winner of the Texaco Perpetual Trophy. Wow, what an honor. Check it out at the museum the next time you are in Muncie.

Dave Harding

Dick Bartkowski with the winning trophy.



2003 NEAT Fair

We go to meets for many reasons, not the least of which is to find out what are the new developments in our hobby. So it is with the Fourth annual NEAT (Northeast Electric Aircraft Technology) Fair, an all electric fun fly organized by Hall Of Famer, Tom Hunt and his loyal band of supporters from the Silent Electric Flyers of Long Island. Many of these guys are former Grumman Aircraft employees (Tom is still employed by them but now it is Northrop Grumman, not the same really!)

The meet is held in a wonderful campground called Peaceful Valley, in Downsville New York, right in the middle of the Catskill Mountains. The campground lies in a wide flat valley flanked on one side by the upper reaches of the Delaware River and surrounded by high steep mountains. The valley floor is absolutely flat and grass covered for an area several hundred feet long and wide.

Now the second reason we go to big meets is the vendors, and NEAT has the largest collection of specialist electric flight vendors anywhere. I am sure it was this inducement that drew Mick Harris to join Dick Bartkowski, grandson Matthew Everett and I for three days "camping" in my RV. Many people camp at the NEAT Fair including Keith Watson and "almost member" Rich Borosa

As an aside, when "we" travel, we do it right. I prepare the RV and Dick organizes the meals. This year we had salmon steaks for Friday dinner, roast lamb for Saturday and of course, America's favorite meal for Sunday lunch; leftovers. In this case lamb curry with a variety of chutney's. Home made bread and a wide variety of imported and domestic beers helped make the away trip bearable. Peaceful Valley is about a three and a half hour drive and in the RV it is like traveling in your family room.

There is always a superb collection of interesting models flying almost continuously from Thursday, the setup day through Sunday. Organized flying is from 10 till 5 each day from nine pilot stations, but much of the flying takes place from dawn through the wee hours with innovative lighting systems allowing quite complex flight maneuvers in pitch darkness. In case you wondered, outside the organized flying time, where transmitter impound is required, the flying is done using a frequency pegboard, just like we do at our fields.

Each day there is a demonstration period where invited pilots show their stuff. This year Jason Shulman, a member of the US World Champion aerobatic team, demonstrated World-class aerobatics with an electric powered airplane, more on this later.



Jason Shulman demonstrated his big aerobat at NEAT. Here he is in San Diego this winter.

This year Sergio Zigras and the Bergen County Silent Flyers organized a range of seminars in their tent. Now these guys also travel in style, but it is a different style. Instead of bringing their RV's, trailers or tents they rent this huge tent. For \$200 the vendor sets it up on Thursday and removes it on Sunday. The Bergen County modelers sleep and eat in this tent when it is not being used as the seminar HQ. (That is if you call hot dogs and chips eating, sniff, nose in the air!)

Back to the seminars, which this year mostly featured indoor flying technology. Sergio had invited the most innovative and experienced indoor technologists in the World. Dick, Mick and I ate it up, wonderful stuff that made you leave with your eyes moist and your ears ringing. Think this is kinda heavy? Well just wait a bit.

First up was Mark Denham from the South Leicester Aeronutz, a group in England who has been pursuing the art of exceedingly small indoor airplanes of all kinds. Mark gave a presentation describing their progress from rubber-powered free flight to electric powered RC with models that weigh fractions of an ounce. They have moved to using a very lightweight Styrofoam sheet material that is 2 mm thick, between 1/16 and 3/32 inch. I bought a large roll of this material in England a few years back and thought it so weak as to be useless...oh well, it, like much in life, is a matter of perspective!

Here is a 10-inch span Corsair with electric power and two-channel control. It weighs seven grams or ¼ oz.

Aeronutz Mark Denham's all-foam Corsair indoor RC model



These are not profile models, they have full "monocoque" construction as they are rolled into tubes and glued. Here is my 15-minute construction experimental 12 inch span C-141, 2 gr.

Author's 15 minute construction trial 12-inch span C-141 Weighs 2 grams!



Of course, the thing you learn about these materials is that the smaller and lighter the model, the lower the loads and stresses. If anything, this material is too strong for the application. But it is this sense of scale that drives this group to challenge each other to smaller and smaller models.

