

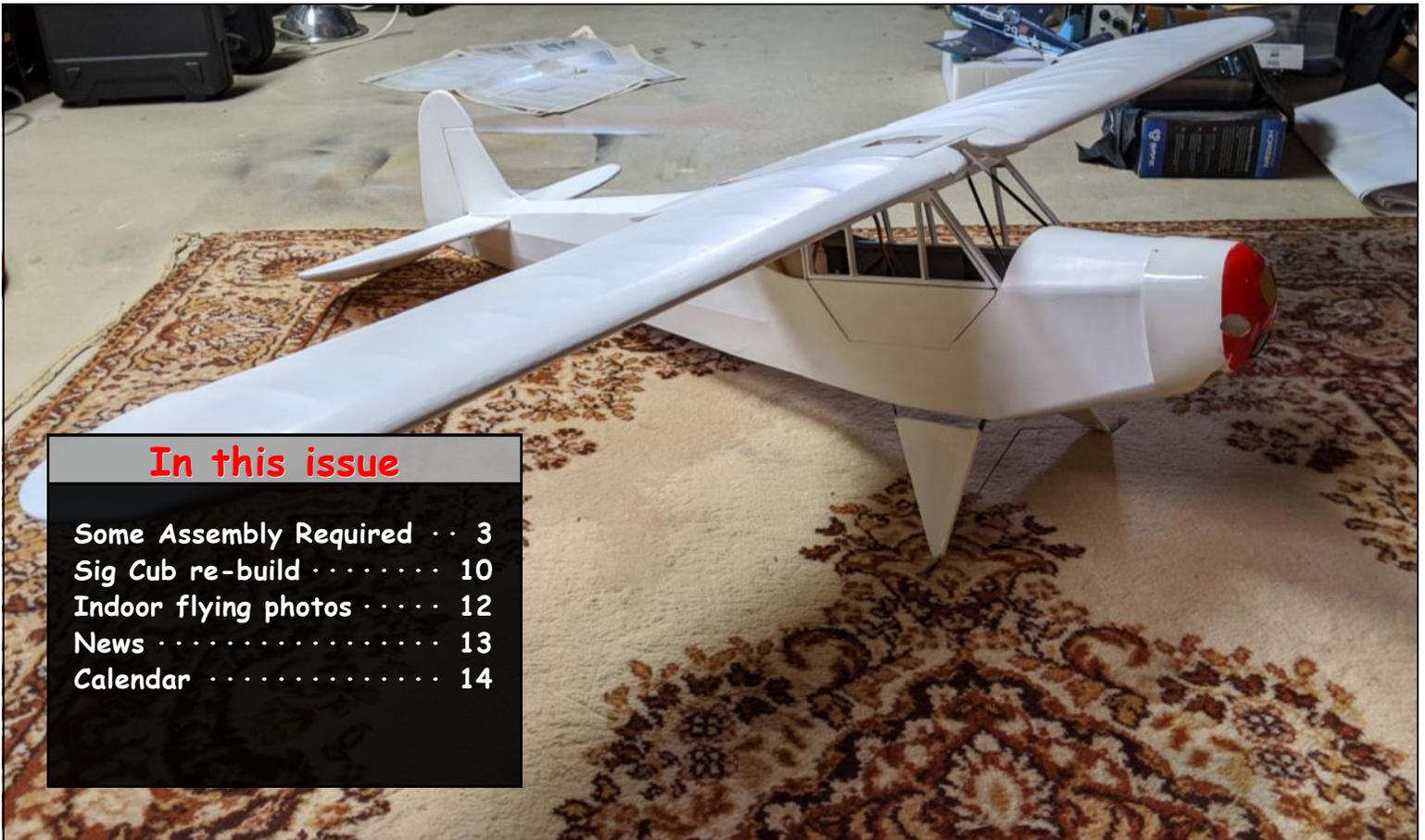
official digital newsletter of  
**Skywriter**  
AMA Charter Club #970      www.skymasters.org      24 year Gold Leader Club



**Skymasters Radio Control Club of Michigan**

*it's another beautiful day at Skymasters...*

**May, 2020 (updated 14 May)**



**In this issue**

Some Assembly Required . . .	3
Sig Cub re-build . . . . .	10
Indoor flying photos . . . . .	12
News . . . . .	13
Calendar . . . . .	14



Hi All

Welcome to May 2020. At this point the field is still closed until at least end of May.

**UPDATE:** The previously announced May 16th re-opening has been postponed to at least end of May. Please visit the [Skymasters web site](http://www.skymasters.org) for up to date details.

In the meantime, stay safe and build airplanes! We did have to cancel the spring float fly at Seven Lakes due to the park closures.



