publication agreement number 40050880

May - June 2015

RECREATIONAL RFLYER

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

Frank Owens' RV-7

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

From The President's Desk

Gary Wolf RAA 7379

New Long-Awaited Rotax Engine

Rotax waited for Oshkosh to announce their new 135 hp turbocharged engine, the 915 IS. For years builders have been asking for more horsepower than the 115 of the 914 turbo, and Rotax has now responded. This engine is a development of the 914 turbo, combined with the new technology of the 912 IS engine.

This engine weighs 185 pounds, which includes intake and exhaust, turbo and intercooler, injection and ECU, plus PSRU, and it can maintain sea level power to 15,000 ft with a service ceiling of 23,000 ft, and a TBO of 2000 hours.

Although Rotax is making the announcement now, you cannot phone up and expect to get one next week. Serial production begins some time in 2017.

Colin Hales and His KR-2

It is not often that one meets someone like Colin Hales, a homebuilder from England. It is difficult enough for the average bloke to build and fly his own plane in England, with materials and fuel costs far higher than ours. Still, many achieve this in that country.

Colin Hales with Wayne Hadath

What is unusual about Colin Hales is that he has flown his tiny KR-2 all over the world. He carries a dismantled mountain bike and his camping gear and goes where few would ever consider travelling in a tiny homebuilt aircraft. On a trip to Australia he left the mountain bike at home and took along a friend.

Last year Colin crossed the Atlantic to Canada, and then toured the US in his plane, stopping in the Faroe Islands, Iceland, and Greenland. Except for the leg to Iqaluit when he carried a supplementary fuel tank he managed this on the 20 Imperial gallon fuel capacity built into his plane.

Colin was at Sun and Fun this year where he met Wayne Hadath and they both entered the race. He has since come back to Canada where member Bill Weir hosted him for a few days near London. Colin's next stop will be Oshkosh and after that he plans to head to Alaska. You may read his online diary by googling kr2worldtour.

Colin is self financed by his day job as an AME, and periodically he takes an airline flight home to work for awhile to earn more travelling

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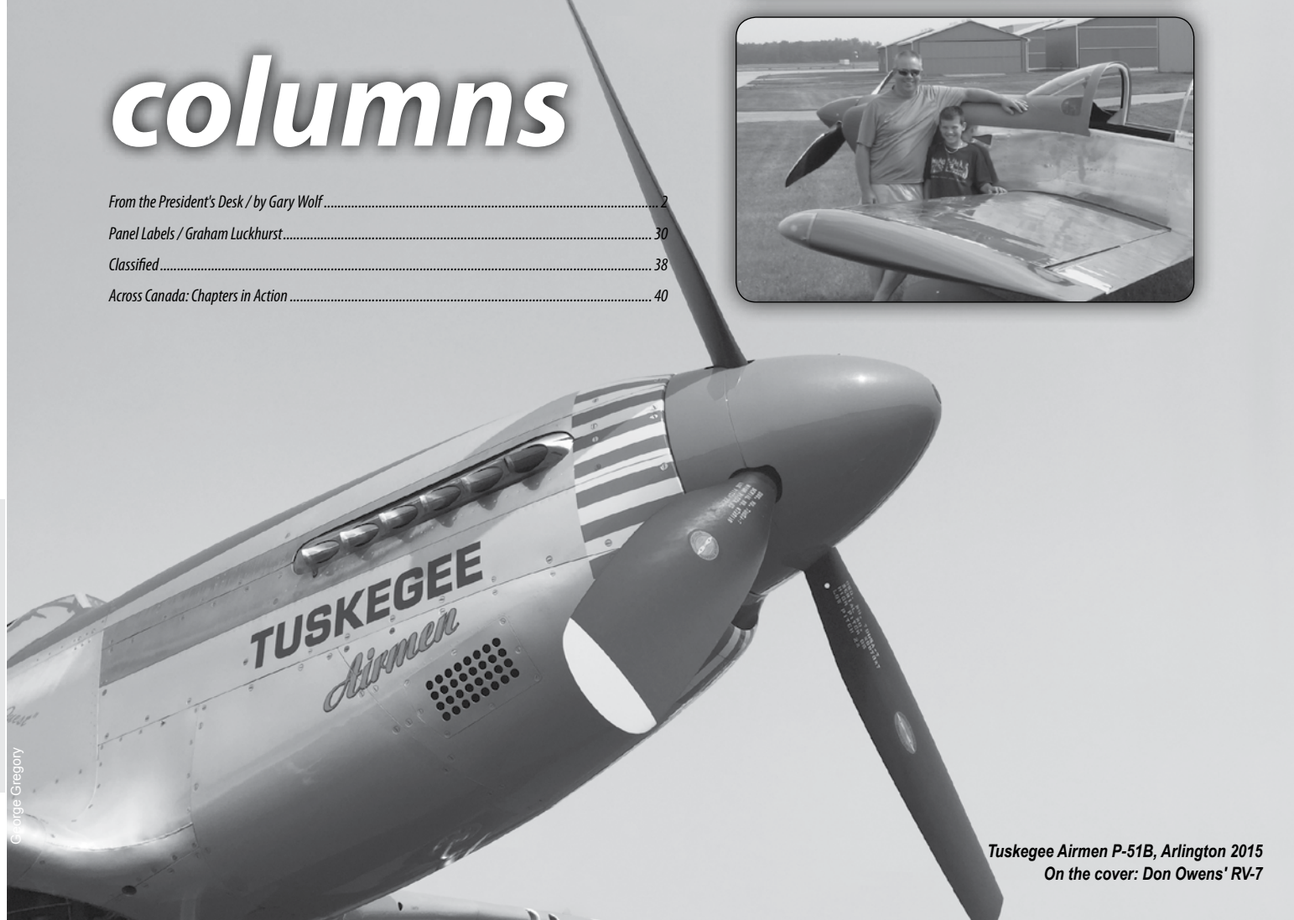
The Recreational Flyer is published bimonthly by the Recreational Aircraft Association Publishing Company, Waterloo Airport, Breslau, ON N0B 1M0. The Recreational Flyer is devoted to the aerospace sciences. The intention of the magazine is to promote education and safety through its members to the general public. Opinions expressed in articles and letters do not necessarily reflect those of the Recreational Aircraft Association Canada. Accuracy of the material presented is solely the responsibility of the author or contributor.

features

columns



George Gregory

Tuskegee Airmen P-51B, Arlington 2015
On the cover: Don Owens' RV-7

FrankenSTOL

Martin Bima

ON APRIL 24, 2003 THE PLANS and a new serial number arrived in a package from the Zenith Aircraft Company. That day was start of what I thought would be a two to three year process of scratch-building a CH701 with a Chevrolet Corvair engine, part time, in a single-car garage.

The first couple of months after receiving plans were spent procuring the raw material and convincing the rest of the family that the car belongs outside and not in what was now a heated workshop.

I started cutting, sanding, bending, and drilling all of the parts made from the flat sheet aluminum. Starting with the thickest 0.25 to the thinnest .016, in a couple of years I had all sheet metal parts fabricated and ready for yellow zinc-chromate.

One of the greatest challenges was the fabrication of the four, 10-gallon wing tanks. The plans called for .025 aluminum sheet to be formed and welded. I could not find a local TIG welder that would work on a fuel tank less than .050, and TIG welding machines were prohibitively expensive. I watched a video from the TINMAN welding very thin pieces of aluminum with a torch, special goggles and flux. After a month of burning holes in many scrap pieces, I learned the tricks to putting the tanks together with a torch. All were pressure tested and checked for leaks, and after a couple of repairs, they were sloshed internally with a sealant and ready to go.

There was just enough room in a single-car garage to build the major components.

After about three years of building, I had four fuel tanks, two wings, a rudder, horizontal stabilizer and elevator together. All of them were closed on one side and ready for inspection. The rest of the parts, forms and tools went into boxes and were stored away. The airplane obsession gave way to a more balanced life. I sold my two Corvair engines to an automobile enthusiast after admitting that it would be a heavy engine for the 701.

In 2011, the flying bug bit hard again and I put in an offer on an old Citabria, but it failed the AME's inspection. I was looking on-line through some used airplanes for sale and found a brand new Zenith CH300 with a zero-time O-320, and a ratty-looking 25 year old CH701, both in Ontario. In December 2011 I bought a one-way Westjet ticket from Winnipeg to Toronto, jumped in a rental car and drove to Sundridge, about 3 hours north of Toronto, with the intention of buying that CH300 and flying it home. Unfortunately when I sat down, with my bum on the cushion-less cold wing spar, my head was touching the canopy.

I drove to a sheep farm east of Peterborough the next day to just have a look at the 1988 vintage CH701. It came with a 10-year old, 100-hr Rotax 912S, amphibious floats and about 12 pounds of birds and wasps nests. It was built under the old plans designed for a 950lb gross weight, but I started having visions of my finished wings and tail on this old plane, and bringing it up to the new generation plans and higher gross weight. The next day I rented the largest U-HAUL van, paid the owner too much money, dismantled the plane, rolled it up an improvised ramp into the van, and drove it home over the next three days of white-knuckle driving through a 50kt crosswind off of Lake Superior to Cooks Creek, Manitoba.

FrankenSTOL over downtown Winnipeg. Opposite: Martin after his first solo in his Zenith.

More easily said than done: "Just put the new wings on the old plane and start flying".

From December 2011 to September 2013…

The ten year old engine had a hundred hours on it, but none of those hours in the last two years. The carburetors had salad growing in the bowls and the rubber and PVC oil and cooling lines were ready to give. All was eventually corrected with proper research, new parts and lots of work.

The cabin had the old original structural members. The bad news was the internal structural members had to be upgraded for the heavier gross weight. The good news was that it gave an opportunity to bubble the roof of the cabin and remove the cross-tube for more headroom.

The fuel system in the cabin had no drain at the low point and I did not like the 7.5 gallon header tank behind the passengers head. This was all removed in favor of the four, ten gallon tanks of my new wings and minimal tubing in the cabin.

The electrical and instrument panel was completed gutted and replaced with a new digital engine monitor and rewired electrical systems.

Transport Canada came out for the first inspection to have a look at the new wings and tail feathers as well as the modifications to the cabin, panel, and seat belts. They determined that so much modification was done, that a new CofA would be required.

A final inspection was completed on our driveway in the summer of 2013. The plane was then dismantled

A new Certificate of Airworthiness was issued on September 10, 2013, immediately before some of the most undesirable flying weather on the prairies for the next 50 days.

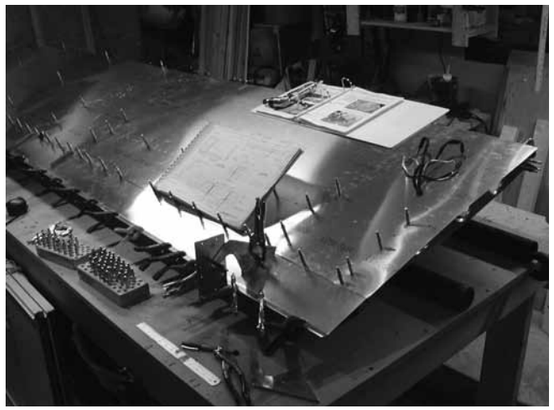
and transported to St. Andrews outside a friend's hangar, where it was reassembled and subject to one more final inspection. A new Certificate of Airworthiness was issued on September 10, 2013, immediately before some of the most undesirable flying weather on the prairies for the next 50 days. The poor weather and accommodating controllers at the airport allowed for about ten hours of taxi testing and running "wheelies" up and down the inactive runways.

On October 28, 2013 Jeremy, an instructor pilot with lots of small aircraft time, and I, left the earth in the "FrankenSTOL" airplane, more than 25 years after its first, first flight in Parry Sound, Ontario. Jeremy had the controls and I was glued to engine and flight instruments, continuously calling out speeds and engine temperatures and pressures. Only after about three minutes did I finally look outside the door and realize we were actually in a flying airplane and not sitting on the ground in a noisy lawn ornament.

We flew to the practice area to determine the stall speed and handling characteristics. About 5 miles per hour before the stall, there was a very loud an unsettling banging sound from the rear fuselage. It was the first indication of flow separation. The stall was uneventful, no wing drop, no nose drop, just a flat mush and some buffeting very quickly recovered by lowering the nose slightly. Straight and level flight had a strong but manageable left-roll tendency which was later corrected by re-rigging the elevator tension bungee.

I flew off the next four hours with Jeremy in the instructor seat as I gained confidence with the controls. At exactly five hours into the new CofA, I took FrankenSTOL solo.

Top: Parts hung up to dry. In a single car garage, space is obviously at a premium. Centre: Welding practice proved to be an educational experience. Bottom: son Nicholas 10 whole years before he actually became a passenger in FrankenSTOL.



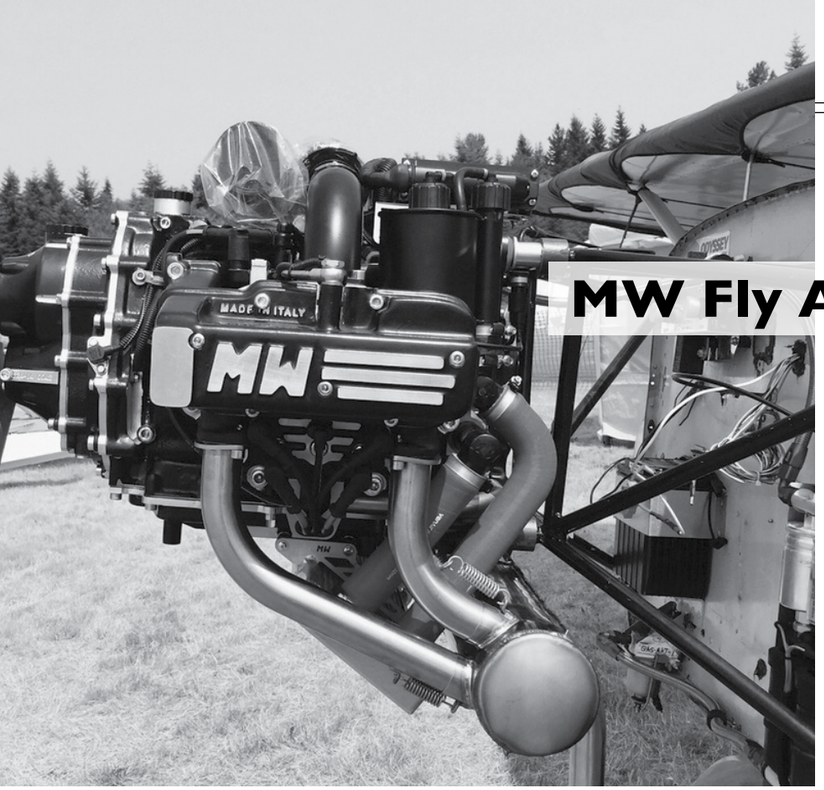
Left: right wing flap arm rib; Right, the roofline was modified into a curved section to allow more headroom as per later models. It looks better, too. Below, right: the cramped (but heated) working quarters are evident here. Bottom: an equivalent amount of sand served for the climb testing.

To this day I have over 160 hours, carried dozens of happy passengers, landed in back yards, flew an entire summer with the doors off, and flew in sub -20 temperatures in the winter, with the doors on. It is a wonderful airplane to fly. It is very stable, light on the controls, has lots of power and is very forgiving to poor approaches. The visibility is fantastic and low speed capability makes it very safe and gives it a near helicopter-like loitering ability. Shortest landing has been less than 30ft with the help of a 20+ knot wind blowing straight down the runway. The same wind was used to demonstrate 20kt direct crosswind landings thanks to the massive, all-flying rudder design.

It was beneficial to have a couple of projects going at the same time. When you hit a snag or get frustrated with one part of the build, you can switch to another and not waste too much time. It was also critical to have a few good people around to help inspire (Jill O.) and provide technical direction (Ken P.). The on-line builders community also provides invaluable experience to avoid mistakes and gain critical advice.

