



# RECREATIONAL FLYER

Issue 1 2021

Recreational Aircraft Association Canada [www.raa.ca](http://www.raa.ca)  
The Voice of Canadian Amateur Aircraft Builders \$6.95



# Bushcat





## From The President's Desk

Gary Wolf RAA 7379

**DRONES, also known as UAV or RPAS.** Drones are legally aircraft and their operators are legally pilots and they now have access to certain airspace. Non commercial operations are limited to 400 ft AGL but a search of the CADORS will show that they are frequently seen at thousands of feet altitude. The Basic license has a minimum age of 14 and requires that the applicant answer 35 questions at his own computer without any oversight or assistance. There is no requirement for a ground school or flight test. If the applicant fails the 35 question exam he may rewrite every 24 hours until he passes, at a cost of \$10 per time.

The successful Basic pilot may then operate a 55 pound drone in Class G airspace with a ceiling of 400' AGL in Day VFR and if the drone is suitably lit, in Night VFR, and there is no requirement to carry liability insurance. This pilot may also allow someone younger than age 14 to operate the drone as long as he provides oversight.

At age 16 an applicant who successfully answers a 50 question exam on his computer, and then has a flight review by an independent examiner, may perform commercial operations, even in controlled airspace if the tower allows. The pilot may fly as close as 5

metres from people and directly above them. Again there is no insurance requirement.

Both categories of pilot may fly close to your runway as long as they do not interfere with normal airfield operations. If you read the drone article in the latest Aviation Safety Letter you will see that GA pilots are now being admonished to stay within the parameters of standard circuits, even on our own property, so that we do not interfere with the drone operations of a 14 year old uninsured freshly minted Basic drone pilot who wishes to make use of it. Clearly the tail is wagging the dog here but that is the current situation that has been approved by Transport Canada. Google and read:

*Transport Canada TP14371E which is the October 8 2020 AIM dealing with drones*

*Aviation Safety Letter 2020-4, article by Shaheen Chohan, Aviation Safety Policy Analyst*

*Notice of Proposed Amendment, Remotely Piloted Aircraft Systems, Lower-risk Beyond Visual Line of Sight, April 2020.*

### KENT FLYING MACHINES, RAA 4975

Larry VanGerven and the members of RAA 4975 have taken on the task

of handling the membership mailings for RAA Canada. This is somewhat difficult in these times but they have maintained suitable precautions and have persevered. We all owe a debt of thanks to these RAA members.

### CHAPTER STATUS REPORTS AND INSURANCE

RAA has just renewed the \$5 million chapter liability policy that covers all chapters that have status. To attain status is simple. Email or mail a statement with the names and membership numbers of five current National members, specifically the President, Treasurer, Secretary, and two other specifically-named members. In addition send in a full list of chapter members with their contact information. When that has been accomplished your events and meetings are automatically covered. If emailing please send to garywolf@rogers.com. Snail mail goes to RAA Canada 22-4881 Fountain St North, Breslau ON N0B 1M0. Covid has caused some questions from chapters about liability. It is very rare for any liability policy to include coverage for a pandemic, and this policy is no exception. It is very unlikely that your homeowner's or business policy has coverage either so it would be prudent to review those too.

### ROTAX 912-914 and 2 STROKE CARB FLOATS

Rotax has issued another Mandatory Service Bulletin to deal with 9-series and 2 stroke carb floats that appear to be absorbing fuel, and gaining weight that results in delayed closing of the

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George Gregory at gregdesign@telus.net.

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is to promote education and safety through its members to the general public. Opinions expressed in articles and letters do not necessarily reflect those of the Recreational Aircraft Association Canada. Accuracy of the material presented is solely the responsibility of the author or contributor.

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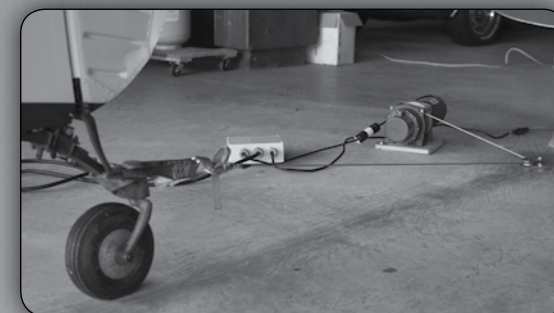
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George Gregory

An Alon AirCoupe (as opposed to the Ercoupe) at Arlington.  
On the cover: The latest iteration of the Bushcat, featuring the enlarged tail





Scott Knowlton's

# Pietenpol Aircamper

**T**WENTY YEARS AGO in my late thirties, like many aspiring homebuilders, I surfed the internet in search of not only the perfect homebuilt to scratch my flying itch but also the method of construction that would most suit my building capabilities. Ideas were all over the map – plans build to quick build kit, vintage wood and fabric to sleek fiberglass and auto conversion to true aero engine. One distinct issue with the internet – even the early search engines of 2003 were such that it could quickly send the “researcher” down a rabbit hole of infinite conflicting information and ideas. Mired in the paralysis of too many choices I resorted to the age old method of decision making and built a list of wants

and needs, tempered by my skill level as a builder and current financial situation. I stared at the graph paper pad in front of me and absorbed the words I had jotted down: I like working with wood; I like taking passengers for a discovery flight; I am a new airline pilot with a family on a tight budget; I like vintage airplanes; if I wanted to fly fast I would use one of my airline passes. This list helped me to eliminate many of the sleek machines mostly built from a kit. In fact, my financial situation eliminated the idea of a kit purely based on the initial cost of pulling the trigger on such a large purchase. I was hoping for a building hobby with a cost limited to \$1000.00 per year and a plans-built airplane evidently became my only option. My

enjoyment of woodworking and tool inventory in my sparse shop further narrowed my choice for the perfect homebuilt. Finally, the internet search came full circle and all answers pointed to the venerable Pietenpol Aircamper, a design out of Cherry Grove Minnesota from 1929.

I convinced my wife that a set of Bernard Pietenpol's plans would be a great 40th birthday gift for me and soon was happily preparing my shop for what would become almost two decades of fulfilling building. Anyone considering such a project should not look at my timelines with trepidation or concern that building an airplane is a life long commitment. My build often took place 15 minutes at a time while renovating our home, raising our

*I convinced my wife that a set of Bernard Pietenpol's plans would be a great 40th birthday gift for me*

son, being a husband and flying a full airline schedule. Some big building sprees took place when my wife was away with work or off at a girl's weekend and truly the project didn't take on an earnest pace until my son left home as an adult. Nevertheless, the project was a large part of my life throughout with many satisfying winter days spent happily in my shop steaming thin pieces of Sitka spruce for the ribs, lofting the elevator or rudder or applying that first coat of spar varnish on a finished piece and watching it magically “pop” as the finish highlighted the lovely golden grain of the spruce and aircraft plywood.

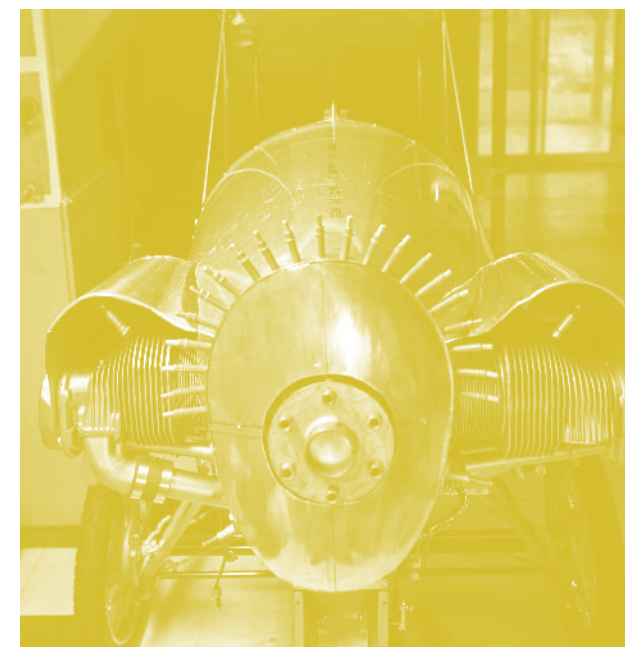
An airplane project is essentially a collection of three things: parts, skills and friends. I soon became an expert on the local supply of straight grained spruce and aircraft plywood and developed a routine of searching the typical internet sites for turn-buckles and strut fork ends while attending Oshkosh fly-marts with a long list of bolt sizes and lengths. I learned how to grade wood, mix epoxy, clamp only so tight and even became a relatively good oxy acetylene welder. The true surprise of the project, however, were the very close lifelong friends I made in the process of building. Common ground is the biggest ingredient of a friendship and every builder

in my community shared my love of fabricating parts in their shop. These fine people migrated from local airfields to my shop, my home and dinner table and in to my life. What an incredible fringe benefit of building!

As life continued and my finances began to improve with modest gains in my flying career I was able to purchase a relatively low time Continental C-85 from a fine fellow in Sault St Marie. A friend from the airline who also taught me to weld was very good around engines and together we dismantled and inspected the power plant and gave it a fresh top overhaul. Another friend rebuilt my carburetor and magnetos. The fuselage once on the gear all but filled my little single car work shop so another good friend agreed to keep it in his heated walk-out basement where he proceeded to help me with rigging, fuel system, engine install and cowl fabrication. This left me with room in my shop to assemble the wings.

When the time came for fabric I reflected on a few instances where I helped a friend doing fabric work with an MEK based covering and paint system. My marriage would certainly be strained if that harsh odour made it in to our home which it was bound to do. I settled on Stewart System's which consists

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# Piper "Annual"

Mike Davenport

IT WAS ANNUAL TIME ONCE again and the hard working Piper really did need some attention. It spends its time in the far north far away from the prying eyes of those who enforce the regulations but even the most optimistic of those northern types would say that it needed some work.

It started out simply enough. New fabric on the wings and tail feathers, again because it spends all of its time outside in the weather. A quick coat of paint and it's done. Right? Not so much.

The AME involved subbed the fabric out to my friend Werner who

due to his Germanic heritage does tend to favour the following particular but simple response. "If it looks bad – it is, so fix it".

As it developed the fuselage cover needed numerous repairs and all the metal bits – cowlings, nose bowl, boot cowl and gear fairings all looked like they had been "rode hard and put away wet" one too many times. There had been a prop strike as well and so the engine had to have some attention and when that occurred, it became clear that the baffles could also use a little love.

Time and health issues may have



taken their toll on Werner's body but not his mind so he sees what needs doing and can be rather insistent about making it happen. He has to use a cane most of the time now so when in need of a hand, he asks a close friend to help out. Dan Holliday has done this type of work in the past (See People Places and Planes – A Canadian Staggerwing) and he can be given a task knowing it will be done right the first time.

At times, it looked to the casual visitor (me) that they were trying to make a silk purse out of a sow's ear or to put it another way, putting lipstick on a pig. In fact Werner was accused of doing just that when he installed red flex seals on the engine baffles. That generated even more discussion about a possible logo on the boot cowl showing a big red lipped pig. One was actually obtained off the internet and just for fun, temporarily placed on the fin. However at the end of the day it all came together as a safe, functional aircraft that can go back to work earning

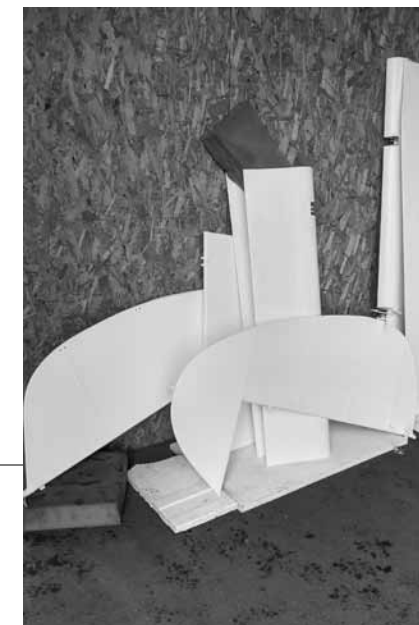
an honest living once more.

Getting it back to the airport for reassembly was the next step in this somewhat extended annual.

Without further drama the Piper's fuselage was loaded on a trailer and towed to a hangar at the Abbotsford airport. The trailer, borrowed from a neighbour was the best I've used, ever. It was a professionally built tandem axle unit complete with ramps and a winch. It probably weighed 3 times more than the load we put on it and towed like a dream. If you need one, be sure to borrow your neighbour's.

Once at the airport, the fuselage was unloaded and carefully placed in the hangar where most of the bits and pieces were already stored.

Some parts still had to have a little more love and attention given them. For example, the paint on the wing tips wasn't curing properly and needed to be redone. Something about the hardener missing? So they had to be stripped and redone.







Top: Werner with Dan Holliday; left, with Gil Fanslau

Now starts the fun bits – hanging and rigging the wings, reinstalling flaps, ailerons, elevators and rudder and making sure that each moves appropriately. What could possibly go wrong?

Well for one, we had two right elevators – well, not really but the left one had the drain holes on the wrong side, so that required another trip back to the shop. For another we needed all of the AN hardware and of course that also was in the shop. Ailerons and flaps wouldn't fit. I mean come on, these came off there, why won't they go back on? Perhaps shrinking the new fabric changed the geometry somehow? And besides that the special ordered pins (Piper part #) were too short. Gawd, aren't airplanes fun!

To lift the wings into place, well we needed 6 guys for that – 4 to lift each panel and hold it in place while the other two struggled with the bolts. The bolts wouldn't fit in the wing attachments – too much paint, not on the bolt – in the hole. Same thing happened with the struts. Try sorting that while 4 guys are holding the wing over their heads. Sure glad they were strong as well as patient although the language did get a little coarse. Eventually though, it got done and by then it was lunch time.

All that was left now was the myriad of little things; connecting flaps and ailerons to the controls, fuel lines and Pitot tube, electrical lines for lights, wing fairings and engine cowlings and on and on it goes until finally it somehow was done. Once all the work was completed, it was flown to a hangar in Langley. It will spend the winter there and then go back north in the spring. Makes sense somehow, I mean, who really would want to go to the Arctic in the winter?

This airplane has suffered many trials and tribulations in the past (see April 20 Bits & Pieces – A Mobile Home for Mickie & Minnie) and perhaps it is overdue for a better future as it goes back to work in Canada's far north. This extended annual has certainly been a good start.

And I promise no more remarks about "lipstick".

*Mike Davenport has been involved with the BC's Lower Mainland aviation scene for decades and has worked with Chapter 85 (Vancouver). He flies a creampuff Stinson 108.*



# Drones and our private aerodromes

THERE IS A LOOMING THREAT to our continued use of unregistered aerodromes, that threat being the drone industry. In the past five years they have been lobbying Transport Canada for more access to airspace and they want more freedom to fly beyond line of sight. BVLOS (beyond visual line of sight) is the holy grail for drone operations, and last summer RAA wrote a position paper to Transport Canada to explain the problems with these operations. The drone industry offers that their aircraft have collision avoidance but at present the technology is patchy. A member who is very familiar with commercial drones says that they will avoid a tree that is in leaf but a tree that is bare is at the low end of their avoidance capability. A drone is now legally an aircraft but for some reason drone operators are not currently required to carry insurance. We all think of drones as something that can be thrown into the trunk of a car but last spring they were asking for an increase in gross weight to nearly that of a Cessna 150. Drones are no longer toys – they are aircraft.

