Radio Controlled Soaring Digest

July 2006 Vol. 23, No. 7

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R/C Soaring Digest

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In the Air!

Event coverage, a personal flying experience, construction and kit production walk-throughs, a rather unique club activity, building an efficient hi-start... It doesn't get much more diverse than the contents of this month's issue of *RCSD*. And the photography! You should see some of the photos we weren't able to include.

Our sincere thanks to all who contributed to this issue. Without the efforts of our contributors, there would be no *RC Soaring Digest*. If you, too, want to join the *RCSD* Team, please contact us!

Mark Nankivil was so busy taking pictures (and doing some flying) at the JR Aerotow, he didn't manage to collect information for the photo captions. So here's the deal: Readers who submit an accurate caption for any of the photos used in the JR Aerotow coverage in this issue will receive a CD containing all of the archived issues of *RCSD*. Captions must include aircraft designation, scale (1/4, 1/3, etc.), and the name of the owner/builder. Send captions to <rcsdigest@themacisp.net>, and be sure to include your "snail mail" address.

We took advantage of the longest day of the year by flying until it got too dark to see our all white Alula. We didn't leave 60 Acres until 10:00 PM. What a great day it was, too. We were able to spend time and converse with others who share the same interests, search out elusive rising air, circle with swallows, and stand in awe as beautiful clouds formed and disappeared. We are involved in a truly wonderful and inspiring sport!

Time to build another sailplane!


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JR

JR Aerotow 2006

Mark Nankivil, <nankivil@covad.net>

This year's coverage of the JR Aerotow will be more of a photo essay than a detailed report. This year's journey to Monticello, Illinois, ended up being for just one day... But oh, what a day it was!

Horizon Hobby, JR Radios, and the Illini Glider Club once again hosted the aerotow event at the Monticello airport. The overall event included a cross-country course where pilots could take their sailplanes out on a course. A number of teams made use of the course, and Skip Miller and his gang put in lap after lap to the tune of 83 total miles. And that was with a scale sailplane!

I'll list a few things that stuck out in my mind and let the photos say the rest...

- The Horizon Hobby/JR gang did it yet again, with a great event that was fun, relaxing, and thoroughly enjoyable. They work hard (and have fun, too!) to make sure that the rest of us can fly, fly, and fly pretty much from sunrise to sunset with little fuss or waiting for a towplane. I think I heard Peter Goldsmith telling someone Saturday night they had gone through 30 gallons of fuel in the towplanes. That'll give you some idea how much flying was done! Horizon Hobby/JR also arranged to ship models in for the West Coast guys who attended the aerotow. A great gesture that allowed those of us from elsewhere in the country to see a variety of sailplanes (big ones, too!) that we might not otherwise see, except in coverage like this article.

- Gene Trevino from San Antonio, Texas, brought along a Multiplex Easy Glider set up for aerotowing. Not only did this work well, it made a solid statement that you really don't need a big model to go out and have fun aerotowing!

- The gang from Hobby Lobby brought along both 1/4 scale and 1/3 scale versions of the Minimoa which were flown extensively throughout the day. Both models feature built up airframes with planked fuselages that really looked nice. I understand they will be available at a later date. I sure hope so, as the prices I heard mentioned are very competitive.

- There was a 1/3 scale Schweizer 2-33 that appeared to have a scale NACA airfoil. Peter Goldsmith flew the model in the afternoon, and it was a real floater that would climb out readily in just about any lift. On approach, as you'll see in the photos, it looked oh so real coming in...

Speaking of real, scale models look scale only with a pilot figure on board. In looking through the photos I took, that is the one thing that really jumps out about these models. Anyone out there have information they are willing to share on sources of inexpensive 1/5 through 1/3 scale pilot figures?

Now, on with the photos!


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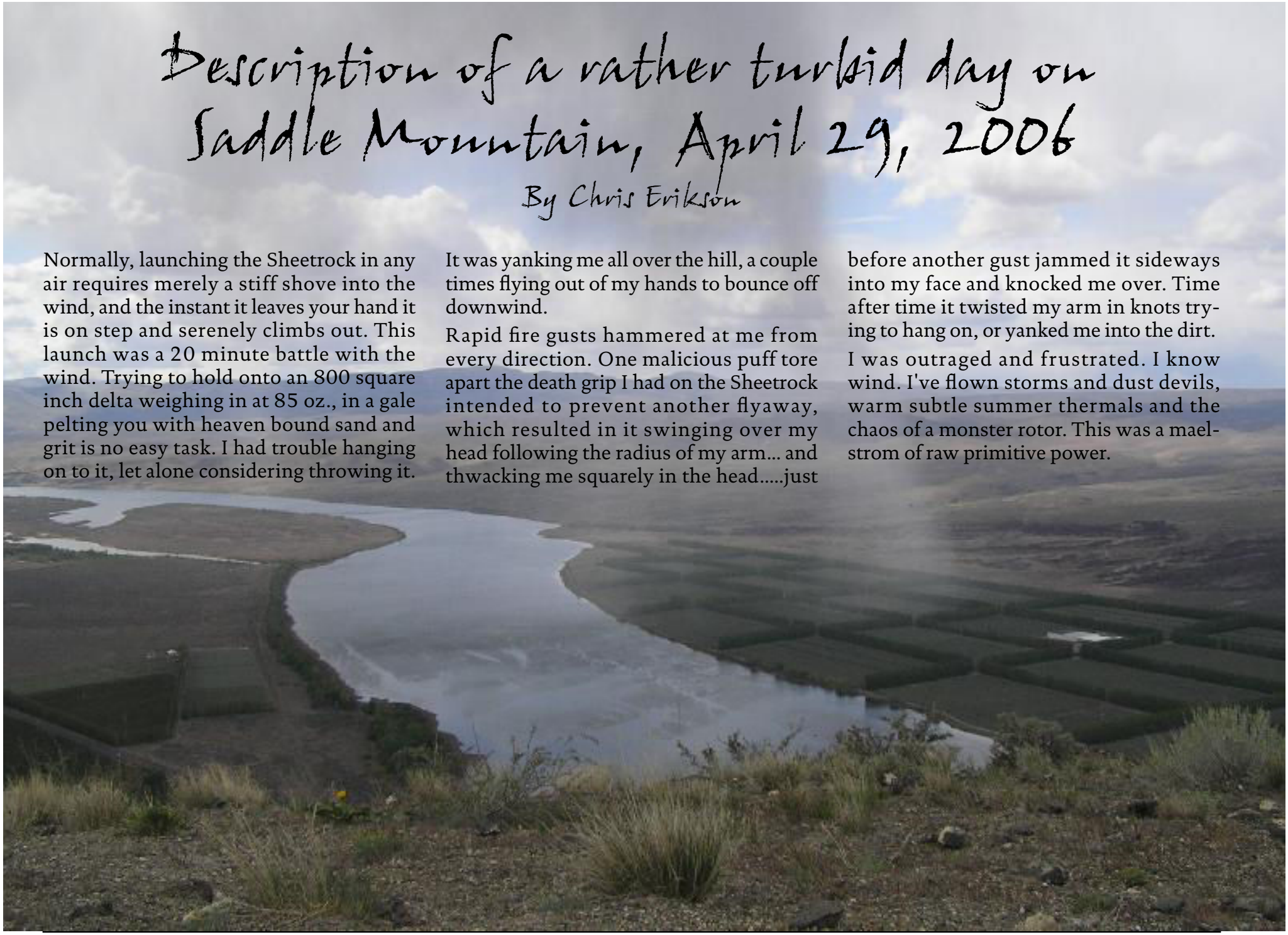
Description of a rather turbid day on Saddle Mountain, April 29, 2006

By Chris Erikson

Normally, launching the Sheetrock in any air requires merely a stiff shove into the wind, and the instant it leaves your hand it is on step and serenely climbs out. This launch was a 20 minute battle with the wind. Trying to hold onto an 800 square inch delta weighing in at 85 oz., in a gale pelting you with heaven bound sand and grit is no easy task. I had trouble hanging on to it, let alone considering throwing it. It was yanking me all over the hill, a couple times flying out of my hands to bounce off downwind.

Rapid fire gusts hammered at me from every direction. One malicious puff tore apart the death grip I had on the Sheetrock intended to prevent another flyaway, which resulted in it swinging over my head following the radius of my arm... and thwacking me squarely in the head.....just before another gust jammed it sideways into my face and knocked me over. Time after time it twisted my arm in knots trying to hang on, or yanked me into the dirt.

I was outraged and frustrated. I know wind. I've flown storms and dust devils, warm subtle summer thermals and the chaos of a monster rotor. This was a maelstrom of raw primitive power.



When I looked out across spectacular Sentinel Gap, the vivid desert walls and barren hills of the Yakima Firing Range, a couple of miles to the west across the mighty Columbia, were obscured by a howling sheet of dusty muck visibly sleeting off the cliffs on the far side of the gap, driven before raging NW winds right into our faces. Daring to look straight down the hill earned you a face full of grit and the sight of tumbleweeds blasting up the side of the mountain, sailing past you, and then carried off above the hill.

Everywhere you looked, a pall of sideways dust was moving across normally sweeping vistas. I became aware of an eerie sound permeating the air, the moan of high tension lines a mile away resonating with the wind. Rising and falling, sometimes a rending shriek, other times an unnerving sound redolent of restlessness and loneliness carried across the empty land.

I struggled to the lip of the 1600' slope, fighting with both hands against pockets of turbulent violence, which threatened to flap the Sheetrock in my hands like a giant paper plate held out the window of a semi-truck late to Petaluma.

I approached the lee side of a huge rock right on the edge of the precipice, and managed to tuck in right behind it on my knees, trapping the plane against the dirt. I checked trims and readied the radio, then firmly seized the plane. I knew if I didn't get a powerful clean launch to clear the rocks and sage by at least 10 feet or so, the Sheetrock would be mercilessly pummeled into the surrounding boulders on it's back by the sheer force of the wind.

Chris, his Sheetrock, and flight engineer Forrest at Greyback Mountain., Oregon. Photo by Mike Gore.

I waited, several times rising instantly and bringing up the plane only to be slammed about and barely get tucked back down. Then, a pause... NOW! I shot to my feet and hurled the Sheetrock out and slightly down, somehow managing to miss my head. For an instant it was on step, regal, victorious, then before I could blink it was on knife edge and plummeting towards the rocks only a few feet below. I slammed the stick to the left and jammed the nose down, I needed speed and to get away from the hill, as the Sheetrock was only about 15 feet off the deck and directly in front of me.

From here on out, the storm gods had their way with me. It was on. The normally smooth, massive, and fast MH45 delta was hurled about the sky like a ping-pong ball whacked by the gods as fast as I could mix the sticks. I had no flight plan, no time to execute any flight plan save one, to avoid the ground at all costs. For a furious minute or two, it was sky or rocks at warp 4. Up, down, left, right, blown back, shove the nose down and dive, slammed sideways and back, nose down and dive away from the hill. I was battling a mindless leviathan, a high speed river of air whipped into inchoate fury.

A final penultimate blast of cosmic "bite me" physically drove the Sheetrock backwards for many yards while it was in a 30 degree dive, pushing it to about 150 feet above the open and sharp ridge line before I managed to maintain position as the airframe began an unsettling, sinuous motion i had no choice but to ignore. A mere few fatal feet farther back and I'd be in the massive cement mixer rotor behind the hill, currently mixing eye eating dirt and misery in equal measure. So I shoved the nose down again, intent on utilizing the Sheetrock's good high Reynolds performance to creep back forward while trading altitude for speed towards the front side and into the wind.

The Sheetrock hung in the dust-filled gale for an instant, then obligingly put her nose down and crept forward a few feet, every tape scrap used for field repairs buzzing in the wind.

The Sheetrock hung in the dust-filled gale for an instant, then obligingly put her nose down and crept forward a few feet, every tape scrap used for field repairs buzzing in the wind. Suddenly a "whup-whup" noise like a dusty carpet being snapped leaped into audibility and increased to several hertz in the blink of an eye as the Sheetrock flapped its wings as if trying to fly, visibly ripping covering free of the foam along the entire span.

An instant later the joiner failed with a bang, and the wings clam-shelled together, sending chunks of ballast spinning off into infinity in a cloud of tape fragments as wires yanked free whipped visibly between the cores. The tail assembly ripped loose and windmilled, held by a single thread of fiber tape as the cores fluttered to desert sage 100 feet below.

The Sheetrock will live to fly another day, but I will never forget my battle with the Wind Gods of Sentinel Gap.

LET'S BUILD A GENIE!

Or "How to Get an Open Class Glider the Fun Way, Not the Buy-N-Fly Way"

Part 4: Spar building and core prep

by Chris Boultinghouse, <caboultinghouse@yahoo.com>

In our last installment, we finished with the fuselage and stabilizer construction.

This month we'll show how the Genie's main spar is assembled, as well as the joiner boxes and steel joiner blades for the 3-piece wing setup.

Joiner Boxes & Blades

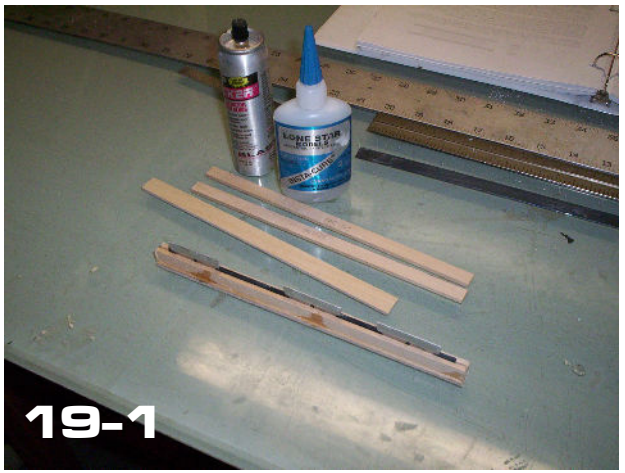
The Genie has a 3-piece wing with a flat center-section, and plug-in tips with dihedral.

