RECREATIONAL FLYER

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The Voice of Canadian Amateur Aircraft Builders $6.95

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

from the president's desk

Gary Wolf

NavCanada Montreal-Windsor Airspace Review

RAA attended the June VFR stakeholders' meeting and will again be represented at the November 21st meeting. The Ontario airspace had another ad hoc change this summer when the newest layer of Mode C transponder airspace was added above Toronto, with a radius of 65 nm. The intention is now to meet with stakeholders before doing a complete revision for Ontario, and pilots are being asked for their input. If you go to the www.navcanada.ca website and scroll down to the Notices, there are links for the airspace review and the survey. Please take the time to do the survey and to offer comments. This is your chance to have direct input. Very Light Jets (VLJ's) operating as air taxis appear to be the future of light commercial aviation, and they will be staking their claim to a lot of what is currently Class G airspace. This is your opportunity to let NavCanada know that our sector uses airspace too.

Gliders still enjoy a CARS exemption to the requirement to carry a transponder, and they are allowed to use the new Mode C transponder airspace without any radio call to warn the controllers in Toronto or Hamilton. The intent of the recent airspace change was to provide quarantined airspace for the airliners, but this will not be achieved until every aircraft using the airspace is required to have a Mode C transponder. Back when a transponder was the size of a Deforest Crosley console radio this exemption might have made sense. Nowadays transponders have become small enough even for the panel of an ultralight aircraft, which by the way must carry a Mode C transponder if it uses the new airspace. Glider pilots use the argument that they cannot afford ten pounds of extra weight. Show me one glider pilot who would ground himself if he gained ten pounds at Christmas, and I might buy that line of reasoning.

NavCanada Flight Service contact changes

The toll free telephone numbers to access FIC services within Canada are 866-WXBRIEF (866-992-7433) for English service and 866-GOMETEO (866-466-3836) for French service.Each FIC also has its own unique toll free telephone number. Pilots may use this number to contact a specific FIC from outside the FIC service area, when calling from outside Canada or when making a call from a mobile phone (satellite or cellular), when the telephone carrier may not route to the correct FIC. The toll free number will direct calls to a specific FIC from anywhere within Canada or the continental United States.

Halifax
1-866-541-4106
Winnipeg
1-866-541-4103
North Bay
1-866-541-4109
Québec
1-866-541-4105
Edmonton
1-866-541-4102
Whitehorse
1-866-541-4107
London
1-866-541-4104
Kamloops
1-866-541-4101

Light Sport, not here soon

Three years ago RAA Canada began lobbying Transport Canada to adopt the US Light Sport regulations quickly, so that our manufacturers could get on with making and selling aircraft into the US market. Our proposal got derailed by Transport a couple of times, but it did result in six months of intensive (and expensive) meetings between the Industry and Transport. Transport had parlayed the Light Sport initiative into a complete revision of the non-certified categories, but once we had done this work, all of it was put on hold because the document was too large to be dealt with in whole. It sat for six months until RAA jumpstarted the process again. Transport asked which part they should do first, and we have responded that Transport should first adopt the US Light Sport regulations lock stock and barrel, and

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features

Ken Armstrong

PAWNEE

Story and Photos by Gary Wolf

Ed Butler has been crazy for airplanes since he was a farm boy in high school. In the Sixties he passed all the military tests and the RCAF wanted him as a pilot, but at age 17 he could not convince his parents to sign the release. Instead he pursued a career in telecommunications, and ended up engineering and overseeing fibre optic cable installations all across Canada and the US. His love of aviation was partly satisfied by the purchase of a Cherokee, then a J-3, followed by a Tiger Moth, and finally a Chipmunk project in 1990, which he sold in 2002. He then left for several years of engineering in Australia and later to various US states. Upon his return he began looking for another airplane, a project this time that he could get his teeth into. His two sons are in their thirties, and one is an RJ Captain for Air Canada, the other became a communications and radar specialist on the Aurora stationed at Comox BC. He left that to go into telecomunications and operates the farm at which Ed keeps his Pawnee. This is an agriculture and aviation family. For Ed Butler, an agplane was a natural choice.

Ed had run into a couple years of arbitrary roadblocks at Transport when he was trying to register his certified Chipmunk after its restoration, and was determined not to get into that situation again. Owner Maintenance was one option for this next project but by that time the FAA had changed its policy, and our Owner Maintenance planes could no longer cross the border. Amateur Built seemed like a natural choice if his future project could meet the 51% requirement. Ed wanted a strong tailwheel airplane that could carry a lot of weight without CG issues. He was planning to use his plane to visit pals around the province, and he wanted strong landing gear and the ability to get out of a short rural strip. Ed used to do a lot of glider towing, and likes having twelve feet of airplane in front of the cock-

TWA? Tail Wheel Airplane, of course. Ed's engine had been carefully pickled by the previous owner and was in excellent shape. Even came with a zero-timed prop

pit because it feels like a fighter plane. A Pawnee pilot is seated behind the wing trailing edge for good downward visibility, so it made Ed's short list. He found that the high horsepower Pawnees are in demand, but the 150 hp versions do not command a great price, so he went looking for one.

Ed found his project

in Vankleek Hill near Ottawa. The owner was an AME with a Structures ticket, who had originally bought the Pawnee in Alabama in 1979, and then dismantled it for a ground up restoration. A professional opportunity at McGill University sidetracked him, so for twenty years the parts had been stored in the AME's rambling Victoria home in a controlled environment. The engine was pickled and stored inside the home as well, and every morning it was rotated several revolutions while the fellow had his coffee. When Ed received the engine it was perfect inside, with 1040 total time in its log from new. The leakdowns ranged from 76-78 over 80. The carb and one of the mags had six hours on them, and the prop had just been zero timed.

The airframe had 2243 hours from new but the fuselage and landing gear had already been sold. Since Ed was planning to go into the Amateur Built category he figured that he might have to build a fuselage anyway to make the 51% requirement. All the airframe, engine, and prop logbooks were included, plus the original parts book and POH. Ed wrote the cheque, put the parts into the back of a cube van, and drove home to his son's farm in Alma where he has his hangar.

