MAX FAX

Journal of the D. C. Maxecuters

... home of the dreaded POTOMAC PURSUIT SQUADRON of the Flying Aces Club

Editor: Stew Meyers **NOV -DEC 2006**

Sunday morning 8AM, October 22, 2006 in Wawayanda, NY

Three lower photos by Ron Gosselin

36" Gleeny Henderson Gadfly by Tom Hallman

COMING ATTRACTIONS

Sunday, January 7, 2007 Noon to 4pm CAAMO COLLECTO Tyson-Pimmit Regonial Library 7584 Leesburg Pike, Falls Church, VA 22034

Sunday, January 14, 2007 6 pm Maxecuter Holiday Banquet same place as last year more details from paulspreiregen@verizon.net 202-337-2887

Saturday, January 20, 2007. National Building Museum
10 to 4pm check with Dan Driscoll djdriscoll@cox.net 703-768-7538 for more details

Indoor flying every Monday and Wednesday 12:45 - 2:30pm
Bauer Community Center Rockville Md. contact Stew Meyers for more info

Scenes from the ill-fated World War I mass launch

Top six photos by Frank Rowsome

Pre-Flight Protective stance....uh-oh....

Photo by Julie Farrell

Up, down and all around...geez....

Photo by Frank Rowsome

Winner Dave Mitchell

Final flight by Harvey Wallbanger winner

Photos by Ron Grosselin

Saturday events — Wawayanda 2006

FAC Scale (8 flyers)

1. Vic Nippert	Spruce Goose	144.5 (best flt 81)
2. Dave Mitchell	Aero A.10	135 (best flt 58)
3. Lynn Morton	P-38	134 (best flt 54)

FAC Peanut Scale (5 flyers)

1. Tom Hallman	Martinsyde Buzzard	117 (42)
2. John Houck	Bebe Jodel	117 (57)
3. Walt Farrell	Piper Cub	112 (58)

Embryo (7 flyers)

1. Dallas Cornelius	Cadet	67	97	120	(9)	293
2. John Houck	Swallow	71	112		(9)	191
3. John Stott	Mr. Malcon	56	120	oos	(9)	185

Nocal (6 flyers)

1. John Stott	Extra 400	99	163	128	390
2. Jim Hemmel	Cessna OE-1	213	52	65	330
3. Ed Pelatowski	Wildcat	59	40	38	137

World War 1 Mass (10 flyers)

1. Dave Mitchell	Bristol Scout
2. Bruce Foster	Fokker DVII
3. Everyone else.....	

Golden Age Racers (9 flyers)

1. Dallas Cornelius	Mr. Smoothie
2. Ed Pelatowski	Folkerts SK-4
3. Dick Gorman	Firecracker

Fiction Flyer (7 flyers)

1. Walt Farrel	Mystery Tailless
2. Dave Niedzielski	Mystery Tailless (what else?)
3. Ed Pelatowski	Joys Racer

Oldtime Plan/Kit Scale (7 flyers)

1. John Houck	Fairchild 45	120	83	69	30 bp	302
2. Tom Hallman	Mureaux Fighter	119	78	72	15 bp	284
3. Walt Farrell	Waco bipe	45	63	64	45 bp	245

MaxFax Nov-Dec 06

Editor: Stew Meyers

This issue features "*OACAR*", a cute little free flight design by Albert Hatfield given to us by Lindsey Smith. While not a subject for FAC or SAM contests, it's an appealing sport design. We also have plans for my "Nieuportenezer", a small electric Ebeneezer.

Over dinner at Kudzu we discussed alternatives to dope. When we got back, Dan Driscoll found some interesting articles on Future floor wax. I have long used Future for a decal finish, now it is being used in lieu of dope.

I went to the "Gathering of Turkeys" in Pensacola last month. Let me put in a plug for this contest. I probably wouldn't have gone, but for the fact that I was going to Pensacola earlier that week for my Nav-Cad fiftieth reunion. It was an easy two day drive and helicopter field 8 is a wonderful flying site. I am definitely going back. George White invited me to give a seminar on Electric Flight on Sunday evening. I wrote up notes for the talk, and have expanded these to include them in this issue. Finally Marcel Lavoie has sent around an interesting take on building box type fuselages. We also have the results of the 2006 Wawayonda FAC contest from Tom Hallman.

When I got home from leaving the Sept-Oct issue with the printer, I found the latest issue of Crosswinds in the mail. The early SE5 was one of the featured models. It was immediately obvious to me that the Guillow's SE5 was a Hisso powered version and Rocky Top's (Midkiff's) is a Woolsey powered version as is the three view on the back cover. The Wylam 3V is a Hisso powered version and close to the photos, of this mark except for the curvature of the radiator shell and fairing under the engine which is slightly curved rather than straight.

I apologize for getting the last issue out so late. OK, go ahead and dock my pay. Haww! This issue hopefully will catch us up.

Our usual photo editor Tom Schmitt is slowed down a little by a knee replacement, so the photos is this issue are courtesy of Tom Hallman. Next year I'll be at the Barron Field Air races!

Tom has some nifty movies of the event if you have a high speed modem:
http://www.hallmanstudio.com/Gadflywawa.mov
http://www.hallmanstudio.com/WW2.round_1.mov
http://www.hallmanstudio.com/WW2.round_2.mov
http://www.hallmanstudio.com/WW2.final.wind.mov
http://www.hallmanstudio.com/WW2.final.round.mov
http://www.hallmanstudio.com/DOXwawa_2.mov
http://www.hallmanstudio.com/Mortons.B25.mov
http://www.hallmanstudio.com/FictionFlyerMass.mov
http://www.hallmanstudio.com/GA.Racers_1.mov
http://www.hallmanstudio.com/GA.Racers_2.mov
http://www.hallmanstudio.com/Gosselin.catch.mov
http://www.hallmanstudio.com/HouckAristocrat.mov

Wawayanda Report

Tom Hallman

The conditions this fall at the annual Flying Aces Club contest, known as the Barron Field Air Races in Wawayanda, NY, were the best and worst that Hung had to offer. Fortunately he saved the best for last, as we were able to roll over many of the first day events to Sunday, making the contest a memorable one.

Saturday began with about 15 minutes of calm air, but quickly turned into a day where cool temps and 15-20 mph winds were the norm. Still, we had 18 official entrants, the most since this contest began back in 2000, so I was pleased to see the support from the Flying Aces gang. We had flyers from CT, DC, NJ, NY, PA,VA, AL & OH. Even Canada!

With eight events each day, the wind was going to make it a challenge to get through many of them, especially the mass launches. Early flights were posted in nocal and embryo, with most of the flights heading east, down the 1/2 length of sod toward the narrow stream. A few easily made it over the tree line that borders the water, but most were found and returned to fly for another official. Braves souls indeed.

We decided to run the first mass event, World War One, and eleven wide-eyed flyers lined up for their chance to grab the kanone...wind or no wind. Our worst fears were realized when many of the ships flew immediately into the ground through the choppy, rolling air...while the others did perfect *figure nines*, nosing into the ground shortly after launch. It wasn't pretty. Many found that they were chasing after 'pieces' of their models after launch, since the glue joins decided to give up. No surprise. It looked less like a chase and more like a gang of kids, hurriedly racing in all directions after someone yelled 'GO' in a game of hide and seek. Of course this time, there was no place to hide.

One flyer, Earl Smith, decided to give his model a second chance at flight, and launched the large, white Fokker back into the air. Rewarded with a climb to about 25 feet, the smiles turned to major frowns when Hung, acting like the Hand of God, pushed the ship directly back down to the turf. Collectively the 20 or so witnesses cringed as the model simply exploded, imploded, broke apart like a water balloon on a brick wall. I had never seen anything like it. Ever. All was not lost however, because he was awarded the coveted Harvey Wallbanger Award!

Only two flyers made it to the second round, with Mr. David 'Ironsides' Mitchell acing out Bruce Foster for the win. I tried to convince a few flyers that even a fully wound, wingless fuselage had a chance today, but their motionless, steely gaze suggested otherwise. They eventually commented, but with words not suitable for printing...

Eventually we all looked at each other, united with the keen sense that today was not the day for mass launches. Divine wisdom suggested that we move the other two mass events to the second day of flying, with hopes of a more agreeable air to Sunday.

. . . . . Continued on page 16

Electric Motor Systems

A Rubber Analogy

Stew Meyers

A rubber power system stores energy mechanically in the wound motor which drives the prop directly as it unwinds. An electric power system stores energy chemically in a battery which releases it as electric current to the motor which converts it to mechanical power to drive the prop. There is an electric circuit loop that allows current to flow from the battery through wires to the motor and back to the battery to complete the path. It's the current flowing through the motor that supplies the mechanical power to the prop. We'll discus the battery later, now let's look at how a motor works.

When current passes through a wire it sets up an magnetic field around it. In motors the wires are wound into coils to intensify the magnetic field produced. This magnetic field reacts with the permeant magnet field of the motor to produce a force that drives the motor. The motion would stop when the magnetic fields algin with each other, but there is a commutator which switches the current to the next coil to produce a continuous rotation. The force, or in the case of a rotary motor, the torque is a function of the number of turns in the coil and the current passing through it. DC motors have a linear torque constant that is the ratio of torque to current.

Rubber motors are essentially a torque device, you wind them up and they store energy as torque. This torque is independent of the rpm. A prop can also be thought of as a torque device. The speed at which the prop spins is a function of the size of the prop i.e. diameter and pitch and the torque applied. It so happens, the speed (rpm) of the prop is proportional to the square root of the applied torque.

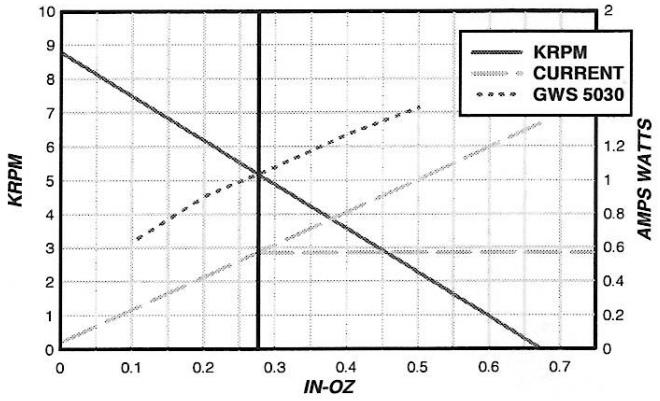
As in the case of a rubber motor, the electric motor drives the prop by applying torque. However the torque of an electric motor is not constant, but is a function of its rpm. For a given voltage, the speed of an electric motor (rpm) is a function of a linear voltage constant and the load applied to it by the prop. The prop then loads the motor by drawing a current that is a linear function of the torque associated with that rpm. The constants result in straight lines for the rpm and current curves when they are plotted against torque. This is easiest to see in a graph.

In the first graph, a vertical torque reference line has been drawn in where the propellor load curve intercepts the rpm curve. Torque is read off the horizontal axis. This defines the operating point of the motor in terms of torque and rpm. The motor speed in krpm is read off the left axis. A horizontal reference line has been drawn in to aid in this.

Since current is a linear function of torque, the intersection of the torque reference line and the current curve defines the current drawn by the prop at the operating point. This is read off the right vertical axis. A dashed horizontal reference line has been drawn to aid in this in the graph below.

