

Building a Morane Saulnier Type "N" - Steve Sweeney



At the very beginning of the First World War, the use of aircraft was limited to strictly reconnaissance with opposing pilots waving at one another as they gathered information of enemy troop movements, supply shipments, and artillery spotting. The planes of this era were barely capable of flight themselves much less carrying armament. Before the war, most countries in Europe did have an air service, but very few top military officials thought aircraft to be of much practical value in time of war. This narrow-minded thinking was to change by the war's end, as the First World War was to ultimately change many facets of warfare forever including aviation.

Pilots soon realized that it would be beneficial to the war effort to try and prevent the other side from spying on your troops and those cheerful "hellos" soon turned to nasty hand gestures. Very limited to what they could do at this time, dropping steel darts, throwing hand grenades, or even trying to drag a grappling hook over a hostile plane hoping to snag a wing, were early efforts. This soon morphed into the observer carrying a pistol or rifle to take a pot shot at any enemy they could get close enough to. This was the dawn of aerial warfare.

Looking to build a pre-war design for this year's "Cole and Rita Palen Memorial Free Flight Scale Meet" held at Old Rhinebeck Aerodrome on May 24th, I started to look around for a suitable plan for the theme event. To coincide with the start of the First World War, this year's theme event would be called "The Guns of August". Since at the start of the war, pretty much any plane that was flying was pressed into service, so any pre-war design from 1910 to 1914 would be eligible to fly in the event. At this point, those who know me have realized that I like to pick a plane of the Old Rhinebeck collection and build a model of it to bring each year's event. In the collection is a Morane Saulnier Type "N" which would fit my needs quite nicely for this year's theme event.

Originally designed as a pre-war racing plane, the Type "N" first flew just three days before the start of the war at an air meet in Vienna. It didn't see active service until the spring of 1915, primarily used by British and French squadrons. Regarded as one of the first true pursuit planes of the war, what makes the Type "N" unique is that it used crude triangular steel plates attached to the propeller blades that deflected machine gun bullets that might otherwise strike the blades. Mounting the machine gun to fire through the propeller's arc now enabled the pilots to aim the entire plane at the enemy aircraft giving much greater accuracy.

Deflecting bullets off your own prop wasn't a perfect answer to the problem, but it was much more precise than randomly pointing a rifle or shotgun at a fast moving target. It should be noted that it would still be another year until a leading gunsight would be perfected that would allow the pilot to actually aim in front of a moving target that would get the bullets and target converge at a determined distance. Also introduced about this time, was the interrupter gear perfected by Anthony Fokker that would stop the machine gun from firing as the propeller blade passed in front. Being so important to the success of the Type "N", could I possibly attach a deflector plate to the prop of my model, balance it, and get it to fly?

So I now knew what I wanted to build. I just had to find some suitable plans. Searches online for a set of plans were disappointing with a single plan of a Type "N" for a CO2 motor showing up. It looked to be usable but only as a starting point as it was built too heavy for rubber power. The wings looked like they would work after some lightening, but a whole new fuselage would have to be built as it had too much wood in it. Then I remembered a couple of years ago I answered a request from a Mr. Tony Ross from Indiana for information on the landing gear and lower pylon arrangement for a Morane Type "N" he was looking to draw up for free flight. Drawing from my 40 year photo collection of the Old Rhinebeck Aerodrome, I was able to help Tony with his needs. Upon contacting him and inquiring if he ever drew up a set of plans, he responded that he did draw a set for an 18 inch wingspan rubber powered version, and build a prototype but really never fully finished the plans going on to other interests.

Telling him about my idea and sending him the plan of the CO2 version Tony laughed and begged me not to use it, remarking that the airfoil and fuselage shape was horribly wrong. He then offered to scale up his unfinished plans to my desired 24 inch wingspan, and send me a printed copy so that I could use them as a basis for my build. We struck a deal that I could change things around to suit my needs, and send him details with photos so that he could finish his set of plans. I would build the prototype for a 24 inch version and Tony could incorporate some of my ideas and finish his 18 inch plans. A win-win situation for both of us! I was looking to build a copy of the "N" model that was in the Rhinebeck collection that was finished in Russian markings. The Rhinebeck example had differences from the standard French design, and Tony agreed to add these changes to his plan.

