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Recreational Flyer

Recreational Aircraft Association Canada www.raa.ca
The Voice of Canadian Amateur Aircraft Builders $6.95

Gary Wallace's

Cessna 140

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

From The President's Desk

Gary Wolf

Paul Poberezny passes

Paul Poberezny, founder of the EAA, has recently passed away. He started the EAA in 1953 and fortunately made it to the sixtieth year of its operation. From humble beginnings in Rockford Illinois his annual fly-in has grown to become the largest aviation event in the world, devoted to builders and pilots of amateur aircraft. Fair winds, Paul.

Fly-ins OK

Despite a recent COPA article there has actually been no threat to fly-ins. In 2003 there was an article in Copa asking if fly-ins were doomed, and RAA took up the case and dealt with it at the time. The agreement reached with Transport was that as long as there were no competition events like flour bombings, and as long as pilots stayed within the circuit procedures, fly-ins were legal. Since that time RAA has consistently advised its chapters that they must not countenance blatant circuit infractions, and that the Chapter Liability Policy covers only fly-ins and not airshows.

Transport Canada would have a very difficult time if their enforcement people ever tried to shut down fly-ins. Canadians have the right of assembly and a chapter BBQ is an example of this right. Attendees may arrive and depart by any legal means, even by aircraft as long as proper circuit procedures are observed.

A call to the Enforcement people confirmed that fly-ins are not even on the TC radar screen. They have much bigger fish to fry.

Rotax 912 SB-912-063 expanded

For the full story go to www.rotax-owner.com. Owners of the 912, 914-series engines should pay the admission fee and stay updated with Rotax bulletins and service videos.

"Rotax has released an amended engine serial number list for UL engines affected by this fuel pump SB. In accordance with the current "LINE" Maintenance Manual all mechanical fuel pumps have a 5 year life. Fuel pumps prior to 2008 (with S/N starting 07. or 06.) should have already been replaced in line with the routine maintenance requirements. If this 5 year replacement has been omitted the pump should be replaced immediately. It is necessary to check the part no. & S/N of any pumps previously replaced to ensure that they are not in the affected range. NOTE: Basically, all fuel pumps with part no. 892542 and part no. 892546 are affected. Pumps with serial numbers(S/N) as listed in the SB-912-063UL R2 as originally installed in the engines and/or delivered as spare parts are also affected by this replacement recommendation. In all cases owner/operators should check their existing engine and fuel pump serial numbers against those listed as affected in the most recent release of this SB to assure they are in compliance with requirements."

Patterson Aero Sales

Patterson Aero Sales, who represent the Murphy line of aircraft has also been the Canadian representative of the Italian MW Fly engines, a line of small boxer engines with built in redrive. Patterson has recently terminated the business relationship and has posted an announcement on their website www.pattersonaerosales.com

ECI Cylinders again

Several years ago there was an AD that recalled ECI cylinders that were installed on Lycoming 4 and 6 cylinder engines, because the threads at the interface between head and cylinder were cracking, causing leaks and

continued on page 35

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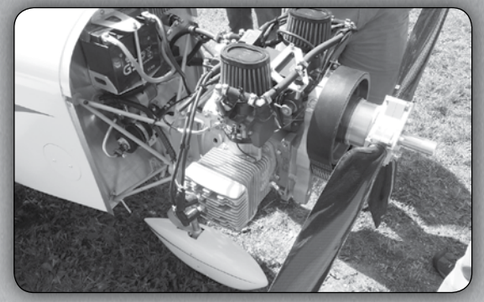
features



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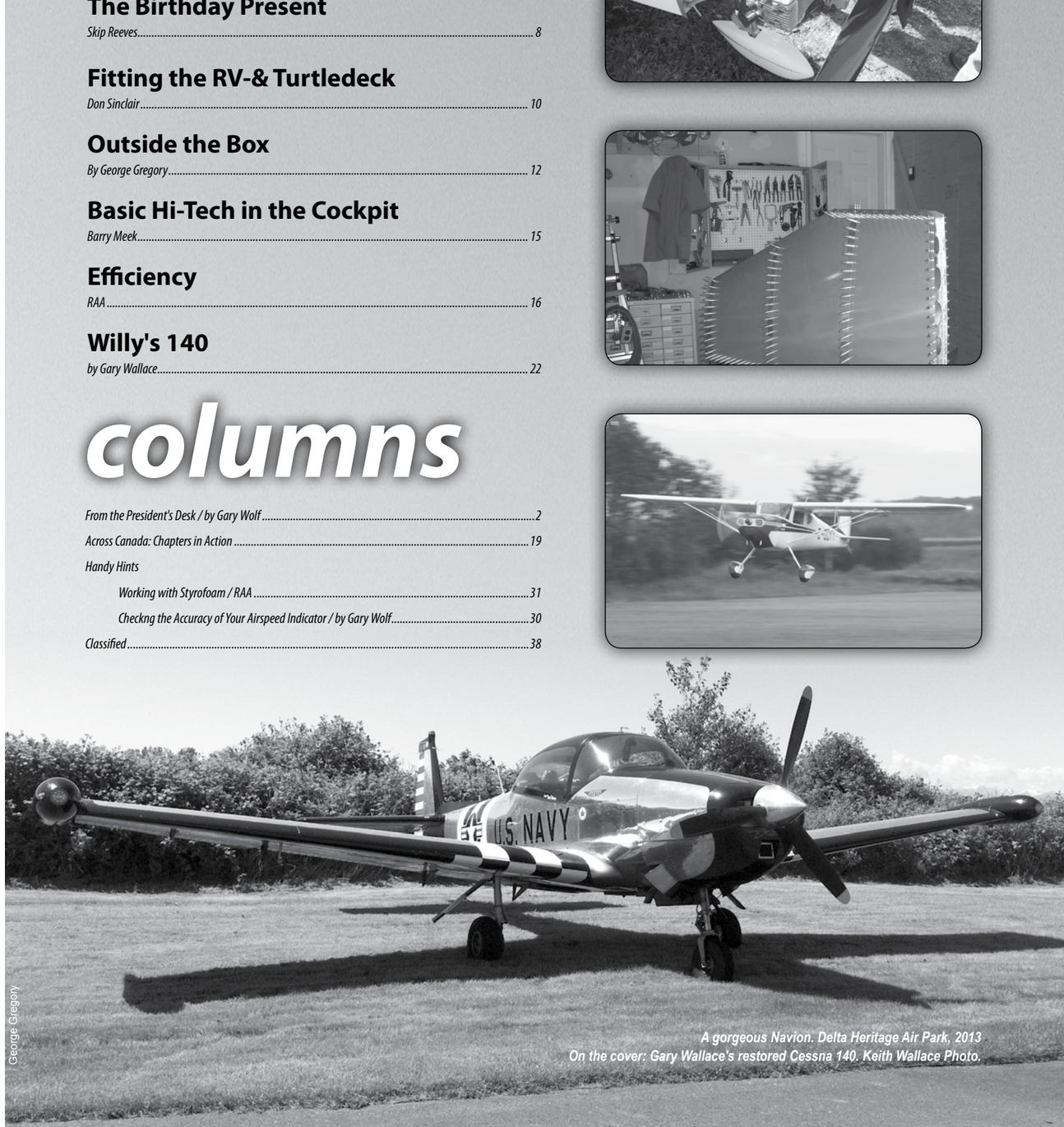


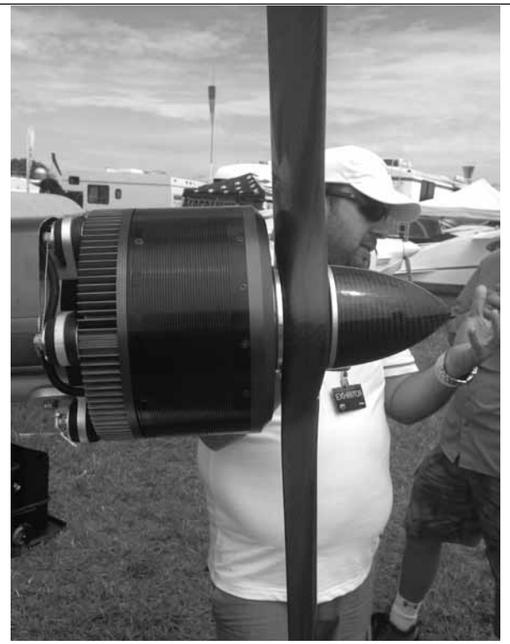
George Gregory

A gorgeous Navion. Delta Heritage Air Park, 2013
On the cover: Gary Wallace's restored Cessna 140. Keith Wallace Photo.

Oshkosh Review

By Chris Horsten

IT HARDLY SEEMS POSSIBLE but it's been about 10 years since my last visit to Oshkosh. It's not the same event I remember. With less and less Poberezny influence the show has long since crossed the line from "homebuilder heaven" to "commercial venture". Despite that, the organisers are calling it a great success with record numbers of vendors and sales. It would be interesting to see the details of those sales because I'm not sure if sales of sunglasses and carved wooden planes really count as successful except for the bottom line. One outfit I've been watching was indeed doing a brisk business. From the $20 T-shirt I bought right up to a $189,000 A5 amphibian, Icon is amongst the most successful new aircraft designs (that is yet to be) of the last few years. With over 1000 orders they stand to be busy for the next 5 or more years. I even witnessed a couple walk up to the counter and slap down a deposit check for a spot in line.



Opposite: Probably the lowest cost LSA or Amateur Built kit available ($60,000) - the SkyCraft SD-1 Minisport
Above: The Yuneec Electric ESpyder UL offers one hour of flight for pennies per hour.

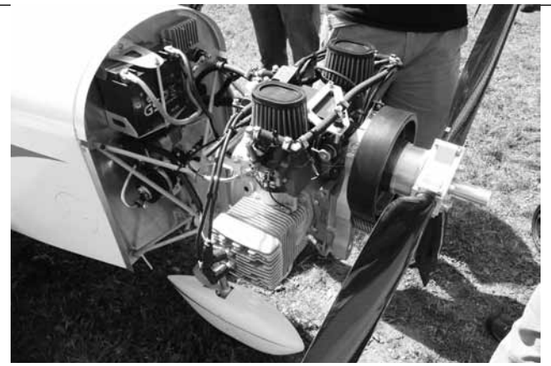
Missing was the deep roots of the homebuilt movement, the used parts, the entry-level kits, and the plans. If you went looking for an entry level project, you likely came away disappointed. With the price of a booth running between two and three thousand dollars it's become prohibitive for many would be vendors. With the economy such that it is, I expected a huge increase in the Ultralight segment. In fact this appears to be one of the hardest hit areas with very few vendors in attendance. And in retrospect it makes sense because it's the entry-level pilot that is suffering the biggest drop of discretionary income. Most people I know with money seldom take any notice of a poor economy when they decide they want something.

With my pockets stuffed with greenbacks I made the Aeromart tent my first stop. With all the modern avionics and gadgetry out there I felt confident that I could pick up a few

Missing was the deep roots of the homebuilt movement, the used parts, the entry-level kits, and the plans. If you went looking for an entry level project, you likely came away disappointed

bits and pieces for my Baby Ace. With my 12-year-old daughter in tow I promised no more than a half hour for browsing. Sadly, I have never seen a more overpriced pile of junk in my life. Unless these artefacts belonged to Earhart's Electra, they were hardly worth bringing to Oshkosh. After seeing a Cessna 150 yoke for $500 we headed for the door. It seems that the Aeromart is no longer a source for parts exchange and is now a souvenir shop.

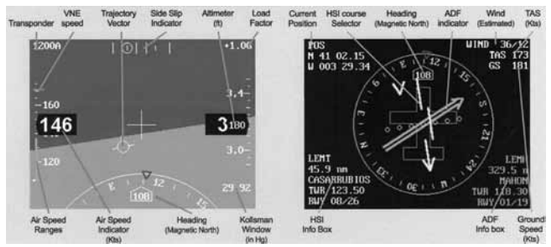
I devoted the next three days to looking at what's new and I'm happy to say that I got my fix. AOA (angle of attack systems) are quickly becoming the must have gadget for the aircraft owner who has everything. Icon aircraft really lit the fire by incorporating one into their A5 panel, and promoting it as essential equipment. There are about 4 manufacturers that I could find. Some, like Dynon, have already incorporated the technology into their EFIS system. The prices are high though: expect to pay about $1200 for an entry-level system and up to $1800 for one with a military type display. The most nicely packaged example was a new entry by Bendix King. The KLR-10 was designed for the non-certified world and at $1600



Under the cowling of the SD-1 Minisport. Its 50 horsepower Hirth engine engine propels the airplane at a respectable 118 miles per hour, and can climb up to 1400 fpm. It can carry pilots up to 230 lb and burns a miserly 1.8 gph to yield a range of nearly 600 miles. Right, the cockpit features some glass. EFIS systems are getting to the point that they are more affordable than conventional instrumentation.

was probably the best value in the higher end of AOA systems.