The next step was to open a file with Gerry Haliburton of MD-RA, and to book a 51% Inspection with Bob Buchanan. Ed has only good to say about the way he was treated by these two gentlemen. He stripped the fabric off the flying surfaces and Bob found that he would be performing 54% of the project to turn it into an airplane, so Ed was on his way. The left wing was going to require a complete rebuild, but a new spar and ribs had come with the project.

Gallons of aircraft paint stripper and lacquer thinner, and a lot of scraping and sanding got the metal wing structure and the 4130 tail completely bare and ready for precover inspection. Because they had been carefully stored all those years, there was not one bit of corrosion anywhere. The flaps had some damage so Ed formed new parts and riveted them in. The missing fuselage was going to be a problem, but while he was in Arizona Ed found that a company in Alabama made replacements for the agplane industry. Their prices were very competitive, and a few months later Ed had a fresh fuselage and landing gear. He

The wire cutter is usually mounted in front of the windshield. It was left of the restoration as Ed really isn't planning on doing any cropdusting. Note the air intake at the top of the cabin. Ventilation plus!

had the fuse built without the brackets for the wire cutter knife and the tail wire because his plans do not include flying under telephone wires. He plumbed the bare airframe with the help of Ron Fleet, who is a resource to the members of the Hanover RAA Chapter. Ed made notated drawings of each and every hose and keeps these in his builder's log. The precover inspection went without any hitches, so the next step was to modify the fuselage to fit a passenger seat, cover with fabric, and assemble the whole collection of parts into an airplane shape.

This is an agriculture and aviation family. For Ed Butler, an agplane was a natural choice.

The intent was to turn this agplane into a 2 place aircraft, so the hopper area was fitted with a birch plywood floor. Four point seat belt mounts were added, and both the pilot and passenger seats were modified from Ford Focus items. Weight was not going to be an issue with this plane, and Ed wanted comfort. The forward seat retained its reclining mechanism, but does not adjust fore and aft because this could have interfered with the pilot's rudder pedals. There are no controls in the forward seat so the accommodations are much roomier than in a car, with lots of elbow room. There is plenty of legroom too, and with the seat reclined it is like first class seating in an airliner. Ed plans to make leather saddlebags to surround the passenger seat, and these will act as armrests. He fashioned a canopy frame from 20 ga. steel and fitted this with 1.5mm lexan sheet as the covering. He went through a lot of Bristol board while making and revising patterns for the canopy. The view forward is limited but the side vision is excellent. Even with the heavy seats and the new canopy, enough weight was removed by deleting the tank and spray equipment that with Ed and forty gallons of fuel, the passenger compartment can still carry 512 pounds.

The cockpit is set up for VFR using traditional gauges. Ed has two venturis for the gyro instruments. He found what he believes to be a Spitfire artificial horizon, and it is run from the larger of the two venturis. The other runs the turn and bank. The panel has a slot for the radio/intercom and a holder for the portable GPS, but Ed plans to stay away from controlled airspace, and to navigate the old fashioned way as much as possible. Five mounting points were welded in for the rear seatbelt assembly, and the Ford Focus seat was mounted. Once all the mods had been completed, out came everything and

The unusual placement of the passenger compartment is obvious here. Below, both the passenger and pilot's seats were liberated from a Ford Focus. In a load - hauler like this, a few concessions can be made for comfort.

it was time for prime and paint.

The new fuselage went to Husky Farm Equipment for their 2 part epoxy primer, followed by epoxy colour coats. Their paint is impervious even to cow and pig exhaust gases, and it provides a good solid base to which to adhere the Randolph system fabric covering. Ed then painted the wing structure and other aluminum parts in his hangar using the same 2 part primer. He had previously used the Stitts covering process on his Chipmunk but was unfamiliar with Randolph and he wanted it done right, so he took the wings to Ron Riley in Grand Bend. Within three days the two of them had the wings covered, shrunk, and ribstitched, ready for doping. The wings were left with Ron to apply the silver and colour coats of Cub Yellow.

Ron Riley later came to Ed's hangar to assist with covering the fuselage using the same Randolph process. Ed applied the dope, silver, and colour coats with a brush, lightly sanding with 400 grit between the final coats. The doors were done the same way using 2 part epoxy primer and finishing with Randothane, coloured to match the blue dope on the aft fuselage. The two crests are from his family and a local shop digitized them and made the decals which were applied to the fuselage. Because of his love for military aircraft, the vertical stab has the RAF colours.

The gearleg fairings and forward fuselage aluminum were cleaned with lacquer thinner, then painted with 2 part automotive epoxy primer and paint. 2004 Corvette yellow was a good match for the Randolph Cub yellow. Some of this was done by a local auto bodyshop, and some by Ed. The wing root fairings required metal massaging and the bodyman massaged them back smooth. The spinner was painted 1937 International Diamond T red because

Even with the heavy seats and the new canopy, enough weight was removed by deleting the tank and spray equipment that with Ed and forty gallons of fuel, the passenger compartment can still carry 512 pounds.

The tail on Ed's Pawnee sports the family crest and RAF colours.

the shop was restoring a truck with that paint, and Ed fell in love with the colour.

Once everything was painted, Ed assembled the airframe and mounted the engine using stock parts. He made new engine baffles, fitted the new control cables and hoses, and the plane was ready for final inspection. Bob Buchanan did a thorough final and the Pawnee came through without any snags.

Now that the plane is flying, the only matter of concern is that Ed has to decide whether he wants the doors on or off. If he leaves them down in flight they chafe against the fuselage, so right now he is enjoying the Fall weather with one door on, the other off. He uses Shell super autogas in the 150 hp Lycoming and experienced a bit of leakage around the O-rings of the fuel selector and the primer. Typical of Ed, he bought a selection of O-rings from the various aviation suppliers and immersed them in test bottles of Shell autogas to check their stability. One O-ring grew almost 50%, another only 10%, neither acceptable. His search for suitable O-rings took him to the airconditioning industry where he found that their green O-rings would remain stable and do the sealing job. Of course all of this testing is recorded in his builder's log.