Upon receiving a .pdf file of Tony's unfinished plans it looked pretty good, but with me wanting a larger version changes would have to be made if only to suit my personal tastes. The tail was designed to be nice and light, so from experience I thought it better to improve some other areas. Not that Tony's design had any flaws, but scaling it up would impose more strain on key areas as the plan was designed for a smaller and lighter plane, not to mention I have a knack for crashing! But I'd rather not talk about that. Even though the model would be larger than originally designed, the wood dimensions would remain the same but add just a little more structure here and there, mainly around the landing gear and wing mounting.

I like to use laminated parts for wingtips and other curved sections that might be vulnerable to abuse, so forms were made and parts laminated out of 2 strips of 1/32 by 1/16 basswood. I also changed the method of mounting the wings by using tubes embedded in the wings that slip onto music wire mounted in the fuselage. This method has served me quite well in the past: very strong and makes the wings removable for repair. It wasn't my own idea, but borrowed from the late Henry Struck, a very talented free flight builder and designer. To anchor the flying and landing wires, I like to glue small styrene tubing into the wings at the proper locations for the elastic thread to pass through thus making removing the wings easier

and without damaging the covering. Some wash-in and wash-out was built into the wings to insure it would turn in the tight confines of the Aerodrome's runway.

Most FF designs are weak in the landing gear area, but I stole another trick from Master FF designer Mike (Iron Mike) Midkiff by using thin aluminum tubing mounted in the fuselage and stubs of music wire glued and bound to bamboo landing gear legs that slip into the fuselage tubing. It is very strong, looks neat and more scale, and is lighter than using full length landing gear wire. A nice change for me was not to have to make up a set of wire wheels for this build as simple wheel covers would be needed.

The wings were built in one piece and then separated afterwards before adding the mounting tubes and some added gussets. I cut both leading and trailing edges and spars all out of the same piece of hard 1/16 inch sheet, but used a much lighter sheet of 1/16 inch balsa for the ribs. Ambroid is my glue of choice, but if I think I need a little more strength in a particular joint, I have been known to put a very fine drop of thick CA just on the inside of a joint as not to impede sanding. When finished and sanded, the uncovered wings weighed a mere 3.5 grams. It is very flimsy, but once the covering was installed and shrunk, it would add as much strength as the wood structure itself.

The fuselage was constructed much like any other, except I had a hard time getting my head around making sure the tailpost was straight. All the early Morane Saulnier designs had a full flying tail which meant the tailpost was horizontal instead of vertical. It took a good number of tries to get all the stringers glued in without adding any twist to the light tail, but with some perseverance, swearing, and some acetone by my side to unglue my mistakes, I got it pretty close to perfect. The front of the fuselage was sheeted with balsa, and the cowl was made by soaking balsa sheet in ammonia and water and then wrapping it around a roll of electrical tape that just happened to be the right diameter. Well after I removed about 20 feet of tape, it was. The pylons for the flying and landing wires, as well as the tailskid assembly were made out of bamboo.

The engine was made from balsa with the cylinders being thread wrapped around balsa dowels. I lucked out as the Rhinebeck example has a 160Hp Gnome Monosoupe (one valve) engine installed instead of the correct 80Hp LeRhône, so I would have to make a single pushrod and not any of those curved intake tubes for each of the nine cylinders. The spinner was made up of 1/4 inch sheet balsa glued in a cross-grain pattern and sanded to the proper shape by chucking it in my drill press and taking a course sanding block to it. The inside was hollowed out not to save weight but provide room for balancing weight.

I was just about to cover the stabilizer when Tony sent me a replacement plan for the stabilizer. After some calculations, he came to the conclusion that it could benefit from a slightly larger stabilizer than he originally designed. At first I didn't think it was going to make a difference, but since he knows much more than I, another stabilizer was built. This did prove to be a wise decision later on when I was able to move the CG from his originally marked position letting me remove some weight from within the spinner assembly. This guy really knows his stuff!

I originally covered the fuselage with light blue domestic tissue hoping not to have to paint the finish on. I didn't like the look, so I stripped it and covered it with white Esaki Japanese tissue. With the help of my son, Michael (who isn't colorblind!), I mixed up my own colors using photos of the actual plane and airbrushed the color on. I really didn't want to paint this plane, but it had to look right for me to be happy. I like to paint on my own markings, so stencils were made up and the markings airbrushed on. I prefer Tamiya acrylic enamels for

their ease of application and color mixing. A light coat of Krylon Crystal Clear then brings all the paint together giving it both a more uniform and scale look.