7MM RED BACK MOTOR

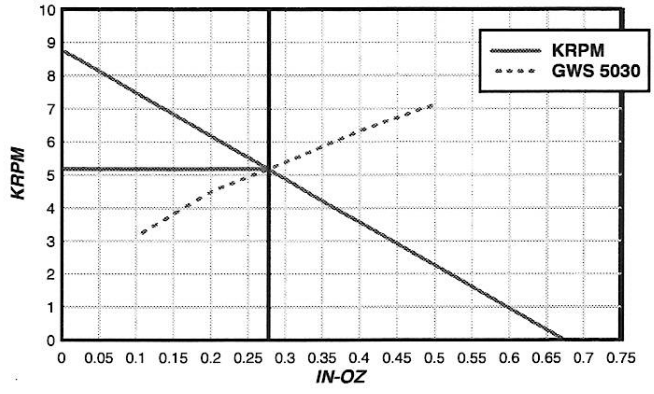
3.5 VOLTS 4:1 GEARING
GWS 5030 PROP



Power is the product of speed and torque. If we multiply the motor speed in krpm by the torque in in-oz and a constant of 0.74, we get power in watts. Since rpm is a linear function of torque, the resulting power curve is a parabola rising from zero at zero torque to end at zero rpm. The maximum power of a DC motor is produced at the operating point that is defined by operation at half the no-load speed and half the stall torque. This is indicated in the graph below by the dotted vertical reference line. Read

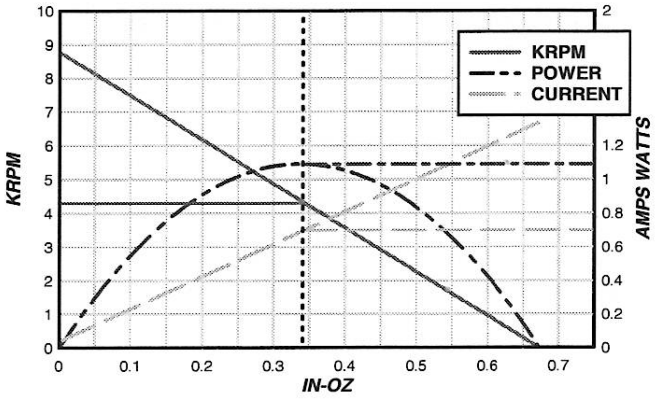
7MM RED BACK MOTOR

3.5 VOLTS 4:1 GEARING
GWS 5030 PROP



7MM RED BACK MOTOR

3.5 VOLTS 4:1 GEARING
GWS 5030 PROP



the torque off the horizontal axis where this reference hits it. Using the dash-dot horizontal reference line at this operating point, one can read max power off the right axis. This graph is a little busy, but lets drop down the vertical reference line to where it crosses the rpm curve. A solid horizontal reference line is drawn here, following it to the left axis we can read off the rpm at max power. Similarly dropping further down the vertical reference line to where it crosses the current line and drawing in another horizontal reference line (in this case dashed) we can read the current at max power off the right axis.

(These graphs include the effect of a 4:1 gear box. The rpms are 1/4 of the motor rpm and the torque is four times the motor output torque.)

As we put more of a load on the motor by larger props, the vertical operating point reference line moves to the right as the torque is increased and the rpm is reduced. Naturally the current increases with torque. Once the peak power point is exceeded, the motor continues to draw more current, but actually produces less power out. The extra power is dissipated as heat and can in the extreme case can result in destruction of the motor. Heat dissipated = current through the motor squared, multiplied by the terminal resistance of the motor.

Electric motors like to run at high rpms and low current to reduce heating. If you hang too big a prop on an electric motor you can move past peak power and bad things happen. Too small a prop results is not producing much power. Small high rpm props don't match up well with light, slow or draggy airframes. Fortunately you can use gears to let the motor run at high speed and turn a larger prop at lower speed which is a better match to the airframe.

With rubber motors the torque is a function of the width of the rubber and the percent of permissible turns. With an electric motor, the current and therefore torque available from the motor is a function of battery amp-hour capacity as well as the percent of charge and the motor constants, somewhat analogous to both rubber width and length. The percent of charge of a battery is analogous to the percent of permissible turns. As power is drawn from the battery, the voltage runs down and the current produced is reduced, some what analogous to the reduction of torque as the rubber motor unwinds. The shorter the rubber motor, the more quickly it will run down. The smaller the amp-hour rating of the battery, the quicker it will run down. The width analogy comes into play, when you hook up a motor to a too small an amp-hour rated battery. It's like using a rubber motor that is too small in cross section, the prop will not turn very fast and barely produce any power. Too small a battery will have a large initial voltage drop and produce less power in the motor, the battery also will not tolerate this very well and can overheat and be damaged. The message here is you must use a battery that is has a enough capacity for the job.

The electric motor system includes the battery, prop, and gearing all of which affect performance. This is a little more complicated than rubber motor performance which is dependent on rubber cross section, length, percentage of winds and prop. I hope this article helps explain why.

Selecting an Electric Motor System

Stew Meyers

Well so much for theory and analogies, in practice, how do you select a power system for a free flight model? First of all let's rule out brushless systems as too expensive unless you really need the lightest possible motor. For brushed motors, you initially want about 2 watts of input power per ounce of all up weight for good climb. (Note the power in the preceding graphs was out put power.) For a scale model, I like to use a scale diameter prop. You want to find a motor and gearing that will drive your prop while operating in a efficient range and produce the required power. This will define the voltage and current needed. You then select the battery that will supply this input power.

The biggest advance in electric power has been battery chemistry. Lithium Polymer cells have three times the capacity of Nicads. They do have to be treated with respect however. Let's look at low vs. high voltage systems. The fewer number of cells, the simpler the system, but the lower the voltage. For the same power, a low voltage system requires higher current. Higher current results in more voltage drop and losses in switches, connectors, and wiring. With Nicads the nominal voltage is 1.2 volts per cell, this drops to about 1.1 under load. NiMh cells run about a tenth of a volt less. Lipolys have a nominal loaded voltage of 3.7 volts per cell. They also can not be discharged below 2.8 volts per cell with out permanent damage. The use of a Lipoly dictates a timer to limit depth of discharge. For reasonable free flight models one or two cell Lipoly batteries are the way to go. A fuse is very good idea and not hard to implement. There must be some provision to remove the battery from the circuit after flying to prevent it being drained by the timer over time. Good practice would be to provide a way to remove the battery from the airframe for charging. I quite often don't bother.

For practical free flight with Lipolys, the battery is chosen to provide enough power for 10 minutes of flight. Multiply the amp-hr rating of a battery by 60 you have amp-minutes. Drain the battery in 10 minutes and you operate at a 6 "C" rate. You can't always trust the rating on batteries, but in general you don't want to operate Lipolys at more than 8 times their mAhr rating. Some will not even tolerate this very well. Nicads will stand the abuse of drawing much higher current ratios, but still end up being heavier.

You don't have to plot the motor constants to figure out how to use motors. You just need to know the motor peak power and current at the operating voltage. It also helps if you know the rpm at peak power. You also need to know the prop and gear ratio that will load it to that point or a point just a little shy of this. It's important to know the current that the motor is drawing from the battery as well as the voltage. Both the motor and battery performance are highly dependent on current.

. . . . . continued on page 22

Floor Finish as a Dope Substitute

by Andy Mitas and Wout Moerman
April 9, 2006
(from www.smallartsflying.com)

Wout: As my re-entry in building stick-and-tissue models takes place on the dining table in the living room, I soon was trying to find a substitute for dope. When browsing on the internet I found a possible substitute: Future Floor Finish, which is sold in the Netherlands as Pledge Parket Plus.

Andy: I'm on a perpetual quest to find chemicals that allow me to build good models without the headaches I always get from dope, acetone glues, and even Krylon spray. For a covering sealer I wanted something that I could brush on, thin and dissolve with water, and use to good effect on models that required additional strength from their covering, like light Dime Scale models.

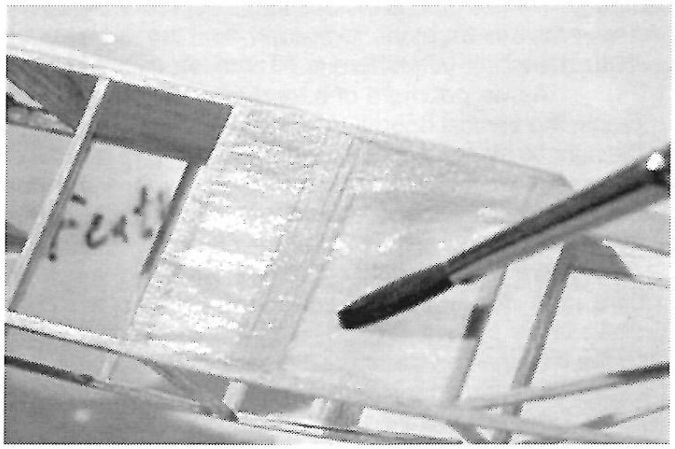
Wout: "Future" is a water-soluble acrylic floor coating which dries into a completely clear, waterproof, tough and flexible layer. As it does contain ammonia it is not completely odourless, but the smell is less annoying than the smell of dope. Brushes can be cleaned with water directly after use. Hardened Future can be dissolved in an ammonia solution. More info on Future and its different names can be found at: www.swannysmodels.com under Tools & Tips.

In this article we will show different techniques to use Future:
- dry covering
- wet covering
- pre-shrinking and pre-doping
- tissue over tissue
- tissue over foam

Dry covering

Wout: The balsa frame is coated with diluted PVA-glue, and a slightly oversized piece of tissue is put on the coated frame. The tissue is pulled taut to remove wrinkles. The excess tissue can be removed after the PVA has dried.

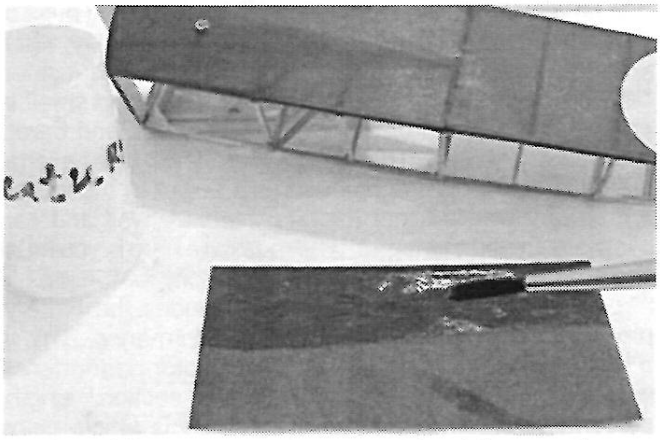
The tissue is coated with Future, which contains enough water for a moderate shrinking action. If the tissue is very sloppy it can be watershrunk before applying Future. Normally this will not be necessary.



Andy: I actually use the Future, thinned 50% with water, as both adhesive and sealer. I first brush it on the frame, stick the tissue on, then brush thinned Future on the tissue to seal it. If it doesn't stick, I wet the tissue again, then use full-strength Future around the edges, and rub the tissue against the frame with the back of my fingernail.