What does it fly like? The closest comparison is a Super Cub. The tail gets up within 50 ft, it is light on the ground within 300, and the Pawnee gets airborne by 500 ft. Acceleration is quick and so is climb. Ed compares the lightness of the controls to his Chipmunk. The ailerons are large, so the roll rate is impressive. Top speed is 113 mph, but he uses 95 mph for cruise. The stall with flaps is a very acceptable 45 mph, and he can certainly get into small strips. Ed plans to do a lot of local grass strip flying in Southern Ontario to renew old acquaintances, and controlled airfields are not part of the plan. He might have to install a transponder if he goes to the fly-in at Geneseo NY or to the Piper convention. In the near future he plans to fly into the International Plowing Match, and to visit his pals in other RAA chapters. Many will do a double take before they comprehend the addition of a passenger compartment. Look for Ed Butler and his Pawnee next summer at your own fly-in. RAA

Bernard Geffray's Spratt 103

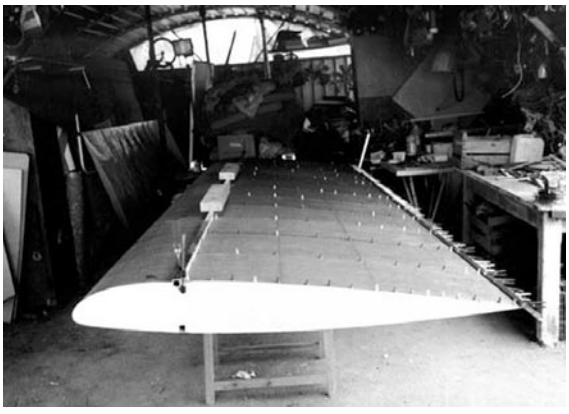
The Controlwing concept has quite a pedigree. It goes right back to the days of Orville and Wilbur Wright; Spratt Sr. was quite involved with the brothers, though the solution the Wrights came up with and Spratt's concept represented two distinctly different schools of thought. The Wrights felt that control was everything; Spratt wanted automatic stability and then control. Ultimately, the Wrights won out, though their first successful aircraft was dangerously unstable; and the Spratt concept went into relative obscurity.

by George Gregory / Photos courtesy Bernard Geffray

Not entirely, though. George A. Spratt's son, George G. Spratt, continued to quietly develop the idea, building a series of aircraft on the concept, including a roadable aircraft, a number of flying boats and a towable land-plane version. Since then, a number of experimenters have toyed with the idea. One of the latest is Bernard Geffray.

15 years ago, with nothing much to his name but an intense desire to fly, Frenchman Bernard Geffray built a trike. It featured an engine pulled out of a Citroen and, being cash-strapped, he taught himself to fly in it. The experience inspired him to find a way to help other people of marginal means find away into the air, so he built a few more trikes with the same overriding principle: simple, safe, and affordable.

At the Mignet factory, he successfully fit a BMW flat twin on a Balerit, a derivative of the Mignet Flying Flea. The design is popular in France and features a tandem wing aircraft with a front wing that pivots on its spanwise axis for pitch control and gust alleviation. He started envisaging a sort of cross between the two concepts he was familiar with, sort of a "Flea-Trike" aircraft. Attending Sun 'n Fun a decade ago, he was showing his idea around when someone pointed out that George G. Spratt had taken a similar path, and this led to a couple of meetings between the two men. There was a lot in the Controlwing for Bernard to like: it was simple -



The ribs are attached to aluminum spars and fibreglass panels are glued on. The wings were tested to 4 g before deformation occured.

Top: a fuselage doesn't get much simpler than this. A few pieces of square stainless welded together. Above: ribs are hotwired out of styrofoam.

Below, right: the 103 is hung by its wing pivot to check its C of G. This is a pendular aircraft - like a hang glider or autogyro - and the airframe hangs from the wing pivot. What matters is that the nose is high when you're landing.

far less moving parts. It was safe: impervious to stalls. The potential for affordability was there too; the less there is to build, the less there is to buy. Mr. Spratt was able to give him a list of plans owners for the Spratt 107, plus a healthy dose of enthusiasm for the concept. Subsequent visits stateside filled in some of the gaps, mainly culled from museum visits as there were only 4 Controlwing builders he was able to contact.

Enter the Spratt 103, Bernard Geffray's vision of an ultralight that capitalizes on the Controlwing's inherent simplicity. Why "103"? It's in keeping with George Spratt's numbering conventions, but it's also meant to be a Part 103 ultralight in the FAA's terminology.

There have been design challenges. One of the most difficult, says Bernard, was overcoming adverse yaw. The Spratt 103 does not have rudders; there are some stabilizers aft to help the aircraft weathercock, but there was no positive aerodynamic means to offset the adverse yaw created when the wings are deflected. Initially, 20 kg of force was required to turn the aircraft. After much experimentation, he found that by allowing the upper wing to float free in the turn, he was able to reduce the effort required and eliminate adverse yaw at the same time.

A glance at M. Geffray's design reveals an aircraft optimised for economy, simplicity and strength. Theoretical work done at Tecnitas, a department of the French laboratory Veritas, and practical on-the -ground tests have confirmed the airframe's integrity. It's certainly not fast - about 28 mph to a maximum of 70 mph - though entirely comparable to its more conventional hang-glider based cousins. In fact, Bernard describes the Spratt 103 as a "pure trike" - albeit one with a double surfaced composite wings that pivot independently of each other.

Construction

A simple structure is TIG welded out of square stainless steel; the main wheels were liberated from a wheelbarrow, the nosewheel from a moped, brakes and all. The wings consist of styrofoam ribs, aluminium

The Spratt 103 is easy for the physically challenged to access. No rudder pedals either. Below: the airfame is short at only 13 feet long. There are no elevator or rudders.

spars and polyester resin with fibreglass fabric. The polyester was chosen for its economy, but Bernard is aware of its corrosive effect on styrofoam; one of his challenges was to find a way to use the polyester without affecting the styrofoam.

Bernard feels the aircraft can be scratch-built in as little as 200 hours for about $5000 CDN.