There is a lot of money behind the drone industry and they have had great success with these approaches and they want more. They are much better financed and organized than General Aviation and there is a lot of money to be made. The latest is that they are proposing to have dedicated airways for their exclusive use, to provide courier services in cities and across Canada.

There was recently a small article in the Kitchener news about a company that is mapping proposed airways for the exclusive use of drones. I pursued this and found their website, [www.airmatrix.ca](http://www.airmatrix.ca). The company has been attending Transport and Nav Canada meetings and it looks as if they want to control low level drone operations in the same way that Nav Canada controls conventional aircraft airspace. At present the money is in routes to deliver products within cities, the advantage being lower machinery and employee costs. The same advantage exists outside of cities where the cost of operating delivery trucks is onerous, so it is not a stretch to consider that the drone industry will also want routes there.

At present the industry is laying out possible airways and it is assumed that they will not interfere with normal GA and commercial flights. To this end they are using the CFS and that document that shows the locations of *registered* aerodromes. The problem is that they have no way of knowing the location of unregistered aerodromes of the type that many of us have on our own property, so they will go ahead with whichever routes are most efficient for their operations.

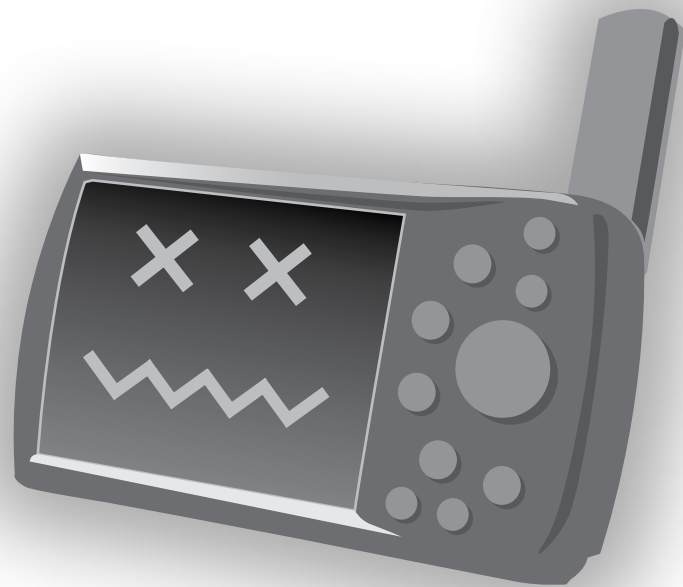
Unregistered aerodromes already have problems when commercial entities seek to install wind farms or communications towers that conflict with our use of our own aerodromes, but these are small change compared to what can happen when drone operators want dedicated airways. Once these airways go into effect it is entirely possible that a pilot could find that he can no longer take off from his own runway, and that his hangar has become in effect a storage unit for an aircraft that can no longer fly.

The regulations governing aerodromes changed in January 2017 but an aerodrome in operation before that date can easily be registered. The process is explained in Transport's document AC 301-002. You would do well to google and print this, and I encourage all aerodrome owners to get moving on this quickly. Most of the work can be done by email.

Transport's AC 301-002 estimates that there are some 6000 airfields of all types in Canada, but only one third are registered. There could be a lot of aerodromes rendered unusable if pilots do not take action to register. If you value your freedom to fly I encourage you to do this before drone airways are put in place.

Gary Wolf





# WHEN YOUR HANDHELD GPS SCREEN SUDDENLY GOES **BLACK**

Fred Grootarz

**PICTURE THIS SCENARIO:** You are flying under VFR on a cross-country trip and follow the pre-programmed route/magenta line on your trustworthy handheld yoke mounted GPS. For over two years it never failed on you. Suddenly, without warning, the screen turns black on you.

## The Distraction

First things first, you say to yourself: Let's quickly trouble shoot the problem. You check that there is still enough battery power in the unit. Oh yes, you tried to be one step ahead of things and always have the unit plugged into the USB port / cigarette lighter adapter during flight. You confirm that the cable is connected properly on both ends. Nothing happens. Perhaps the plug has an electrical connection issue or perhaps the wires have a little shortcut somewhere. Then you quickly reach into your flight bag for the little back-up battery you always keep charged in there. Assuming you find the charged battery without a lengthy search, you connect it to your GPS. That should work. But it doesn't. The screen remains black. Turning the GPS off and rebooting it doesn't bring any new results either. You finally have to admit to yourself that the GPS is dead, at least for this flight.

Remember, the GPS is not your primary navigation tool, although many of the latest versions can lure you easily into believing that. The handheld GPS should complement your panel navigation skills and be considered an alternative tool which gets its data from satellites, a different source

from which your older panel instruments get it.

## The Dilemma

Looking again outside your window, you realize that your situational awareness is no longer something you can count on at this moment. This may be compounded by the fact that the approaching weather has turned a little hazy. While you can clearly see the ground below you, your forward visibility is down to an estimated 5 to 7 NM. Those prominent landmarks in the distance are no longer visible.

Your little trouble shooting exercise has taken your eyes away from looking primarily outside the window to inside the cockpit focusing on the malfunctioning GPS. That distraction has resulted in getting you a little off course, perhaps also changed your altitude a little. And the by-now hazy skies around you prevent you from recognizing those distant landmarks you would otherwise have seen. In other words, your situational awareness is (at least temporarily) gone. Meanwhile you continue to fly roughly into the same direction as the magenta line used to guide you, or at least you think you are. Reality is that you have to admit to yourself that you are lost.

Any idea what to do next and how to get you back on track?

## The Alternatives

If your malfunctioning portable GPS is an iPad, chances are that your cell phone app is paired to the iPhone's GPS, allowing you to follow the same preset track including the magenta

line, and supplementary flight information like altitude, heading, speed etc. You can easily steer the little airplane icon (now off to the side) back on course and continue your flight as planned. Problem solved.

If your handheld GPS is a specific standalone aviation unit (like Garmin or similar make), your cell phone is most likely not paired with the handheld GPS. In this case your cell phone should have (as a backup) an independent app with another moving map and magenta line if you program in the route you want to fly. That's another way of solving the problem.

If you are not already on Flight Following, contacting ATC is probably the best advice to get your situational awareness back. It requires that you have a transponder and a radio. Otherwise this option is not available. Tell ATC what happened and ask for vectors to get you where you wanted to go to in the first place.

Of course, besides all these new very efficient handheld electronic cockpit devices, there is still your panel with the 'six-pack' made up of the old steam gauges. Since most of the older private VFR-only GA airplanes do not have an expensive panel installed GPS, flying is based on old school navigation techniques with dead reckoning using compass, attitude and heading indicator and a sectional paper map and CFS to get you safely anywhere.

The problem is, however, that these old fashion pilot navigation skills have often been eroded and replaced by the convenience of the portable GPS with

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## Ask yourself this question: do you still have enough skills and proficiency to fly the old fashion way when your colorful GPS moving map suddenly goes black?

that fantastic moving map and the ever so popular magenta line display. And many of these 'electronic' flight bags include all sorts of VFR maps, airport diagrams and information otherwise found only in the paper version of the CFS.

Ask yourself this question:

Do you still have enough skills and proficiency to fly the old fashion way when your colorful GPS moving map suddenly goes black?

Consider yourself as the reliable alternative when this happens, and be mentally prepared for it, just like if the engine may quit unexpectedly and you have to execute a forced landing. Remember time is of the essence in those situations. Every second thinking and wondering what to do next cuts down on your actual available time left to deal with the situation. That's why it helps to practice simulated GPS failure events now and then with a qualified instructor, so you know what to do instantly rather than wasting valuable time trying to figure out what to do next.

### Case in Point

Many VFR pilots who own their airplane do not have a panel mounted GPS. Instead they have purchased one

of the many available portable GPS units. Most of them have these GPS units yoke mounted. That makes for clear viewing and allows for re-programming or adjusting during flight if required. The relatively small size does not obstruct the view to any of the instruments on the panel either.

For the convenience of the pilot, these GPS units also display heading, speed and distance to then next destination or waypoint including the time it takes to get there. Their menu offers a lot more available information. Just follow the magenta line and you stay on course. Should you find yourself off line a little, simply adjust your course a little to get back over the magenta line.

Before long, the little GPS draws your eyes on it and replaces the otherwise scanning view at the panel instruments. That little GPS now has now become your convenient primary instrument panel. The tendency is for your brain to match up what you see on the little moving map with what you see outside; not the other way around.

Reality also, is that your brain focuses on the magenta line on the moving map to manage your on-course navigation. You are much less

concerned with the actual heading degree you are flying. You may look from time to time at the actual distance left and perhaps also the time it will take to get there, and you know that the heading is OK as long as you follow the magenta line.

All this is gone once the GPS has gone black. You now have no choice but to continue navigating by the panel's steam gauges. Don't forget to look out the window too. After all, you are flying VFR.

You may suddenly see a recognizable landmark which may help you get back on course. Meanwhile you are trying to figure out what the correct heading is that you should be flying. Most of the time that number is not really stored in your memory for this flight. Therefore it helps to know the anticipated heading before each leg. Write it down on a piece of paper on your kneepad. Your paper sectional map, if you have one on board, is probably outdated and out of reach resulting in your old-fashioned 'moving map' back-up (in paper form) is not available either.

To avoid falling into this trap, make it a point to know the heading (Desired Track- DTK) of each of your legs. Set your heading bug on the current heading, if you have one. You can always make some small wind corrections if you feel the wind is pushing you off course. But make sure you know which way the wind is blowing you off course, so you can figure out the direction it will take you if you don't make any course correction. It will help to anticipate any prominent land marks you may look for outside the window (a town, river, lake or

railway line etc.).

Know that heading number for both directions of your flight. For example, on the way to the destination it's 330°. On the way back the heading is 150°. Knowing the NM distance of the leg will allow you to estimate the approximate flight time in the air and when and where you will see familiar land marks to confirm you are on the desired track.

If ATC gives you vectors, make sure you write them down or put the heading bug that way. While navigating in that direction, it allows you a little more time to look outside the window for available landmarks confirming you are on the right track to your destination.

### Complacency Kills

It finds vulnerability in the comfort of past success and plants itself in the crevices. It wants for you to develop over-confidence, to lose sight of the dangers around you, to become unaware of the deficiencies you have developed. The only time for complacency is after the A/C is tied down or parked safely inside your hangar again.

Safe Flying! 

*Fred Grootarz is the president of RAA Chapter 41 based in Brampton Airport. Fred does an annual tour of Ontario chapters to present Transport Canada approved recurrency seminars for RAA members.*



## PEOPLE PLACES AND PLANES



by Mike Davenport

This book is about my journey as a private pilot with an all-consuming interest in anything relating to flying. As the cover says; it is about the people, places and planes I have met through flying.

**Judge, 27<sup>th</sup> Annual Writer's Digest Self Published Book Awards made the following comments:**

Judge's Commentary:  
The author's passion and knowledge shine through on every page. He provides historical context for the airplanes as well as a well-rounded portrait of his subjects and an excellent history of Canadian aviation. Each chapter includes nice color photos of the pilot, planes or institutions being profiled.



The book is available for \$29.95 plus \$5.00 for postage. Send \$34.95 to:

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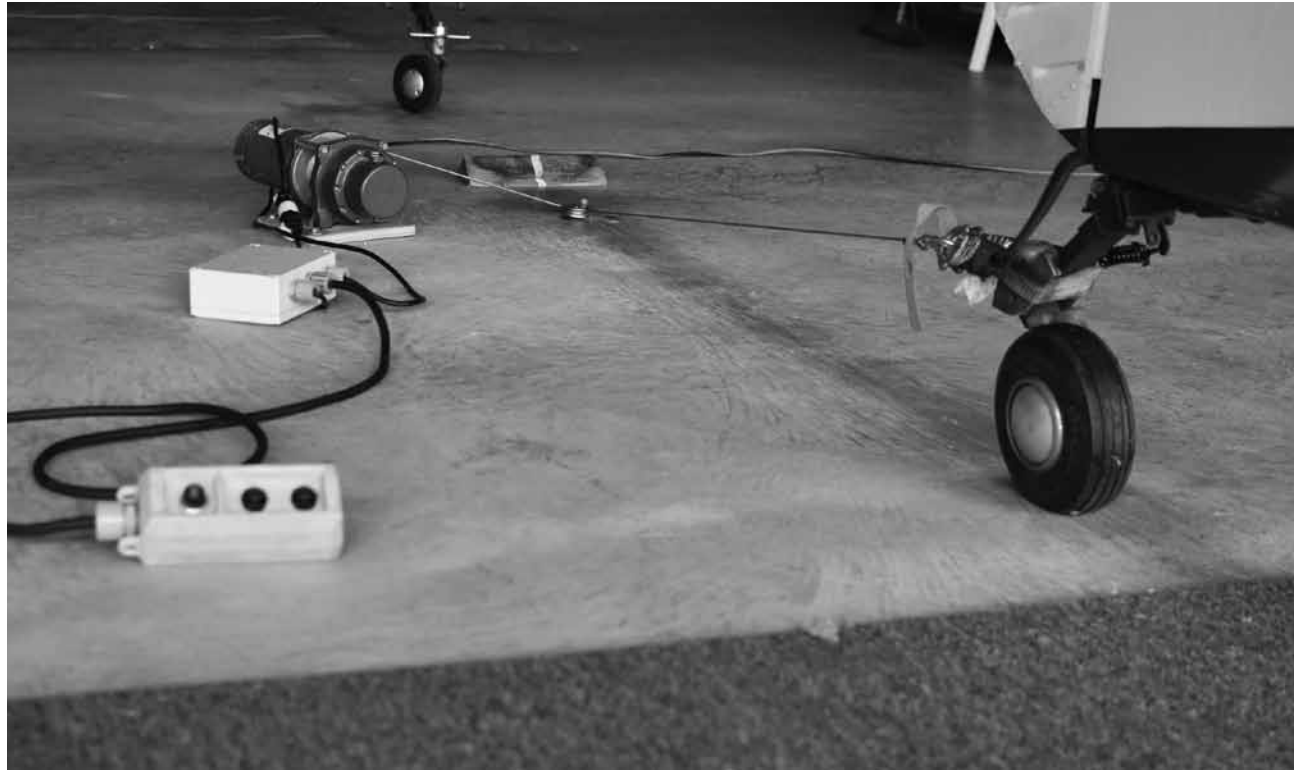
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# Home made Hangar Winch

Mike Davenport



A FEW YEARS AGO I was faced with an upcoming back operation and I own a fifteen hundred pound airplane; what has one to do with the other?

Well, how can I go flying if I can't put the airplane back in the hangar at the end of the day? That was the question that had to be answered before the operation. I mean, really, one must deal with the important issues of life – right? Never mind how long it will take to get healthy again after surgery but more importantly, how in heck will I put the airplane away. This flyer's life is all about establishing priorities.

In front of my hangar is a short ramp that pre-operation was never considered to be a problem – back wise that is. Perhaps the solution would be to install a winch so that I could tow it up that rise and back into the hangar. That raised yet another question; how to rig a winch to tow the airplane up that slight ramp and back inside the hangar? There was another small problem to be solved. Because of the layout of our "all common area" open style hangar – there are no interior walls on which to mount a winch.