I'm working on a few projects to stay sane including a Balsa USA 1/4 scale D.VII, a Miss Hanger One flying hydroplane and adding lights to my West Michigan Park Flyers Highlander on floats. Always wanted a night float plane for home and the NEAT Fair!

Thanks, *Pete*  
**Pete Foss, President, Skymasters RC**

*(Continued on page 2)*

(Continued from page 1)

**Editor's note:**

Well, here we are on a monthly basis again. I know we announced we would be publishing the newsletter bi-monthly but given the current state of lockdown and the closure of our flying field, we decided that keeping contact with everyone on a monthly basis was a good idea. Until the situation returns to normal, the Skywriter will still be published monthly but will be an abbreviated edition. For any current information such as the calendar, please visit the [Skymasters web site](#).

**Paul Goelz**  
**Skywriter editor**

**Front Cover**

My "re-born" 1/6 scale Sig Clip Wing Cub (see article in this issue). Built in the 70s, crashed in the 90s and re-built in 2020. Shown here covered and painted white in preparation for blue trim.

**Paul Goelz photo**



## Nats Control Line "Authentic Scale" FW-190 Project: Retractable Tail Wheel

Scale competition in the AMA Nationals consists of two elements. The first is the static judging that evaluates how well the model replicates the 1:1 aircraft. In the case of the "Authentic Scale" category, judging is highly detailed but it is static, meaning no operating feature has to be demonstrated. The second judging element is the flying of the model where "realism in flight" is very important. So, if the 1:1 aircraft has retractable landing gear and flaps for example, the model must have and demonstrate those same features. Not having flaps on an FW-190 would be a serious scoring deduction. That is why I modified my model to include them. My model was originally built with retractable main landing gear but with a fixed tail wheel for simplicity. In the flying portion of the competition I would get a deduction for not having a retractable tail wheel. If you want to win, every fraction of a point matters so I need to retrofit a retractable tail wheel. I've known of this need since the beginning and have spent months trying to figure out how to do this. Sadly I couldn't just go to some catalog and buy a retractable tail wheel for a 1:6.9 scale FW-190. So I need to design and fabricate one. Making matters a bit worse. The tail wheel mechanism has to fit in a very crowded area where the elevator and rudder controls are taking up valuable space. It turns out that I need to do something about the rudder controls also or I'll get a points deduction for having exposed "model airplane" push rods and control horns. Ok, so I'll have to bring the rudder control inside of the fuselage right where the tail wheel mechanism has to go. That problem has to be dealt with along with the design of the retract system. So here are two pictures of the starting point. The first is the tail of the model and the second is what an FW-190 tail wheel looks like.



### *Tail wheel project starting point*

The rudder was a pull - pull cable system exiting ahead of the tail wheel. There is also a push rod from the rudder to the steerable tail wheel tiller. All of that has to be relocated into the fuselage.



### *Full scale tail wheel*

Note the diagonal arm which is part of the retract mechanism, a push rod that operates the tail wheel caster lock. The FW-190 (and many other fighters of that period) did not have a steerable tail wheel. While taxiing, the tail wheel was allowed to caster and steering

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was done with brakes. Prior to take off the pilot would engage a locking mechanism that would connect the tail wheel to a centering spring.

A control line model does not need a steerable tail wheel so my design will fix it straight ahead so that greatly simplifies the problem.

Early in my design thinking, I looked at commercially available retract units to see how they worked. Although none were the right size I saw that they all tried to replicate the pivoting mechanism of the full scale FW-190. Here is an example:



### ***Elevator push rod location***

My model has a fiberglass fuselage so the fin is hollow so I decided to make a slide mechanism that would extend up into the hollow fin and attach to the fuselage sides ahead of the rudder hinge mounting block. Although the slide design have the tail wheel move straight up into the fuselage instead of on an arc like the full scale FW I believe that the judges won't notice the difference as the model flies by at 60 mph.

So the slide design was frozen in principle but the actual means was still open. I considered 6 methods:

Using the jack screw actuator from a standard electric retractable landing gear.

Hobby King makes a jack screw mechanism similar to idea #1

An air cylinder removed from an old Dave Platt retract unit

A servo mounted inside of the hollow fin

Pulleys and cables and a servo mounted in the forward part of the fuselage...basically a pull - pull system.

A single cable from a servo in the forward fuselage. The retract slide would be held in the retracted position and the cable would work against the spring to extend the wheel.