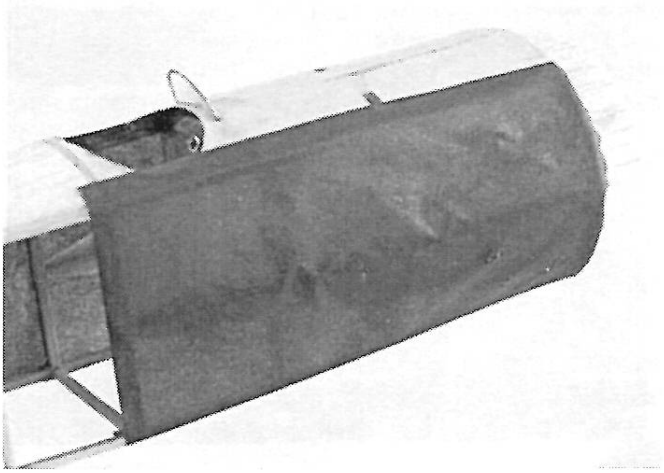
Wet covering

Wout: When tissue is used for covering complex forms it is better to use wet covering:
- coat the frame with diluted PVA,
- coat the rear of the tissue with Future,
- place the tissue on the frame and try to smooth as much as possible,
- the remaining wrinkles should disappear when the tissue dries,

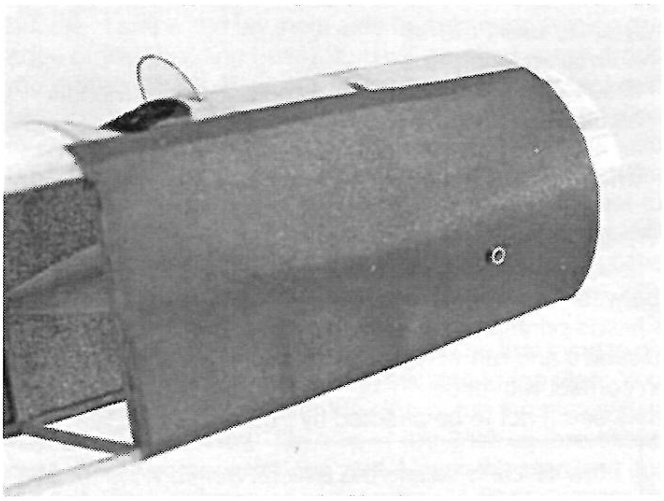


coating of Future brushed on one side of tissue only

In this example green Esaki tissue is used which has been sprayed with Tamiya spray paint (rattle can) before covering. The sprayed tissue can be used as regular tissue. If dope is used over spray paint it will smear the paint, but Future can be used without problem.



tissue applied, still wet



dried tissue

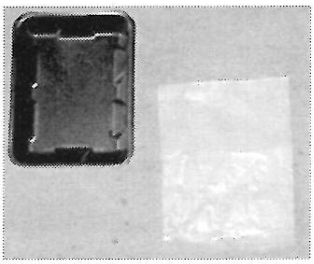
Andy: I now use wet covering on everything except the most fragile structures (indoor models and tail surfaces). My procedure is a little different from Wout's. I cut each piece of tissue to the size & shape needed and dip it in water. While it dries from wet to damp, I brush Future on the frame. Then I place the damp tissue on the frame, starting in a corner, and take advantage of its wet strength to pull it tight. If it is a wing, it is advisable at this point to pin it to the board in a jig to keep it flat or even warp in a little washout.

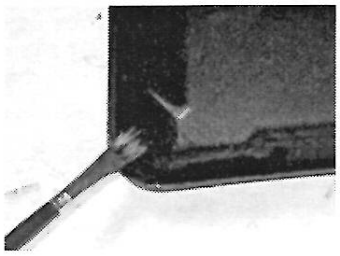
Water soluble dyes like food coloring can be used to tint Future. I plan to test other dyes and inks. Dr. Martin and Ritt dye are candidates. Windsor-Newton inks work. I wonder what SNJ powder is? Regular aluminum powder and by inference gold & bronze work fine. SCM

Covering fragile structures – pre-Futured tissue

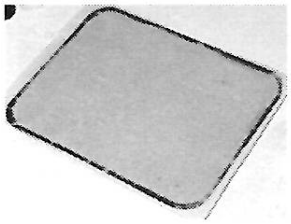
Andy: Light indoor models do not require any kind of sealer for the covering, as the structures are not dependent on the strength or water-repellance of the covering. The tissue should, however, be pre-shrunk, so that the humidity in the air does not warp it over time.

On the other hand, on the fragile tail surfaces of an outdoor model, you may want to seal the tissue for reasons of strength or appearance. I'm going to explain a procedure that will allow you to either pre-shrink or pre-seal tissue with Future, then apply it to get a tight, attractive finish without warping. I use a Styrofoam meat tray as a shrinking frame.

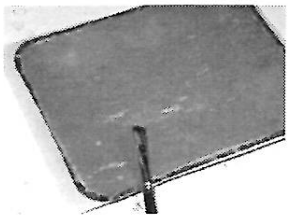




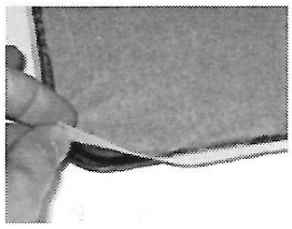
The meat tray sits right side up on my workbench. I brush full strength Future over the edges and apply the tissue, as if I was gluing a covering to the top of the meat tray to cover its contents.



After the Future dries, I now have a sheet of tissue loosely covering the top of the meat tray.

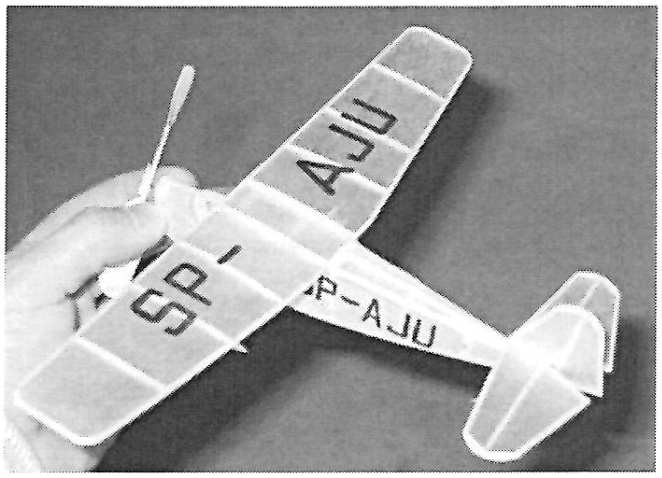


If it's sprayed or brushed with water at this point, it will sag, then shrink and tighten.

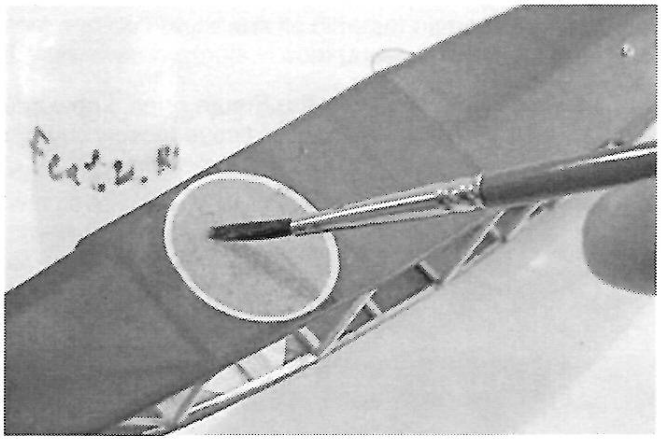


Peel or cut it free and let it "breathe" for a few hours before covering an indoor model with it. It won't be perfectly smooth once cut off the meat tray for a while, but it won't warp your model.

For tail surfaces of outdoor models and other applications where very slight tension and strength is needed, I paint the tissue with thinned 50% Future (instead of spraying with water) while it's stuck on the meat tray frame. It will tighten as it dries. The key to a tight covering job with such pre-doped tissue is to cover immediately after you cut it off of the meat tray. It will maintain its smooth, tight finish but shrink very little. My Nickel Scale RWD-5, recently published in the **Tissue**, flies with Future pre-doped tissue on wings and tail surfaces.



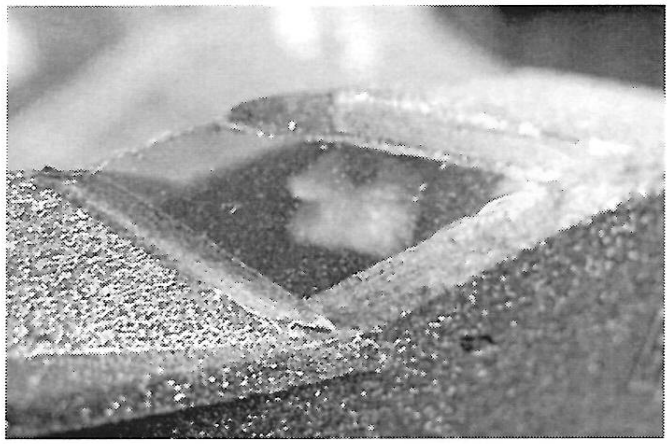
Tissue over tissue



Wout: When tissue is used over tissue, the new piece of tissue can be placed dry in the right place and Future can be applied directly on top. The Future will be absorbed by both layers of tissue, which will bond together when the Future dries. In the meantime you have a few minutes to make adjustments or to correct mistakes.

Tissue over foam

Wout: Future is completely friendly for all types of foam. In the example, tissue strips are used as canopy frame over foam and clear plastic. Don't try this with dope!



Best and Worst of Future (we both worked on this)

When to use Future:
- normal covering jobs
- tissue over foam: Future is completely foam friendly
- as a sealer over decals
- as a topcoat over acrylic paints
- when the smell or high of dope is prohibitive

When to use dope:
- tissue over Mylar, because dope gives a better bond between tissue and mylar film
- tissue printed on an inkjet printer, because most inks will dissolve and run when in contact with water, but are safe in contact with dope (I have found that Epson inks seem not to be affected by Future. SCM)

Toys 'R' Us is selling the *Silverlit Single Wing* for $20 This is a 12" span R/C model on 27 mhz that has a three position throttle and a bang-bang magnetic actuator. More importantly it has a 3.77 :1 geared 7mm motor with a 4.5-4 prop. This appears to be equivalent to the red back motor. The three 70 mhr nimh cell battery weighs 8.9 grams. The motor, prop and gearbox weigh 5.2 grams when excess plastic is cut away. The receiver weighs 2.3 grams and the actuator 1 gram. The lightened r/c system weighs about 8.9 grams less battery. An Atomic Workshop 130ma Lipo weighs 3.6 grms. If you substitute this you have a small R/C system for 12.5 grams. Keep the nimh battery and the system weighs 17.8 grams. Substitute a $15 timer for the receiver and actuator and you have a free flight system that's a gram or two lighter. Just keep the tx to charge the battery.

Oscar..what a little pet

Lindsey Smith

Whilst on a visit to relatives and friends in East Anglia I enjoyed a visit with Albert Hatfull, the famous designer of many models in the Kell Kraft range of yesteryear. We were looking though one of his portfolios of past designs, some of them never kitted or published, when this little gem appeared. Named Oscar after a little dog he once owned, it appealed to me instantly for two reasons; firstly it is an easy first stab at rubber powered free flight and secondly with the increased popularity of the under 25" wingspan class duration competition for small field sites, I wanted to see if it could contend with the Achilles and Commandos which dominate the class at present. So, I begged a copy of the plan, took it home and built it.

