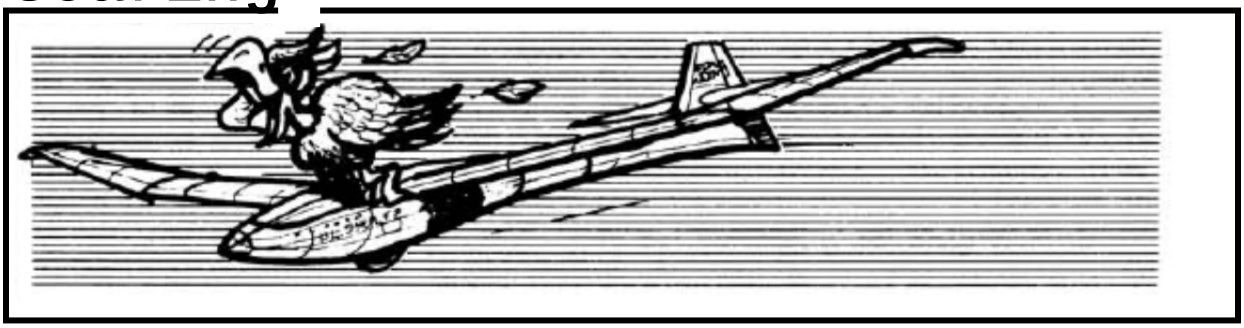
Silent Wings Soaring Association

October 2014

Soaring



Keith **Kindrick** **October** 2014

October is time for Fall Soaring
We held the October club contest in a nice fall temperature range for all who could make it. This month I was the CD for the event. We had a 5, 8, and 8 minute flight time with short tapes. Dan landed for his first round and noticed I had two types of landing point tapes out there. We had to make a change to fix that so Eber would not go crazy. Good catch Dan!

Henry also took home the annual Pumpkin for his Daughter with his RES winning score.

Fall Soaring Festival at CVRC Several of the SWSA membership just completed the annual trip to the Fall Soaring Festival hosted by the Central Valley Radio Control club in Visalia. This was the 41st annual event which has been held the first weekend in each October. This year the weather was around 95 degrees for both days. Lift conditions were mild to moderate. In years past the thermals have been real hat suckers! Here is a few of the action shots taken of our members during this year's event. Final scores are posted at the end of this newsletter.

Dan Borer and his 4.0 Meter Xplorer

Dan Borer flying and Edgar timing

Tony Brooks with Andy Thonet timing

Tony in for a 15 point score.

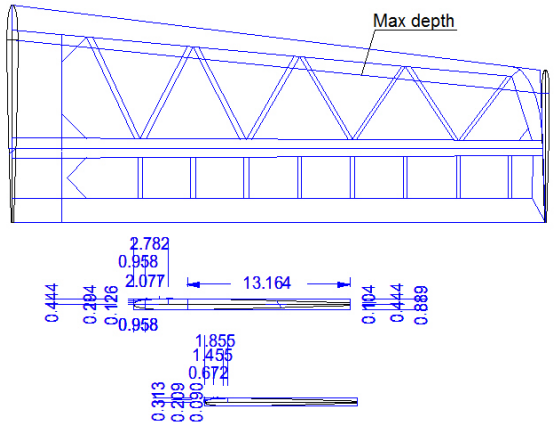
Andy Thonet concentrating on final

Andy in for 25.

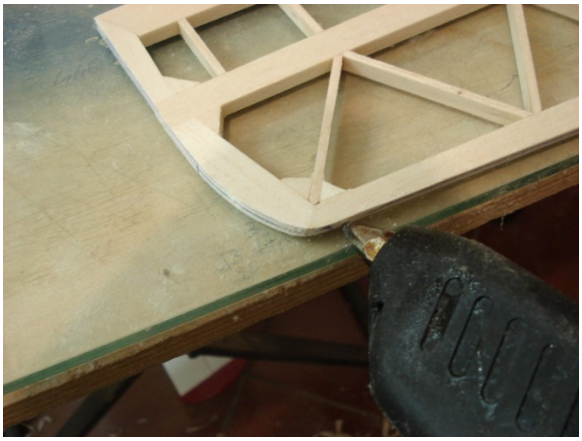
The Colonel just after his launch. At 96 years of age, still a strong competitor.

Check it out!

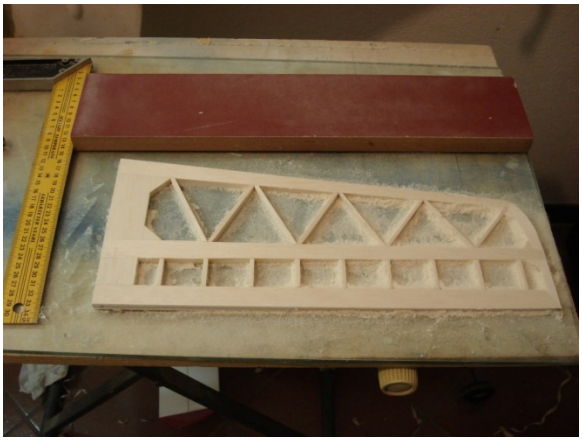
Harvey has a new Club 2 meter off the board! The guys are still tuning the structure to make it a strong and light bird.



Start by tacking the stabilizer to the board in some spot with hot glue (it is very useful when you need extra hands).



