

The Schriebe SF33 Motor Glider

Build Document #1

Project Phase: Wings: Leading & Trailing Edges

Introduction

The Schriebe SF33 is a short-kit and for whatever reasons, short-kits rarely come with instruction manuals. Short-kits are bare-bones kits with the expectation that people who undertake such projects have enough experience and knowledge to allow them to work completely on their own. In lieu of this, short-kit manufacturers often have build-threads for their designs in which individual builders provide a bit of the information that will detail a semblance of the steps required to complete a project. **Laser Cut Sailplanes...**

<http://lasercutsailplanes.co.uk/>

...in the UK, the manufacturer of the Schriebe SF33, will provide such a thread, which can be found on the forums upon request. And if you require their direct assistance, they will be more than happy to answer your questions.

This paper begins the documentation of my own project, which I am hoping some of the LISF members may be interested enough in following as my sailplane slowly comes to life. To this end, as a senior software engineer (though I am retired, I am still not sure if I am a *former* engineer, since I have not suddenly lost my skills and expertise...), I tend to write very detailed descriptions of my work, which in this case will be to your advantage if you decide to attempt this project.

This paper starts from scratch since building a short-kit is a semi-scratch build process. Such kits are just one step above building everything on your own from a set of provided plans, which many people do with the number of outlets that provide such documentation (ie: AMA Plans Service).

If you have any questions about this paper, please don't hesitate to contact me at my email... blackfalconsoftware@outlook.com

Creating a Build Board

If you are one of the adventurous and have never built any type of kit before or have not built one in a long time, the creation of a build-board can be a daunting prospect if you have never put one together or if you have disposed of an earlier one. One of the most common recommendations in the hobby is

to simply get a used, completely flat door that has been disposed of. As long as you get one that is solid, you should have no issues. However, if you pick one up that is paneled with an empty interior, just note that they can eventually warp.

I have built all of my kits on cork. It is easy to stick pins into it and maintains their integrity. However, for a kit of the size we are contemplating (the Schriebe SF33 is a 2.4m aircraft), a single cork-board will be inadequate; so what to do?

One, go to your local lumber house and request a good piece of hard pine (or similar type wood) that can be cut to a minimum of 6 feet or more (the longer the better) with a width of approximately 24 inches. My own build-board is 6 feet by 17 inches and it has worked out fine.

Two, purchase a good number of cork panels that can be taped to your build-board. These panels can be easily purchased from Amazon...



Link... https://www.amazon.com/gp/product/B007SV7LR4/ref=ppx_yo_dt_b_search_asin_image?ie=UTF8&psc=1

Three, once you have your cork panels, you will need a good box-cutter to trim them to smaller pieces where needed. This tool can be picked up at your local hardware store.

Four, obtain some good, double-sided Scotch Tape, which will be used to attach the cork panels to your wooden build-board. Trust me, this works quiet well. Do NOT use common, thicker double-sided adhesives or your final result will most probably have panels that can be pushed down onto the board unevenly.

Five, take the full sized cork panels and apply the double-sided Scotch Tape to the side that will be face down against the board. Gently arrange them so that they are neatly aligned with each other. Press down on them firmly so that that the tape adheres to the wood. Where the cork panels overlap your board because they are too big, simply trim them down to size and then gently align them against the existing, attached panels on your board with the tape on their backs.

You should now have a rather solid surface to begin laying out your plans.

Tools

If you have been primarily working with foam-based sailplanes, your tool-chest may be little thin for a complete build project. And with so many hobby shops in decline or closed, local options may be limited.

Not to worry... Here are two places you can get practically all of the tools you will require.

Micro Mark

<https://www.micromark.com/>

Scale Hobbyist

<https://www.scalehobbyist.com/index.php>

Micro Mark should have everything one may require. However, Scale Hobbyist, though primarily, for plastic model builders, has quite a selection of hobby tools as well. And what you may not find at Micro Mark, you may find at Scale Hobbyist.

What will be needed are the following, minimum tools to begin with...

T-Pins



These are the best type of pins to use for pinning down your wood. The smaller, more common pins may be more available but once you have the experience that such a pin may go through your finger, you will be quite happy to pay the price for a bunch of T-Pins.