Dynon D1's were everywhere with a street price down to about $1275. Attitude indicator software, AHRS components, and touch screens are a cheap commodity now, so it's no surprise that they are popping up on every tablet and smartphone. The Dynon D1 is nice, but the prize for a truly useful AI goes to the AVmap Ultra. It is similar to the Dynon D1 in size, but blows it away in function. Holding it in my hand I was delighted to see pitot and static ports, as well as a GPS antenna connector. The dedicated EFIS market has reached a new price plateau. The Ultra is a complete



The prize for a truly useful AI goes to the AVmap Ultra. It's getting to the point that even conventional used instrumentation costs more than brand new glass. At left is the unit itself, and a diagram explaining its features.

backup for a loaded panel, but there's more. It sports an HSI page and GPS database too. You'd expect this unit to be priced about the same or more than a Dynon D10A, but surprisingly it's a mere $1200 – less than the current Dynon D1. It's getting to the point that even used steam gauges are more money than glass. My only caution is that it hasn't been released for sale yet. And don't hold your breath because delays are the hallmark of Avmap. The EKP-V, AVmaps answer to the Garmin 696, has also benefitted from the Ultra's technology. An AHRS box, which includes the pitot/static ports of the Ultra, is now available to add EFIS functionality to your EKP-V GPS. A panel dock with multiple connection options allows you to link two EKP-V's with AHRS, Zaon Traffic, and satellite weather. I'd say this is a scaled down version of the Garmin G3X EFIS system for a lot less dough. Engine monitoring is also in development, with basic graphical representation available now.

If you are building or restoring a more vintage aircraft, there is a new fabric covering called Oratex. The product is pre-painted with UV barrier and colour, which means there are no lengthy and chemical ridden steps to tackle. A Super Cub can be covered in under a week ready to fly. It can be painted if desired, but it's much easier to add your own personal touch with vinyl graphics. The cost is as much or more as any of the other more labour intensive systems, but the ease of application and strength of the product make it an attractive alternative. They handed out a neat sample which I intend to try when I get a few hours.

The Bede 5J was and still is a dream for many, but the difficult to fly and impractical design have hindered any chance of mass production. Sonex has decided to have a go at this segment with version two of their Sub Sonex PLJ. The design is 100% John Monnet which means a simple, pop riveted airframe.

Making this possible is a small jet engine produced by PBS engines. The TJ-100 engine has been used in gliders and unmanned vehicles, and now provides an adequate if not marginal engine for the Sub Sonex. Sonex is taking deposits on a production kit expected to be available in the next 12 months at a guaranteed price tag of $125,000. The prospect is exciting – for about 10 minutes - and then you realise it's good for little more than flying around the airport for an hour, the limit of its fuel supply. But this is a good start – or should I say restart, because the door is open again to the idea of a personal jet for the "average" guy. A few companies are in the early stages of development for other new engines, which may eventually lead to a useful airframe and power plant combination.

The LSA category is alive and well with many great designs. If you've got $100,000 or more dollars then you can buy a great ready to fly aircraft, but for now it's a moot point for Canadians. LSA's have no place to go in Canada yet.

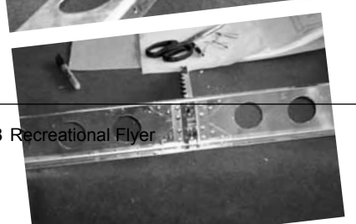
Addendum: Just before press time we learned of Paul Poberezny's death at the age of 91. Poberezney was a great advocate for the amateur built aircraft movement, and it's due to his vision that we have such great freedoms that we do, even in Canada. Founder of the EAA in 1953 he drove the idea of building and flying your own plane to what it is today. With a number of designs to his credit, and literally tens of thousands of hours in hundreds of types he was truly one of the great aviators of our time. R

Chris Horsten *is a long-time member of the RAA and comes from a family of homebuilders. He is presently working on a Baby Ace.*

Fuel Injection vs. Carbuettors

By Eustace Bowhay

I'd like to pass on my experience with fuel systems over the years and as related to my RV-6. All of my flying with horizontally opposed engines since the sixties had been with fuel injection until my RV-6. At the time of building the -6 I didn't think I had a choice, with Van recommending only the 0-320 and 0-360 Lycomings. My choice was the 0-360. With most of our flying here over hostile terrain and sparsely settled areas, I decided to install the Gem graphic display. This would give me advance warning of any valve problems, as well as mixture and ignition info. This is when the wide spread in mixture to the four cylinders showed up, and having to lean to the leanest cylinder wasn't really the most efficient. Carb icing was a bit of a concern, with the difficulty of getting what I felt was adequate hot air for carb heat. Turned out to be a non-issue, with the crossover exhaust system located over the alternate air door. I had my engine overhauled in 1996, and decided to give the Bendix Fuel Injection a try- a system I was familiar with. This is a big change, requiring a change in both the engine driven pump. and the boost pump, because of the higher pressure and the extra plumbing required. This was another reason for moving the gascolator into the wing root (so that the gascolator would not be pressurized). I mounted the Weldon pump on the fuselage side of the firewall above the rudder pedals. That wasn't ideal, because of the lift, but didn't want it in the engine compartment because of the heat and starting problems associated with fuel injection on short turnarounds. This problem was completely solved with the installation of an AirFlow Performance purge valve this year. Flying with the fuel injection system is a real treat, to see the EGTs straight across, and the CHTs almost the same. The leaning is now the same on all four cylinders. Carb ice is a thing of the past. So which system is the best? Here again I think it is a matter of personal choice. Cost is certainly a major factor with fuel injection. I believe fuel injection is more reliable but can honestly say I haven't had any trouble with either. It's hard to beat the simplicity of the carb system, and in my opinion a carb gives easier all around starting with less wear and tear on the starter and battery. However, fuel injection has to be better for the engine because of its even fuel distribution and better leaning, and has the added benefit of no carb icing problems. I am looking seriously at the Airflow Performance system for the -6A because of the pump ($300 versus $1000) and the purge valve. It uses a large capacity inline filter (I believe between the pump and the throttle body) that I would like to know a bit more about. I'll also use the Andair gascolator for its better quality and easier servicing.



The Birthday Present

by Skip Reeves

I BEGAN BUILDING my RV-12 in my garage late last summer, 2012 and joined the RAA at about the same time. Very recently, I was asked if I'd be interested in writing an article about the process. I am both flattered and excited to chronicle and share my experiences. I should though, start at the very beginning.

It began innocently, like so many things do. Two years ago my wife bought me what she believed would be a very special birthday present. She bought me a one-hour flight at our small, local airport. It certainly should have been special and it certainly should have been an innocent enough gift. And it should have been, she believed, a one- time gift that would bring me much enjoyment.

In order to understand why she would choose this gift it's important to know that I'm a retired Master Warrant Officer. I spent 30 years in the Royal Canadian Air Force. Nineteen of those years were spent as a flight engineer. Consequently, I've spent thousands of hours in the air. Add to that, the fact that after retirement, I worked for Air Canada as a Flight Ops and simulator instructor on the A340, A320 and A330 for 10 years. I realize now that I've told my wife countless times how much I miss being in the air and miss being involved in aviation. I have to assume she understood the first part of that notion, but the second part of the scenario didn't register, at least to the extent that it probably should have. After all, her gift was meant to be, as I said, a one-time thing with a specific outcome; that being to satisfy my desire to be in the air again. She couldn't have predicted the chain of events that that innocent gift sparked. Nor could she comprehend why I didn't rush right out to capitalize on her gift. My reticence to do so was confusing and somewhat upsetting to her and prompted many a discussion.

Of course, I was very pleased with her thoughtfulness, but I knew that a one-hour flight would only increase, not satiate my hunger for flying and everything I missed about it. Nevertheless, after a considerable length of time, I reluctantly booked a flight. To her disappointment, it was, (as I knew it would be) a bittersweet experience. It's said that every cloud has a silver lining and in this instance that certainly turned out to be the case.

My wife and I had often discussed a mutual hobby or passion that we might be able to pursue in our retirement years. I have a motorcycle that I was quite happily planning on restoring. My hope was to be able to share the excitement of it with my wife. She wanted no part of it. Neither of us particularly likes driving or the notion of having a camper. My wife is a homebody and loves gardening. Though I enjoy the beauty of her gardens it would never become a passion of mine. It seemed there was nothing upon which we would both agree. However, after the birthday flight, we began talking about what it might be like to own an airplane. It began as an intriguing idea for her and a really exciting idea for me. The one and only hitch in this day dream was that I didn't just want my wife to be able to tolerate flying in a small aircraft; I wanted her to love it. It was a huge question mark for both of us. We began talking in earnest about the prospect. What we initially decided was that I would take lessons and get my pilot's licence. I was thrilled!

I began taking lessons and dutifully reported my experiences and happily shared my enthusiasm with this new chapter of my life. I was particularly pleased, when only after a few lessons my wife expressed her interest in going to see what I was flying. It was *the* turning point. She watched the take-off and landing. After which she told me she was 'jealous'. Never one to miss a golden opportunity I seized the moment, and before she could change her mind, arranged for her to go up. Imagine my joy when she returned equally, if not more enthusiastic than I was. She was hooked! The result was that as soon as we got home we began to look for airplanes for sale.

Never one to miss a golden opportunity, I seized the moment, and before she could change her mind, arranged for her to go up.

It was a very short step from that, to my cleverly offering the notion that I'd love to build our own plane. It's surprising how many of my ideas my wife has encouraged, but this one she fully embraced from its conception. The fact that we live in town, have a double car garage (but have three vehicles) didn't deter her belief in my explanations that it was completely doable. And so, we set about researching home built aircraft manufacturers and googled their promotional videos. My wife watched many more videos than I did. Her interest increased exponentially. We narrowed our research to include only those planes with side-by-side seating and with over the wing views. Before too long we found ourselves agreeing on a Van's Aircraft, RV-12. For me, it was one thing to agree on it, but quite another to commit our resources to it. A year to the day, after my wife bought me that fateful, first birthday gift, she insisted that I process the order for the RV-12 kit. Now that's a birthday present!

Van's offers a number of options. I could have bought the plane in several kits, one at a time, but in for a penny in for a pound, I chose to order the complete kit with the exception of the avionics and engine. I placed the order, sent the initial down payment to process it, then arranged for a broker to get it over the border, sent the final amount due once I was notified that it was ready for shipment and waited, albeit impatiently.

A discussion with Van's told me that I would need to be able to off load the crates from a tractor tailor, and that some crates weighed several hundred pounds. A quick trip to my local super store allowed me to determine the height I would need to construct a temporary unloading dock.

Up to this point everything around this venture involved birthdays. It didn't stop with the ordering of the plane. I was particularly and profoundly touched when the delivery date turned out to be my late father's birthday. I'm sure it's a good omen. He would have been really interested in this project and I regularly feel his presence as I work on it.

The unloading went very smoothly and each of the crates fit into the basement, thanks to wide doors and an even wider stairway. Van's instructions are very clear and the expectation is that an inventory will be completed within 30 days of delivery so that the proud new owner can notify the factory if anything parts were missing.

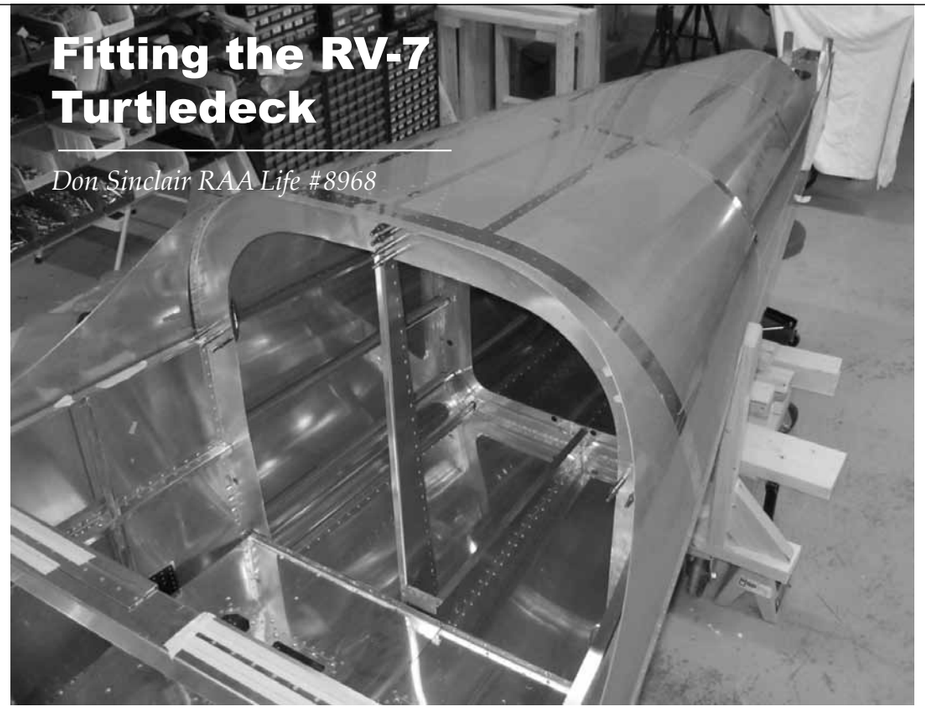
Our excitement was boundless, and as a result my wife and I immediately tackled the inventory over the course of 4 days. There were only a few hardware items missing. Van's very quickly sent the items we identified as missing. By now, however it was October and as we both worked full time at that point, we put the build on hold until the following spring. I've never liked winter, but that one seemed deliberately longer. As soon as the weather was warm enough for me to be comfortable in the garage I began preparations to turn it into a workshop. I can't emphasize enough how taking the time to build workbenches, to set up tool cabinets and parts' drawers is worth every minute spent and makes the actual building a really enjoyable experience.

My wife and I are both teachers and so we waited to begin the build, in earnest, until July 2012. I decided that it made sense to start with the first kit described in the manual, the vertical stabilizer. You can just imagine how thrilled my wife was to learn that, at least at this point, her contribution to the build would be deburring. She was even less enthralled when she realized that there was an entire plane to debur! Nevertheless, she tackled it with feigned enthusiasm while I began fabricating hinges. We had a long way to go but I assured her that the real fun was about to begin!