Someone else once said, "Where there is a will there is a way" or was it "necessity is a mother"? Something like that.


The winch would have to be mounted on the floor but there is no room behind the plane because there is another airplane tailed in just inches away.

It quickly became obvious that the winch had to be off-set to one side and the cable would have to run through a pulley and thus on out of the door to the tailwheel. A loop around the tailwheel assembly and then the plane could be towed straight back into the hangar. The operator (me) would have nothing heavier to stress his back than the winch controller.

A quick trip to the local auto parts store supplied all of the necessary parts: winch, cable, pulley, anchor, bolt and a concrete bit (to drill the hole in the floor). This also required a 12 volt battery as all their winches were for automotive use and didn't run on 110 volt. Not a problem as we have power in the hangar and I can put my battery tender to use to keep the battery up to snuff.

Like all good ideas, this one was so simple that it worked. Because the cable is lined up with the center of the bay and is hooked directly to the tailwheel, it pulls straight back with no concerns about hitting the wing tips on either door frame.

Sometime later a hangar mate offered a larger industrial-quality 110v winch for free and since it would be considered churlish to refuse, I swapped it out with my original from the auto store and that is the one you see in the picture.

It works like a charm and is infinitely controllable and most importantly stresses my 76 year old back not even a little bit. 



# Dave Knight's Volmer

Tom Knight



MY DAD IS 87; when he was a young man he helped install the first radios in Toronto police cars, we had a few jobs they were technical in nature including working on the radio attenuation on the Avro Arrow.

He got interested in general aviation in the Late 50's - early 60s and by 1962 decided to build the hottest new kit plane - a Volmer sportsman (The designer by the way also designed the Star Trek - starship enterprise ) with a friend Wolf Browne from just plans. They actually built two side-by-side in Wolf's garage and flipped a coin at the end. Dad picked his registration based on his initials so it was CFDRK.



They won the Keith Hopkinson award for the best home built that year.

They finished in 1966 and dad went on to fly his until the early 80s when he had to sell it for financial reasons. He had many adventures including flying in the Toronto airshow with the two airplanes in formation.

Later in 1990 when his son (me) started flying commercial cross country at college he got interested in aviation again and got himself a Cessna 172. CGSEX.

(As a sidenote the first jet airplane I flew was an Airbus a 320 which I did circuits in the middle of the night at Edmonton airport in fin 204 which had the registration CFDRK. It turns out that the sportsman had been sold to somebody in Florida and the registration went back in the pool so that when Air Canada bought it's a 320s they just grabbed a random one and it happened to be his old one).

Anyway in the late 1990s he retired and wondered where his old airplane was.

He was able to trace it to Florida

where it was in pieces. He thinks it was used for the drug trade but I think that's just embellishment. Anyway he found the sister ship CFWVHB in a barn in Guelph. It was in pretty tough shape hadn't flown in 16 years so he bought it and spent the better part of 10 years refurbishing it.

The list of improvements he did was mine boggling.. here are just a few

- Redid the wings, including replacing the wooden spars to aluminum I beams

- added a tuned exhaust and muffler and redid the cowling to fit

- increased rudder size


- added numerous systems like auto bilge, gear warnings, marine and CB radios, fuel flow and Engine monitoring system, Electrical gear retract etc.

He documented everything and probably had hundreds of CAD schematic drawings etc. for the changes he done. I think there were 7 three ring binder's full of building notes and diagrams.

If you gave him a dollar an hour

for the time that he put into that airplane he would be a millionaire. That's probably true for most home-builders but in this case it's not far off.

In 2010 to 2015 we had her up and flying quite a bit and it was still working perfectly. Dad decided however that he wasn't flying it enough (He was in his 80s by this point ) and he put it up for sale. After the second year with no offers the price came down and we got a few bites, but I did the test flight after the annual inspection in 2016 and a screw that had been replaced was left under the cowling and came free. It hit the big constant speed prop and left a permanent mark. So we didn't get any bites after we advertised it suggesting it needs a new prop.

So it broke my heart this summer when we decided to scavenge some of the instruments out of the aircraft to go into my ch701 which needs a new instrument panel as his granddaughter is using it to build her time for her ATPL. The engine and aircraft however are still in great shape if somebody wanted a bit of a project. 







## Homegrown Hysol Dispenser

Dan Oldridge KW-RAA

WHEN I STARTED BUILDING my Highlander nine years ago, the epoxy used to fasten many of the parts together came in one litre cans like those used to hold paint. Dispensing was simply a matter of digging out an appropriate amount of each component to mix, then replacing the lids. Recently, I found out that the main supply of Loctite EA9460 (Hysol) now comes in dual cartridge 200ml containers with a common outlet designed to accept a mixing/dispensing tip.

The idea of having the epoxy dispensed at the correct ratio is appealing of course, but these cartridges present an interesting challenge... how to dispense the contents without having to spend a small fortune on a mixing gun too. The applicator gun for the 200 ml cartridges sells for upwards of \$300, with the optional tips costing an additional \$3 or so each if bought in a

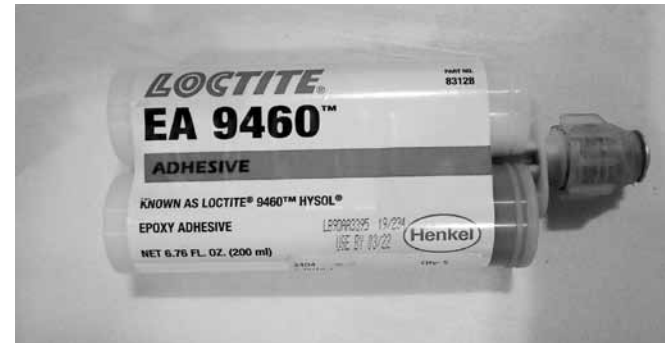
quantity of 10 or more.

I came across an idea that used two dowels to squeeze the contents out of the cartridges and I adapted a squeeze clamp (12" ratcheting locking bar type) to do the work easily. I simply mounted two 6" dowels using 3 1/2" long screws through a 2" x 4" piece of 3/4" plywood at a spacing to fit the tubes. A small groove is then cut into the centre of one side of the plywood block to act as a guide for the bar clamp.

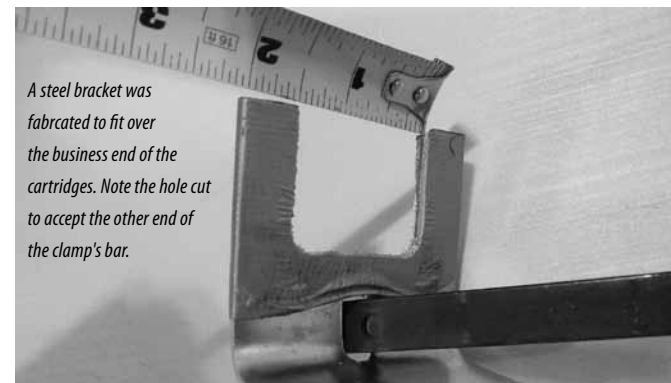
I adapted a small steel bracket to fit over the business end of the cartridges, but I'm sure it would be quite easy to fabricate a bracket using a scrap piece of steel or heavy aluminum about 1/8" thick. Cut a slot 1/2" wide on one side of the bracket, at least 1 to 1 1/2" deep. I added a little duct tape on the bracket to tighten up the fit into the cartridge slots near the tip of the cartridge. Cut a

small rectangular hole about 1/2" below that just big enough to pass the bar clamp through (remove the pin and reinsert it once through).

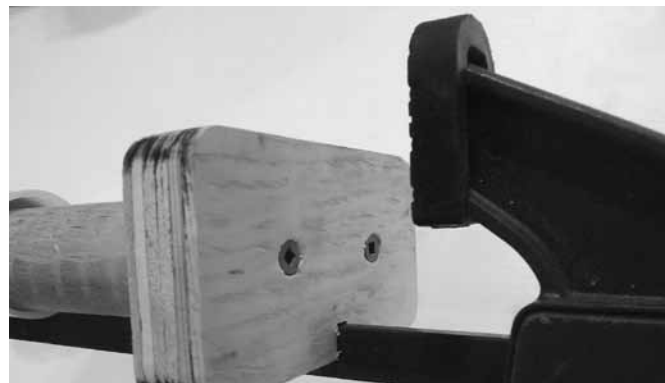
Now, simply insert the dowels into the cartridges and use a little duct tape to hold down the cartridge into your dispensing tool. Remove the cap and squeeze out as much epoxy as required to do the fastening job. I'm sure the tips that are available do a great job, but I just use mixing sticks... old habits die hard. Besides, with the 6" tips installed on the dispenser the whole thing gets a little unwieldy especially in tight spaces. If you are not using the specially designed tips, make sure you use different sticks to clean out each half of the cartridge before re-capping it so you don't contaminate the contents and accidentally glue the screw cap on. Use a third stick to do the mixing and application.




Above: Hysol now comes in 200 ml tubes: the store bought dispenser for said product pictured here goes for a cool \$300. there has to be a better way.



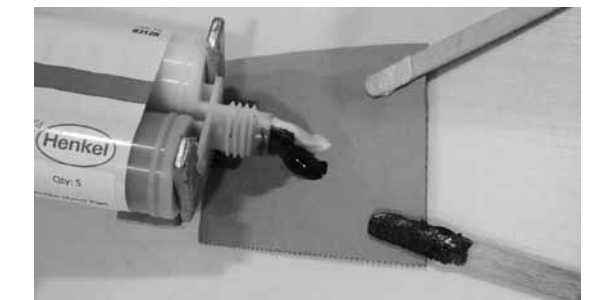
A steel bracket was fabricated to fit over the business end of the cartridges. Note the hole cut to accept the other end of the clamp's bar.



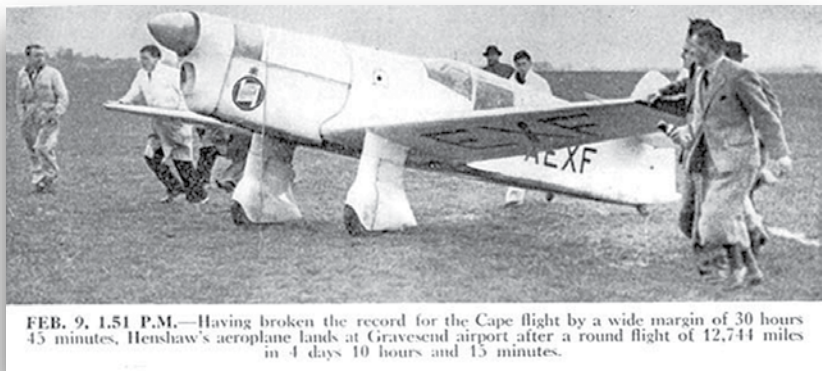
As always, I could just go out and buy the tool, but \$300 will fill the plane up three or four times! It's all about having priorities. 



A set of plungers were made out of wood dowling and mounted on a plywood base that has a notch cut in it (below) to slip onto a hardware store bar clamp.







hawkrestorations.co.uk

## Disjointed Thoughts

Bill Weir / Slipstream Newsletter

LAST MONTH'S STORY by Chris Stains about a hot rod Jodel with its Rotax 914 engine brings several thoughts to mind. That member Jack Schenck has built and flown a Jodel 11 and has generously taken many of us for a ride in it. I enjoyed my ride immensely. It left an aroma of hot oil with a trace of exhaust that I savoured every time I put on the coat I had worn. That was real flying at its best. Another time Jack landed at my strip and took Phyllis for a flight. Phyllis's son Nigel and Jack were acquainted through some connection and Nigel was there to take pictures. He took a picture of Jack's Jodel 11 in the air [riding in my plane] and of Jack with Phyllis together in the Jodel after they had landed. These pictures went with Jack's story of building his Jodel 11 that he did for Rec' Flyer.

The Rotax 915 is the engine that Chris Staines has selected of his

Pereira GP4 His reasoning being that this engine weighs less than the usual Lycoming 360 making for an aircraft with less overall weight and being turbocharged maintaining its power at altitude whereas the un-turbocharged Lycoming loses power. The outcome being that Chris's GP4 has performance at least equivalent to a Lycoming powered one but with lower fuel burn and subsequent greater range.

There was a time when a flight of any distance was a serious challenge and its participants became international heroes. Among these, Charles Lindbergh is probably best known but my hero is Alex Henshaw who flew his Mew Gull from Gravesend, England to Cape Town, South Africa and return with an overall time of four days, ten hours and sixteen minutes in February 1939. At a later date, Henshaw issued this challenge, 'I defy anyone to better my time England to South Africa and return flying solo in an aircraft with 200 horsepower or less.'

Henshaw's record stood until Charles Stoddard flying a Pereira GP4 accomplished the round trip, only Cape Town to England and back in 3 days, 15 hours and 17 minutes on 2009, May 11. His record stood for only a short time until it was bettered by Steve Noujaim with a time of 3 days, 11 hours and 16 minutes flying an RV 7. I have been unable to find out anything about Stoddard's GP4, only that it was 'modified'. The impression from what I've been able to find about Noujaim's RV 7 is that the plane was especially built for the flight. In any case the difference between the two

times can probably be explained by luck more than by the merits of either aircraft or its pilot's ability.

Both Stoddard and Noujaim are sixty year old experienced airline pilots, compared to Henshaw's 27, flying planes with full Garmin instrument panels and Storm scopes to avoid the equatorial convergent CBs such as the one Henshaw flew into and during his flight with paved runways at their refueling and rest stops compared to Henshaw's navigating with compass, air-speed, and slide rule and airfields of gravel and bonfire for beacon.



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*There was a time when a flight of any distance was a serious challenge and its participants became international heroes.*

But civilization has reared its head. Stoddard delayed his departure three hours at Capetown until the weather came up to VFR while Henshaw took off in fog using his directional gyro to stay on the runway. And had to wait until an airport was opened after being closed because of its country's president's presence and Noujaim was confronted by an antagonistic ATC over France.

To go back to the beginning. Suppose one were to build a GP4 especially for the Cape Challenge. To start, take Chris's advice and use a Rotax 915 engine and use the aircraft's lighter overall weight for more fuel capacity and the subsequent extended range. The GP4 has a retracting undercarriage with its weight and complexity but with a non-retracting gear the plane would be lighter so here again that even though the plane might be less fast it would be able to carry more fuel for greater range. And with its greater range it might be possible to avoid a refueling stop. The Challenge specifies that it be a solo flight so with the Rotax being narrower than the Lycoming 360 that the GP4 plans as published call out the Challenger GP4 could be narrower with the subsequent

less drag. I wonder about this one, though. Could the wood structure of which a GP4 is built be coated to create integrated fuel tanks for more weight saving.