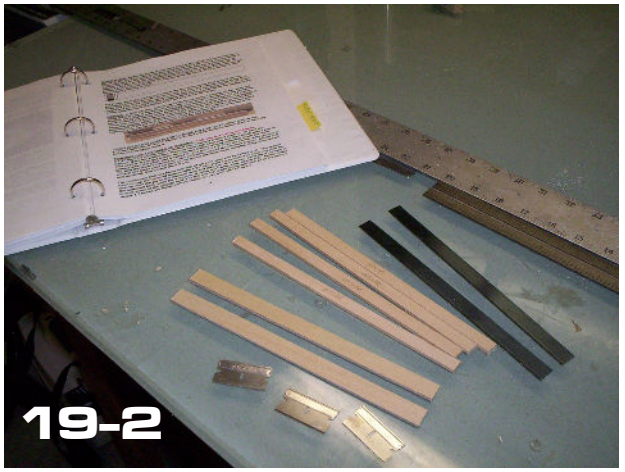
The center section has a very strong Kevlar-wrapped carbon spar assembly, and the outer panels are retained using a flat spring-steel joiner blade. These blades fit into boxes constructed of spruce and ply, which are wrapped with Kevlar thread.

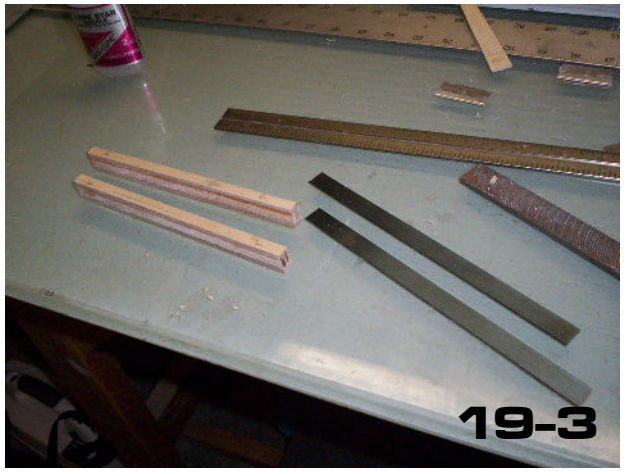
The instructions detail two different types of blades and boxes: Straight blades and angled boxes, or angled blades and straight boxes.

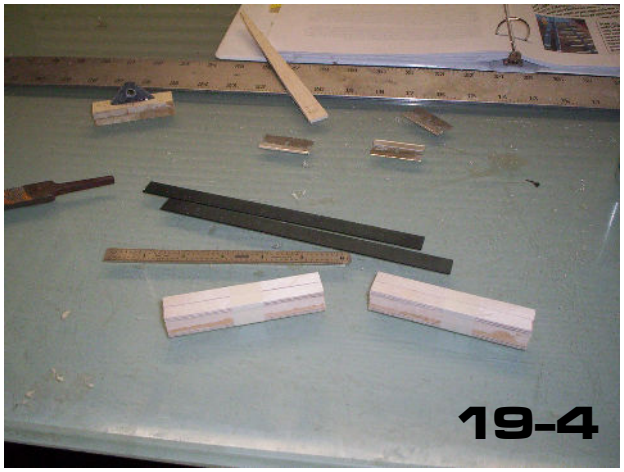
I opted for the angled blades since I had access to metal working equipment. You should make the "straight or angled" blade decision prior to ordering your hardware pack from Harley so he can send the appropriate blade stock.

Here you can see the parts for the blade boxes and the assembly steps using the (as yet un-shaped) blades as guides for assembly. Harley has very good instructions for assembling the boxes, so don't let this step intimidate.





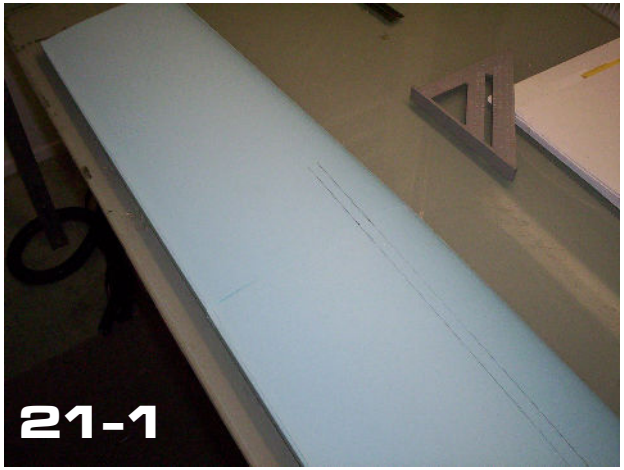


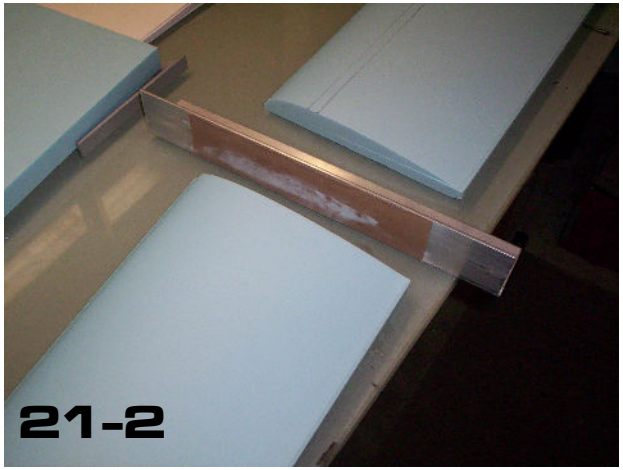


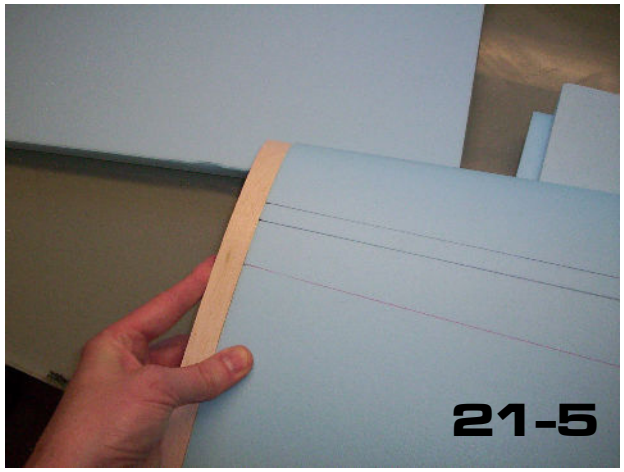
I then took a road trip to Brownwood, Texas, to visit with my family and use my Father's knife-making equipment to shape the steel blades. Keep in mind that you can do these steps with an ordinary bench grinder and files, but it is far easier with the high-tech tools!

Main Spar

Once the blades are finished, the spar can be made. It is quite horrifying to cut the beautiful cores I purchased from Les Horvath at <www.compufoamcore.com> but it must be done! Spar lines are marked on the cores. Prior to making the cuts with the bandsaw, the core is used as a template to make balsa end-caps that will be added to the core later.



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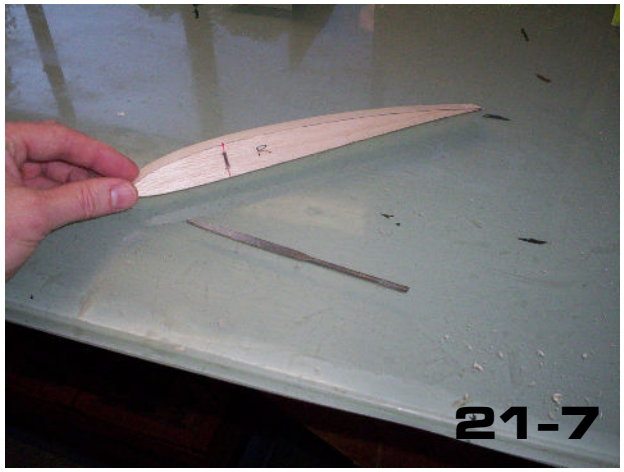
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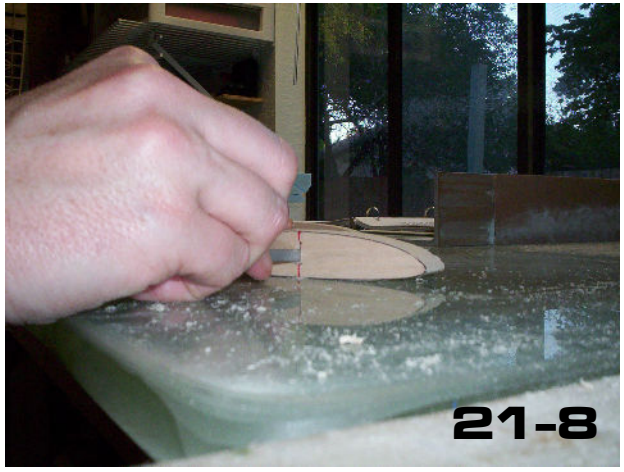
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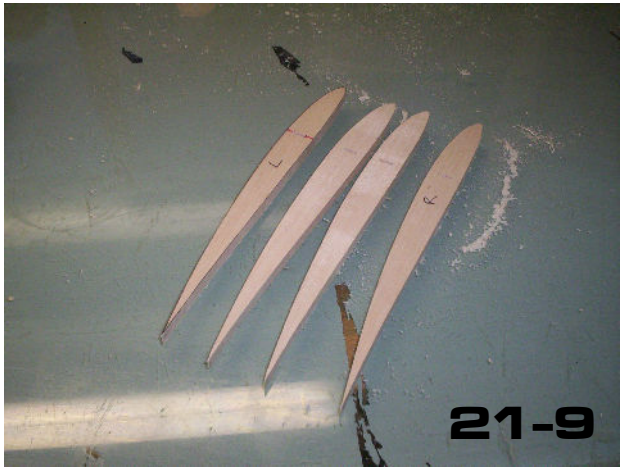
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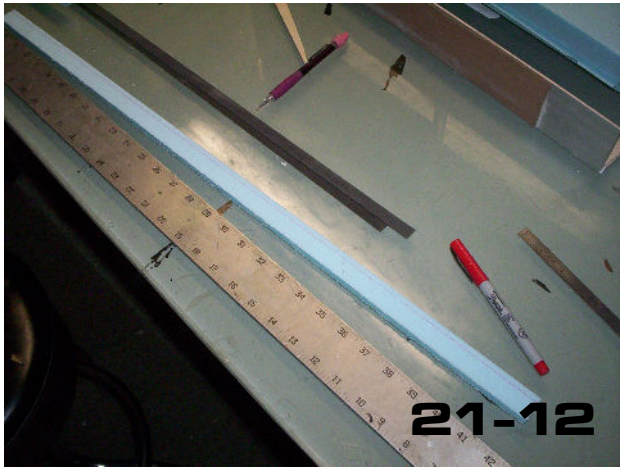
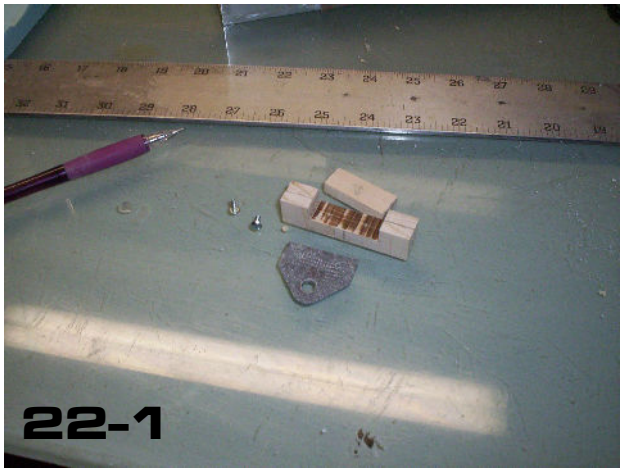
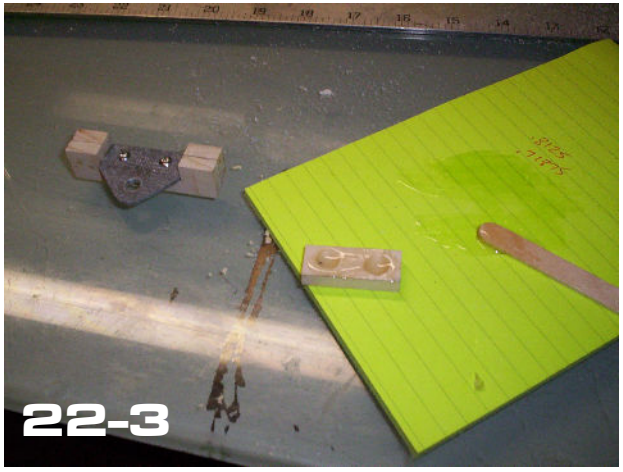
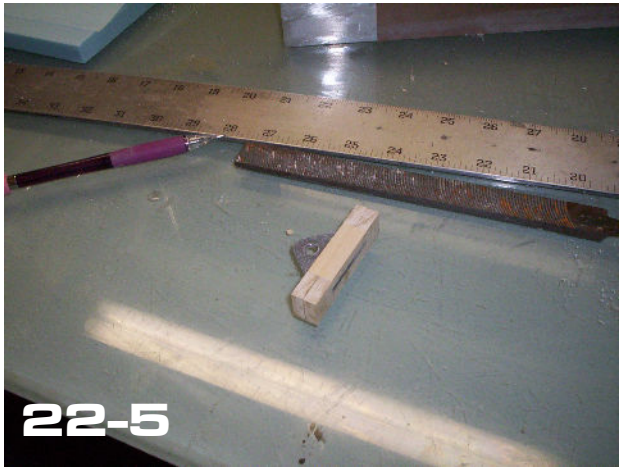

21-12

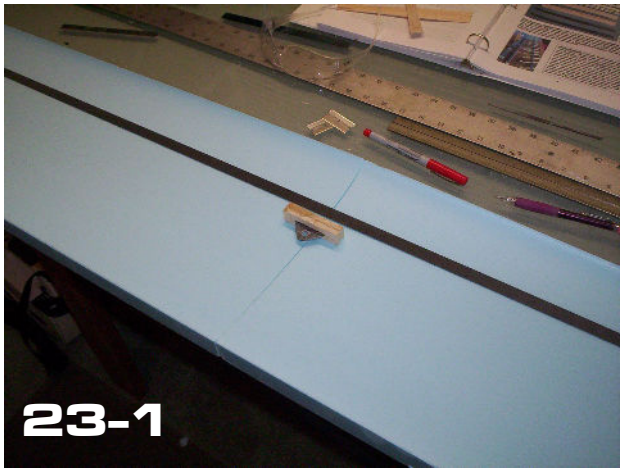
Next up is the main bolt hold-down block and plate. I made the plate from 1/8" glass/carbon sheet that I fabricated myself from heavy cloth and epoxy, vacuum bagged between two aluminum plates. The wood portion I made from poplar, but any hardwood will work.