Future plans include building straight skis for next winter and re-installing the amphibious floats next summer.

***Martin Bima** is from the Winnipeg area.*



MW Fly Aircraft Engine

RAA

METALWORK IS an Italian engineering firm that was created twenty years ago to partner with the R&D and motorsports departments of Lamborghini, Ducati, Pirelli, Marzocchi and Peugeot. In 2003 they designed their first clean sheet aircraft engine and began bench tests, with first flights in 2006. By 2007 they had completed all the foundry moulds for engine and gearbox castings and finalized the production machinery. In 2010 the company had completed 230 hours of flight testing and began testing for compliance with FAR 33, and in that year reached 800 hours of flight test and 2000 hours of bench test. A separate company was then created as a sterile environment to assemble and test the production engines. The most recent step was to partner with Ottawa Aviation Services to create MWFly North America as the sales and distribution arm of the company.

The MWFly is a watercooled four cylinder boxer configuration engine that incorporates a gearbox to reduce crankshaft revs to those required for a decent length propeller, similar in concept to a Rotax 912 but with nearly twice the displacement. The crankshaft is a steel press fitted unit, again similar to a Rotax, but instead of plain bearings the MWFly uses rolling element bearings at both ends of its forged connecting rods. 10.5:1 pistons are machined from billets of an aluminum alloy that features low thermal dilation, to maintain a proper fit throughout the temperature range.

The MWFly's magnesium/aluminum crankcase castings are vertically split on the centerline with each half incorporating a pair of cylinders that have easily removable cast iron liners. Above the crankshaft is a gear driven service shaft that drives the oil and water pumps, holds the disengage mechanism for the electric starter, and mounts the sprockets for the chain driven overhead camshafts, one camshaft per side. There are no rocker arms – instead hydraulic lifters act directly on the valves through hardened metal shims. The camshafts have a proprietary valve lifting mechanism that reduces cranking compression, allowing the use of a smaller starter and battery. In the event of a failure of the decompressor the normal operation of the hydraulic lifter is not compromised.

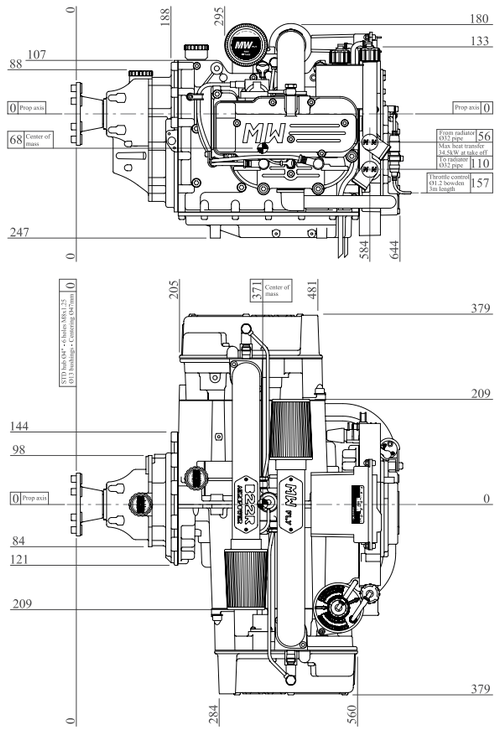
Oil pressure is provided by a trochoidal gear pump with all passages internal, so there is no chance of an oil line rubbing against a hot exhaust system tube. The rolling element crankshaft bearings generate much less heat than plain bearings so the MWFly engine does not need an oil cooler, and the engine can be run dry for 15 minutes, albeit at a lower power setting.

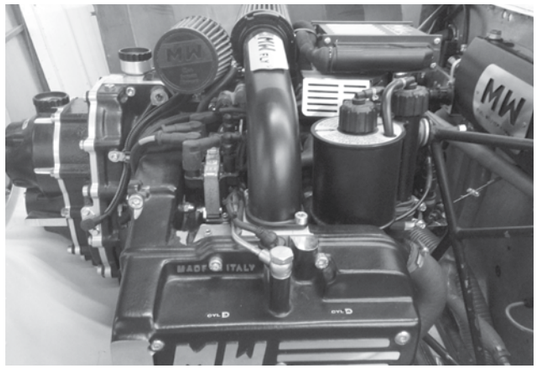
The intake system of the MWFly is unique in that it has one intake port per bank with each throttle butterfly set into its head in the common area of the intake port, to keep the throttle butterflies at engine temperature to prevent icing. Downstream of the butterflies are the ECU-controlled fuel injectors, one per port. Fuel pressure is supplied by an ECU-controlled main pump and regulator, with a supplementary pump for takeoff.

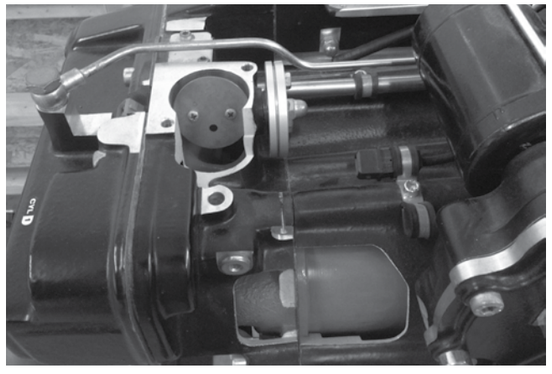
The ECU is mounted to the top of the engine and controls ignition curve and the fuel injection timing, monitoring oil temperature, battery voltage, and air temperature as inputs for mapping. The electrical system is integrated into the engine and above 1500 rpms it can function without a battery. Connection to the wiring harness is through sealed connectors that protect the loom from vibration. Everything that is necessary for operation of the engine is preinstalled, including the thermostat and header tank with pressure cap, fuel rail with pressure regulator, alternator and regulator, starter and relay, and of course all sensors and the ECU.

Horsepower of the engine depends on the rpms and the reduction ratio of the integrated gearbox. Prop rpm is 2400 rpm for both versions, with engine revs at 4550 rpms for 130 hp and 110 hp continuous at 4250 rpms. The 115 hp version makes its maximum power at 3950 rpms and has a continuous rating of 100 hp. Both engines have an installed weight of 197 pounds including radiator. The prop flange has six drive dowels to accept 8mm bolts, and the pattern is a 101.6mm (4 inch) circle, same as the Rotax 912. Rotation in a tractor installation is counterclockwise as viewed from the cockpit, so Rotax pusher props become MWFly tractor props. TBO is 2200 hours for the 115 hp engine and 1800 hours for the 130 hp version.

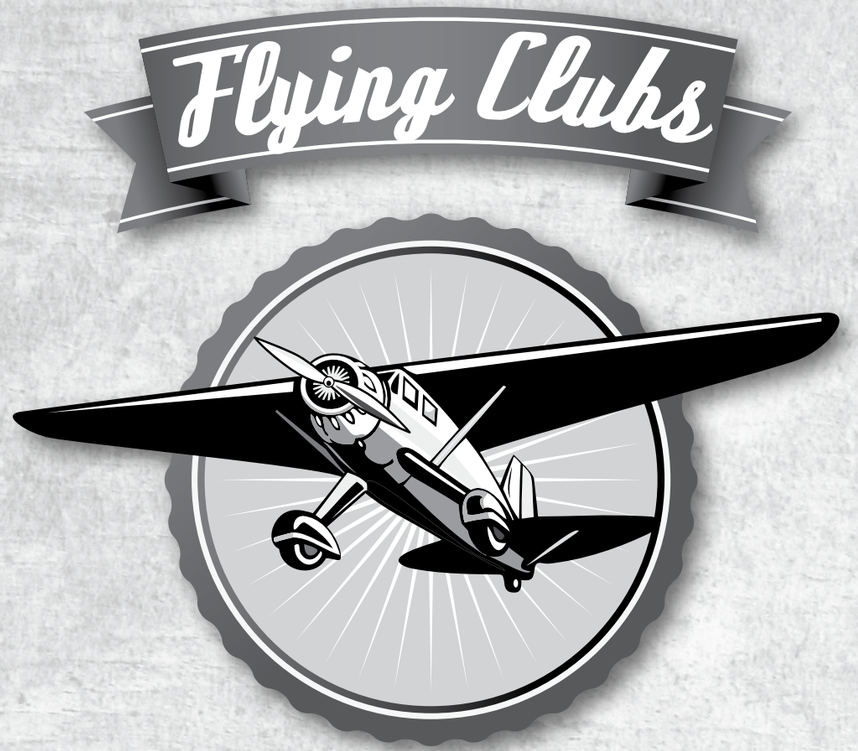
Pricing is $22,600 US for 115 hp and $25,500 US for 130 hp version..







Opposite: the MW engine installed on a Bushcaddy at the Arlington, WA fly-in. Top: the top and side views show the compact size of the engine. Left, The intake system of the MWFly is unique in that it has one intake port per bank with each throttle butterfly set into its head in the common area of the intake port, to keep the throttle butterflies at engine temperature to prevent icing. Right: the cutaway shows the fully waterjacketed cylinder and head, and also the throttle butterfly in the intake port.



And Our Need To Keep Them Alive

Barry Meek

AT OUR FLYING CLUB in Vernon, B.C. we stay active all year. Obviously, there is not as much flying in winter months as there is in the summer, but the health of the club is defined then more by the social activities. With less than one hundred members, it is diversified, active, dynamic and interesting. The core activity is actually not the flying, but the coffee hour each and every morning at the clubhouse. The normal average attendance is about one to two dozen members, mostly the retired pilots. Like most flying organizations in the country, the age group in this club tends to lean to the senior side. Of the relatively younger fellows, several are still involved in working at their careers and at their businesses.

We are not a flying school and there is no club airplane for rent, however the majority of members are aircraft owners. The number varies between fifty and sixty who have their own airplanes. At last count, at least eighteen RV's are at home on this airport, some still under construction, but most are flying.

As with any organization, it takes a certain amount of money to operate a flying club. Expenses to maintain a clubhouse include taxes, mortgage, utilities and insurance. The club is also committed to a few community services. Members' annual dues are the biggest source of income, but we host various fund-raising and community events through the year. Every flying club in the country seems to rely on functions such as pancake breakfasts, fly-ins, bar-b-ques, and social gatherings to help out with their expenses. B.C. pilots have for many years come to know that Vernon puts on the best "rust remover" seminar in the area. Every spring in May the club hosts knowledgeable speakers presenting aviation and safety talks and discussions. Members here also work to gather items for an annual storage locker auction. And donations come from a few sources, including families whose children have been part of our COPA for Kids event.

We are very fortunate to be situated at an airport with supportive management. The businesses on the field are good to deal with, the security is efficient yet reasonable, and the general public for years has not had a problem with aviation in their community. However, we may be experiencing the first wave of change in public acceptance of this airport. We're "coming of age" with the rumor of disgruntled neighbors taking up a campaign against the noise. The problem is not uncommon, and as airports grow, new business is almost inevitable. When there are more airplanes flying, the sound level goes up too. We know that there is less flying in the private sector, but as the economy improves, so too does commercial aviation. Even without scheduled airline service, many airports are home to glider operations, training schools, FBO's, parachute businesses and charter companies, all producing their own "airplane noise". Even as the flying clubs are shrinking, we all face the same challenges in protecting our freedom to fly.

As a former member of two other flying clubs, and from regular reading of newsletters published by many more, I know we're not unusual or outstanding in any way. Our members share common interests, either building, flying or just similar backgrounds. We have retired military and airline pilots, bush and charter pilots, along with a couple of former aviation business operators. Most are private pilots however, who simply like to fly for the fun of it. Our fly-outs tend to be spontaneous and weather dependent. The fly-ins are well organized. The feeling of camaraderie is highly defined in this club, and it's not difficult to find parts or

help from someone who will volunteer when the need arises. The single, most serious concern expressed by most pilots is that we're all getting older, and new younger people are just not signing up. There is a fear that flying clubs have become, or are on the way to becoming "old boys clubs", a label that tends to keep younger pilots away to an even greater degree. Many discussions have centered on how we can change this and attract a new generation, people who can bring new ideas and new life into private aviation.

Like it or not, we also face the challenge of a public perception that we're a bunch of old, rich guys and have shut ourselves out from the general population. It tends to give flying clubs a "Fort Apache" image. Only certain folks are welcome here. Of course nothing could be further from the truth, but there's work to be done to dispel that myth. Our public profile could always stand improvement. Part of the problem in doing it though, has to be recognized as Transport Canada and the restrictive regulations they impose on aviation. It starts with the security at most airports. As they drive by an airport, the non-flying public is met by high, chain-link fences, the back walls of hangars, search lights and security cameras. There are official looking black pick-up trucks on patrol, outfitted with flashing lights, signs and emblems on the doors, driven by uniformed guards. It is hardly a site that says "new members and public welcome". It's necessary in some cities and larger airports, but it seems a bit overdone at small ones too. Here at Vernon, I will admit that there are no "guards" on duty, but with all the gates and fences and signs, it's no wonder new inquiries and memberships suffer at a flying club.

There are many suggestions out there of methods to change that perception, and to show people that

Look around the table at your next flying club meeting. Are there any "young" pilots looking back?

flying is an achievable dream for them. The old ways when someone had the dream and was able to reach out for it by simply hanging around the field, have given way to the need for us, the pilots and flying club members to reach out. Our job description now says it is our turn to step forward to welcome and encourage them. That could include more open houses at the clubs and airports, to working with students at the flying schools. Regulations and insurance reasons often preclude offering rides to newcomers, but showing off our airplanes even in static displays is another possibility to get folks close to and comfortable with small aircraft. Airshow attendance has always been spectacular, which proves the interest in aviation is already there.

Most pilots admit to being bitten by the flying bug at a very early age. That must still be happening with kids today. It would be a good place to start as we push for the survival of aviation. COPA for Kids events held across Canada always face lineups of young aviators, eager for the right seat spot! Another and somewhat simpler way to get the kids into our domain is to encourage schools to plan field trips to the airport. And to further advance our "agenda", it wouldn't hurt to submit positive aviation articles to local newspapers. Good news and airplanes are not heard about much in those publications.

I surf the web quite frequently to find newsletters from other flying clubs and keep up on their activities. I would also like to encourage anyone with good, proven ideas for promoting the good things we need to get out, to respond to my e-mail address below. We can share information and keep a good impression out there for the non-flyers by working together a bit more. COPA works hard to promote and protect G.A. But there will never be a time we can simply relax and say the job is done. I believe we're falling further and further behind. Look around the table at your next flying club meeting. Are there any "young" pilots looking back? I think we need to see some younger men and women walk through the door to welcome to the ranks.

Barry Meek *is a retired ambulance paramedic, former broadcaster, mountain bike tour guide and commercial pilot. His articles have appeared in the COPA newsletter, the Aviation News Journal, and (of course) the Recreational Flyer. He resides on Gabriola Island in British Columbia.*

Making Flying Attractive Again

I recently returned from a large fly-in in Washington State. I haven't missed one since 1993, and one of the striking things is that every year the event gets a little smaller. The vendors seemed discouraged, and there seems to be a general malaise in the industry. This is also reflected in the diminishing size of flying clubs and chapters.

I don't think anyone would deny that probably the biggest single factor is the retiring of service pilots from WW2, Korea, and even Vietnam. The military is not training as many pilots as they used to, and less people are entering civilian life with tax-payer funded pilot training. But are there any other things?

Being of a scientific frame of mind, I thought I'd do a bit of research, meaning I asked my young adult sons if they had any ideas. Being millennials in good standing, I asked what they considered disincentives for young people pursuing aviation as a hobby. Several Things came out of that discussion.

First and foremost was the cost of flying. People can't afford to own an aircraft. Of course this is one of the things that gave birth to the homebuilding movement. If you can't afford to buy an airplane, you can probably afford to build one.