Caliper (used for checking sizes)



No.1 Xacto Knife for #11 Blades (with extra blades)

#1 Knife w/Safety Cap and 5 #11 Blades



This is the best all-around hobby knife I have used with my kit building projects. You can get this knife at Scale Hobbyist as Micro Mark has a limited selection.

Ruler with both **Imperial** and **Metric** measurements

C-Clamps

Sanding Blocks with Sandpaper (sold at **Micro Mark**)



Adhesive/Glue

*I always use 30-minute Epoxy as it allows for correction of placement Mistakes. **Zap** appears to be the most common type of hobby Epoxy these days. **MotionRC** is a good place to get your supply from...*

<https://www.motionrc.com/products/zap-z-poxy-30-minute-epoxy-8-oz-pt-39>

*If this is your first build project **DO NOT** use a cyanoacrylate. It may work fast but one mistake could set your project back.*

Hobby Saw



Measurements & Kit Plans

Kits coming from the UK and Europe tend to often be calibrated with the Metric system. As a result, the measurements on the plans will have to be converted into Imperial measurements. Unless a preference is for doing this

by hand, there are quite a few conversion tools that can be found on the Internet. See... <https://www.metric-conversions.org/>

Doing this conversion work will take a bit of time and research on your part until you feel satisfied that you have gotten the Imperial measurements to the point that you feel comfortable ordering your additional wood.

However, if you follow my papers, this will all be done for you as you will see below. Nonetheless, you should check the provided measurements for your own purposes.

The basic standard that you can use for all your measurements is the following...

$$1.5\text{mm} = 1/16 \text{ inch}$$

Not all of the kit's converted measurements will come out to perfect sizes that can be easily obtained in the United States. As a result, you will have to make your best judgement as to what such sizes you are comfortable working with.

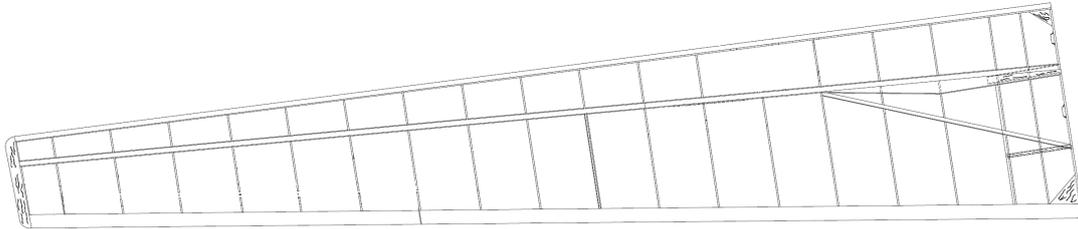
You should note that the plans only reflect the approximate size of what every component should be. When laying my own wood against the plans, I found that even if my wood was purchased in an exact equivalent of the Metric measurement, when laid against the plans, the alignment within the outlined areas was not perfect. Do not worry about this. A good rule of thumb then is to not lay any wood beyond the outer-most lines of any given area. For example, ensure that your leading edge's frontal edge is laid as closely on the forward, leading edge line on the plans as possible. Conversely, ensure that the rear-most edge of the trailing edge is laid against the rear-most line of a wing's trailing edge on the plans as possible. The same will hold true for all other components.

The laser cut components that come in the kit's package will not be perfectly cut to the exact size. As a result, both the plans and the components are again, only approximate sizes. When I queried the designer of the kit, Cliff Charlesworth, regarding this anomaly, he said simply sand the components to the proper size.

If one were to read what is going on with Model Aviation in the UK such as is reported in their excellent publication here in the US, *R/C Model Aeroplane*, you would get an idea as to how detailed a lot of the work is making kit building both a science and an art. The same could be said of the excellent US Balsa-USA kits for their large line of WWI combat aircraft.

Starting Your Project; Wings; The Leading & Trailing Edges

For whatever reason, I have always started every kit I have built with the wings. In this case, I began the build of my Schriebe SF33 with the left wing.



Partial Left Wing image from plans

Reprinted with permission from Cliff Charlesworth, Designer/Laser Cut Sailplanes

The Schriebe SF33 has a slight swept-forward effect with its wings as you can see from the image just above.

Since the plans come folded instead of rolled as with most US plans, placing the lower half of the plan with the left wing over your build board, should not be much of a hassle.