I'm always amazed at how fast a plane assembles from a pile of finished parts. After three months of cutting, sanding and covering, it all comes together in a few hours. Preassembling all the parts before covering insures that there will be no surprises later on . . . maybe just a warp or two to steam out. The small details were added such as a machine gun, windscreen, and access panels.

Inherent to most of these early rotary powered planes is a short nose. Unfortunately this means lots of nose weight to balance the plane. But luckily this plane has a large spinner to get the weight as far forward as possible to use less of it. Nine grams of epoxy putty was molded around the prop's hub to get the balance just right. Nine grams is about 1/5 of the plane's total weight, and I sure wasn't happy about all that weight spinning around out front. I didn't really know what to expect. If anything it might be a very short, but spectacular maiden flight. The whole prop/spinner assembly was then balanced, and 2 loops of 3/16 inch braided rubber was installed.

First trim flights showed nice flat straight glides, so I started adding a little power to the rubber motor. She showed a nice tendency to turn left during the climb phase of the flight, but then fly straight as the power ran out as she glided back to earth. A little added left rudder insured that she would not stray from her left-handed turn and make a beeline to the trees during the meet.

I first flew it without the aforementioned bullet deflector plates as not to affect the initial trimming. I then made up some balsa deflectors and glued them to the prop blades and rebalanced the prop/spinner assembly. Due to the crappy weather we all experienced this spring, I wasn't able to make it back to the field for another trimming session, so it might be a bit of a surprise at how they might affect the flight profile during the Meet.

This build was pretty much kept a secret, so it was quite a surprise when I displayed it at the Meet. I didn't attempt any flights until the time of the event as not to tempt fate and damage it beforehand. It was damp in the morning with a threat of a passing thunder shower around early afternoon. The storm never materialized, but a breeze blew down the runway all day, occasionally shifting its direction just to keep us on our toes and let the trees claim their victims.

I noticed that there wasn't much else built for the event and those that were had some trouble with last minute trimming. A last minute decision was made to open the event up to include all WWI models. So it was no wonder when the 5 minute call was made to start winding many instead grabbed their better flying models. I can remember looking at those untested bullet deflector plates while standing on the starting line waiting for the "launch" command and just hoping for the best. When launched, the Morane didn't disappoint and flew in a wide climbing left turn and started circling overhead much to my delight. The worry regarding the deflector plates was all but forgotten. Clearly she was outclassed by the well trimmed planes, but she was holding her own and a crowd pleaser by the comments emitting from the crowd. The stiff breeze was drifting her towards the seating area but luckily she landed short, missing the announcing tower and the crash barriers. I was very surprised to find out that I took third place in the event with a plane that only had maybe 6 or 7 trim flights in total! I decided to fly her again during the Mass Launch "Free for All" event. I increased her winds from 550 to 700 throwing some caution to the wind. Just avoiding not one but two midair collisions right after launch, she again circled overhead, but this time drifted over the first line of fencing and into

the seating area. Just before she landed, she clipped the spectator fence roughly a foot off the ground. Not knowing what to expect, I was elated to see that she suffered only a broken leading edge between two of the wing ribs. No other damage and an easy fix.

Tony had sent a small number of signed plans to me to donate as prizes at the meet. True Rhinebeck collectors' items such as this plan will not be reproduced anywhere else. Tony will only release the plan for the 18 inch version in the standard French version. They did prove to be very popular with the prize winners. Later during the awards ceremony, I was stunned to learn that the Morane was awarded the "Pilots Choice" trophy.

The Morane was since been fixed, and awaits it's next Dawn Patrol only this time at Stillwell Woods. Being a much larger field, but still surrounded by those ever model hungry trees, it will be interesting to add some more power and see what she can really do.

These photos shown in more detail and many other photos of this build can be found in the [Building a Morane Saulnier Type "N" photo gallery on the LISF website](#). If any members have any questions on this or any of my other exploits into the world of free flight, feel free to drop me an email or grab me at a club meeting.