Whatever approach that one would take, an aircraft for the 'Cape Challenge' is an interesting challenge. If I were building a special 'Challenger' aircraft it would be an aluminum interpretation of Henshaw's Percival Mew Gull with a Ford automobile four cylinder 2.3 litre turbocharged engine which is rated at 280 horsepower at 5600 rpm with its rpm limited to only produce the legitimate 200 horsepower. And if I were rich enough to offer the prize, I would sponsor the RAA Canadian Challenge. 'Best overall time departing from any airfield in Canada, landing at Victoria BC and at St. John's NL [in either order] and return to the original departure point. R

*Bill Weir has been an RAA member since the beginning of time and he has served on the board of RAA and then as the president of RAA London-St. Thomas. A firm believer in auto engine conversions for light aircraft, for many years Bill held annual fly-ins and seminars to promote their use. Until his late eighties Bill flew his Cessna 150 from his own farm airstrip and was pleased that he could still do a crosswind landing.*



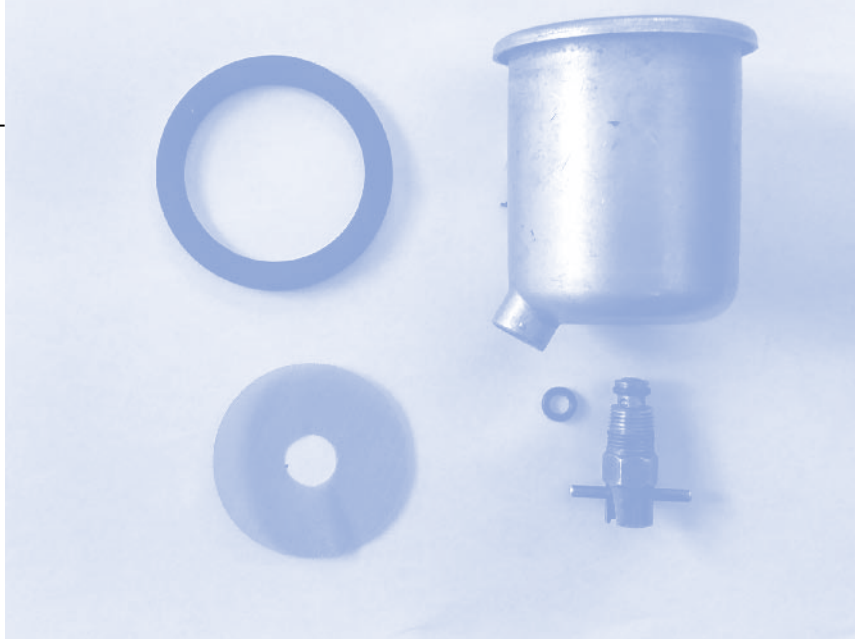
## The Lowly Gascolator

Gary Wolf

IF A PLANE has been properly built the lowest point in the fuel system will be the gascolator. It is the settling trap in which any water or debris that have somehow entered the system are collected to be drained before each flight. As long as the drain valve does not drip we tend to ignore this simple but important part of the fuel system.

My own gascolator began showing water the day after refueling at another airfield. Usually I plan to refuel upon landing, to give water and debris a chance to settle while I am having lunch. This time I could not, but an immediate drain check showed only clear fuel. However upon landing at my home field I did another check and found quite a bit of water. It took almost a dozen samples before the fuel checked as clear. Next day it was the same situation. It took many water filled samples to get clear fuel. This persisted for the next few flights and then the plane sat for awhile.

The next check showed not only water but also rust flakes, plus after sampling, the fuel drain now had a persistent drip that could not be cleared by pushing it up and down to seat the o-ring. I unwired and removed the bowl and found its bottom covered in a layer of rust flakes. These were the reason that the o-ring of the drain valve could not seal. I used a screwdriver to scrape much of the rust out but saw that the steel bowl had lost its cad plating at the bottom where water



had been settling for years. A friend had a sandblaster so I used it to get all the rust out, reinstalled it, and tried again. The fuel sample was clear but the drain valve was still dripping.

Removing the drain valve and checking with a magnifier showed that the perimeter of its tiny o-ring was pockmarked and frazzled. I doubt that the deterioration was solely from this occurrence, but rather from many years of wear by odd bits of dirt and rust flakes.

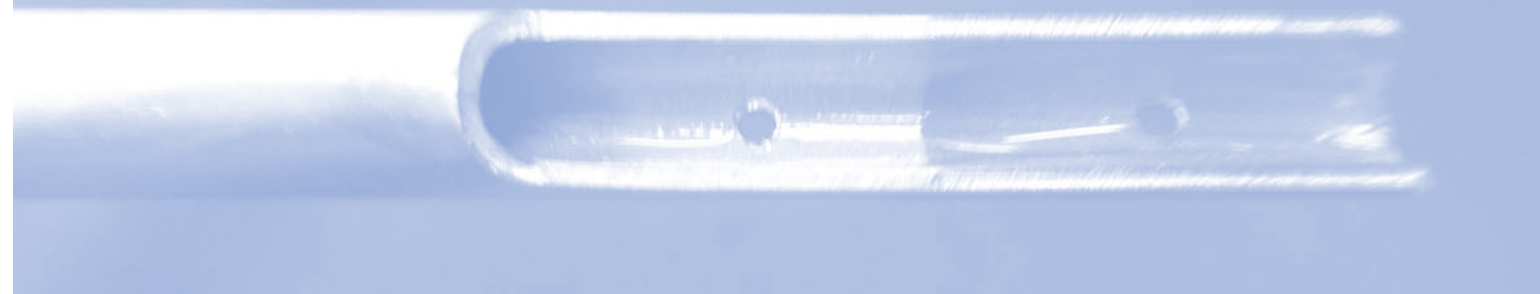
Because the bare steel settling bowl was only going to produce more rust every time there was water, I decided to replace it. My gascolator is the Aircraft Spruce non certified part and they sell an aluminum replacement bowl for about \$35. I also bought a replacement o-ring for another dollar.

The other ignored parts of a gascolator are the filter screen and the gasket that seals the bowl to the

housing. Screens are usually under \$10 and for their gascolator Spruce sells a \$9 rubber gasket that is rated for auto fuel.

I also found a fuel weep from the compression fitting that seals the 1/8" primer line to the top of the gascolator. The solution was to cut an inch from the copper 1/8" tubing, fit a new brass ferrule, and tighten everything up. The hardest part of the whole exercise was to find the 1/8" ferrule. I could not find it at Spruce so I checked with Home Depot where I used to get them. Unfortunately they have reduced their inventory and no longer carry this part so I went to Home Hardware and they had them in their plumbing section for under a dollar each. Everything was reassembled and leak checked and pronounced fit for flight. The aluminum settling bowl does not significantly affect weight and balance. *R*

# Dipsticks



Brian Heinmiller

NO, I'M NOT REFERRING TO YOU, dear readers. I'm talking about those rods we thrust into the fluid reservoirs in our airplanes, and then withdraw them to see how much is there. Here are a couple of ideas.

### Fuel Dipstick

We always dip our fuel tank(s) before the first flight of the day, don't we? Fuel gauges can be trusted even less than politicians. So we can measure the fuel quantity in a tank by using one of those hollow transparent tubes the pilot supply places sell, or you can just use a wooden stick. The problem with the former is that they can be hard to read and the measurement can be off if some air leaks in under your thumb. The wooden stick can also be hard to read when it gets dirty or permanently stained and it smells of fuel for days after it's used. Here's another option.

Go to your local hardware or big box store and buy, for less than \$5, a chain-link-fence tension bar – in black fibreglass. Don't buy the metal one. These tension bars are about 1.5M long and flat - about 12mm x 3mm in cross section. With a hacksaw, cut it to the length you need. Then be sure to roughen the surface thoroughly with coarse sandpaper. Voila! You now have a fuel dipstick! Likely more than one!

The nice thing about the matte fibreglass bar is contrast - it is much darker where it is wet with fuel (easy to read), yet it dries in 20 seconds or so ready for your next measurement or to be stored odour-free. You can add your own calibration and insertion marks by filing notches in an edge or drilling small holes. The photo shows my Sonex fuel tank is half full (plus reserve). You can see the ¾ mark at the upper left.

### Oil Dipstick

Your airplane engine probably has a built-in oil dipstick, attached to the oil filler cap. Mine is a round steel rod about 3mm in diameter with some grooves at the Max and Min levels. I find it can be hard to use – (a) when the oil is new and transparent, or (b) when the rod has picked up some oil from the wall of the filler tube on the way in or out. I also find that hot oil likes to run off the convex surface of the rod making for an indistinct level mark. I've had similar issues in the past with the flat rod type of oil dipsticks.

So for my pre-flight inspections I made a separate oil dipstick using a length of ¼" aluminum tubing. I fastened a handle to one end to ensure a consistent insertion depth, and cut away one side of the tube from above the MAX level to

*continued on page 37*





# BUSHCAT

Chris Horston

I'M GRATEFUL TO HAVE the opportunity in RAA's fine magazine to share with you about the SkyReach BushCat, but first a little housekeeping. Full disclosure: I am the Canadian Distributor of the BushCat. I will do my best to contain my enthusiasm for this great little aeroplane and not taint my own objectivity. And rather than dwell on company history and other mundane information, I will get straight to the what, why, and how.





**T**HE BUSHCAT is a high wing, aluminum tube, fabric covered aircraft. It is available in either a tailwheel or tri-cycle gear. It's powered by the ubiquitous Rotax 912 ULS engine. At present there are no other engine options, and nothing available would add anything meaningful to the performance profile. Factory built BushCats come with a 3 bladed Kiev fibreglass prop which is ground adjustable. The BushCat carries 90 litres of useable fuel, but there is space for a little more in the tank. Even the most basic factory built aircraft comes with a high end Trig radio, and VFR instruments. These days, we highly recommend using Kanardia avionics, as they are extremely light, easy to install, and very reliable. Theoretically, you could fly this plane with a Kanardia Horis EFIS, and a Digi EMS, but we recommend a dedicated ASI and Altimeter for both aesthetics, redundancy, and convenience. The Kanardia engine monitoring system is an effective but simple device which satisfies just about every possible sensor input you could want with the Rotax. The unit is 100% configurable

via an android app, and uploaded using a Bluetooth dongle. If an EFIS is your preference it's possible to configure the BushCat with a larger panel at the expense of a bit of knee room.

The BushCat structure is made up of aluminum tubes which converge together inside welded stainless steel fittings. The stainless fittings are expertly crafted by factory technicians in Springs, a small town just outside Johannesburg, South Africa. This pretty much accounts for the entire airframe structure. The cabin is a fibreglass shell which encloses the tube structure and provides for a 50 inch wide cabin, complete with a centre console which houses the centre stick, the ELT, and storage. There have been more than a few requests for the cabin to be made from carbon fibre with an eye to saving some weight. It's a very rigid and strong structure and it's been suggested that if all the fibreglass components were converted to carbon and engineered to take advantage of its more rigid characteristics, some significant weight could be saved. Unfortunately this has not been a priority due to some other airframe modifications which were developed and tested in 2018-2020. More on these later.

The gear legs are of spring aluminum, which replaces a tubular braced system in earlier models. Another huge improvement over previous models was the addition of Matco toe brakes, now standard on both sides. A parking brake completes the system. This makes the BushCat ideal for training. A very robust stainless steel tube brace is used in the taildragger version to transfer the landing gear loads into the airframe as a result of moving the

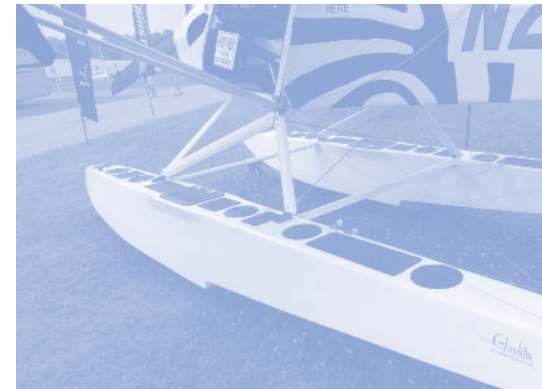
gear legs forward. The BushCat has three different tire size options on the taildragger. Pretty much everyone orders the middle size, which performs equally well on grass and asphalt. Most of the 150 hours we put on our demo was off blacktop and they still looked like new when it sold. I'd love to take credit for being an exceptional tailwheel pilot, but the BushCat was my first tailwheel experience, so much of the credit belongs to the design. Having the large bush tires might make the plane look even more impressive, but the huge cost of large tires make them hard to justify unless you plan to stay off the asphalt.

The fabric is a unique feature of the BushCat. Every ready to fly BushCat or kit includes a choice of fabric colours and patterns which allows the owner to customise their aircraft in thousands of combinations. Some patterns which waste more material have a small surcharge. The fibreglass can be painted any colour, which expands the possibilities. The fabric itself is called Trilam, and is a brand of sail cloth used in racing yachts. It is a pre-coloured lamination of 3 layers. The centre layer is a ripstop mesh, which makes the fabric extremely durable – even more than aluminum. Where an aluminum monocoque fuselage obtains its integrity through the completed structure, it can be compromised by a dent or tear in the aluminum skin. By contrast, the fabric is tough enough to not dent or puncture with even very severe impacts from sharp objects. If a puncture or tear does occur, it will not progress any further thanks to the ripstop. There are actually several deliberate cuts in

the fabric designed to give access to nuts and bolts internally, and they do not propagate. In our show display we have a small trampoline of which the skin is made of Trilam. We've used it for years and years and it has sat out in the sun while literally thousands of people have jumped on it. I carry a roll of duct tape in my onboard kit, but I doubt I would ever need to use it to patch a hole. The BushCat was designed for the African bush, and it's even used for Rhino anti poaching.

#### ASTM vs AULA.

The BushCat is built and tested to ASTM standards, like many other Light Sport Aircraft. Luckily for us, it also meets the requirements of DS 10141, the design standard for Advanced Ultralight Aircraft in Canada. ASTM requirements exceed the requirements of AULA, so buyers can be assured of a robust and honest aircraft. For example, ASTM requires



*The improvements have undoubtedly resulted in a much better aeroplane, and the BushCat has gained a reputation of being the most well tested and honest LSA available anywhere.*

that flight testing and compliance use calibrated airspeeds to prove the design. It's well known that indicated airspeeds can be manipulated simply by bending the tube up and down, plus there is instrument error to account for. Using certified test equipment ensures an honest assessment of

the actual performance.

A couple of years ago, the factory needed to produce their design and test results for certification in Europe. A flood at the factory had destroyed those records and they had to seek backup from the South African Aviation authority. Unfortunately, they too





had mislaid the files, forcing SkyReach to rebuild all the data. In the process of recreating the data, the Factory discovered some deficiencies, some of which were inherent in aircraft of this type, and some which they hadn't anticipated. SkyReach set to work immediately to rectify them.

The improvements have undoubtedly resulted in a much better aeroplane, and the BushCat has gained a reputation of being the most well tested and honest LSA available anywhere. SkyReach used three test aircraft in different configurations along with three professional test pilots. The factory team of engineers and the test pilots invested hundred and hundreds of hours and thousands of maneuvers to verify the engineering. Spin testing alone required over 600 distinct spins in every CG location, and flap set-

ting, and in each gear configuration. Each aircraft was fitted with certified test equipment to measure airspeed, angle of attack, and other parameters. The major improvements that resulted from all this work include a 50% larger tail, a new enhanced trim system, a very accurate pitot static system, and a vortex generator kit for the wing. These improvements have resulted in a lower stall speed, a very stable aircraft, and an expanded C of G. Upgrade kits were provided to all owners at no charge and take only two days to complete. SkyReach developed a step-by-step process for owners to perform the upgrade and avoid dismantling the airframe as little as possible.