As long as you're scratch-building. But if we are increasingly experiencing a paucity of discretional income, we now also face a shortage of time. Kitplanes do much of the work for you, but the cost of kits nowadays can still give a considerable case of sticker shock, and some kit manufactures (Van's in particular) while offering excellent value for the money, are very sticky about the engines used in their aircraft - and the limited options are all quite expensive, with Rotax 912s approaching $30K. Lycomings and Continentals are equally spendy. Aviation is increasingly becoming the hobby of rich people (if you're young) or retired, established people who will be hanging up their goggles given a decade or so anyways.

Flying training costs and over regulation also contribute. It's expensive to learn, and even at that flight instructors often need to supplement their meager earnings with alternate streams of income if they are to keep home and hearth together.

There also exist a far greater range of alternatives that are emotionally satisfying while being a lot easier on the pocket book. Video games, (one notable game, WarThunder, features photorealistic combat with views of the inside of the cockpit. The shadows even move with the attitude of the virtual aircraft. And it's free) drone flying with live video feed,

We aren't as handy or as clubbable as we used to be. The computer, chat rooms and especially social media have redefined how we interact with others and share tips.

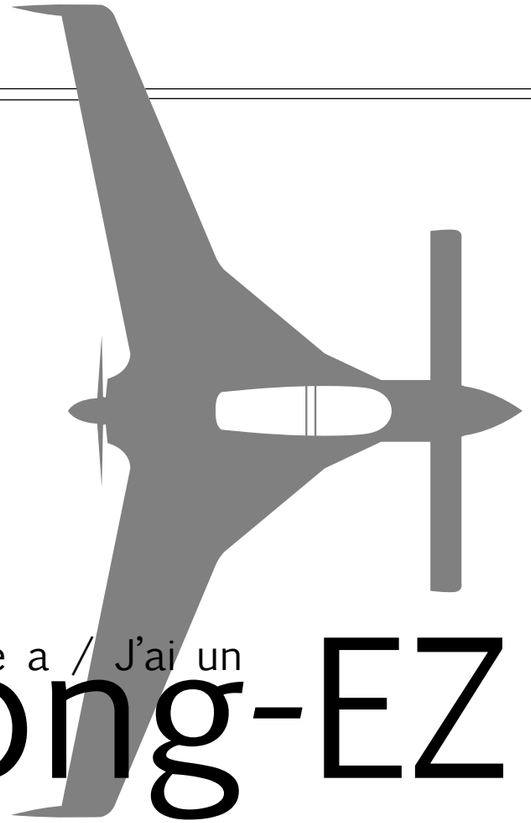
A lot of pilots are just giving up, fed up with the regulation and cost of what has become an expensive hobby.

What can we do?

We need to redefine the role of the light aircraft. How can we make flying more practical? I don't think we will see a relaxing of the rules, but we can make it more worthwhile to learn by increasing the utility of aircraft.

How can we further spread the word? EAA's Young Eagles' Program, COPA Flights for Kids are steps in the right direction. RAA Chapter events and community involvement can play a part here.

And if there is a smorgasbord of distractions to choose from, there is also a distinct lack of mentoring relationships in society today. I got into sport flying because a neighbour was building an Isaacs Fury and took the time to answer my questions - and arrange for a free flight. The structure of the family has changed to the detriment of many young people, and a big brother (or sister!) who can give of their time to show the next generation the wonders of flight does more than just good for the sport. One could change a life.



I Have a / J'ai un Long-EZ

Jean Claude (JC) Audet

JUST IMAGINE being in a gathering of some sort where nobody is really into this airplane thing, let alone homebuilt aircraft, or having ever heard of RAA. You suddenly come across somebody who shares your interest and you eventually admit: ''I have a Long-EZ.'' Then your immediate environment gradually goes silent around the two of you, but thankfully decides to go on with whatever they happened to be caught up in. So yes, I have a Long-EZ, but what is it exactly, and how did I get to have that?

My long standing interest in airplanes led to my joining the Air Force where I discovered airplanes of course but also a lot of fantastic folks with similar devotion. About the Long-EZ? Well, like everybody involved in homebuilt aircraft, I spent lots of time researching various types in an effort to find my ultimate machine. I obviously came across the name Rutan and the designs associated with this talented individual. A long time ago, on my way to Moose Jaw, SK, for pilot training, I visited with a friend in Winnipeg, MB. He took me to their hobby hangar where a Vari-Eze was under construction. First one I had ever seen and touched and I was certainly intrigued by several aspects of the design. Jump ahead a few years in Greenwood, NS. One day, this fellow contacted Jack, our Flying Club CFI about his potential interest in performing some early test flights of an aircraft he had just completed. This aircraft turned out to be a Vari-Eze. Although this was the first one of the type I finally had the opportunity to see, I was nonetheless able to appreciate how beautiful this aircraft was, how much work went into it. Needless to say, I envied Jack. But regardless of the type of aircraft I would eventually choose, if I ever did select a particular one, I also had enough sense to recognize that being in the Air Force, which implies moving every three years, this aircraft building project was doomed to take forever and a few years to complete. I would spend more time packing, unpacking, packing, unpacking, repairing parts damaged in the move, and start the cycle over again, and again, and again.

Acquiring my Long-EZ

Shortly after my transfer from 425 Squadron in Bagotville, QC, to National Defense Head Quarters in Ottawa, I discovered that one of my new colleagues, Nigel, owned a Vari-Eze and was flying out of a grass field in Embrun, ON, a short drive from Ottawa. In the course of discussions on our favorite topic, he allowed knowing a fellow in St-Lazare, QC, who had a beautiful Long-EZ for sale. The owner of this Long-EZ had built the aircraft strictly according to plans. He eventually came to Embrun to show me the plane. He took me up for a short flight and I was hooked. At that point in my life, I had been shopping for an aircraft for several years, never finding the right one, or more likely the one I could afford. And then of course, like all of you, I had heard, and had witnessed, numerous horror stories about the surprises that came with a used aircraft, even more so with a homebuilt aircraft. No matter how impressive that first flight may be, one must not lose focus of the important issues: what is the quality of construction of that aircraft, how well does it really fly, and so on.

My pre-purchase inspection experience was greatly enhanced by Nigel's support and advice. He had owned, flown, and modified his Vari-Eze for several years and

IMAGINEZ-VOUS à un évènement quelconque ou personne n'est vraiment intéressé à l'aviation sportive, encore moins pilote d'avion de construction amateur. Vous rencontrez soudainement quelqu'un qui partage votre passion et en cours de discussion vous laissez tomber les mots ''J'ai un Long-EZ''. Tout le reste autour de vous disparaît alors que votre conversation se concentre sur vos avions. Eh oui, j'ai un Long-EZ, mais de quoi s'agit-il, comment en suis-je arrivé là? Et quels sont les avantages d'avoir une telle chose?

Mon intérêt dans les avions remonte à très longtemps et m'a incité à m'enrôler dans l'aviation militaire ou j'ai découvert évidemment des avions, mais aussi un grand nombre de personnes ayant la même dévotion. Et le Long-EZ? Comme tous ceux qui s'intéressent aux avions de construction amateur, j'ai passé beaucoup de temps à rechercher différents types d'appareils dans l'espoir de trouver la machine ultime. J'ai évidemment découvert le nom de Burt Rutan et les designs qui lui sont attribués. il y a de cela plusieurs années, en route pour Moose Jaw, pour commencer ma formation de pilote militaire, je me suis permis une brève visite chez un ami à Winnipeg. Il me fit visiter leur hangar pour hobbies et j'y découvris un Vari-Eze en construction, le premier que j'aie eu l'opportunité de voir de près, même d'y toucher.

Plusieurs années plus tard, à la base de Greenwood, unb pilote approcha le Chef Instructeur de notre Club de Vol, voir sa disponibilité pour évaluer un avion dont il venait de terminer la construction. Il s'agissait d'un Vari-Eze. Bien que ce fût là le premier avion de ce type que j'ai finalement eu la chance de voir en condition de vol, j'étais quand même en mesure d'apprécier la beauté de l'appareil, et l'ampleur du travail requis pour en arriver là. Mais peu importe le type d'appareil sur lequel j'arrêterais mon choix, si jamais j'y arrivais, je comprenais quand même qu'en tant que militaire qui doit déménager tous les trois ans, mon projet de construction d'avion demanderait certainement une éternité et même quelques années de plus avant d'aboutir. J''investirais beaucoup de temps à emballer, à déballer, à emballer et déballer encore une fois, à réparer les pièces endommagées durant le déménagement, et le cycle recommencerait encore, et encore, et encore.

C-GBVC arriving at its new home in Embrun.

Le Long-EZ et le Vari-Eze sont deux avions de construction amateur, à voilure canard, conçus par Burt Rutan en Californie dans les années '70 et construits en très grand nombre. Ces avions sont de construction composite et ont été construits en grand nombre. Ce sont des avions très rapides et aptes aux longues distances, parfaits pour jouer au combat aériens, ou pour les voyages, tout en ayant une extrèmement faible consommation d'essence. Normalement, le Vari-Eze a un moteur O-200 alors que le Long-EZ utilise le O-235. Si vous avez appris à voyager en motocyclette, l'exiguité de l'espace bagage ne sera pas un problème, quoique le Long-EZ offre quand même plus dans ce domaine.

L'acquisition de mon Long-EZ

Peu de temps après ma mutation de l'Escadron 425 de Bagot-

The first thing I realized was that the Long-EZ *really is* a fast, long distance touring plane.


In position, ready to go

knew the ins and outs of composite work. He had also attended Oshkosh several times and had seen many good builds and several not so good ones. His advice was invaluable with respect to how to look at this aircraft, what and where to look for in the workmanship, quality of materials and finish, and so on. Nigel knew this aircraft quite well and the builder, Bernard Verdon, from St-Lazare, QC, about an hour west of Montreal. In fact, Nigel was already sold on the aircraft, but he took the time to inspect it in minute details, primarily to show me and teach me how to inspect a composite homebuilt aircraft. The aircraft, C-GBVC, was based at the St-Lazare airport. After a few hours, literally, of looking, touching, drooling, etc, I expressed my definite interest in the aircraft, but I needed to run that acquisition through the approval of my Minister of Finances back home. I also had to inform Bernard that I would not be able to do anything about it until sometime in September as the Air Force wanted me to spend most of the summer in Europe. I know, it is a terrible job, but somebody has to do it, right? Anyway, Bernard agreed as it would give him one more summer of flying the Long-EZ, and that aircraft type is not easy to sell as most interested parties tend to view it as a high performance aircraft and thus demanding on pilot skills and likely a handful to fly, which is not necessarily the case, but more on that later. One thing was reassuring in all of this: Bernard had already built, flown, and then sold two other aircraft prior to the Long-EZ, a Pietenpol and a Maranda. This was happening on 1st July 1990.

As anybody would probably understand, the summer of 1990, the summer that Saddam went South for a while, was a long one for me. Finally, C-GBVC became mine on the 16th October 1990. Bernard delivered it to Embrun. The aircraft had been first flown on 31st July 1984 and the logbook showed 205 hours TT. The panel was very basic VFR with a few additional instruments such as a fuel computer for instance. The only concessions to modern technology were an old Genave Alpha /200B nav-com radio which did have the CDI incorporated in the face of the radio, and a relatively recent STS Loran-C 110, which I really did not have an opportunity to try in flight.

Early Life with GBVC

A few days later, on 20th October, Nigel took GBVC for a 1 hour flight to get accustomed to it. He then gave me a thorough briefing on the aircraft and took me up for a check flight, then declared me safe for solo. This is when I started referring to my Long-EZ as my baby F-18. This is the closest I can get to an F-18 on my budget. And it feels like that multi-million dollar fighter. The bubble canopy, the feeling of speed, the maneuverability, the g-loading (not as much as the F-18 …), everything is there except that enormous thrust from the F-404 engines. But a lot cheaper on gas!!!

At this point, I knew there were a few things I wanted to change on the aircraft but this was a winter project. My primary objective was to fly at least 10 hours on it before the cold temperatures put a stop to my fun. I wanted to know as much as possible about the flying qualities of GBVC as well as what I liked and what I wanted to change in the cockpit. I thus managed to accumulate 9 hours by 1st December. Close enough, given my travelling and our customary late fall weather. Snow and real cold were late that year.

Those 9 hours, brief as they may be, allowed me to learn a lot about my new toy and to define what this first winter mod program would entail. The first thing I realized was that the Long-EZ really is a fast, long distance touring plane. As my ASI is in mph, I will stick to that format. I saw that I could easily cruise at 160 mph at 8000 ft, consuming less than 6 gph, and I can have 45 gallons imperial on board. Making full use of

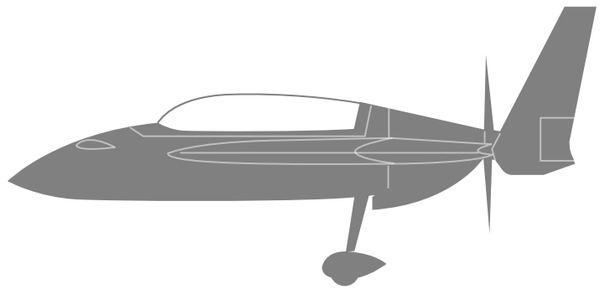
ville, QC, au Quartier Général de la Défense Nationale à Ottawa, j'ai découvert qu'un nouveau collègue, Nigel, possédait un Vari-Eze et volait celui-ci à partir d'une piste en gazon à Embrun, une courte distance à l'est d'Ottawa. Lors de l'une de conversation sur notre sujet favori, il avoua connaître une personne à St-Lazare, approximativement une heure à l'ouest de Montréal, qui avait un superbe Long-EZ à vendre. Cet avion avait été construit avec un respect strict des plans. Le constructeur est éventuellement venu me montrer l'avion. Nous avons fait un vol de démonstration et j'étais convaincu : il me fallait cet avion. À ce moment, j'avais déjà passé plusieurs années àmagasiner pour un avion, sans jamais trouver le bon avion, ou du moins celui que je pouvais m'offrir. Et évidemment, comme vous tous, j'avais entendu, ou été témoin, de nombreuses histoires d'horreur relativement aux surprises que l'on découvre quelques temps après la réalisation de notre rêve, et pis encore s'il s'agit d'un avion de construction amateur. Peu importe jusqu'à quel point ce premier vol peut être impressionnant, nous ne devons surtout pas nous permettre d'oublier quelques points très importants, comme la qualité de construction de l'avion, la maniabilité et le contrôle en vol de cet avion, et j'en passe.

Mon expérience de l'inspection pré-achat a été grandement satisfaisante grâce au support et conseils de Nigel. Il avait été propriétaire et pilote de son Vari-Eze depuis plusieurs années, y avait incorporé plusieurs modifications et possédait une bonne expertise du travail avec les matériaux composites. Il s'était rendu à Oshkosh à plusieurs reprises et avait eu l'occasion d'admirer plusieurs avions donc la qualité de construction était excellente, et même quelques fois un peu moins bonne. Ses conseils furent d'une inestimable valeur quant à l'inspection de l'avion, les points importants à considérer, comment évaluer la qualité du travail, les matériaux et la finition, et autre encore. Nigel connaissait bien cet avion ainsi que le constructeur Bernard Verdon de St-Lazare. Après quelques heures à toucher, à caresser, à admirer, à discuter, j'ai finalement informé Bernard que j'étais très sérieusement intéressé mais que je ne pourrais rien faire avant tard en septembre. Je devais d'abord obtenir l'approbation de mon Ministre des Finances qui était à la maison à ce moment et n'avait aucun intérêt dans les avions, surtout quelque chose comme ça, et l'Aviation Royale Canadienne voulait que je passe cet été en Europe. Bernard accepta car ceci lui donnerait l'opportunité de voler un autre été avec GBVC, et en plus, il réalisait que cet avion n'est pas nécessairement facile à vendre car la majorité des intéressés ont tendance à voir cet avion comme étant haute performance, exigeant des habiletés exceptionnelles de le part du pilote, et généralement exigeante en vol, ce qui n'est pas vraiment le cas, comme nous le verrons plus tard. Un facteur très rassurant dans tout ceci : Bernard avait déjà construit, piloté, et éventuellement vendu deux autres avions avant le Long-EZ, un Pietenpol et un Maranda. Tout ceci se passait le 1 juillet 1990.