After some study and experimenting I rejected #1 and 2 because of the complexity of the necessary limit switches. I rejected #3 because of the size of the air cylinder and its weight that far back in the fuselage and its impact on the center of gravity. I rejected #4 because a servo with a long enough servo arm to get the required motion would not fit in the fin. I rejected #5 because the pulleys system was going to be too fiddly to make, install and rig. That left me with #6 which at the time still required a single pulley. After some more thought experiments I came up with an idea to eliminate

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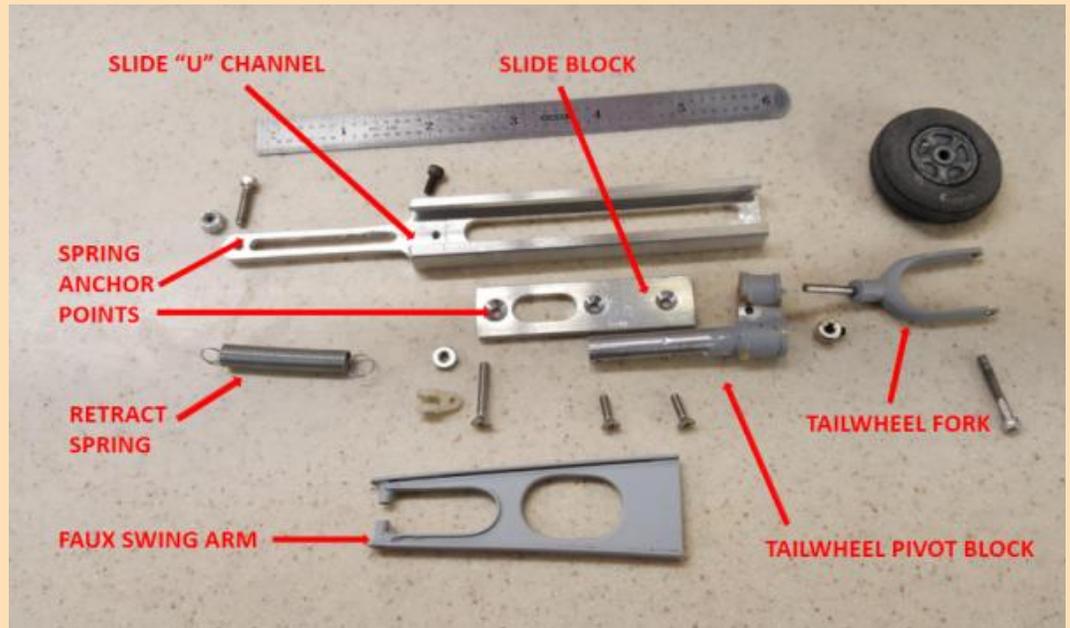
### ***Commercial retract mechanism***

These mechanisms have the pivot mechanism right where my internal elevator push rods are located so the design is not feasible.

(Continued from page 4)

the pulley. More on this a bit later.

So, in words here is how it will work. There will be a machined "C" channel slide track. It will be bonded to the inside of the fiberglass fuselage just forward of the rudder hinge block. It will have a finger extending further up into the hollow fin. At the end of the finger extension there will be a pin which will anchor one end of the retract spring. Next there is an aluminum block designed to slide up and down the "C" channel. The block will have a pin to anchor the other end of the spring. There will be an aluminum block machined to look like the visible portion of the full scale tail wheel assembly. It will bolt to the slide block and that assembly can be moved along the "C" channel track against the retract spring force. So you can slide the block against the spring force. There will be a stop pin which limits how far the spring can pull the slide assembly up inside of the fuselage and keeps some tension in the retracted direction. In the FW-190, the tail wheel does not retract completely into the fuselage for reasons that are not obvious to me. Anyway, there will be a swiveling scale looking tail wheel fork that will attach to the slider block assembly. So, if you have followed this you can see that with this mechanism, the tail wheel can move up and down through the opening in the bottom of the fuselage. The spring will keep the tail wheel retracted against the stop in the "C" channel leaving the wheel partially exposed as it is in the full scale aircraft. The following pictures show the individual parts labeled and then the whole thing assembled.



**Retractable tail wheel exploded assembly.**



**Retractable tail wheel assembly ready to install.**

Ok, so the tail wheel will slide up and down the track and remain retracted by the spring. You may recall that I was going to use a cable and pulley to extend the tail wheel. The pulley is necessary to turn the cable to run up inside of the fin to attach to the slider block. I made a pulley setup and hated it but I came up with a better way. In the new way I heat bent a short piece of the inner part of a standard Nyrod push rod to make a small radius 90 deg. bend. The formed Nyrod piece is attached to a plywood T plate that screws to the bottom of the horizontal stabilizer. The cable runs through the tube and up into the fin where it attaches to the slider.