As this is an ideal beginners model I will go into some detail of the construction sequence. Experienced builders can skip this bit and get on with it!

Fuselage

This is built from 3/32 square strip. Select 4 strips of medium hard balsa of equal stiffness. To do this take a bundle of strips and lay them side by side overhanging the edge of your building board. You will see that some droop more than others. Pick out the four that droop least and use them for the longer parts of the fuselage called longerons. Trace Part A, the wing seat, and cut two from 3/32 sheet. Do the same with shape at the rear of the fuselage with the hole in for the rubber peg. It is best to hold both these pieces together and pierce them with a drill but or sharp pencil to get the holes matched. Cut out the shapes at the front of the fuselage in the same way.

Now we are ready to start construction. The first thing to do is to prevent the framework from sticking to the plan. You can either lay cling film over the plan or rub the plan with a wax candle end. Now, pin one of the 3/32 square sticks over the lower longeron. Pin part A over the plan and cut the two top longerons to size and pin and stick them in place. Now, cut the uprights to length checking the fit and cutting two of each to ensure that both sides are identical. Fit the rear motor peg piece and nose piece and leave to dry. Note that the short upper longeron under the tailplane butts up against the upright next to it.

Whilst waiting for the first fuselage side to dry amuse yourself by cutting out 12 wing ribs. The easiest way to do this is to make a template of ply using the shape shown on the fuselage side view, then use this template to cut 12 blanks the same shape with the notches for the 1/8 square leading edge' x 3/32 main spar and 3/8 x 3/32 trailing edge accurately cut to ensure the ribs are identical. Put them all together side by side and pin them together with two pins true up the notches and sand the top and bottom surfaces. Set them aside.

Back to the fuselage. Build another side on top of the first, without removing it from the board and leave to dry. Now cut 2 each of the cross pieces shown on the fuselage top view, two of the 3/32 sheet shapes at the nose and two of the long thin triangles at the tail_ Construct formers 1 and 2 over the plan from 3/32 x 1/8 strips.

Now comes the first tricky bit! Carefully release the two fuselage sides from the plan. If the candle wax or clingfilm hasn't worked, slide a razor blade between the plan and balsa but be careful not to slice into it. Now separate the two sides but leave them stuck together at the tail. Now stick former 1 between the uprights at the front of the wing seat with its top cross piece sticking to the wing seat piece A. Leave to dry then stick former 2 at the rear of the wing seat in the same way but with the cross pieces facing forward. Check that you have ever curvature on both sides of the fuselage by holding it over the top view and checking that it lines up equally.
Now stick the remaining cross piece in starting at the front. Wait until the front two are dry before continuing one pair at a time, top and bottom. Note the upper cross piece at the front of the tail mount is 3/32 x 3/16 to fill the gap between the upper longeron and the tail seat. When these are dry, stick the nose and tail insert shapes in place trimming if necessary to fit without distorting your nice square fuselage.

You will have noted little triangular shapes at various places on the fuselage side view. These are called "gussets" and strengthen the framework at these points. Cut triangles from 3/32 x 3/16 strip with the grain going across the angle, trim to fit the angle in question and stick where shown. It is a good idea to reinforce the holes for the motor peg with pierced pieces of 1/64 ply or celluloid, this will prevent future wear.

Bend the undercarriage using 20swg steel wire and bind in place where shown at the four corners with thread. Then smear the binding with cement. Cut the nose former from thin ply saving the centre "cut out" make marks on both former and cutout, so that you can line them up later, and stick the former to the nose of the fuselage. Take the cutout and stick it to a piece of 3/32 sheet. Cut out and do it again twice more, but with the grain running a different way each time. You now have a ply faced block which fits in the hole in the nose. If you have a gash box, take a suitable piece of block balsa, stick the ply faced block to the open grain end and carve and sand the nose block to shape. If this is your first model and you don't have any bits of block, fit 14 pieces of 3/32 balsa cut to the side view of the nose block and stick them together. Leave to dry overnight then stick your ply faced block to the back and proceed as before. Grain should be fore and aft.

Stick the subfin centrally to the 3/32 infill under the rear of the fuselage. Now you need some bamboo pegs. These can be made by splitting a kebab skewer until you get the thickness you want and sand it smooth. You need two for the wing fixing bands and one at the tail where shown.

. . . . . Continued on page 22

Wawayanda report continued .....

And so it was decreed. In fact, everything except nocal and embryo was rolled over to Sunday.

But I still had the bug to fly....so I handed out a dozen or so vintage Atomic Jet Flying-o-Saucers. These 6" discs are an early 50s version of the frisbee I guess, made of tin, wire, and a spool on a dowel. Wrap a yard of string around the spool, yank it off and let her go. I found these on eBay a few years ago, and have pulled them out when flying stick and tissue looks doubtful. By twisting in a little bit more pitch, you can get high flights over ten seconds. Not earth shattering duration, but a perfectly good way to spend a few minutes on a field. Kids love 'em, and by the looks of the guys on the field this day, dad's love 'em too! If anyone can beat 14 seconds and about 100' altitude...let me know, 'cause that's my limit so far. We toyed with the idea of asking GHQ if we could give a kanone to the mass winner. These guys were really hungry for the Ks...

The day ended early, but not before John Stott was able to have his high flying nocal returned after being feared lost. This Extra 400 is the class of the field every time out, so John was delighted to see its return. Checking the score board, he realized that he was a little behind the current leader, so another flight was in order. With winds gusting beyond 25 mph, John put in another long flight, and you guessed it....he lost the model 'again' after a long downwind chase. I'm sure he'll build another. Then again, I suspect he builds them three at a time...

Many of us met at a local diner in Middletown for an evening of stories, lies and laughter, anticipating a better day on the field come Sunday. We awoke to a misty morning and dead calm conditions. A blanket of fog had settled in at the field, making our trek to the flight line an ominous one. Felt more like Halloween than a Flying Aces contest...and wasn't that Vincent Price over there by that lone, leafless tree??

But truly, it was beautiful. The blanket of fog began to rise as the sun was low on the horizon, leaving a textured sky that looked like an umbrella over the entire field. Stunning. The disappoint of the previous day had lifted, leaving us with a morning full of expectation. Literally, I thought I heard my Gadfly pounding from inside the box to get out, so I obliged, cranking her up at 8AM for a long majestic flight. Framed by this amazing sky, the flight will remain memorable on many levels, I'll never for it.

The good weather also brought out more contestants. A group of flyers from New England made their way to event, bringing the total to 25, by far our largest turnout. More and more guys are looking to get in this one last fling before the winter building season arrives, so thanks to everyone for supporting the contest.

Hung treated us to a morning of near perfect conditions. The cool air from the day before was giving way to milder temps. The wind drift was minimal until around 1:30PM, when a quick moving wall of wind passed across the field, bringing back memories of the day before. But by then, most of the serious flying had already taken place.

We flew five mass launches this day, including Golden Age Racers, Fiction Flyer, World War 2, Modern Military, and finally the Flying Horde (in that fast moving wind storm). All of the scale events were heavily flown, along with the other duration events, Dime Scale, Oldtime Plan/Kit Scale, Modern Production Civilian, and Golden Age Civilian and Military combined.

Perhaps the most memorable battle was the World War 2 mass event with 12 flyers. All of the rounds were tightly contested, with everyone getting cleanly away from the flight line. High flying action swirled directly overhead in the calm air, so the flyers didn't have far to chase. These guys really came out to fly, giving each other some serious action. The early round flights were in the 60 second range, yet no one ran away with it. The final came down to Farrell, Fineman, Mitchell, and Stott. The guys must have been holding back in previous rounds, since all of the last flights came in around 80-90 seconds. The altitude was impressive. But Mitchell then Farrell were out first, leaving Stott and Fineman to re-enact the final from this past summer's WW2 event at the FAC Nats in Geneseo.

The final descent created a finish that was as close as I'd ever seen, with the winner taking the kanone in a bang-bang finish. All I can figure is that Mark Fineman's P-63 landed in the center of the sod field, while Paul Stott neatly trimmed his Fiat G-55 to land on the down slope of the irrigation ditch, which was about a foot lower than the sod.... Man, that guy is good!!

I'll let the pix and movies tell the rest of the story. Thanks go out to Julie & Walt Farrell from Charlottesville, VA, Rich Gorman from Seaford, NY, Frank Rowsome from Annapolis, MD and Ron Gosselin from Montreal, Canada for their pix. Special thanks to Ron for the movies. We were glad to see that he made the trip from Montreal for his first visit. Many thanks to Dave and Ann Niedzielski of Easy Built Models for making the long trip from Alabama, and offering their fine line of products to the gang. They also donated a special award to the winner of the WW2 event, a Fossil mantel clock with an aviation theme.
And finally, a very special thanks to John Houck and his family, who took care of scoring, and offered a free lunch and snacks to the entire gang.

By the end of the weekend with the scores tallied, the Grand Champ was the hard flying John Houck, who scored well in many of the events. Congrats, John! No one is more deserving.

Next years contest is scheduled for October 20-21. Hope to see you there. Now go on eBay and find yourself an Atomic Jet Flying-O-Saucer and fly that little disc all winter long. I guarantee she won't go OOS on you.

..... Tom Hallman

THE COMPLETE FUTURE

by Matt Swan

Some time in the dim and forgotten past, a modeler discovered that this stuff, when applied to both side of a piece of clear polystyrene, would make it appear thinner and clearer. It will help to hide minor scratches – simply pour some Future into a small cup and dip your canopy into it or brush it on and let dry– it's a kind of magic! After you dip your canopy (or other parts) in Future, be sure to place a cover over it to prevent dust from collecting on it. Also it is helpful to lay down a piece of tissue paper or a paper towel to set the part on, this will wick away any excess so that you will not have a heavy buildup on the low points. It has been reported that if you leave a small piece of sprue on the part and dip and let dry, then remove the sprue it stop's the splintering you sometimes get when removing parts off the sprue. I have not verified this yet. And finally, let the Future cure for around 48 hours before masking to reduce the possibility of pulling it off with the masking material.

It is also useful as a sealant prior to AND after the application of decals. Before using Future to seal your model with it is important that the kit be clean and free of any oils such as fingerprints. All coats of paint should be allowed to cure (dry) for at least 24 to 48 hours (especially enamels) before applying Future. The sealing coat of Future (usually one coat is sufficient) should be allowed to dry for 24 to 48 hours before applying decals. After decals have been applied and everything has dried completely (24 to 48 hours) you can apply a dull or flat finish safely such as Testors dull coat lacquer or Polly Scale clear flat. Testors Dull Coat is a lacquer so it should be applied in light coats to avoid orange peel.

Some modelers even apply decals using Future to set the decal. Wet your decal as usual in water, but before it goes to the model, dip it in future. It works well and does away with the need for Micro-Sol/Set or similar setting agent. The only downside I have noted is that the Future goes tacky quite quickly and can cause a few problems if you are still trying to place/adjust the decal at that time. The upside is that it pretty much ensures no silvering.

There have been a few reports by modelers that yellowing has occurred with all white finishes. I have investigated several of these reports of yellowing and have found in each and every one that it was the underlying paint that had yellowed and not the Future. White paint contains a resin pigment that will yellow under long-term exposure to direct sunlight and there is no clear coat that I am aware of that will prevent this occurrence.