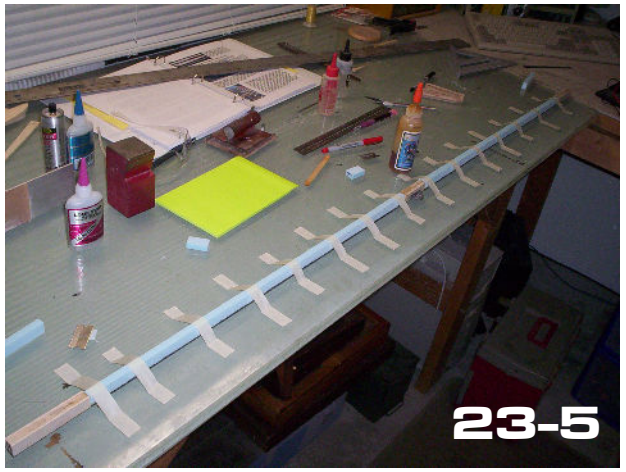


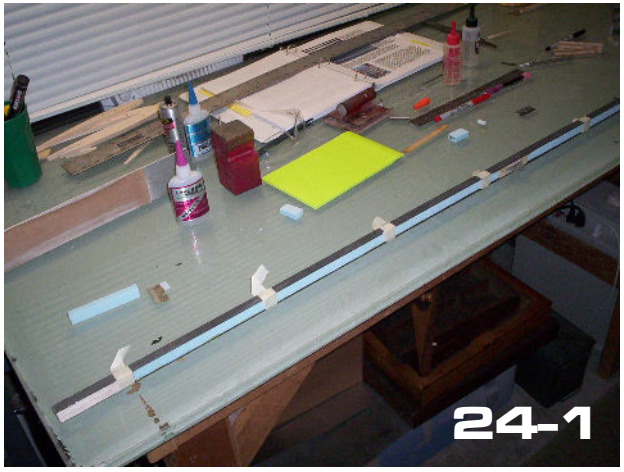




This bolt block assembly and blade boxes are then epoxied to the pre-laminated tapered caps obtained from Aerospace Composite Products. The foam piece that is removed from the core is then trimmed for height and bonded to the caps as well. I used polyurethane "Gorilla" glue for this task.







The other cap is then bonded in place

The foam web is slightly narrower than the spar caps, so the sides must be leveled. Harley suggests water-based spackle for this task, but I chose to use epoxy and filler (in this case a mixture of milled glass fiber and colloidal silica). This added about one ounce of weight compared to spackle, but the stiffness added to the spar was amazing!

After the filler cured, the corners of the spar caps were rounded off and the Kevlar thread wrapping began. The wrapping is very closely-spaced in the center section and around the spar boxes, and looser everywhere else. This is not a hard task but it is tedious and for some reason made my eyes very tired!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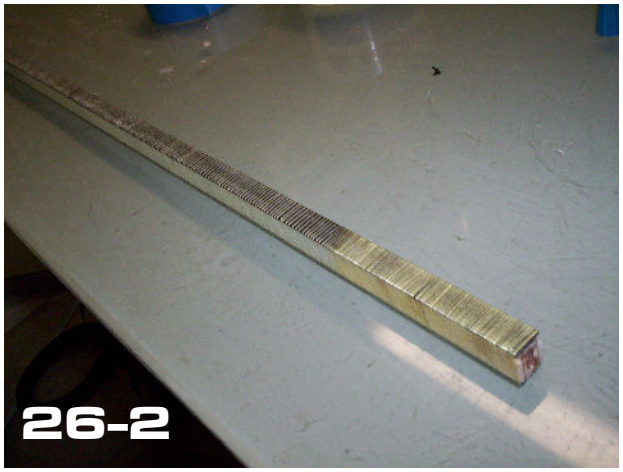
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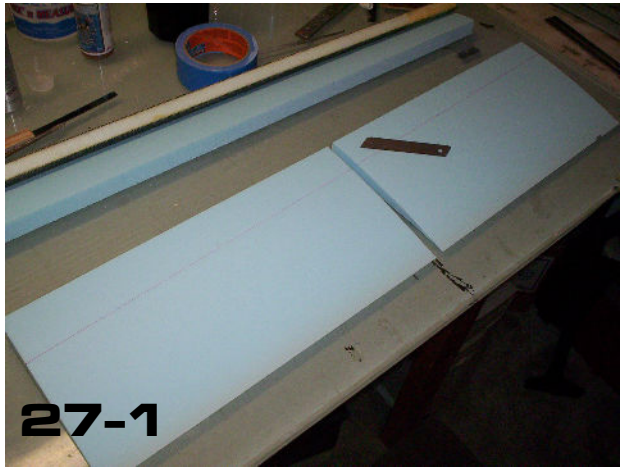
Next up is the "hot-rodding" of the cores for the servo wires. Harley suggests cutting the core into shorter sections for this task to have a better chance of getting the tunnel straight. He also has suggestions for a jig, and both suggestions worked perfectly! My wire tunnels matched up and it was a simple (if somewhat smelly) task.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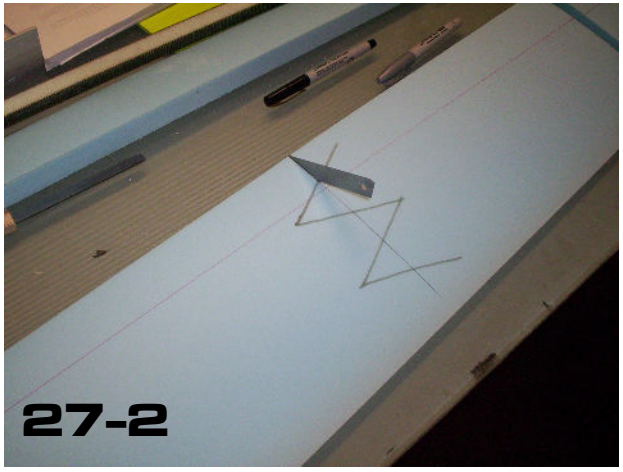
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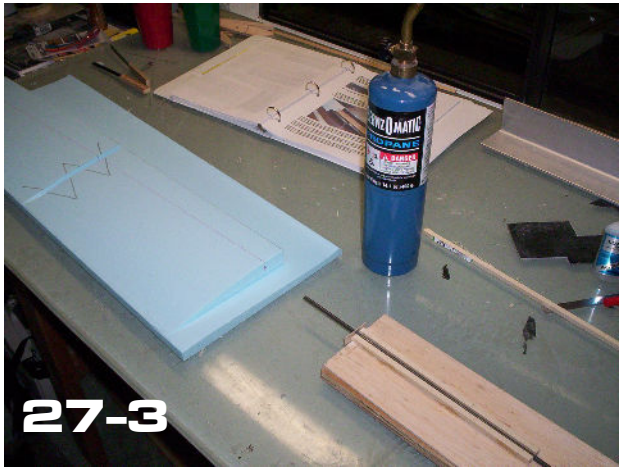
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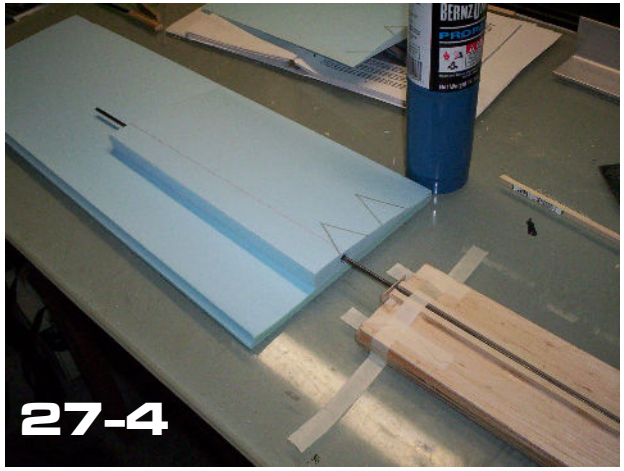
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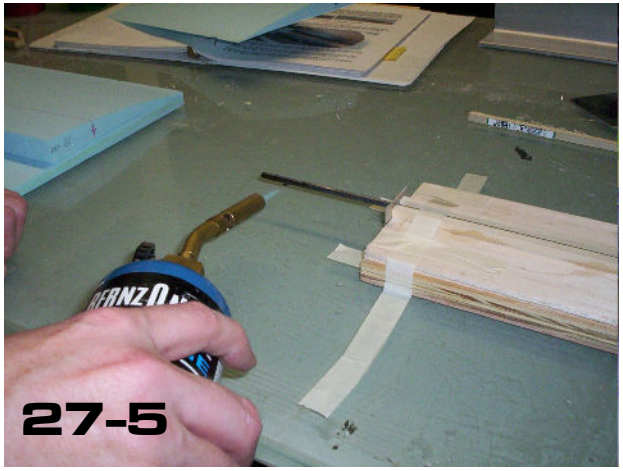
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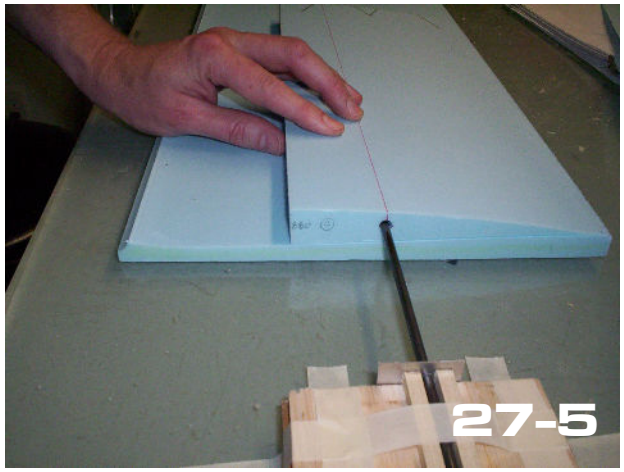
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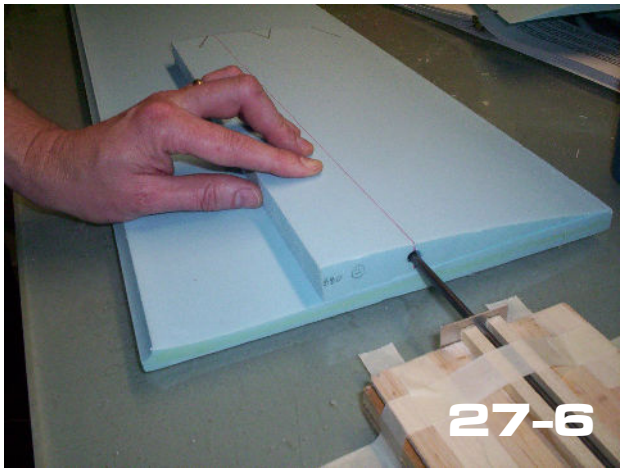
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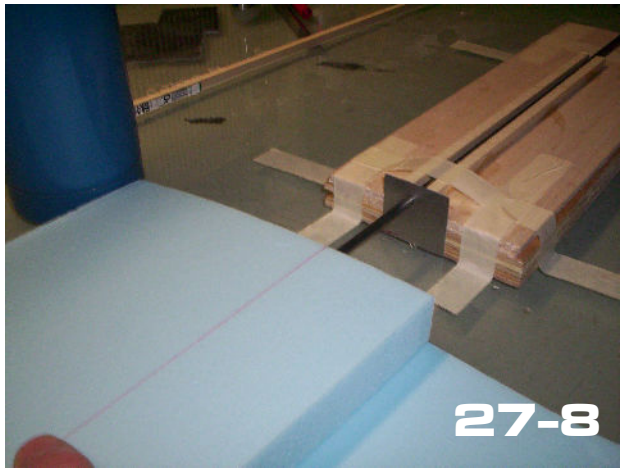
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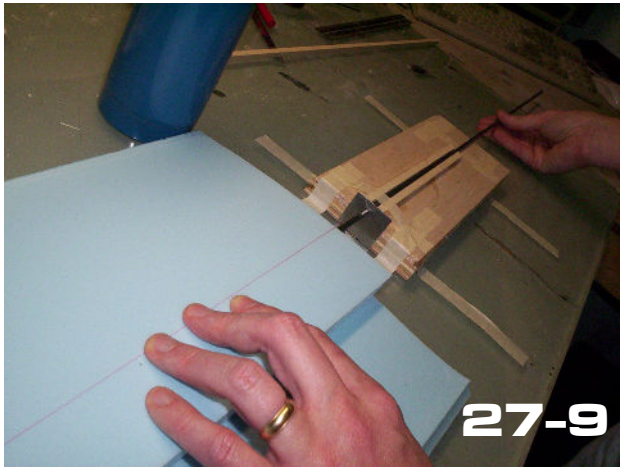
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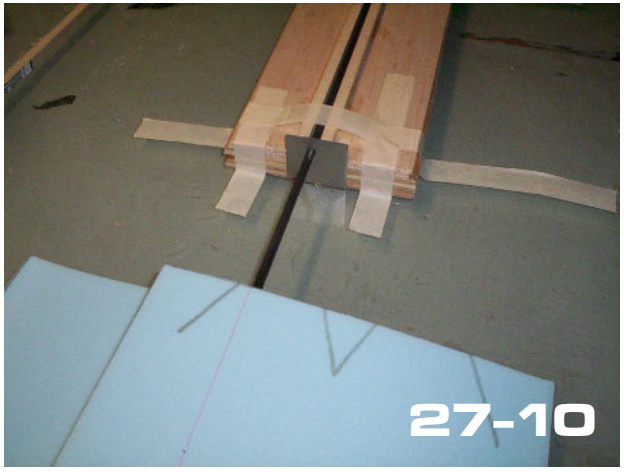
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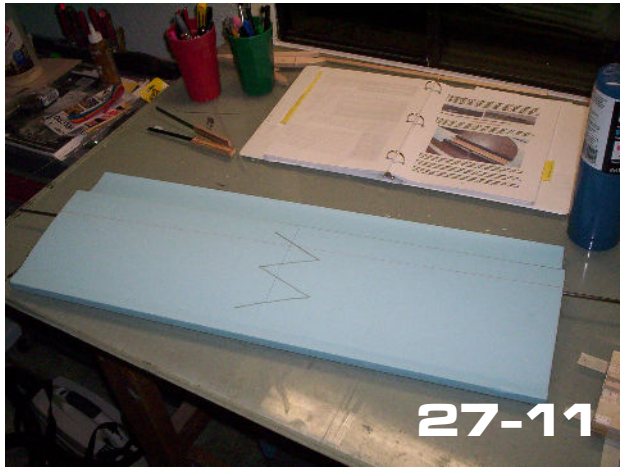
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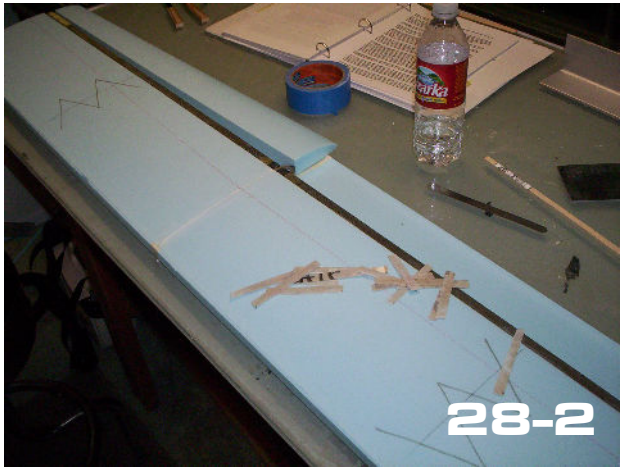
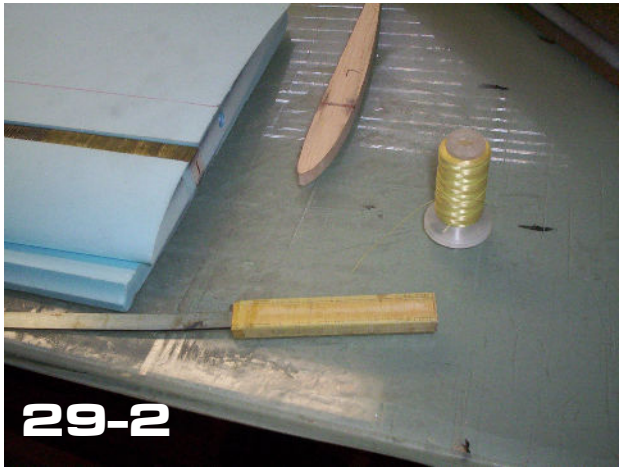
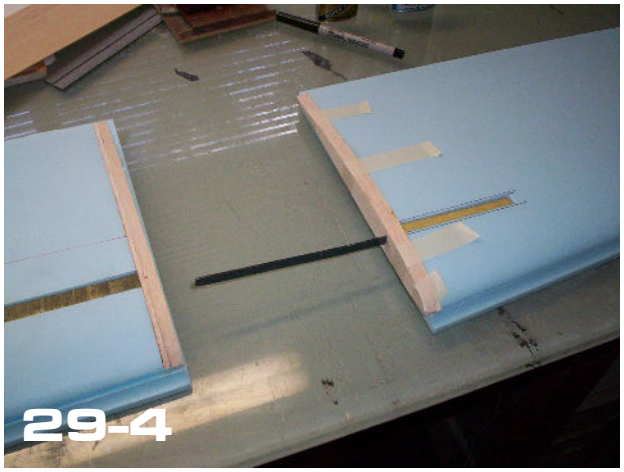