(Continued on page 6)

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#### ***Cable guide***

The other end of the cable runs through the fuselage to a servo mounted in the forward section. So the servo pulls on the cable and extends the tail wheel. To retract the wheel, the servo relaxes the cable and the spring pulls the wheel up. I originally left the wheel and fork to freely swivel like the full scale version but I found that the wheel had to be centered to fit through the opening so I just locked it in the straight direction. It works perfectly...Woo hoo!!



#### ***Retracted***



#### ***Extended***

In the above pictures there is a hatch opening in front of the tail wheel. The opening was necessary to get the cable guide and faux swing arm inside of the fuselage. The hatch is held in place with a magnet.

#### **Rudder control modification project.**

As mentioned at the beginning of the article I will get a points deduction if model airplane control mechanisms are exposed. I can't have that. Again, here is what it looked like originally.



#### ***Exposed controls***

So one option would be to remove the exterior parts and glue the rudder in a fixed amount of "right" typical of control line models. But here is the issue. In the flying

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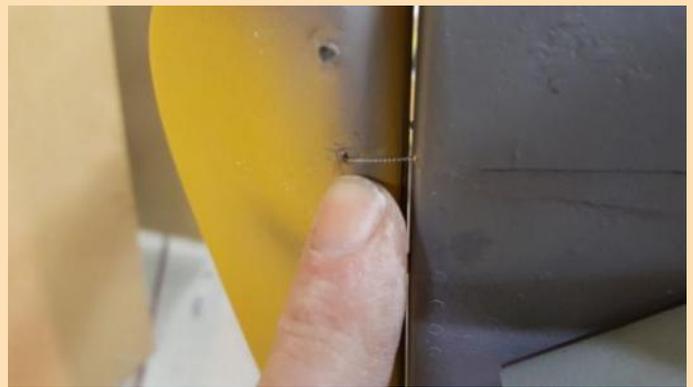
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portion of the competition a scale like take off is required which entails a pretty long roll with the tail on the ground. During that portion of the take off the propeller "P" factor wants to yaw the model to the left (towards the center of the circle!!). with my 1/4 scale Miss Los Angeles It takes a very large amount of rudder to correct that problem. Once the tail comes up and the model becomes airborne, it is WAAY too much rudder. So, I keep the rudder control by the radio. If you are a regular reader of my columns, you may recall that I modified a spinner for this model that allows me to use a clockwise rotating prop (pusher prop). The idea is the the "P" factor should cause the model to yaw right rather than left. That may be the solution but until I know for sure I will keep control of the rudder. So to conceal the controls I decided to keep the pull - pull setup but keep the cables completely inside of the fuselage and attach them to the rudder without a traditional control horn. Instead, I'll use a piece of tubing that goes through the rudder with its ends flush to the surface. The pull - pull cable goes through the tube and is secured by soldering to the inside of the tube.

I knew I was going to solve this problem this way when I designed the tail wheel retract mechanism. The cables need to get past the tail wheel mechanism on their way forward to the servo. To do that, I glued two 1/16 o.d. brass tubes to the inside surface of the fiberglass fuselage. The tubes end at the rudder hinge line and extend forward past the internal elevator horns to prevent any possibility of the two interfering with one another.



**Guide tubes being installed**



**Pull - Pull cable installed**

A small portion of the cable is still visible but will be almost completely invisible as it is in the full scale when I install the rudder gap covers in the gap.

The cables run to the servo and are attached with adjustable eyes.

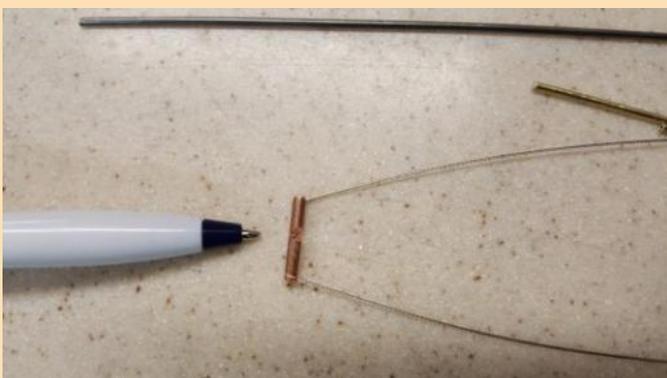
### **Homemade decals project**

Military aircraft typically have verbiage stenciled all over them identifying what's inside of hatches, lift here, don't step here etc . The list of stenciled stuff can get quite long. Modern Jets are covered with this kind of thing. Fortunately the Aircraft I am modeling is not as bad in this respect as some in that period. My documentation pictures of the FW-190 F8 R1 restored by and on display at the National Air and Space Museum shows these stencils. If something shows in your documentation it better be on the model or there will be a scoring deduction. I normally paint all of my markings but this stuff is too small to do that way. So it needs to be done as decals or stickers. There are other methods such as dry transfer etc, etc but the cost can get really high for custom work. So for this plane I can go to Callie Graphics and have stickers made. She really does