It is not necessary to thin this product prior to use. It can be applied directly from the bottle by either paintbrush or airbrush (15 to 20 psi), clean up with an ammonia-based window cleaner like Windex or if you are in the U.K., Windolene. It is non-toxic and non-reactive. If using the Tamiya Flat Base you may not want to use Windex for clean up as it can react with the Tamiya product and cause gumming in an airbrush. Because Future is a true Acrylic coating washes that are oil or Turpenal based will not affect it as they would lacquer or enamel based coatings.

Future can be applied to your model with either a wide soft paintbrush or via an airbrush. If you choose to use the paintbrush approach be sure that your brush is clear and free of any dust particles before starting. Use slow continuous strokes to avoid causing bubbles on the finish. Once you have brushed a coat on, leave it alone and let it's self-leveling properties take care of itself until thoroughly dry. If you are going to use an airbrush set your delivery pressure at about 15 psi and keep your range at about 6 inches. I prefer to apply Future with the airbrush most often and lay down one or two heavy, wet coats. I have also found that mixing 3 parts Future to 1 part Isopropyl Alcohol before airbrushing really seems to help the finish. Some modelers prefer to apply several light coats but I feel this can lead to a pebbly result sometimes. When using heavy coats should you have a run develop simply touch it with the corner of a piece of tissue to draw off the excess. Should you discover a run after the coat has dried simply use a cotton swab soaked in ammonia based window cleaner and gently rub the run until it has been removed – only takes a minute or two.

Future can also be polished with a non-volatile polishing compound, like Turtle Wax Polishing Compound (the kind in the white container with a green label).

Future does produce a glossy finish so many modelers will introduce a flattening material or only use it as a pre-decal sealer. If you wish to use flattened Future as a final coat here are a couple of suggested ratios of Tamiya flat base for different effects:

1 part flat base to 3 parts Future = very flat
1 part flat base to 10 parts Future = flat
1 part flat base to 15 parts Future = satin

If you get too much of anybody's flat base on the surface of your model you run the risk of making it all go white. No thinning is required just make sure it is well mixed.

You can mix Future with Model Master Acrylic paints and add 20% to 25% of matt clear to obtain a realistic semi-gloss finish. Using Future as a "mixer" for acrylic paints will help them airbrush better, increase the durability of the paint to resist damage, and if you use enough Future, the resulting finish may not need to be gloss coated prior to decaling. It has been successfully used with Polly Scale, Model Master, Gunze Sangyo, and Mister Kit acrylic paints. Results have been poor when mixing Future with Tamiya acrylics and I do not recommend it. Usually around 25% Future to 75% paint will give good results but depending on your project you may want to add a little more Future. For example, if you are doing a fade/blending coat, you might add 80% Future to make a "translucent" paint.

If you screw up the application you can remove the dried Future with Windex, Windolene or simply let it soak in a cup of Future overnight. It is important that the clear parts are clean and free of wax or oils (such as your finger print) prior to application otherwise these contaminants will repel the Future and give unsatisfactory results in the end.

On clear parts, Future is a good protecting agent, including giving a good hedge against the 'chlorosis' white spray effect that cyanoacrylate glues can cause on windows and such.

Some modelers are using Future as an adhesive for photo etched and brass parts or even to attach canopies. The bond is somewhat tenuous and I think I'll stick (little pun there) to super glue myself.

Future can be used for making mud puddles or standing water when doing a diorama. It's not as thick as epoxy, but it's easier to work with. And, it doesn't take nearly as long to dry as resin type clear mediums. Pastel powders can also be mixed with it to create grime, mud, yuck, or whatever.

Use Future for instrument dial faces. It may take many more applications than epoxy, but you don't get the domed effect you do with epoxy, and Future is clearer.

When creating dioramas or display bases utilizing Sculpey or other clear molding materials for water situations coat it with Future for a really wet look.

You can add talcum powder to Future to make quick drying seam filler that is hard, but sands easily.

If you want to create your own shades of transparent colors, food coloring can be mixed with Future for the desired effect. Tamiya clear colors work well as toners also. If you mess up, you haven't invested as much money as you would combining clear paints.

For those gold tinted canopies on contemporary jet fighters try adding a few drops of Tamiya acrylic gold to a couple teaspoons of Future.

Future as a sealer over decals allows the modeler to use an oil based paint mixture thinned with Turpenoid to color to darken panel lines etc. The Future will prevent the oil paint from marking the surface and you can use a paper towel or q-tip to remove as much as you want until you get the effect that you desire.

If you do your own mold making and resin casting, Future is a great clear coat to use on your masters or molds to ensure a clean casting. You can either brush it or spray it on. The clay you use to make your master mold can be used over and over again, as the Future does not seem to harm it.

Mix a little SNJ powder with Future and have a rock hard gloss silver finish. Add about 4 "blobs" of SNJ powder to a 1/2 oz jar of Future and mix well. Using low pressure like 8 or 10 psi, apply two or three light coats, the last one a little heavier. Wait about 45 minutes and then buff with some more SNJ powder. This will create a very convincing aluminum finish. After drying overnight, this produces a very durable finish. Another plus to this technique verses using a series of lacquer primers and lacquer paints is that if you are dealing with very fine panel lines you do not run the risk of compromising those lines with paint buildup. Thanks to Michael S. for experimenting with this process.

Future also makes a great barrier coat between styrene and lacquer-based paint that would otherwise attack the plastic. Some modelers use it as a primer coat before applying lacquer based paints such as Alclad.

A common problem reported with Future is a condition referred to as "Orange Peel". I want to first talk about the causes of "Orange Peel" which will, for the most part, indicate some solutions. "Orange Peel" is a dimpled surface, like the skin of an orange, resulting from Future droplets drying too much to level out and flow smoothly together (poor coalescence).
Root causes of "Orange Peel" are;
1. Improper flash or drying time causing subsequent coats to lose solvents to the dry coat.
2. Extreme shop temperature causing the droplets to lose more solvent and dry out before they can flow and level properly.
3. Improper gun adjustment and techniques.
4. Improper drying by gun fanning causing the paint droplets to dry out before they have a chance to flow together.
5. Improper drying time for previous coats of paint can result on "out-gassing" preventing the Future from leveling out.

With these causes in mind potential solutions become apparent.
1. Allow proper dry time for undercoats and topcoats.
2. Schedule painting to avoid temperature and humidity extremes.
3. Use proper gun adjustments, techniques, and air pressure.
4. Allow sufficient flash time. Do not dry by fanning.

In mild cases, a second, wet coat of Future or a mild polishing compound for enamel or rubbing compound for lacquer may help. In severe cases, remove the Future with Windex or comparable product and recoat.

Additional alternative solutions are:
1. Add a couple drops of a liquid dishwashing detergent (like Ivory, or Dawn, or such) to the jar holding the Future to be sprayed. What that does is help the Future 'break' it's natural surface tension and help it to 'level out' faster. Also, mix in about 15% to 20% Polly Scale airbrush thinner.
2. Another avenue would be to add a few drops of Windex to the paint cup to reduce the surface tension of

the Future.
3. A few modelers have been happy with the results from sanding the surface with 3200 or even 6000 grit sandpaper.
4. Try using a little 80% rubbing alcohol to thin the Future with and adjust your airbrush air pressure to about 15 to 20 psi.

All of these approaches have worked for modelers in the past. Regardless, this pebbling will not affect the application of decals and in most cases disappears once a final dull coat is applied. I have been using Future for so long that I cannot remember the first model that I coated with it and have never had this 'pebble' effect happen so these possible solutions are as reported by other modelers and caution should be exercised when experimenting with them.

Snake Skin: If you are using enamel paints and they have not been allowed to cure completely you may get a snake skin effect in the Future. It is important that your underlying coats of paint be fully cured before applying Future. It is also imperative the the surface be clean of oils and fingerprints. Before coating your model with Future let it soak in a mild detergent solution and then rinse with warm water. Let it dry completely before proceeding.

When using flat paints more Future is required to get the glossy finish as a flat surface is, in reality, not flat. It is very rough on a microscopic level to break up light reflection causing it to look flat and this roughness must be filled in by the Future coating. You recreate the flat look with a final coat of flat finish after all decals and weathering has been completed.

Decal Setting Solution Reactions: Strong decal setting solutions, like Micro-Sol, will react with Future that has not cured fully and create a white haze. Do not dispare, this haze will disappear when you apply a second coating of Future. Remember to always allow your Future to cure for a minimum of 24 hours before applying decals.

Stripping Future:
Future can be stripped from the canopy in several ways.
1. Windex.
2. Soak in Future overnight.
3. Chameleon Paint Stripper.
4. Ammonia.

I want to talk about Windex for a moment here. Windex is an ammonia based window cleaner, it has a transparent blue color to it. In the United Kingdom a comparable product is Windolene or if you are in New Zealand you can look for "Mr. Mussle".. What it's called is not so important as what is in it - ammonia. In the Netherlands and in Portugal the equivalent of Windex is Glassex.

A cautionary note on Humbrol masking liquid, Humbrol is an ammonia based masking liquid and the ammonia will break down Future so DO NOT use this product to mask over Future floor polish. However, with this same information in mind, you can use Humbrol masking liquid to strip Future from select areas of a model without harming the underlying coats of paint.

When using Future in an airbrush, to clean your brush all you need to do is shoot some Windex or other ammonia based window cleaner through your airbrush. I know that some modelers like to shoot straight ammonia through their brushes but this can cause some pretty strong odors - similar to a barnyard. I don't know about you but I got off the farm many years ago and do not care to be reminded of the olfactory joys of my childhood.

Okay, so what if you are a little careless and get the Future on your hands? Washing with soap and water will take care of you.

One modeler reported that he had fogging problems after using superglue, here is an excerpt from his solution using ammonia:

"I dipped a q-tip into pure household ammonia and started to scrub the canopy. Well, it worked PERFECTLY. In less than 30 seconds the future was stripped, and the fogging went with it, and I was back down the original clear plastic surface, undamaged. Amazingly, even though I had painted the frames after dipping in future, the ammonia did not attack the future under the painted frames - the paint stayed intact.

So next time you dip a canopy in future and something goes wrong, like dust, a fingerprint, or a thick spot in a corner, just take a q-tip and straight ammonia and you can undo it in seconds."

Recently there has been speculation on the various forums that the formula for Future Floor Finish had been changed. This is false, the formula has not been changed since 1992 when S. C. Johnson added fragrance to the formula.

Recently I have had some reports of the product "Klir" yellowing in the bottle over time so pay attention if you are using this version of Future. It does seem like there are some minor variations in the formula as the product travels around the world so it is recommended that you always test a new product on some scrap plastic to 'get the feel for it' before risking an expensive kit.