Sand the taper from the root to the tip

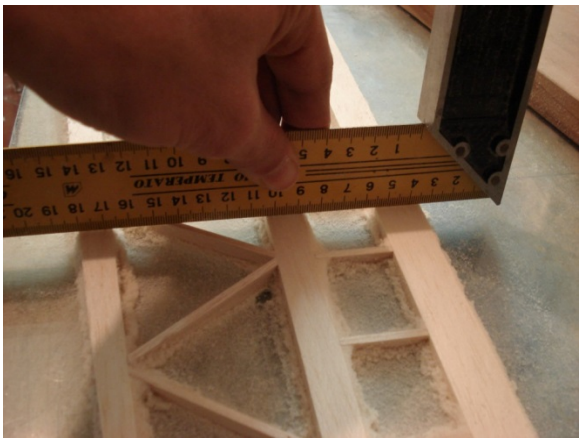


Building Tips

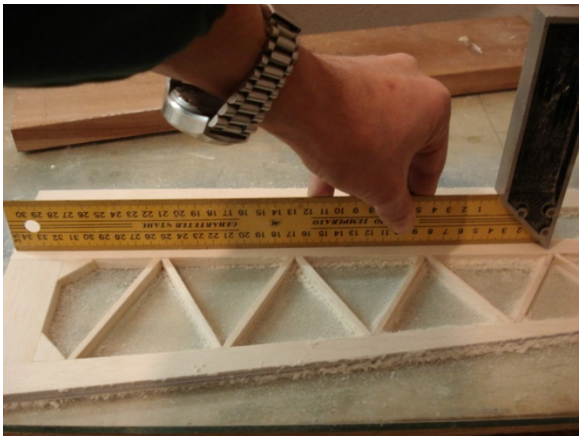
We all have had our building projects that require airfoil shaped tail surfaces. These simple techniques will help you get the results you need to have for best performance.

Mark the flying surface with pencil or ink to draw airfoil reference lines you want to obtain.

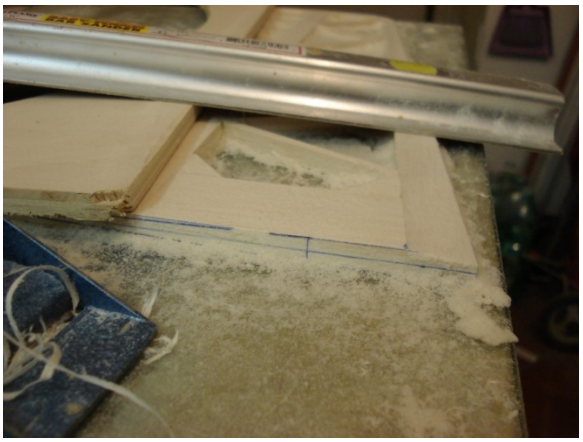
Checking with a square ruler chord wise



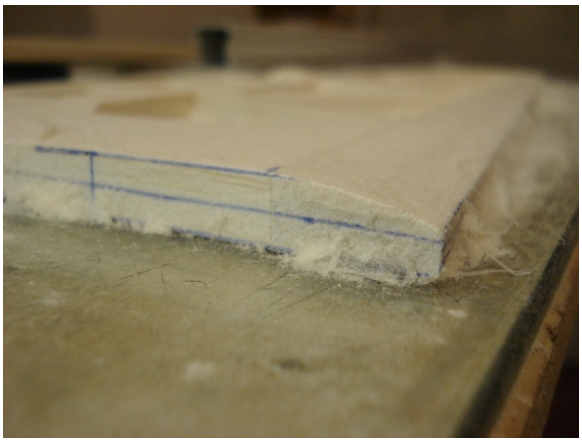
Check span wise for the taper to the tip



From the side examine the surface as you sand to shape



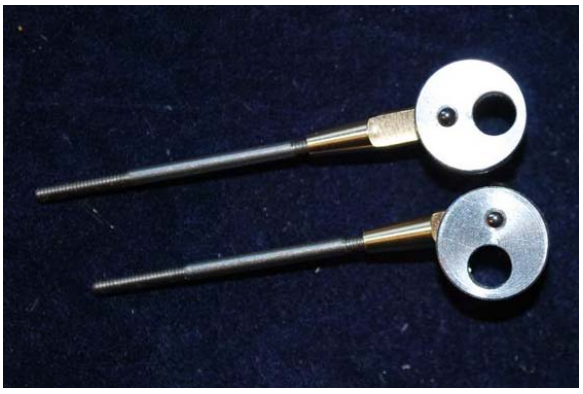
Sand freehand to get the right profile for the airfoil you want



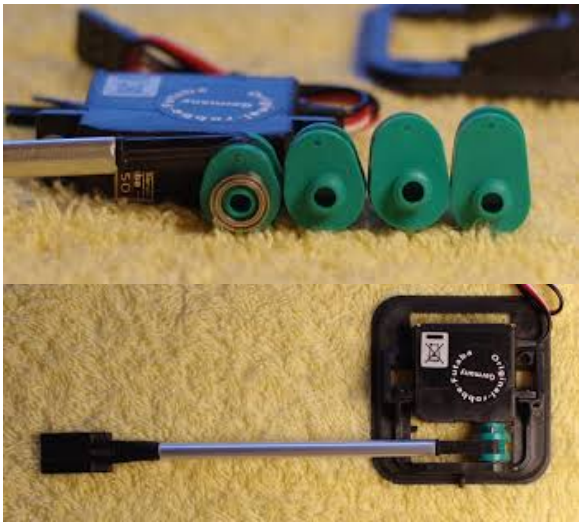
The final result. If you put a minimum of attention during the sanding process the two halves are identical.

Have you ever heard of LDS or IDS?

Linear Drive Systems (LDS) or Integrated Drive Systems (IDS) are starting to gain popularity with sailplanes. With proper attention to geometry assuming the servo has enough angular rotation to meet the needs of your surface. These would be a natural replacement for the servo arms installed for ailerons in skinny wings.

