

Monthly Newsletter of the Kitchener-Waterloo RAA

- December 2023 -



There's nothing quite like flying with a buddy. Whether it's the knowledge that there's someone else nearby if something goes wrong, or having someone else to share the experience of flight, or even just to have someone else to talk to when you are out flying. I consider myself very fortunate to have a flying buddy with similar interests and flight profiles. This was the last opportunity Lee and I had to fly together this season since I brought the plane home shortly after this flight. It was a good year of flying in spite of the lack of a long trip this year. My son's place near Sudbury was about the limit this year.

President's Message

Well, we managed to get a few good days in November for flying, so I finally reached my 100 hours goal for 2023. The vast majority was on floats, but I managed to get in a few hours on the bush wheels doing some local flights to some of our smaller local airstrips.

I hope that everyone else had an opportunity to get some flying in or spend some quality time on your aircraft projects. Life gets quite busy at times and even being retired I still find getting out when the weather is favourable can be a challenge at times with so many other life commitments.

I have included another update on my Aerial One rebuild project. I have been able to get several components done, including the exterior covering, the landing gear and rebuilt a number of the interior cover panels with lighter aluminum in an effort to lighten up the plane as much as possible.

I had expected that Lee and I would find the time to put together a longer update on the ADS-B situation in Canada. I'll try again next month to get the analysis and white paper done before the next issue.

November was election month at KWRAA and the existing Executive and Directors at KWRAA will remain in place another year

I am still working on the pilot recency issue and hope that we will have access to some local TC-approved safety seminars before the spring. We will do our best to sort that out before the January meeting.

2024 is going to be a great year for KWRAA.

Dan

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Aerial One Rebuild Update

November has been a busy month for me as I try to get as much done on Aerial One as possible before the extreme cold of a Canadian winter sets in. When it gets too cold, it makes fabric work a little more challenging and the shop costs a lot more to heat. For the most part, the weather has cooperated, allowing me to make a fair amount of progress on Aerial One.

I used a number of good-sized scraps of Oratex to complete the inside fabric work earlier, so when I went to the roll of fabric I had left from covering Aerial 2, I hoped there would be a long enough piece to do both sides of the outside of the fuselage. Upon measuring, my worst fears were realized; there wasn't enough to cover the plane... or was there?



I decided to create some templates from paper and strategically lay them out on the Oratex fabric to determine exactly how I might make things work out without having to buy more. Undoubtedly, matching it could be a nightmare and who knows how long the wait would be if I ordered more Folker Red fabric.



I laid the pattern out and found that if I tried to get the entire side out of one piece, I wouldn't have enough to get both sides and the bottom from the roll and I would have a lot of scrap.

By dividing the side into two pieces with the joint near the rear of the cockpit, the seam would be very small and I could easily get the pieces I needed from the material I already had. So, I began laying things out to maximize the coverage and minimize the waste.

I had to ensure that when I laid out the bottom and one side, there was enough material left on the roll to flip the pattern over and cut out the second side.

Once that was done, I began using those templates I created to strategically position each cut giving priority to the pieces I needed to complete the sides of the fuselage and to cover the rudder, which was being replaced.

After that, I used the excess material in the cutoffs to create Oratex covers for the seat pans and backs as well as the rear of the cargo area, which was punched full of 3.125" and 2.25" holes to lighten the plane. The front of the floor was left full strength for heavy loads.

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Installation began with the bottom of the plane to ensure the overlap seams did not show once the sides were installed. There are a lot of attach points on the bottom of the Highlander since it is designed to be either a nose wheel or tailwheel aircraft, as well as having the ability to use it as a float plane. This makes the installation of fabric a little more challenging, but it's more a matter of taking the time to work around each attachment point slowly to ensure a nice finish and seal.





With the bottom done, I set about to cover the pilot side of the fuselage. Like many aircraft, there is a handle near the tail to allow for easier maneuvering on the ground. This makes fitting and shrinking a little more interesting. To make the fabric reseal around the handle once cut, I created a small angled plate to provide a gluing surface above and below the handle.



Getting the angle right took a little trial and error and even a little adjustment after it was glued down, but since there is a slit in the fabric to fit around the handle and the starboard side was still uncovered, it was fairly easy to accomplish. It has slightly more flair angle at one end than the other. I removed it temporarily until the fabric was installed before placing it into position and securing it with the fabric.

The fabric requires a bit of bagginess in the area of the handle to accommodate the transition curve between the fuselage and the vertical stabilizer. This is later shrunk-out with the heat gun.

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One of the tricks of removing wrinkles in Oratex is to not try to shrink an area too quickly. I found doing a little bit of shrinking in key areas all over the airframe is best, and often shrinking lines across the baggy ripples helps to pull the fabric covering into position. There are videos on-line that describe the process quite well so I won't go into a lot of detail on that aspect here.



I did a quick ironing at a low temperature of 135° C to get it flattened out once all of the wrinkles were removed with the heat gun.



This is a good point to look inside the fuselage to ensure all of the internal components have been installed before closing in the other side of the fuselage. Don't forget things like the ELT mounting bracket and antenna, which should be in the tail section as far back as possible. If there are cable runs for the rudder, this is a good time to run them or put in pull strings.



Next, I covered the seat pans and backs. The odd arrangement of lightening holes is to accommodate the support tubes within the welded seat assemblies without them showing through, in order to get maximum support strength while trying to minimize the overall weight of the seats. In the photo above you can see one of the seat assemblies under the table and the "V" pattern that replicates in the holes of the seat pan on the right. Once covered in Oratex, the seat will easily accommodate the seat cushions and the holes will disappear from sight as seen in the next photo. Every ounce of weight makes a difference, especially in a STOL aircraft.