Amongst Bernard's design parameters were amphibious capability, able to fit pilots of various sizes, and easy for disabled flyers to handle. The

The airframe is the very definition of simplicity. There are no ailerons, rudders or elevators

open design certainly seems to have obtained these goals; the seat is right at ground level, with little in the way of surrounding structure to impede large pilots or wheelchairs. His amphibious version has what look like a pair of surfboads with slots cut in them for bicycle-like main wheels to protrude out the bottom - as Curtiss and Voisin did in the past, Geffray points out. Because the pusher prop is mounted high and behind the pilot, exposure to water spray is minimized, and bystanders are protected from the prop by the structural tubes outboard of its area of operation. The entire fuselage is a scant 13 feet long.

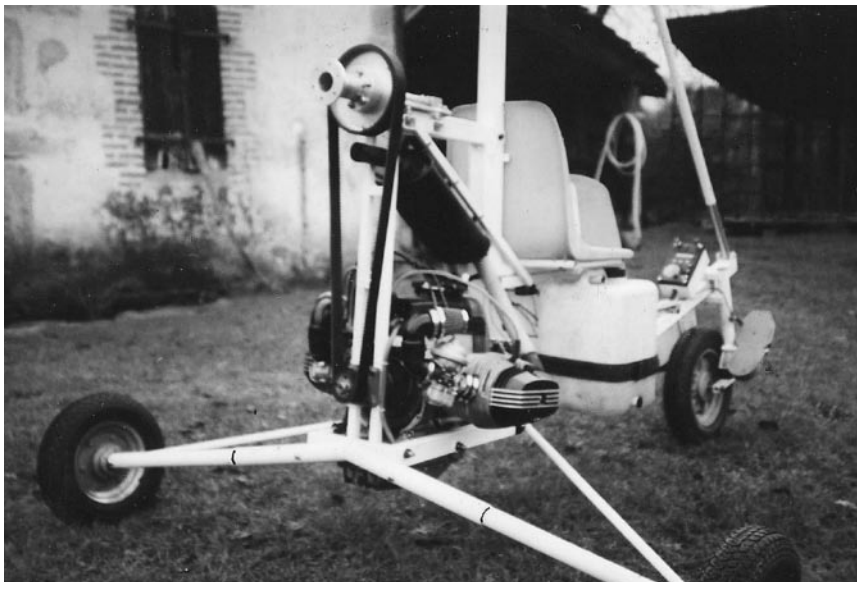
The airframe is the very definition of simplicity. There are no ailerons, rudders or elevators. The aircraft is manipulated entirely by the application of power for altitude control, and the differential movement of each wing panel to turn the aircraft, with collective movement for speed control. More on that later.

Another area where Bernard sought economy was in powerplants. Several have been tried, none of them conventional aircraft engines. Industrial 4-strokes have been the engine of choice; he's tried a 25 hp Kohler ("fine but heavy"), a 20 hp Honda, which he feels is a little on the weak side, and a 22 hp Briggs. None of these engines consumes more than a gallon per hour. A diesel engine is being considered, and electric power is an exciting possibility (Electric Flight Corporation is already promoting a package for use with conventional trike wings that could have an endurance of up to 1.5 hours).

Bernard says the aircraft can be disassembled in about an hour. There are no wires or bellcranks to disconnect, and it will fit in a "small van (or trailer or back of RV)".

In flight

"Foolproof" is how Bernard describes it. The Controlwing concept is immune to stalls and spins. It cannot be rolled, looped, or spun, and you can't put one into a dive. The wings absorb turbulence like shock absorbers (this could take some getting used to. It is akin to the Mignet Flea concept and feel); and this means there is feedback in the control wheel as it moves with the wings. You just ignore it unless you want to turn. The gust loads felt by the pilot are, according to various NASA reports on the



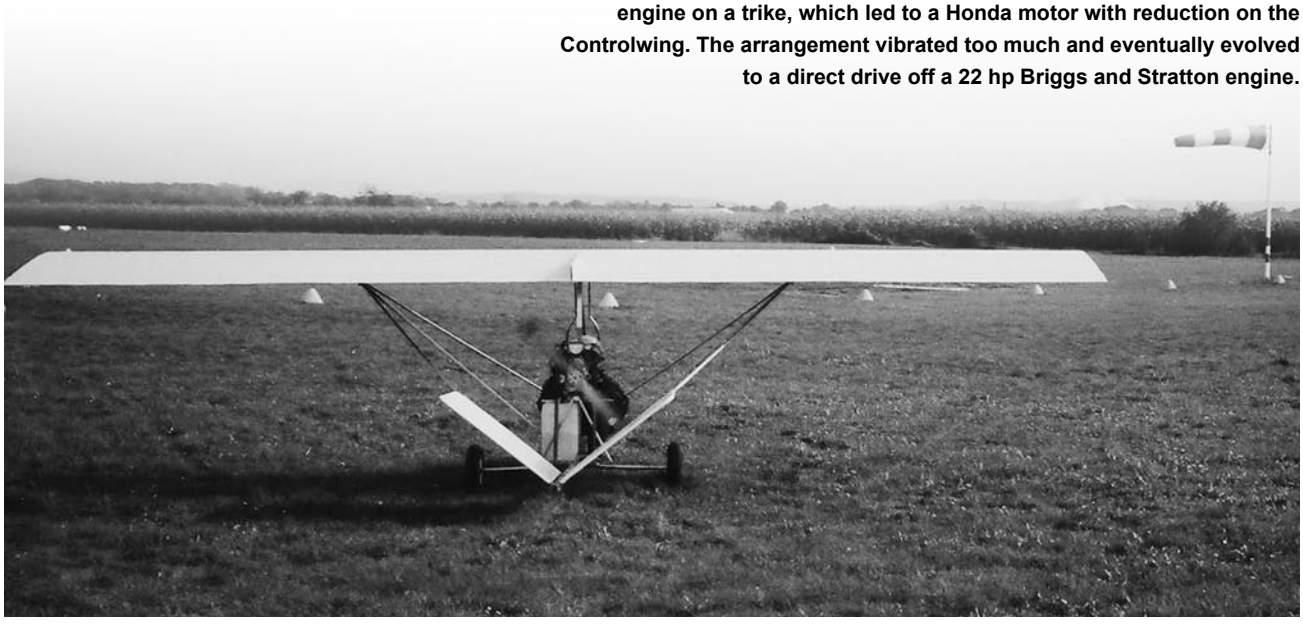
concept, about one-quarter what are normally experienced in a fixed wing aircraft.