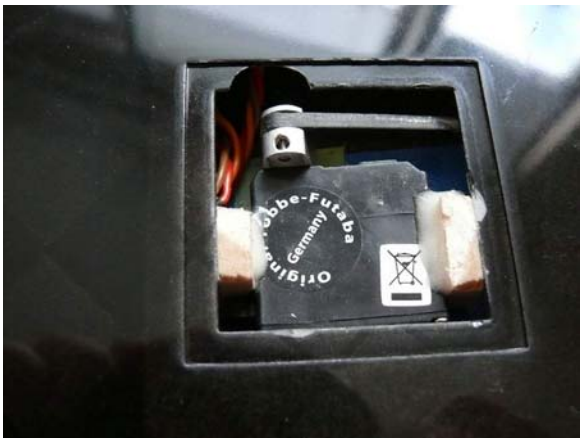


There are several versions. Soaring USA would be the first place to start if you feel this might be a good solution for your next project. This set of pictures to gives you the general idea of the parts used for this clean linkage. A steel pin secures the control rod to the pivot arm which is mounted to the servo spline.



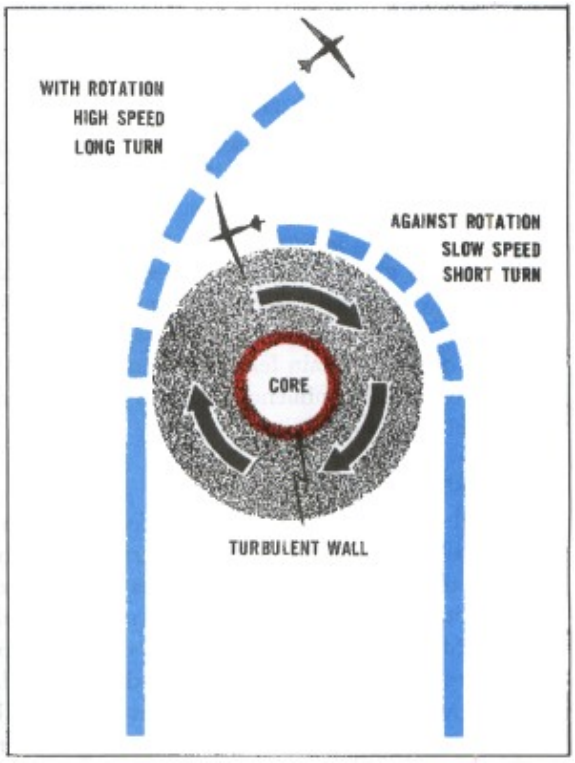
More LDS / IDS Pictures

Assembled servo with LDS / IDS is clean. It also provides a very low profile installation for thin wings.

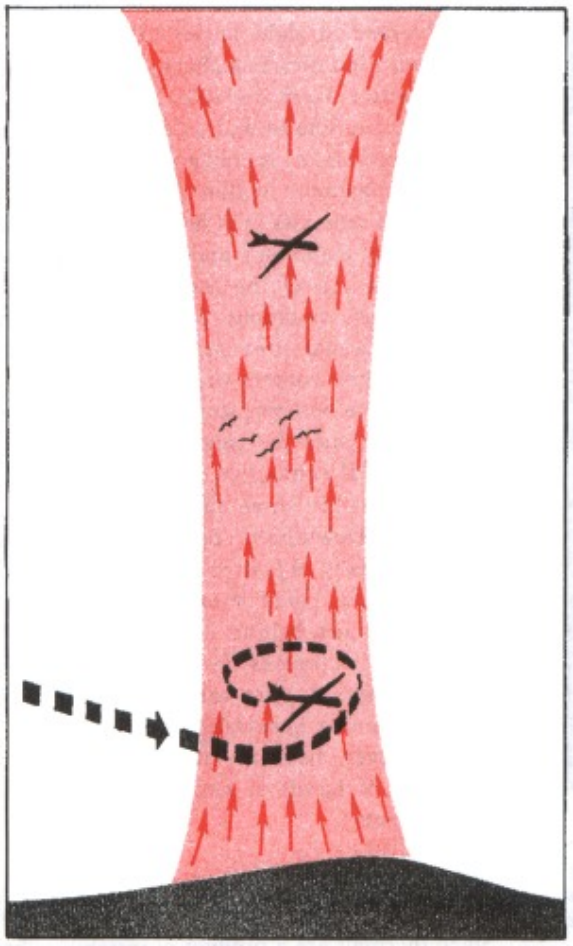


Thermal Reminders

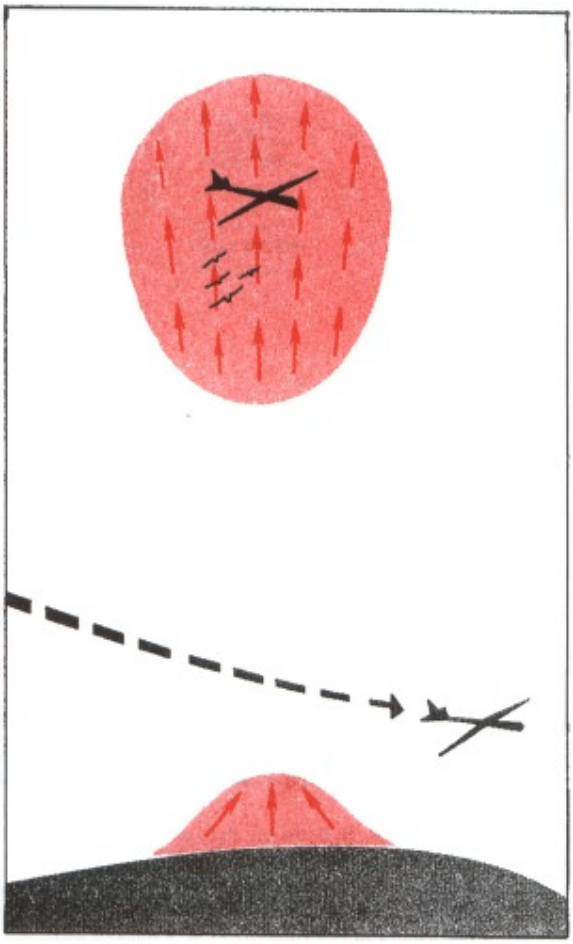
Ever wonder why should you enter against the direction of rotation? The picture below shows a horizontal cross section of a clockwise rotating dust devil and ways of entering it. If you enter with the direction of rotation as on the left, the wind speed is added to your airspeed giving you a fast circling speed probably too great to remain in the thermal. Against the rotation as on the right, wind speed is subtracted from airspeed giving you a slow circling speed. If this is a fast moving thermal in the summer your sailplane could feel uncontrollable. In the winter time you might find the wing is traveling faster in a slow weak thermal which allows you to climb out and have more control.