I covered the rear floor to conceal the lightening holes I had punched into the floor to minimize the weight of the plane. The rear cargo area is only used for lighter objects like sleeping bags, clothing, tarps, etc.



Once the fabric work was done, I installed the header tank and sight tube. Over the next week or two I will try to get all of the firewall back fuel lines run.



I also got all of the internal components, including the seat belts, fuel valve, rudder pedals, brakes, flap handle, control sticks and mixer re-installed. They all had been test fitted and adjustments made before installing all of the fabric on the fuselage.



Many of the covers I had created originally for Aerial One were made from .032 aluminum and covered in marine grade vinyl. Re-making them from .020 aluminum and simply adding a nice swirl pattern using a Scotch-Brite pad on a cordless drill, means they are much lighter and still have a nice finished look.



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The floor of the cockpit is .020 rather than .040, so it needed a little more support. I bent some .020 into channels and created an "Inukshuk" shaped support for the floor, saving a pound by not using the .040 floorboard.



Anyone who has installed bungee-type landing gear on their projects can probably attest to the need for patience and strength in wrapping them. I mounted the bungee supports to a large steel frame crate I have in the shop, which gave me something solid to attempt the process of wrapping them.

It took several attempts to get them done. I started by marking the center point of the bungees with a fine point sharpie. If the sharpie mark didn't reach the halfway point of the wrap, I released it and started again... and again... and again. Finally, after working up a major sweat, I managed to complete the first of four wraps... two on each strut.

When they were finally wrapped, I realized that the welder at Just Aircraft had added a couple of tack welds inside the axle mounting bracket. Since they have a full welded seam outside, I'm not sure of their purpose other than to make mounting the bungee struts impossible.



Below, you can see the huge blobs of weld blocking the mounting holes on the axle.



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After considerable filing by hand inside the brackets to remove the top of each weld blob, I was able to attach the bungee struts to the axles. I installed the gear legs and "V" brace cabane portion of the landing gear. Next, I took the wheels apart, installed the valves and internal "O" ring that seals the seam between the halves of the tubeless hubs. I then installed the tires and reassembled the hubs and brakes and inflated the tires.



Ater packing the bearings with grease, I mounted the wheels, installed the wheel nuts and cotter pins.



That's a pretty good summary of my progress to date on the Highlander I lovingly refer to as Aerial One. Now, all that's left to do before I continue the rebuilding process is to sit in it and make airplane noises...

Dan



Thanks to Terry Fisher for coming to our November meeting to inform our members about CIFIB. This group of pilots, engineers and programmers has designed a groundbased 978 UAT ADS-B system that is gaining in popularity in Canada and even has had enquiries from other countries. In lieu of a Nav



Canada operated system similar to the FAA system, this is certainly an excellent way to fill the void in pilot safety. There were even some visitors from other areas that came to learn about CIFIB. Check out the website at www.CIFIB.ca

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November Meeting Recap

Tech Tip from the Garage Mahal

While assembling my wheel hubs and mounting the tires on Aerial One during my rebuild, I discovered a useful tip that you may find helpful.

I found at one point that I was in need of a ¼ inch Allen wrench in order to disassemble the hubs, which had 6 large machine screws in each one. I was just about to go searching my tool chest for one when I noticed a Phillips screwdriver bit sitting on the bench next to me. A light bulb went on!



By installing the bit in the drill chuck backwards, I had discovered a quick way to tackle the task.



Not only did it work well, it made short work of removing and reinstalling the six large machine screws holding each wheel hub together.



Whether you found this tech tip helpful or not, please consider submitting a tech tip for the next issue. As builders, we are all looking for better, faster or safer ways to complete our projects.

Sometimes the simplest tip can be extremely helpful to someone else facing a challenge or even just to have another trick in their toolbox of ideas.

I know our KWRAA members are a great source of information for other builders, but we need to share our ideas. If you have an idea of something to share (and I suspect everyone has something to share) please send me the idea for the newsletter. If you have a photo, that's even better, but not required. I can likely replicate the idea and generate a photo or two of your idea or tech tip.

Thanks,

Dan

Upcoming Events in 2024:

- Highlighted lines are KWRAA Events*
- Bolded Lines are KWRAA Fly-ins* (More details on fly-ins coming in the new year.)
- Fly-in Data Sheets are available on the KWRAA website at www.kwraa.net

January 18	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
February 15	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
March 21	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
Mar 28-Apr 2	-	Sun-n-Fun 2023
April 18	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
May 16	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
June	-	KWRAA Fly-Ins - TBD
July	-	KWRAA Fly-Ins - TBD
July 24-July 30	-	Oshkosh Air Venture 2023
August	-	KWRAA Fly-Ins - TBD
August 18-20	-	UPAC Convention 2023
August 31	-	Damascus Field Fly-in CDF6 - (date to be confirmed)
September 19	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
October 17	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
November 21	-	KWRAA Monthly Meeting – Cadet Youth Dev. Centre at CYKF
November 29	-	KWRAA Christmas Party – Runways Café at CYKF

* KWRAA events are fly-in and/or drive-in.

KWRAA monthly meetings will be on the third Thursday night of each month next year unless we hear otherwise from the Cadet Youth Development staff, since we are using their building and working around their schedule for our KWRAA meetings.

If you know of other aviation events in Southern Ontario advise me and I will append the list.

KWRAA Executive Contact Information:

Due to an increase in spam emails, please reach out to me directly for the latest contact information for the KWRAA Executive members. Thank you, Dan Oldridge (519) 651-0651.