The next article will chronicle the build up to the pre-cover stage by MD-RA. As well, I hope to offer some suggestions so that others might avoid some mistakes and misunderstandings I encountered along the way.

Fitting the RV-7 Turtledeck

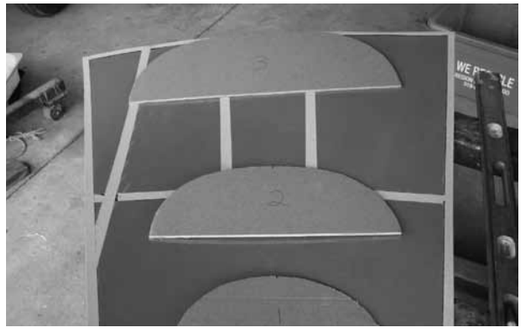
Don Sinclair RAA Life #8968



THE VAN'S RV-7 kit supplies the turtledeck skins as prepunched but almost flat .025" parts. The turtledeck bulkheads are also prepunched, and the manual recommends to pull the skins into place with clecoes, but 2024 is rather stiff and it is reluctant to set down, especially along the upper fuselage longerons. Some have found it very difficult to make the skins fit, and have even had problems getting the prepunched holes to line up. Even when everything has been pulled into place the reflection lines can look rather wavy.

I decided to preform the skins to the desired curvature so that they would lie easily on the bulkheads. A set of 4 ft sheet metal rollers is necessary for this task and this can take a bit of work to find. Fortunately my RAA chapter has access to a set, but you might find these also at heating and sheet metal shops.

I made cardboard templates patterned from the Van's bulkheads, to be used for checking the



Top: When finished, the skins now drape easily and snugly over the bulkheads, and all holes now line up for riveting
Upper right: The profile templates at their respective stations
Right: Each side was rolled parallel to its edge, towards the centreline of the rearmost station

Top: The part now lies well against the templates
Above, Graham and I next rolled the section behind the cabin

curvature of the turtledeck as it was being formed. When rolling sheet metal it is important not to run diagonally over an edge, and I took care to run parallel to the outer edges of the parts. The sheets are tapered so this required beginning just inside the edge and running towards the centre from both directions. It took several tries for each sheet but eventually they became formed to a reasonable fit over the templates.

I took the parts home and draped them over the bulkheads and the clecoes then lined up and everything went easily into place without any cargo straps. The reflection lines are straight and true, and a side benefit is that the outer edges lie tightly against the lower skins where they meet at the upper longerons.

Auto Engine Endurance

Tedd McHenry

Some of you may recall that a couple of years ago I wrote an article hypothesizing that there is no reason not to expect auto engines to have adequate durability when used in an airplane (WC RVator, April, 1998). I based my hypothesis on an analysis of cylinder pressures, piston speeds, and piston accelerations in a Chevy 4.3 compared to a Lycoming O-320 and O-360. My belief is vindicated by this quote from a Chrysler engineer about the test cycle used in the development of their truck V10 engine for use in the Viper sports car (reproduced from Contact! magazine). The test cycle he describes is much more severe than the certification requirements for aircraft piston engines. "We use an [sic] unique 500 hour endurance cycle. The traditional Chrysler endurance cycle for trucks had been 800 hours. To shorten our program timing, we discarded all of the specified light duty and idle test modes and got it down to a 500 hour cycle. It's pretty much a WOT test between peak torque and peak power with a little bit of light load in between. We set our targets at passing three 500-hour durability tests, a general 500 hour test, an ECE test, which is a European emissions certification procedure and a 100 hour test traditionally done for the exhaust manifold durability. Engines must pass a minimum of those tests."

To put this in perspective, remember that a Lycoming produces rated power at peak torque. So when an auto engine is tested at peak power (which is above peak torque), it is actually being run at loads beyond what a Lycoming ever sees, either in testing or in use. Almost the entire Chrysler test was run at loads greater than what the aircraft industry would call full rated power. And all of the test was at loads at least equal to "full rated power." Furthermore, the FAA certification requirement is for a 100 hour test at rated power. So the Chrysler test is also five times as long as is required for certification. I think this test shows that auto engines are extremely durable, and easily capable of handling the loads they would be exposed to in a typical aircraft installation.

OUTSIDE THE BOX

There's a type of aircraft overlooked until recently by the aviation community. They are simple, cheap, stall resistant, and offer some unique properties that conventional aircraft don't. And it's not a new idea; in fact, it's been around since aviation's early days.

By George Gregory

I'm talking about aircraft that literally hang from their wing - autogiros, trikes, powered parachutes and paramotors. They are different in a fundamental way.

In conventional aircraft, the wing is bolted to the fuselage. This means the balance of all the parts is critical; too far forward, and your airplane is inefficient; too far back, and your airplane is dangerous to fly.

But with what might be termed a *pendular* aircraft, the fuselage literally hangs from the wing. As long as the attach position is right, the only real balance issue is that the undercarriage hangs slightly forward of its centre of gravity so that the nosewheel rides a little higher than the mains.

They have their limitations. Pendular aircraft are not suited at all to aerobatics, and inverted flight is a no-go. But otherwise they can be handled in a fairly aggressive manner under full control.

The main difference is that the wing pivots rather than the entire aircraft rotating for takeoff as is the case with conventional aircraft. And this different approach to balance opens up some unique design opportunities.

Assuming it's built strong enough and is adequately powered, it should be possible to attach different wings to the part that contains the rest of the airframe. Some trike manufacturers, for instance, will sell the wings by themselves to be attached to whatever sort of trike undercarriage the owner desires. This means you could own one fuselage/engine combination and several different wings for different missions. Perhaps a small, stout wing for higher speed flight (some trikes can cruise at over 100 mph), a larger, higher aspect ratio for local flying and soaring.

An innovation gaining popularity with the trike crowd are strutted wings. This is significant, because these wings can be broken down to a trailerable (car-toppable?) size in about 10 minutes: transport and/or on site storage is easy and cheap. The aircraft wouldn't take up much more room than a motorcycle if you were sharing hangar space, and it's a lot easier to take home if you're so inclined.

But for myself, the main point of this type of aircraft is how balance issues relates to the idea of a roadable aircraft.

Street-legal aircraft have always been a compromise, and the biggest single reason is the different balance requirements for cars and airplanes. Aircraft must be light on the nosewheel so a reasonable sized elevator has enough authority to rotate for takeoff and landing; since they spend all their time flying, it's not an issue for the few minutes it has to spend taxiing to the runway. But if the same vehicle is being driven at highway speeds with the wings folded up, that nosewheel is the only control you have. Would you want to be barreling down the highway with only a couple hundred pounds on the only directional control you have? I don't think so. One bump and you're in the ditch. To drive safely at speed, weight *has* to move forward.

Solutions either address the problem inadequately or are so heavy and complicated that they make you wonder if it was worth the trouble. Molt Taylor's Aerocar had the entire back half of the aircraft detach (neatly solving balance issues) but it was complex and took 45 real-world minutes to convert. Fulton's Airphibian took a similar approach, but you had to leave the wings at the airport; if you're travelling cross-country and you need to drive through some weather, that limits the usefulness of the vehicle. There's even a roadable Glastar (The PD-2, which is pretty cool) that carries a separate motorcycle engine and drive wheel for ground operations.

As an aside, interest in the concept of roadable aircraft seems, if anything, to be increasing, regardless of how it's done.

There's a couple of examples of pendular aircraft in particular doing double duty as street-legal cars, and I think they represent a more elegant solution. One is I-TEC's Maverick LSA. A fire-breathing dune buggy on the ground (0-60 in under 4 seconds) it can fly as well, albeit slowly. Designed for use in the jungle, it's a pretty

Top: Hang gliders are pendular aircraft, as is I-TEC's Maverick LSA (right).

neat trick, and its pendular design means the centre of gravity issues that plague most roadable aircraft are a non-issue. Weight distribution remains the same for both ground and air modes, saving weight and improving utility. In the venue the Maverick operates in, it could be considered quite efficient. The ram-air wing, optimal for jungle work (since it packs up so small), is not fundamental to the concept; it could be replaced by a faster wing, although it wouldn't stow quite as neatly.

Another notable vehicle is the PAL-V One. A roadable autogiro, it seats two and can cruise in the neighbourhood of 100 mph. It features the advantages of autogiros (it can land with virtually no forward motion, a big safety plus). To my thinking this is the most elegant and potentially successful example of an aircraft that's reasonably good at both flying and driving. Again, weight distribution is not an issue, and the relatively small rotor stores on top. A delta (one wheel in front) trike, it overcomes tipping issues by being able to lean into turns like a motorcycle. At this point, it's not going to be cheap, but if they were manufactured in decent numbers the price would hopefully come down.

Both of these craft represent paradigm-shifting examples of radically new levels of utility thanks to their pendular nature, and with it the chance to make flying both useful and cool again. They are exciting and useful in a whole new way: two vehicles in one.

What about the idea of taking a trike and doing the same thing? Some, like the Pegasus Quik can fly up to 100 mph. Give it a roadworthy suspension, power to the wheels and a way to trailer the wing, and you're off to the races. Affordably.

Stay tuned.

Above: The PAL-V One is a hoot to drive (it leans like a motorcycle) and offers autogiro safety besides. Below, the Pegasus Quik cruises at 82 mph and a top speed of 104 mph.

Free IFR Scenario Training iPad app from PilotWorkshops

121.5.com reports: PilotWorkshops.com has announced the release of their new IFR scenario-based training app for the iPad. Called "IFR Mastery", the free app provides two challenging IFR scenarios based on PilotWorkshops' popular IFR Mastery online training. The app is available at: http://pilotworkshop.com/ifrapp or by searching for "IFR Mastery" in the iTunes store.

Within the app, pilots watch a video that sets the stage by putting them in a real, challenging IFR flight situation. After watching the video, pilots are presented with multiple options and relevant resources to help them decide which course of action to take. The pilot commits to their decision via a poll and immediately sees how their decision compares with thousands of other pilots.

Pilots are then presented with a brief instructional video where a PilotWorkshops expert instructor explains how he would have handled the situation, providing valuable tips and tactics. Finally, a roundtable audio lets the pilot listen in as the entire PilotWorkshops' team of instructors discusses the scenario and shares their own relevant experiences and strategies. Contact: Jeff Mulligan, PilotWorkshops, 603-315-3456; jeff@pilotworkshop.com

Basic Hi-Tech in the Cockpit

by Barry Meek

GENERAL AVIATION has been following right along with commercial flying in terms of the technology available to pilots. If "glass cockpits" are not standard equipment on new airplanes, including amateur-builts these days, they're offered as options. GPS navigation has replaced the NDBs and VORs we older pilots learned to navigate with. Paper charts are disappearing, victims of the iPad and other such devices with apps that include maps, weather info and approach plates.

This is all good. It's progress, and there's no question it all makes flying easier, and for most pilots, less of a challenge. When I say it makes things easier, that would be only after you've gone through the learning process with any of these devices. But many pilots prefer to stay with the steam gauges, ADF & VOR radios, paper charts and the CFS and that's likely because they're all familiar. Just as some of us in Canada still work in MILES as opposed to Kilometers, because that's the way it was when we grew up, the old-school pilots are comfortable with what they learned initially too.

No one can be faulted for the equipment they prefer in their airplanes. As long as you get from A to B without problems, enjoy what you're doing and don't worry about the rest of the world. But I will concede to the idea of getting rid of the paper charts. Strapping an iPad on my kneeboard and having any map, airport, approach plate, even current fuel prices at my fingertips sure beats folding and unfolding large maps to follow along on a flight.

If you believe that the entire population of pilots actually flies with the newest technology written up in today's magazines, you would be sadly mistaken. Anyone not using all the latest gadgetry, is not alone. There are still those of us who haven't made the big changes.

A few comforts in the cockpit could be considered necessary "higher-tech" devices. These items are appropriate more for the older pilots. If you're not in that category yet, your time is coming, so read the following information carefully.

One day in the not too distant future, you'll come to realize you're having trouble seeing those charts, or the iPad/tablet device. You'll be holding them further away in an effort to focus on the tiny details. It will be worse as the light fades. While you shouldn't be alarmed with this development (it's perfectly natural as we get older) you will need to do something about it. That means corrective lenses sooner or later. Many people require them only for close-up viewing. Reading glasses! Your medical examiner will have the words "glasses required in the cockpit" added to your medical certificate.

Most older people carry reading glasses around with them for reading menus, looking at the fine print on medication bottles, and anything else they can't see up close. But carrying reading glasses is a hassle, mainly because you can never find them when you need them. Fortunately, there are non-prescription bifocal glasses available. The small corrective part of the lens is simply a reading glass with a power of 1.00 or higher, set in a clear lens. The advantage is you never need to take them off, so they don't get lost, and they're always available for that fine print.

These non-corrective bifocals are also available as sunglasses. More and more manufacturers are selling various styles including

continued on page 30

EFFICIENCY

HOW DO YOU MEASURE IT?

We often consider pure aerodynamic efficiency as the greatest good, but there are different ways of looking at it. How we define it depends a lot on the mission we have in mind.

For instance, I've long been a fan of Steve Wittman's work, and especially the Tailwind. But though the aircraft is fast, delivers great miles per gallon and is a delight to fly, it has a wood wing - and needs to be hangared, or at least should be. That would add at least $200 a month to my cost of ownership. You can buy a lot of gas with that, and the old beater of a Cessna I used to own represented a more efficient use of my money, because it tolerated outdoor storage better. My mission was maximum 4-place flying time for minimum dollars. Hangaring the aircraft was out of the question.

So we can define efficiency in terms of not just how far or how fast per gallon but in total bang for the buck - how much it costs to build, own and operate.