There are three main controls: directional control is managed with the control wheel, which actuates the wings via control cables (earlier versions used push-pull tubes attached directly to the leading edge of each wing panel). The throttle controls altitude, and the collective control is achieved with fore and aft movement of the wheel. Trim is simply a device that attenuates the wheel's fore and aft movement to a desired setting. The wings can be locked at zero degrees incidence for parking; in this position it even sets the parking brake.

If you are flying level at a certain speed and want to go faster, you adjust the collective so that the present power setting resulted in a descent, then adjust the power to maintain level flight. If you leave the collective alone, when you add power the aircraft does not accelerate; it starts to climb. If you reduce power, it descends. At first I thought this rather limiting, until I thought about how seldom I actually dive an aircraft unless involved in aerobatics.

When landing the aircraft, you can flare with the application of a bit of power or a tug on the collective to increase the angle of attack momentarily; the wing

Above, right; Bernard Geffray, designer; the 103 on its amphibious "floats" - actually a pair of surfboards. Top, left: Bernard tried a BMW engine on a trike, which led to a Honda motor with reduction on the Controlwing. The arrangement vibrated too much and eventually evolved to a direct drive off a 22 hp Briggs and Stratton engine.



cannot be stalled, however.

How a Controlwing works

Two things that are critical in a Controlwing are the selection of the airfoil and the location of the spanwise pivot. The airfoil used a NACA 23112, a reflexed airfoil chosen for its low pitching moment (remember, a controlwing is essentially a flying wing with a fuselage hanging underneath it). Like the gyrocopter or a trike, it's a "pendular" aircraft though in this case true only in pitch as there is a positive aerodynamic input for roll. Maneuvering is accomplished by manipulating the orientation of the wings, and the airframe follows along for the ride. The wings pivot an a spanwise axis at a point below the chord and 25 percent aft of the leading edge. They are free to float in response to aerodynamic forces but are connected to the pilot's controls so they can be tilted differentially without restricting their collective freedom.

This means they can move to absorb gust loads, and aerodynamic forces will not allow them to stall: when flying at low speed, any attempt to increase the angle of attack is met with increasing resistance. Around the top of the lift curve, a differential wing displacement - as when turning the aircraft - results in no (practically speaking) increase in angle of attack; almost all of the rotation will be in the wing having decreasing angle. If a gust strikes only one wing, it tends to maintain its angle of attack and lift, but reduces its incidence. The aircraft does not roll if allowed to absorb the gust in this way.

As before, the main altitude control is the throttle. When the power is applied, aerodynamic forces automatically increase the angle of incidence and the aircraft starts to climb; the opposite happens when power is reduced. Landing speed is 45 km/hr.

Speed is controlled by first selecting the default incidence with the collective and then applying power for the desired result, whether climbing, level flight, or descending.

Conclusion

I think Bernard's on to something. Pilots used to conventional aircraft may feel a little disconcerted by the lack of elevator controls or its movable, gust-absorbing wing panels; but after five prototypes with a variety of configurations and engine/prop combinations, the design is getting a degree of refinement, and the safety of an aircraft that can't be stalled or spun is evident. For a small one-seat aircraft just to putt around the sky as cheaply as possible, M. Geffray may have just the ticket. Bernard hopes to be selling plans by the summer of 2008.

For More Information:
http://spratt.103.free.fr/spratt103_english/welcome.htm
http://www.flyingflea.org/
http://www.georgespratt.org/
http://www.electraflyer.com/

Minister's Delegates: Recreational Aviation (MD-RA)

By Don Hatch

As Canadians we are able to avail ourselves of the opportunity to build and fly our own airplanes. However, this privilege would not be possible without the Minister's Delegates – Recreational Aviation (MD-RA) program, and their volunteer inspectors.

MD-RA grew out of what was formerly known as Airworthiness Inspection Representative-Amateur Built Aircraft (AIR-ABA) which itself evolved from the Designated Amateur Built Inspector (DABI) program. Prior to the mid 1980s, government inspectors certified amateur-built aircraft, but cost cutting measures forced Transport Canada to delegate this responsibility to volunteer inspectors. Transport Canada employees Gary Clayton and Harry Barr approached Bill Tee and he cooperated with them in setting up training courses and exams for inspectors. Dick Eaves also participated and he became the first volunteer inspector. The second was Bill Tee. Jamie Alexandre was also involved in the early years. The administrative paper work was initially handled by EAAC and later by RAA Canada. In 1995 DABI became AIR-ABA, headed up by Allan Mahon, who was appointed by Denis Doyle, President of RAA Canada at that time. By 1998, all Provinces were covered by 64 inspectors. MD-RA was formed early in 2000 with headquarters in London and RAA Canada was no longer involved in administration.

The foregoing is merely a brief summary of the history of the transition of amateur-built aircraft inspection from government to volunteer inspectors. A detailed history describing the activities of the many dedicated people involved has never been written. Perhaps this can be the subject of a future article. What follows is a summary of what is occurring today.

MD-RA is overseen by a corporation known as Recreational Air Services with Allan Mahon as President, Pierre Fournier is Vice President and Jamie Alexandre is Secretary-Treasurer. Allan responds to Don Sherritt, Director of Maintenance and Manufacturing at Transport Canada, There is a Board of Directors consisting of Allan, Pierre Fournier (Quebec) Jamie Alexandre (Ontario) Wayne Grimes (Nova Scotia) Ed Slivinski (Manitoba) Arnold Forest (Alberta) and Terry Elgood (B.C.). All of these people are volunteers, receiving only travel expenses as they occur. The board meets once each year and is responsible for setting inspection fees, training programs, fiscal accountability, insurance and hiring personnel. Gerry Haliburton was hired as Office Manager of MD-RA in late 1999.

Allan continues to expand MD-RA's services. As a result of his proposals to Ottawa in 2006/2007, MD-RA has been awarded new responsibilities to inspect Canadian amateur- built aircraft being constructed in a foreign country, where existing inspectors are not available. Additionally, MD-RA now performs import inspections, and by year-end will be issuing final or permanent Certificates of Airworthiness (C of A) on all Canadian and imported amateur-built aircraft. It is MD-RA's goal to be a one-stop centre for all amateur building needs.

