

- April 2023 -



Thanks to Dave Hertner of Fisher Flying Products, the attendees at the March KWRAA meeting learned all about the back story and ongoing development of the Archon SF-1 and SF-2. Dave explained how it may soon be able to build and own one of these scaled-down versions of a modern-looking air superiority fighter aircraft. Powered by a Rotax 912 series engine and pusher prop they promise to be fun to fly and economical as well as grab attention anywhere they go. - Photo by Lee Coulman

President's Message

It is good to be back home after my trip to BC, but it doesn't come without regrets too. Not only did I miss two meetings this year already, I missed meeting a few potential new members for the chapter. Hopefully, I will get the chance to meet Mark, James and Patricia at the next KWRAA meeting on April 13. I have had an opportunity to 'meet' them electronically I suppose via e-mail, but it's really not quite the same, is it.

One other regret on returning is that after three years of keeping my guard up in respect of the Covid-19 virus, it finally caught up with me a few days after returning. Whether it was on the flight home or picking groceries upon our return is really irrelevant. The point here is that it's likely going to get all of us eventually and I think many of you have already experienced it in varying degrees. Mine is like the worst cold I have ever had, while others have told me it

was more like a mild flu, and yet others tested positive without even experiencing symptoms. It certainly has a wide range of impacts, but I am glad none of our members were seriously affected a couple of years ago when the results could have been much worse.

This month the newsletter has a great story from David Wood about the EFI kit he is installing on the Rotax 912ULS in his CH750. It looks like an interesting alternative to the somewhat pricey Edge Performance EFI that I installed on my Highlander.

There is also a short outline of a proposed program that could involve our own KWRAA members assisting the Cadet training personnel to deliver part of the aviation component of the grade six science curriculum.

2023 is going to be a great year for KWRAA!

- Dan

SDS Electronic Fuel Injection Installation on a Rotax 912 ULS - by David Wood

Before my last "flight" last fall on a beautiful November day I returned to the hangar after the engine ran very poorly during the runup. When I got out, I noticed a pool of fuel forming on the ground. I removed the cowling, tied down the tail, re-started the engine and got out and had a look. There was fuel overflowing the left carburetor. When I removed the bowl, it was overflowing.

Dad and I had been thinking of installing fuel injection because of prior carb issues and after this incident, we decided to pull the trigger on purchasing an EFI kit. After reviewing some information on the internet and talking to SDS EFI and Ignition Products, I decided on their kit. The kit arrived in January and the installation commenced.

The first step was to remove the carburetors, and associated hardware, such as the fuel lines, choke, and throttle cables. The Rotax mechanical fuel pump is no longer used, and the kit comes with a plate to block off the opening.



Rotax 912 ULS with the carbs removed

The next step was to start installing the new components. The fuel injectors are installed in aluminum blocks that mount between the cylinder head and the stock intake manifolds.

This is where things start to get interesting. As advertised, the wiring connectors for the injectors need additional clearance from the intake manifolds. Removing some material with a Dremel was easy. After a test fit of the

throttle bodies and throttle linkage, I found that the ignition boxes interfere with the linkage. Again, the instructions warned about this. This job was a bit more difficult because the fasteners for the ignition boxes are difficult to access and the wires are short, which limits the options available to relocate the boxes. I was able to fabricate a new bracket to lower the ignition boxes enough to give good clearance to the throttle linkage.



Injector blocks and throttle bodies installed. Ignition modules have been lowered to clear the linkage

I roughed in the supplied fuel lines that run from the fuel block to the injectors without incident. Likewise, the hall sensor that mounts on the crankshaft was easy to install. I ordered a new vernier throttle to replace the dual friction throttles we had for the carburetors. The action of the vernier throttle is much nicer and I don't think we will miss having a throttle for the right seat occupant. (The Zenair CH750 has a centre stick, with the throttle on the left.)