28-2

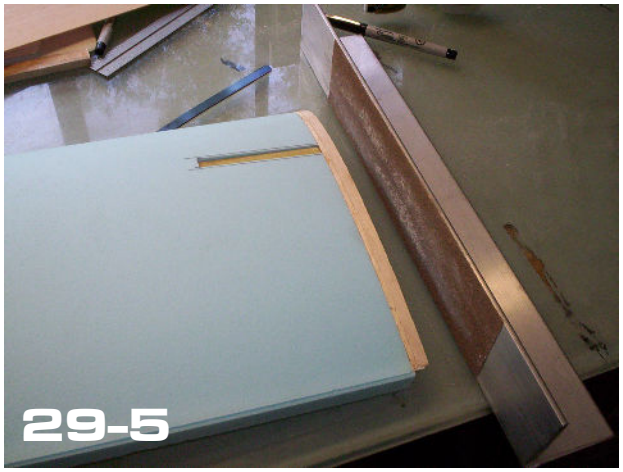

28-3

Finally it was time to rejoin all the foam panels with the spar! Harley suggests 3M spray adhesive for this step, but I chose to use epoxy instead. Consultation indicated he has used both methods with equal results, so choose whatever adhesive method you are comfortable with. In either case, small shims of 0.014 mylar are used to keep the spar centered in the core during the joining process.

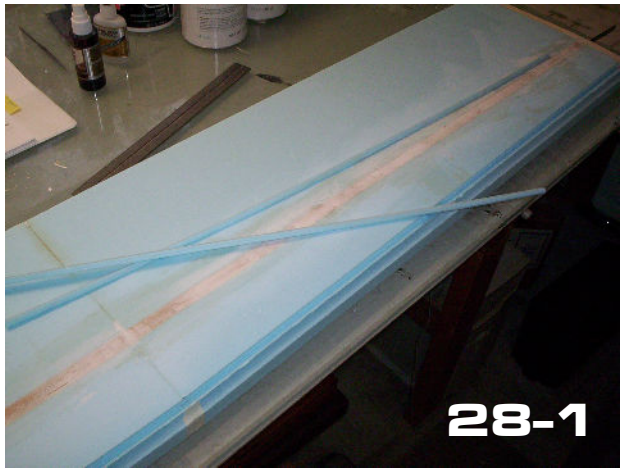
The next step is adding the balsa end-caps and installing the blade boxes into the tip core pieces. I must admit that I found this task of sanding the end-cap angles and setting the dihedral to be the most tedious part of construction thus far. In fact, I ended up taking it apart and re-gluing before I was happy with the results.







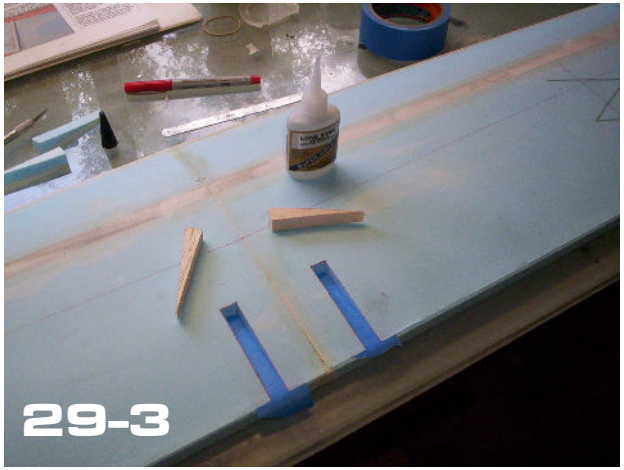
Once happy with the fit of the blade boxes and end caps, it's time to level the main spar with the core. Harley suggests using thin balsa and "icing putty". I chose to use epoxy and filler, this time colloidal silica and West 410. This provides a very strong yet flexible fill between the spar caps and (later) the wing skin. After the epoxy cured, the smaller voids and low spots were filled with lightweight water-based spackle.

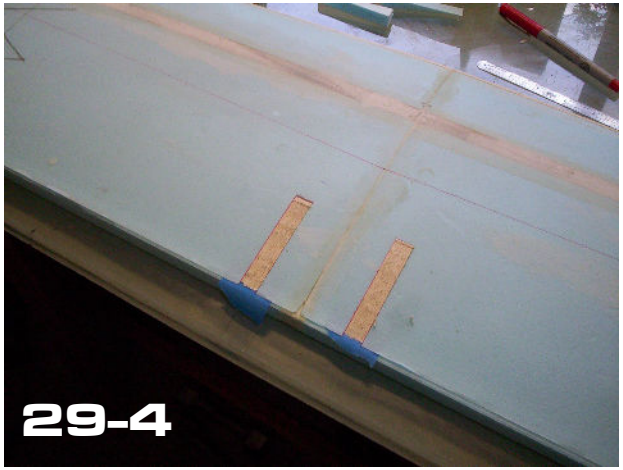


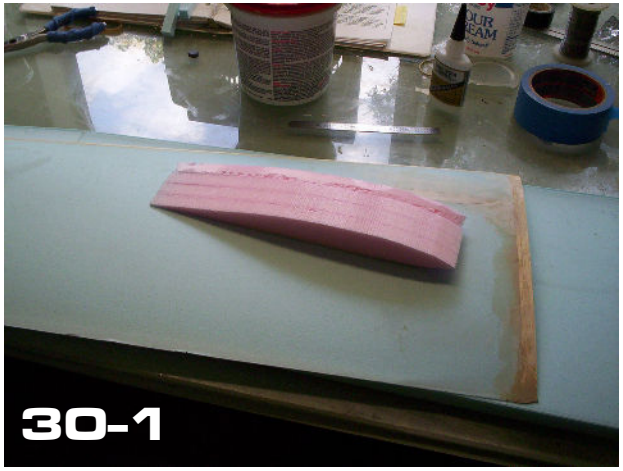
Despite the perfect leading edges on these cores, Harley suggests a wood leading edge for durability and repairability. Again, it was hard to deface such pretty work, but the leading edges were sliced off and a hard balsa leading edge bonded on and shaped. The results are satisfying and should be very strong.

Next up is to insert some balsa sections that will later be the flap root sections. This provides a nice flap root surface and increases rigidity.

And the final step before bagging is to make and install foam end-caps to go over the balsa end-caps. This extension keeps the mylars from bending downward at the root and allows the skins to overlap the balsa end-caps for later trimming back to a perfect fit.







NEXT INSTALLMENT

The cores have had a final spackling and are now ready to bag, but we're out of space. Next installment we'll get these big beautiful wings covered with uni-carbon and in the bag!

MEMORIAL DAY SOUTHERN

Brian Laird's original design Boeing B-17 Flying Fortress, flown at Little Mountain on the Sunday after the main event at the 2006 PSS Festival.

WEEKEND 2006

CALIFORNIA PSS FESTIVAL

Dave Garwood, <DGarwood@nycap.rr.com>

The ninth annual Southern California PSS Festival was held May 26-27-28, 2006, and despite some unusually varied weather conditions, in my view this one was the same good time, plus interesting learning experience, as we have come to expect from the Inland Slope Rebels.

THURSDAY

The traditional Thursday-before warm-up day at Point Fermin on the Pacific Ocean was a happy time, with sunny skies and steady light breezes. There was plenty of lift for light and medium weight planes. There were some group stall turn maneuvers, and plenty of fun watching the across-the-street landings.

There were 20-30 flyers at the park — a mix of local hotshots, slope burners from all over SoCal, and a few travelers from out of state, come to town for the PSS Festival.

FRIDAY

We got to the Cajon Summit flying site to find the top enveloped in fog. We joked that some of the photos we made in the morning could be labeled "Nantucket, Massachusetts" for the location. The fog cleared and we had fine lift for the afternoon, and most flew until around 6:00 PM before heading home. For those willing to fly for the camera, we got many of our publishable photos on Friday.

Soaring from the main hill, waiting for the fog to lift.

SATURDAY

The main event day was marked by weird and changeable weather. Around 9:00 AM the ceiling was high enough to fly, but the wind had not come up yet. Later in the morning, light planes could stay up, gradually building to where most planes could fly, but sometimes the lift came and went. In mid-afternoon the wind died. Just died. And then turned around. A high pressure system in the high desert behind the ridge stole our lift. Still, on the day there were many flights, and some impressive PSS models.

One high point on the day was an aerobatics clinic run by instructor pilots Reed Sherman, Carl Maas and Steve Lange. Shortly after the clinic was the award ceremony and the raffle. Many pilots met at the Beerhunter for dinner.

SUNDAY

As of noontime on Sunday we had blue skies and sun, but the wind was still from our backs. It showed little sign of turning around and giving us flyable lift at Cajon, so some headed down to lower altitudes and flew at Little Mountain, where we saw everything from a Bob Martin Talon to Weasels, EPP foam warbirds, Slope Scale warbirds, and one of my personal favorites, Brian Laird's original design B-17 Flying Fortress.