Mark explained that they design them just like paper airplanes, like the ones produced by Fiddler's Green:

www.fiddlersgreen.net

These people have 117 paper airplanes available in plan form. Here is the plan of their Corsair.

Notice the fuselage is printed flat and colored. You just cut it out and roll it then glue the tabs. Just like you did in kindergarten. With the wall foam, the Aeronutz make a similar layout then mark and color it. They don't use tabs, they roll then butt-join the edges like I did on the C-141.

Since the whole thing is rather delicate, particularly the marking and coloring, which is done on the flat, they make several at a time. This way, if one is broken in assembly they have another already to form.

Here are some pictures from the Aeronutz web page;

<http://www.aeronutz.flyer.co.uk/>

Now this is the technology for very lightweight airframes but what about motors and control? Well the trend in electric motors is to use those that are made for pagers. They are the motors which drive an offset weight to produce the vibration alert. The Aeronutz have been working with 4mm diameter motors geared 16:1. This is the motor used in the Corsair.

They are now using LiPoly batteries down to 40 mah cells, they weigh 1.6 grams (28 grams to the ounce). LiPoly cells are produced flat but use thin polymer materials and the Aeronutz have found that you can roll them in the shape of a tube. The Corsair has one cell rolled and inserted into its fuselage.

Sergio Zigras is the pioneer behind the development of the Z Tron infrared model control. He has produced the hardware to control very small indoor airplanes with multi channels. The hardware weighs a few grams.

This is the controller that the Aeronutz have been using but now a whole new wave of Radio Controllers are being developed.

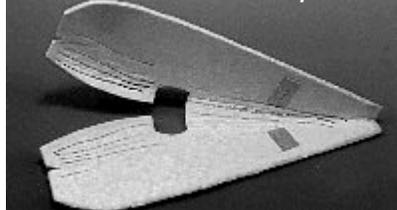
The next speaker was Henri Pasquet, a man who has been in pursuit of a dream of the smallest RC model for over thirty years. He started with a small Cox 010 powered



Flat foam sheet marked and painted



Cut out and folded and shaped



Then glued together to form the fuse.



biplane that he built while stationed in Cam Rahn Bay, Vietnam. He still has it, see the picture below.

Henry Pasquet's collection of small to minute models



His earlier very small models were powered by a whole range of tiny CO2 motors, initially built by the legendary Bill Brown of Brown Jr. fame. Indeed, Henry still uses CO2 motors, now built by Gasparin in the Czech Republic. The latest motor will have a cylinder bore of one millimeter, 0.040 inches, just over 1/32 inch!

The RC model shown below is CO2 powered and weighs just 1.8 grams. It is about 4 inch span. His smallest electric powered RC plane is about 2.8 ounces right now but he has specific plans to reduce it much further.

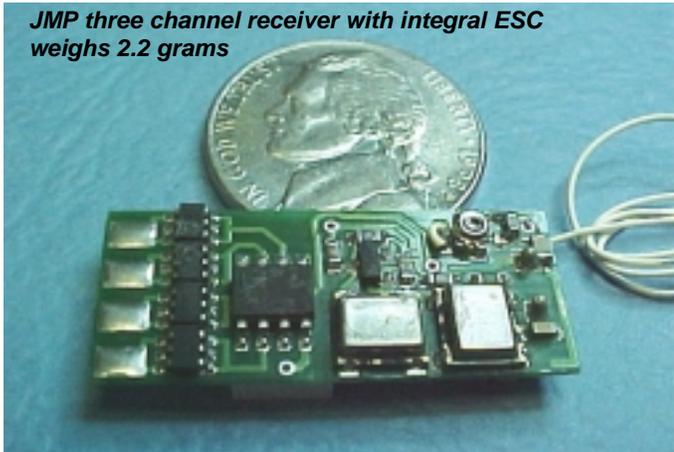


Less than 2 grams RC CO2 powered airplane. Magic!