Neatly square off the folded areas of your plans with a plastic ruler or pen so that they are razor sharp in order so that the plans can lay neatly and as flatly as possible on your build-board with the left wing part of the plan being the first area exposed for you to begin work on.

Cover this entire area of the plan with wax paper so that if glue gets on the plans, they will be protected.

At this point you will need to order your wood for the leading edges, the leading edge backings, the trailing edges, the main spars, the mini spars, and the main spar backings and forward strengtheners.

I also ordered additional wood as strengtheners for the rear part of the wing ribs as well as triangular wood for strengtheners for the forward areas of the wing ribs. This is not called for in the plans but I like to add additional strength to areas where I believe it could be of benefit. Please note, that the build thread provides for rear wing rib strengtheners but not the forward areas. This is a personal decision.

Ordered Wood Measurements

You should be able to obtain all of your additional wood from either of the following US outlets...

National Balsa <http://nationalbalsa.com/>
Balsa USA <https://shop.balsausa.com/default.asp>

Both outlets have a huge variety of wood sizes, so anything you require should be easily obtainable for them. Please note that National Balsa has much faster shipping than Balsa USA since it is a larger concern.

Here are the measurements of the wood and wood types needed to begin this part of your project. Remember that you should order enough wood pieces for 2 wings, plus a little extra.

Leading Edges (Balsa):

1/4 inch x 1/2 inch x 48 inches

Leading Edge Backing (Balsa):

1/16 inch x 1/2 inch x 48 inches

Trailing Edges (Balsa):

1/4 inch x 3/4 inch x 48 inches

Please note that the plans do not make it clear as to the complete sizing of the Leading Edge (6mm), the Leading Edge Backing (1.5mm), and the Trailing Edge (15mm x 5mm). This has to be determined by doing the measurements on your own from the various views that the plans provide. As you can see from the sizing information provided immediately above, this has already been done for you.

Laying Out The Leading & Trailing Edges

As previously mentioned, the rule of thumb to be used when laying out your components on the kit's plans is simply not to place any component outside the outer-most lines of any encompassing component (ie: wings' leading edges). You may have to make some minor adjustments when implementing such components as wing ribs but the outer-most edges should not have their placements exceed the outermost lines of where they should be placed. Following this recommendation should ensure that your wing-root areas should fit well to the aircraft's under area where the wing is supposed to be fitted.

The overall issue here is the fact that the plans use the Metric system of measurement and even exact equivalents with your purchased wood with Imperial measurements may be slightly off.

So lets get started... See the following page...

1.

Place your Leading Edge over your plans in the proper area as shown on the plan in an upright position as shown below. Please also note that the span of 48 inches for your Leading Edge wood should fit nicely within the plan's outlines for this component.



Please note that in the image above, the Leading Edge appears thicker than the piece you should have ordered. This is because the Leading Edge Backing has already been applied, which we will get to in the next step.

For now, set your Leading Edge onto your plan by gently pressing a number of T-Pins through it so that the wood is firmly held to the underlying cork. Do this gently so as to not damage your wood.

Ensure that your Leading Edge component is correctly upright by using a square-leveler or a small triangle.

2.