NEXT YEAR!

Next year will be the 10th Anniversary SoCal PSS Festival, and the ISR club members hope to make it an especially memorable event. At the time of this writing, the North American F-86 Sabre, and the Mikoyan-Gurevich MiG-15 were being discussed as group building projects. Watch the slope soaring section of <RCGroups.com> for building project info, and be sure to check <www.inlandsloperebels.com> for information about the Tenth Anniversary PSS Festival.

Brian Laird's Flying Fortress with molded fuselage and molded engine nacelles. Brian is not afraid to tackle a complex slope project. The "ISR" squadron designation could stand for "Inland Slope Rebels," the club that sponsors the PSS Festival series.


AIR FORCE
USAF


Coca-Cola

Opposite page:

Upper left; Jeff Fukushima's McDonnell-Douglas F-18 Hornet, an original design that he molds and sells under the company name Vortech Models. This plane flies very smoothly, or Jeff does, I'm not sure.

Lower left; Brian Laird's Lockheed U-2 Dragon Lady, high altitude spyplane from the cold war era. This molded fuselage is an Inland Slope Rebels club project, and of several under construction, Brian's is the first in the air.

Right:; Dave Arnold's Bell P-39 Airacobra built by Jack Cooper at Leading Edge Gliders. Dave has this special paint scheme made at the sign shop and flew it during the traditional pre-Festival get together at Point Fermin on the Palos Verdes Peninsula.

This page:

Left; Brian Laird's Messerschmitt Bf-109, a classic Slope Scale kit from times past.

Right; Ralph Robert's Heinkel P-1076 with forward-swept wings, an original design in EPP foam. It has an SG-3016 airfoil and weighed about 76 ounces. Ralph is the artist who produced the artwork for festival t-Shirts and he gave up one of his secrets on getting his trademark immaculate finish on EPP-foam: no strapping tape, two layers of Solartex. Thanks, Ralph. Maybe someday, some of us might come close to catching up to you.

Upper left: A Shorts Tucano T1, this one built and flown by Carl Maas. This was another ISR club project from a few years back, and a popular plane because of its sterling flight characteristics. Tucanos are frequently seen at PSS Festivals over the years.

Above: Brian Laird's Supermarine Spitfire sports an exceptional finish. This is another classic Slope Scale kit, about 48-inch span balsa sheeted foam core wings, molded fiberglass fuselage, and balsa or basswood tail parts. The fling surfaces are covered with Solartex, primed, then painted and detailed.

Left: Dave Massongill's Slope Scale Bell P-39 Airacobra finished in "Pinball Squadron" gunnery target scheme.

Dave Massongill's Lippisch P 01-118 single seat rocket fighter, a plane that was designed but not produced. Dave built this one from EPP foam, covered it with Solartex and painted it. The model flew very well.

Marty Hill from Malad, Idaho launches a Leading Edge Gliders Curtiss P-40 Warhawk from the "sport hill."

ISR club member Robert Cavazos prepares to launch Brian Laird's U-2 Spyplane on the "speed hill."

2006 PSS JUDGING RESULTS BY CATEGORY

CIVILIAN CLASS			
	1st	Bugatti Racer	Ralph Roberts
	2nd	BD-5	Dave Massongill
	3rd	BD-5	Rick Schwemmer
	4th	Tucano	Tim Neja
PROP CLASS			
	1st	Hawker Hurricane	Brian Laird
	2nd	P-39 Bell Aircobra	Reed Sherman
	3rd	Manta	Sean Galt
	4th	P-40 Warhawk	Bill Dalhagen
	5th	Me-109E	Ian Gittins
FOAM CLASS			
	1st	P-51 Mustang	Bill Dalhagen
	2nd	Mig 3	Marty Hill
	3rd	P-63 Kingcobra	David Field
	4th	Me-109	David Casper
	5th	BD-5	Andrew Thompson
JET CLASS			
	1st	F-14 Tomcat	Carl Maas
	2nd	U-2	Brian Laird
	3rd	Fouga	Ralph Roberts
	4th	F-16	Ian Gittins
BEST OF SHOW		F-14 Tomcat	Carl Maas

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Marty Hill's North American P-51 Mustang, built to order by Jack Cooper at Leading Edge Gliders.

Clockwise from upper left: Best Civilian winners, Best Prop winners, Best Foam winners, Best Jet winners

Tech Evening

By Don MacCandish

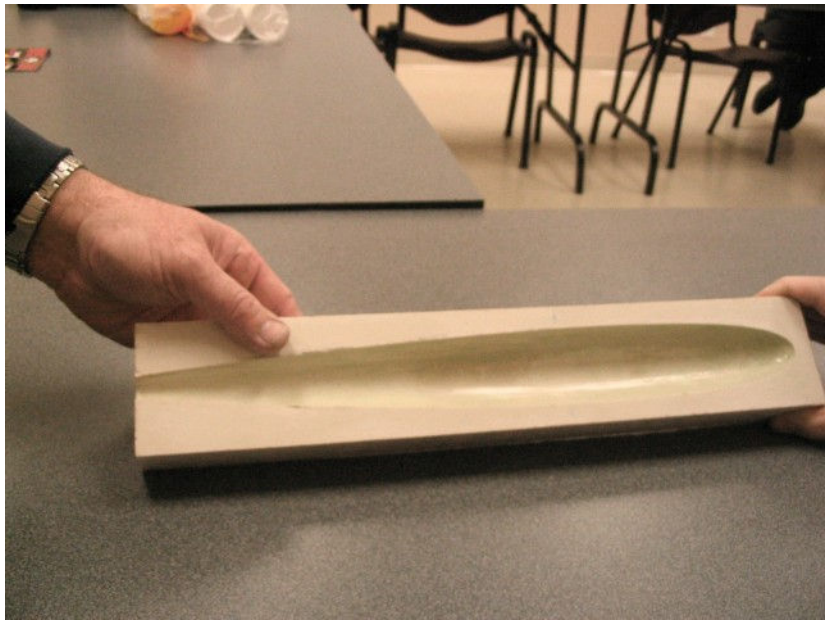
We seem to be a club gifted with many highly intelligent members. Through some sort of Darwinian selection process, this cannot fail but to produce a high degree of talent at the executive level of the club.

Building on past experience of Film Nights of other years, where video presentations created by others were shown, this year our executive reached into our own membership talent pool to produce an outstanding technical evening.

Our venue this year was a lecture room in the Dollard Cultural Center, arranged through the efforts of Mark Gervais, a change from the theatre format of the film nights. For those who were unable to attend, know that the size of the room was perfect. Tables were laid end to end to create a square pattern with a space in the middle.

Those in attendance were seated around the outside perimeter. Thus, a wonderful seating arrangement where show and tell articles could be placed on the tables, but all those present enjoying eye contact with presenters.

MATS club members seated around the perimeter of the Tech Evening tables.



Stephen Barry holds his Hydrocal female fuselage mold

Epoxy partially hardened, Stephen trims off the extra cloth.

Lead off presenter was Stephen Barry, who should have been wearing a white clinical coat which would have fitted in with the pots, syringes, fiberglass cloth, and carbon fiber material, all of which he skillfully used in his hands on demonstration. His task to demonstrate the molding process required to produce the nosecone of a boom and pod type, high performance aircraft. Surprise number one! A concrete box shape, in which was the female mold shape for half of the fuselage of a Bubble Dancer sailplane.

To the uninitiated, like the writer, it was explained that this concrete box was a mold created with Hydrocal - a gypsum-concrete producing a very fine surface texture.

Knowing the readership of this paper, I will fast forward, but keep in mind the writer is on a learning curve during this whole incredible evening of knowledge exchange.

A box is used to support the male plug of the shape to be produced. The male plug is coated with a release agent and placed in the box with the plug supported up to the parting line. Hydrocal is poured into the box holding the plug. The hydrocal solidifies producing the first half of the mold.

The process to produce the second mold-half is repeated using the plug, which is still in the first mold half. Walls of a second box are now built to onto the mold/plug assembly to contain the second half Hydrocal pour. Once hardened, the two halves of the mold are separated from the male plug, thus leaving an upper and lower female impression in the Hydrocal mold-halves. The process to replicate the desired shape in fiberglass then commences.

The female Hydrocal molds are now coated with PVA release agent. The fiberglass cloth is then laid into the female mold dry and epoxy is poured onto the cloth and brushed in to soak into the cloth. Carbon fiber cloth strips are added for strength and rigidity. All is left to cure with the edges of the cloth in a mess protruding above the mold. The whole thing is put aside to cure.

Left: Stephen Barry explains his Bubble Dancer fuselage layup prior to trimming and popping it out of the mold.

Above: Ghislain Lamothe in consultation with Ken Starkey about motors and batteries for his e-glider.

Hint, hint, - in creating the compound-curved nose of the fuselage, a square of fiberglass cloth is cut and placed such that the strands of the material are angled (biased) to the centerline of the fuselage. This, to more readily adapt (without wrinkles) to the curved shape of this part of the fuselage. I wonder how many screwed up moldings it took to discover that little gem of an idea?

You ask, "Where do you get the little syringes used to measure the epoxy and hardener? Answer from Stephen — these are non-hypodermic syringes and you buy them in the drug store where they are sold to young moms who use them to measure medication for their babies! Lets leave Stephen now, to allow the meeting to continue while his about-to-be-born fuselage-half is curing.

A short feeding frenzy now ensues! The members attack the lemon squares prepared by Mrs. Reece that are laid out on a side table. There is also hot coffee, courtesy of Mark Gervais, who trundled the coffee machine in from his car in the parking lot on a handtruck. Clever devil he

Manny Vardalas hard at work on his fan-fold foam airplane.

Manny, with Tim Smith, club President, shows off the nearly completed aircraft for MATS members.

Manny gluing on the motor block.

is, he also sucked John Reece into actually running for and making the coffee! He also knows how to adapt his milling machine to be CNC (computer numeric controlled) and to create, from scratch, a computer driven hot wire foam wing cutter, but all that is common knowledge to club members.

The focus of enrapt club members now is directed to the other end of the square of tables to where our next presenter, Ghislain Lamothe, is seated. Hand out notes are on the table in front of him. His subject is LiPo battery technology. Thank goodness for the notes because, to the writer, this is complicated stuff. While I say that, the exchange of dialogue with those present would indicate that our members are at a receptive level of understanding.

Ghislain's presentation is in keeping with what is an outstandingly educational evening. His notes, copies of which are

distributed, are highly professional and indicate a comprehensive understanding of the subject.

The headings of the subject matter are a measure of the contents of his presentation:

- Advantages / Disadvantages
- C Rating explained
- 3SIP, $S3P, what the ??????
- State of charge vs. voltage
- Factors that will shorten life (ABUSE!)
- Cell balancing & charging precautions
- Long-term storage
- On the horizon (the future)
- Useful references

Ghislain's paper starts off with a general disclaimer as protection against the use or misuse of the information presented. The amount of information presented by Ghislain is simply too extensive to present here. In fact, to do justice to the knowledge divulged, a small book would be warranted. We witnessed the product of someone who has gathered virtually everything one could know about the subject, and presented it in a comprehensive manner.

The general disclaimer probably ties in with the comment in the Disadvantages list — LiPo packs can start a very nasty fire if overcharged.

Although Ghislain left with us the need to completely respect the dangers in misuse of this product, he also made clear the potential power packed into a relatively small package when compared with other types of batteries. Clearly, the competitive element will embrace these light, compact, sources of power if they are to beat the competition. But understanding the product will be required. This was made clear when Ghislain explained that the charging of these batteries includes balancing the charge of individual cells within the battery.

Jacques Girard and Jean Hubert with Jacques' Supra wing.

To some of us the technical level of the presentation left us wide-eyed in wonder. However, the exchange with other members present, who were obviously comfortable with the technical language used, is a measure of the high level of intellect of our club members. One could not expect a more comprehensive discussion of the subject. Presenting the concerns in using the product, but also the advantages in their use. Bravo to Ghislain for a fantastic job!

While Ghislain's presentation is going on, remember that across the room Stephen has been poking away at his mold. The epoxy has been curing and the success or failure of molding half of the pod is about to be exposed to the world! The fiberglass cloth extends above the level of the mold. Using a sharp knife, our magician slowly, as if to heighten the tension in the room, skillfully cuts through the cured fiberglass flush with the level of the Hydrocal cement mold surface. The skill of a craftsman is

MATS members look over Jacques Girard's Supra wing and Pretty Mantis fuselage. The vacuum bagged wing tips still smelled of wet Krylon. The wing will be a three-piece, with flat center section to take advantage of the pylon mounting and use of a single flap servo.

apparent and with the extraneous fiberglass cut away, a slight tap on the mold, and "poof," out comes a perfect piece. Wow!

So here we are, with the investment of a few hours we have seen a demonstration of molding fiberglass and been exposed to the leading edge of LiPo batteries. What next?

Well, with hardly time to grasp another of Mrs. Reece's lemon squares, or a gulp of newly brewed coffee, we are about to see a demonstration of the use of fanfold foam in building a model. A few hours have passed, but all are wide-awake. It is now time for Manny Vardalas to demonstrate the building of a 3DX flying model.