Thermals are as varied as trees in a forest. No two are exactly alike. When surface heating is intense and continuous; a thermal once it starts to develop continues for a prolonged period in a steady column. Sometimes called the “chimney thermal. ” This type seems to be most prevalent. In the chimney thermal lift is available at any altitude. Below a climbing sailplane or soaring birds are seen within it.

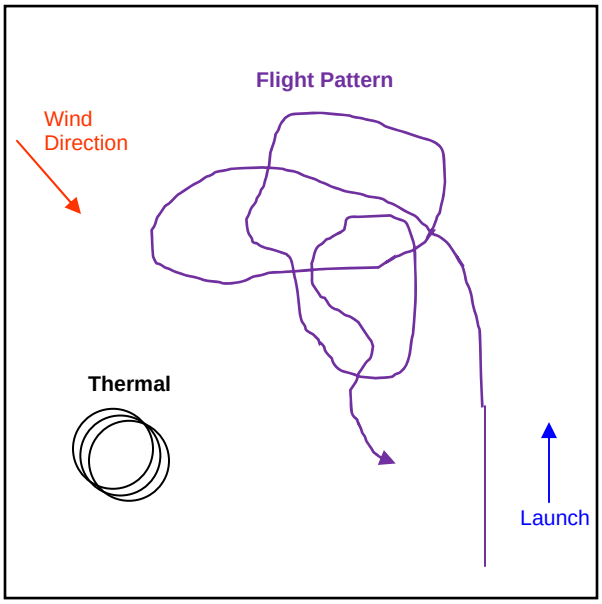


When heating is slow or intermittent, a "bubble" may be pinched off and forced upward. A sailplane or birds may be climbing in a bubble, but an aircraft attempting to enter the thermal at a lower altitude may find no lift. A soaring pilot will be disappointed when he seeks lift beneath birds or sailplanes soaring in this type thermal. This is a hard to accept when your glider sinks as your competition looks down below on your sailplane.



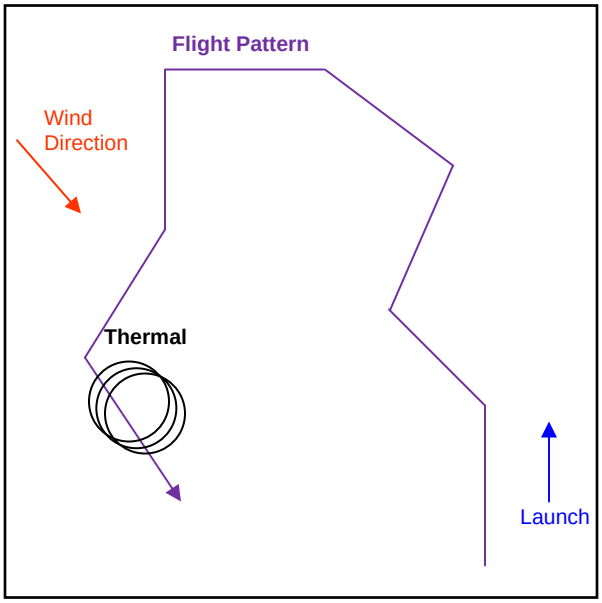
Another area that we can all benefit from is the way our flight path is used to cover lots of ground to locate a thermal or greatly enhance our chances of finding one.

In this example the pilot launches up wind and covers the same area multiple times. His flight path overlaps too many times. It is as if the pilot is wishing for a better outcome each time they cover the same area. If you don't see it the first time chances are it will not be there the second time!

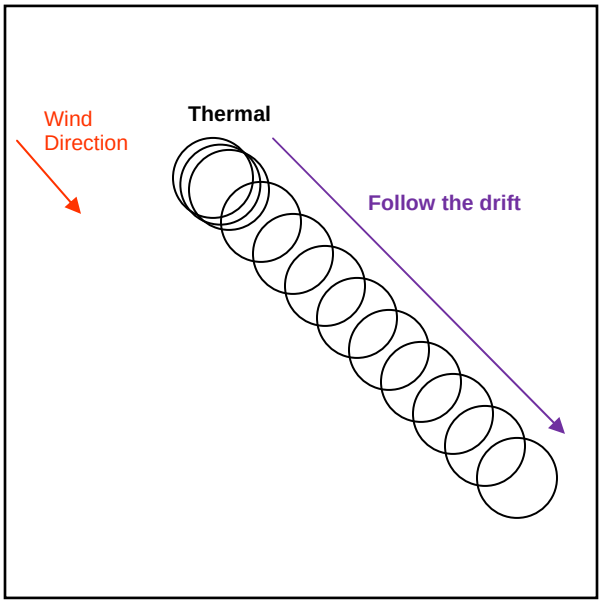


A better way to increase your chances is to fly a wide pattern that allows you to cover more area. Chances are better you will see some type of air current interaction with your sailplane which will lead you to fly in a direction finding the thermal. You can set up the flight path in your mind while you watch others fly in areas prior to launching. If they fly in an area that has yet to show a thermal try not to cover that section. It is a waste

valuable time which will not help increase your chances of finding thermal.