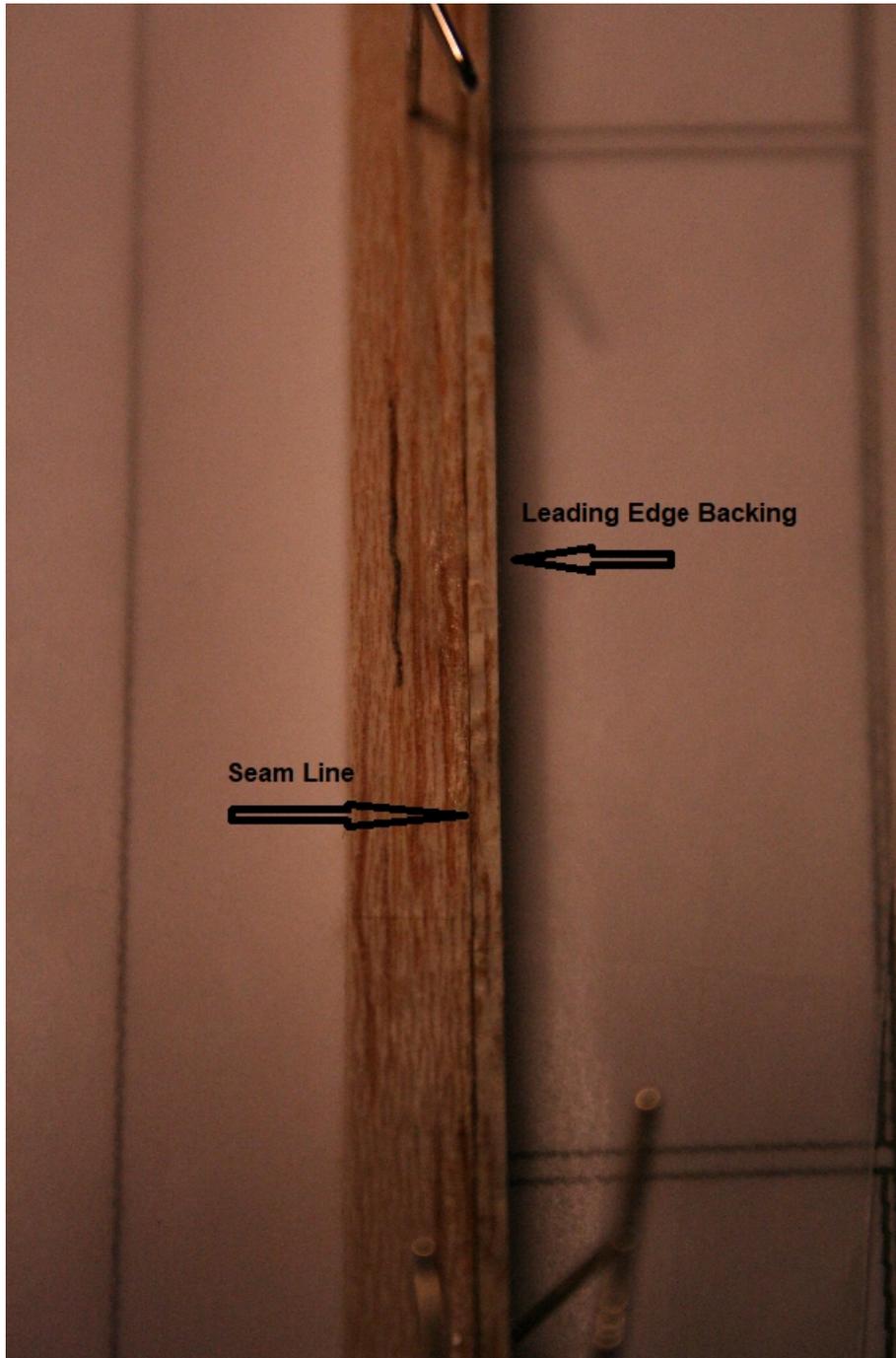
Once you are satisfied that your Leading Edge component has been properly placed on the plans you can now prepare the Backing. To do this efficiently, obtain several Epoxy brushes that can be used to paint on a smooth application of your Epoxy adhesive.

Mix enough Epoxy so that you will have enough to apply it to the length of your Leading Edge's back. Apply it smoothly to the entire length of the back of your Leading Edge. If you are using the recommended 30 Minute Epoxy, you will have more than enough time to apply the Epoxy and securing the Leading Edge Backing.