Moving to the middle of one row of tables where, because of the arrangement of the desks, all present can watch, Manny launches into the task. A cutting pad, tools, and material, are laid out while he explains the origin of the fanfold (insulating) material. He shows it to be a sandwich of foam bonded to thin plastic sheeting. Manny`s hand skills are awesome and the slab of fanfold is cut into the body profile of a plane, including the rudder. A slot is cut into the fuselage to receive the wing, also fanfold, while all the time the use of a straight edge and X-Acto knife are demonstrated. Ailerons are created in the trailing edge of the wing by cutting a V shaped groove in the fanfoam. The topside skin of the foam sandwich is left intact to act as a hinge line. Simple clear packaging tape is applied to the flat surface along the line of the groove on the top of surface of the wing. The aileron is folded onto itself to expose the grooved side and tape is applied to that surface to produce a strong, hinged aileron. Manny strongly embraces low

cost constructions so, instead of costly fiber rod material or the like to stiffen the body profile laterally, a shaped strip of fanfold is quickly spot glued lengthwise and square to each side of the body. Both glue and glue gun are the cheapest available. The topside of the wing is grooved and material is removed, creating a slot to receive the spar, a carbon fiber rod glued into the wing material. Simple wire wheel landing gear is added, cunningly bent to adapt to the body. Stab glued into its slot, square short piece of pine glued to the foam to receive the plug-in GWS motor and gearbox. The construction is completed and Manny explains how receiver, battery, servos, are mounted to the side of the fuselage, and it is ready for flight. Talk about fast hands Luc!

Manny then attempts the initial flight of the powerless plane by a hand launch aimed across the room at the writer. His launching technique stinks and the plane hits the desk in front of me. I, on the other hand, take time to launch the plane back towards him at the proper attitude. With a gentle thrust, the newly born plane gracefully floats across the room and lands in Manny's hands. Others present can witness my assessment of the flight.

But the charm of a plane cut out of fanfold does not necessarily attract modelers. For those who need something closer to the real thing, Manny then produces a great looking model created with the body fabricated of fanfold. He demonstrates how the fanfold can be cut and glued together to produce a scale looking body. In that particular model, hot wire cut foam wings are covered by bonding cheap gift basket wrapping film, to the foam surface with 3M spray adhesive, all to produce a good-looking plane built with imagination out of simple, readily available materials. Oh yes!

All present were impressed with the cockpit canopy which started life as part of a salvaged Windex bottle. Talk about imagination!

All present declared the meeting a success. Complete attention prevailed from 7:00pm to 10:00pm, which to my mind, is the measure of a successful, informative and well-appreciated meeting!

30 YEARS

AND STILL GOING!

After its humble beginnings for having its first glider flying season ending Tournament, which was held at the Forward Thrust Park in Redmond Washington in 1977, the Northwest Soaring Society (NWSS) will celebrate its 30th anniversary Tournament September 9th and 10th this year at a sod farm near Pasco, Washington.

The Tournament will feature preliminary flight rounds all day on Saturday and continuing Sunday morning, with a championship fly off on Sunday afternoon between the top 12 flyers.

There will also be team competition in the NWSS Expert and Competitor Classes and an award for the highest scoring "Grey Beard" (62 and older), AKA the "Silver Cup," during the preliminary rounds.

Serving as Contest Director for the tournament is Tom Culmsee; this will mark his 29th year as the CD for this contest.

For more information and registration for this Tournament go to <http://www.northwestsoaringsociety.org/>.

Maple Leaf Design *Encore*

Fabrication walk-through, Part 3

by Phil Pearson

Coverage this issue details the actual lay-up of the Encore fuselage pod.

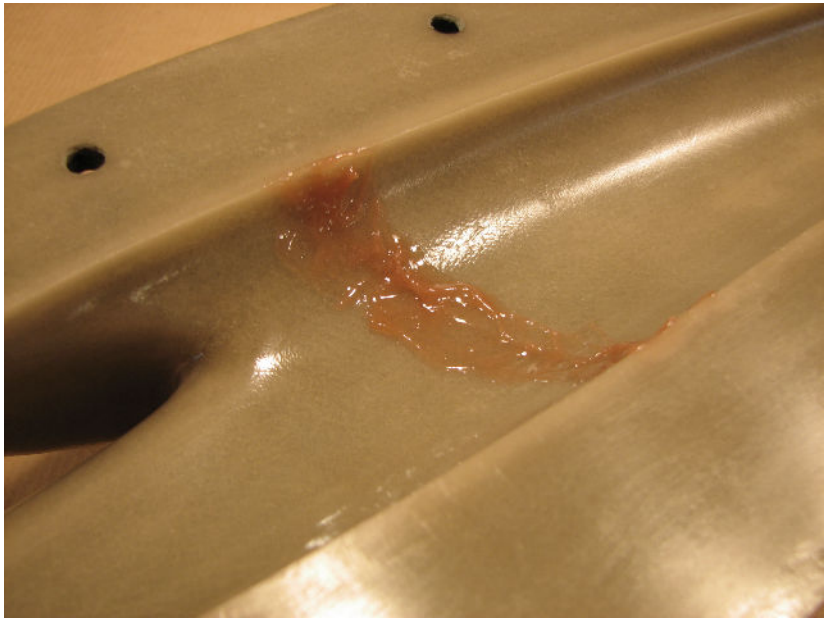
Three layers of 1.8 oz Kevlar cloth are used to give a strong light weight and very durable structure.

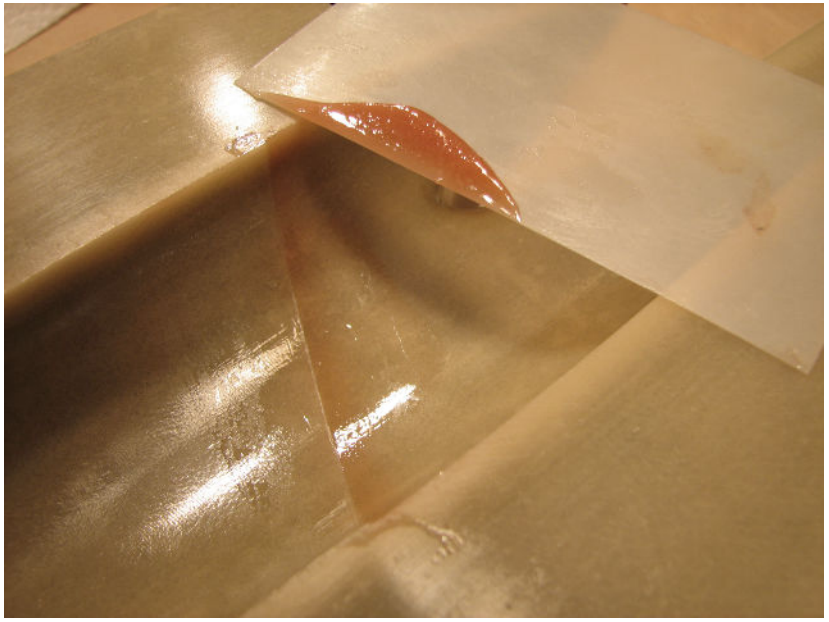
Wing fillets merge into wide flanges that are taped to the wing and add great strength to resist the enormous radial forces produced by the discus launch.

The wing leading edge is attached with two 1/8" birch dowels fitted into a 1/8" plywood bulkhead. The aft part of the wing is secured with a 6-32 metal screw anchored in 1/4" plywood mounted on the tailboom and secured in the aft end of the Kevlar pod.

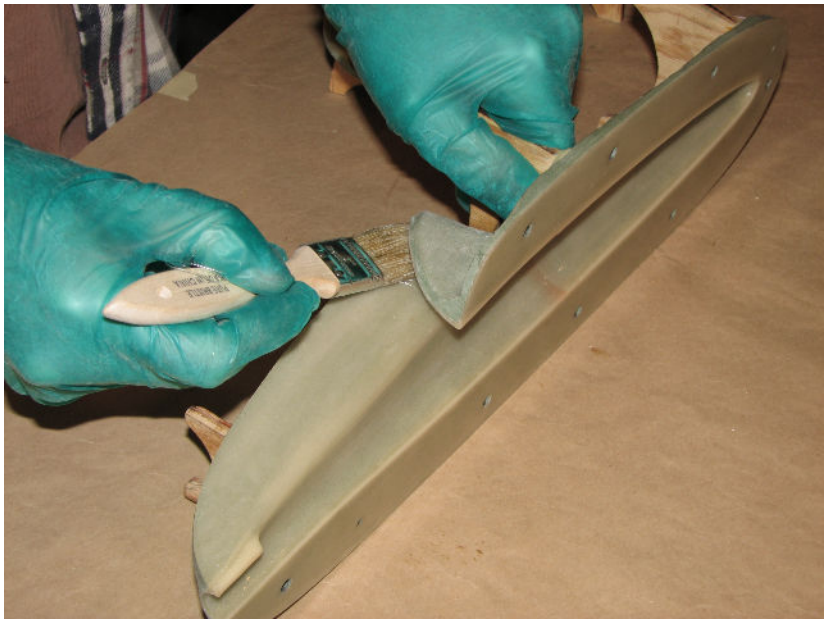
The next installment will illustrate the CNC milling of the Encore wing cores, balsa tail surfaces, and other small parts. Photos will show the various fixtures and method of manufacture.

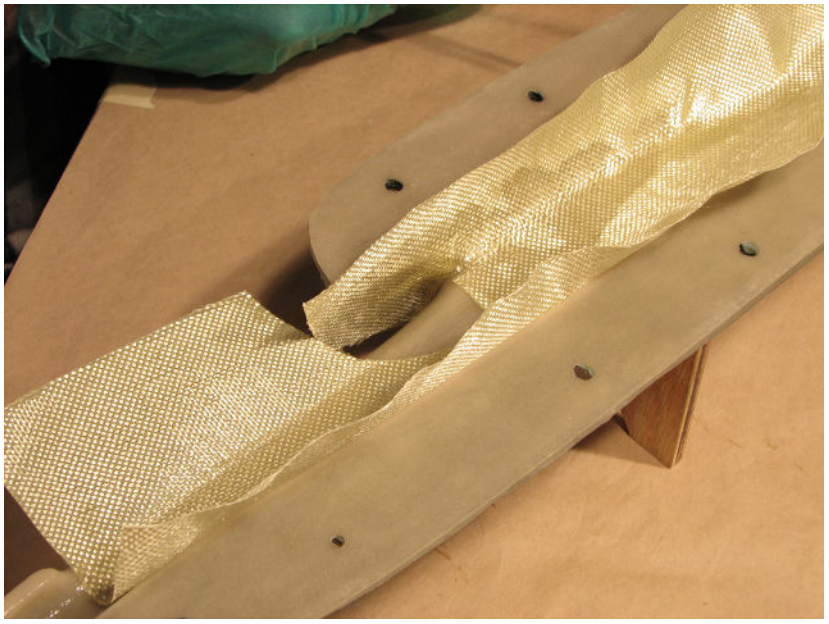
http://www.mapleleafdesign.com/encore.html



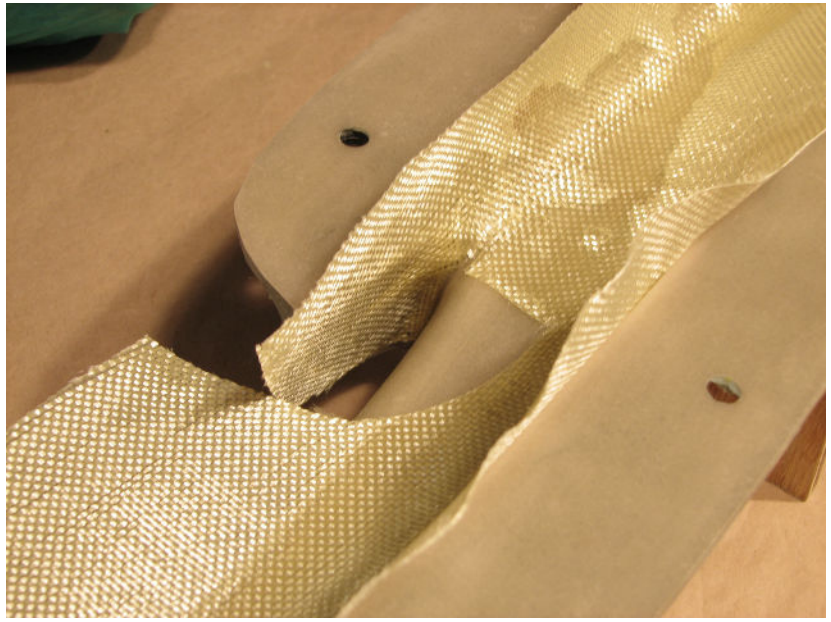


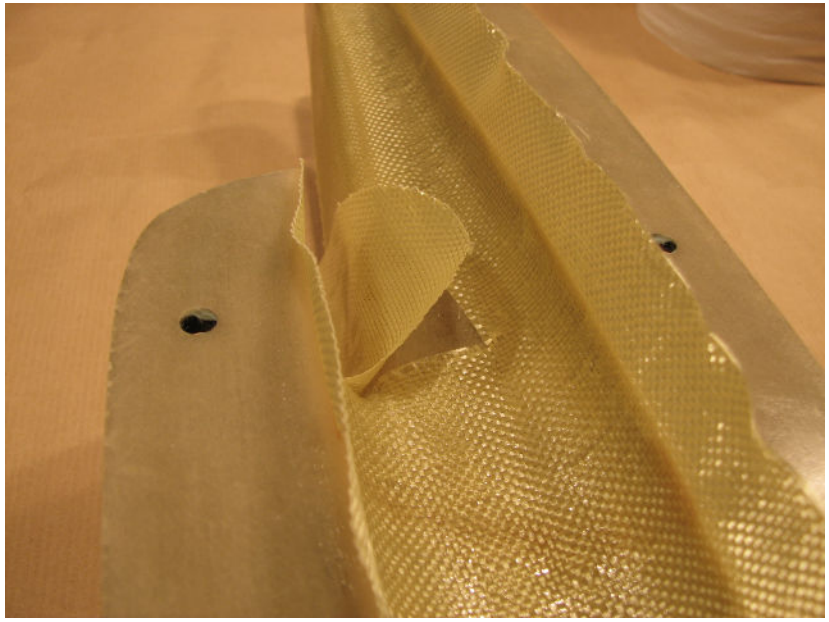
Left: 15 minute epoxy, with silica thickener added, is placed in the nose cone step to "level surface" for cloth. This eliminates air bubbles from cloth which is "bridging" the step. Right: Mylar is used to trowel the epoxy level with the mold surface.