One of the most important things to do once you find a thermal is to follow it down wind. Many times a pilot circles in the same area he found the thermal in only to miss their target time as the thermal blows down wind. Thermals move in the same direction and at the same speed as the wind. Once you locate one do not expect it to stand still.



December is near. Keep your eyes open for the year end banquet announcement.

No date is set – it was discussed at the last club meeting. Stay tuned!

Missing a tip?

Anyone know who the pilot was for this Sailplane at the 2006 Fall Soar Festival one year?

(Answer on page 10)

That is it for this month.

Thermals to all ~ Keith

2014 Schedule

Sunday,
Nov 09, 2014 **SWSA CLUB** Unknown

TBD
December 2014 **SWSA Year End Party**

If you have any events let me know

Answer from the prior page

Me! I was in a thermal at about 1,500 feet when a guy came out of nowhere and took the right tip panel off. I fought the spiraling descent to save the Pike Giant for another day.

Special feature

For those of you who like to look at what has taken place in the sport over the years check out the **MaxiSailer** that Ken Willard designed as his top notch thermal sailplane back in the day. Airfoils have come and gone yet the Eppler 387 was the prized section in the 70's and 80's. Enjoy!

by Ken Willard

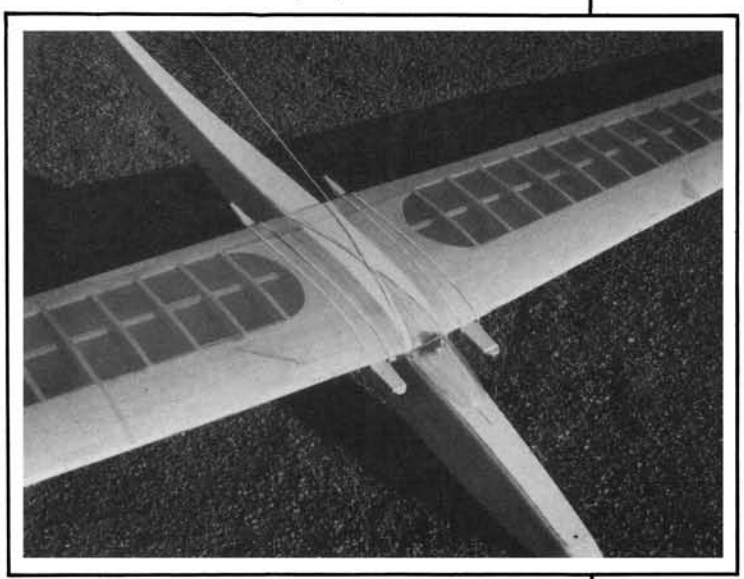
The MaxiSailer is a competition thermal soaring sailplane. It is easy to fly – but hard to fly well. With the lifting stab, and the C.G. further back than most sailplanes, it will pick up any light lifting thermal. But if you're not ready for it, the MaxiSailer will fall off from the delicate setting and drop ten feet before you can recover. If you are ready for it, it will go up in a small thermal that other sailplanes can hardly feel. And, because of the light weight, the turning radius allows you to keep it inside the thermal. The Eppler 387 airfoil is normally considered to be a compromise section, good for slope soaring and thermal flying. It has proven itself in both elements; the wing of the MaxiSailer is the same wing that I used on the "Led Nalivag" in the R/C Modeler Trophy races last spring.

The design philosophy of the MaxiSailer is simple. I wanted a very light sailplane, with a long tail moment, and a wing section that would thermal well, but also would penetrate the wind if necessary. And, from a practical viewpoint, I wanted to build it from four foot wood stock which is available from most dealers.

A look at the plans will immediately show you that there is nothing unusual in the construction of the fuselage and the tail surfaces. It's a standard "slab-sider" design, and goes together very quickly. The stab is glued right to the top of the top longerons. Incidentally, you'll note that the center sheeting is not inset; just added right on to the top and bottom of the center ribs. This isn't quite as streamlined as it would be if inset, but it's stronger. And covering it with MonoKote makes it easy to get a smooth transition from the stab surface when you shrink the MonoKote in place.

The fin is cut so that it extends down to the bottom sheeting of the stab. A slot for the spar aligns it fore and aft, and a slot in the top of the center section sheet covering lets the fin slide down into the stab between the two center ribs, which are spaced 3/32" apart to make a socket into which the bottom of the fin will fit.

Now those are about the only details on the fuselage and tail surfaces that might need explaining. Most of you who plan to build this job will probably have your own favorite modification anyway.