Wittman's Oldsmobile conversion for the Tailwind approached the problem by reducing cost. Was it absolutely optimal for aircraft? Not exactly - he was running high rpm's with a cut down prop and a direct drive sporting a prop extension supported by a transmission bell housing. But he got nearly the performance of a Lycoming (about 180 mph cruise) on a dirt cheap engine that required minimum modification. It was typical Wittman thinking.

In those days, people just didn't have as much money, and there was a push to make aviating affordable to people who just wanted to fly. People had time to scratch-build cheap airplanes.

By the early 1960's the organization sponsored design contests that included folding wings as a requirement so pilots could take their aircraft home with them, thus reducing the cost of ownership. Some great designs emerged from that period, cheap, good flying and time consuming to build. But it worked for some, and a lot of airplanes - Jodels, Minicabs, Tailwinds, Fly Babys and more - flourished.

Fast-forward a few decades. Now we have glass panels, composite construction, and a cornucopia of exciting new designs... and a lot less people flying. Service pilots from World War 2 and Korea are hanging up their goggles, and they're not being entirely replaced by new pilots.

One disturbing indicator is the recent scarceness of aviation publications on newsstands; they're getting harder to find. Recreational aviation is fading from the public consciousness as these pilots retire. It's too expensive and impractical to attract new blood. The non-aviating public has neither the time or money for such an expensive hobby, and even if the time part has been somewhat addressed by the advent of the kit plane, the cost to complete one has gotten beyond the reach of many. With the price of new aircraft engines going over $30K, and kit costs going in a similar direction, lots of people have been priced out of the market anyway. It's just too much for most folks to spend on something that is essentially a toy.

We're competing against the internet, 500-channel satellite TV, and social media. And there are cheaper motorsports, be they motorcycles or jet skis, less regulated and a lot of fun for the money.

The cost of learning can also be a disincentive. A private pilot's license is not cheap - unless a good case can be made for going to all that trouble. There have been some promising developments - the Recreational Pilot's rating in Canada, the Sport Pilot rating in the US - but I don't think it's enough. Even with all the gizmos and bells and whistles, we're still losing pilots.

What can we do to change the math? We have to find new and innovative ways to create interest in aviation, new ways to make it practical, useful and fun: to make it worth the time. To make it efficient in a new kind of way.

There's a couple of avenues we can try. We can continue to make the aircraft cheaper, easier to build and maintain. This is the traditional route, and ultralights - especially the smaller autogiros, trikes and paramotors - show some promise. I think they represent much of the future, because you can get a ready to fly aircraft for a reasonable price, and if you want to build, they're relatively cheap and quick. They are inexpensive to own, fix, and learn on. Don't dismiss these as toys: some are getting pretty sophisticated (and bear in mind that even the humblest of them is still an aircraft, and their operators add to our numbers). Besides, the public seems a little more interested in this sort of thing; rather than appealing to the traditional pilot, they have sort of a jet-ski vibe to them. They're cool. You're not going to fly across the country with one, but it's still flying.

Are there ways we can make them more useful? Can we enclose cockpits, design launch systems, enhance safety? The definition of "ultralight" gives us a little wiggle room - many are a far cry from the first-generation flying lawn chairs of the 1980's - and can yield a fairly neat fun flier.

We can make aircraft cheaper to own. The A-5 Icon, for instance, has wings that fold in seconds. You can take it home, saving on hangar costs.

We can improve the utility of aircraft. If you're going to drop fifty grand or (sometimes much) more on an airplane, what can you do to make it more useful? Getting back to Icon, amphibious aircraft have always had an extra level of usefulness built into them. (As a sidebar, ICON's marketing strategy is interesting, because I sense their target market is not the traditional pilot, but rather the upscale fun-at-the-lake crowd. It's styled like a high end car, all ergonomic and very friendly to people who like their BMW's. If it gets more people into the air, I'm not going to complain).

Better, more capable instrumentation may make VFR flight more practical, and glass cockpits are getting cheaper.

Finally, I think this is where another kind of dual-use aircraft - roadable aircraft - may come into their own. There's a reason why the idea just won't die: they make an aircraft practical in a whole new way by combining two vehicles in one, reducing the cost of ownership and improving the practicality of VFR flight by allowing the operator to drive through bad weather. They would represent a quantum leap in personal mobility.

I believe efficiency is no longer just a matter of speed or fuel consumption, or even cost of ownership, but of overall utility. It needs to be efficient with our money in new ways *and* be engaging enough to get the attention of non-aviators. It can be cheaper, but cheaper or not, how about more useful? *That* would get some attention.

One last thing. Supporting organizations like the RAA is vital. United we stand.

RECREATIONAL AVIATION IS FADING FROM THE PUBLIC CONSCIOUSNESS. IT'S TOO EXPENSIVE AND IMPRACTICAL... WHAT CAN WE DO TO CHANGE THE MATH?

Racing at Airventure

Wayne Hadath
RAA Lifetime #8793

I HAVE BEEN RACING my F-1 Rocket Little Bit in the annual Airventure Cup race for many years, finishing second in class in 2009 and 1st in 2011. This year because of family commitments I did not send in an entry before the July 1st cutoff date. In the past this would not have mattered – the only downside was that you would not have been in the promotional literature. A pilot could have showed up on the day of the race, and if he had the entrance fee and the paperwork he was allowed to race.

In the past the event was run as an EAA-sanctioned event and ran under EAA classes and rules. Under EAA rules there were no factory class aircraft – all had to be amateur built. Anything amateur built was allowed, and even a Pietenpol entered and was scored. It entered in the lightly subscribed Unlimted class and got second.

Two years ago everything changed when EAA pulled affiliation at the last minute, so SARL (Sport Aircraft Racing League) took over sponsorship of the race to continue the legacy of the Airventure cup. For those two years the race was held under SARL classes and rules, so certified aircraft were allowed to race.

This year EAA under new leadership decided to resume affiliation with the Airventure Cup. It was still a SARL race so it ran under their rules, but EAA now had some say in matters.

One of the outcomes was the denial of post entries. However my family situation had loosened up and the weekend was available, so I flew down on the Saturday to enter the Mount Vernon 100 race where I got a first place, and then ran the Airventure Cup as a volunteer, which meant that I could race but would not receive an official score.

There were over sixty airplanes in the race that had sent in their entries before the cutoff date, and a few who did what I did and ran as unscored volunteers.

On Sunday the Airventure Cup race began at Mount Vernon Illinois. The weather was good but we were ploughing against headwinds. Most planes flew low to encounter lower headwinds but this meant a bumpier ride. I chose 1000 ft agl because below that altitude the bumps were too harsh. We were legal down to 500 ft. Bumps take away speed so fuel management became critical. My own plane will do a 400 Nm race but with 12 knot headwinds fuel consumption became a concern. The race has two check points and both were set up to allow fuel stops without a time penalty, and racers were encouraged to use these for safety reasons. Many airplanes that normally could have run the course without a fuel stop had to refuel this time because of headwinds. Being very familiar with the fuel management of my Rocket, and knowing that the turn thirty miles before the end would result in tailwinds, I ran without a stop and still landed with legal reserve fuel in my tanks.

The race ended at Waupaca Wisconsin late in the morning where we refueled and had a lunch. EAA no longer does a mass arrival at Oshkosh so we just joined up in small groups and landed in small batches and did the Fiske arrival into Oshkosh. The small groups are a lot safer than the previous mass arrivals that used to open the Oshkosh show.

On the Monday of Oshkosh ten of the racers flew crank and bank, non aerobatic displays down the runway at Wittman Field as part of the opening day airshow event.

I had run in the Sport FX class and at 240 mph ran more than 20 mph faster than the American plane that was scored as first place. Another Canadian, Marty Abbott of Calgary won overall in his turboprop Legend with a speed of 350 mph. Marty's plane holds the current speed record for the Airventure Cup at over 400 mph which shows the effect of the headwinds this year.

The Airventure cup is well organized and it is a very safe race to run. Yes it costs $250 to enter but you get to rub shoulders with Reno racers and with a lot of pilots who love to build and compete in their aircraft. There are many media opportunities and photo shoots, and a lot of local people come out to meet the racers. There are worse ways to spend $250 on a July weekend.

Across Canada

RAA Chapters in Action

Toronto Rotorcraft Club
RAA chapter 4911

The Toronto Rotorcraft Club hosted a Fly-In / Drive – In at the Wingham Airport August 17th. and 18th. Although the event was small in nature, there were a few fixed wing and gyro pilots who showed up for the event. There were two Bensen Gyros and one modified gyro at the event. There was also a Magni M16, factory built, which flew in. We provided static thrust test for those that wished to participate. One member started his McCulloch engine for the first time, some fine tweaking will be required. For those that chose to camp over, we were treated to a night flight of an electric RC fighter aircraft. It was quite a spectacle to see it equipped with led lights doing aerobatics at night. Thanks Blair of the Wingham Jets for the display. Neil Laubach and a student gyro pilot flew in from Guelph on Sunday. Presently, Neil is the only gyroplane CFI in Ontario. He does his flight instructions in a Magni M16 trainer. Neil gave Greg a member of the TRC a introductory flight. I think Greg is hooked and will be a future gyro pilot.Next year, will be bigger and better. We'll see you there!

Jerry Forest

Jerry Forest

Above: Neil Lauback and student flew in from Guelph in a Magni M16 trainer. Above, Don taxiing into position

Ottawa/ Kars RAA Chapter 4928

On Sunday 14 July 2013, the Ottawa/ Kars RAA Chapter 4928 held their annual Kars 'n' Planes Summer Fly-In BBQ at the Kars Rideau Valley Air Park. The grass runway was in excellent shape even with the excessive rain this summer. Weather was warm and overcast however, 28 homebuilt, classic and antique aircraft arrived. There was a good turnout of classic cars despite a local car show in Merrickville on the same day.

In the last few years we had more Challenger II ultra-lights out numbering all other aircraft types. This year we had 5 Challenger II ultra-lights that showed up. Next most popular aircraft type was the Ran RV line (2 RV9A's, RV8 and RV6A) and several Cessna (120/140/170), Luscombe 8AC, Taylorcrafts and Stinson 108's.

The Rideau Valley Soaring Club was in full operation launching several gliders during the day adding to the fly inn atmosphere. A special thanks to Vintage Wings ground crew who provided personnel who expertly

Chapter 85 Volunteers at the Boundary Bay airshow. L to R: John Macready, Cyril Henderson, Bruce Prior, Al Mcdougal. Not in the picture is Tim Novak. Behind them are two chapter aircraft: Paul Trudel's Coot amphibian and President John Macready's C-140.

and safety looked after all aircraft ground movements. Vintage Wings uses our fly inn to train a few new members to their ground crew team. Again, as always, a very professional performance by the Vintage Wings Ground crew team.

This was another successful summer fly inn for the chapter. Lunch was served from 11AM-till 2 PM consisting of hot dogs or summer sausages with all the trimmings and refreshments. Visiting pilots commented on the warm reception and on our excellent hospitality.

The next chapter meeting is at the club house (06 August) where the Chapter President will give a PPP of the chapter fly inn and the Iroquois Municipal airport Fly Inn Breakfast. Up-coming presentations will be on chapter members cross country trips to Alaska and an Oshkosh report.

Chapter 85 Vancouver

On Saturday July 27,2013 Chapter 85 organized an exhibit at the Boundary Bay Air Show. Bruce Prior, Tim Novak, Cyril Henderson, Al McDougal and John Macready intended to bring the RAA booth and set it up at the show. Initially Tim Novak offered to transport the booth in his truck but the panels turned out to be too large to load into the truck. The Boundary Bay Air Show graciously provided a space for our display along the ramp east of the new terminal and supplied a folding tent to dress up our display and keep the participants out of the sun. The Aerobatic Club of BC, located next to us displayed an uncovered Pitts Special wing which added a lot of interest for the public. There were many other displays of local aviation organizations that day.

Our initial plan was to display the Turbi but that was changed as the Turbi was out of service due to a landing incident. John Macready took his Cessna 140, C-FPJP instead and rationalized this by explaining that our chapter promotes the restoration and maintenance of vintage aircraft in addition to promoting the building of amateur built aircraft. Lucky for us Paul Trudel pulled up in his Taylor Coot, a true example of an amateur built aircraft and agreed to display it with us.

We arrived at 08:00 to set up, borrowed the tent and did our best to keep everything from blowing over in the wind. Thank goodness for duct Tape! Later in the morning things settled down and we were able to relax, watch the proceedings and speak to the public.

The airshow started at 11:00 AM with the Armed Forces parachutists, and included some very good examples of formation flying, and Reno type simulated air racing with a group of Harvards, There were lots of advanced aerobatics and two displays of military vintage aircraft including a Douglas Skyraider and a T-28 to rattle your teeth.

We were satisfied that we managed to increase awareness of our chapter activities and even potentially enlisting a few new members.

The event was well organized, the exhibits were excellent, the air displays interesting and the concessions useful.

It was a great day and we all enjoyed ourselves and we will look forward to doing another air show next year.

Thanks to all our participants for making this event happen.

RAA London/St.Thomas

What can I say about the July Picnic at Karl Pfister's Pioneer Airpark but wow! Karl and his gang once again outdid themselves. The picnic was a huge success. Every seat and table was full! I do not remember when we had such a good turnout at a club event.

The attendance was even more amazing due to the weather. All day, it had been hot, humid and calling for severe thunderstorms. Well, the weather held off and we had a dry

NEW BC REGIONAL DIRECTOR

Chapter 85's David Marsden is British Columbia Director for RAAC National. He is an aerodynamicist and the designer of several aircraft, including the Griffin and the Skylark, which was written up in the Recreational Flyer a number of years ago.