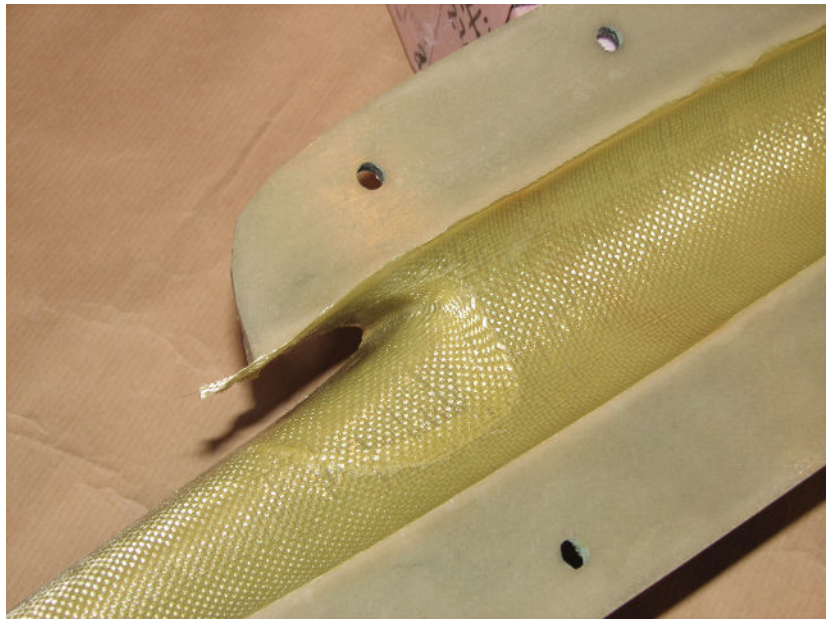


Left: MGS epoxy, with colloidal silica added, is painted over mold surface.
Right: The first layer of Kevlar is placed in the mold and resin is stippled through the cloth.

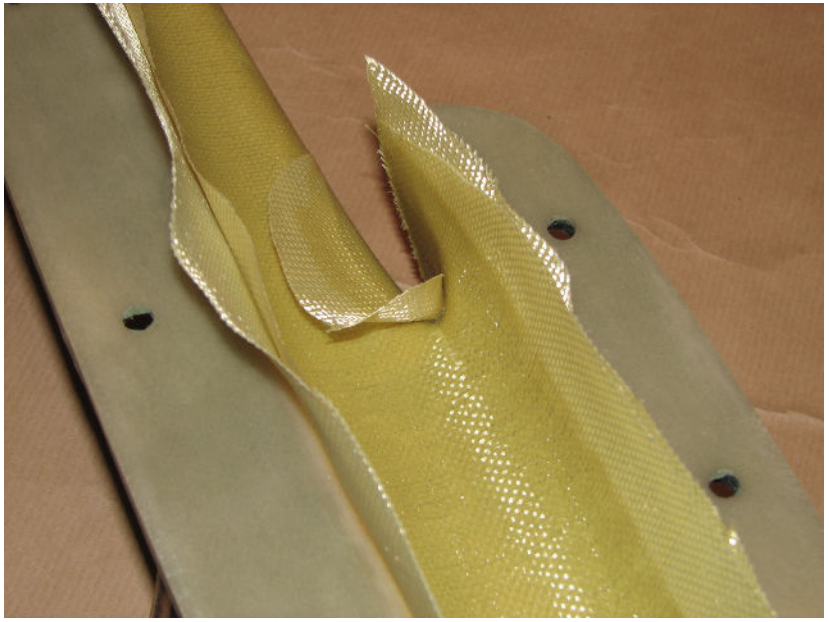




Left: Detail showing cuts to allow cloth to lay with minimum distortion of weave. Right: Detail showing placement of patch to cover cutout. A small amount of resin is brushed on cloth edges before patch placement.



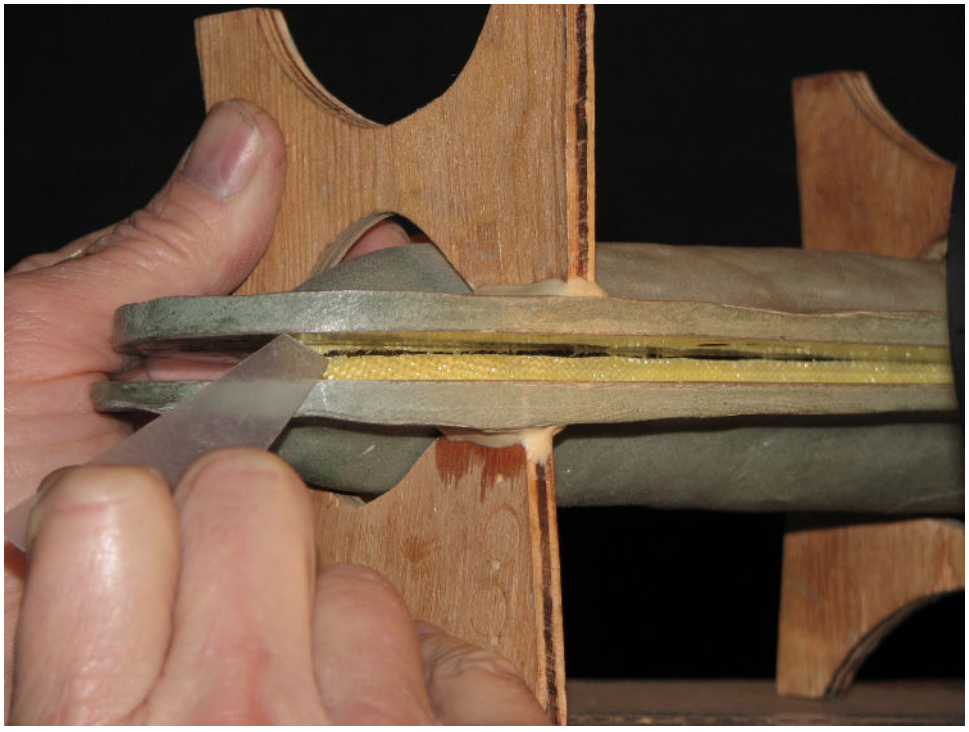
Left: Patch in place and resin applied. Right: The first layer is trimmed flush to the mold flange and allowed to partially cure. A layer of resin is brushed into the mold before the second layer of cloth.



Left: The second layer of cloth is placed and resin stippled through. The second layer is placed with the weave on a bias to the pod longitudinal axis. A third layer of cloth is then added. The first and third layers have weave parallel to the longitudinal axis of the pod. Right: A second patch, with weave biased, is added. A small amount of resin is brushed around the patch cutout area.

Left: The second patch is stippled into place. Right: The second and third layers are trimmed to allow an overlap along one side and flush to the mold flange along the other for each half. The lay-up is then allowed to cure to a “sticky” state.

Left: A small amount of resin is applied along the seam prior to joining the two halves.
Right: The mold halves are positioned, with good lighting, for joining.



Left: A small piece of mylar is used to position the cloth flange inside the flush side.

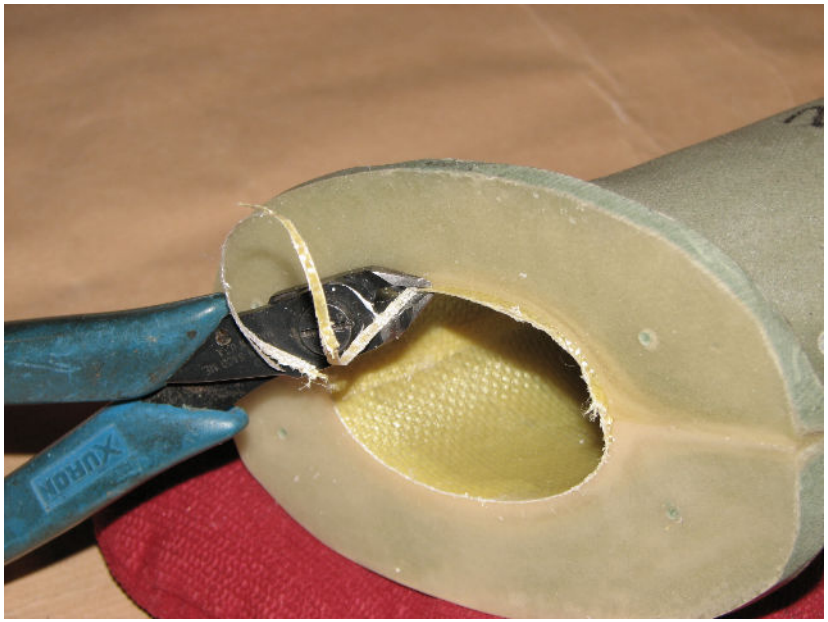
Left: The flange of cloth is pressed in place with rollers.

Right: Close-up of seam rolling process.

Left: Molds are placed in a heat box and cured overnight at 85 degrees Fahrenheit.

Right: Brushes are cleaned and stored in MEK 96.

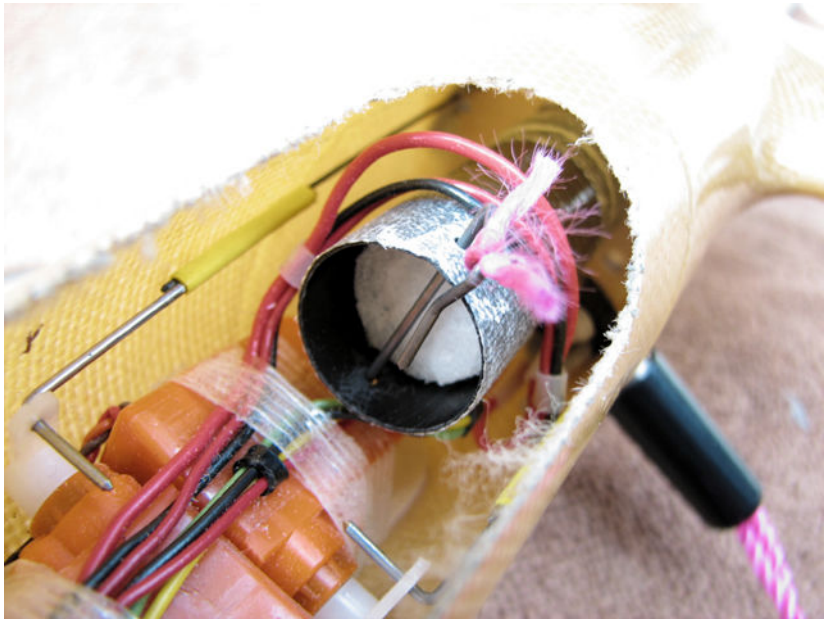
Above: Fuselage pods, trimmed with Lexan scissors, prior to packaging.



Left: Detail of nose cone trimming.

Right: Fuselage pod detail showing carbon tube extended forward to house ballast.

Left: Ballast weight arrangement. Standard ballast consists of three concentric weights.



Right: Detail of forward ballast area.

Making up a light weight, low drag hi-start

By Jerry Slates, <oldjer@themacisp.net>

I have been flying gliders for many years, and I have flown many gliders off of many hi-starts.

Over the years, hi-starts have gotten bigger and stronger — maybe too big and too strong. Some of these bigger and stronger hi-starts that I have used made me uncomfortable. I was unable to pull the line back to its maximum length. I was afraid that the tow hook may pull out of the bottom of the fuselage. I was afraid that the model might slip from my hand and cause some damage. As I tried to pull these hi-starts out to their maximum length I would sometimes feel the fuselage sides starting to give under my grip.

What to do?

The next time you are out at the flying field, walk part way down the field parallel to the hi-start, but at a safe distance, and watch the hi-start in action. What you will see, looking at Figure 1, is a glider going up in an arc like motion, but the glider cannot maintain its maximum arc.

Why?

There could be several reasons. (1) Perhaps you are trying to launch a glider that's 75 ounces plus. That's just too much glider for the hi-start. (2) The surgical tubing that you are using is too big and too heavy, so the model can't carry it. (3) The line that you are using is too big, the large diameter causing drag. Or (4) the line could be dirty and heavy, too much for the glider to pick up and carry to the maximum arc.

Again, what to do?

Looking at Figure 2. The perfect launch would be your glider maintaining the maximum arc from the time your glider left your hand to the top of the arc at the point of line release. You and I know that we will never see that perfect launch, but we can come close.

How?

Use a smaller and lighter section of surgical tubing, and a smaller diameter and lighter tow line.

So let's go shopping and gather up the parts and build a new light weight, low drag, hi-start.