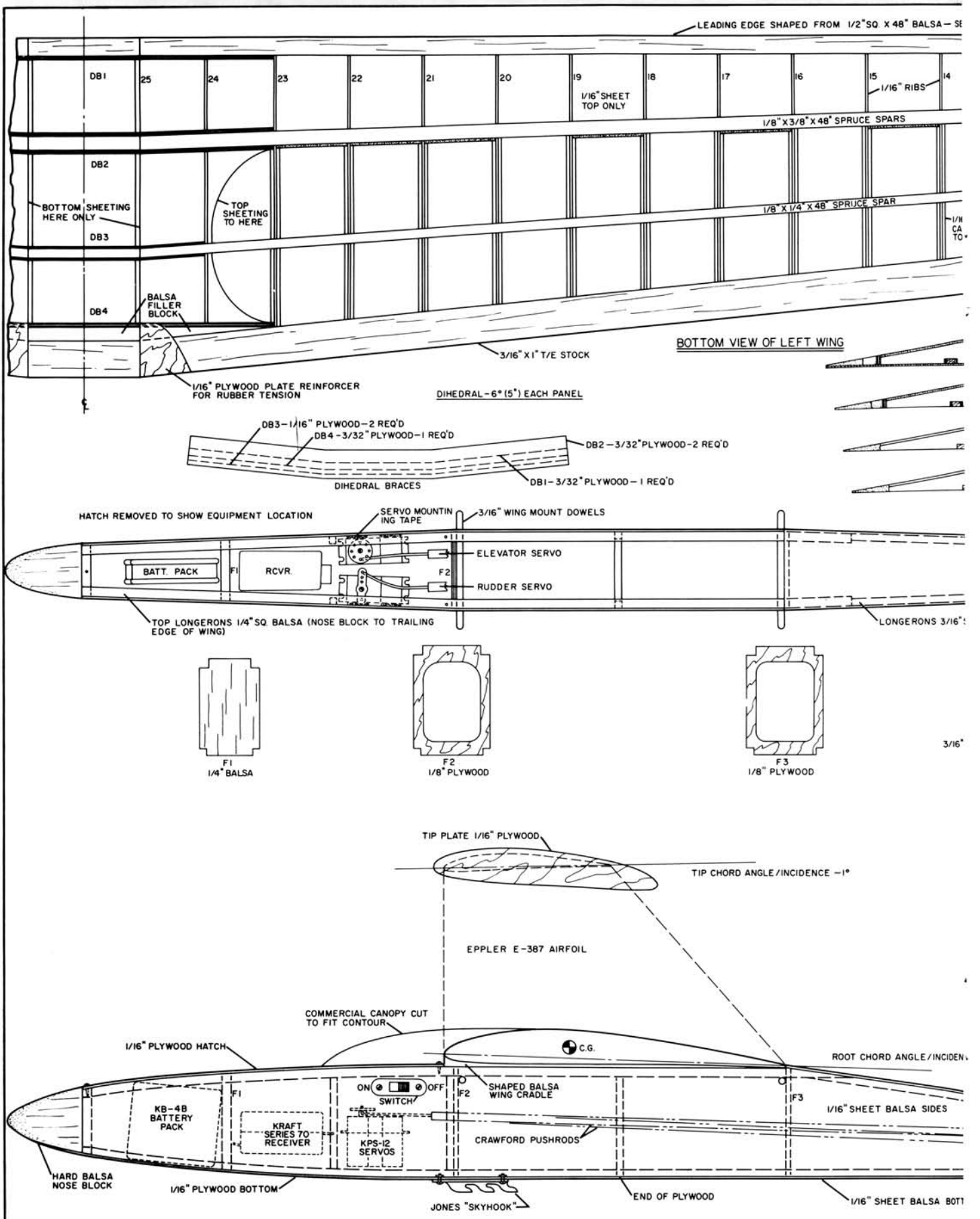


THE maxisailer

But boy, oh boy! That wing! It nearly drove me nuts! Not that it's really hard to build, but it sure is tedious! All those ribs, each different from the other. Plus the cap strips (top only; they're not needed on the bottom) and the shear webs. And then that center section, with the straight leading edge requiring that the dihedral braces at the main spar and the rear spar have a fore and aft bend in them, and the trailing edge needing a balsa filler block because the dihedral brace wouldn't make the bend.

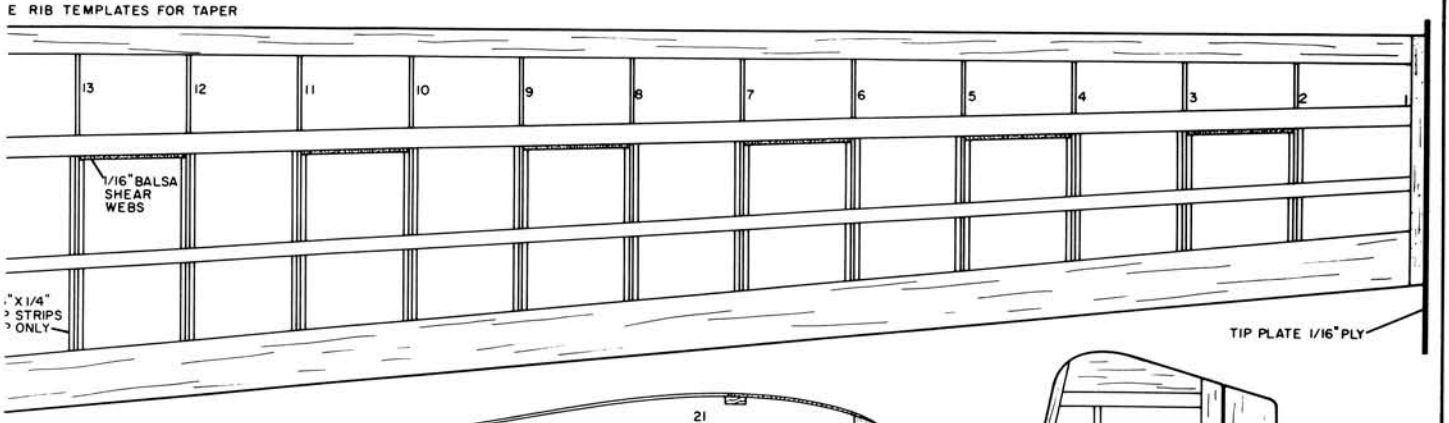
Note that the spars are made from four foot sections, and the center section is a separate short piece. To tell you the truth, although the design calls for a straight leading edge, I didn't quite make it. As I tried to force the bend into the main spar dihedral braces, then the leading edge would bend back just a bit. I finally gave up and compromised with a slight sweep, but you can hardly see it – and I was not about to break it apart and reglue it! Probably a lot of you will make the wing in two sections anyway, using Crawford arrow shafts and steel dihedral braces, because you won't be able to get the one piece wing in your car. As a matter of fact, my wife calls the MaxiSailer my $4000.00 design. After I built it, I bought a station wagon to carry it around! Well, not really, but it sure is nice to be able to stick it in the back, all in one piece, and not have to go through setting up exercises when I get to the field.