I hope that you have found this information to be helpful. If you have any other information or tips or names for Future in other countries that you think should be included in this lesson please forward them to me at: Webmaster@SwannysModels.com

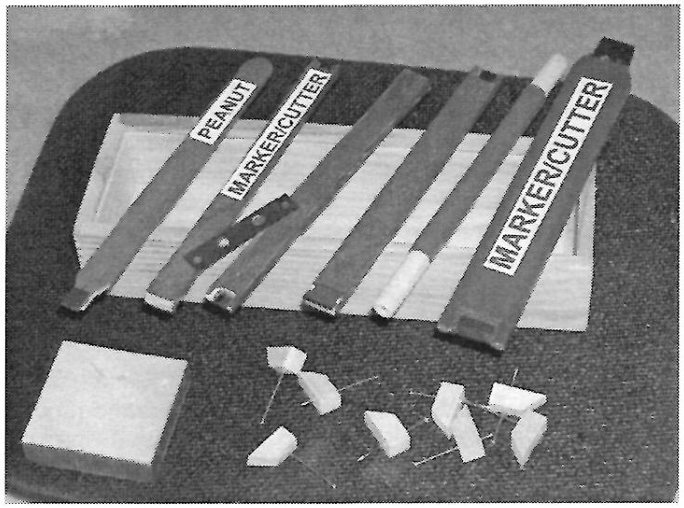
Matt Swan is a chemical engineer and goes a little deep into the "Future". While aimed at plastic models, much is relevant to us. I edited his article a bit, go to his web site for the complete "Complete Future". www.swannysmodels.com --under Tools & Tips

Making Stick Fuselages

Marcel Lavoie

Over the last several years I have devised a method of building box fuselages from stick balsa by lifting up the longerons when building a side frame, then placing a strip of balsa under them for marking and cutting the uprights, together with some tools to do the job. The usual way is to place the upright strip over the longerons, and by sighting down or eyeballing, try to obtain the correct angles and length.

This requires quite a bit of skill and is passé with this new method. It is also great for diagonal spacers and Warren truss type of structures with all the angled cuts, as well as for cross pieces. The method described here deals with 3/32" and 1/8" square balsa strip, with some changes when using smaller and larger sizes of balsa(more on this later).A favorite model, the Miss Canada Sr. is used to illustrate the system. As a side note, the method has been found to be a great help to a fellow modeler handicapped by a stroke.



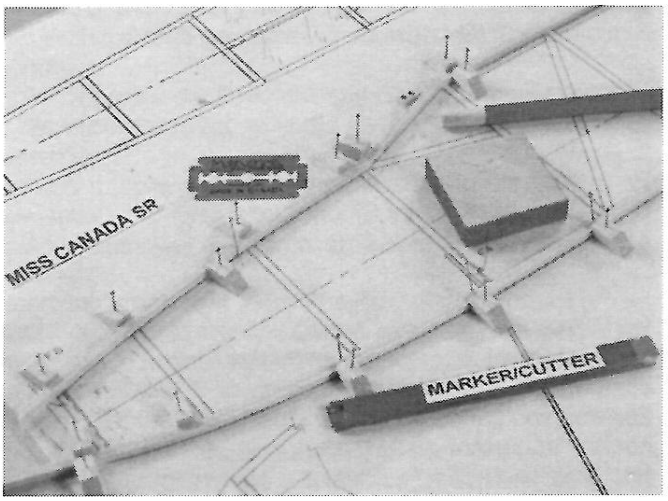
Getting ready:--- The tools for cutting spacers are very simple to make. There are two types of cutters, but at this point the discussion centers on what I call a MARKER/CUTTER because it is a double-ended tool in which one end is used to mark where the cut goes, and the other end of the tool, the cutter, finishes the job. The tool is made by sandwiching a short(3/8") length of razor blade between two popsicle sticks having both ends squared off. Cut a 5/32" deep x 1/4" wide U-shaped opening in one end and square off the inside corners, then glue a piece of blade to the other end to serve a marker. The blade should project from both ends no more than 1/32". I use popsicle sticks because they are readily available and are a convenient size(1/16' x3/8" x4 1/2").

Use epoxy for gluing the sticks together and contact cement for the marker blade. This arrangement gives a very rigid support for the blade, even the narrowest ones I use which are 1/4" wide. The long "handle" helps a lot in keeping the tool close to the vertical for nice square cuts.

I use blades from our local Dollar Store and some double edged blades. I will leave it to the reader to work with what he has available. Better quality blades should give better results but the tool works beautifully to ensure accurate cuts on the first try thus speeding the work along greatly. A second item that is required is a set of jig/building blocks as can be seen in the photos . These are made from a strip of hard 1/4"(16 lb.) square balsa cut into blocks 1/2" long with one end sanded to 90 degrees and the other end cut to about 30 degrees. They could be made of pine or some similar wood.

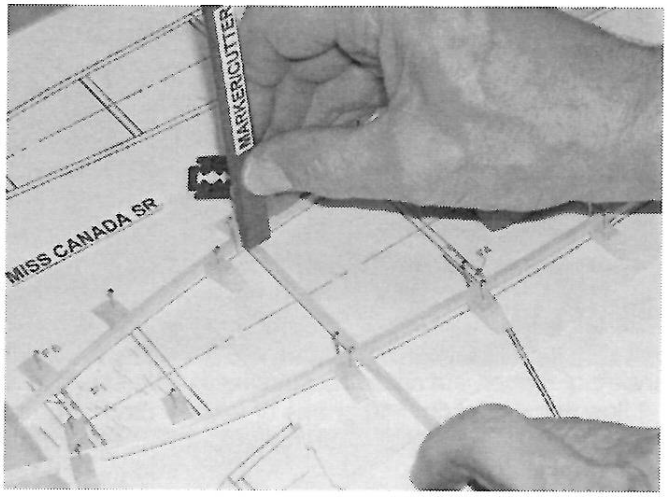
Drill pilot holes about one third of the way from the square end to receive the pins which should be a tight fit in the hole. Make about 30-40 of these blocks which will be used mainly on the outside edges of the longerons. The pins remain in the blocks permanently. This size block can be used for both the 3/32" and 1/8" strips. A Pin Driver is next, make this from a 4-5 inch length of 1/4" diameter hardwood dowel with a 1/8" diameter hole drilled into each end. The depth of the holes is such that the straight pins do not penetrate my gypsum wallboard building board and ruin the kitchen table(ouch!). A last item that is needed is an end-grain chopping block, again hard balsa or pine, onto which the strip is placed for cutting after it has been marked. The two faces of the block have to be parallel of course and sanded smooth.

Please, always use the end-grain block as this will give a cleaner cut as well as prolong the life of the blades. Paint/colour all these tools, though not the faces of the block, with a bright colour so that they will be easy to spot among the clutter. This may seem like a long preamble but the tools just described will be available for future building jobs. It would be useful, nay, necessary, to provide for some type of container to hold the knives and blocks(mine were purchased at the same $ Store).

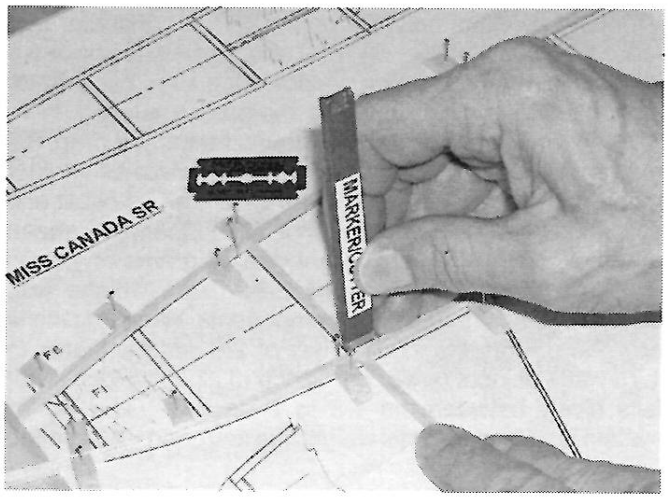


And now, for the fun part:--- because, compared to the standard way of placing the upright strip over the longerons, this new way is actually fun. Protect the plan in your usual way to prevent the structure from sticking to it.

Lay down the longerons by placing the blocks for the top longeron in line with the upright positions. For the bottom longeron, place the blocks about 1/4" off to the side of the upright positions so as to allow free passage of the upright strip under the longeron and to leave room for the marker. Glue up the several pieces of the top longeron if it is made up of more than one piece such as for a cabin model. For the inside edges of the longerons a pin at every second station might suffice.

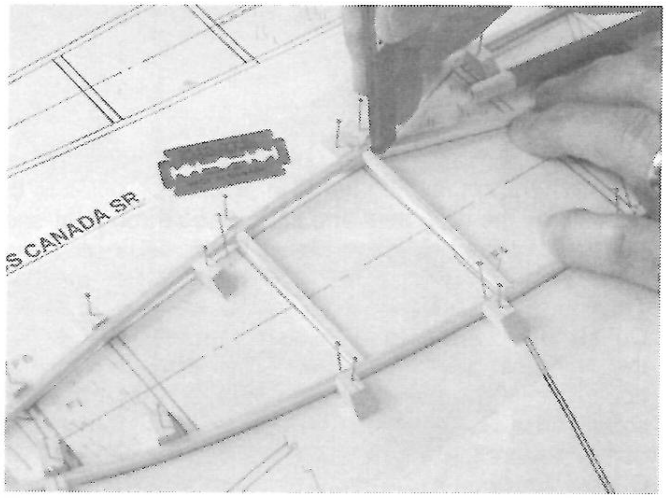


A word here on how to hold the tool....I find that holding it at a point about one third up from the bottom end gives a good control in keeping the tool vertical as well as making it easier to apply a slicing motion when needed for harder strips. OK, so we are ready to start. Insert a strip of balsa under the bottom longeron, then under the upper one. Line it up on the upright position and gently push blade side of the marker up against the top longeron to mark the angle at that end. At this point it would be a good idea to put a mark of some sort on the piece to ensure its proper orientation later, a < pointing towards the front is what I do.



Remove the strip and place it on the block for cutting with the other end of the tool. Re-insert the strip under the bottom longeron and slide it up against the top longeron which by this time has been lowered back down onto the plan. Push the strip up fairly tight against the top longeron and proceed to mark the lower end of that upright. Experience will tell you how much pressure is right. Remove, cut, and, **voilà, one very neat fitting upright.**

The angles and length are perfect! You really have to work hard to get a reject. The speed of this method and the high degree of accuracy is miles ahead of the old ways. After one side is built, remove it from the building board, but leave the blocks in place to build the second side. With the jig blocks in place it should not at all be difficult getting the two sides the same. A little care is necessary, but then again, we always do use a little care, don't we?



The business of cutting the cross pieces is handled in the same manner. Since we need the top view of the plan to cut the cross pieces, I draw a basic copy of that onto a strip of paper and staple it a few inches above the top view of the actual plan. The assembly of the side frames is done over this drawing using poster board triangles about 5" high x 3" at the base to keep the frames in line and square. An extension at the base is bent over to a 90 degree angle to allow stapling the triangles to the building board. For a typical model of, say, 36" span, eight to ten of these triangles are needed. As each pair of cross pieces is cut mark them with an arrow as before. When gluing in place put the arrow marks towards the in-side of the fuselage.

For smaller models using 1/16" square such as Peanuts, life is even simpler. The tool, if one can dare call it that, is simply a short length of razor blade glued onto the side of a popsicle stick. Narrow the end of this tool to 1/4" wide to accommodate tighter inside curves on small models. Leave no more than 5/64" projecting from the end and glue it on using contact cement. A neat way to measure this is to push the cutting edge of the blade through a scrap of the chosen longeron material with about 1/64" projecting. This simple device will be used to cut the uprights and cross-pieces while the strip is still under the longerons.

. . . . . Continued on page 22

Making Stick Fuselages continued

For 3/16" and 1/4" wood on larger model the type of marker/cutter described at the outset is made bigger, eg, two strips of 1/16" ply or pine, 3/4" x 5" long, with a 1/2" wide opening, just over 1/4" deep. Jig blocks 1/2" square could do for these two sizes of strip.