Comme vous le comprendrez certainement, l'été de 1990, l'été des expéditions de Saddam dans le sud, fût un peu long pour moi. Finalement, C-GBVC devint ma propriété le 16 octobre 1990. Bernard livra l'avion à Embrun (photo 1). L'avion avait fait son premier vol le 31 juillet 1984 et son journal de bord totalisait 205 heures. Le tableau de bord était VFR de base avec quelques items additionnels comme un totalisateur d'essence par exemple. Les seules concessions à la technologie moderne étaient un radio Genave Alpha/200B NavCom avec le CDI incorporé dans la face du radio, et un STS Loran-C 110.

Premières expériences avec GBVC

Quelques jours après la transaction, soit le 20 octobre 1990, Nigel accompli un vol de 1 heure sur GBVC afin de s'acclimater à l'avion. Il me donna ensuite un bon briefing détaillé sur les particularités de l'avion et son comportement en vol, suivi d'un court vol de formation et me déclara prêt à prendre mon envol en solo. Depuis ce moment, je réfère



Long-Eze C-GBVC		
Builder	**Bernard Verdon**	**Constructeur**
Construction Time	**3300 hours**	**Délai de construction**
First Flight	**31 July 1984**	**Premier Vol**
Specifications		
Wing Span	**26'**	**Envergure**
Length	**16'-8"**	**Longueur**
Wing Area	**95 ft² / 95 pi²**	**Surface Ailaire**
Engine	**Lycoming 0-235 C-1, 115 hp**	**Moteur**
Propeller	**Hendrikson 62" x 66"**	**Hélice**
Fuel Tanks	**44 gal imp/200 litres**	**Réservoirs**
Empty Weight	**867 lbs**	**Poids à Vide**
MTOW	**1425 lbs**	**Poids Max Décollage**
MLW	**1325 lbs**	**Poids Max Atterrissage**
Performance		
Rotation Speed	**65 mph**	**Vitesse de Rotation**
Take off Speed	**72mph**	**Vitesse de Décollage**
Climb Speed	**110fpm@1325lbs 1600 fpm@1000 lbs**	**Vitesse Ascentionnelle**
Best Rate of Climb	**105 mph**	**Meilleur Taux de Montée**
Best Angle of Climb	**80 mph**	**Meilleur Angle de Montée**
Maximum Speed	**187mph (3000 rpm@1000')**	**Vitesse Maximale**
Cruising Speed	**172mph (2800 rpm@7000') 147 mph (2600 rpm@12,500') 134 mph (2250 rpm@8000') 114 mph (2000 rpm@2000')**	**Vitesse de Croisière**
Max Range	**1800 miles/milles**	**Distance Maximale**
Glide Ratio	**14:1@100 mph**	**Finesse**
Approach Speed	**80 mph**	**Vitesse d'approche**
Landing speed	**63 mph**	**Vitesse d'atterrissage**

the aircraft meant that its very basic VFR panel would not do the job. Then I discovered some particular flying characteristics of the aircraft. On one of my early flights, I was going to Smith Falls, accompanied by Nigel in his Vari-Eze, with my son riding the rear seat. We flew a lose formation, Nigel landed first and I came around for the landing. The calm air at departure in Embrun was replaced by a 25 knots wind at 45 degrees from the left; nothing to worry about, really. Mechanical turbulence appeared around 500 ft AGL, may be lower. Then, we experienced a sudden right wing drop, rolling the airplane beyond 60 degrees. My immediate thoughts were that my right wing had stalled for some unexplained reason and I did not have much space to recover. That is when my experience as an instructor kick-in and for the first time, I had a golden opportunity to practice live what I had tried to instill in my students for several years. If you stall and lose altitude quickly, don't try to regain that altitude, specially if you do not have a lot of air between you and the ground. Your salvation is in airspeed. Shove the throttle forward and the nose down. As airspeed builds up, roll your wings level

Parking stance with nose wheel retracted. Below, JC recently repositioned the plane from St Hubert to Waterloo Airport, where the members were all curious about this rare aircraft.

à mon Long-EZ comme un bébé F-18. C'est le plus prêt d'un F-18 que je puisse espérer atteindre avec mon budget, mais en vol, cet avion rappelle vraiment le F-18. La verrière, biplace tandem, l'impression de vitesse, la manœuvrabilité, l'accélération (pas tout-à-fait autant que le F-18 …) tout sauf la poussée phénoménale de moteurs F-404. Et à bien meilleur coûts en essence !!!

J'ai rapidement déterminé que j'aimerais changer certaines choses sur l'avion mais ceci devrait prendre la forme d'un projet d'hiver. Mon premier objectif était d'accumuler au moins 10 heures de vol avant que le froid et la neige ne mettent un frein sérieux à mon plaisir. Je voulais en connaître le plus possible sur les qualités et le comportement de mon avion afin de mieux déterminer ce que je modifierais au cours des prochains mois. Éventuellement, j'ai réussi à accumuler 9 heures de vol au 1 décembre. C'était suffisant.

Ces 9 heures, aussi brèves soient-elles, m'ont tout de même permise d'en apprendre beaucoup sur mon nouveau jouet et ainsi définir ce premier programme de modifications hivernales. Tout d'abord, j'ai vite compris que cet avion est vraiment un avion qui peut parcourir de longues distances et ce rapidement. J'ai découvert que je pouvais facilement obtenir une vitesse de croisière de 160mph à 8000pi, en consommant moins de 6gph, et les réservoirs peuvent contenir 45 gallons impériaux. Mon désir d'utiliser l'avion à son plein potentiel ne serait donc pas réalisable avec son panneau VFR de base.

Ensuite, vint la découverte de certaines caractéristiques de l'avion. Lors de l'un de mes premiers vols, je rendis à Smith Falls, accompagné de Nigel dans son Vari-Eze, et mon fils dans le siège arrière. Après un vol en formation relâchée, Nigel se posa le premier alors que je faisais un circuit supplémentaire pour revenir me poser. Les vents calmes au départ d'Embrun avait fait place à un vent de 25kts à 450 de la gauche; rien d'inquiétant vraiment. La turbulence mécanique se fit sentir aux environs de 500AGL, peut-être plus bas. Soudainement, notre aile droite tomba littéralement

and then ease the nose back up. I have no idea how close the ground got to me, but Nigel who had cleared runway at the far end and was watching me come in, did lose sight of me and was expecting to see a cloud of dust. But then, the Long-EZ reappeared and went for another circuit. Once on the ground, we discussed the event over coffee and came up with the following theory. The Long-EZ has a speed brake, a large belly mounted panel that the pilot deploys on final to enable a steeper approach path and break the ground effect; otherwise this airplane will float and simply refuse to touch down. This speed brake panel is deployed and visible on the belly of the aircraft in photo 1 (page 15). It so happened this morning, that the combination of a deployed speed brake and that mild cross-wind resulted in a highly turbulent flow directly under the right main wing, causing the wing to simply quit flying, resulting in a sudden, totally unexpected, deep roll to the right, at less than 500 feet AGL. That is the best explanation I could come up with, and still have not found anything better.

All being well, we took off and headed back to Embrun. Arriving at destination, we discovered that the Smith Falls winds had moved along, as they tend to do, and Embrun was presenting the same wind condition as earlier in Smith Falls. What a great opportunity to prove my theory I thought. So I went ahead and sure enough, I got exactly the same result, but not quite as dramatic this time as I was anticipating the wing drop. Going around, I flew the next approach without the speed brake, deploying it only within the last few feet from the runway to break the ground effect, and no bad surprise. I have been using that technique consistently in crosswinds since, and with good results.

Stall Characteristics

This wing drop event enticed me to explore the stall characteristics of the airplane sooner rather than later. I tested the stall behavior of the aircraft in various conditions: heavy, light, wind and no wind, smooth air and turbulence, head wind, tail wind, cross wind, anything I could think of and find in flight. The stall behavior was consistently the same and very mild and easy to control. The technique was typical: power off and maintain constant altitude until the stall occurs, gradually bringing the stick full aft through the procedure, no aileron or rudder input. On the Long-EZ, the canard stalls first at about 55 mph, the nose drops and the airspeed very quickly builds up to 65 mph (rotation speed on take-off) and the nose comes back up, no throttle input.

du ciel, résultant en un angle de roulis au-delà de 600. Ma première pensée fut que mon aile droite avait décroché pour quelque raison inattendue et je n'avais que très peu d'espace pour reprendre contrôle. Mon expérience d'instructeur pris rapidement le dessus et pour la première fois de ma vie, j'avais l'opportunité de mettre en pratique ce que j'avais toujours essayé d'inculquer à mes étudiants au cours des années précédentes. Si vous décrochez et perdez de l'altitude rapidement, n'essayez pas de regagner cette altitude, surtout si vous n'avez pas beaucoup d'air entre le ventre de l'avion et le sol. Votre salut demeure dans la vitesse aérienne. Poussez la manette des gaz à fond et pointez le nez vers le sol. Votre vitesse augmentera rapidement au régime voulu, ramenez les ailes à l'horizontale et relevez graduellement le nez de l'avion. Je n'ai aucune idée de la proximité ultime du sol durant cet épisode mais Nigel, qui avait déjà dégagé la piste et m'observait, a déclaré m'avoir perdu de vue et s'attendait à voir tout un nuage de poussière. Finalement, le Long-EZ réapparut et compléta un autre circuit pour revenir atterrir. Une fois au sol, nous avons discuté de l'événement devant un café et en sommes arrivé à la théorie suivante. Le Long-EZpossède un frein aérodynamique, un grand panneau monté sous le ventre de l'avion et que le pilote déploie en finale pour permettre un angle d'approche plus prononcé et pour briser l'effet sol, sans quoi l'avion flottera longtemps, allongeant ainsi l'atterrissage de façon importante. On peut apercevoir ce frein sur la photo 1. Tout simplement, le déploiement du frein, en combinaison avec le vent de côté, résulta en un écoulement très turbulent immédiatement en-dessous de l'aile droite, causant un décrochage net de l'aile et ce roulis soudain et très prononcé, à une altitude inférieure à 500AGL. Il s'agit là de la théorie la plus plausible que j'aie pu développer et je n'ai encore rien trouvé de plus apte.

À notre retour à Embrun peu de temps après, j'ai découvert que les vents prédominants à Smith Falls s'étaient déplacés comme les vents ont toujours tendance à le faire et des conditions identiques existaient maintenant à Embrun. Quelle magnifique opportunité de valider ma théorie. J'ai donc répété la même procédure d'approche et j'ai obtenu exactement le même résultat : décrochage aggravé de l'aile droite et roulis prononcé. Le roulis n'a pas atteint les mêmes proportions puisque je prévoyais maintenant le comportement et j'étais en mesure de récupérer plus rapidement. Remise des gaz et un nouveau circuit pour revenir et effectuer une approche sans frein aérodynamique et sans aventure. Déployant le frein en très courte finale et à moins de 50 pi sol, l'atterrissage fût sans histoire. J'utilise depuis cette technique lors d'atterrissage par vent de travers sans plus aucune histoire.

Caractéristiques du décrochage

Cet événement du décrochage aggravé de mon aile droite m'a incité à explorer les caractéristiques du décrochage du Long-EZ au plus tôt. J'ai testé ces caractéristiques dans différentes conditions : lourd, léger, avec vent et sans vent, vent de face, vent ce côté, vent arrière, air calme et turbulence, toutes les conditions que je pouvais imaginer et obtenir en vol. Le comportement au décrochage était consistent, doux et facile à contrôler. La technique était typique : gaz au ralenti et altitude constante jusqu'au décrochage, en ramenant graduellement les commandes vers l'arrière au maximum, aucune application des ailerons ou des dérives. Dans le cas de mon Long-EZ, le canard décroche à 55mph, le nez tombe et la vitesse augment rapidement jusqu'à 65mph (vitesse de rotation au décollage) et le nez remonte, sans aucun ajout de puissance. En maintenant les commandes au maximum de leur course arrière, le naz continue à monter, la vitesse tombe à 55mph, le canard décroche, le nez tombe, la vitesse revient à 65mph, et le cycle continue à se répéter tant que le pilote maintient la puissance au ralenti et les commandes à fond vers l'arrière. Dans ces conditions, l'avion tombe à un taux de descente d'environ 1100fpm. Si on relâche les commandes et ajoute de la puissance lors que le nez commence à tomber au moment du décrochage du canard, l'avion recouvre sa vitesse de vol et son plein contrôle avec une perte d'altitude d'environ 50pi à 100pi. J'ai testé cette procédure à maintes reprises au cours des années avec des résultats consistants. Mais puisque tous les avions de construction amateur sont généralement uniques, je me permets de vous aviser de ne pas vous attendre à ce que tous les Long-EZ aient exactement ce comportement. Par contre, si vous avez un Long-EZ et ressentez le désir d'explorer les caractéristiques du décrochage de votre avion, je vous encourage à le faire, simplement parce ce que je crois sincèrement qu'il vaut mieux faire cet exercice plutôt que de découvrir le comportement de votre avion à 10pi de votre atterrissage, ce qui n'entraînerait probablement pas des résultats favorables. Mais attention : si vous décidez d'explorer les caractéristiques de décrochage de votre avion, faite le en altitude, assurez-vous d'avoir de la sécurité en-dessous de votre ventre.

Certains d'entre vous avez certainement entendu dire

suite à la page 34

Holding the stick full aft causes the nose to keep coming up, the airspeed falls to 55 mph, the canard stall, the nose falls down, airspeed builds up to 65 mph, and the cycle will keep repeating itself as long as the pilot maintains throttle idle and the stick fully aft. Under these conditions, the aircraft falls out of the sky at approximately 1100 fpm. Releasing the aft stick pressure and adding power when the canard stalls and the nose starts pitching down, the aircraft regains flying speed and full control within 50 feet or so, at any rate, much less than 100 feet. I have tested this procedure several times over the years and it was consistent. As all homebuilt aircraft are always one-off, I would caution any and all not to expect that all Long-EZ's behave the same way. If you have a Long-EZ and feel inclined to explore the stall characteristics of your aircraft, I encourage you to do so, simply because I believe it is wiser than to discover the real behavior of your aircraft in the last 10 feet of your landing, which is not likely to result in something very pretty. Be careful, if you decide to explore these stall characteristics, do it at altitude, get some safety under your belly.