It is obvious that MD-RA activities are increasing substantially

The MD-RA office in London is a very busy place. Recent increases in activity have necessitated the hiring of Shirley Cameron on a part time basis (three days a week) in order to keep operating in a timely fashion. The following statistics indicate the extent of the current activities.

MD-RA Activities	2006	2007 (6 mo.)
Letters of Intent Filed	201	216
51% Determinations	56	34
Sub Assembly Inspections	70	N/A
Pre-cover Inspections	134	116
Final Inspections	142	85
Imports	1	7
Total Transactions (Invoices)	490	470

It is obvious from the above that MD-RA activities are increasing substantially. There are now 54 volunteer inspectors covering all of Canada. The number of final inspections has consistently been around 135-140 each year. The fees charged for the various inspections are shown below.

MD-RA Inspection Fees

(effective January 25th 2007, includes GST)

Letter of Intent	58.30
51% Determination	$307.40
Box Spar Inspection	$307.40
Pre-cover Inspection	$307.40
Supp. Inspection	$180.20
Final Inspection	$769.56
Import Inspection	$769 56

Note The 51% inspection fee applies on kits that are not on the FAA list of eligible kits.

The box spar inspection is only for wooden aircraft such as the Jodel.

The Supplementary Inspection is necessary only if a significant number of snags are found in the pre-cover inspection. It is at the discretion of the inspector.

In addition to the fees listed above, builders must remit inspectors for their traveling expenses.

Most projects will require only the Letter of Intent, pre-cover inspection and final inspection. A Certificate of Registration (C of R) must be obtained from Transport Canada before the final inspection. For some builders, the paper work may be a bit of a challenge, but help is readily available from the MD-RA office.

The fees help cover the operation costs of MD-RA, which is a non profit organization. An initial Transport Canada grant of $50,000 helped get MD-RA organized, but Transport Canada has contributed no cash since then. Support from Transport Canada does come however, in the form of supplying the curriculum and instructional staff for the re-current training that is required of all inspectors every two years. MD-RA inspectors will meet for training in Richmond B.C. and London Ontario in late September 2007.

The most popular amateur built aircraft in Canada are aluminum covered. Vans RVs account for about 30% of total projects, followed by Zenair and Murphy kits. Rag and tube is still a good share, but wood construction is declining. Helicopters are becoming more popular. A builder's manual has been available from RAA Canada in the past, but it is being up-dated and revised and should soon be available again.

As mentioned above, Gerry Haliburton is the manager of the MD-DA office located in London. He has had a long time interest in aviation. His father was a radar technician in the RCAF and Gerry obtained his private pilots licence at the Toronto Island Airport in 1972. He worked as an Air Traffic Controller for eighteen and a half years, operating out of Toronto Island, North Bay and London. He left the London tower in 1988 to pursue other occupations and joined MD-RA in late 1999. He is fluently bilingual which is not only an asset, but a necessity in his present position.

Anyone contemplating the construction of an amateur-built aircraft should contact Gerry Haliburton at (519) 457-2909, or 1-800-419-2111 or email him at md-ra@md-ra.com He will get you started on the right track. Also check out the MD-RA web site at www.md-ra.com. The mailing address is MD-RA, 2469 Aviation Lane, London ON. N5V 3Z9.

Rebel Ramble 2007

by Ken Lehman

After short stops in Wiarton and Gore Bay, we overnighted and cleared customs at Drummond Island where James Bailey runs the airport and a gas station and a cabin on the lake was available.

A thunderstorm chased us into Munising/Hanley Field the second night.

Third night was a great meeting/party/campout at Ashland Wi. at the SouthWest corner of Lake Superior.

Fourth night was Thief River Falls, Mn. after a stop in Grand Rapids. Across the border and customs at Piney where the runway runs N. and S. right across the border and up to Lyncrest at Winnipeg where there was another great party and BBQ. An enthusiastic group of folks there with an amazing growing airport. Then Moose Jaw municipal, Killarney Man. and on to Carlisle Sk. where there is a motel and gas station at the airport. Weather kept us there for two nights but great hospitality and we toured the area a bit.

On to Swift Current and Medicine Hat for the next night.

Next day was long but magnificent. After some maintanance we stopped in High River (S. of Calgary), past Lake Louise, Kicking Horse Pass, a brief stop in Golden followed by a long hot climb up and down the valley to 8500' then past Revelstoke, through Rogers Pass (whew) and onto Vernon in the Okanogan for another great visit , party, and overnight. Apparently 6500' will get you through if you don't mind watching your wingtip clearance but 8500 was confortable. We had clear skies and almost calm winds for the day.

One night in Chilliwack for tours of Murphy Aircraft and Rotac and of course great pie at the airport cafe.

The next two nights found us camping at the Arlington show. Weather delayed us a bit so we cleared customs at Bellingham and landed in Arlington after the airshow. You guessed it - another party at Arlington! Then S.E. to Ellensburg Wa., past a Boeing 777 doing circuits at Moses Lake and up to Sandpoint Id.

Next day the runway was closed at Libby Mo. so we continued on to Kalispel. Kalispel also has several new motels at the airport but despite a very high density altitude we pressed on past Glacier Park to Shelby for the night.

The following day found us having lunch in Glagow and then some guys stopped in Lewiston and some of us went to Tioga in search of mogas. A common theme seemed to be that airports have stopped supplying mogas because of insurance but almost everywhere had a courtesy car or gave us the keys to a vehicle when we mentioned that we were looking for mogas. With submersed fuel pumps and EFI, I am happy to run mogas at any altitude. I do try to avoid alcohol but I'll take alcohol over leaded avgas as I'm running an oxygen sensor, full synthetic oil, and an automotive fuel system. It would sure be easier with a diesel running on jet fuel though as most everywhere had jet fuel. Perhaps a future project... Anyway we all continued on to Devil's Lake for the evening and that was our record long distance day.

Next day found us in Grand Rapids again for lunch and on to Ashland for another campout and party.After a very bumpy flight to Manistique the next day it was lunch in the casino and since weather precluded further travel we all did a picnic supper at the motel across the road. One Rebel that joined us in Alberta continued on to Oshkosh. Last day was Drummond Island, Gore Bay for lunch and on to our respective homebases.