From this point, I will unashamedly sing the praises of the BushCat. When my wife and I decided a few

years ago to get into aircraft sales, we had a few basic criteria. Firstly, the aircraft had to have a decent useful load. The BushCat at that time weighed in about 720 lbs. Fully equipped, our demo was closer to 750 lbs. That resulted in 482 lbs of useful load in the AULA category, and still well below the LSA aircraft's design gross of 1320 lbs. Secondly, it had to be affordable. With some LSA aircraft now pushing into the \$300,000 range, finding aircraft under \$100,000 is becoming increasingly difficult. Foreign exchange complicates matters even more. At the time of this writing, the American dollar has fallen about 10% in value year over year. These fluctuations and increasing costs of materials has resulted in a steady increase over the LSA dream for \$50,000 airplanes for all. Still the Bush-



Cat represents the best value in Light Sport aircraft flying behind the Rotax 912ULS 100 hp engine. SkyReach has consistently upgraded the BushCat each year with higher end parts, and airframe improvements. Despite these upgrades, the price has remained one of the lowest in the industry.

The BushCat has proven itself over and over as a very capable aeroplane. Some of our customers are regularly flying the plane at gross weight. One in particular is 6 foot 2 and weighs about 300 lbs. He is quite well known on YouTube and can routinely be seen with some full sized passengers too. The BushCat still gets off the ground very quickly, and climbs decently at gross. I can only report on my own experiences but typically I would be off the ground in about 250 feet or less, and climbing out at 1000 fpm solo. Cruise speed based on the new properly calibrated pitot static system is about 90 mph and stall occurs at about 38 mph in the landing configuration.

People always ask the same questions when considering a new aircraft: range, endurance, and speed. Perhaps a better assessment would be made by defining the various missions expected by the pilot. For the most part, LSA and AULA aircraft fly locally, but from time to time pilots will take a passenger, and will want to make a longer trip. What I have been able to do with the BushCat is explore a lot of grass strips in the area where we live, while also doing the requisite CN Tower Toronto tour. With It's transponder and radio, I can fly just about everywhere a Cessna can, and some places it can't. I've flown to Oshkosh and back twice, and com-

pleted the trip in about 6 hours. One of those trips involved some extremely hot and windy conditions, along the same flight path of 737's arriving at Chicago O'Hare only 1000 feet above. The BushCat is a very capable aircraft in crosswinds, and I was able to complete the journey each time in one average day of flying.

Transitioning to the BushCat was very easy. Coming from a 172 I thought I would have a shallow learning curve, but I was competent

in about 4 hours with the tailwheel, and very proficient after about 40 hours. For this reason I highly recommend the tail wheel configuration, it is great fun to command an aircraft that I initially found intimidating. It will make you feel like a rock star with very little effort, but both gear types are good looking aircraft in their own way. It would be easy to say that the Tricycle version would make a better trainer, but the reality is, either one

*continued on page 37*





## Product Review: Yaesu Vertex FTA-550AA Handheld Radio

Brian Heinmiller RAA #9359

I HAVE ALWAYS LIKED to have a handheld radio with me when I fly for several reasons. First, it allows me to pick up ATIS and/or traffic from outside the airplane – like in my hangar or the airport restaurant, for example. I also use it to monitor airport communications as I drive out there for runway in use, etc. Further, I decided that if I’m going to bring a handheld with me I might as well have it really handy while in flight so I have a mount for it on my panel and an accessible external antenna. It becomes my backup radio, my COM 2. By playing its audio through an aux input on my COM 1 radio, I can easily monitor a second frequency such as ATIS, CFA or air-to-air.

Alas, this arrangement recently let me down when the display on my old handheld radio went berserk. I could still communicate; I just couldn’t tell with whom. Time for a new handheld.

After some research into specs and prices I settled on the Vertex FTA-550AA by Yaesu.

This radio is powered with 6 AA-size alkaline batteries and cost me about C\$275.00 before taxes. For about \$140 extra you can get the FTA-550L – the same radio, but with a rechargeable Li-Ion battery. For roughly \$250 extra you can get the FTA-750L which has the Li-ion battery as well as a full ILS receiver/display and a GPS. I decided I didn’t need these extra features and their attendant costs.

By the way, I’ve always been a fan of ICOM products and they offer excellent and popular handheld radios. But the comparable ICOM A25C Sport (also 6 AA batteries) costs more than \$400 from the same dealer.

Back to the FTA-550AA. Here’s what you get in the box: radio, alkaline battery tray, antenna (with BNC connector), headset adapter, plug-in 12Volt external power adapter, USB cable, belt clip, operating instructions. No manual - you can get that free online. Below I’ve described a just few salient features.

The radio is controlled by the keyboard on the front, two concentric knobs on top, and three buttons on the left side. As you can see it has a big backlit LCD display. Let’s start with the knobs. The inner knob controls the radio VOLUME which is shown graphically on the display. The outer knob lets you SCROLL through various things. Three buttons on the left side – POWER (press ON, press and hold OFF); SQUELCH



(press to adjust by SCROLL knob; press and hold to disable squelch); and PTT (Push-To-Talk). On the front are 3 navigation keys – UP (Left); Down (Right); and ENT to select what you have highlighted on the display. The keyboard has 0 to 9 as well as a few self-explanatory function keys.

The radio powers up on the last frequency you used (the big numbers). Below that is a list of previously-entered frequencies, depending on the MODE you are in. SCROLL down and select from the list and ENT to make it operational. Or you can enter a frequency directly from the numeric keypad.

Let’s hit the MENU key to see what the modes are.

The COMM mode provides a list of the last 10 frequencies you entered. Scroll down and select (ENT) the one you want. Entering frequencies as your trip progresses ensures they’ll still be there when you come back by the same route.

The MEMORY mode provides a list of frequencies you have previously entered into memory. These can be entered into one or up to 8 Groups which can be selected in the MEMORY mode. I use 3 groups – LOCAL group

is a list of the Comm and ATIS frequencies I might need within an hour or so from my home base; CYYZ group has all the Toronto Pearson frequencies

along the route into a dedicated Group for that trip and save looking them up when you are busy in flight.

Even if you use another radio as

*I think this radio represents excellent value. It can’t be beat for an inexpensive backup COM*

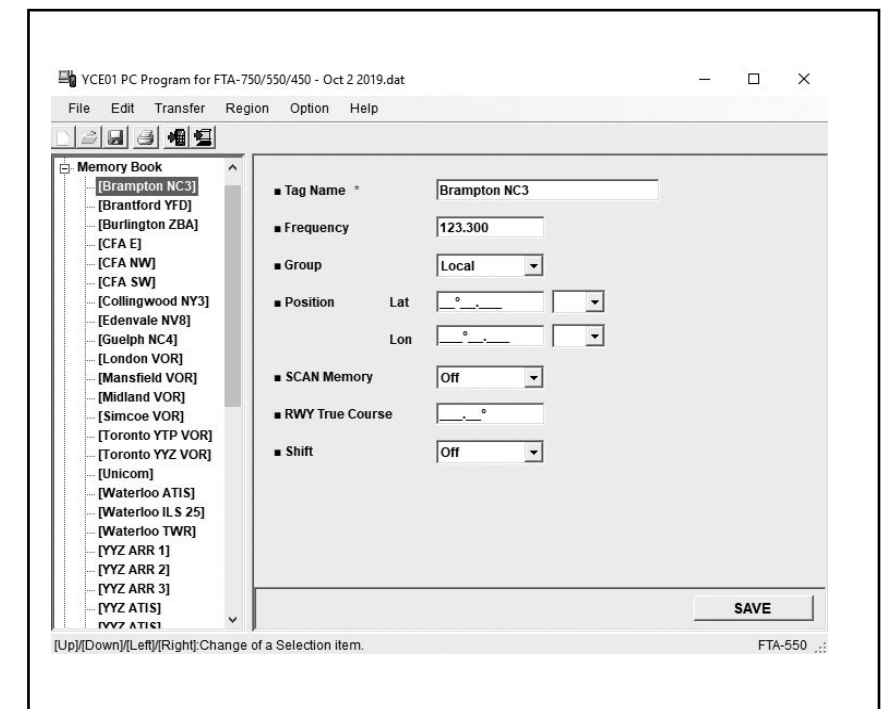
because I live and fly near there; and VOR/LOC group has all the nearby VOR and Localizer frequencies because the radio will receive and display them and who knows when one could come in handy. When I fly I have the LOCAL group selected. When planning a trip, you could pre-enter all the frequencies

your COM 1, having all this annotated frequency information at your fingertips can be a really handy reference.

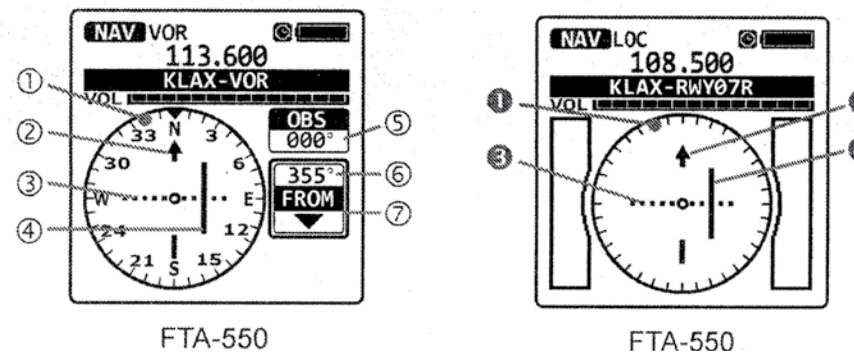
The WEATHER mode accesses the ten NOAA / Environment Canada VHF weather frequencies.

Any frequency in memory (including weather) can be assigned a 15-char-

*Yaesu has a free downloadable utility that connects your PC to the radio (using the supplied USB cable) and really simplifies frequency management. Here’s a screenshot of a typical computer entry page.*







acter alphanumeric tag. This can be entered from the radio keyboard but doing so can be really tedious. Happily, there's an app for that! Yaesu has a free downloadable utility that connects your PC to the radio (using the supplied USB cable) and really simplifies frequency management. Here's a screenshot of a typical computer entry page.

Use your PC to key in all the annotated frequencies you want, organized the way you want into groups, etc., and then dump it to the radio. Change your mind? Make your adds, deletes and updates on the computer and dump

the new setup to the radio, overwriting what was there. Simple. Even I could do it.

I mentioned VOR and LOC, didn't I? Well when this radio detects a VOR or LOCALIZER signal the display automatically switches to look like one of these (see above):

You can use the SCROLL knob to set the VOR OBS to the radial you want or to the one you are on and navigate accordingly. I've only used this feature once so far but maybe before the VORs all disappear I can have some fun playing with this.

The radio has other features such

as instant 121.5 access, split-frequency operation, dual-watch operation, frequency scanning, memory scanning and an up/down timer that I won't go into here.

In limited use I've had consistently good signal reports. The interface with my airplane's headsets, PPTs and COM 1 radio were straightforward using the supplied headset adapter. I haven't used this radio long enough to have any sense of reliability, interference with other avionics, range limitations or other problems, but I've had no issues to date. A good external antenna will maximise its usefulness.

AA battery life has been reported as an issue. Hence I use the supplied 12V power adapter in the airplane. Other times I'm not transmitting anyway, and batteries life is reasonable.

In summary, I think this radio represents excellent value. It can't be beat for an inexpensive backup COM, and by using the plug-in external power adapter I think it could even be a very capable, inexpensive primary COM 1 radio for certain homebuilts and ultralights, although it's perhaps lacking 6-10db transmit power for this role. And its ancillary features (up/down timer, etc.) can be useful in flight even if you never use it to communicate. *R*

### Specifications Shortlist: Vertex FTA-550AA

Frequency Range	TX	118.000 to 136.975 MHz
	RX	108.000 to 136.975 MHz (Nav and Com) 161.650 to 163.275 MHz (Weather)
Channel Spacing		25kHz or 8.33 kHz
Memory Channels		200 (with 15 alphanumeric characters)
Dimensions		2.4 x 5.2 x 1.3 inches (62 x 133 x 34 mm)
Weight		14.5 oz (410 g)
Receiver Sensitivity		< 0.8 uv (for 6dB S/N)
Audio Output		0.8 W @ 16 ohms
Transmit Power		5.0 W (PEP), 1.5 W (Carrier Power)



## The Builder's Library

Gary Wolf

To build an aircraft is a major accomplishment, and to maintain one is an ongoing exercise. The key to success in both is to have correct information available in a timely manner. You will inevitably need materials and parts, and information how to combine these successfully in a manner that will ensure safety and light weight.

### BINGELIS

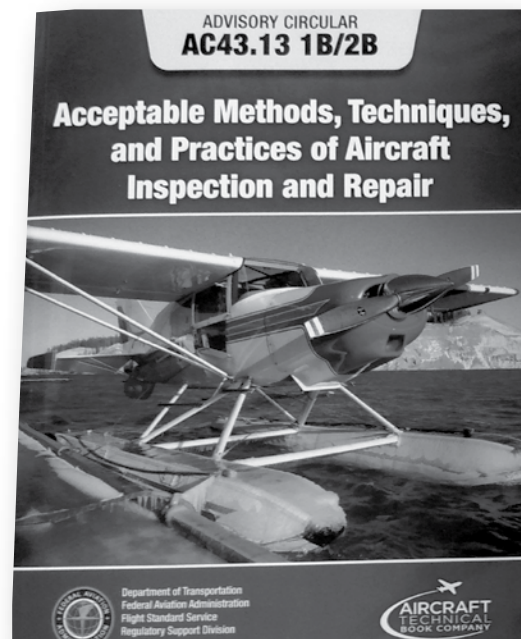
The most complete repository of information is from Tony Bingelis who in the seventies wrote *The Sportplane Builder*, at a time when most amateur aircraft were built from plans that assumed that the builder was already well versed, so details were frequently omitted. Tony's first book fills in many blanks and teaches some theory plus very practical construction methods. These include forming metal wing ribs, using foam and composites, canopy and inspection panel installation, cable making, fuel systems, landing gear, fabric

and finishing, and lastly weight and balance. Bingelis released three more books in the eighties and nineties, *Firewall Forward*, *Sportplane Construction Techniques*, and *Tony Bingelis on Engines*. All are well laid out and have many illustrations and photos.

*Firewall Forward* begins with engine selection and motor mounting methods, firewall materials, cable pass-throughs, and exhaust systems. Baffling and cowling follow, with attention paid to accessibility for service. Fuel systems are well discussed as are electrics, controls, and panel. He discusses prop and spinner installations and has more about weight and balance.

*Sportplane Construction Techniques* elaborates on his first book and goes much further into the small details of making fittings, bending tubes, welding clusters without warping when cooling, bend allowance and layout for sheet metal parts. Many pages are devoted to designing





and fabricating a comfortable cockpit with controls that fall to hand, very useful because we rarely think about these aspects of building until we find that what we have built requires gymnastics for entry and exit, and having to stretch for what should be easy to reach.

Tony Bingelis on Engines is an update and expansion of his Firewall Forward with more attention paid to the small details that could otherwise take hours to solve. Engine baffling, engine compartment heat, and firewalls get considerable attention. Bingelis then devotes forty-eight pages to the explanation of the advantages and construction methods for aluminum fuel tanks and all aspects of the fuel system installation. The practical aspects of choosing and installing propellers and spinners receive thirty-five pages, including illustrations and photos. Electrical and battery installations are well discussed and have practical recommendations.