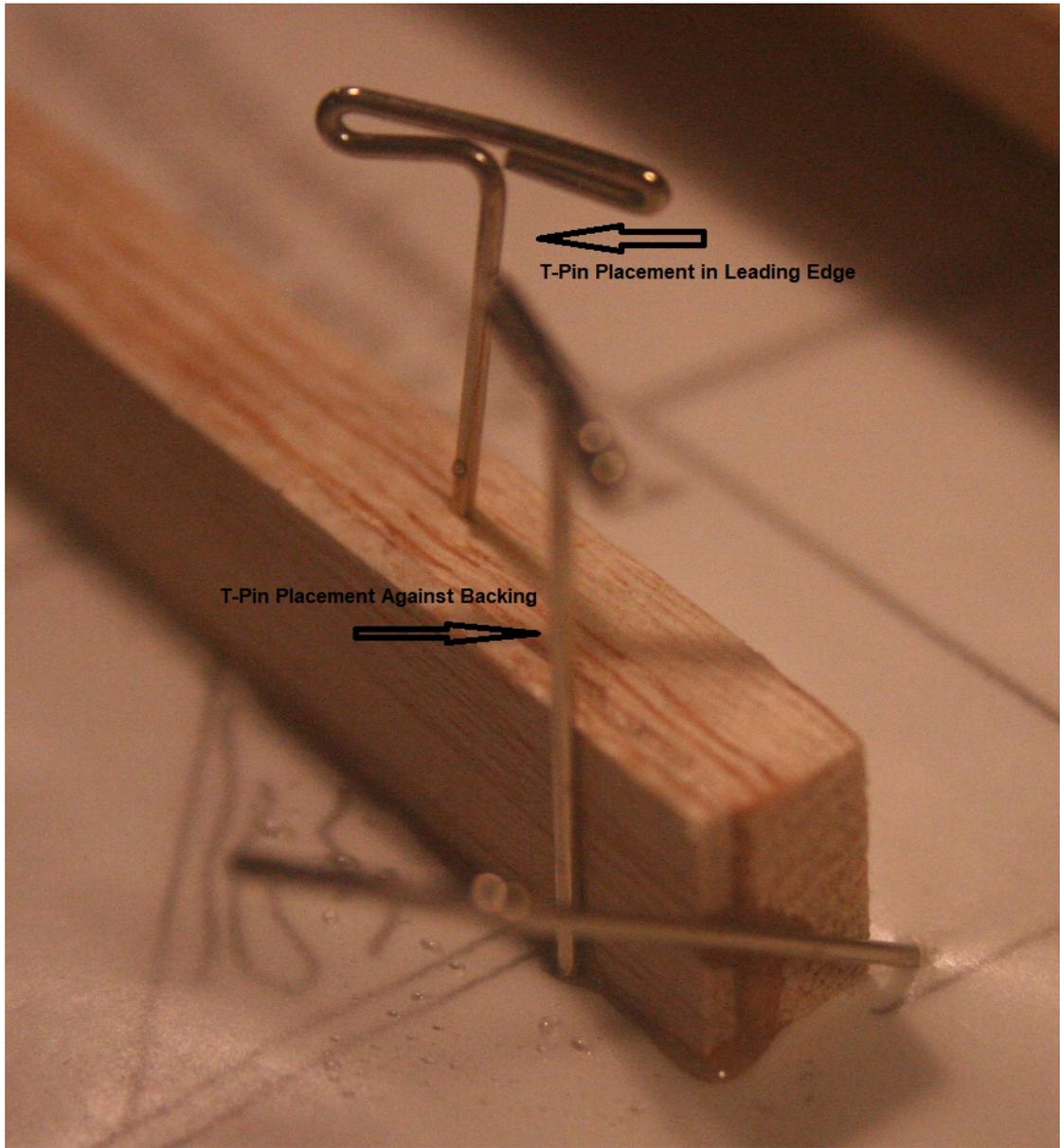
Once the back of your Leading Edge has had the Epoxy applied to it, gently but firmly apply the Leading Edge Backing to the back of your Leading Edge Component. Use your fingers to press the Backing component to the back of your Leading Edge, ensuring that the two pieces have the adhesive applied between them.

Set enough T-Pins up against the Leading Edge Backing to keep it firmly in place against the back of the Leading Edge. In addition, use some light c-clamps to hold the two pieces together tightly.

See following page for image...



Notice the seam line between the Leading Edge and its Backing component.



T-Pin Placement in Leading Edge

T-Pin Placement Against Backing



3.

Now place your Trailing Edge component on to your plans and pin it in place.



Remember that the rear-most edge of your Trailing Edge should not be placed outside the bounds of plan's rear-most outline for this component.

Final Note...

Depending on where you purchase your wood from, you may find that the Leading Edge Backing is slightly higher than that of the Leading Edge itself.

To rectify this, simply gently sand down the Backing until its top is flush with the Leading Edge itself.

Though you may be using 30 Minute Epoxy, a good rule of thumb for all Epoxies is to allow them to cure for 24 hours.

Next Document... Wings; Main Bottom Spar