Some of you have no doubt heard that these Rutan designs do not stall. That is absolutely true, they do not stall, at least in the sense as pilots normally mean it, the stalls that we learned and practiced during our training, and that some keep doing for fun afterwards, or to impress an unsuspecting passenger (not a good idea). What I discussed was about stalling the canard. If a Long-EZ is well built and properly rigged, the angle of incidence of the canard is such that it will ensure the canard stalls first, before the main wing even gets close to stall, thus resulting in the behavior I described. The stability exhibited during my stall tests was entirely the result of a main wing that was fully flying, not even near stall. Nonetheless, it is possible to stall the main wing, and the resulting deep stall is unrecoverable. The Velocity folks have experimented extensively on this and published some highly interesting and informative material a few years ago. A necessary condition for such a stall is to have the CofG too far aft, as in out of aft limit. The further aft the CofG is out of the envelope, the more susceptible the Long-EZ (or any other canard design) is to that deep stall. Some individuals have achieved that condition, usually through the installation of a larger, heavier engine, and not compensating with some ballast in the nose in an attempt to save weight. One such event was documented on video tape several years ago by someone who happened to be filming the country side

continued on page 34

Time Machine

Frank Owens' Speedy RV-7

By Gary Wolf

Frank Owens and son Cole

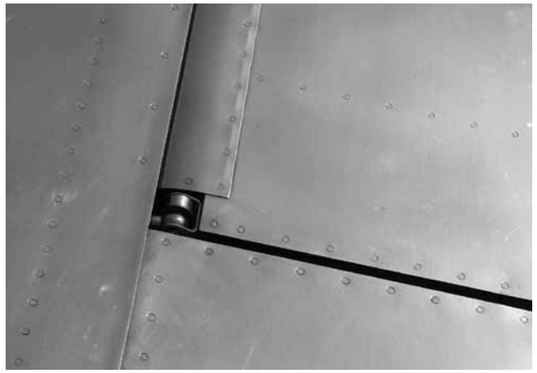
FRANK OWENS HAD ALREADY owned a Katana DA20 C1 and a Maule MX 180 B, so why would he want to go to the work of building a Van's RV-7. The answer came quickly – performance, speed, range, sportsman aerobatic capabilities, IFR, and no handcuff as with a certified plane. He had a flight in an RV-7 and then went shopping for a project. Frank found a few that the owners had given up on but found them somewhat overpriced or not finished to his liking.. Then he found a partially built quickbuild in the US that had a new engine with it, made the deal, and brought it home.

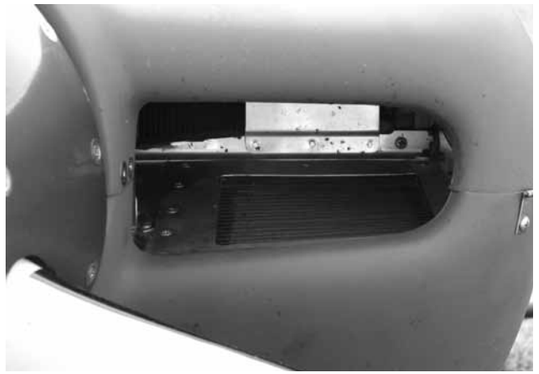
To meet Canada's regulations an Amateur Built project must still be at the precover stage. The exception is a quickbuild kit where the manufacturer has done some of the assembly, but not so much that his contribution exceeds 49% of the work of building the plane. Frank had to remove the leading edge wing tanks to take it back to 49%, so that the MD-RA inspector could look inside down the length of the leading edges of the wings.

Once the Canadian precover was finished Frank went to work with determination. He wanted to fly this RV-7, not spend the rest of his life building it. When building a plane it is always good to have a mentor, and Frank chose Clarence Beintema of Tri City Aero. Clarence had already built an RV-4 and his company had been performing maintenance and annuals on Frank's Katana and Maule. Clarence's hangar is just 300 feet away so there were many footsteps through the snow in the winter of 2014.

The previous owner had already done some wiring but not to Frank's standard, so he hired Geoff Lee of Tailwind Aviation to remove everything and start over. Two hundred hours later and Geoff had wired the engine compartment, fuselage, wings and tail, and created a new glass panel.

Even an "all-metal" plane has a lot of fiberglass work and although





Top: Bearings are used in the control system; centre, Air filter receives high pressure air from the left cooling duct. Above: A composite duct feeds air from the filter to the injection intake

the previous owner had done some it was necessary to refit most of it, including drilling out everything that held the cowl on. The wheel and gearleg fairings came in for rework too. Frank chose to leave almost all the fiberglass in primer to give it a chance to move around in the summer heat before investing in the paint scheme that will be applied next winter.

The engine that came with the package is a brand new Superior XP IO-360 with a 4 into 1 exhaust system, and horizontal induction with a Precision Silver Hawk injection system. A fiberglass plenum feeds air to the injection unit from a filter in the left side cowl intake. The result is 185 dependable horsepower at 2700 rpms. Frank sold off the prop that had come with the engine and bought a Catto 72-74 composite prop with nickel leading edges. The prop tracked and balanced perfectly, right out of the box. Electrics are handled by a Plane Power lightweight alternator, a Skytec starter, and two Slick mags. Because of the lightweight prop, starter, and alternator Frank had to add a 20 pound propeller crushplate to move the CG forward. A constant speed prop or heavy electrics would have effected the same CG change. American regs do not require a gascolator so Frank plumbed in a Andair gascolator and fitted an Andair fuel selector.

The interior of a travelling plane is always important and Frank chose seats, carpet, and a baggage tonneau by Classic Aero. Recalling the heat from the Katana's bubble canopy, Frank installed an effective sunshade from Koger and all-metal cabin air vents. He cut out and formed his own side panels from thin aluminum sheet, covering them in matching leatherette. Comfort is important in a plane that will be doing a lot of hours, especially in IFR conditions. With Frank's side panels the interior width is 42-1/2", enough for two full sized adults. The die-formed canopy of the RV-7 helps in this because it has a broader, flatter shape than a half-round blown bubble canopy.

The Garmin rep must have been able to retire after he filled Frank's order for avionics. The panel has dual Garmin G3X PFD and MFD's, fed by a Garmin GTN 650, and also by a GNC 255A with power to the panel managed though the VPX (Vertical Power). Audio is managed by a Garmin 240 mixing panel while a remote Garmin GTX23mode S transponder along with along with a Garmin GDL 39 provide ADS-B in and out to give weather and traffic. Airspeed is handled by a Garmin

Superior IO 360 has a stainless 4-1 exhaust, lightweight starter and alternator, and a Catto prop

regulated/heated pitot while the displays are backed up by dual Garmin ADAHRS gyros and 110 minutes of standby power through the TCW battery backup. Engine systems are monitored through four CHT and four EGT sensors and a fuel flow meter, while the 2 axis auto pilot utilizes Garmin's servos to trim aileron and elevator. Tosten Stick Grips allow access to PTT, autopilot disconnect, ident, and frequency flip flop while the hat switch controls the elevator and aileron trim.

Frank and former partner in the Maule, Steve Perschbacher, did 500 hours to finish the plane, and by May 3rd the RV-7 had its first flight with Tim Stain at the controls. The plane performed flawlessly and has been since that date. The Hobbs now reads over seventy hours and Frank has enjoyed every one of them.

Technical overview

The RV-7 is of course a development of the RV-6, and without a tape measure it is difficult to distinguish between them. The RV-7 has a 25 foot wingspan, 2 feet wider than the RV-6 and on all but the earliest models the rudder has a bit more area to improve spin recovery. Van's made a running change in 2002 and offered parts gratis to update already purchased kits.

The biggest difference between an RV-7 and a -6 is the time it takes to build one. The RV-6 kit was not prepunched, so the builder had to locate and drill all holes. He also had to build or borrow jigs to hold everything true, especially the fuselage. By comparison the RV-7 uses modern CNC manufacturing, so accurate that parts may be clecoed together and everything lines up and fits perfectly. The builder still has to dimple his kit for countersunk rivets but this becomes part of his 51% contribution to the construction of the project. If a replacement part ever becomes necessary the owner can just phone Vans and know that the new part will be a drop in fit. Van's manufacturing process is the envy of many certified aircraft manufacturers.

The constant chord wing of the RV-7 shares much with that of the -6 including the NACA 23013.5 airfoil, which has a low pitching moment. The chord for both is 5 ft, which results in a wide CG range. The RV-6 flies on 110 sq. ft while the RV-7 has 121. Both aircraft have a wing loading of just under 15 pounds/sq. ft. One of Van's speed secrets is the way that the wingskins are attached to the main spar. Most manufacturers have the nose skin overlapping the centre

Top: heated pitot and butt-fitted wing skins
Centre: Windshield frame provides rollover protection and a Koger sunshade keeps the interior cool. Bottom, All-Garmin IFR panel

skin of the wing at the spar, and this step results in turbulence that trips and detaches the airflow. Van's tightly controlled manufacturing process allows the two skins to butt perfectly at the spar to retain smooth laminar airflow. Wingskin thicknesses change from .032" at the root to ,025" from the 40% point outwards., and in the wing walk area there is an additional thickness of .025".

The plain flaps are made from .025" aluminum, with piano hinge full length as the pivot. Actuation is by pushrods, and while manual actuation is possible most builders opt for an electric control. Frank's plane has 10-20-40 degree settings but he rarely uses more than 20 degrees.

The airfoil shaped ailerons of the RV-7 are skinned in .020" aluminum, hinged with one bearing at each end from standoffs on the rear wing spars. Aileron trim may be an inset control surface as is commonly seen on an elevator, but many instead opt for spring bias acting on the control mechanism. Actuation of the ailerons is by pushrods, again with bearings at all points. Each is mass balanced to 100% by internal weights added in its nose section, ahead of the aileron's spar.

The wing to fuselage attachment method differs between the two aircraft. On an RV -6 the spars extend to the centerline of the aircraft, which means that controls and wiring run through the spars, so wing removal is

In Canada there are currently 100 RV-7's registered and flying, with most in Ontario and the Prairies where there are distances to be covered

a major undertaking. By comparison the RV-7 has its attach points at the sides of the fuselage, so the centre carrythrough area remains undisturbed. There is a further benefit if the plane is the nosedragger RV–7A model. An RV-6A must have its main gear removed in order to remove the wings. This means that the owner must have some sort of padded wheeled table if the plane is to be moved around the hangar. The RV-7 can just remain sitting on all three wheels.

The RV-7 has leading edge fuel tanks that at 42 US gallons are 4 gallons larger than those on a -6. Vans uses riveted construction and the owner dimples the parts and seals the joints with Proseal, a black ackypucky that has a short shelf life and sticks to everything. Fortunately it is also very good at sealing fuel. Each tank has a perimeter flange by which it is screwed into the wing. One benefit of the popularity of the Van's aircraft is that there are companies that will assemble a customer's tanks, all sealed and fitted with senders, and ready to fasten to the wing structure. Because the tanks are so close to the spar there is little CG shift between full and empty.

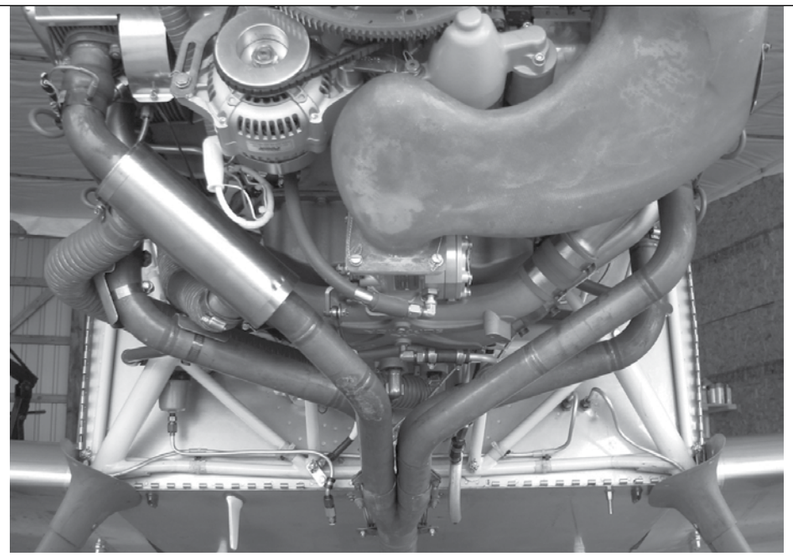
The fixed tail surfaces of an RV-7 are conventional.2 spar design, with bearings at all hinge points. The skins for the vertical and horizontal stabs are .032", while the rudder has a.016" skin and the elevators have .020". The elevators are mass balanced to 100% at their forward tips. The elevator is actuated by a pushod that goes forward to a bellcrank behind the baggage compartment, while the rudder is actuated by cables. Elevator trim is by an inset control surface in the left elevator. The kit includes manual trim with vernier control, but most choose the optional electric trim.

There have been some upgrades and bulletins to the tail components. In May 2002 Van's made a running change to a larger rudder for better spin recovery, and made this available to early purchasers. On some examples of the horizontal stab there was some cracking in the area of the forward spar. Check Van's service bulletin 14-01-31 for this. The rear spar of the horizontal stab has a service bulletin as well; 14-02-03 describes an inspection of the hinge bearing mounts for cracking of the rear stab spar, with the method to upgrade or repair.

The landing gear on both the -6 and -7 is the tapered steel rod type. On taildraggers the gearlegs fit into tapered sockets welded to the engine mount, while on –A models the gear sockets are attached to the centre fuselage structure. The –A model nosegear has a castering fork that has caused some concerns in soft field operation. In 2007 Mandatory Service Bulletin 07-11-09 was issued to require replacement of the nose fork and replacement or modification of the nose gearleg on kits that were made after February 2005. If you are buying a kit that has been started you should be certain to check the Van's service bulletins. One might expect that there would be an appreciable speed penalty for having a trigear but the –A models are well faired and are only one or two mph slower than the taildraggers.

The fuselage of the RV-7 is conventional with bulkheads, stringers, and stressed skins that vary in thickness from .025" to .040". The tailcone's turtledeck skins can be a bit of work to pull into place but in the July / August 2013 issue of the Rec Flyer member Don Sinclair showed how to roll these so that they become a drop in fit.

The RV-7's cabin integrity depends largely on the bulkhead behind the seats, plus the instrument panel structure and the wing carrythrough. There are two canopy options, a front-hinged tip up canopy or a slider canopy. The tip up makes entry and exit easier but a long downwind taxi can become very warm on a summer day, even when the rear of the canopy has been lifted. With the slider it is possible to taxi with the canopy slid back for good ventilation, but entry and exit require stepping on the seats. Rollover protection with a tip up is by a roll bar at the seat



Tightly fitted exhaust, Precision injection, and lightweight starter and alternator make a great engine package. Right, Andair fuel selector, heat and air controls, and Tosten grip all fall readily to hand

back bulkhead, while with the slider the roll bar is the frame for the fixed windshield.

The seat bases are fixed and have a series of half piano hinges on 2" centres. Each seat back has a matching half piano hinge at its lower end and the pilot may engage whichever seat base hinge provides a comfortable fit. Each seat back also has adjustability at its upper end so the pilot may play with fore and aft movement and seat back incline. Rudder pedals are not adjustable unless the builder makes his own cables, so the ability to adjust the seats is important.

An RV-6 is saddled with a gross weight of 1600 pounds, so many have applied for an increase to 1800. The RV-7 begins at 1800 and some have been granted a rise to 2000. Even without an increase the RV-7 has a very useful load capacity. Frank's RV-7 has an empty weight of 1090 pounds, so a payload of 710 pounds. With two real world crew and 36 gallons of fuel he can carry 80 pounds of luggage behind the seats, another10 pounds under the passenger's knees, and the plane will still be inside the CG envelope and the gross weight.

Performance

Van's is one of the few companies whose performance numbers can be trusted. There will be some variations because no two aircraft are built to the same specification, but they all fly well. Frank cruises at 75% power, running rich of peak, burning 9 gph US. He is comfortable with a 2000 ft strip and gets off the ground quickly, but not as quickly as Van's 300 ft number – Van's performance numbers are with a Hartzell 2 blade constant speed prop. Frank decided instead to spend the difference in price on his glass panel. For landing he approaches at 70-75 knots, goes over the numbers at 60-65 knots and at 50 the wheels are on the ground for a 500 ft. landing.

This machine is a time compressor, making it possible to make the 250 nm trip from Kitchener to Ottawa in an hour and a half for a business meeting, and return that afternoon without feeling rushed. In his Maule he felt that he might just as well have driven there because the plane did not have enough speed advantage over a car. In Canada there are currently 100 RV-7's registered and flying, with most in Ontario and the Prairies where there are distances to be covered. Besides having good straight line speed, an RV-7 is an entertainment machine capable of sportsman level aerobatics, meaning loops, rolls, and other positive G maneuvers. Control forces are moderate and balanced and an RV-7 exhibits positive stability in all axes. Van's G-rating for the plane is +6, -3 G's.