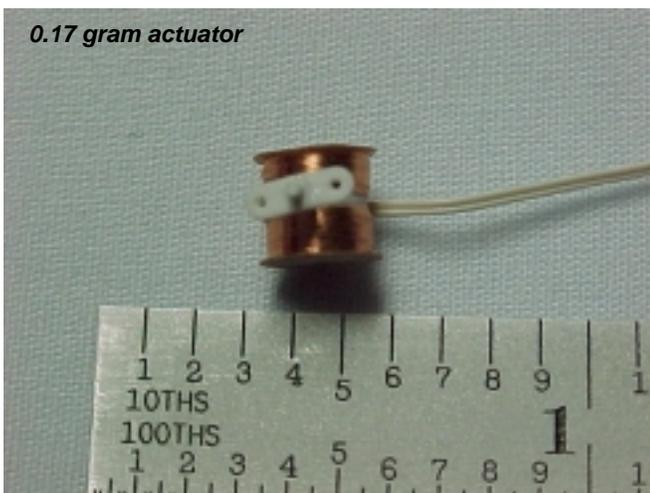
One of the great advances which has allowed such developments are the tiny "actuators" that replace the conventional servos. The common design involves a small magnet mounted inside a tiny copper coil. The coil is driven through some interface electronics, from a conventional receiver output. The result is proportional control movement. These typically weigh one gram each and cost about \$30.

Of course the receivers have also kept pace. Shown below is the French JMP unit, available from Bob Selman in the US.

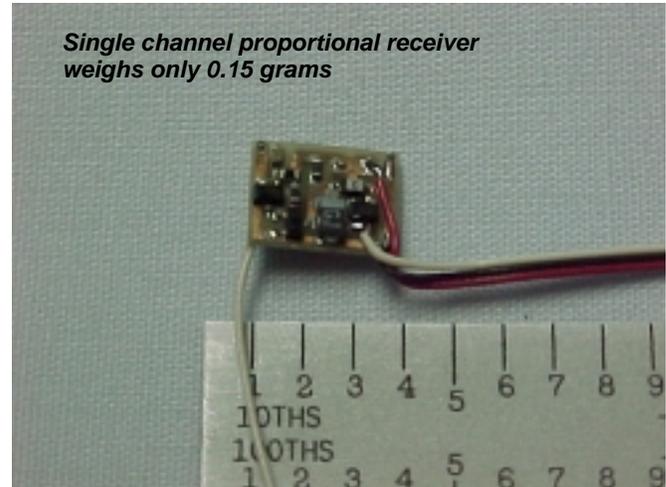
It weighs just 2.2 grams and includes an on-board ESC to control the miniature electric motor.



Not small enough you say, well how about these units; they weigh just 0.17 gram!



And for the companion radio, how about a single channel unit that weighs 0.15 grams!



Now these tiny actuators are just not small enough for these people so they are now using the most advanced technology our Government can fund. The new technology is known in these circles as "Muscle Wire" but in the high dollar industry it is known as Nitinol or Shape Memory Alloy and is used to make "smart actuators". In one of my last activities at Boeing we were planning to apply this technology to the V-22 propeller blades to allow re-twisting and optimizing for both hover and cruise flight.

In the indoor community you can buy this technology for \$8 per foot in the form of a one-thousandth of an inch wire.

It works like this, the Nitinol wire has a memory. It changes length between two extremes when heated, kind of like the bi-metallic strip in your home thermostat. In the indoor model application the wire is included in part of the "servo" circuit in such a way that current is pulsed through it causing it to heat up. Longer pulses, more heat, shorter pulses, less heat. This causes the wire to bend one way or the other.

Now for the real trick, how do you fasten the wire so that the result is adequate movement of your surface? The guys are all trying different ways right now so wait a while till they get it sorted out. But, in the meantime, imagine, an almost weightless actuator to go with your 0.15 gram receiver. This is the kind of technology now flowing from the minds and work benches of these fanatical modelers.

Now do you see why we were blown away at the symposium? But it gets better, in several different ways.

Next up was Matt Keenon who works, on our tax dollars, making miniature model airplanes for Airvirement, Paul McCready's company in California (where else!). Matt has been working on the Defense Advanced Projects Agency's (DARPA) Micro Air Vehicle Program. You may remember I hosted the deputy program manager at a technical meeting on this subject for the American Helicopter Society a few years ago.