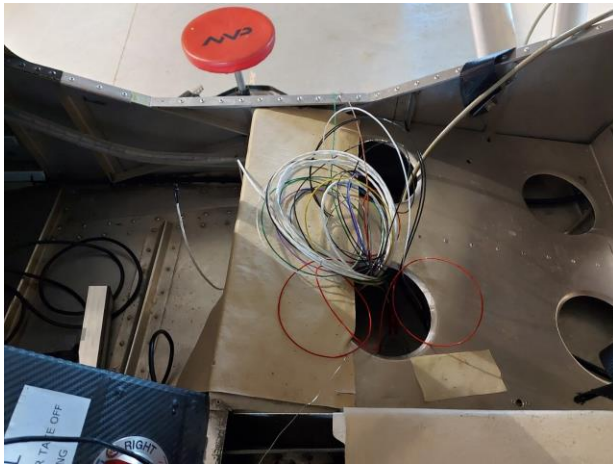


Fuel block and lines to injectors

Next up was to test fit the cowling. It didn't clear the throttle cable and linkage. I cut some openings for clearance and left the fabrication of some fibreglass bubbles for later.

I decided to locate the ECU under the passenger seat. There is enough room, and the location is well protected from the elements and physical damage. I installed $\frac{3}{4}$ " flexible electrical conduit from the seat to the firewall. This keeps all the wiring running inside the cockpit safe and tidy. Terminating the cables and plugging them into the injectors and sensors was straightforward.

As of today, there are some challenges ahead. The first is to get everything powered up.



Lots and lots of wires

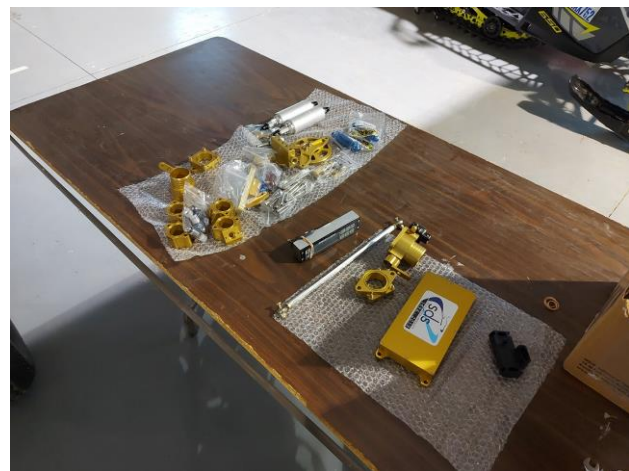
I plan to use two fuel pumps, with the second as a backup. Each pump will require a 15A breaker and a switch. The injectors require either four separate 5 A circuits, or they can be paired in two 7.5A circuits. I don't have anything existing in the airplane's electrical system to provide this power, so I will need to source new components and figure out where to locate them in the aircraft. The ECU requires a single 5A circuit, which I have available in the existing Composite Designs power panel.

I plan to use a duplex fuel valve and plumb the return lines back to the tanks. Unfortunately, the valve is backordered and not expected for 20 weeks. I plan to temporarily install individual shut off valves in the return lines and to be very careful about managing fuel until the correct valve is installed.



3D printing brackets for fuel pumps

My impressions of the kit are that it is well designed and the support from SDS so far has been excellent. Every homebuilt aircraft is different, so the challenges I have encountered were not unexpected.



SDS Fuel Injection Kit

There is certainly more to do before we can test run the Rotax 912ULS with the SDS EFI kit installed, but it should be ready to do a run up soon, followed by some taxiing and eventually a test flight.

Once the plane has flown successfully with the new EFI installed, I will follow up with part two of this article so you will have the rest of the details on the installation and my experience flying with the SDS EFI in the Zenair CH750.

- David Wood

Proposed New Program Promises to Educate and Inspire Young People to Better Understand Aviation

There is a new program being explored at the CYDC at CYKF. Operating at arm's length, yet potentially greatly benefitting the cadet program, a number of administrators and instructors are organizing to deliver an aviation program directed at the Ontario Grade Six Science Curriculum; specifically targeted at the Aviation Module. The new Youth Aerospace Program will allow one class of grade six students per week to learn about aviation in an environment outside their normal classroom. The program is being specifically designed to help them understand things like the forces of flight, how an airfoil works, basic propulsion systems and numerous other topics through demonstrations and experiments, culminating in an opportunity to try one of the flight simulators at the CYDC.

A small group of retired airline pilots have committed to donate some of their time to the program and I have been asked on behalf of our chapter to explore whether any of our group of recreational flyers would like to participate as either regular or substitute instructors to assist in the delivery of this new program. There will be a test (pilot) run of the program from Easter until June, in the hope that it will become a 'full time' program, running weekly for most of the next school year.