(Continued on page 8)



**Rudder tube and 1/16" cable guide tubes**



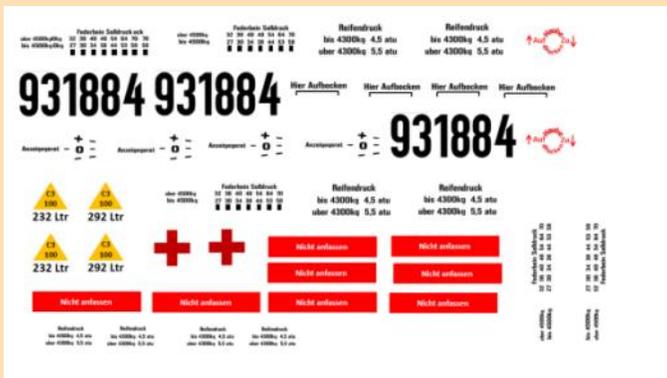
**Pull - Pull cable soldered inside of rudder tube**

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good work but they are stickers and the material is pretty thick compared to decals and they can shout out "I'm a sticker". So I have made the decision to learn to make decals myself. How hard can this be?? Well, to get the look that I want it got a little tricky. To start I reviewed a few YouTube videos and still thought "how hard can this be? So, here's how I made mine.

First, you need to create the art work. 99% of what I need is text and numbers. On the full scale plane its all in an unknown stencil font. So, after thinking about it I concluded that most of what I need is so small that you would be able to use almost any stencil font and without a magnifying glass a judge wouldn't know if my font is wrong. But the Werk No. on the tail is large enough that if I get it wrong it'll be obvious and my score will get dinged. So I scoured all of the fonts I found on line to find one that was pretty close to the font on the target plane. The site where I found the font allows you to type your words to see what they look like in the font. So, I typed I the number and copied it into a paint program and modified the image so the numbers were exactly like the font on the target plane.

I then used the same font and a little graphics work to create a decal sheet for everything I needed.



### FW-190 nomenclature decal sheet

I went to Amazon and bought a package of decal paper sheets for ink jet printers. The sheets are a special heavy paper that has a clear film that will detach from the backing paper when soaked in water. When you use an ink jet printer, the ink will come off if you put it in water so you need to seal the ink to the film on the paper. Once sealed, you cut the decal from the sheet and soak it in water for about 15 sec. You can the slide the decal off of the backing onto the surface. This works fine but... you want the decal to basically fuse to the surface. My surface will be flat latex. The decals didn't want to fuse. There are commercial products that the plastic modelers use for this purpose. They didn't work for me. I found that almost any clear spray will seal the

decal but getting the decal to fuse was a problem for me. After many experiments that I won't bore you with I found the right combination of materials and process to get this to work right. I have used a Rustoleum clear spray that is used to frost glass. It is quite flat and I believe it is a lacquer based material, I use it because its sheen is identical to that of my flat latex. So, I use that paint to seal the ink to the decal. Next, I spray a wet coat of the same paint on the latex paint on the test panel. Always make test panels for everything you do... ALWAYS!!



Prepared test panel

I let it dry for about an hour. I now cut the decal I'm going to apply from the sheet and put it in the water. While it is soaking I spray lacquer thinner on the latex/frosted clear where I want to put the decal. I make sure it is wet with the thinner. This softens the frosted clear. While it is still wet I slide the decal off of the backing. You have a couple of seconds to get it positioned where you want it. I now take a Q-tip and roll the cotton tip over the decal to force the remaining water and thinner out from under the decal. Don't slide the Q-tip...roll it. Next I spray the decal with a wet coat of lacquer thinner. At this point do not touch it or mess with it in any way... go get a beer. When you are done with the beer take a look at the decal. It may need another shot of the thinner to get it to suck into the rivets etc. Get another beer. When you are done with beer #2 you can spray a topcoat of the frosted glass spray. The decal should now look great and the edges should be almost undetectable and the sheen should match the surrounding flat latex. This seems to work with my materials...your mileage may vary. Always test, test, test.

(Continued on page 9)

(Continued from page 8)



### ***Test panel #2***

That's it for this month. Next month I'll go through how I dressed up the main landing gear oleo struts and how I did all of the surface details such as panel lines, scale hatches and rivets ( my rough estimate is that I'll be putting down about 20,000 rivets)

Before I sign off this month I'd like to give a special thanks to fellow Skymaster Sandy Gorney who sent me a thumb drive with copies of 30 books on the FW-190 including what appears to be a complete FW-190 maintenance manual in 12 volumes...thousands of pages....Absolutely amazing. Thanks again Sandy.