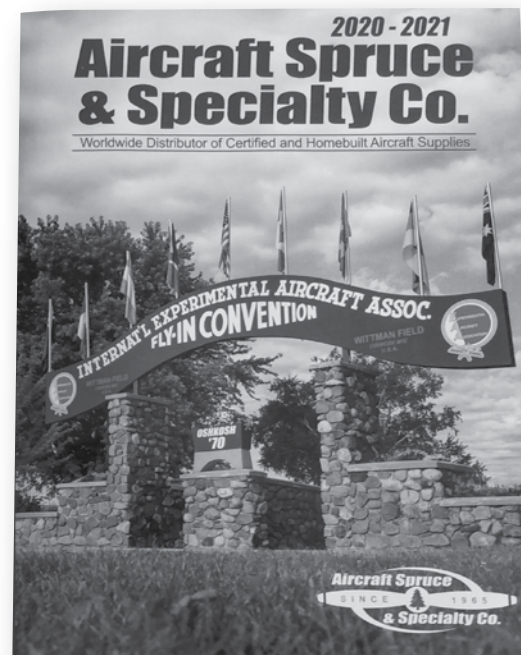
These books should be required reading for anyone who plans to build or maintain their own aircraft. All four Bingelis books are available from Spruce, individually \$40 or ~\$140 for the full set.

#### FAA AC 43.13

Do you need to know how to inspect and repair damage to wood, composite, or riveted metal structure? Do you want to repair a 4130 tube by splicing and welding? Aircraft Circular 43.13 is the bible that is used by AME's and structures repairmen to ensure that repairs are performed to the standard required to ensure full strength of a part or structure. Need to know how to swage cable ends and safety wire turnbuckles and bolts? Go to 43.13. Are you planning to perform a leakdown test as part of your annual? 43.13 has the procedure and the limits before an internal inspection is required. This manual has a comprehensive illustrated section on hardware with MS, NAS, and AN identifiers. The electrical section has charts, calculations, and details of safe installation methods. The manual is occasionally updated to incorporate new technologies so it is important to have the latest version, currently AC 43.13 1B/2B. It is possible to find sections of the book online but Spruce sells the latest paper copy for ~\$40.

#### AIRCRAFT SPRUCE CATALOGUE

Each year Aircraft Spruce prints and hands out gratis their 1000 page catalogue that offers almost everything that a builder or owner could need. The materials section has comprehensive charts with dimensions and weights of the various aluminum alloys in sheet, tube, and extrusion, plus for the various grades of steel they include tensile strengths. The hardware charts are comprehensive and demystify the inch to AN grip length relationship. The fittings section has full size illustrations of the thread sizes of AN and NPT, and many fittings are dimensioned to make selection simpler. Any fitting, cable, bulb,



placard or tool that you could need is in this catalogue. The paper catalogue is a very good winter read and has the benefit that if you don't know what you are looking for you can leaf through the pages until you find the part. Prices in the paper catalogue are US dollars but the Aircraft Spruce Canada website is priced in Canadian dollars at the current exchange rate.

#### PRINCESS AUTO CATALOGUE

This catalogue is considerably downmarket but very useful when outfitting a workshop for aircraft construction or servicing. Princess has good prices on welding machinery and supplies, especially when they are in the sale flyer. Their house brand equipment is usually sourced offshore and repair parts are not readily available so buying North American brand name welding equipment is recommended. Air compressors, drill presses, grinders, presses, toolboxes, and workbenches are available in all sizes at competitive prices. Princess has a comprehensive 500 page paper catalogue that is not frequently on display in a store but if you ask they will usually hand one out. The catalogue and flyer are online at their website but the paper versions are more usable. Princess will price protect, so if you buy something at full price and subsequently find that it is on sale in their flyer they will refund the difference. If you paid by credit card they will even do this over the phone. *R*

Bingelis 4 pack .....	13-13500	\$139.75
AC 43.13 .....	13.06923	\$ 39.90
Aircraft Spruce catalogue .....		free
Princess Auto catalogue .....		free

#### Pietenpol / continued from page 5

of water based contact cement and waterborne primer and paint. The entire fabric process was wonderfully satisfying and set the hook for me to enthusiastically complete the project. Many of my non-builder friends remark on how focused one must be to stick with a build - especially from plans - but I maintain that there is a stage in an airplane project where the airplane pulls the builder along to the finish line. For me it happened at the fabric stage.

So many of the little details and procedures that I fretted over I now reflect with pride at how satisfying each of them were. The carving of the landing gear legs into streamlined shiny pieces of laminated wood, the thousands of modified seine knot rib stitches, the forming of the nose bowl in an English Wheel and the application of coat after coat of non-smelly aircraft paint were all incredible milestones where mastering the skill and producing something to be proud of left me with an incredible sense of fulfillment.

Dec 19th 2020 I taxied away from

the hangar on a skiff of light snow with the giddy but significant anticipation of my first flight. The temperature was 1 C and I was bundled in a Nomex jacket and pants, fire resistant hood and gloves and many more layers along with a crash helmet as a precaution. My thoughts raced in my mind about how much time and energy I had put in to this little airplane and now all that was left to do was to fly her! Had I tightened every bolt, safety-wired every turnbuckle and cotter pinned every control pulley nut? Would the

*continued*



*Pietenpol / continued from page 35*

engine run strong? Was there enough clearance around the cowl to keep things from rubbing? Many eyes had gone over the airplane through the construction stages and certainly MDRA were thorough in their initial and final inspections but as a professional pilot I was no stranger to human factors in my industry. I had rehearsed a lot of “what ifs”, had developed plans and drills for the loss of power at 50, 100, 300, 500 feet and made “go, no-go” points on the field for my take off roll.

I completed one last scan of my sparse panel, closed the carb heat, verified one more time the fuel valve was on and did a thorough control check craning my neck to ensure the rudder and elevators were all operating as designed. I took a big breath and smoothly applied full power with a reassuring pressure of the plywood seat pushing against my back. Acceleration was brisk and the light tail was soon up in the air followed by the CB350 motorcycle wheels of the main gear. I momentarily pushed forward on the stick to accelerate in ground effect but quickly realised that it wasn’t necessary. The little C-85 was a terrific match for the Pietenpol airframe and soon I was climbing at a very aggressive deck angle. With the runway quickly disappearing behind me and my altitude increasing at an impressive rate I throttle back slightly and took stock in my new bird. No significant control pressure was needed to climb, my right foot had slight weight on the rudder bar to centre the ball and the ailerons were level indicating the



*It doesn’t get more grassroots than this, nor truer to the original spirit of homebuilt aircraft.*

rigging was very true. Rolling over to downwind the control harmony was delightful and throttling back to 2100 RPM gave me a nice indicated airspeed of 85 MPH. I hollered an enthusiastic, “Whooooohooooo” and immediately wondered if anyone could hear me. Looking around at my machine I gazed at the drag and anti drag cables connected to my struts, the motorcycle wheels lazily spinning in the slipstream, the view through the two Perspex windscreens that I fabricated in my shop and the daylight reflections lighting up my wooden instrument panel. This little airplane was everything I had expected and more! It represented seventeen years of well pondered decisions, problems to solve and a host of skills and friends acquired in the process. I touched down in a gentle crosswind from the left and was humbled by a predictable veer into

wind that I was able to fix with a small push of the rudder bar. Taxiing back to the hangar I fixed my stare on some of the great friends who saw me through this build and were there to witness the first flight.

As I write this I am still basking in the glow of my first flight and look forward to the summer of 2021 where I am hoping to get to know my little Pietenpol better and fly as many dawn patrols as I have time for. I am also looking forward to flying off the time necessary to lift the restriction to taking passengers so I can share the exhilarating experience of open cockpit flight. To those considering a build I would encourage you to make a well informed decision on the type that will fill your needs without emptying your pocketbook. For those already building I share your enthusiasm and am excited for you to experience your first flight. ✈

*Dipsticks / continued from page 23*

the bottom end. I then drilled 1/16” holes to mark the MAX and MIN points using the airplane dipstick as a template.

You can see in the photo how brand new warm oil stays where it can be distinctly seen on the concave (inner) surface of the tube, (less so on the rest) and is unaffected by contact with the oily walls of the filler tube. It easily wipes clean with a rag or your passenger’s jacket.

This type of dipstick also works well for brake fluid. ✈

**Brian Heinmiller** is the past president of RAA-Toronto CH 41. In the early 2000's he hosted annual BBQ's for members to share building experience of the then-new Sonex. Brian built his own Jabiru powered Sonex and first flew it in 2005.



*BUSHCAT / continued from page 29*

would. After flying a Cessna 172 my entire life, I made the transition to Light Sport, and Tailwheel, all in about five or six hours. With over 150 hours on type now, I feel very confident flying the BushCat in any weather it’s designed for.

2020 has been a tough year for many manufacturers, but not for the BushCat. In Canada there will be 3 BushCat’s on the registry by the end of 2021, and a few more on the way. For SkyReach it was a record year from which they are still rebuilding their

inventory. Thanks to a recent approval from the FAA, the BushCat is now approved as an Amateur-Built under the 51% rule. This qualifies the BushCat automatically in Canada as an Amateur-Built too. For many this will be a desirable configuration because it means they can register the BushCat at its design gross of 1320 lbs on wheels and 1430 lbs on floats. There is already one kit builder in Canada who is going this route.

To learn more about the BushCat, you can visit our website at [www.sportaircraftcanada.com](http://www.sportaircraftcanada.com), or [www.fly-skyreach.com](http://www.fly-skyreach.com). Kits start at \$25,300

USD as of February 2021, and ready to fly versions are available to spec. If you’re looking for a new modern construction of a classic design, look no further✈ than the BushCat. For comfort, performance, and price it checks all the boxes. ✈

**Chris Horston** is a Recreational PP holder and advocate for 20 years. He has done a ground up restoration of a Zenith 300, and built a Flybaby with his father. He is the Canadian distributor for SkyReach BushCat, U-fly-it Aerolite, Kanardia Avionics, Trig and TQ avionics, and participates in numerous working groups with Transport Canada, Executive member and SAR volunteer with CASARA.

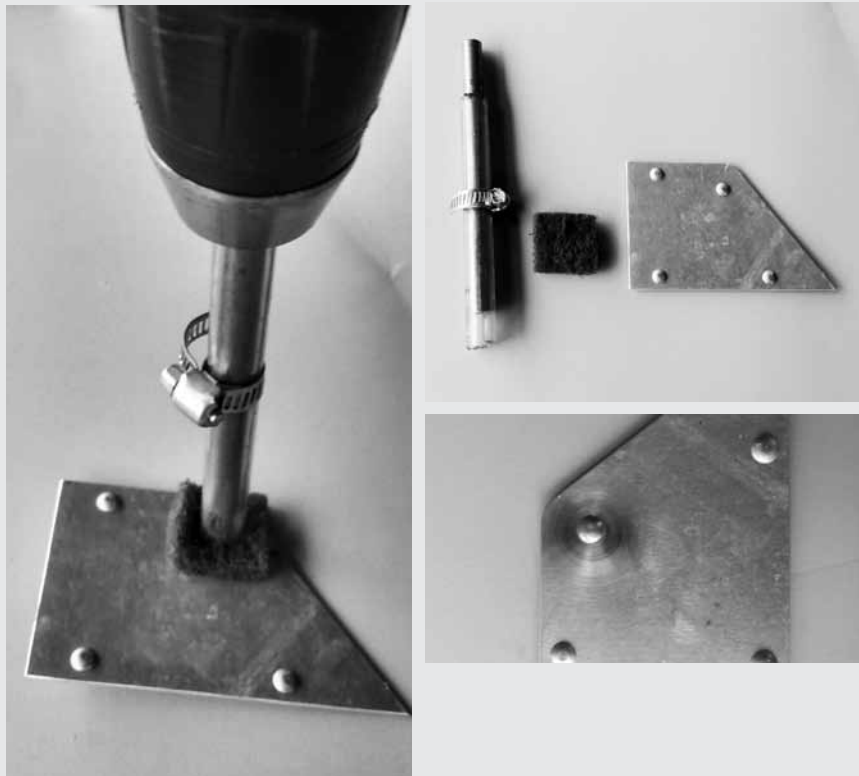


## RIVET SANDING TOOL

Here is a simple sanding tool for rivet heads. The parts required are; (1) one piece of 1/4" rubber hose, approximately 3 inches long, one 1/4 " hose clamp, and one 1/4" bolt, four inches long with the head removed. Slide the bolt into the hose until the end of the bolt is approximately 3/8" from the end of the hose and clamp it in place with the hose clamp.

How to operate the tool: install the 1/4 shank in a cordless drill. Cut a green Scotchbrite pad into 1" squares. Position a square centered over a rivet head, and with light pressure place the tool over the pad. It takes only a few revolutions of the drill to get a perfectly sanded rivet head. This amazing tool was suggested to us by Evert Wevers of the RAA Chatham-Kent chapter.

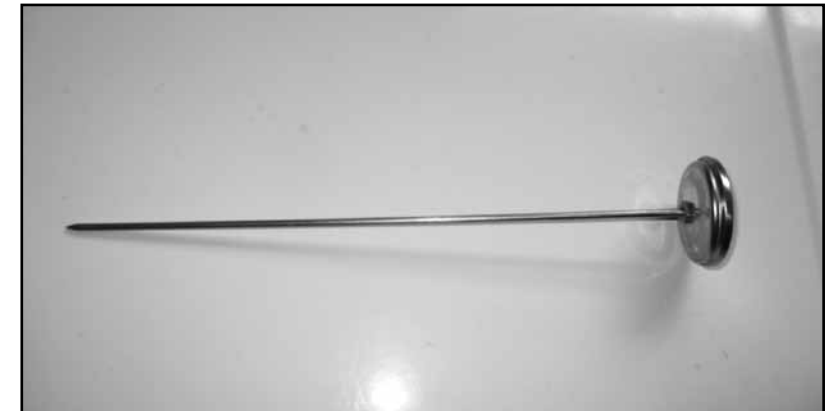
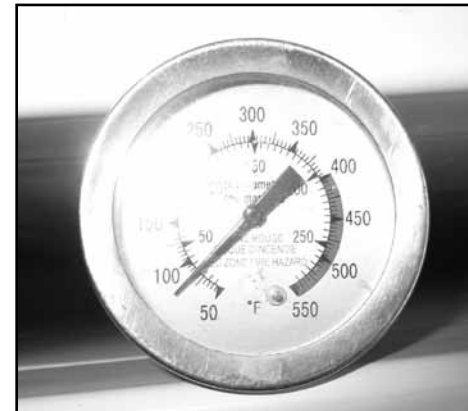
- Ed Butler, RAA# 2908



## Straightening Aluminum Fuel Lines

I AM PUTTING ALUMINUM fuel lines with AN fittings in the 701. I'm using 1/2 " for the feed lines. It comes in a coil that you have to straighten out. By hand it's difficult to get a nice straight profile so I fabricated something i have been thinking about after seeing a manufactured device at an automotive speed shop, that cost 2-3 hundred dollars, see attached picture. It is made of a set wheels off some inline skates, stacked 2 high and attached to my work bench with 1/4 inch carriage bolts. I used a couple holes already in the bench for a vice and drilled two more. I set the separation using a piece of half inch bar and added the wire just to reduce Flexing of the bolts, which should have been flipped to have nuts on top. It took all of about 20 minutes to make (I had removed the wheels c/w bearings and bushings from the skates some time ago). It works really well.