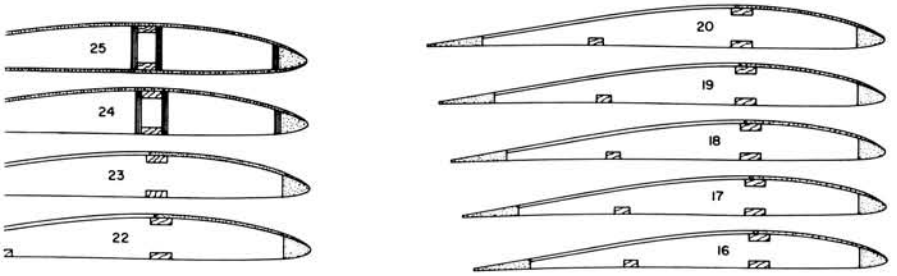
(continued on page 64)

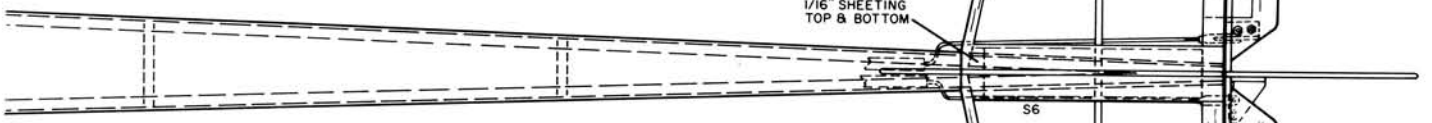


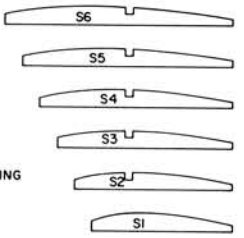
FULL SIZE PLANS AVAILABLE ON PAGE 88

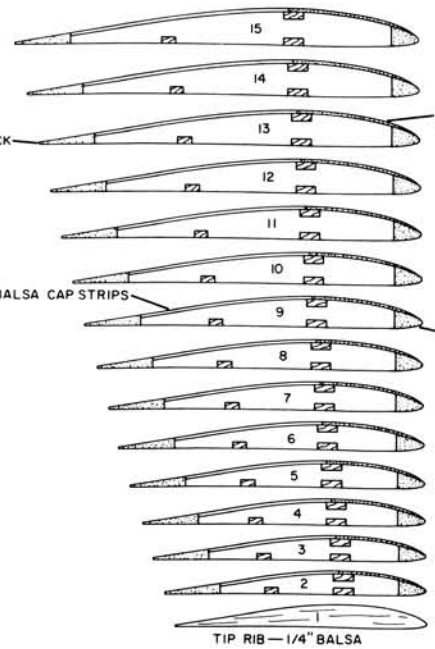
E RIB TEMPLATES FOR TAPER

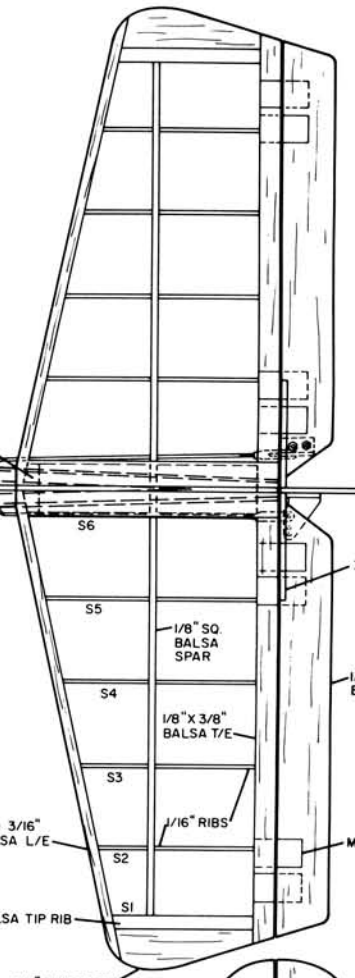












Q (T/E OF WING TO TAIL BLOCK)