Until next month...

**Steve Kretschmer**

# New life for an(other) OLD plane

Here's another entry under "What to do under house arrest". Anyone else?

Last month I wrote about converting an old Wattage B2 from NiCd to lithium and adding the brick from a UMX Ultrix. I have now flown it quite a few times and it flies GREAT. Really happy with this conversion.

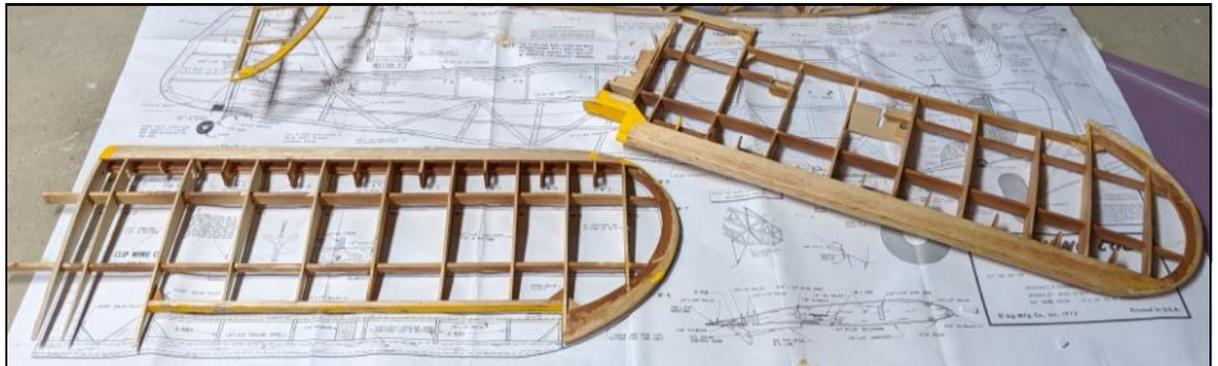
But we're still under house arrest so how to keep busy? The answer was obvious. Way back in the early 70s I built a Sig 1/6 scale clip wing Cub. I flew it for the next couple decades but shortly after joining Skymasters one of the functional (ie., necessary) wing struts failed and the wing folded in mid-air. The wing was ripped in half and the resulting impact with mother earth destroyed the nose from the instrument panel forward. I put the remains in a box and vowed that I would re-build it some day. In the intervening years, ARFs became my go-to way to fly without the angst when I crashed something. I still intended to re-build the Cub but never got around to it.

Well, with the advent of COVID-19, that day has arrived! Sorry I did not take more before and after photos.... I just didn't think of it. Plus, the project was very piecemeal and haphazard. And my workbench is too messy anyway :)

When I took the pieces out of the box and surveyed the scope of the project, I found that about half the wing ribs were broken beyond repair, the wing was snapped in half (the wing struts had failed and the wing folded) and the fuselage was destroyed from the instrument panel forward on one side and from behind the door forward on the other. I had a

box of balsa, the original full size plans and lots of time on my hands so I figured no time like the present and got started. Fortunately, I had purchased a set of plans long ago so I had full size plans to build over.

The original wing was all one piece with a center spar that was not strong enough to support the plane without functional wing struts. When one of my "functional" struts failed, the wing folded and the whole thing hit the ground hard. As I looked at the wing, I decided to re-build it with a wing tube and removable wing panels and a separate center section. That would mean that the wing would be stronger since the carbon fiber wing tube would be longer and forward of the original spar and could carry through the center section. It would also mean that the wing could be broken down for storage if needed. This re-design meant I