-Perry Delano



## Checking Your Oil Temperature Guage

Ever wonder if your oil temperature gauge is accurate?

We decided to replace the oil temperature gauge on our Bakeng

Duce because it was reading —230 degrees while the CHT's measured 325-350F. We installed a new gauge and came up with a simple solution to test its accuracy. The new gauge read 170F

in flight so we took the thermometer from a lobster pot and checked its calibration with boiling water. After a flight we taxied back and removed the oil dipstick and inserted the thermometer.

Big difference. By this time the oil temp gauge was showing 155F and the thermometer showed the same temperature.

Tyler Butler and Ed Butler



### President's Message / cont'd from page 2

float needle that controls fuel level in the float bowl. This results in a rich mixture throughout the operating range, especially at low throttle settings. This is about the seventh bulletin about superseded carb floats in this engine family. The current bulletins are: SB-912-074/ SB-914-056 and SB-912-074UL / SB914-056UL / SB-2ST-004 . Before contacting a service centre please read the bulletins to determine if your carb floats are among the affected batches.

### **CESSNA AIRWORTHINESS DIRECTIVES**

If you have a Cessna four or six seat

aircraft with lift struts, or if you are considering to buy one, you should be aware that there is an FAA AD to deal with cracks in the structure around the forward door post. This area takes the lift strut loads into the fuselage. The AD requires inspection for cracks, and repair if necessary. Cessna has a kit to reinforce the area and the cost with labour will be in the \$10-20,000 range. Clearly this devalues any of the named aircraft, so a purchase should be contingent upon the plane having a clean bill of health or upon having had the repairs performed.

Owners of Owner Maintenance aircraft may do their own inspections

and repairs but the Cessna kit is not inexpensive. Because O-M aircraft are not required to comply with AD's the owner may create his own reinforcement kit but an insurer might raise an eyebrow at this. O-M aircraft do not receive notifications of AD's so this is your warning.

There is a more recent AD for 180/182.185 Cessnas to inspect and repair the tailcone and horizontal stab. Amateur Built Cyclones have sometimes been built using some Cessna parts so owners should perform their own inspection. *R*





# RAA Chapters and Meetings Across Canada

The following is a list of active RAA Chapters. New members and other interested people are encouraged to contact chapter presidents to confirm meetings as places and times may vary.

**ATLANTIC REGION**

HAVELOCK NB: Weekly Sunday morning get together year round, all aviation enthusiasts welcome. Havelock Flying Club - 25 mi west of Moncton. Contact Sterling Goddard 506-856-2211 sterling\_goddard@hotmail.com

**QUEBEC REGION**

COTE NORD (BAIE COMEAU): Meeting times to be advised. Contact Pres. Gabriel Chouinard, 418-296-6180.  
LES AILES FERMONTOISES (FERMONT): First Sunday 7:30 pm at 24 Ibergville, Fermont. Contact Pres. Serge Mihelic, 418-287-3340.  
MONTREAL (LONGUEUIL): Chapter 415, Meeting in French second Wednesday at 8 pm, at CEGEP Edouard Montpetit 5555 Place de la Savane, St. Hubert, PQ. Contact president Normand Rioux at n.rioux1@videtron.ca or J-F Alexandre info@raa415.ca  
OUATOUAIS/GATINEAU: Every Saturday 9:00 am to noon at the restaurant l9Aileron in the airport terminal. Contact Ms N.C. Kroft, Gatineau Airport, 819-669-0164.  
ASSOC DES CONSTRUCTUEURS D'AVIONS EXPERIMENTAUX DE QUEBEC (QUEBEC): Third Monday 7:30 pm at Les Ailes Quebecoises, Quebec City Airport.  
ASSOC AEROSPORTIVE DE RIMOUSKI: First Saturday at 9:00 am, La Cage aux Sports, Rimouski. Contact Pres. Bruno Albert, 418-735-5324.  
ASSOC DES PILOTES ET CON-

STRUCTEURS DU SAGUENAY-LAC ST JEAN: Third Wednesday 7:00 pm at Exact Air, St Honore Airport, CYRC. Contact Marc Tremblay, 418-548-3660  
SHERBROOKE LES FAUCHEURS de MARGUERITES. Contact Real Paquette 819-878-3998 lesfaucheurs@hotmail.com

**ONTARIO**

BARRIE/ORILLIA CHAPTER 4th Monday of the month at 6:00 PM at the Lake Simcoe Regional Airport for the months of June, July & August (BBQ nights) For other months contact Dave Evans at david.evans2@sympatico.ca or 705 728 8742  
COBDEN: Third Thursday of the month at the Cobden airfield clubhouse 20:00 hrs. Contact Bob McDonald 613-432-8496 or bobkim.mcdonald@gmail.com  
COLLINGWOOD AND DISTRICT: The Collingwood and District RAA, Chapter 4904, meets every first Thursday of every month, at 7:30 PM except July and August, at the Collingwood Airport or at off-site locations as projects dictate. The January meeting is a club banquet held at a local establishment. For more information contact Pres. Skip Reeves 705-429-5154  
FLAMBOROUGH: Second Thursday 8:00 pm at Flamborough Airpark. Contact Pres. Karl Wettlaufer 905 876-2551 or lazykfarm@sympatico.ca  
KENT FLYING MACHINES: First Tuesday 7:00 pm at various locations. Contact President Larry VanGerven 519-809-8979 larryvangerven@hotmail.com  
KITCHENER-WATERLOO. Meetings are on the second Monday of each month at 7:30pm upstairs at the Air Cadet building at CYKF except during the summer months when we have fly-ins instead. Please contact Dan Oldridge at kwraa@

execulink.com for more information or visit our newly expanded website at http://www.kwraa.net/.  
LONDON/ST. THOMAS: First Tuesday 7:30 p.m. At the Air Force Association building at the London Airport. Contact President Roy Rader 519-349-2641  
MIDLAND/HURONIA Meetings: first Tuesday of each month, 7:30 pm, at the Huronia Airport terminal building (CYEE). Contacts: President Rob MacDonald - 705-549-1964, Secretary Ray McNally - 705-717-2399, e-mail - raamidland@gmail.com E-mail – raa.midland@gmail.com .  
NIAGARA REGION: Regular meetings occur the second Monday of every month at 7:30pm in the CARES building at St. Catharines Airport (CYSN). During the summer months though, June-September, meetings take place the second Monday of those months at 5:30pm in Hangar #4 at Welland Airport (CNQ3). Contact Elizabeth Murphy at murphage@cogeco.ca, www.raaniagara.ca  
OSHAWA DISTRICT: Last Monday at 7:30 p.m. at Oshawa Executive Airport air terminal, ground floor, 1200 Airport Boulevard. Contact President: Jim Morrison, 289-675-0660, jamesmorrison190@msn.com Website raaoshawa.blogspot.ca  
OTTAWA/RIDEAU: Kars, Ont. 1st Tuesday. Contact: Secretary, Bill Reed 613-858-7333 bill@ncf.ca  
SAUGEEN: Third Saturday for breakfast at Hanover Airport. President: Barry Tschirhart P.O. Box 1238 27 Ridout Street Walkerton, Ontario. Home: 519-881-0305 Cell: 519-881-6020. Meetings are held every second Tuesday evening, at 7:30pm. Location(s) Saugeen Municipal Airport, Kincardine or Port Elgin. All interested pilots are welcome. Email: barry.tschirhart@bell.net  
YQG AMATEUR AVIATION GROUP (WINDSOR): Forth Monday, 7:30 pm Wind-

sor Flying Club, Airport Road, Contact: Kris Browne e\_kris\_browne@hotmail.com  
SCARBOROUGH/MARKHAM: Third Thursday 7:30 pm Buttonville Airport, Buttonville Flying Clubhouse. Contact Bob Stobie 416-497-2808 bstobie@pathcom.com  
TORONTO: First Monday 7:30 pm at Hangar 41 on north end of Brampton Airport. Contact: President Fred Grootarz - Tel: (905) 212-9333, Cell: (647) 290-9170; e-mail: fred@acronav.com  
TORONTO ROTORCRAFT CLUB: Meets 3rd. Friday except July, August, December and holiday weekends at 7:30 pm Etobicoke Civic Centre, 399 The West Mall (at Burnhamthorpe), Toronto. Contact Jerry Forest, Pres. 416 244-4122 or gyro\_jerry@hotmail.com.  
WIARTON: Bruce Peninsula Chapter #51 breakfast meetings start at 8:30am on the second Saturday of each month in the Gallery of Early CanadianFlight/Roof Top Cafe at Wiarton-Keppel Airport. As there are sometime changes, contact Brian Reis at 519-534-4090 or earlycanflight@sympico.ca

**MANITOBA**

BRANDON: Brandon Chapter RAA meets on the second Monday of each month at the Commonwealth Air Training Plan Museum at 7:30 PM except in the months of July and August. Contact Pres. John Robinson 204-728-1240.

**SASKATCHEWAN**

Chapter 4901 North Saskatchewan. Meetings: Second Tuesday of the month 7:30pm Prairie Partners Aero Club Martensville, Sk. info at www.raa4901.com. Brian Caithcart is

the chapter president. Contact email: president@raa4901.com.

**ALBERTA**

CALGARY chapter meets every 4th Monday each month with exception of holiday Mondays and July & August. Meetings from 19:00-21:00 are held at the Southern Alberta Institute of Technologies (SAIT) Training Hangar at the Calgary Airport. Join us for builder discussions, site visits, tech. tips, fly out weekends and more. Contact President Dennis Fox dennis77fox@gmail.com 403-443-8434 or Secretary Bruce Flach o2fly@yahoo.ca  
EDMONTON HOMEBUILT AIRCRAFT ASSOCIATION: meets second Monday - Sept. to June. Contact Michael Reimer 780-975-5263 or secretary Roger Smealand 780-466-9196. Website www.ehaa.ca  
GRANDE PRAIRIE: Third Tuesday, (September to April), 7:30, 2nd floor boardroom of the Grande Prairie Terminal Building. Summer events on an informal schedule. For more information contact Lee Merlo at 780-518-4254 or e-mail arniesusanmeyer@gmail.com

**BRITISH COLUMBIA**

DUNCAN: Second Tuesday 7 pm members homes (rotating basis). Contact Pres. Howard Rolston, 250-246-3756.  
OKANAGAN VALLEY: First Thursday of every month except July and August (no meetings) at the Mekong Restaurant.1030 Harvey Ave. Dinner at 6:00pm, meeting at 7:30pm Contact President, Cameron Bottrill 250-309-4171 email: Outintheair@yahoo.ca  
QUESNEL: First Monday/Month 7:00 p.m.

at Old Terminal Building, CYQZ Airport. Contact President Jerry Van Halderen 250-249-5151 email: jjwvanhalderen@shaw.ca  
SUNCOAST RAA CHAPTER 580: Second Sunday 13:30 pm Sechelt Airport Clubhouse, sometimes members homes. Contact Pres. Gene Hogan, 604-886-7645  
CHAPTER 85 RAA (DELTA): First Tuesday 7:30pm, Delta Heritage Airpark RAA Clubhouse. 4103-104th Street, Delta. Contact President Alex Mackay mackay@physics.ubc.ca. Website www.raa85.ca.  
VANCOUVER ISLAND AVIATION SOCIETY (VICTORIA): Third Monday 7:30 pm Victoria Flying Club Lounge. Contact Pres. Roger Damico, 250-744-7472.  
THOMPSON VALLEY SPORT AIRCRAFT CLUB: Second Thursday of the month 7:30 pm Knutsford Club, contact President Darren Watt 250-573-3036  
ALASKA HIGHWAY: meetings held every third Thursday of every month (except July & August) at the Taylor Fire Hall at 7:30 p.m. For more information call Gerry at 250-782-4707 or Heath at 250-785-4758.

**Chapter executives**, please advise of changes as they occur. For further information regarding chapter activities contact RAA Canada, Waterloo Airport, Breslau ON N0B 1M0 Telephone: 519-648-3030 Member's Toll Free line: 1-800-387-1028

Emails can be sent to President Gary Wolf at: **garywolf@rogers.com** and George Gregory at **gregdesign@telus.net**.



# Classifieds

*To submit or delete a classified ad, please send to [raa@raa.ca](mailto:raa@raa.ca) and place "RAA ad" in the subject line.*

The Recreational Flyer is pleased to offer you colour advertising within the magazine. Previously limited to the back cover, we have added 4 new colour pages which will be available with limited space for your advertising needs. Our rates for both black and white and colour ads remain very competitive and you reach a captive and qualified audience. Emails can be sent to President Gary Wolf at: [garywolf@rogers.com](mailto:garywolf@rogers.com) and George Gregory at [gregdesign@telus.net](mailto:gregdesign@telus.net)

Deadline for submissions is the first of the month preceding date of issue.

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The Recreational Flyer is devoted to the aerospace sciences. The intention of the magazine is to promote education and safety through its members to the general public. Material in the Flyer is contributed by aerospace engineers, designers, builders and restorers of aviation devices and vehicles, used in an amateur capacity, as well as by other interested persons, publications and organizations. Contributions to the Recreational Flyer are voluntary and without remuneration. Opinions expressed in articles and letters do not necessarily reflect those of the Recreational Aircraft Association Canada. Accuracy of the material presented is solely the responsibility of the author or contributor. The Recreational Aircraft Association Canada does not guarantee or endorse any product offered through articles or advertising. The Flyer and its publisher welcomes constructive criticism and reports of inferior merchandise or services offered through advertising in the publication.

FOR SALE - Four lengths of spar grade sitka spruce. 7/8" x 6 1/4" rough, x 20 ft. This will plane down to 3/4" x 6". Located in Kenora, Ontario. I will box and wrap and carry to a shipping depot. Buyer pays shipping, or my ship costs will be added to purchase price. Cost for this material, planed, at Aircraft Spruce Canada is \$14/ft, I am selling for \$600 CDN. Call 807-468-4764, or email [pjohnson@kmts.ca](mailto:pjohnson@kmts.ca).