Frank recently applied for removal of the VFR restrictions and Transport Canada sent an inspector to handle this. Geoff Lee had previously performed all calibration tests so the IFR change was straightforward, and Frank is now making arrangements to earn his IFR endorsement.

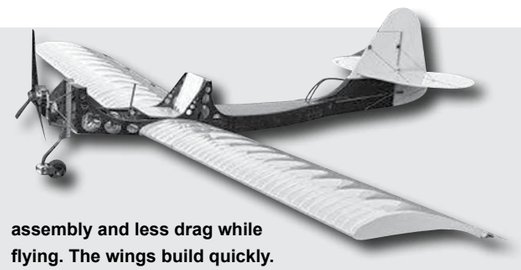
Van's sell the kits in stages or in a single package, with boxing and shipping extra. An RV-7 slowbuild with finishing kit currently sells for $22,600 US at the factory door, while the quickbuild with finishing kit is $33,800 US. The trigear RV-7A option adds $1000 US. Crating for a slow-build totals $280 and for a quickbuild it is $710. Shipping costs are extra. Builders are eligible for OEM price on Lycoming engines and a variety of props, with all numbers available on the Van's website.

Why would someone go to all the work of sourcing and building an RV-7? Frank's answer was that there is simply no other plane that has all the advantages and performance of the RV-7

Why would someone go to all the work of sourcing and building an RV-7? Frank's answer was that there is simply no other plane that has all the advantages and performance of the RV-7. He did not really want to build a plane but that was the only way to get what he wanted. He is very happy with the RV-7 and does not plan to build anything else. The RV-7 fulfills all requirements and has exceeded all expectations.

For more information:
www.vansaircraft.com
www.cattoprops.com
www.precisionairmotive.com
www.classicaerodesigns.com
www.aircraftspruce.ca Canadian supplier for Koger sunshades
www.tailwindaviation.ca

Belite Introduces New Ultralight



Belite Aircraft's newest entry into the ultralight market is SkyDock, which features lighter weight, lower cost and a simpler design that sets a new standard for efficient ultralight Part 103 aircraft.

"We've listened to customer concerns about price, build time and ease of construction. The SkyDock offers Part 103 legal ultralight flying at an affordable price without sacrificing performance or the technology that is a part of the Belite reputation, " said James Wiebe, president/CEO of Belite Enterprises.

The strutless low-wing design offers efficient, low drag, low-speed fun. Wings easily detach for storage or transport. There are no lift struts and no jury struts for easier assembly and less drag while flying. The wings build quickly.

Performance is efficient, enabled by the very clean design. Various engine options are available. The design is fun to look at and grabs attention. Construction is easy: wood and aluminum parts are precision-cut utilizing CNC. No welding is required. Fiberglass and carbon fiber are used for reinforcement.

Currently Belite offers two additional models: The ProCub Lite with CNC foam and aluminum construction, and the UltraCub with CNC aluminum. Both models are available as factory built and kits.

...IN AN OPEN COCKPIT AIRPLANE / by Brian Kenney

I HAVE BEEN TRYING to have a good communication system between pilot and passengers in a loud open cockpit airplane for over 25 years. I have had limited success until recently. I have learned a lot about the technology and the limitations of components. I will try to explain why this is a very difficult application and why I had to learn a lot on how to do this.

Who do you trust?

If you have an open cockpit airplane there are a large number of options available for intercoms and noise attenuating headsets. There may be an excellent system available that works well but how do you tell and who do you believe? There is a huge range of cost and the better quality headsets are not inexpensive. A friend with the same airplane as me bought a good intercom and two good headsets and he couldn't hear a thing. He is still using a gosport system with pneumatic tubes.

I believe that it is a huge leap of faith to buy a system on the basis that it is going to work in this specific application.

Why is it so hard?

Most aircraft systems are designed for in-cabin applications with no wind and much less exhaust noise. In those applications voice actuation is possible with an adjustable squelch control and is important for those customers. Therefore most systems are not built for the open cockpit applications.

Open cockpits have one major problem. They are just too loud. The exhaust noise can be deafening and the wind noise is not insignificant. The combination makes voice activation very very difficult. In my opinion you should not even try to use such a system. The alternative is to ground out the mics when they are not in use. When no one is talking there is no noise from the intercom.

To do this the mic must have a push to talk button or switch for every headset. The best place is on one of the ear cups. My experience is that the pilot should have an off and on switch and the passenger should have a switch that will momentarily activate the mic only when the button is pushed. Let me explain how and why you want the two types. I have put on and off switches on the passenger's headset. They turn the mike on and don't turn it off. Passengers don't listen and are too excited to handle this simple task. If I need to talk on the radio I turn the switch on and leave it on until I am finished. If I have a momentary switch I would have to push the PTT and the mic switch at the same time.

Well-made headsets with 300 ohm ear speakers and good noise attenuation are a must. Most David Clark earphones are examples of suitable headphones for the application. There are many other makes. Ones for military application using 19 ohm speakers are not. They won't be compatible with either portable or built in aircraft radios and the mic input feed to the radio will likely not work.

So you modify the headsets and all is quiet until you need to talk – will it work when you turn on the mic? Unfortunately the answer is not likely. You might hear yourself and the passenger might hear you but in many cases the background noise will be terrible.

Mics are the Achilles heel of this application. Most mics are not really noise cancelling even if they say they are. I bought two David Clark headsets with amplified dynamic noise cancelling mics. They have adjustable gain and were supposed to be good in noisy environments. They weren't. If you try them in a quiet area such as your house they are picking up background noise from across the room.

I had success with M87 military mics. These require a preamp with about 100,000 times gain. My homemade amps worked well but my circuit boards looked awful and were hard to fit in the head cup. They had to be wrapped in foil to prevent feedback from the speakers.

As I have said the David Clark amplified dynamic mic was very disappointing. I had better success with a $2 Electret mic from Radio Shack in a wooden housing.

Recently I discovered an inexpensive noise cancelling that actually works. It is a David Clark M7 D/C and retails for $64. It is at least 75% better than the M1A mic from David Clark in my application. There is a replacement from another company, same model number that sells for less. *I don't know if it is as good.*

Mics have to be placed very close to the lips. Touching the lips is the best.

The addition of a foam mic cover and a leather cover over the foam improves noise reduction about 10% more. The kit cost $25 per headset.

With this mic, the wind shields, good quality headphones (modified with switches), I have a useable system and even my hard of hearing wife can understand me. It has been too long coming.

I am not sure that David Clark makes a headset with the M7 D/C mike and a mic on and off switch. Adding a switch is not hard. Many existing headsets can be modified by adding a switch and if required changing the mics. The mic can be a direct bolt on change on many headsets.

Some options for the frugal

In my application I am using an ancient Hush-A- Com intercom. It is powered by a 9 volt battery so no electrical supply is needed (I have none). It needs a resistor from the battery supply to the mic terminal inside the metal case. This provides a DC source to provide the energy for the mic preamp. This makes polarity in the mic wiring important.

This intercom uses only one cord and plug. There are several models of David Clark headsets that are sold as ground support workers at airports. They sell used for as little as $50 on ebay. They already have an on and off mic switch and use only one cable with a ¼" stereo plug that plugs into the Hush-A-Com. Most have the M1A mics but are easily converted by replacing the mic with a M7 D/C mic. The ones with a flexible staff boom it is a five minute job. If the headsets have a wire boom then a mic extension cord is required. David Clark charges $40 for a six inch piece of wire and two $1.50 plugs. Too rich for me. The plugs are available on ebay but are a bit tricky to terminate.

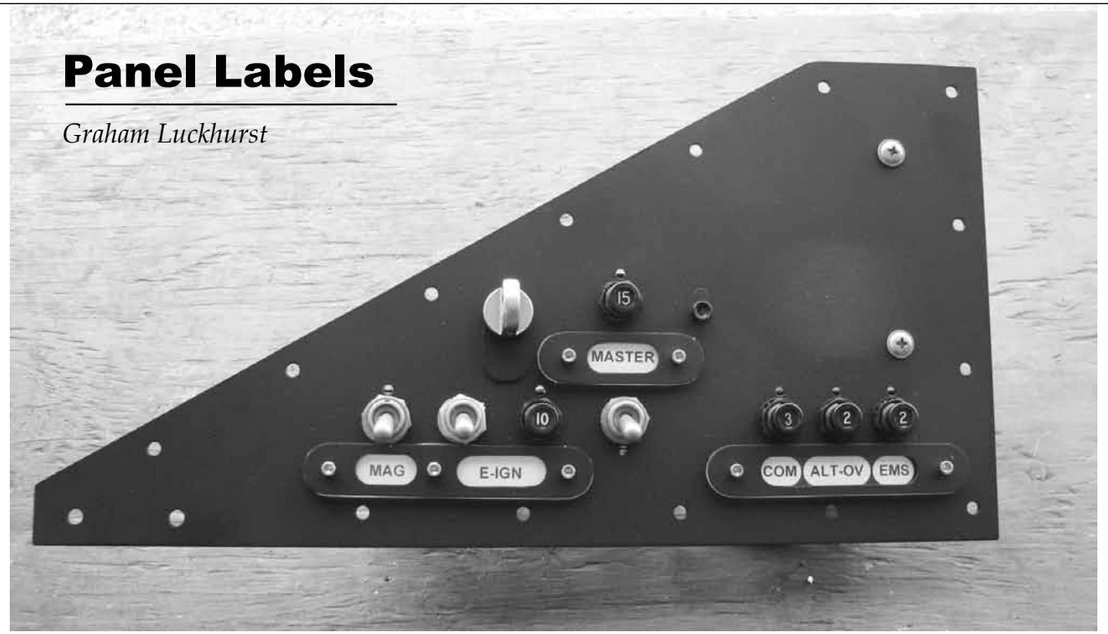
The passenger headset requires the replacement of the off and on switch with a momentary contact switch. David Clark has wiring diagrams on most of their headset models on-line that makes it easy to figure out how to change this switch.

If you go this route you can have great headsets for under $150 each but will need an adapter cord to connect to an aircraft intercom or you will need to find a Hush-A-Com intercom.

Hopefully this can help frustrated open cockpit pilots who have had the same problems. If you already have success then perhaps you can share your equipment configuration in your application.

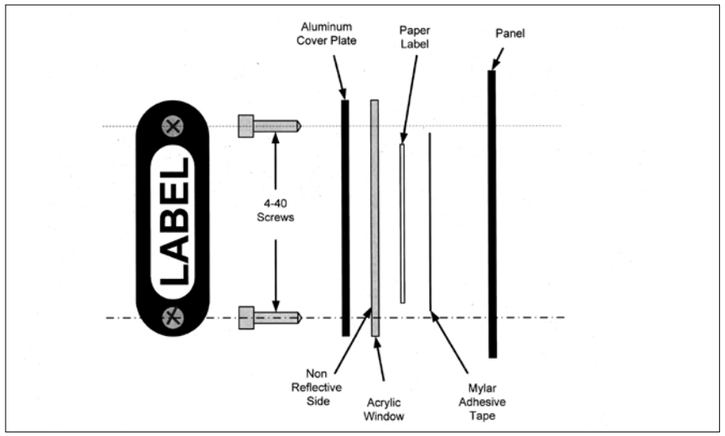
Panel Labels

Graham Luckhurst



FINDING OR FABRICATING the right labels for your panel, especially if they are small, can be a challenge. They need to meet the physical constraints, be located properly, say what you want, have good contrast and have an acceptable font size for easy reading. I also wanted to be able to change them readily if necessary, and the results to look professional. Cost is always somewhere in the equation.

I had some photocopies sitting around in the back of my car for some time and noticed that the print had not degraded and the paper was not too wrinkly. Could I make the labels I needed on my printer at home? I would have full flexibility of font size and style, bold, italics and even graphics if I desired. I'd just need some way to secure them and provide reasonable protection of the paper labels from the environment inside my cockpit.



The solution I chose was to fabricate aluminum face plates and acrylic windows with the paper labels secured by mylar tape to the back of the acrylic.

I used 1/16" aluminum for the face plates, and drilled and and filed the window openings. Using 1/16' thick aluminum gave enough rigidity to the face plates such that I could use just 2 or 3 x 4-40 nuts and bolt to secure the label assemblies to the panel and have them tolerate bumps and scrapes without deforming. The face plates were painted black to match the panel.

The acrylic windows were trapped between the face plate and panel. I ensured sure the non glare surface of the Acrylic faced out. Black Arial 14 point bold face type was used which fit nicely in a 3/8" high opening in the face plate, nice and big for my aging eyes. The finished product looks quite good! It will be interesting to see if the paper and print hold up. They will be easy to replace if necessary.

New Avionics Shop Opens

Tailwind Aviation Services is a new avionics shop located at the Tillsonburg Regional Airport. The shop was created in the hopes of being able to offer affordable avionics services to the amateur builder community, as well as warbird and vintage aircraft owners. Being located at the general aviation friendly Tillsonburg Regional Airport with one 5500ft paved runway and two grass strips, we're a leisurely flight away with a fantastic restaurant on the field!

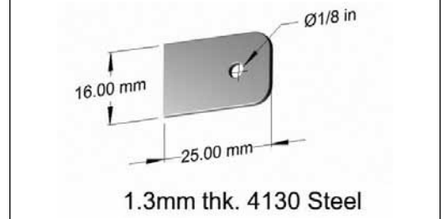
Tailwind Aviation Services has two main focuses. Our first is offering custom instrument panel plug and play services from full EFIS to pre wiring harnesses for avionics installations. Our second focus is providing 24 month altimetry and transponder calibrations. We obtained a Transport Canada Approved Maintenance Organization rating for avionics in 2014 and have been in the process of adding a range of avionics dealerships. We are very experienced with Garmin, Dynon, Trig, King, PS Engineering ,Vertical power and many more.

Owned and operated by a 20 year licenced AME, aircraft builder, and pilot, Tailwind Aviation strives to make your project our project. Attention to detail is vital and quality of work is a must! When you walk into our shop you'll immediately see our own project aircraft in progress. Check us out today at tailwindaviation.ca and give us a call for your next avionics venture.

Canadian Made Welding Tabs

Anyone building a tube fuselage knows that 4130 welding tabs are indispensable for attaching boot cowls, panels, and fittings. Making tabs is a slow and onerous task, so many used to buy them from the sole US supplier. Unfortunately that company has ceased production, so it was back to the old layout / drill / saw method.

Gilbert Custom Aircraft in Brantford Ontario has now invested in tooling to stamp out these tabs and they are available in ziplock bags of 50 for $20 CDN. Contact Darryl Gilbert at 519-751-1398, or if you are at Aircraft Spruce Canada just walk over to Gilbert Custom Aircraft and buy them in person.



President's Message / cont'd from page 2

money, then resumes his KR2 World Tour. If you see a little white KR-2 with registration G-BSTL at your airport, please take Colin out to lunch, offer him hangar space (the plane is small), or invite him to stay overnight at your home.

Bev Shenstone and the Spitfire wing

Several years ago we ran an article about Bev Shenstone, the Canadian designer of the elliptical wing of the Spitfire. Due to an oversight we neglected to credit Wayne Saunders as the source for quotations and inspiration in the article. Mr. Saunders has written prolifically on the subject in Airforce Magazine and in the Canadian Aviation Historical Society Journal, and while these are not available online you may wish to see if your local library has copies.

The originals are:

"A Magnificent Contribution" Airforce 34 No.1, Spring 2010

"Shenstone: An Unparalleled Career" Parts 1, 2, and 3, Canadian Aviation Historical Society,Journals 49, 50, 51, 2011-2012

"Shenstone: An Unparalleled Career" Parts 4 and 5 which deal with Shenstone's work in the postwar years). Canadian Aviation Historical Society Journal 51, 2013

RAA Canada would like to thank Mr. Saunders for bringing to the forefront the contribution of this notable Canadian.