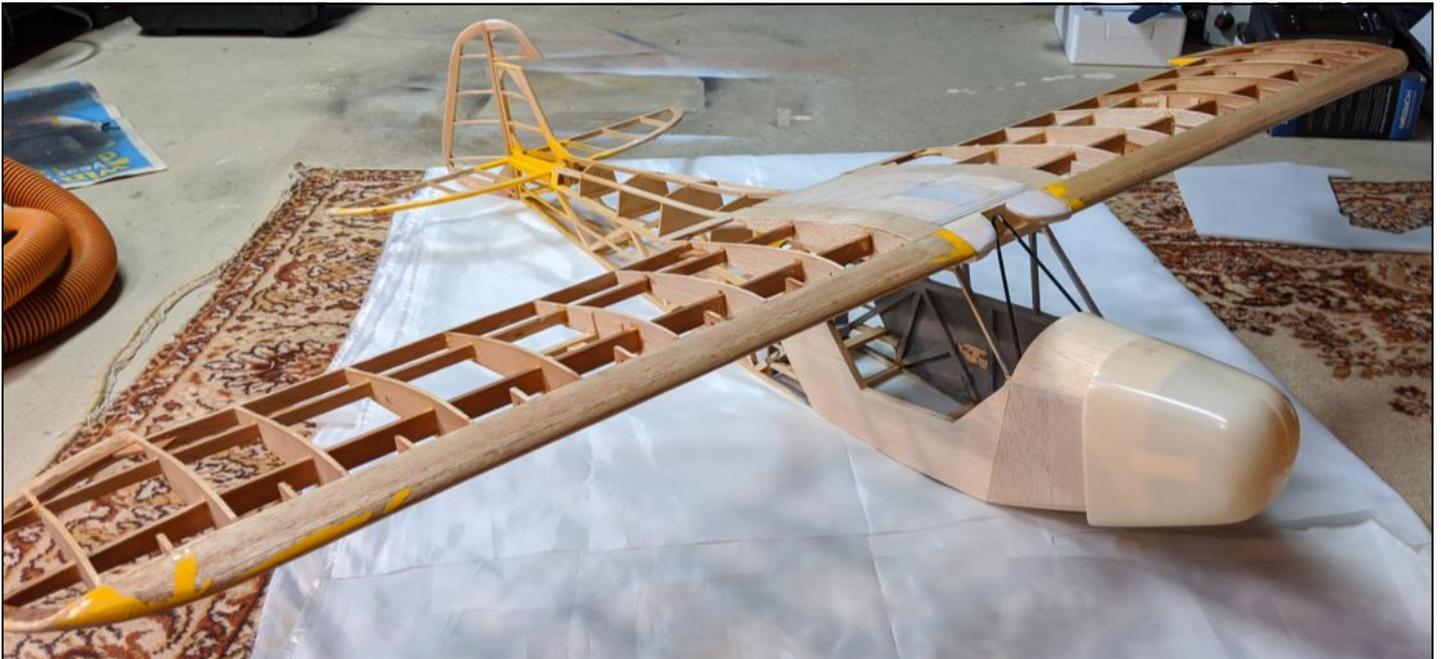
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(Continued from page 10)

needed to build a brand new center section (which was destroyed anyway), fit the wing tube and re-engineer how the center section attached to the cabin and pass the wing loads to the cabin structure and braces.

So.... with the rough concept in my head, the first task was stripping out the damaged ribs, making about 12 replacements and starting to piece the wing back together. That task was actually fairly straightforward and before long I had two undamaged wings. In the process I omitted the original center aileron servo, belcranks and aileron linkages and set the wing up for two separate aileron servos. I hate to admit it but while I have always disliked building, I found this repair process addictive.... like putting a puzzle together.

The fuselage rebuild was a bit harder since I had to make portions of the fuse over the plans and then graft them to the surviving parts of the fuselage. As the rebuild progressed, I discovered that my original build was not straight so I had to fudge some things to get the wing straight with the tail. But before too long I started to see a recognizable airplane again!



After the wings were rebuilt and the fuselage was together enough to fit a wing center section, I made a new center section and fitted it to the rebuilt fuselage cabin structure.

The original plane flew with a tired old Supertigre .23 but I decided to convert it to electric. I had a motor and speed controller I salvaged from a crashed plane that I thought might work so I fitted that to the nose. Testing the motor showed that it was probably similar to the Eflite Park-480 and with the prop that came with it, it drew about 17A on 3S. From what I could tell, that was close to the motor's maximum power rating and although it might

(Continued on page 12)

*(Continued from page 11)*

fly the plane it probably would not have much power left over so I bought an Eflite Power-25 (870KV) on Ebay. Turns out after testing that this motor is probably a bit of overkill but aside from being a tad heavier, I can always de-prop it. For starters I selected an 11X5 prop that draws about 29A at full throttle static, which feels like plenty of thrust and should not stress my intended 3S 2100mAh packs. Much.

After some elevator and rudder repairs, it was time to cover it. The original build was covered with silk and dope but I was looking for something that was still fabric appearing and could be finished without dope.... too smelly these days! After looking around and doing some research, I found that the obvious iron on choice (Solartex) was no longer made and its replacement (Oratex) was considerably heavier. So I ended up using Sig Koverall and gave in and used good old dope. I considered EZDope but when I used it on a couple tissue covered planes last year I found that I disliked the fact that successive layers did not dissolve and fuse together like dope does. However, dope really is too smelly to apply in the house with the windows closed so I got one coat of clear on the fuselage and decided to suspend operations until warmer weather and either dope outdoors or in the basement with the windows open and a fan running. It also turns out that many dope colors are out of stock at Sig so I really could not finish it for a while anyway.