RAA FORUM CLOSED

Due to a recent hacking attack on the RAA website, the forum has been shut down. If you have any questions, or feel the forum is a thing that should be continued, please contact George Gregory at gregdesign@telus.net.

INFORMATION SOUGHT

Member George Opacic writes:

"When Ben lived in Sechelt, he did a series of interviews of Ayliffe "Pat" Carey. Pat was a respected pioneer aviator who started flying in Chilliwack, then did bush flying from the 1930s to 1972 around northern BC, the Prairies and NWT. He ended his flying carrier after his first bad accident in August of 1972. It was reported in the Lethbridge newspaper. He had flown for a few of the important first airlines in western Canada.

"We are looking for original pictures that could be used in the book, and any direct incidences that people may have had with him. Of course, all attributions will be noted in the book."

Contact George or Ben at bnuttall_smith@shaw.ca

Dick Eaves (left) with Ross Whitney and Mark Pfister discuss the Nexus.

picnic. We only had one aircraft fly-in, not surprising with all the thunderclouds around. I brought one of my R/C models and flew it a couple of times. Karl's runway provided a great place for me to fly. On behalf on my wife Gerry, and son Kevin, I want to thank Karl for his hospitality and support of our chapter. A wonderful evening!

On the evening of July 4th a well-attended gathering honouring Dick Eaves took place at his hangar at the London Airport. Dick is certainly one of the most prolific aircraft builders in Canada and this tribute, organized by Paul Brooks, is well deserved.

Dick built many of the classic homebuilt designs starting in 1962 with a Baby Ace and more recently a Midget Mustang (which won a Bronze Lindy Award at Oshkosh 2000) As well as the incredible Nexus Mustang.

Dick is a licensed Aircraft Maintenance Engineer (Canadian equivalent to an A&P) with over 25 years of experience repairing all sorts of light aircraft.

NOW IT CAN BE TOLD

Have you ever wondered what is inside an IVO prop to allow it to be twisted? A crooked rod acts as a torsion bar to transmit twist from the lever at the root, and the glass blade is flexible enough to be twisted by the U-end. IVO allows blades to be shortened for specific applications, and this UL model has the tip of the U some 23" from the centre of the hub. Check with IVO for permissible minimum length if you wish to shorten your model.

Willy's 140

In 1996 my father purchased a 1964 Corben Baby Ace which was in need of a major restoration. My father Keith, brother Grant, and myself tackled this project from start to finish, with the help of Bob of the Tiger Boys in Guelph applying the sprayed coats of dope to the fabric and finish to the remaining components of the airplane. I had been flying this airplane powered by a Continental A65 from completion in 1999 to the day I decided I needed another project.

by Gary Wallace / Photos by Keith Wallace

I thought that I would like to upgrade my current Ultralight Pilot Permit to a Private Pilot Licence and have the opportunity to let others enjoy the gift of flight with myself, so the contemplating started. Will I consider a advanced ultra light kitbuilt project or another restoration project. I enjoyed the taildragger configuration of the Baby Ace and thought I would continue with this. I was considering Taylorcraft or Luscombe, and after researching for some time I came across the Cessna 140 Owners Association ww accidentally. I spent some time on their forums and had an occasional look at the classified ads as well. Hmmm... 1947 Cessna 140 Project, Continental C85-12F project available for sale near Sarnia, Ontario so in 2005, and after some consideration and research I thought this might be the project for me.

My father and I decided to go for a drive and have a look at it. The plane was stripped of paint and fabric, the fuselage was on its gear and in the very, very early stages of its restoration. I thought it could use a bit more cleaning up, fabric on the wings, a check over of the engine, and she would be flying in a couple of years. I'll take it!! Delivery was through a gentleman in the area, Hemmingway Aviation, as he had a large trailer and could deliver the entire project in one trip. The project was unpacked and distributed throughout my 20 x 20 foot heated garage which was to become my workshop. I soon realized that in this limited space a rebuild project of this size would be a very challenging task. Fortunately the higher than average ceiling and 20 x 9 mezzanine were a real saviour to get some open area to work on the aircraft itself.

After unpacking and having a closer look at the entire project I realized this was going to be a LOT more work than I originally anticipated. With the help of my father, brother, and a few co-workers this thing would be flying in 8 years! At the time of purchase I originally thought that I would rebuild this plane and keep it as a certified aircraft. After having a further look at the condition of the entire project, and realizing that there was going to be a lot more work to do here than I originally anticipated, I decided to go the Amateur Built route as I was definitely going to be dismantling and rebuilding a large percentage of the plane. After all, the Baby Ace was in the Amateur Built category and was a treat to keep mechanically airworthy. My 140 was sure to be similar, and this way I would be able to maintain this airplane on my own. This was definitely the way to go!

Realizing that there was going to be a lot more work to do here than I originally anticipated, I decided to go the Amateur Built route

Fuselage

I found a lot of repairs, dents, patches and poor workmanship on 60% of the fuselage. The parts to be replaced included the skylight panel, the top rear fuselage skin, the D-window skin behind the skylight, the right fuselage strip from door post down the entire length of the tailcone, the complete boot cowl, new door skins, and gear box panels.

I bought a new nose bowl from Univair and made new upper and lower engine cowlings. All skins and panels were hand cut and fitted from 4 x 8 sheets of 2024t3 aluminum sheeting. The panels were formed as sections and all parts were solid riveted. Other than the panels that I replaced due to cosmetic issues the gear boxes, carry-through spars, door posts, bulk heads and floors were all free of any significant corrosion and defects. The entire fuselage and remaining components were treated with Alumiprep and Alodine, then epoxy primed inside and out. After fuselage reconstruction, the entire fuselage was externally epoxy primed, ready for final sand and paint.

The entire electrical system was removed. The new Concorde battery was relocated to engine side of the firewall; the generator was upgraded to a 50 amp Plane Power alternator; the fuses have been replaced with circuit breakers, and all wiring was replaced with new. I utilized the existing Grimes swing down landing light after rebuilding it, and added a new Whelen nav, strobes for the wing tips and rudder, and a Whelen anti-collision strobe on fuselage top skin.

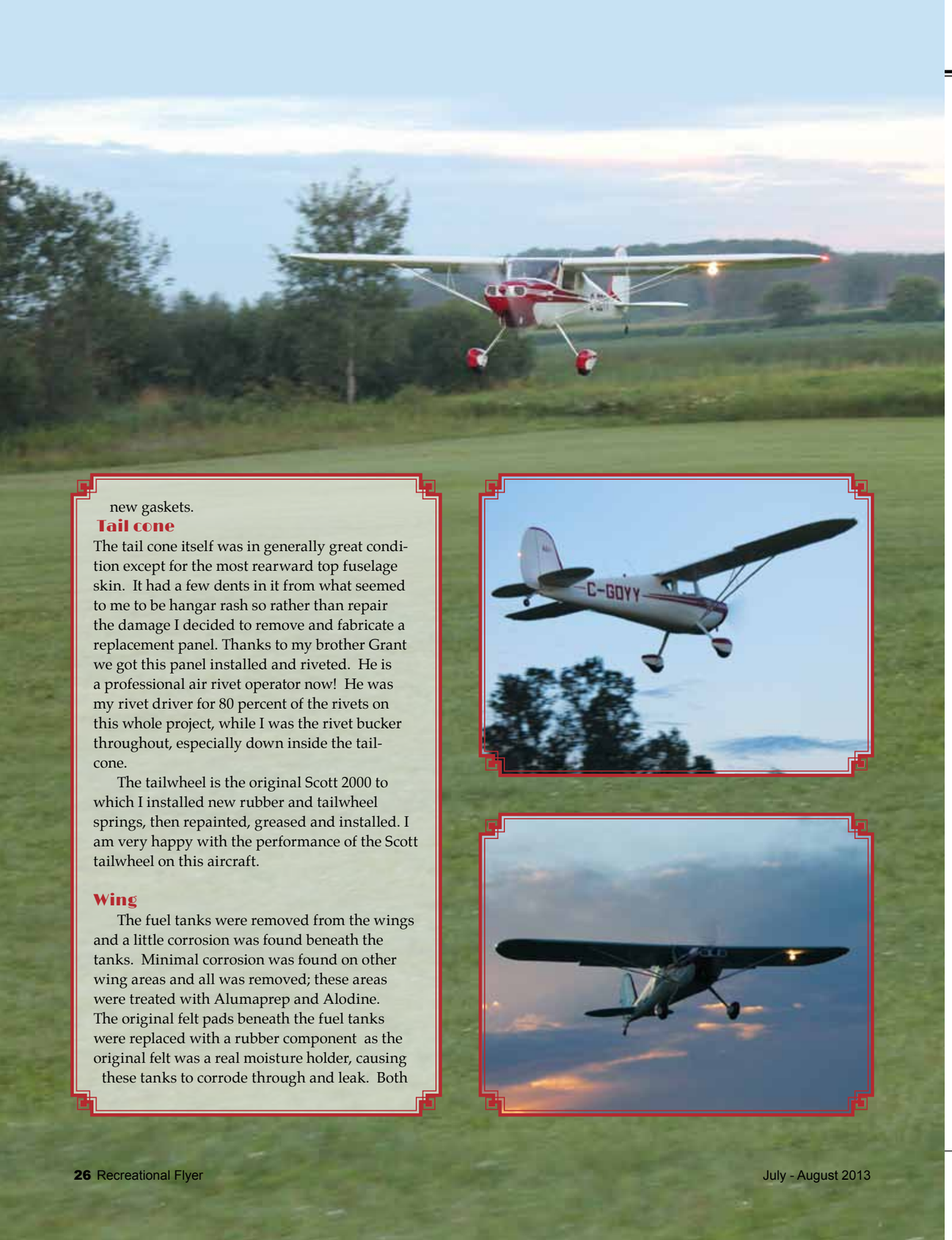
The original project was missing all glove box and radio panels and instrument bezels. I managed to purchase all these components from the US and they certainly dress up the instrument panel, and the glove box gives a large area for storage. I stripped the yokes and painted them gloss black, then covered with custom leather yoke covers with built-in PTT switches in both the pilot and co-pilot yokes. Pivot bearings had little to no play in them, and the linkages, turnbuckles, and cables were all inspected and deemed airworthy and in excellent condition.

The rudder pedals assemblies were all stripped and repainted, the rudder pedals were polished, and new bearing blocks installed for the pedal assembly. The master cylinders were dismantled and cleaned internally, and stripped and painted externally. I installed new o-rings and thread sealed all flare adapter fittings to the master cylinders. The original Goodyear wheels and brakes were replaced with Cleveland wheels and brakes, all new brake lines were fabricated, and new flex hoses were installed on both sides.

All windows were replaced with LP Aero Product which were purchased from Leavens Aviation. Most did fit quite well but the windshield itself did require a fair bit of trimming for proper fit. The original panel was a six pack with vacuum heading indicator powered by a venturi. I utilized all existing gauges and made no changes in this area.

The original lap-only seat belts were replaced with Hooker Harness products with shoulder belts. The new carpeting is a very lightweight automotive carpet. I made templates for all floor areas and cut pieces and had their edges bound. The luggage area is the stock 80 max luggage capacity. No tie downs are installed at this time but there is provision under floor mats. The seat frames and foam are all original, with new upholstery completed by a friend of mine at P.K. Upholstery in Waterloo. He did a fantastic job on the seats as well as the interior door panels and panels for luggage area. Headliner material was purchased from Aircraft Spruce, cut and installed by myself. This was a time consuming tedious job but the outcome was worth it.

Dual cabin heats had already been installed with the one on the pilot's side having a duct though the glare shield for windshield defrost which works great. A new fuel selector was fitted with new fuel lines from the wing tanks right through to the original gascolator on the firewall. The original wing root fuel gauges were extremely seized but with a lot of time and scrubbing they came out like new. New floats were installed and the gauges were reinstalled with



new gaskets.

Tail cone

The tail cone itself was in generally great condition except for the most rearward top fuselage skin. It had a few dents in it from what seemed to me to be hangar rash so rather than repair the damage I decided to remove and fabricate a replacement panel. Thanks to my brother Grant we got this panel installed and riveted. He is a professional air rivet operator now! He was my rivet driver for 80 percent of the rivets on this whole project, while I was the rivet bucker throughout, especially down inside the tail-cone.

The tailwheel is the original Scott 2000 to which I installed new rubber and tailwheel springs, then repainted, greased and installed. I am very happy with the performance of the Scott tailwheel on this aircraft.

Wing

The fuel tanks were removed from the wings and a little corrosion was found beneath the tanks. Minimal corrosion was found on other wing areas and all was removed; these areas were treated with Alumaprep and Alodine. The original felt pads beneath the fuel tanks were replaced with a rubber component as the original felt was a real moisture holder, causing these tanks to corrode through and leak. Both

The gift of flight is one thing but the gift of flying your own project after all those hours and hours of work is really something else.

fuel tanks were leaking so brand new 140A fuel tanks were located and purchased. One wing tip had previously been patched and repaired and was replaced with another wing tip that I purchased. There were a few repairs needed in the rib areas especially at the top nose where they attach to front main spar. Both leading edges had previous repairs and these were not to my liking. They were both removed and replaced with new .016" 2024t3 leading edge sheets which were preformed in a home made press. This made them a lot easier to install with less stress at all attach points. These skins were riveted to the nose ribs with 1/8" inch solid rivets. The entire wing was then prepared and sprayed with epoxy primer. After priming, the new fuel tanks were installed as well as new wiring through the wings for the Whelen nav/strobes, and the left Grimes swing down landing light.