At the NEAT Fair symposium Matt showed similar models with tiny motors and muscle wire actuators, but he also showed us some of the larger, heavier and faster models built from the DARPA technology. The most amazing one was a small, ten inch span P-38. Here is Matt:

The plane is a scratch built profile 10.5" span P-38 Lightning all solid wood using balsa, ply and bass. Motors are the M-20 high 5.8 Ohm type supplied by Aeronutz Mark. 2 x Kokam 145s in series for energy (6 to 8.4 volts). Props are custom. R/C is custom UHF driving 2 x 3mm stepper motors



Matt Keenon's P-38 in the wind tunnel and flying. It's fast.

controlling the twin rudders and elevator, also throttle control. All up weight is around 35 grams, covering is Monokote. Only bit left is spinners.

I wind tunnel tested it at Aerovironment to check the speed range and throttle settings since flying these heavy little planes the first time can be tricky(!). Shown with my favorite pencil.

This model had dazzling performance outdoors during the lunch time demonstrations. Matt says the scale speed is 2000 mph, and we believe him.

All of this indoor technology was thrilling to hear about but the NEAT Fair organizers held an indoor flying session at a local high school. Having determined that the peasants would fill the air for the first few hours, we enjoyed our roast lamb dinner before embarking for the indoor demonstrations. Wonderful and magic, stand back, I have the 2mm foam sheet and the desire, see me at the Propstopper indoor meets? Better yet, try some of this stuff yourselves.

Although there were many other presentations the final one I will report on was not on small planes, quite the reverse as the presentation was by Jason Shulman, grandson of the great Leon Shulman (who came to our Electric Fun Fly) member of the World Champion F3A RC Aerobatic Team. Jason and Sean Plummer, the US importer of Hacker electric motors told us of their successful project to fly a competitive electric powered airplane at the 2003 World Model Aerobatic Championships that was held in Poland.

Jason has been flying electric powered aerobats for a while and he and Sean thought a competitive F3A airplane could be built. When Jason qualified for the US team with a glow powered model they decided to see if they could build the electric alternative. There was only two months to go when Hacker sent them an airplane from Germany. They had to install everything and work out a propulsion system etc.

The first problem was that the model had to weigh under eleven pounds to meet the FAI rules. This was quite a challenge as when they first assembled all the pieces they were about eight ounces over. All kinds of carbon pieces were made and eventually a smaller battery, which incidentally is a many-cell, \$700 LiPoly, was installed. The assembly of the lightweight parts took place while Jason was on a business trip and since it was imperative to keep the development moving Jason suggested they get someone else to test fly the model when it was complete. Jason told them that there was really only one maneuver they need to demonstrate. If they could do a knife-edge loop, every other maneuver would be possible. Well, it worked, but that only moved them on to the next problem, **it was too noisy!**

Further work was conducted in propeller selection



Jason Shulman prepares to fly his electric powered F3A aerobat at this year's World Championships.

and addition of a soft mount for the motor. Also, since the model was a large composite shell, sound deadening material was added to the large panels. In the end the model met the requirements and performed perfectly so Jason committed to use it at the championships.

At the NEAT seminar he gave a blow by blow, and flight by flight description of his adventure. He said the first practice flight took place in front of a collection of former World Champions and other top flyers who were waiting for delivery of the their fuel! Following the flight these people were stunned and a hush fell over the crowd. With each successive competition flight the story grew and so did his acclaim by the astonished onlookers.

Despite very difficult wind conditions, gusting to over 30 knots on occasion, he managed to qualify for the final series in fourth place, out of 97! The final ten fly a series of additional rounds to determine the individual winner. By this time the US Team had already assured the Gold.

At this level everything is tough and Jason ended up in seventh place, but F3A will never be the same again. Now there is another alternative to the YS 140DZ or OS 140 EFI

Curiously, no American magazine covered the event.

Well done Jason, want to come out to Moore field with your granddad next year and give us a demo?

Dave Harding

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Propstoppers R.C. M.A.C



*The winning US F3A Aerobatics Team at the World Championships in Poland.
 Jason Shulman, right, flew an electric powered Rhapsody to finish seventh overall.
 Electrics have arrived!*

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**Can you name the mystery Propstopper?
 Hint; He is one of our most prolific builders.
 Answer at the next meeting.**



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