I then moved on to working out how to hinge and secure the doors. They were originally non-functional but with the conversion to electric, I needed them to open for battery insertion. I ended up using fabric hinges and magnets, which works great. When finished there will be an additional magnet on the upper door and a small washer buried in the wing so the door will stay open by itself if needed.

I decided to stick with the original scale looking but un-sprung wire landing gear for now since it fits my goal of re-using as much of the original plane as possible. However, I do have a spare and very scale appearing sprung landing gear from an Eflite Super Cub. It looks to be a near perfect drop in replacement although it is considerably heavier. Depending on how the Cub flies, I may install it in the future. In the mean time, the wheels are perfect for the original gear, complete with white hub caps with "Cub" molded in.

In the intervening years, Sig changed the supplied cowl from a one piece vacuum formed "nose cap" to a two piece molded plastic part that slides part way over the nose. A long time ago, I bought a couple replacement two piece cowls so I assembled one. I find it does not look good at all. It fits the shape of the firewall poorly and does not look anything like a real Cub cowl. I still have the original "nose piece" cowl (shown in the cover photo) and after filling the unneeded muffler and needle valve openings with fiberglass and Bondo (thanks to Steve K. for the technique) it may be the one I settle on.

Sig never supplied a scale dummy engine so it will initially fly without engine cylinders. However, there are some aftermarket dummy engines available and I'll eventually put one on the nose.... it just doesn't look right without it.

With the re-build complete, it was time to get serious about doping it. I found a can of white butyrate dope at Sig and when it arrived I started applying it over the clear. For simplicity, I decided to brush it on but after two coats it still looked very streaky so I sprayed a third coat which evened things out nicely. As of this writing, I am waiting for a can of blue dope from Brodak but it is taking its own sweet time to get here. USPS says it is moving but it spent a couple days at the Detroit sorting center and has been "on its way to the next location" for more than a day. In the mean time I plan on applying one more coat of white to get a bit more gloss. When the blue arrives, I'll mask and spray the sunburst pattern, same as the original Hazel Sig cub.

So in a couple weeks of work my old Cub has risen from the ashes and will.... finally.... fly again. In the mean time I was able to correct a couple of the more glaring construction errors and she is looking good!

That's what I've been doing with my locked in time..... what about the rest of you?

**Paul Goelz**

# ON THE WING

## Notice:

The Retirees and  
Wannabes Breakfast  
At Red Olive

Is cancelled until further  
notice due to COVID-19

## Notice:

The Skymasters  
Breakfast  
At Iris Café

Is cancelled until further notice  
due to COVID-19

Due to COVID-19 guidelines  
and restrictions, all  
Skymasters events for May  
have been cancelled and the  
field is currently closed  
through end of May.

*The previously announced re-opening has been  
postponed by the latest stay-at-home order  
extension.*

We have asked for an exemption and this is a  
developing situation, so please check with the  
[Skymasters web site](#) for any updates.



# May 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat	
<p><b>Due to COVID-19 guidelines and restrictions, all Skymasters events for May have been cancelled and the field is currently closed through end of May.</b></p>						1	2
3	4	5	6	7	8	9	
<p><b>The previously announced re-opening has been postponed by the latest stay-at-home order extension.</b></p>						15	16 Skymasters Field Re-opens
17	18	19	20	21	22	23	
<p><b>We have asked for an exemption and this is a developing situation, so please check with the <a href="#">Skymasters web site</a> for any updates.</b></p>						29	30
31							

# Skymasters Information...

[The Skymasters field is located in Lake Orion, within the Bald Mountain Recreational Area](#) on Scripps Road, between M24 and Joslyn (see map). A recreation passport or sticker is required and can be obtained from the Park Headquarters on Greenshield Road or you can check the box on your telephone bill for "Recreational Passport".

you bring something for the grill - enough to feed (at least) you and your guests -OR- bring a dish to pass -OR- bring your own (non-alcoholic) beverage. Something for

for a side salad, or bakery for dessert always works!

From June through August, club meetings are held at the field, on the

**Due to COVID-19 guidelines and restrictions, the Skymasters flying field is CLOSED through end of May.**

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**We have asked for an exemption and this is a developing situation, so please check with the [Skymasters web site](#) for any updates.**

Airplanes

Lapeer Rd.

Helis and C/L

## 2020 Club Officers & Appointees...

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### Newsletter Submissions

Please send all articles, photos and announcements to the Skywriter editor at:

[newsletter@skymasters.org](mailto:newsletter@skymasters.org)

Deadline is the 20th of each month.

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[www.skymasters.org](http://www.skymasters.org)