This may present an interesting and unique opportunity for a small number of KWRAA members interested in teaching young people about aviation. I have asked Dan Pfohl, who is heading up the new program to come out to our next monthly KWRAA meeting to explain the proposal. Lesson plans are being developed currently, but Dan will show us some of the facilities and teaching aids that will be used and is open to suggestions about how the props or lessons might be improved.

Teaching the program will require a commitment of one day per week from 9 am to 2 pm or so, working closely with the other instructors from the Youth Aerospace Program.

As part of the grade six curriculum, the school teacher will be present and be responsible for discipline and control should unforeseen issues arise. The number of educational assistants and parents that are present may be a function of the level of abilities of those students in each class.

The overall class (20-30) may get some instruction first, but the class will be broken up into manageable sized groups (5-10) and assigned a station for each theme, then rotated through each of the stations as they learn about each of those themes.

Note: Vulnerable Sector Checks are required.

KWRAA Involvement:

During the pilot period (Easter until June), one or two volunteer instructors from KWRAA will be required to assist in delivery of the program. If the program is successful, more instructors will be required next year. This is not expected to be onerous on any one individual, but rather a distributed effort to provide quality instruction to the students on basic aviation related topics that address the needs of the Ontario grade six curriculum.

Other Plans (after the pilot ends):

It is hoped that the lessons learned in this pilot will allow expanded programming for both junior and senior groups within the Cadets to get advanced instruction on other more advanced topics like aircraft propulsion systems (using donated engines at the CYDC), Aircraft design and systems (using donated airframes at the CYDC), Avionics and Comms (Using donated equipment at the CYDC), etc. Some of the donated equipment could be repaired/modified by KWRAA to create suitable teaching aids.

Conclusion: This looks like an interesting and exciting program for KWRAA to get behind. I look forward to hearing what Dan Pfohl has to say at our next meeting! ...See you there!

2023 AAIR Reports

Aircraft owners that have tried to file their Annual Airworthiness Information Report (AAIR) were greeted with this message on Transport Canada's website:

“PLEASE NOTE – ANNUAL AIRWORTHINESS INFORMATION REPORT (AAIR) PROGRAM FOR 2023 IS CURRENTLY ON HOLD

Submission of your data for the reporting period covering January 1st, 2022, to December 31st, 2022, is not currently required and an exemption to this requirement will be issued shortly.

Transport Canada will not be providing the AAIR Form or any support for the program this year.”

AAIR reports were previously required from the owners of all Canadian-registered civil aircraft, but the reason for the change was not stated. Information previously supplied stated that there was an issue inputting all of the 2022 AAIR report data, but they did not say if it was a technical issue or a staff shortage.

Regardless, we are all off the hook for now on filing AAIR reports for 2023.

Upcoming Events in 2023:

- Highlighted lines are KWRAA Events*
- Bolded Lines are KWRAA Fly-ins*
- *Fly-in Data Sheets are available on the KWRAA website at www.kwraa.net*

Mar 28–Apr 2	-	Sun-n-Fun 2023
April 13	-	April Meeting at 7:30 in the Cadet building at CYKF
May 11	-	May Meeting at 7:30 in the Cadet building at CYKF
May 27	-	Swap Meet and Fly-in at CYEE (Midland)
June 3	-	KWRAA Fly-in at Tom Shupe's (Mount Forest)
June 18	-	Father's Day Fly-in at CNC4 (Guelph)
July 8	-	KWRAA Fly-in at Largo Woods - CLW6 (Winterbourne)
July 24-July 30	-	Oshkosh Air Venture 2023
Aug 5	-	KWRAA Fly-in at Juergensen Field CPG7 (Fergus)
August 18-20	-	UPAC Convention 2023
Aug 26	-	KWRAA Fly-in at Largo Woods - CLW6 (Winterbourne)
Sept 2	-	KWRAA Fly-in at Deming Field – CDF6 (Damascus)
September 14	-	September Meeting at 7:30 in the Cadet building at CYKF
October 12	-	October Meeting at 7:30 in the Cadet building at CYKF
November 9	-	November Meeting at 7:30 in the Cadet building at CYKF
November 24	-	KWRAA Christmas Party – Details to follow later in 2023

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

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.