Free Ultralight Plans

If you're looking for an ultralight project you might wish to download the free plans from Team Aircraft, longtime manufacturers of many wood and fabric light aircraft. Team is offering free downloads of seven of their proven designs in hopes that the builders will later purchase sub- or complete kits.

The construction of a Team aircraft is similar to a model aircraft, but in large scale. Member Mike Thorp built a Hi-Max many years ago, later fitted it with a set of plansbuilt wooden floats, and has had many years of enjoyment from the plane.

You may download free plans at http://www.teammini-max.com/plans/ or you instead order paper plans for $95 US plus shipping etc.

Long-Eze / continued from page 21

behind his house while one of those aft CofG Long-EZ's happened to be flying in the area and stalled. The aircraft pancaked into the ground, sustained a damaged fuselage, and the pilot walked away with a minor back injury and back pains for a while. As it happened, the falling Long-EZ entered the field of view of the camera for a brief moment before disappearing behind a dune. That brief moment on video was enough to allow someone to measure the rate of descent of the aircraft: approximately 700 fpm.

In reality, it is nearly impossible to get out of CofG limits (FS 97 to FS 103) on a properly built and configured Long-EZ. An empty Long-EZ has a CofG almost at the aft limit, hence the nose on the ground parking stance seen in Photo 3 to prevent it from falling back on the propeller and wing tips. The fuel load, and the passenger for that matter, has virtually no impact on the CofG location. When the pilot climbs in that front seat, the CofG moves back towards the forward limit. Exactly where depends on the pilot's weight. If a Long-EZ with the pilot on board has a good CofG location, the aircraft cannot be loaded enough to accidentally bring the CofG out of limit. You will get way over maximum weight before that CofG moves appreciably. The important factor is to have a good CofG with the pilot on board. When I bought GBVC, the first thing I did was to remove the ballast in the nose. Bernard is a smaller man than I and he had installed 16 lbs of ballast in the nose, wedging it between the battery and the structure.

These stall characteristics were the only aspect of the Long-EZ that really needed to be understood from the beginning. Over the years, the aircraft never exhibited any nasty tendency or anything that required special attention. It's speed, long legs, agility, and comfort have just made it a formidable flyer, be it to attend the next fly-in breakfast or to make the trip to Oshkosh or other distant goal as we will discuss later, which is not to say that it was always dull or boring.

Ultimately, these first 9 hours allowed me to discover my Long-EZ and to define that first mod program. And this will be the subject of my next article.

I cannot however leave without touching on the all important topic of actual performance for GBVC. The Owner's Manual supplied with the plans provides a good perspective of what a builder can expect from his product. I call it a good perspective because this is what it is. If the builder does not achieve these numbers, he will be told the quality and accuracy of the build, and/or the flying skills are not up to par, and/or the testing conditions differed, and other. If the builder reports figures that better the published numbers, he will likely be considered as a tad optimistic at best. The only way to really know what the airplane does is to actually flight test it and produce a table of performance. And yet, that builder/tester still remains the only one who really knows for sure. Table 1 is a reproduction of the Performance Table that Bernard gave me at delivery of GBVC. I did not attempt to repeat nor otherwise validate this table. But based on my overall experience with this aircraft, I do believe that Bernard is an honest man.

que ces avions conçus par Rutan ne décrochent pas, ce qui est tout-à-fait vrai. Ils ne décrochent pas, du moins au sens où les pilotes l'entendent normalement, les décrochages que nous apprenons et pratiquons durant notre formation. Ma discussion touchait le décrochage du canard. Si un Long-EZ est bien construit et bien assemblé, en respectant les plans, l'angle d'incidence du canard assurera que le canard décrochera toujours bien avant que l'aile principale n'approche son angle d'attaque critique, démontrant ainsi le comportement que j'ai décrit. La stabilité démontrée dans ces tests était uniquement le résultat d'une aile principale qui volait normalement, qui n'approchait même pas son angle de décrochage. Néanmoins, il est possible de décrocher l'aile principale, ce qui mène à un décrochage aggravé dont l'avion n'en sort pas. Les gens chez Velocity ont réalisé beaucoup d'essais en vol sur ce phénomène et ont publié quelques article très intéressants sur le sujet, il y a de cela plusieurs années. Une condition nécessaire pour arriver à décrocher l'aile principale est d'avoir un Centre de Gravité (CG) trop à l'arrière, c'est-à-dire, hors de la limite arrière de l'enveloppe du CG. Plus le CG est reculé, plus il devient facile de décrocher l'aile principale du Long-EZ (ou tout autre voilure type canard) et de se retrouver dans un décrochage aggravé. Quelques individus ont réussi à rassembler ces conditions, généralement suite à l'incorporation d'un plus gros moteur et sans compenser avec du contrepoids à l'avant dans l'espoir de minimiser l'impact sur le poids de l'avion. Un tel incident a été documenté sur vidéo il y a quelques années by quelqu'un qui filmait la campagne à l'arrière de sa maison lorsqu'un Long-EZ au CG trop reculé survolait le coin et décrocha. L'avion descendit à plat jusqu'au sol, subit un fuselage légèrement endommagé et le pilote s'en tira avec des blessures mineures et des douleurs au dos pour quelques temps. Le hasard a voulu que le Long-EZ en chute libre pénètre le champ de vision de la caméra quelques moments avant de disparaître derrière une dune. Ces quelques instants ont été suffisants pour permettre de mesurer le taux de descente de l'avion : approximativement 700fpm.

En réalité, il est pratiquement impossible d'avoir le CG en dehors de ses limites (FS97 à FS104) pour un Long-EZ bien construit et bien configuré. . Lors de mon acquisition de GBVC, mon premier geste fût d'enlever le ballast du nez de l'avion. Bernard est plus petit que moi(6'1" et 210lbs) et avait installé un contrepoids de 16lbs dans le nez de l'appareil, coincé entre la batterie et la structure. Un Long-EZ à vide est apte à avoir son CG quelque part à l'arrière de sa limite arrière, hors de l'enveloppe, et par conséquent sa position de stationnement nez au sol (photo 3) afin de l'empêcher de tomber en arrière, sur l'hélice et les bouts d'ailes. En fait, même avec les réservoirs pleins et quantité d'autres choses à bord, et conséquemment un CG bien dans l'enveloppe, le Long-EZ doit toujours être stationné de cette façon simplement parce que lorsque l'avion est sur ses trois roues, le CG pourrait fort bien être situé derrière les roues principales et l'avion serait très instable et à grand risque de tomber vers l'arrière. Dans le cas de GBVC à vide, le poids sur la roue de nez est 0.5lb, ce qui implique que le CG est pratiquement sur les roues principales et l'avion est très instable et extrêmement sujette à tomber vers l'arrière. En fait, le CG à vide se situe à la FS109.9 et les roues arrières sont à la FS110.

Lorsque le pilote monte dans le son siège, le CG se déplace vers l'avant, selon le poids du pilote. Si un Long-EZ avec le pilote à bord montre un bon CG, il devient impossible de charger l'avion suffisamment pour positionner le CG accidentellement hors de ses limites arrières. Les limites de poids total seront excédées sans même en arriver là.
Le facteur critique est d'avoir un bon CG avec le pilote en placeTous les aspects du chargement d'un Long-EZ (pilote, essence, passager, bagages) déplacent le CG vers l'avant de l'enveloppe. Les variations dans les poids de l'essence, du passager et des bagages n'ont à peu près aucun impact sur la position du CG.

Remarques finales

Les caractéristiques du décrochage étaient vraiment le seul aspect qui demandait à être bien compris dès le départ. Au fil des ans, l'avion n'a jamais démontré aucune tendance déplaisante ou dangereuse. Sa vitesse, son rayon d'action, son agilité, et son confort en font un appareil formidable, que ce soit pour participer au prochain déjeuner, pour aller à Oshkosh ou d'autres destinations éloignés. Nous discuterons ces aspects du Long-EZ un peu plus tard.

Éventuellement, ces premières 9 heures de vol m'ont permis de découvrir mon Long-EZ et de définir le programme de modifications pour notre premier hiver. Ceci constituera le sujet du prochain article, incluant les performances réelles de mon bébé F-18.

Mais il serait tout de même disgracieux de vous quitter sans toucher un peu aux performances de GBVC. L' Owner'sManual accompagnant les plans fournit une bonne perspective de ce à quoi un constructeur peut s'attendre. Je dis perspective puisque c'est bien de quoi il s'agit. Si un constructeur n'atteint pas ces paramètres, on lui dira que c'est dû à la qualité du travail, ou à l'habileté du pilote, ou aux conditions de test qui différent, ou autre chose. Si le constructeur cite des paramètres qui excèdent le manuel, on dira qu'il est pour le moins optimiste. La seule façon de vraiment savoir est d'évaluer l'avion en vol et de produire un tableau des performances. Et encore là, seul le constructeur/pilote d'essai connaît vraiment la réponse honnête. Le tableau 1 est une copie du Tableau des Performances que Bernard m'a donné à la livraison de GBVC.

Long-Eze / Suite de la page 34

Jean Claude (JC) Audet *Avec une MSc en Physique et un BÉducation en main, JC entrepris sa carrière comme enseignant à l'école secondaire avant de passer à l'aviation militaire un an plus tard. Il se qualifia comme ingénieur en aérospatiale au sein de l'aviation militaire pour ensuite passer à la formation au pilotage. Il a servi en opérations, dans le support, la formation, et sur quelques programmes d'acquisition majeurs. Après la vie militaire, JC se retrouva chez Bombardier Aéronautique comme Chef de l'Ingénierie des Systèmes pour les flottes Regional Jet et Challenger. Par la suite, il rejoignit Fairchild-Dornier en Allemagne en tant que Directeur de l'Ingénierie des Systèmes et éventuellement Chef de l'Ingénierie sur certains nouveaux programmes d'avions. Dans cette position, JC travailla de plein pied avec IsraeliAircraft Industries (IAI) et s'établi à Tel-Aviv pour une période de temps. À son retour au Canada, JC exécuta quelques contrats avec l'aviation militaire et Transport Canada avant d'accepter des responsabilités au niveau de la gestion de programmes et l'ingénierie des systèmes chez CAE à Montréal, le manufacturier de simulateurs de vol de renommée internationale. Par la suite, il forma sa propre compagnie pour effectuer le design, les essais en vol et la certification de modifications d'avions pour missions spéciales. JC occupe maintenant le poste de Chef des Opérations Aériennes et Chef Pilote d'Essai chez CMC Électronique, un manufacturier d'équipement de navigation et communication pour avion de transport de ligne et militaires, ainsi que des cockpits intégrés. Il détient une licence de pilote de ligne (ATPL) et a accumulé plus de 1000 heures de vol comme instructeur Classe II.*

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 4th Monday of the month at 6:00 PM at the Lake Simcoe Regional Airport for the months of June, July & August (BBQ nights) For other months contact Dave Evans at david.evans2@sympatico.ca or 705 728 8742

COBDEN: Third Thursday of the month at the Cobden airfield clubhouse 20:00 hrs. 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. KW-RAA meets the second Tuesday of each month at 7:30 pm at the Air Cadet Building at CYKF. In summer months we have fly-ins instead of meetings. Please contact President Dan Oldridge at oldridge@golden.net .

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, 19:30 pm at the terminal building Midland/Huronia airport (CYEE) . Contacts: President Robert Gow, 705-549-2894, Secretary Ray McNally 705-717-2399

E-mail – raa.midland@gmail.com .

NIAGARA REGION: Second Monday at 5:30 pm in the orange hangar at Niagara Central Airport June to September. Contact Pres. Elizabeth Murphy at murphage@cogeco.ca , www.raaniagara.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

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 Bob White 403-472-1035 pittsflyer111b@gmail.com

EDMONTON HOMEBUILT AIRCRAFT ASSOCIATION: Meetings, Second Monday, 19:30 at the Aviation Museum. Contact: President Roger Smeland (780) 466-9196 or Jim Gallinger (780) 242-5424 . Website - http://www.ehaa.ca/

GRANDE PRAIRIE: Third Tuesday, (September to April), 7:30, 2nd floor boardroom of the Grande Prairie Terminal Building. Summer events on an informal schedule. For more information contact Lee Merlo at 780-518-4254 or e-mail arniesusanmeyer@gmail.com

BRITISH COLUMBIA

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 Peter Whittaker pwhitt@telus.net 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 Wally Walcer 250-578-7343

ALASKA HIGHWAY: meetings held every third Thursday of every month (except July & August) at the Taylor Fire Hall at 7:30 p.m. For more information call Gerry at 250-782-4707 or Heath at 250-785-4758.

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

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

Classifieds

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

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

Deadline for submissions is the first of the month preceding date of issue.
Artwork: Rates apply to camera ready artwork. Digital files are preferred and should be sent as email and in .txt format, PDF, JPEG, MS WORD, Photoshop or other common file types.
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The Recreational Aircraft Association Canada does not assume responsibility for advertisements, but does exercise care to restrict advertising to responsible, reliable individuals.
Please note: Ads running more than 3 issues must be renewed to guarantee continued display in the magazine.

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

Recreational Flyer Magazine

Registration Mail Publication No. 09869

Contributing Editors: Gary Wolf, Don Dutton, George Gregory, Wayne Hadath, Tom Martin
Art Director and Layout: George Gregory.
Printed by Rose Printing Orillia, ON

The Recreational Flyer is published bi-monthly by the Recreational Aircraft Association Publishing Company, Waterloo Airport, Breslau ON N0B 1M0. Toll Free line: 1-800-387 1028
Purchased separately, membership in RAA Canada is $35.00 per year, subscription to Rec Flyer is $35.00 per year; subscribers are elegible for reduced membership fees of $15.00 per year. Rec Flyer to have a single issue price is $6.95.

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

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.

RV6 for sale $69,900 440 hrs TT Lycoming A1A 180 hp Sensenich Fixed Pitch Propeller JPI Fuel Flow Gauge Dynon D10A and autopilot servos Dynon Heated Pitot Kannad 406 ELT GPS Garmin Aera 560 Transponder KT76A Odessey Battery Bell Tailwheel Yoke Stereo Intercom PM3000 Garmin SL30 ADF KR87 Certified for IFR until September 2016 Annual due June 2014 Call George at 647 588 8544

4 Pietenpol lift struts for sale.They are brand new and are made from 4130 streamline tubing bought from Aircraft Spruce Part # 03-00192. Wall thickness 0.065. major axis 2.697", minor axis 1.143"
These have been epoxy primed and painted black -price: $1500. pjb@ornithopter-pilot.com Ontario

0-290-D Lycoming Engine with newly overhauled carb, 6 Bolt prop extension
Newly reconditioned 80 amp light weight alternator. Starter. 80 amp gel-cell battery. Cooling plenum. Log book and maintenance manual Asking $8,000 OBO ontact Norm at graham110@rogers.com

1947 Stinson 108-2 Voyager w/float fittings, no floats, restoration started by retired AME. Sandblasted and zinc chromate, all new bearings, pulleys, cables etc. All logs and tags included. $7,500 / OBO. 705-653-4525. davidcarlaw@prototyperesearch.com

Completed RV9 tail section (empennage). Interior parts all painted with rust inhibiting primer. Comes complete with fibreglass wingtips. Can be seen in London, Ontario. Price $1200 CDN. New price from Vans is $1795 US. rebel56@rogers.com 226-777-4155

Zenith 100 Mono Z, the first example of the series and built by Gerry Boudreau. This historic aircraft is in good condition but the VW engine has an oil leak and should be dismantled before flight. $8000 204-261-1007 jill.oakes@umanitoba.ca

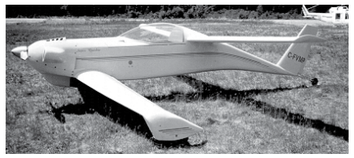
Wanted – A-65 cylinders in good condition. 204-261-1007 jill.oakes@umanitoba.ca

Mini Max. Rotax 447. TTSN220. TSEO40. ICOM Navcom. Header and wing tanks. Shape 9/10. Always hangared. Medical forces sale. Skis available. Reduced to $6900.00 for quick sale Contact by phone Alberta 780-460-6841 or cell 780-945-0411.