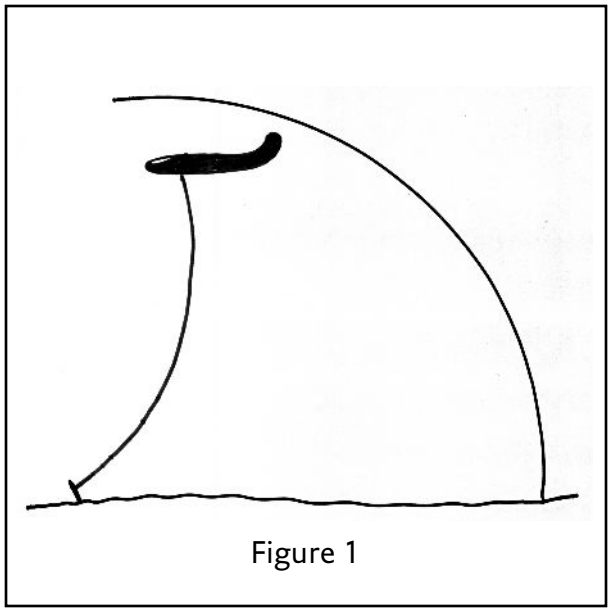


Figure 1

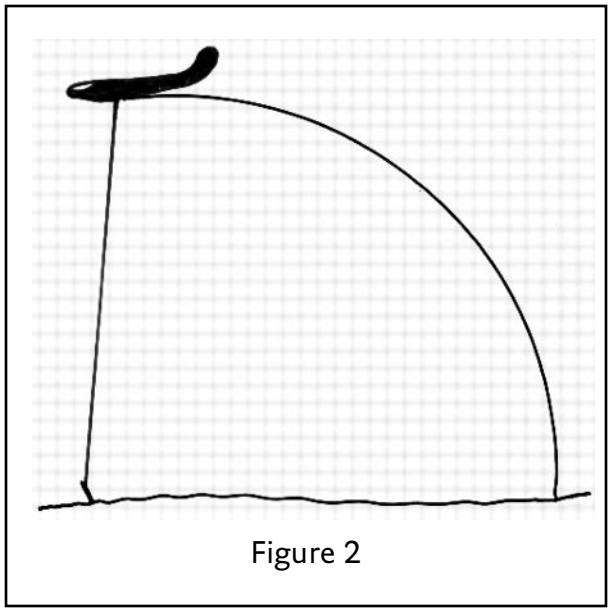


Figure 2

First stop, a medical equipment and supply store for some surgical tubing. Check your yellow pages for a store near you. They have a lot to choose from if you are lucky. The size that I chose was one with a 1/4 " I.D.and a 1/16" inch wall. This size I can pull back 300% for a 14 lb. pull. It cost 92 cents per ft., and I bought 50 feet.

Next stop was the hardware store. There I got a 1/4 inch eye-bolt for 29 cents, a plastic electrical cord reel for $2.99, and a pair of work gloves for $1.25.

The last stop was a an up-scale fishing tackle shop. There I was looking for a tow line and I found several hundred types of fishing lines to choose from. The one that I selected was “Spider Wire,” 30 lb. test. It is only 0.008 inch diameter and has an extra — it's Teflon coated, so it’ll be easy to keep clean. One spool, 450 feet, cost $11.99. (If you are looking for some “Spider Wire” and can't find it, call Pure Fishing at 1-877-502-7743.) While there I also picked up a small swivel for $1.50.

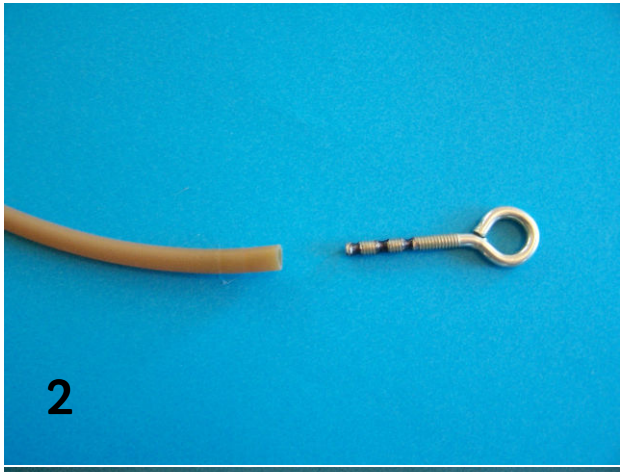
The remaining parts I found in my shop: some 1/4" hardwood dowel, 0.020 stainless steel safety wire, the same wire I use on my foam cutter, and the last item, the parachute, given to me by an old friend Bruce Abell in Australia.

To assemble this light weight, low drag, hi-start, just follow the step-by-step pictured instructions on the following pages.

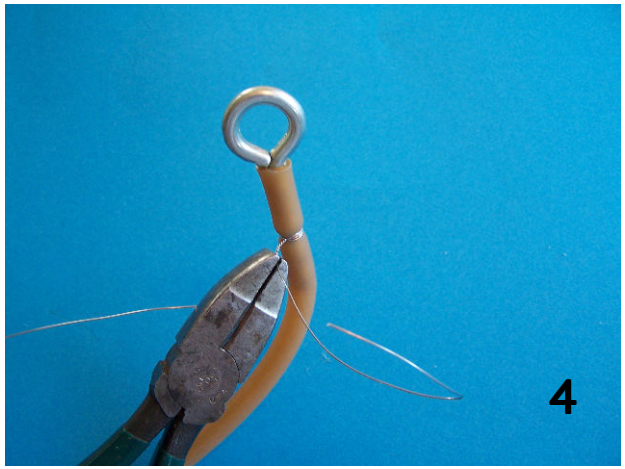
1.See the difference between these two lines. The line that I used before was 0.044 inch diameter, 120 lb. test.

My new line is only 0.008 inch diameter, and is 30 lb. test. I used 300' of the 450' on the spool.

2. File or grind groves in the eye-bolt.



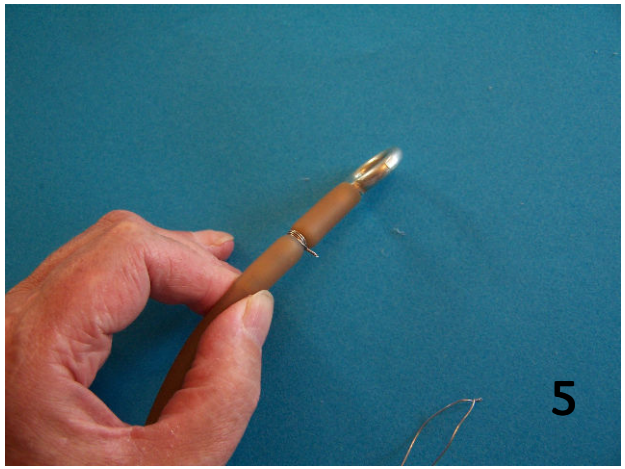
3. Insert eye-bolt into surgical tubing, then take stainless steel wire and wrap three or four turns over the grooved part of the eye-bolt and pull up tight.



4. Twist the ends of the stainless steel wire.

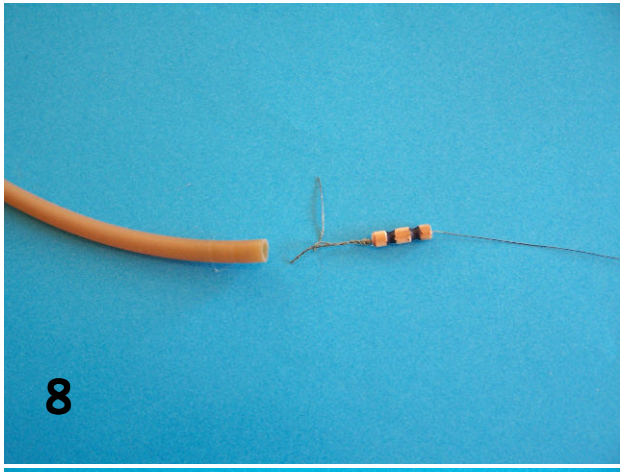
5. Cut off the long wire ends.

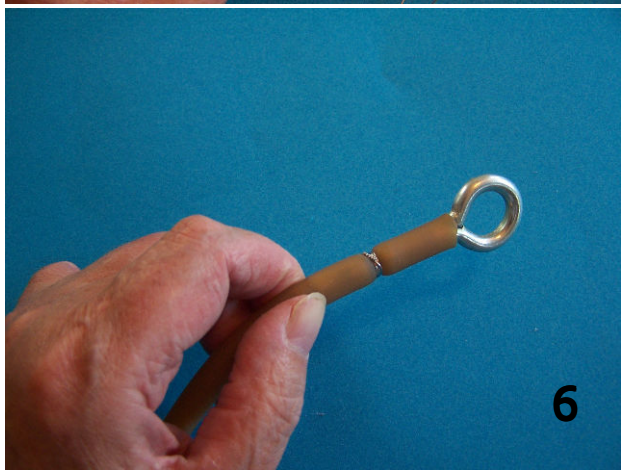
6. Bend wire end over so it lies flush with the wrapped wire.



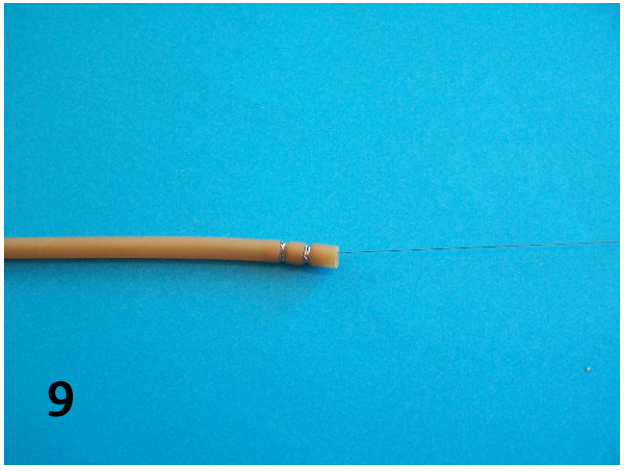
7. Continue wire wraps over each eye-bolt groove. In use, you'll place your steel spike through this eye-bolt to anchor the far end of the hi-start.

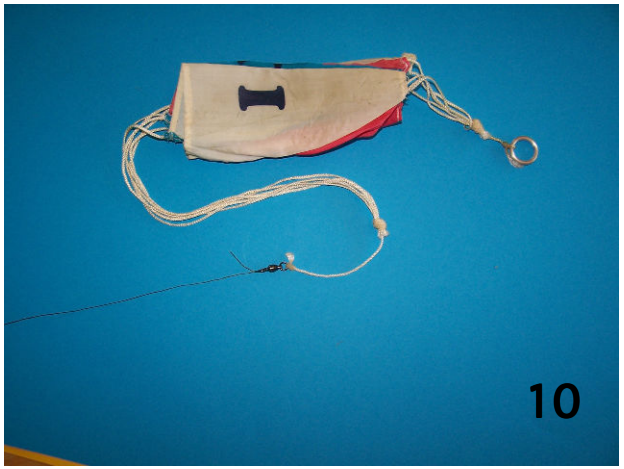
8. Get a piece of 1/4" hardwood dowel, and file or grind grooves like you did for the eye-bolt. Center drill a small hole in the dowel. Insert tow line through the dowel and tie a large knot so that it won't pull back through dowel.





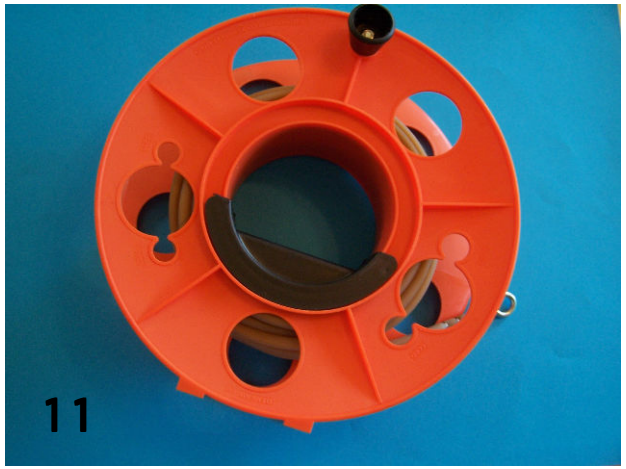
9. Insert dowel with tow-line into surgical tubing and wrap with wire as you did on the other end with the eye-bolt.





10. To the other end of the tow-line, add a swivel and parachute.

11. A storage reel makes end-of -the -day re-winding a breeze, and storage is easy. For safety, you may want to wear a pair of gloves when reeling in this hi-start.



Jojo Grini's Pike Giant flying over a farmer's field just two minutes from home. Photo by Jojo, camera in one hand, sticks in the other.

The above photo was sent to us by August Hahn, and shows a full size Mitchell B-10 and a replica which appears to be 1/3 scale and apparently built using the same structure.

August has plans for the full size B-11, but because of the complexity of the structure, feels he might be better off building an accurate model before tackling the larger project.

August is interested in acquiring any information regarding the model shown in the photo, including plans availability.

If you have any information which may be of value to August, please forward it to him at <augusthahn@sbcglobal.net>.

FAI has received the following Class F (Model Aircraft) record claim:
Claim number: 13877
Sub-class F5 Open (Aeroplane, Electric motor S (rechargeable sources of current))
F5: Radio Controlled Flight Category
Type of record: N°174: Distance to goal and return
Course/location: Yarrawonga, VIC (Australia)
Performance: 142.8 km
Pilot: Raymond COOPER (Australia)
Date: 27.05.2006
Current record: 80.43 km (30.07.2005 - Jüri LAIDNA, Estonia)

FAI has ratified the following Class F (Model Aircraft) records:
Claim number: 12006
Sub-class F5-P (Aeroplane, electric motor (non-rechargeable sources of current))
F5: Radio Controlled Flight Category
Type of record: N°181: Distance to goal and return
Course/location: California Valley, CA (USA)
Performance: 24.99 km
Pilot: Gary B. FOGEL (USA)
Date: 07.10.2005
Previous record: 19.92 km (19.07.2005 - Jüri LAIDNA, Estonia)

Claim number: 12371
Sub-class F5-P (Aeroplane, electric motor (non-rechargeable sources of current))
F5: Radio Controlled Flight Category
Type of record: N°181: Distance to goal and return
Course/location: Lucerne Valley, CA (USA)
Performance: 30.44 km
Pilot: Gary B. FOGEL (USA)
Date: 17.12.2005
Previous record: 24.99 km (07.10.2005 - Gary B. FOGEL, USA)

FAI congratulates the aeromodellers on their splendid achievements.

Remark: F5-P records no longer exist since 01.01.2006 (modification in the Sporting Code section 4, vol. ABR, 2006 Edition). Claims 12006 and 12371 are ratified as World Records as they were made in 2005. But they are retired from the list of current World Records.