The lift struts had previously been stripped and zinc chromated. This chromate was removed and they were internally treated with Linseed oil. The exterior of the struts was epoxy primed to ready them for paint. The end fittings had previously been removed for inspection and they were replaced.

I covered the wings with medium weight fabric and used the Poly Fiber process from start to finish. The original fabric clips were removed, and all holes were drilled out for the Dip Davis mechanical rivet fabric attach process. I am pleased with resulting look of these rivets under the fabric. I followed the Poly Fiber Book faithfully for the number of coats of each step. A final three coats of the Poly Fiber urethane insignia white was applied to the fabric for completion of the wings.

Some existing main spars were replaced with replacement spars from other surfaces that I had purchased. I replaced all the corrugated skins on all the moving tail surfaces and the ailerons and flaps with new material from a fellow in PEI who manufactures the material to the original specification. I built jigs from MDF to hold everything flat and true. The corrugated skins were first attached to their main spars using 1/8 " rivets,

and then placed in the jig to drill and rivet all trailing edges of each surface. Prior to assembly all these surfaces were epoxy primed internally, and finally prepared and primed externally to prepare for paint.

Tail group

The tail group was inspected and found to be sound. It was corrosion proofed inside and prepared for paint externally with epoxy primer and finished with Insignia white Aerothane.

Gear legs

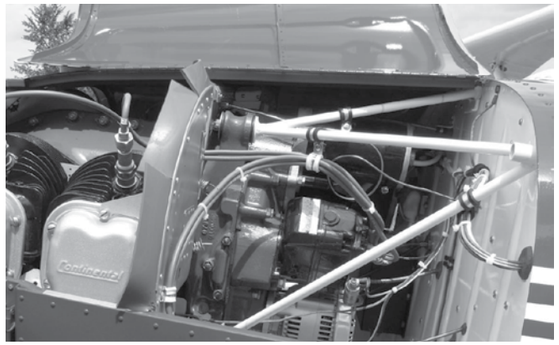
When I got the project the landing gear legs were clean of all paint. There was no rust on the gear legs and they were in very good condition as far as corrosion and pitting. To prepare the gear legs for paint I applied about 5 coats of epoxy primer, sanding between coats to fill in the minor flaws. A final 2 coats of Poly Fiber Aerothane Insignia white were used to finish them off.

Cowlings

These were in the worst possible condition and the existing cowl was used for patterns and I used all the reinforcing channels tokeep the shape of the panels. The nosebowl was replaced with a new nosebowl from Univair and the rest of the cowling was fabricated from flat sheet. This was a very tedious and time consuming part of the project but I am very happy with the result. The original cowl latches were removed and new cowl latches were purchased from Aircraft Spruce, and installed. The original firewall was used again as it was in good condition with no reason to replace it. It was painted the same as the rest of the airplane. The motor mount was replaced with a new mount and all engine mount rubbers were replaced with new from Aircraft Spruce.

Engine

The engine was completely stripped down...All bearings, journals, and cylinders were found to be within limits. Top ends were overhauled on the four cylinders, and the engine is still using the oil screen at this time but I may install a spin on oil filter adapter in the future. Compressions are all in the high 70's. The Stromberg carburetor was completely rebuilt, float set, jets checked, and I also rebuilt the original carb heat box. The 15 amp generator was replaced with the 50 amp Plane Power alternator. The original pull start starter assembly was rebuilt and reused at this time. The engine already had a C150 exhaust with heat muffs and they were inspected and cleaned, and reinstalled on engine. The original McCauley 7148 aluminum propeller was overhauled and reinstalled on engine. First engine start after rebuilding was done at my home and it was found to run smoothly with no problems. There was only a small oil leak at a push rod tube and this was easily resolved.



Weight and balance

The weight and balance was finally completed. Empty weight came out at 1001 pounds, a little higher than I was hoping . Calculations were done at all loading conditions as far as nose heavy and tail heavy scenarios and in each configuration the airplane does not fall out of the envelope.

Performance

The performance is typical for a Cessna 140, and is comparable to many of the new generation Light Sports. Cruise is constant 108 mph at 2300 rpms, and climb at full gross of 1450 pounds is 470 fpm on a 75F day. My strip is 1500 feet of grass and getting out with two on board does not present any issues. For landing I use 40 degrees of flap and am over the fence at 60 kt solo and 65-70 dual. Engine oil temps run between 160 and 180 F, with oil pressure at 45 psi cruise and 15 psi idle.

First flight was July 18th 2013 and I quickly flew off the 25 hours without any snags, and had the restrictions removed. In August I had a total time of 54 hours and have taken a lot of passengers for rides. I am enjoying the flying characteristics and performance (or lack of it as some might think) more than I had anticipated. I am finding it difficult to tame my flying itch – I can't get enough time in the Cessna and I smile and enjoy every flight! It may be that the flights are made more enjoyable because at times I had thought that this day would never arrive. The gift of flight is one thing but the gift of flying your own project after all those hours and hours of work is really something else.

Thanks to my dad Keith, Grant, Bob, fellow co-workers, and most importantly to my wife Lucinda who was unbelievably understanding through this whole project. As for the itch for another project, well my wife Lucinda is holding that thought for me. It will not be in the near future but only time will tell!

Certified to Amateur Built: How to do it

By Gary Wolf / This was at one time a very simple process. It has always been the case that every project must meet the 51% requirement of the Amateur built category but until a few years ago the "meat chart" was much more generous in the awarding of percentages for the work being performed. One could dismantle a Cessna, pull out all the wiring and plumbing, open up the wings and tail for internal inspection, and the work of reassembly plus installing all the usual new parts was enough to constitute 51% of the work. The builder could then have a precover and final inspections and his Cessna would then be in the Amateur Built category, and it would have been turned into a much better plane than when it had been a tired old certified.

In the spring of 2006 I was at TC meeting which was attended by the FAA rep who had earlier forbidden our Owner Maintenance to enter US airspace, his reason being that he viewed these planes as certified planes that were no longer receiving certified maintenance, so he did not want them in his airspace. "Once a certified, always a certified" was his opinion.

A Hamilton TC inspector who is now fortunately retired took it upon himself to pull out of his briefcase a large photograph of a Canadian-registered Cessna that had been converted to Amateur Built, and its rebuild included a turbine engine, amphib floats, and glass panel. The TC fellow then informed the room and the FAA rep that in Canada we were allowing conversions like this to be registered as Amateur Built. The FAA rep's eyes went wide at this news.

I had lunch with the FAA official and he said that they could not ignore this situation, and some time later I received a call from Ottawa to say that they would no longer allow any formerly certified conversions, nor would they allow any formerly certified parts to be installed on Amateur aircraft, otherwise the FAA would not allow any of our Amateur aircraft into their airspace. The FAA had actually asked for a list of planes that had been converted but TC said that this would not be possible, and they promised that they would prevent Canadians from converting any more planes.

It took six months of meetings between TC and RAA Canada to get the situation resolved. The Chief at the time understood that many formerly certified parts make their way into the build of an amateur aircraft. Some older planes like the Breezy and the Volmer Sportsman had even been designed to use a complete set of certified wings. Engines and props, gascolators, pedal assemblies, yokes, cabin heaters and vents, antennas, and other parts including main gear and tailwheels all get used in Amateur aircraft, especially the plansbuilt ones. The Chief understood that it would be unreasonable to now forbid the use of all formerly certified parts. We worked out a middle ground that would still allow formerly certified parts but only to the 51% limit. Also some labour to reassemble would not qualify, for example the re-riveting of a wing that had been opened for the precover inspection. If a new skin were made the installation labour would count, but re-riveting the old skin would not. Together we hammered out a compromise that is now the blueprint for converting a deregistered certified aircraft into an Amateur Built.

The list of operations and the points assigned are now on the www.md-ra.com website, and if you are considering doing a conversion you should definitely refer to this before making the decision. Read the Inspection Documents section, particularly the TC staff instruction 549-001 and the 51% determination checklist.

In many cases it would be less work to buy a modern quick-build kit that has already been qualified for 51% by its manufacturer. However if you find old and antique aircraft more to your liking it is far easier and cheaper to rebuild it as an Amateur Built than to pay AME's and B-license holders to do the work under certified regulations.

Gary Wallace has produced a Cessna that is show quality, and he did almost all of the work himself. To do the same in the certified world would have cost over $100K, and who would invest that much in a sixty year old plane? One of the advantages starting with a certified plane is that it was designed to FAR 23, any AD's or other deficiencies would be public knowledge, and there is probably a type club to provide support. Gary used the Cessna 120-140 club to answer his many questions and to source parts.

There are many older certified aircraft now being offered for under $10K, too rough to make an annual but just right as the starting point for rebuilding as an Amateur aircraft. Damaged aircraft are also good candidates for rebuild as Amateur aircraft. Find one that is only half there and you are on your way.

Barry Meek / from page 15

wrap-arounds and aviator glasses. For those of us who need the reading glasses while flying on sunny days, the sunglasses are absolute necessities, even if they're not "high-tech". Search them out on-line. I found many reasonably priced bi-focals at framesdirect.com, sunglasswarehouse.com, maximumeyewear.com, seentvcanada.com and gizmag.com (they have plenty of other cool glasses too). Amazon.com had a listing for them as well. With a few questions at your local optical outlet, you can probably find some locally.

As we get older, most of us notice our hearing isn't what it once was. Maybe it's too late at this stage to be doing some preventive maintenance on the ear drums, but it's worth discussing active noise canceling headphones. I started using them in 2005, and although I can't boast of perfect hearing, I can only guess at how much worse it would be without that headset. That summer, I flew over 500 hours in four months and probably could not have done it with a standard headset. In the past six or seven years, there has been improvements in the technology too, making the purchase of an ANC headset an even easier decision. Yes, they're expensive, but if you're flying a lot each month in a small aircraft, you'll not regret spending the cash.

Some of the airplanes out there, particularly the older ones in general aviation, are badly equipped for night flying. It's difficult to see things inside the cockpit because of poor, altered or insufficient panel and interior lights. Even the certified designs challenge the pilot with lights over the shoulder and on the wing root providing the only illumination on the panel. The older the pilot, the worse the eyesight, and the bigger the problem. Fortunately, there's an inexpensive fix to that as well. I refer to the tiny flashlight fixed to a ball-cap, your glasses or headset. They work just like a coal miner's headlamp, putting light where ever your head is turned. It's a brilliant idea. Many are available in L.E.D.'s in colors like red and green. What a simple solution to fumbling around at night in the cockpit.

Old school or new: it's still a great idea to organize your stuff in a fishing jacket so you don't have to hunt for it in flight.

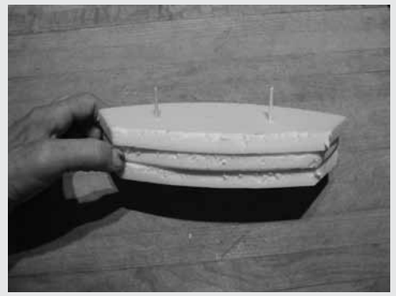
In past articles, I've written about a few other "high-tech" devices that go a long way toward making your flight a bit easier. Maybe they should called "low-tech/hi-tech" because they don't involve special apps for the tablets or iPhones, new glass instruments on the panel, or the latest high-priced navigation tools. But they all work to help us along with our piloting chores. I will wrap up this article with a reminder to obtain a fishing vest, wear it in the airplane to organize your other "tools", such as pens, glasses, notepads, flashlights, batteries, spare GPS, candy bars, ear plugs, cell phone, camera, and whatever else you'll otherwise waste time searching for in flight. For pilots who have yet to upgrade to the latest panels, tablets, nav-aids and other devices, there's still lots you can do to make flying easier and more enjoyable.

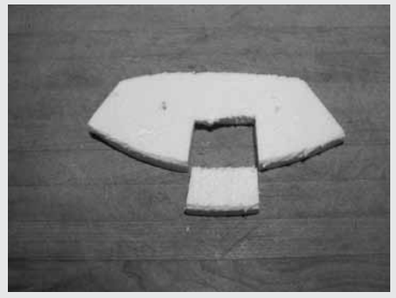
That's what it should be.

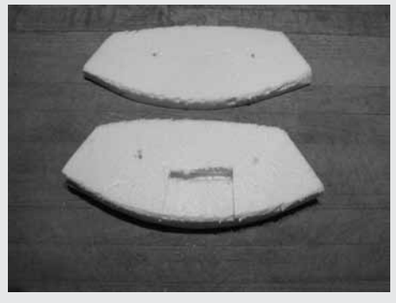
Barry Meek *is a retired paramedic, former broadcaster, mountain bike tour guide and commercial pilot. He now flies mainly in the summer in northern latitudes. He lives on Gariola Island, British Columbia.*

Working With Styrofoam

RAAC







Making a styrofoam form for fibreglass work can be done many ways. You can start with a big block and begin sawing and carving, a method that turns a lot of material into dust. You can spray insulating foam to approximate the shape, but the spary material is very porous and soft. Bob Johnson prefers to use pink styrofoam board material, 3/4" thick. He saws or cuts it with a knife to make slightly oversized laminations that are stacked, saving a lot of shaping and sanding.

The laminations are commonly stuck together with glue but this takes time to dry. Another problem is that if the glue squeezes out to the edges it causes problems when sanding. The styrofoam is soft and the glue is hard, and this makes it difficult to sand a smooth line. The easy way around this is not to use any glue at all - just pin the laminations together with toothpicks or shishkebab sticks.

It is easy to rectify a mistake when using toothpicks. Just dismantle the parts, cut out the bad section, and pull it outwards a bit. Everything can be reassembled by picking up the original holes, and the repair section can get its own toothpick to hold it in place.