Once again I was very impressed by how helpful everyone was that we met. There seemed to be no problem crossing the border with a transponder waiver but every border crossing did require a passport and it was obvious that the US customs sticker should now be purchased by mail/internet before leaving home. Having camping equipment made the trip pretty relaxing. Oh, and I now carry a spare inner tube with me.

Across Canada

RAA Chapters in Action

CHILDEN PLAY BIG PART IN EXPO

The RAA Oshawa tent at the Canadian Aviation Expo 2007 was a busy place with sessions on welding for aircraft, construction of wood and aluminium wings, working with composites, seminars by Nav. Canada and Transport Canada. Two of the best looking show planes were on display with their builders out front to talk about them. But chapter members working there over the three days of the Expo said the was nothing more satisfying than watching the group of enthusiastic youngsters building wing ribs in the tent under the direction of experienced builders, then proudly showing off their work to their parents.

RAA members working at the show were tireless promoters of recreational aviation, none more so than the builders of the "show planes." In front of the RAA tent was an RV6-A built by Frank Granni of Cobourg and a Ch 601 HD built by Ed McDiarmid. On the airport flight line were two replica Spitfires, one a 2/3rd scale scratch built, beautifully finished wood and fiberglass creation by Ross Ferguson, an amateur built inspector and RAA member. The other was a 75 per cent scale built from an Australian kit by Dave Austin, also an RAA member. Both builders were busy throughout Expo answering questions about Spitfires and the difference among the various models.

In the RAA tent the youngsters building wing ribs could compare their ribs to the real ribs in a wing of a Christavia not yet covered which was brought to the show by John Colven. Peter Morrison demonstrated TIG welding and Wayne McCarron showed sections of his composite project to a steady stream of EXPO visitors.

Aircraft manufacturers and those who supply radio and navigation equipment were well-represented at the show again this year but the crowds missed the aerobatic air shows and military displays that were part of the 2006 EXPO.

Vancouver Chapter 85

Despite the unstable weather this summer, the chapter managed to get a few activities, including the AGM, a poker run, several barbeques. Member Adrian Cooper took a contingent of RAA types down to Reno as crew to race his Cassutt Ms Twitchie. Member Terry Elgood accomplished his first flight in his RV-9, and Bob Cutting's newly restored J-5 got some air under his wings.

RAA Director Terry Wilshire presents Bruce Prior with a COPA Award of Merit at the September chapter meeting.

Jean Prior held a suprise birthday party for husband Bruce at Delta in July, and Bruce was recipient of a COPA Award of Merit for his work in DHAP-COM, the organization responsible for running Delta Heritage Airpark.

The Chapter 85 AGM was on 2 October. Officers elected or reelected for 2008:

President: Tim Nicholas (elected)
Vice-President: Terry Wilshire (reelected)
Secretary: Jim Hunter (reelected)
Treasurer: Carol Foley (reelected)

Custodian/Librarian: Robin McNamara (elected)

Program Chair: Chris Cutting (elected)

Directors: Eric Munzer (reelected), Don Souter (elected)

Sean Walker completed his Private Pilot's license and is now terrorizing the skies in Colin's Emeraude... It's good to see it flying again.

Charlie Longstaff's Emeraude has completed it's year-long in-hangar restoration and is also flying again.

Gogi Goguillot's memorial at the Canadian Museum of Flight in Langley was well attended by a large number of people. Pictures can be viewed at http://picasaweb.google.com/rob.prior.

Formation practices are starting this week, in preparation for the Remembrance Day flypast on November 11th.

Rob and Bruce Prior

Rideau Valley (Ottawa)

Our meetings are usually at the Field in Tom Bennett's hangar, first Tuesday of each month Feb thru November.

The last meeting featured a nice presentation by Phil Johnson on the EFIS system going into his Cozy MK4, the November meeting will feature Charlie Martel's flight to Vancouver Island and return. The December meeting will be at David Stroud's house and he'll demonstrate the wing folding mechanism and panel on my Fairchild 51 project.

No meetings January. The Feb meeting will be our AGM and will be back at Tom's hanger. featuring Michel Tondreau's presentation on his Hummelbird project.

David Stroud

Scarborough/Markham

Many chapter members are very grateful to Dave and Ann Austin who hosted the July and August Summer BBQs at their home again this year. These BBQs are a wonderful way of keeping up our mutual contacts and friendships over the summer months when a lot of flying is being done.

Our thanks and congratulations are due to Wally and Sandy Norris. The thanks refer to a really splendid party/corn boil which they hosted at their home in Valencia on September 8. The congratulations refer to the fact that Wally and Sandy were celebrating their 45th wedding

Tony Swain

Left: Gogi with one of his many completions, a Druine Turbi. This aircraft is still in use by Chapter members. Below:An SE-5A replica of Gogi's design is started up for the fly-by. Bottom, a pair of Harvards perform in Gogi's honour. More pictures can be viewed at http://picasaweb.google.com/rob.prior.

Rob Prior

Rob Prior

Harvey Rule, of Rideau Valley Chapter, after the chapter's recent fly-in.
Ah, for summer! Picture by Bill Reed.

anniversary.

This party has become an annual event at the Norris home. Perhaps that is a not-so-subtle hint for a repeat next year!
John Goodings.

The speaker for our October meeting will be Peter Muehlegg of Skywagon City Inc. (tel.: 705-484-5667, E-mail: parts@skywagon- city.com). Peter and his company have taken over from Herb Cunningham's Salvair. Peter will talk to us about salvaging aircraft, and what is available in used parts for homebuilt aircraft.

As is our habit, some of us will be meeting for dinner with our guest speaker at 5:30 p.m. before the meeting, at Kelsey's Restaurant in the Longos/ Home Depot/etc. plaza on the south side of Hwy #7, just east of Woodbine. If you can make it, please join us.

Our members should be aware that Peter James has forwarded $350 from our Chapter to cover « the mailing cost of an issue of the Recreational Flyer. An unexpected increase in the mailing rates created a serious financial hardship for the magazine.