So, there it is, it is not an automatic thing, but after you get the feel of using these tools, and this will come quickly, you will be surprised at the beauty of it. Anyone having questions or suggestions can reach me at harrier@nb.sympatico.ca, or at, Marcel Lavoie, 111Victoria Street, Campbellton, N.B. Canada, E3N 1J6

Oscar continued

Drill carefully through the tail post and into the upper infill and cement the tail peg firmly in place. Drill holes in the gussets by the wing seat and stick a peg through at each end for the wing hold down elastic bands.

Tailplane

Cut six tailplane ribs from 1/16 sheet in the same way as the wing ribs. Cut strips of ¼ xl6 and 3/16 x 16 and pin down over the plan. Stick the ribs in and add the 1/16 square spar. Use a piece of 1/16 packing to make sure the centre ribs are the right distance apart for the fin to slide in. Cut the fin from 1/16 sheet. Note the direction of grain parallel to the leading edge Lay a piece1/4x1/16 on the fin, carefully cut round it, remove the cut piece and key in the piece of strip into the fin. Cement well and sand flat, this will prevent warping. Don't stick the fin into the tailplane yet.

This is an ideal beginners model. One sheet of 3/32 and one of 1/16th ,some good Jap tissue ,a length of 20 SWG wire ,a piece of tube to suit, a small piece of 1 /64th or I mm ply and an 8"plastic prop is all you need.

I made a couple of alterations to Albert's original plan, I have included a simple former at each end of the wing seat, these are not essential but make constructing a square fuselage easier for a beginner, and since I sometimes have to pack my models for travel I made my undercarriage in two separate pieces plugging into aluminium tubes. I also included a Garami style free wheel on the prop.

My prototype weighs 35gms and has a 20% motor which works out as 7' of 1/8 Tan 2 made into a 4 strand braid , you could put a larger motor in but my Oscar climbs like a homesick angel on this one and the glide is respectable . I reckon it could be built lighter with a carved prop and would then be very competitive . Sadly it is not SAM kosher as Albert tells me it was drawn after 1951, but built as it is, it makes an ideal introduction to rubber powered free flight. Why not have a go?

Electric Motor System continued

It is easy to measure voltage, but not so easy to measure the current since an ammeter must be placed in the current loop. This usually is done by inserting the shunt or ammeter between the battery and the rest of the circuit, so you can see if your motor is trying to draw too much current or if the battery voltage is sagging too much under load. There are several power meters that combine the ammeter and voltmeter function and as a bonus show power.

If you don't measure the current at least measure rpm with a tach when you change props to make sure you are above the max power rpm. This will assure you not loading down the motor too much. If you know the voltage constant of the motor, the Kv, you can multiply this by the operating voltage to get no load rpm. Divide this by 2 and again by your gear ratio to get the max power rpm.

Let's look at a specific example, converting a rubber power design to electric free flight. My 18" Bristol Scout has 117 sqin wing area and weighed 47 grams without rubber, but about 15 grams was ballast and prop. I flew this model on 8-10 grams of rubber. Say, 55 grams all up weight (55/117= 0.47 grams/sqin or about 2.4 oz/sqft and 55 grams is about 1.9 oz). For brushed motors, you initially want about 1.5 to 2 watts of input power per ounce of all up weight for good climb. In this case that's 2.9 to 3.8 watts. The scale prop diameter is 5 inches.

Gordon Johnson has published data for the 7mm pager. This comes in several winds and Gary Jones developed a 7mm 4:1 gearbox for it. With the red back 2.3 ohm motor it's a great combination with a GWS 5030 prop and a single LiPoly cell. At 3.5 nominal volts from a LiPoly cell the red back motor draws 630 ma for 2.2 watts in and turns the 5030 at 5.1KRPM while the motor runs at 20.8 KRPM. The peak power point is 690 ma and 17.6 KRPM. The motor prop and gearbox weigh 5.6 grams. Ordinarily, the battery is assumed to weigh as much as the motor; however the Atomic Workshop series of LiPoly batteries has a very high specific energy. A 130 mahr Atomic Workshop weighs only 3.7 grams with a connector and more than does the job. My tests show it staying above 3.8 volts for several minutes while powering a red back motor driving a 5030 prop at 2.8 watts input.

So where are we? 5.6 grams motor and prop, 3.7 grams battery, 1.5 grams timer. 1.2 grams fuse and holder for 12 grams all up. Remember the 15 grams ballast and prop, and 8 grams rubber? With a WWI bipe we're ahead of the game. The empty weight was 47 grams or 1.6 oz; that's about what the electric conversion weighs with structure to hold the electric components. Wing loading is now 2.0 oz/sqft; the input power of 2.8 watts equates to 1.75 watts of input power per ounce of all up weight. That falls nicely between the 1.5 to 2 desired. The power system is 25% of the total weight like any good FAC model.

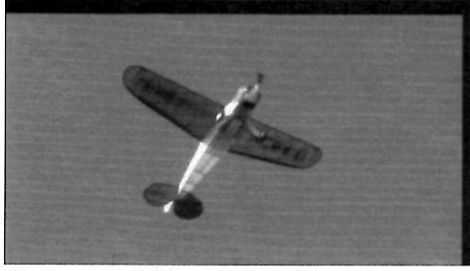
More info in my column in the Jan 07 Flying Models.

Better flying on sunday

Rich Weber launches his DH-29

Lynn Mortons beautiful B-25

1st round Fiction flyer mass launch

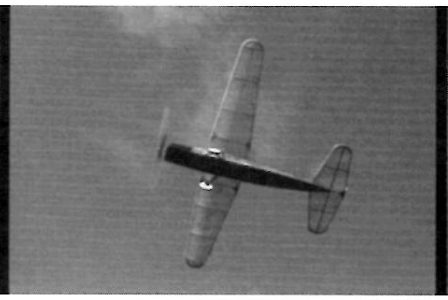


Cessna C-34 by Dallas Cornelius

Tom H. preparing his Do-X for a flight

DO-X making the rounds

Ron Gosselin with his Dewoitine 33



Ron's hi-flying Messerschmitt M-20

John Houck, co-CD & Grand Champion

Sunday events — Wawayanda 2006

Jumbo Scale (7 flyers)

1. Mark Fineman	S.M. 92	149 (best flt 60)
2. Ed Pelatowski	Folkerts SK-3	143.5 (best flt 100)
3. Tom Hallman	Gadfly	143 (best flt 85)

Power Scale (5 flyers)

1. Tom Hallman	DH-2	145.25
2. Mark Fineman	Boeing L-15A	140.5
3. Ed Pelatowski	RWD-8	90.3

Golden Age Scale - Civ & Mil (13 flyers)

1. Vic Nippert	Piper Cub	120	112	93		325
2. John Houck	Gen. Aristocrat	113	101	109		323
3. Frank Rowsome	" "	88	101	107		296

Dime Scale (8 flyers)

1. Frank Rowsome	Fokker DVII	60	68	55	45bp	228
2. John Houck	Fairchild 45	72	65	54	0bp	221
3. John Stott	Curtiss Falcon	39	57	74	45bp	215

World War 2 Mass (12 flyers)

1. Paul Stott	Fiat G-55
2. Mark Fineman	Bell P-63
3. Walt Farrell	Mustang

Modern Production Civilian (7 flyers)

1. Vic Nippert	Pilatus Porter	71	104	88	263
2. John Houck	Citabria	80	100	74	254
3. Dallas Cornelius	Lacey	54	94	71	224

Modern Military Mass (4 flyers)

1. Walt Farrell	Skyraider
2. Ed Pelatowski	Mig-9
3. Lynn Morton	Skyraider

Flying Horde (11 flyers)

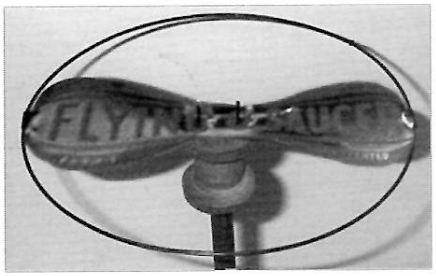
1. Dave Mitchell	Cessna 140

2006 Grand Champion John Houck

Scenes from Sunday at Wawayanda

Flying-O-Saucers mass launch fun

Wind up with a string and let her rip



Greg & Jasper West camped on the field

Golden Age Racers mass launch

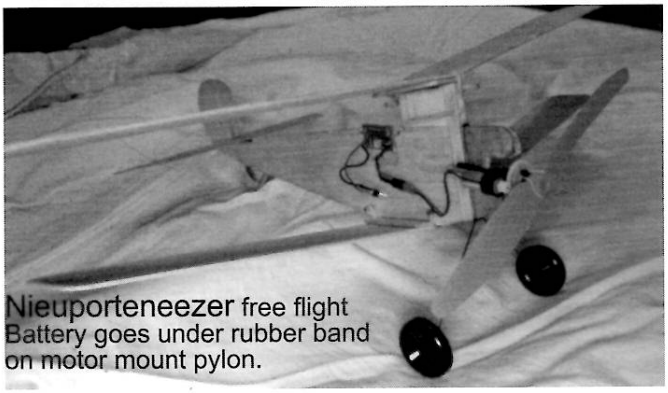
Greg West with his Grumman bipe

Grumman bipe in flight

Tom Hallman Launches his Piper Tri-Pacer

Dave and Paul Stott winding Fiat for final

Final flights in WW2 mass event



Nieuporteneezer free flight
Battery goes under rubber band on motor mount pylon.

R/C version with Plantraco receiver and actuator. Battery is on other side.