PARTIAL KIT for Zenair CH 640 See my Facebook photo album for progress (George Lowes). I've lost my medical. See Zenair web page for specs. <http://www.zenair640.info/standard-ch-640-kits.html> Kits List Price in \$US: Rudder Tail 590.00, Tail (Manual Trim) 1,995.00, Wings 7,995.00, Fuel System 1,495.00, Extended Range Auxiliary Fuel Tanks 2 X 46 USgal 900.00, Nav/Strobe/Position Lights (Incandescent NOT LED) 828.00. Total List Price 13,803.00 \$US. Many air tools are also available. \$10,000 OBO. George Lowes 705-843-0826

BX-1000 Black Max brakes, wheels and tires. 6 inches, axles 5/8" Brand new. 575.00 OBO. [Lmistor@hotmail.com](mailto:Lmistor@hotmail.com) 289 838-9588, 905 469-2198

½ VW ENGINE FOR SALE. Big cylinders, 1200cc, 45hp at 3600 rpm. No electrical, no starter. Cut crankcase. Attached to an airframe. 3.0 hrs since new. Single spark ignition, Bendix mag, Zenith carb, oil coil on Y intake, 2 aluminum NiCom cylinders, BxS 94x86 mm, 8:1 compression, shrunk fit 5" hub, 6 x5/16" bolt pattern on a 79 mm diameter, straight exhaust. 4100 CAD. Contact Liviu at [Lmistor@hotmail.com](mailto:Lmistor@hotmail.com)

PRINCE PROP for Half VW, P tip,

wood, 52x36 DxP. Contact Liviu at [Lmistor@hotmail.com](mailto:Lmistor@hotmail.com)

ACEY DEUCY 2 place tandem open cockpit, 63TTSN, 0200 Engine, radio, 406 ELT, Intercom, B&C Lightweight Starter and Alternator, 3 blade adjustable Prop, Hangared, Would consider



trade to closed cockpit, \$22500 . 905-396-7533 (Apr 30 photo)

CLEANING THE HANGAR! PS Engineering Aerocom !! intercom with one brand new never used PS Engineering stereo / mono headset (switchable) Including Mini XLR (switchcraft TA4FLX) plug for remote \$150. Two Soft-Comm aviation headsets – in like new condition \$100 /pair.. 1 used Cessna 150 remote drain gascolator \$100. 2 new Facet 40108 low pressure fuel pumps with AN6 fittings \$40 each. 1 ASI 40 – 140 knot new (green band 70-110 knot) \$100. 1 VSI-used Garwin g991-01 (Cessna 150-170-1800) \$50. Panel mounted digital clock with alarm \$25.00 Leece Neville adjustable electronic voltage regulator 5078RB – new in box \$30. Insite GEM 602 Rev D engine monitor with 6 EGT and 6 bayonet CHT sensors for 4 or 6 cyl. \$500. Digiflow 6710m metric fuel flow meter/totalizer with both push on and threaded sensors – New \$75. Lift Reserve instrument - Minihelic 11 Series 3000 with custom scale in case for glareshield mounting \$75. 2 Cleveland 10-22 master cyls \$300 for the pair. 2 Cleveland 30-63a Calipers

(\$829 each from ACS – in ACS boxes) \$350 for the pair. Warp Drive prop left hand. It is a 68 inch and it is the HP (2 piece) hub and the HP has C14227 68L 2BLD blades. \$500. All items open to reasonable offers. Contact Clare Snyder [Clare@snyder.on.ca](mailto:Clare@snyder.on.ca) 519 574 4322

3/4 SCALE STOL Slepcev kit for sale \$5000 or b.o. (purchased in 2006 \$30,000). Amateur class built aircraft approved in Canada. All metal wing (33ft), tubular frame fuselage for 100hp engine and fabric cover fuselage and controls surfaces. This is a complete aircraft minus propeller, engine and instruments. Robert Badiali, Ajax. Ontario [thai@sympatico.ca](mailto:thai@sympatico.ca)

HATZ CB-1 PROJECT, fuselage on gear, Gypsy Major 1-C engine, Cleveland wheels and brakes, wood spar kit and flying wires incl. Some ribs built, most materials to complete. Misc. parts, hardware, instruments, etc.. \$12,000.00 OBO. Mark 613-301-0364

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LYCOMING 0290G for sale checked by Gilbert in Brantford, new pistons,

rings, one piece oil pump, new bearings. In eastern Ontario dry basement. Long block only no carb or mags. Ask \$7000. 705 653 4098 e mail [rvator\\_f@hotmail.com](mailto:rvator_f@hotmail.com)



MURPHY REBEL PROJECT for sale SN 309. Wings enclosed. All control surfaces complete not covered. The fuselage is basically done with the Ontario mods. heavy corner wraps, firewall beef up etc. Just working on the floor channels. Gull wing door opening. All parts in original kit.

\$30,000 OBO. 613-243-5353 [wrayt59@gmail.com](mailto:wrayt59@gmail.com)

THREE PAIRS OF WHEEL PANTS: RV-6 new but shopworn \$225/pr. Challenger UL or similar \$150/pr. Cessna 150, one has slight damage \$100/pr [garywolf@rogers.com](mailto:garywolf@rogers.com)

CONTINENTAL 75-12F engine from a 1946 Ercoupe. This aircraft was imported to Canada in 2008 with 158.6 hours on rebuilt engine. The aircraft was stored until 2014, certified and flown until Oct 2015 with only 163.1 hours on engine. Aircraft sustained a ground loop and prop strike on grass. Engine complete. Crankshaft was dial indicated and the engine is within tolerance. Dial readings are 0.003" Radial and 0.001 Axial. The Crankshaft Glance is not bent. Compression #1 77/80 #2 72/80 #3 73/80 #4 75/80. Other Ercoupe parts available. Will ship worldwide at cost. \$4000.00 OBO. Campbellford, ON 705 653 4525 [sales@prototyperesearch.com](mailto:sales@prototyperesearch.com)

WANTED: spring landing gear for a Zenith CH300TD taildragger.. new or used. Call Sherald @ 416-426-5410 cell or Email [sheraldm@yahoo.com](mailto:sheraldm@yahoo.com)

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**RAA LONDON-ST. THOMAS**

September's meeting was a free-form discussion on a pair of topics, preparing aircraft engines for storage, led by Jerry Trimble, and electric project by Fisher flying products, led by Dave Hertner. On a side note, Dave Hertner or Fisher Flying Products now has a YouTube Channel. Dave had mentioned this in a previous meeting. I thought it would be a god idea to check it out. There are some great videos there, go check it out. Dave, our YouTube celebrity!

<https://www.youtube.com/channel/UCsrzvZZwV7b0kfE3aEEQ/videos>

In addition to Jerry and Dave, the meeting was attended by Eric Bartlett, Jim Tyler, Chris Staines, Jim Stevenson, and Mike Stoddard.

Jim Tyler described how he prepares his RV for winter; basically, he changes the oil, flies the plane, adds "Cam Guard", sets it down removes the top plugs and puts in dryer plugs, packs all orifices with silica gel packs dried in the oven. Jim has a home-made air dryer constructed from an aquarium pump. He has never had iron show up in his oil samples in the 10 years he's been owned his RV.

Eric discussed how to prepare diesels for storage. Chris flies his Europa year-round; his Rotax has non-steel cylinders that are not subject to rusting.

Electric propulsion with Dave Hertner. He described project that his company is working on to develop an electric propulsion platform for some of the Fisher flying products aircraft. They are developing it in a manner that they hope will become an industry standard that can be used across various makes and models of home-builder craft. Dave's goal is to have

an alternative for the Polini engine, or the equivalent of 55 hp, that would provide flights of 45 minutes in the air, with a 35% to 40% battery reserve on landing.

This month's meeting was an online Zoom meeting, it had featured a free-form discussion member's experiences with Volkswagen motors. Gerry Trimble spoke about his Volksplane project and the motor that was obtained from a local wreckers. He mentioned that the carb was prone to icing. It was mentioned, that like all aircraft motors, cooling is essential for longevity. Volkswagen motors have had crank and bearing issues, primarily caused by expecting too much horsepower from the motor and not enough bearings to support the crank. Phil spoke about the use of the AeroVee in Sonex aircraft. He mentioned that Sonex has a baffle kit to assist in cooling.

**CHAPTER 85 VANCOUVER**

Summer has come and gone and we are still trapped by Covid -19. RAA Chapter 85 managed to do OK this summer with one Zoom Meeting and two in-person meetings at the airport. At these two outdoor member events, we strived to follow Provincial Covid-19 rules; social distancing was practiced and we collected phone numbers from all the participants.

Our July Zoom meeting featured our own Perry Delano describing his Zenith 701 project which is nearly completed. Perry reported on why he chose the 701, on challenging problems in the build and he showed us quite a few places where he was able to improve on the design using his considerable engineering skills. We learned about how to 'divorce' ailerons. Many of us came from the meeting feeling that



*Eric Barlett's new Varieze.*

Perry's presentation truly captured the spirit of our Chapter. This has generated plans for future presentations by members who are building or have built or restored an airplane.

Our August 4th meeting featured Kate Klassen from Coastal Drone Co. Kate brought three small drones. Kate introduced us to drones at our February Meeting but to really get to know them, we needed to have hands-on experience. There are no regulatory restrictions for drones weighing less than 250g (which Kate brought); hence Nav Canada permission was not required. We flew the drones in front of Mary's Place. 15 members came to try out drone flight and I believe that all were impressed by the technology. They are self-restricted to below 400' and at any point in the flight one can push a button which causes them to return and land at their take-off point. They have sensors which enable them to automatically move clear of any obstructions. Drones also provide an ideal mechanism for taking group pictures- no-one has to stand in front to take the picture and if there are small kids in the picture, no needs to convince them to look at the camera!

Finally, we held our annual Show and Shine on September 1st.



*Chapter 85's fall Show 'n Shine was a great success.*

The turnout was superb! We had 37 attendees, 13 airplanes and one antique car. Our members have some very fine airplanes! For the record, the following airplane types were in attendance: RV7, Osprey, Pietenpol, Bede4, Murphy Super Rebel, Murphy Maverick, Zenith Cruzer, Diamond DA40, Cessna 140, 2x Cessna 150, Cessna 170, and a Cessna 172. There was also a restored MG sports car.

Our program for the October Meeting was a very informative briefing from Sebastien Seykora on the use of the SkyView Engine Monitoring System (EMS) recordings to diagnose engine problems.

For our November meeting we

were treated with a video of Tiger Moth aerobatics from the cockpit and an aerial tour in a CAC Winjeel in Part II of Peter Sleeman's account of his Australian Odyssey in early 2020. The rest of our season was eclipsed by Covid-19 concerns- there was no Remembrance Day event at the Airport and no Christmas party.

The Cruzer provided us with one more learning experience before the end of the year. A substantial power loss occurred in cruising flight which was assessed in the air to be caused by lack of flow from the right fuel tank. The aircraft engine operated normally when fuel was switched to the left tank. The problem was later

determined to be plugged vent in the right fuel tank cap. Kudos to pilot Jeff Clarke for expertly managing this potentially serious incident.

So, to wrap up, it's been a 'different' year for Chapter 85. We had 3 regular general meetings, 3 in person socially distanced events including our Cleanup day in May, the Drone Demo in August and our annual Show and Shine in September and 5 Zoom meetings. The Zoom meetings have been fun – we hope that more of our members will join in next year, it is not at all difficult to use Zoom and to my knowledge it is quite safe. The Cruzer did well this year; it has over 200 hrs


*continued*



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flight time - imagine how much time it would have accumulated without a

pandemic! This was also a very good year for new Chapter members- we had 11 new members join our Chapter this year. We await patiently (maybe

not that patiently) for a time in 2021 when we can once again mingle in the Roundhouse and organise special events like our Annual Fly-In. 

# Bearhawk Introduces a Six-Place Aircraft

AUSTIN, TEXAS, MAY 21, 2020 – Bearhawk Aircraft announced today the introduction of its largest Bearhawk model to date, the Bearhawk 5. The new aircraft was designed by engineer Bob Barrows and is the first in the lineup of Bearhawk aircraft to use a 300-horsepower engine, seating up to six occupants.

The Bearhawk Model 5 made its first flight on May 3rd. The prototype has flown more than five hours in testing and is exhibiting excellent flight characteristics, according to test pilot Rollie van Dorn. Further flight testing is expected to confirm the airplane's projected 3,000 lb gross weight.

The Bearhawk Model 5 has been under development for two years. Slightly wider and longer than the original 4-Place Bearhawk, the new design is powered by a spec-built Lycoming IO-580 engine. The first Bearhawk Model 5 was built in collaboration with avid Bearhawk builder Collin Campbell of Bolivar, Missouri. Collin has scratch built a fleet of different Bearhawk models and has a reputation for outstanding workmanship.

Mark Goldberg, president of Avipro / Bearhawk Aircraft, manufactures Quick Build kits of the Bearhawk models. Mark has been eager to announce the Model 5 for some time. "A brief history of how this design came about... a friend of design engineer Bob Barrows requested he create a larger version of the Bearhawk 4-Place as this friend is a big guy. Bob did the drawings for his friend who began construction on it. However, health issues forced him to quit working on the project and it sat for about a year. One day I was talking to Collin Campbell who told me he was getting bored now that his Bearhawk LSA was finished and flying." Mark said a light bulb came on and, thus, a plan was hatched for Collin to finish the Model 5 project. "Truly, there is no one in the world, except Bob himself, more qualified to have built this prototype than Collin," he concluded.

In many ways, the new Model 5 can be compared to the Bearhawk 4-Place the way the Cessna 185 is compared to the Cessna 180. Just like the two Cessnas, both the Model 5 and 4-Place use the same wing. The Cessna wing has 174 sq ft of surface area while the Bearhawk wing has 186 sq ft with its Riblett airfoil. Compared to the 4-Place Bearhawk, already bigger than a C-180, the Model 5 has a wider, longer fuselage and features a bigger motor. Specifically, the Model 5 is two inches wider than the Bearhawk 4-Place, and its cabin is fourteen inches longer. Overall length

of the Model 5 is twenty-four inches longer than the 4-Place. There is room in the Model 5 for 5th and 6th seats in the back or, alternatively, extra cargo space. The Model 5 has considerably more interior room than a C-185. While the Bearhawk 4-Place can use four-cylinder Lycoming engines, up to the parallel valve O-540 series, the Model 5's smallest engine will be the six-cylinder 250/260 hp Lycoming O-540. The Model 5 has the ability to use the heavier angle-valve cylinder Lycoming O-540 and IO-580 of 300 and 315 hp respectively.

The prototype Model 5 partly owes its outstanding performance to the Lycoming IO-580 at 315 hp. A three-blade Hartzell 82-inch diameter carbon fiber Trailblazer propeller completes the package with its really strong takeoff thrust and climb. At a projected gross weight of 3,000 lb, with utility category strength at full gross, the 1,512 lb empty weight of the Model 5 results in a plane that is expected to carry double its own weight.

Cruise speeds around 160 mph are also expected as 156 mph TAS, at 3,500 ft and 24-squared, or 72-percent power, was seen during tests. Reduced, economy lean-of-peak fuel flow speeds of around 145-150 mph and 14.5 to 15 GPH are also anticipated. Takeoff performance was 220 to 300 ft. Landings were kept to under 650 ft as the wet, muddy runway conditions in the very middle of the 1,350-ft runway allowed use of only half the strip, Rollie reported. "Collin did a beautiful job building it, and he and I worked together for the three days I was there to get as much done as we could. The Bearhawk Model 5 offered no surprises on takeoff or climb out. With all that power, things happen quickly." Rollie also noted power-on stalls to be less than 40 mph.

The Bearhawk lineup includes two-place Patrol, Companion and LSA models. The 4-Place and new Model 5 fill out the larger end of the lineup with excellent carrying capacity. All are available in kit or plans and excel at accessing remote airstrips. 2-Place and 4-Place Bearhawk kits are now shipping, including a Bearhawk 4-Place Model B shipment to New Zealand today. Bearhawk aircraft are renown for their rugged construction and large cargo areas.

For more information on Bearhawk Aircraft, visit [www.bearhawkaircraft.com](http://www.bearhawkaircraft.com), or contact Bearhawk at [info@bearhawkaircraft.com](mailto:info@bearhawkaircraft.com) or 1-877-528-4776.

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