Rutan Long-EZ, first flight Aug. 30, 1986. Total time 961hrs., engine overhauled at 542 hrs.Light weight starter installed. Prince PT prop. New ELT awaiting installation.
Terra 720 com., Collins VOR available. Removed as planning GPS installation. Loss of licence due to medical issue.$30,000. Phone (403) 5279571, balewis@telus.net Medicine Hat AB

1946 Aeronca Champ 7 A/C. Very good condition. Wings rebuilt in 2002 with new spars in right wing. Hanlon Wilson exhaust. Good glass. New floor boards and skid plates. Front seat rebuilt with new padding and leather cover. 406 ELT. About 2600TT airframe, 1100 SMOH engine. Like new tires and new wheel bearings. ICOM. Radio. Original aluminium wheel pants. Asking 27900.00 OBO, or some trades.
tinymiller@sympatico.cae

Piel Beryl/Emeraude parts and plans for sale. All 26 wing ribs, rudder, elevator etc. with a/c grade unused plywood, also one piece Sitka spruce 12 ft 3in long x 7.5 in wide x 2 in deep, West System epoxy glue and hardener with pumps. Offers. Contact Nigel at (705) 429-3449



Flying Super Quickie 52 hp Rotax, 349 pounds empty weight and 660 gross. This plane is agile and fast, but not for faint of heart. $6000 OBO. I also have a complete Q200 kit with carbon spars. Never started. $6000 OBO. Email dkeats@tbaytel.net

Pazmany PL-2 with 150 hp O-320 E2A and McCauley fixed pitch prop. 1100 hrs total time, always hangared near Hamilton Ontario. Full panel and everything is in good condition. 905-961-4585 sheldonjobb@gmail.com

Super Cub 15 gallon tank covers (left and right) sold as a set. Super Cub Carb air box, filter and nose cone. Landing lights (old style) for Cubs. Rear sealed strut for PA 11 or Cub from Univair. New style fork ends. Two sets of wing covers - one set for cubs. Nose cone complete for 135-150 horse power - 6 holes. Millie.hanstke@gmail.com

1969 Cessna 150J with fewer than 6000 hrs on airframe and 800 hrs on engine, zero hrs on prop. Selling at less than the price of a kit, $18500. Laurie 519-843-2221

Stinson 108-3 with heavy case 165 hp Franklin. Airframe 2365 hrs, and recovered in 2005. Engine 998 hrs. Float kit. Two props, one fine for climb and one coarse for cruise. $24000 Quesnel BC. 250-991-7958

Lyc. 0-320-E2G 150 hp. Total time 500 hrs/logs. New mags, cam, pistons and rings Jan 2015 by Aerotec Halifax. All accessories including Sensenich propeller M740M-0-49 and SS crossover exhaust system. $15000,- Guy 902-682-2888

Warp drive three blade prop hub with 4" extension.to fit SAE 1 hub (Continental engines) $800. 3 blade Warp drive hub with 4" extension. Believed to be a SAE 2 - fits Lycoming 0235. $300. este@compmore.net

RV6 tail kit with a box full of instructions including videos.$250. este@compmore.net

Rotax 912 exhaust system. This system is intended for a pusher
installation were the exhaust system is over top of the engine. I
purchased in error not realizing it was of this configuration. It's in
good condition.$500 este@compmore.net

Icom Model IC+A200 transceiver. Never installed still in box. $650. este@compmore.net

Pelican Aircraft project. Side by side seating. HKS 60 hp motor with 420 hours Last flown 4 years ago. 1980's design. $9500 este@compmore.net

1963 Piper Cherokee PA-180. Pristine condition : recently repainted, refurbished and corrosion treated. New main tires, discs and brakes. Newly overhauled engine, starter, alternator, and mags. TTAF 3741.4 hours. Mode C, 406 ELT, VHF radio and earphones + emergency hand-held with remote push-button. Garmin 296. Wingtip strobes and rotating beacon. 4 place intercom. Engine tent and baffles for cold weather operation. Wing covers. Interior 8/10, exterior 9/10. Good glass. AD compliant. Fresh annual included. Canadian registered since manufacture as C-FOYB. s/n 28-956. Located at Springer Aerospace, Bar River Airport, P0S 1C0 : 20 minutes from Sault Ste Marie, Ontario. $40,000. robertmcwilliam1@gmail.com or 705-759-2181

Cub project, Wag Aero plans, fuse on gear, brand new Riblett wing kit(still in crates) new windscreen , new J3 style cowls. May sell wing kit separately. Ask $15k. (647) 981-0044.

KR 2 trigear 2180cc Great Plains VW . 3.5 gph @ 130 mph Cruise. TTAF/TTE 54hr. int/ext 10/10 $15000 call Ray Larson 905 892-6389

Ads run for a maximum three issues depending on space available and then must be renewed for continued display. Please direct all classified inquiries and ad cancellations to: garywolf@rogers.com and place "RAA ad" in the subject line.

An experienced Lancaster pilot was posted to a Coastal Command unit flying Sunderland Flying Boats. On his conversion to type the squadron QFI gently reminded his student that there was no need to fly an approach to the strip as there was plenty of water in the bay beside the airfield.
Following the close down procedure, the student thanked his QFI for the timely reminder that he was actually flying a flying boat, opened the hatch, and promptly stepped into the sea!
-Aviation Humor.net

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

RAA Scarborough - Markham

We wish to thank Michael Baranowsky and his two co-builders for inviting us to his garage/workshop at 20 Hughson Drive in Markham to view the early stages of his RV-9A project; he has been working on various parts of the empennage. The RV-9A is a Van's aluminum, low-wing, trigear, side-by-side, two seater (span 28 ft, empty/gross wt. 1028-1075/1600-1750 lbs, 118-160 HP, cruise @ 75% power 164-186 mph). At an early stage in building Van's aircraft, one must become adept at very smooth flush riveting - dimpling the skin with a press tool, use of a bucking bar, etc. Michael has chosen to make extensive use of the hexa-chromium alodine coating for corrosion resistance of the aluminium skins. He showed us a very good Van's promotional video giving the range of aircraft models available. The plans and instruction sheets are very detailed. These kits now come with essentially all the holes in the skins pre-punched ready for match-drilling and riveting. It is our hope that Michael and his colleagues will keep us informed from time to time of their progress. Those of us who have built an aircraft are well aware of the maxim: the last 10% takes 90% of the time! Let us hope Van's aircraft are different!

We extend our thanks to Andy Peng for addressing our May meeting on the subject of UAVs (Unmanned Air Vehicles). Andy is technical advisor to Advance RC Hobbies in Markham, ON. He brought with him some very impressive UAVs of various types, including: a 2-blade, 6-ft. diameter helicopter, 3.5 HP, blade rotating at 2200 RPM, very difficult to fly; a 6-blade (each 15 in. diameter), 3-ft. diameter drone using ac phase motors (not dc); a 4-rotor drone with rotors rotating in opposite directions on each diameter, easier to control (e.g. yawing the UAV by varying the speed of one pair of rotors on one diameter; a similar 6-rotor UAV. The control box typically has a right-side stick like a fixed-wing aircraft for elevator and ailerons; the left-side stick is the throttle. Andy stressed the need for careful regulation of UAVs depending on their utility, size and range. It was most unfortunate, although understandable, that demonstrating the flight of these drones within an airport boundary was not possible. Andy hopes that some of our members will follow up with him in the future using the contact information given above.

RAA Midland-Huronia

In April, Shannon Reiger outlined her proposal to start a food service at the airport on weekends starting in mid-May.

The CFK will be offering rides to local kids; a proposal was made to offer airplane rides to CFK parents as well, but it was decided that more discussion would be required. Bob Gow is investigating a Facebook page for the chapter.

In May, the food service was approved as presented. There was discussion about fly-out activities and destinations.

Leigh R. reported that she now has over 30 kis signed up for rides and 5 airplanes, and Burt P. will organize a "ground school" for the kids.

The NFRI even in July may be attracting the participation of a car club and John S. will confirm the involvement of a local model railway group.

At the June meeting, Leigh reported she now had 8 airplanes for the flying event on June 6.

RAA London-St. Thomas

The April meeting of the London – St. Thomas RAA was hosted by Fanshawe College at their recently opened campus at London airport. This campus focuses on training students in various aspects of aircraft maintenance including structures, engines and avionics. The evening featured an incredible tour of the campus along with presentations about the various course content and objectives. We were joined by our friends from Chatham, it made a lively meeting. Thank you Denny for arranging this awesome night out. I know I came away wishing for a second career!

Our May meeting will be what we are calling our "Recognition Meeting". It will be held at Ed Hollestelle's Airstrip. Details are to be found on page 4. The meeting will be used to express our thanks to several members that have made outstanding contributions to the London-St. Thomas RAA over the years. Please plan on coming out and adding your thanks to the outstanding members. No, I will not tell you who they are, you will have to come to find out! After the presentations, Ed Hollestelle will update us on the progress of his RV6 and show us his gliders.

The May meeting saw us gather at Ed Hollestelle's airstrip and glider port. Despite a fair bit of rain, turn-out was good, Rob Bell braved the weather and flew in! Ed gave us a tour of his facilities and explained the progress and modifications that he is making on his RV7. Ed is a true "experimenter", his RV will be piloted from the right hand seat in recognition of his flight preferences from years of glider piloting. Imagine a mirror image of the dash board and all the changes this might make. For inspiration, Ed has another RV in the shop that is in flying condition. Ed explained that having both the gliders and a flying RV might be the reason the project is progressing so slowly. Ed then went on to show us his gliders. I was amazed to learn that they were made of metal, not composite. .You could not see a seam or rivet anywhere. I was especially fascinated to learn how the gliders are ballasted with water to enable them to get better penetration and speed while travelling from thermal to thermal, or along a ridge His gliders are fantastic works of building and design. Thank you Ed for your hospitality and insights.

Jack Schenck and Bill Weir were recognized by the club for their years or outstanding contributions to aviation and the London –St. Thomas RAA . Roland Kriening explained that the Executive had decided to create "The Slipstream" award to recognize specific members each year for their contributions to aviation. The Executive feels that it is important to keep the heritage of the club alive and promote excellence within its ranks. The hope is to recognize at least one member each year. Bill and Jack gave brief speeches outlining their aviation activities over the years. As I write these words, I am reminded that Bill Weir started all this newsletter stuff for the chapter many years ago. I think there must be near 100 years of aviation between the two of them! It was quite humbling listening in.

There was no formal meeting in June. Rather, we held, what will hopefully become, an annual fly-in at Mark Matthy's Warren Field. Given that this was a fly-in, you will notice that there were no formal minutes taken at the event. The event was held on Saturday, June 6th. The weather was fantastic, with temperatures in the low 20's and wind was OK, about 10 Knots cross wind, but not as much as had been called for. Truly, the weather gods smiled upon us! I am not sure of the exact number of aircraft that flew in, but I believe there were about 15 flying arrivals, and a similar number of people drove in. Aircraft were of a variety of makes including several homebuilts, Cessna's and even a Piper Cherokee. I have

Jack Schenck and Bill Weir were recognized by the London-St.Thomas chapter for their years or outstanding contributions to aviation and the chapter; centre, Chapter 85 at the Langley Fly-in: Eric Munzer's Dornier 22 (big) and Chapter President Peter Whittaker's scratch built Zenith 601 HDS (little). Bottom: at the Delta Airpark Fly In – bare bones Pietenpol Air Camper reveals that old school is still cool.

included several photographs of the event in the newsletter.

The driving force behind the fly-in was Roland Kriening. He took care of the promotion, provisioning food and making sure all the volunteers knew what they were supposed to do. Denny Knott, Eric Bartlett and Bob Buchanan acted as aircraft marshals and ensured all visiting planes were parked safely. Gerry and Phil Hicks took care of the barbeque. I am sure I am missing others, so please accept my apologies. Of course, we must thank Mark Matthy's for hosting us at his fabulous facility. We plan on hosting the event again next year, so plan on being there!

At our executive meeting, it was brought to my attention that Don Hatch's wife, Winnagene, passed away on June 8th. I am sure all of us send our condolences to Don and his family. I am not good with words at times like this. I just hope Don knows that we are thinking about him.

RAA Chapter 85

The chapter now has a Facebook page to track the progress of the Zenith project and keep members updated! To check it out, go to https://www.facebook.com/RAA.Chapter85.

Since the "March Message" Chapter 85 has had a number of significant events. The Annual Awards Banquet took place at the end of March at the Delta Town & Country Inn and this recognized the contributions of many members. John Macready was warmly applauded for his past 3 years as President and his many achievements on behalf of the Chapter. The guest speaker was Jack Dekens who gave a captivating talk about his flight in his C-172 that circumnavigated Canada across the Arctic eastbound, south down the coast of Labrador to the Maritimes and then West through

Chapter members man the booth at the recent Langley Fly-In.

southern Canada and back to his starting point at Chilliwack, BC.

Planning continued for a renewal of the Delta Heritage Airpark operating licence and this culminated with a meeting and presentation by the President to the Vancouver Metro Parks Committee. The application to have Chapter 85 continue as the licence holder was approved and the term runs for another 5 years, starting at the end of July. A spring meeting was also held with Metro Parks and surrounding property holders who had a chance to voice any complaints. One low flying aircraft complaint was lodged and this was discussed and came to an amicable conclusion with the complainant.

Fly-in season got underway with members taking the Chapter 85 booth to the Langley Fly-In on June 20th. Perry Delano had a wing, stabilizer, elevator and rudder from his Zenith 701 project on display. Eric Munzer had his 25 year restoration project on display, this is a Dornier 22 that has been restored to better than original and won the Best Aircraft Award. David Marsden flew in with his Skylark and Peter Whittaker flew in with his Zenith 601 HDS. John Macready and Tom Boulanger helped with the booth setup and manning the booth. The weather was hot and sunny, the chili lunch went down very well and the selection of homemade pies was mouth watering.

The following Saturday, June 27th, was the Delta Airpark Annual Fly In and this also had hot sunny weather with a light breeze straight down runway 25. The day kicked off with a pancake breakfast followed by a hamburger and hotdog BBQ lunch. A variety of aircraft showed up from Harvards to a 1929 designed Peitenpol Air Camper that is under restoration by Cliff Dawson. Two students from the BCIT aircraft maintenance program came out as volunteers to help with aircraft registration and car parking. The automotive world was represented by an impressive collection of vintage MG's from the Old English Car Club and for contrast, the Vancouver Electric Vehicle Association (VEVA) had fully electric cars, including a Tesla.

Replacement of the former Chapter aircraft, the "Turbi", came one step closer as Chapter 85 has paid the deposit on a Zenith 750 Cruzer. Tentative delivery of the kit is in mid to late August and the building group has been meeting to plan the initial steps in the project. The kit is designed around the Continental O-200 engine and an engine search is underway. The building plan is to use the Chapter 85 workshop as a central building site and storage of the crate while components go to other builders for simultaneous work on wings, fuselage and empennage, hopefully to speed up the overall building process. The project has generated a level of interest where even former members are donating tools.

The next half of the year has more events and the Zenith 750 Cruzer building project is a key project to eventually produce a Chapter aircraft for the flying membership.

Have an enjoyable and safe summer with lots of flying and / or building!

Peter Whittaker, President

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