CLUB OFFICERS -President: Stefan Prosky 414 11th Street SE., Washington, DC 20003
Secretary: David Mitchell 230 Walnut St. NW., Washington, DC 20012
Treasurer:Stew Meyers, 8304 Whitman Dr., Bethesda, MD 20817 ---- *Note change - Stew has replaced Norm!*
Editor: Stew Meyers, 8304 Whitman Dr., Bethesda, MD 20817
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CONTACTS - Material for the newsletter and membership questions should be addressed to Stew Meyers phone 301-365-1749. Email gets immediate attention. *stew.meyers@erols.com*
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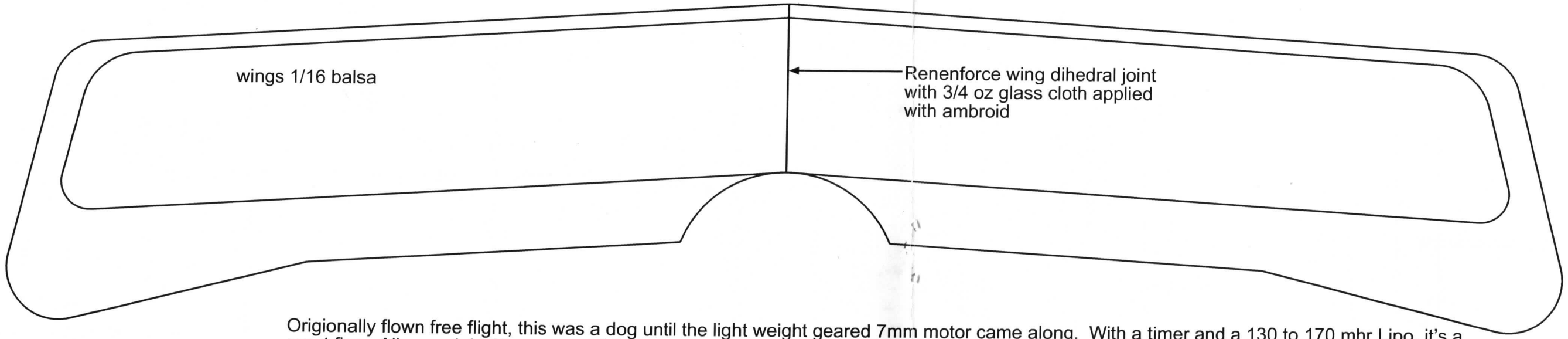
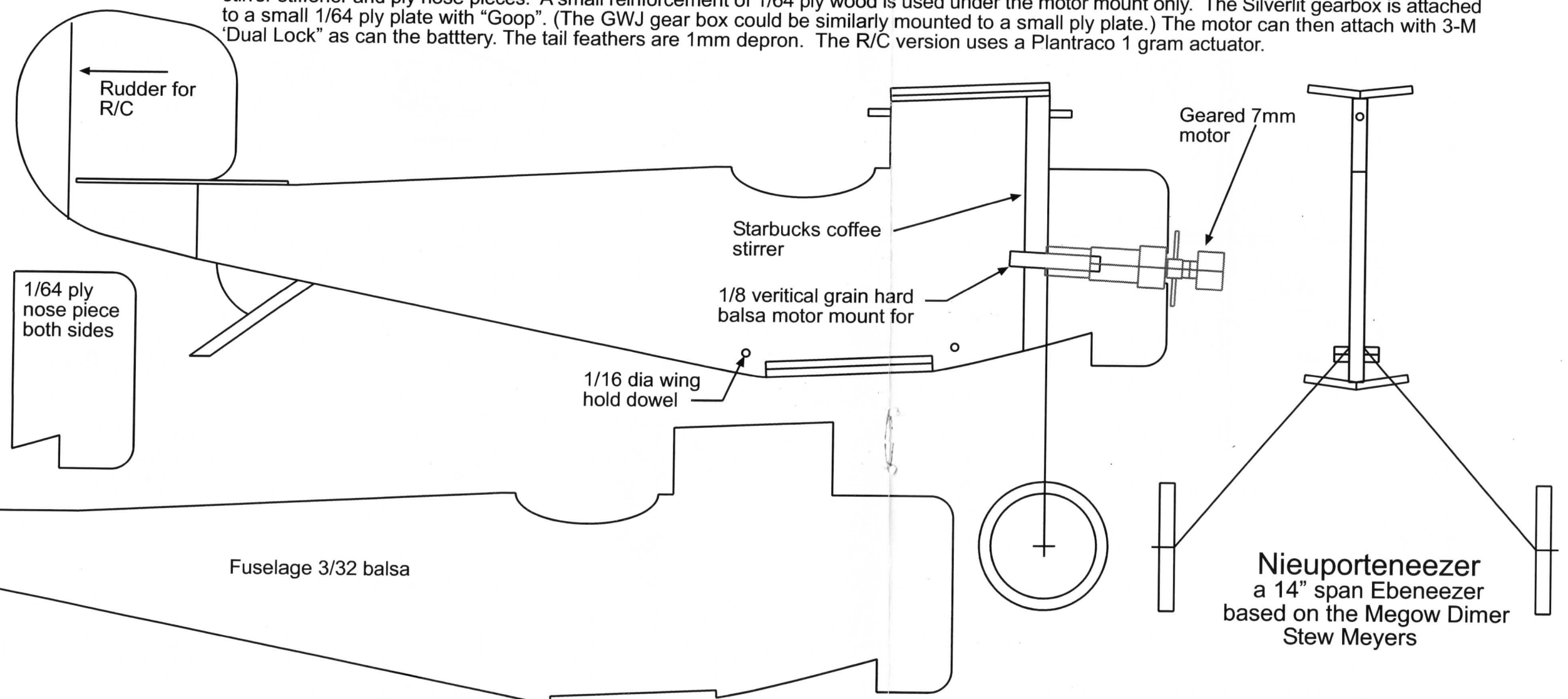
Your DUES are due XXX

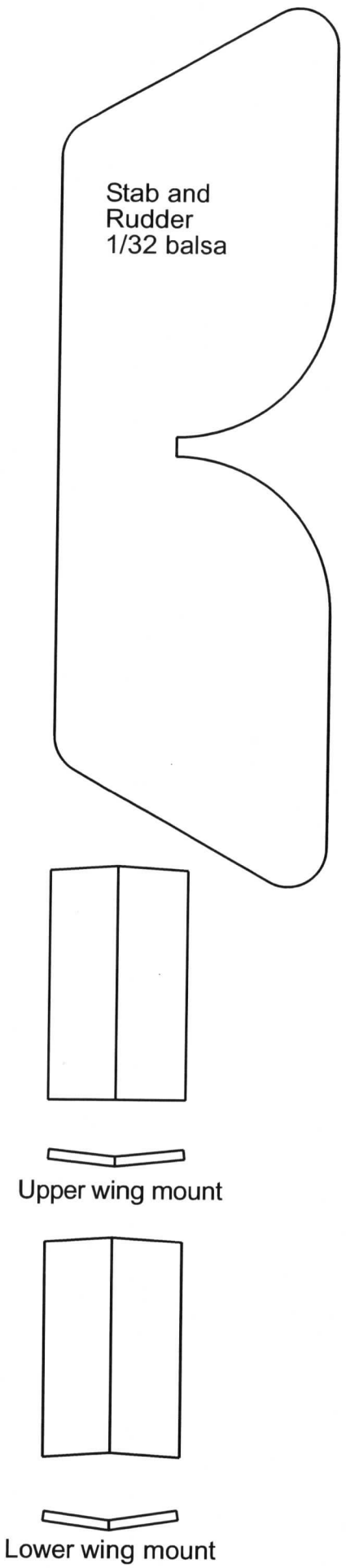


Origionally flown free flight, this was a dog until the light weight geared 7mm motor came along. With a timer and a 130 to 170 mhr Lipo, it's a great flyer. All up weight 25 grams add three more grams for the R/C version. It flys very well with the $20 Silverlit system as well as the much more expensive Plantraco. Enlarged to 24" it is suilable for a Pee Wee 0.02.
I am building a 14" foam version which promises to be much lighter. The key here is to stiffen the 2mm Depron wings with a hard balsa 3/32 sq. leading edge and spar at 30%. Or use vertical .007 x .08 carbon strip for the spar. Dihedral joints are stiffend with bond paper attached with white glue. The 3mm depron fuselage is stiffened by a hard 1/8 sq. strip running fore to aft. I used Peck wheels, but you can save a gram by going to foam with a 3/16 dia dowel hub. The foam version reduces the 1/32 mw landing gear wire to .025 and does away with the coffee stirrer stiffener and ply nose pieces. A small reinforcement of 1/64 ply wood is used under the motor mount only. The Silverlit gearbox is attached to a small 1/64 ply plate with "Goop". (The GWJ gear box could be similarly mounted to a small ply plate.) The motor can then attach with 3-M 'Dual Lock" as can the batttery. The tail feathers are 1mm depron. The R/C version uses a Plantraco 1 gram actuator.



Nieuporteneezer

a 14" span Ebeneezer
based on the Megow Dimer
Stew Meyers



Centre Section

3/8" x 3/32"

1/4" x 3/32" SPAR

Rib 'Tilt' Template

Sub-fin 3/32" Sheet

Former 1

Former 2

RIB TILT TEMPLATE

Left Tip

crack

Right Tip

Trim end of spar to this shape

3/8" x 3/32"

Wing Rib

PART A

2·8°

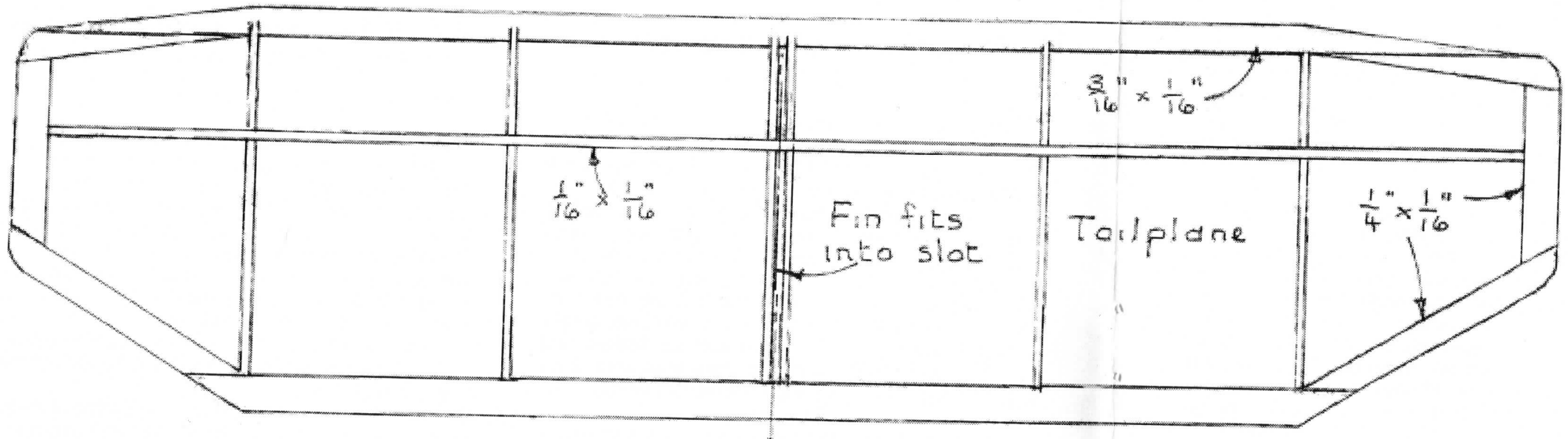
Dihedral.

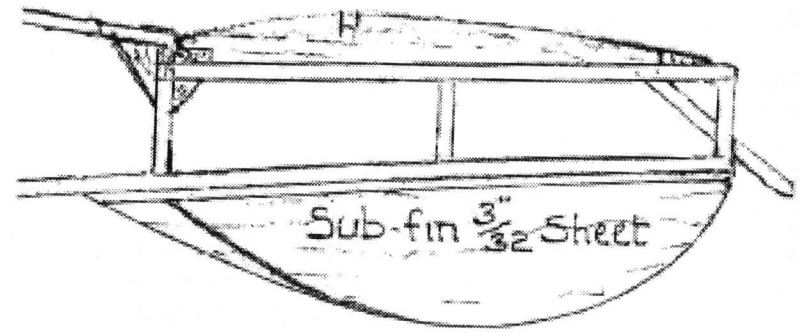
Front View

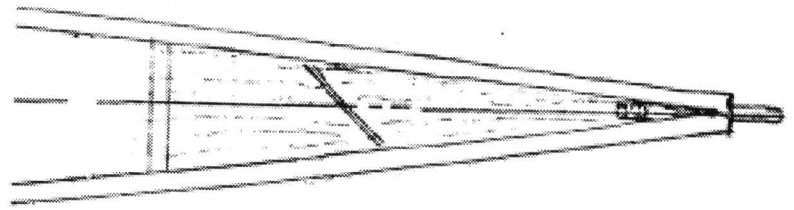
Fin 1/16" Sheet

1/16 Insert

Oscar







OSCAR

ALBERT HATFULL