This part is an airbox for the Corvair engine that will power Bob's third plane, a Jodel. He has previously built a Roger Mann Pitts and a Taylor Monoplane, both powered by VW engines that have HTD redrives designed and built by Bob.

Top: Bob Johnson building his third plane.
Toothpicks or shishkebab sticks hold the parts in place
If you mess up, just dismantle and cut out the bad part
Pull the damaged section out a bit and stab it in place wth its own toothpick

Checking the Accuracy of your Airspeed Indicator

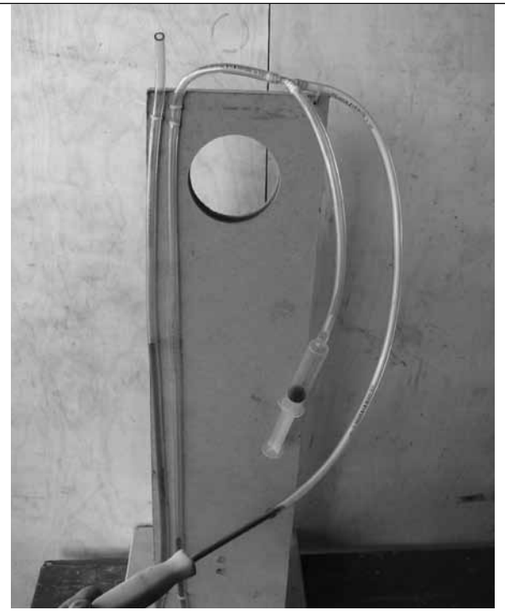
Gary Wolf

AN AIRSPEED INDICATOR is a simple device, essentially a pressure gauge but a very sensitive one. A reading of 100 mph is produced by the pressure of a water column just under 5 inches high.

It is easy to make a manometer to check the accuracy of an ASI indicator and you can do it for well under $20. This would be a good addition to the tool crib of any chapter.

I made mine using a piece of ¾" MDF about 6" wide and 30" tall. A length of 3/16" ID clear vinyl hose was used to make the manometer, and pressure was applied with a small 10cc syringe that is sold in drugstores to sneak medicine into a baby's mouth. A plastic tee fitting came from an aquarium supply, but Aircraft Spruce also sells these. You might also need a barbed hose fitting to connect the hose to the ASI. The thread will be 1/8" NPT and the barb will be chosen to fit your hose. Lastly buy a clear lawnmower fuel filter to fit the ID of the hose. All you need now is a few small cable ties and some wood for the base and you are in business.

Begin by making a perch for the ASI. This could be a small shelf screwed onto the top of the MDF board, or a 3-1/8" hole cut with a holesaw.



Opposite: The finished manometer, ready for use. Above, left: Fill the open end using the syringe, but do not have the ASI installed at this time. Right: Tee the syringe to its hose, plug the ASI end with a screwdriver, and apply pressure to check system integrity.

Fasten the loop of vinyl tubing to one side of the board by drilling small holes and use the cable ties to hold the tubing in place. Use the whole height of the board if you plan to check airspeeds in the 200 Kt range.

The two legs of the manometer should be close together for easy reading with a ruler or tape measure. One end of the manometer can be left open and the other end receives the tee fitting. One leg of the tee goes to the syringe, and the other goes to the ASI. Splice the fuel filter into the hose just before the ASI, as protection from water and vapour.

The working fluid for this manometer is water but it should be treated to give better readings. Red food colouring is useful to make reading easier, and a few drops into one cup of water will do. Also add a drop of liquid dishwashing solution to reduce the meniscus. This is important because otherwise the water will have too great an affinity for the vinyl tubing, to the extent that the two columns might not even zero at the same height.

Fill the tubing from the open end, and do not have the ASI installed at this time. A funnel will work but the syringe will do a better job. If the water breaks into segments you can encourage them to join up by gently oscillating the syringe in and out. Keep an eye on the tee fitting end to ensure that you are not pumping the water out that end. 10cc should be enough to fill the manometer halfway up the board.

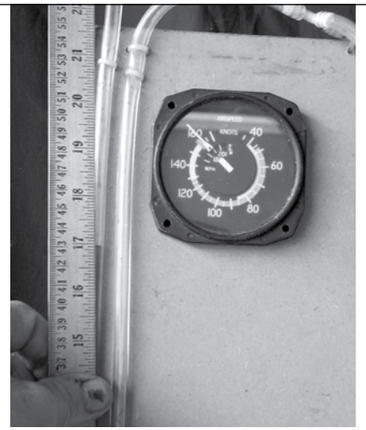
Now it is time to check the tightness of all joints. Plug the ASI end of the hose with a screwdriver and apply pressure with the syringe, and watch to see if the column will hold its height. The most likely spot for leakage will be the piston of the syringe. Use hand cream or silicone grease on the rubber and try again. Also mist some water over all barbed fittings and the body of the fuel filter. The water column should hold its height for several minutes.

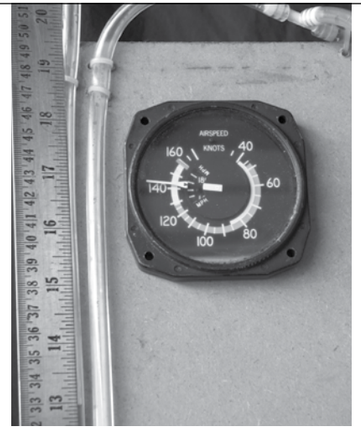
Once the system is tight, remove the screwdriver and pull the piston ¾ up the bore of the syringe. Now install the ASI to its perch and fit the hose to its fitting. Zero the water columns by moving the syringe piston as necessary. You are now ready to test.

The FAA chart gives the column heights for various airspeeds in knots. If your gauge is in MPH you will have to factor in 15.08%. Measure difference in column heights, and if your working fluid has a meniscus measure from the same location on both columns.

A column of 6.56" should show a reading of 100Kt. Transport Canada's CAR 523.1323(a) allows a tolerance of 3% or 5 Kt, whichever is greater. At 100 Kt the tolerance would be 5 Kt. This CAR references true airspeed at sea level with standard atmosphere, but Indicated airspeed is independent of temperature and pressure altitude. Checking your Indicated airspeed is the first step.

You might well ask why you should go to the trouble of making a





Left: Tee the syringe to its hose, plug the ASI end with a screwdriver, and apply pressure to check system integrity.
Above: 16.95" represents 160 kt. This particular ASI is pretty accurate at this speed.... however at 12.94" it should read 140 Kt, but it indicates about 3 Kt high.

manometer when it would be easier to substitute a certified ASI and tee it in parallel with the one being tested. The problem with this is the tolerance – your reference instrument could be as much as 5 Kt out, but you would assume that it is dead on, and then move another 5 Kt from the real number. A comparison with a water column is a lot more accurate. For MPH factor 15.08% into the speed or the water column reading.

From FAA AN 05-10-24

Speed in Knots	Inches of Water
50	1.63
60	2.35
70	3.21
80	4.19
90	5.31
100	6.56
110	7.95
120	9.48
130	11.14
140	12.94
150	14.87
160	16.95
170	19.17
180	21.54
190	24.05
200	26.71
210	29.51*
220	32.47*

**you will need a manometer taller than 30" for these.*

One caution – in a 1998 issue of Kitplanes there was an article on this subject, giving the FAA information in the chart above. It also included a simple formula that is accurate within a couple of mph. MPH = square root of (inches of water column x 1980). This is handy for starters but use the AN information when checking calibration to Transport Canada standards.

When checking your ASI, hold the pressure near its maximum airspeed for a few minutes to see if there are any new leaks. You will have already checked the manometer itself for leaks so the new culprit might be the fitting at the back of the ASI. Soapy water misted in the area will show this up. If your ASI will not hold an airspeed this means an internal leak, not recommended.

Readings at the low end will require a good eye because a 1/16" inaccuracy in measurement will represent ~4%, while at 120 this 1/16" represents just 6/10ths of 1%. It would be useful to make a list comparing your indicated airspeeds to column heights.

You may also use the manometer to check the integrity of your pitot line. Install your ASI and fit the manometer hose to your pitot tube. If you have used 3/16" ID hose you might have to warm he end up in hot water to allow it to stretch. Run through the checks again and compare numbers. A leak in the pitot system will of course show up as a sinking manometer column and a gradually reducing airspeed.

Materials

- 3/16 ID tubing - Princess Auto, TSC,
- 3/16 tee fitting - Spruce 0715-011 or 0716-011 or aquarium supply, or perhaps a window washer tee fitting at CTC
- 3/16 fuel filter - lawn mower section of Home Hardware, TSC, Princess Auto, CTC
- 10cc syringe - drug store
- red food colouring and dish detergent
- If your ASI does not have a barbed fitting you will also need a 1/8" NPT to 3/16 hose barbed fitting. Spruce 0700-150 or 0701-150

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Magazine .....George Gregory
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AirWear.....Dave King

President's Message / cont'd from page 2

sometimes separation of the head. A member in BC died in the crash that followed the failure of the ECI cylinder in his Glastar. The ECI recall kept many planes on the ground while the company worked through the backlog of cylinders that required repair or replacement.

ECI cylinders installed on Continental 6 cylinder engines are now coming under scrutiny by the FAA. They appear to be having a failure mode similar to the ECI Lycoming cylinders. The number of failures is small but high as a percentage. Not too many Amateur aircraft use the 6 cylinder Continental but owners who do have them should check their logbooks to see if they have ECI cylinders.

Flight testing confirms SAM LS won't spin; special 2013 pricing

Courtesy 121five.com:
SAM Aircraft, home again at Lachute Airport (near Montréal) after a 19-hour circumnavigation of several of the Great Lakes (that not incidentally included a week-long stay at Oshkosh), has confirmed what design and testing indicated: that the SAM LS does not spin.

Thierry Zibi, President of SAM Aviation, noted that, "Our test pilot tried to make it spin, and the SAM just spirals… He also crossed the controls; the SAM buffets and goes nose down. The SAM won't spin -- and we tried hard to make it spin." He reminds us, "There was more than one spin-proof LSA design at Oshkosh this year!"

SAM won't spin.

Testing, by professional test pilot Raphaël Langumier, demonstrated that the SAM LS could not be made to spin using normal control inputs; only a spiral would result, despite mishandled or crossed controls. Subsequent flights, with deliberately and severely crossed controls, and entering from an extreme nose-up attitude, prompted the following in Langumier's report: "As a trainer or [for a] general aviation pilot, the SAM-LS will not enter in a spin from pilot error with crossed control." He continued, "With crossed controls, the flight path will not conduct to a spin, so a pilot will be able to recover with conventional use of controls."

SAM kits are available now, at a 20% discount.

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 Iberville, 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 NRIOUX@lapresse.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 CONSTRUCTUERS 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 CONSTRUCTEURS 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 Fourth Saturday (and second Sat. as well) each month 9:00 am at the restaurant at Lake Simcoe Regional Airport Contact Secretary Dave Evans 705 728 8742E-mail david.evans2@sympatico.ca

COBDEN: Third Thursday of the month at the Cobden airfield clubhouse 20:00 hrs. President - Grantley Este 613 432 0797 este@compmore.net

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. George Elliott gaelliott@sympatico.ca 705-445-7054

EXETER: Second Monday 7:30 pm at Summers-Sexsmith Airfield, Winters-Exeter Legion. Contact Pres. Ron Helm, ron.helm@sympatico.ca 519 235-2644

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 Paul Perry 519-351-6251 pkperry@teksavvy.com

KITCHENER-WATERLOO: Meets the third Monday of each month in the upstairs meeting room of the cadet building at CYKF, except during the summer months when we have fly-ins instead. Please contact Clare Snyder clare@snyder.on.ca

LONDON/ST. THOMAS: First Tuesday 7:30 p.m. At the Air Force Association building at the London Airport. Contact President Phil Hicks p.hicks@tvdsb.on.ca 519-452-0986

MIDLAND/HURONIA

Meeting: First Tuesday, 7:30 pm at Midland/Huronia airport (CYEE) terminal building. Contacts: President Ian Reed – 705-549-0572, Secretary Ray McNally – 705-533-4998, E-mail – raa.midland@gmail.com .

NIAGARA REGION: Second Monday 7:30 pm at Niagara District Airport, CARES Building. Contact Pres. Elizabeth Murphy at murphage@cogeco.ca, www.raa-niagara.ca

OSHAWA DISTRICT: Last Monday at 7:30 PM at the Oshawa Airport, South side, 420 Wing RCAF Assoc. Contact President: Jim Morrison ,905 434 5638 jamesmorrison190@msn.com

OWEN SOUND Contact President Roger Foster 519-923-5183 rpfoster@bmts.com

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 Windsor 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@symptico.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.

WINNIPEG: Winnipeg Area Chapter: Third Thursday, 7:30 pm RAA Hangar, Lyncrest Airport or other location as arranged. Contact President Ben Toenders at 204-895-8779 or email raa@mts.net. No meetings June, July & Aug. RAA Winnipeg info also available at Springfield Flying Center website at http://www.lyncrest.org/sfcraac.html.

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 19:00-22:00 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 Don Rennie drennie@hemisphere-eng.com 403-874-0876

EDMONTON HOMEBUILT AIRCRAFT ASSOC: First Tuesday 7:30 pm EAHS boardroom. Contact President Bill Boyes 780-485-7088

GRANDE PRAIRIE: Third Tuesday, Chandelle Aviation Hangar, contact Jordie Carlson at 780-538-3800 work. or 780-538-3979 evenings. Email: jcarlson@telusplanet.net

BRITISH COLUMBIA

ABBOTSFORD: Third Wednesday 7:30 pm Abbotsford Flying Club, Abbotsford Airport. Contact President, John Vlake 604-820-9088 email javlakeca@yahoo.ca

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 250-558-5551 moneypit@uniserve.net

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 President: John Macready jmacready@shaw.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 - zzALASKA 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**

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To submit or delete a classified ad, please send to raa@raa.ca and place "RAA ad" in the subject line.