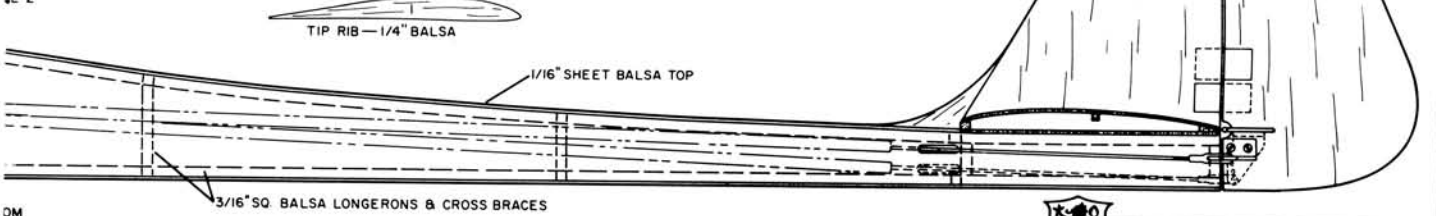
1" T/E STOCK

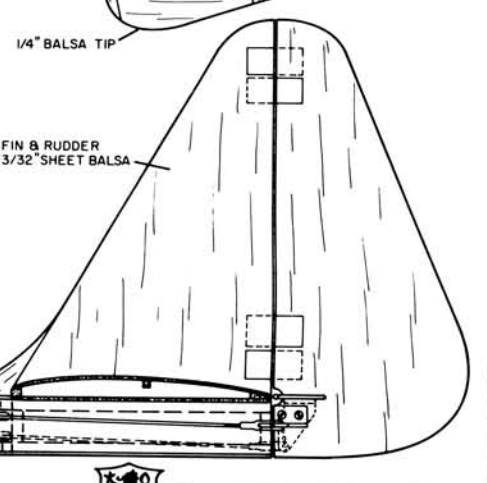
1/16" BALSA L/E SHEETING TOP ONLY

1/16" X 1/4" BALSA CAP STRIPS

SHAPE L/E FROM 1/2" SQ BALSA

E 2°





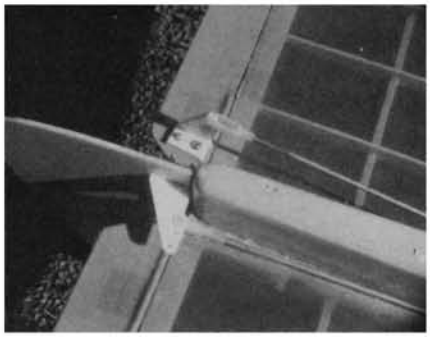
OM

Maxi Sailer

DESIGNED BY	KEN WILLARD	DRAWN BY	DICK KIDD

0 1 2 3 4 5 6

(continued from page 17)



Note the incidence settings. The washout of three degrees (from 2° at the center to −1° at the tip) is absolutely essential. Without it, the model has a vicious tip stall due to the relatively high taper. And, as you can see, the stab, sitting flat on the top of the fuselage, has about 1° positive incidence, so this gives almost no difference in the incidence of the stab and that of the mean chord of the wing. And that's why the model is touchy. If you don't like it quite so sensitive, you can add an ounce or two of weight in the nose to bring the C.G. forward, then increase the incidence of the wing to compensate for it. The amount of incidence added will have to be determined by glide tests. It will make the model easier to fly, but will degrade the performance very slightly, slowing it down and increasing the sink rate.

The tip plates help to eliminate the tip stall, and make it possible to have less washout than would be the case if they were not installed. It's not much, but I did check it by flying the model with only one tip plate installed, and it was evident that the tip without the plate would stall more sharply, and quicker. So I suggest you use them.

Incidentally, in order to get the washout that the wing requires, don't worry too much about building it into the structure. Wings this long are very flexible, and the covering provides the necessary strength under normal stresses to keep them from flexing or even fluttering at high speed. So just build the wing straight, cover it, and then shrink the covering carefully so that the washout stays in the wing when the covering is tight. My wing is covered with transparent MonoKote and some fellows ask how I keep it attached to the undercambered bottom surface. Simple. With the wing upside down, lay the MonoKote on the wing, and seal it carefully to each spar, then to the leading edge and trailing edge, then individually to each rib. When you are finished, you have individual "squares" of MonoKote bordered by the ribs and the spars. Shrink each square up separately, while holding the wing with the slight twist required to produce the washout. Repeat with the top side. That's all there is to it. But it does require care, and be sure to get the same amount of washout in each tip. You can "eyeball" it closely enough by holding the wing at arm's length in front of you and sighting along the trailing edge, which is closest to you, out from the center section to the tips. Actually, the washout need only begin at about half the span and continue from there to the tip.

The location of the Jones "Skyhook" is shown in a relatively conservative forward position. Even so, the model goes up on tow quite steeply when you apply up elevator, and there is no tendency to oscillate.

The canopy is held on simply with a rubber band stretched across the leading edge wing dowels. It's principally for appearance. I've flown the MaxiSailer without the canopy, and can't notice any difference. But it looks better with it.

Installation of the equipment is very simple. The servos are mounted directly to the side of the fuselage, using servo tape. The receiver lies in the compartment just forward of the servos, wrapped in foam, and the battery pack just fits in the forward compartment as shown, and is held back against the bulkhead with foam stuffing. There's room ahead of the battery for weights, and I found that I have to carry one ounce to get the C.G. position shown. You may need more, or less, depending on the weight of the balsa you use in the fuselage and the tail surfaces. I used a medium grade throughout.

The MaxiSailer is not a particularly rugged design. It wasn't intended to be. But it is light, and will withstand most normal useage because it doesn't build up a lot of momentum. The wing is very strong for its weight, due to the spruce spars. It has flown in 35 mph winds on the "Led Nalivag" carrying a total of five and a half pounds. So when it's mounted on the MaxiSailer, which weighs in slightly below two pounds, you can see that it's not stressed very much. In fact, if you are in an area where the thermals are strong, but so is the wind, you can add weight, as I do, by strapping a couple of steel files to the center section of the wing, just alongside the fuselage. Wrap them in masking tape so they won't scratch.

Flying the MaxiSailer is a real challenge. You can't let it free flight very much, because if the nose gets down and the speed picks up, the stab takes over and you're in a dive before you know it. And if it hits an updraft, and you don't nose down slightly, it'll stall.

But once you get used to it, it'll give a lot of pleasure to you, and if you happen to like competitions, it'll get you some hardware too. And it's great for spot landings and all the other requirements for the various level of the League of Silent Flight.

So if you want a maximum performance thermal soaring sailplane, and are willing to put up with the rather tedious job of building a high performance wing, then try a MaxiSailer.

You'll be glad you did. □