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Recreational Aircraft Association Canada
President: Gary Wolf / Treasurer: Wayne Hadath

Recreational Flyer Magazine

Registration Mail Publication No. 09869

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For Sale

FOR SALE: ZENITH CH601XL , airframe 80% complete, controls installed. Canopy mold. No landing gear. Subaru 2.2L no re-drive. $3000 or best offer. Call 705 279 4399 or 519 351 6251

EUROPA XS MONOWHEEL with Rotax 914 turbo engine and Airmaster constant speed prop, 87 hrs total time. VFR panel with Mode C transponder, KMG GPS, Becker 720 com with intercom and headsets. This is a fast and efficient cross country aircraft with low fuel consumption. Asking $65K, no reasonable offer refused. Contact Hazel Peregrym at 250-672-5587 snowgoose@telus.net

1960 BELLANCA CRUISEMASTER 2555 TT 260 HP IO-470F A fast aircraft with good short field performance and triple tail style.Full size nosewheel suitable for grass fields.1000 mile range. Gami injectors, engine analyser,white polyurethane paint . Otherwise stock. Have paperwork to turn it into an amateur built.
$65,000.00 Richard 705-652-6307

RV6 PROJECT FOR SALE. Sliding canopy taildragger model. Wings and tail pieces complete and primed, Fuselage is 50% complete on steel jig and ready for skinning. Jig included - readily transportable. . All parts from the original kit are primed and ready for assembly. .Project started in 1995- recently lost medical $17,500 complete with all of the professional sheet metal tools needed to finish. Included is the finishing kit and Van's electric flap and elevator trim kits, Large trailer included for transporting the project to your shop. Call/email for viewing at Waterloo Regional Airport Peter Hanna 905 629 8836 peterdhanna@gmail.com Or Terry Jantzi 519748 1817 tjantzi@p3tec.com

ACEY DEUCY 2 seat open cockpit project. Fabric covering completed and painted. Engine Continental 0200A rebuilt with logs. New Warp Drive 3 blade ground adjustable prop. B and C Light weight starter and alternator. Full instruments and guages in rear cockpit basic flight instruments in front cockpit. Full electrics. Aluminum fuel tank. Radio included. ELT included. Gross weight 1230lbs. Estimated 50hours to final inspection. Asking $18000. Will sell only as a package. Many extras. 905-786-2482.

FOR SALE: Advanced Flight Systems Engine information system. Some probes, fuel flow. $750 OBO. Chris 1-866-733-8432

STINSON 108-3, a classic aircraft for sale. Airframe 2365TT. Franklin 165 hp engine 998 TT, 82 hours since top overhaul. Fabric in 2005, float kit, wheel pants, spare engine parts, 2 metal props - seaplane and cruise. 30K OBO. 250-991-7958 Quesnel BC.

FIBERGLASS FLOATS-1500 lb+, all bulkheads installed, just ends need finishing, can be finished as amphibs or straight floats- complete with aluminum streamline spreader bars, rigging tubing,fittings. 15' 2" L x 22"W at step- $1200, pictures available.- Also MA-4 SPA carb set up for 125 HP with new float and pump plunger. Includes aluminum airbox- $150. Bob 519-271-9575 trirmb@cyg.net. Stratford ON

BAKENG DUCE, built in 2001. Low time airframe with 180 hour O-290 D2 Lycoming. Good compression on all cylinders. Oil filter, oil separator, Cleveland main wheels, stainless exhaust. Aymar-Demuth wood prop 72 x 52. 100 mph at 2450 rpms. This is an easy flyer that is not aerobatic. Asking $15,500 or make an offer. david.evans2@sympatico.ca. Plane is in Barrie Ontario.

CAVALIER 102.5, "Aero Sport Power" O-320-B2B; 182 TTSN. Sensenich metal prop. Airframe was totally rebuilt in 1997; 1750# GW, 622 lb useful load; VFR instruments + Garman GTX 327 TXP Mode C & Val Radio; Trutrak Turn & Bank; Kept in heated hangar; 8/10 inside and out. $29,000 OBO. cavalier102@uniserve.com or 250-558-5551. Ask for Cameron.

KR 2 TRIGEAR, 2180 cc Great Planes VW, 3.5 gph @ 130mph cruise, TTAE/TTAF 54 int/ext 10/10 $15000 call Ray Larson {905}892-6389 (SEE PIC)
McCauley metal prop, markings - DES 1 C60, DTM 7557 M1, sn# 735006 -history-unknown. Please contact JOHN SHYKULA 403-607-8539

ONE PAIR OF AERONCA CHAMP WINGS with a fuel tank in each. They were briefly on a Volmer Sportsman and have been recovered in Ceconite. The wings include the ailerons and cabling. $3000. Located in Westbank BC. 250-768-2346 dgupton@shaw.ca

O-290 G ENGINE converted to D with dual mags and O-290 cylinders. Includes starter, generator, carb, and Sensenich metal tractor prop. Rebuilt 12 hours ago, this is a very nice running engine. $7500 OBO. 250-768-2346 dgupton@shaw.ca Westbank BC

Lycoming 0-235 C1BX 115 HP ZERO (0) HOUR SINCE (0M) OWNER MAINTENANCE 2013. 1456.1 SMOH 446.4 Stoh on tbo of 2 400 h. come with carburetor starter and mags it has flown 60.8 h. last summer 2012. Presently flyable on my PA 22-108. Also Sensenich 76 AM2-48 (74 x 48) never been repitched. Reason forsale: upgrading to 0-320A2B Price: $7,000 OBO. Paul Gagnon 819-429-6022

"NEW" 2011 CHALLENGER LIGHT SPORT XS50, only 21 hrs. For Sale $45,000 TTSN 21, TET 6 Built professionally by the late Rob Lake of Lake Aviation Wing tanks Brakes, Heater
Upgrades include: Rotax 582 engine installed professionally September 2012 Flip-up nose cone hinge (Aeroloite Flight) for easy access to battery, panel wiring Custom fabric interior with pockets Hinged third door for easy entry and exit to cockpit Oil injection Strobe lights, wing tip lights from Kuntzleman Electronics upgraded Throttle assembly from light Engine Services. Avionics: BECKER CCX 175 COM/XPDR COMPAC FALCON VSI2FM-3 VERTICAL SPEED BANKINDICBALLTYPE20-20M2010-00700 Falcon Gauge Voltmeter, 6-16V, 2-1/4. Model number is VM16-2Q. AmeriKing AK-350 encoder. Avcomm AC-2EX intercom TED antenna for the transponder 11-17995 Miracle Air Whip Antenna 11-03018 for the radio additional ram mounts. Contact Bev 613 478-2923 or bevie01@ho mail.com

2006 ULTRAVIA PELICAN PL with Rotax 914 turbo 115 HP. 173 TT. Airmaster electric constant speed prop, Garmin GTX320A Mode C transponder, Icom AC200 VHF radio. Grand Rapids EIS, Lowrance 2000C GPS, Northern Airborne Technology [NAT] intercom, dual controls and brakes, electric rudder and elevator trim, plus extras. This

a/c has always been hangared. Pictures and articles of Rupert's Pelican featured in past Recreational Flyer and Kitplanes Magazines, reside on the following website, http://www.ballardsportaircraft.com, under the "News" pull down menu - http://www.ballardsportaircraft.com/pages/bsa_news.html. $75000 OBO. Rupert - Kelowna BC. 250 763-9109 – rupertgruen@shaw.ca.

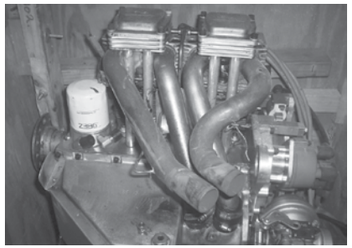
1974 WITTMAN TAILWIND W8, for sale because Transport does not want old pilots flying. C-FSNY has a C-90-14F Continental with compressions 80-70-74-76. Prop is a 3 blade IVO (great prop - easy to change pitch) This plane will fly at 150 mph at 5000 ft at 75% power (measured with a GPS 4 leg measure) Uses 4 imperial gallons per hour (18.24 litres) Capacity 20 imperial gallons.Fuselage was recovered in 2012. with Ceconite. Com transceiver and 1 transponder (not working at the moment). You must have tailwheel time. I will check you out but will NOT teach you to fly. $12,000. Jack Steele, Brockville ON 613-865-8107 jsteele@cogeco.ca

CHEROKEE PA-28-140 with 160 HP factory engine, IFR certified, 6 pack, EI engine monitor, elect tach, VOR/ILS, ADF, KT76A transponder, 2 comm radios, audio panel, Metco tips with stobes, Trutrak auto pilot with alt hold, all ADs done, outstanding condition, all oil filters saved since TOH and available for inspection (no metal ever). $35K . more pics and specs call 519 371 4673 or email dmersich@gmail.com

WANTED: CONTINENTAL A65 PARTS: Pistons, cylinders, carb, magnetos, rocker covers, spyder, cams, etc. Also interested in complete engines up to C90. Email Chris at cphorsten@yahoo.ca or call 416-918-6569.

Rotax 582 engine firewall forward. came out of a Zenair CH 701 - ONLY 25 HOURS since rebuild . Comes with- new muffler, engine mount for ch 701 c/w float fittings, carb main jet update , radiator and mount , GAUGES AND REBUILD WORK ORDER . Runs very well. $ 2,500. Magnetawan Ontario, 705-349-3555

ZENAIR 750 STOL 13hrs TT
Test flown, but not painted. Registered Advanced ultralight March 2013 Analog instrument panel. Ready to fly, $98,000.00 Serious inquiries only please contact Mac at macpat@live.ca cell, 519.831.0967



JABIRU 2200 ENGINE, 200 hours since new, 80 HP. 130 lbs all in. Has updates for flywheel, oil pump diffuser plate, rocker-box lubrication, starter, have (carburetor) improved linkage. Optimized cylinder cooling baffles. Comes with everything to make it run. Mount is for Sonerai II. Engine removed in good condition to install Jabiru 3300 for better performance. Mag drop 25 rpm. Runs strong. Static takeoff rpm 2900, with climb prop. Reaches 3300 rpm in cruise. Log book available. Owned and Maintained by AME. Removed and inhibited fall 2012. $7500 or best offer. Photo is of Engine in Jabiru crate. Shipping at purchasers cost, but can take to Reimer truck terminal. Have engine stand if needed. $50 extra plus separate shipping. Call for list of Firewall forward items included. Would keep it as a running spare but need cash for my kid's tuition. Bill Evans 514-907-4919

AMATEUR BUILT STITS PLAYMATE A11 Registration No. C-FFEO Two place folding wing sport plane Wing Span: 27 Ft., 5-3/4 In. Length: 18 Ft., 4-1/2 In. Gross Weight: 1500 Lbs. Cruising Speed: 110 MPH Three Bladed Warp Drive Prop AVCO Lycoming 0-290-D Engine Includes Trailer. Asking Price $17,999. Can be viewed at Lyncrest Airport: 514 Murdock Road, Winnipeg, MB, Hangar No. 8. Home Phone 204-474-2379 Cell Phone 613-884-3022

WANTED - Reasonably priced, working and accurate airspeed gauge; 0 -140 mph 3.125 dia mounting. William Wojcik, (905) 765 8477 or old_farmer_bill@hotmail.com

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Classifieds On The Internet:
http://www.ocis.net/tvsac/buyandsell.html - more ads from our Kamloops chapter
http://www.lyncrest.org/sfcclassifieds.html - more ads from our Winnipeg chapter

Breakfast in Hanover

by Donna Pickel

Let's go to Hanover for breakfast my neighbour suggested
A normal sort of Sunday morning outing
A ride through the countryside, check up on the crops and the recent storm damage
See a few acquaintances at the Hanover airport
AIRPORT??

Not your usual cross country ride
Rather a plane ride – and nothing ordinary about that!
Into the little two seater,
Rumble down the farm-cut runway between the soybeans rows
Then - committing aviation
No wind, sunny and clear, a smooth voyage
Up above the Ontario patchwork – corn, wheat, soybeans, and hay

What a beautiful country we are blessed with
And what a feast for the eyes to see it all spread out there
Rivers, ponds, woodlots, and cattle
Farm houses, towns, and notable landmarks
The Stratford festival, Wildwood Lake, Number 4 highway
The Hanover airport

A bright dining room
Windows on all sides to watch those approaching & departing flying machines
Decorated with photos, paintings, models of airplanes
A poster tribute to Canada's emblem of flying excellence – the Snowbirds

Heading home, I see the view facing west
No highway lanes, no traffic lines, no potholes
We just cruise along in the clear blue sky
Then the runway of home comes into sight, closer, and sharper
We're down and taxi thru the bean field
A fine morning for my first foray into flight

Photo by Jerry Forest

New BC Director David Marsden is the designer of the ARV Griffin and the Skylark, pictured here. Below, Chapter 85 members Dirk Post and Charlie Longstaff work on a Taylor Monoplane.

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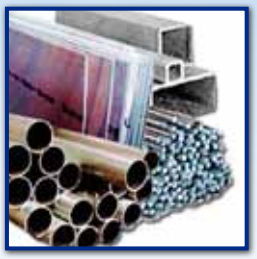
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