At our November meeting, we hold our annual

Sneak Peek: Zenith Patriot

The Zenith Patriot 150 is a completely new all metal high wing aircraft from prolific designer Chris Heintz. The cabin is 46 inches wide for comfort and ease of entry, and has a large wrap-around instrument panel for customization with glass panels - it even has room for cup holders. Visibility is a full 360 degrees, and behind the seats is a large baggage area for overnight bags.

The handling is described as "exceptional". The new strut braced 123 sq ft wing has 32 ft 10" of span and provides a stall speed of 35 mph with flaps. STOL performance is a feature with 115 foot takeoffs and 200 foot landings. Cruise with O-200 is 118 mph with a range of over 600 miles, and top speed is 124 mph, Vne is 143 mph. Landing gear is rugged for training and off-airport operations.

Construction is Aluminium utilizing Avex pulled rivets as in all Zenair designs and uses the same construction techniques that Chris Heintz is famous for, though in the Patriot more attention to detail is quite noticable where form is considered just as important as function.

The new aircraft is delivered completely built and meets the US Light Sport category requirements when powered with the new lightweight Continental O-200. When powered with a Rotax 912S, the Patriot is a perfect fit for the Canadian Advanced Ultralight category.

At present the Patriot with the Continental O-200 is undergoing certification in the United States as an SLSA for the Light Sport Category marketed by AMD which is managed by one of Chris Heintz's sons. By mid to late spring the Patriot will be available in Canada as an AULA sporting a Rotax 912 ULS marketed exclusively by the Canadian distributor Can-Zac Aviation Ltd.

For more information please visit Can-Zac Aviation's website at www.canzac.ca.

VNE (Never Exceed Speed):143 mph
Top Speed:124 mph
Cruise Speed (75%):118 mph
Stall Speed:35 mph
Rate of Climb:1,100 fpm

elections for the Chapter executive committee. Kingsley Butt, John Goodings, Bill Phipson and Bob Stobie will have finished their two-year terms. Helmut Bayer, Fred Briggs and Peter James will serve for another year. Please give some thought to letting your name stand for election. There is always a need for new blood on the committee, with new contacts and ideas.
Bob Stobie

RAA-TR

Summer Activities:

A very successful Chili Bash, with lots to eat on a beautiful evening – no rain this year! This is traditionally our first event of the year and the turnout was respectable, 45 hungry souls. There were 14 chilies, ample salads and lots of dessert. Obviously, everyone was famished because they ate everything - barely a crumb was left. The Monday night BBQs in the RAA-TR hangar saw a total of 510 people, so attendance was spectacular. The corn roast was wonderful – thanks to the extraordinary efforts of Jim Albright. This year saw a reversal of last in that all the pork was eaten up but some beef was left over. On May 18th to May 20 the chapter hosted the Zenith Fly-in. In all 120 Zenith owners, builders, dreamers and aviation enthusiasts made this first year event a success. The attendee who came the farthest is Peter Cove from Western Australia. Alain Ouellet reported the number of planes visiting the Zenith Fly-In was

Mike addressing the RAA-TR Septermber general meeting on the luxuries of flying in Canada.

26 and the net income from the event exceeded all expectations.

September meeting: One RAA-TR member's house guest from over the pond, Mike Jackson of the PFA (Popular Flying Association) giving an overview of the benefits of aviation in Canada vs. the UK. Amateur built operations in the UK are significantly different from Canada. For example the gas is $4/litre. This is creating quite a push to diesels. RV aircraft prices are in the range of 120k$ to 180k$, Cubs and Luscombes 36-40k$. A Falco (Italian) goes for 140k$. Eastern bloc kits are using the 100 hp Rotax and go for 72k$. $2700 a year for hangar rental (approx. the same as here) with insurance being 32k$ on the A/C. Everyone has to have mode-S transponders (cheapest at 3300$). Airspace usage is requiring a mode-S PLUS a VISA card # for the purposes of billing flight time. The PFA will shortly rename themselves the Light Aircraft Association.
Ian Parson

A young and foolish pilot wanted to sound cool on the aviation frequencies.

This was his first time approaching a field during the nighttime, and instead of making any official requests to the tower, he said, "Guess who?"

The controller switched the field lights off and replied, "Guess where!"

True story about Muhammand Ali: Once he was on an airplane. The flight attendant came and asked him to buckle his seatbelt. He replied, "Superman don't need no seatbelt." She responded, "Superman don't need no plane."

During class the skydiving instructor would take time to answer any First Timer Questions. One guy asked: "If our chute doesn't open and the reserve doesn't open, how long do we have til we hit the ground?" The jump master looked at him and in perfect deadpan answered: "The rest of your life."

MOTO

Long time readers will recall my statement that I am so enamored with amateurbuilts that I would never own another factory certified aircraft. They may also recall my admission that I had lied as I bought a Diamond motorglider a few years ago. I couldn't help it, my cheque book slipped.

RGLIDER FLY-OFF

Certified Diamond Extreme vs. Kit Europa And How You Can Get Into Gliding/Soaring

by Ken Armstrong

By now, you will also know I am hopelessly in love with the soaring sensation and my wife is also delighted with the pleasure the motorglider brings. But, I had reservations. On researching the kit-built Europa one observes many apparent improvements in terms of payload, lower purchase and operational costs and some minor performance enhancements. It was mandatory that I sample her wares and decide accordingly. The opportunity provided itself at the Sun 'n Fun fly-in.

Kit Versus Certified

Apples vs. Oranges? Not really. There is little difference, if any, between certified aircraft and kit-builts nowadays. I generally prefer homebuilts because I can accomplish my own maintenance and performance enhancing modifications. Whether I could find time for these pursuits may be arguable….

Honesty Amongst Mistresses

To be completely open on this comparison, it's necessary to point out my machine is a normally aspirated tail dragger and the tested Europa is a turbocharged (Rotax 914) mono wheel resulting in a comparison between 80 and 115 hp engines. (Specifications and performance stated below will compare

Top: the Europa's prop feathers for gliding. Centre: the front office. The main wheel retracts into a tunnel between the two seats, making the legroom a little narrow. above: the Europa comes ahead in the baggage department.

turbo Xtremes to the Europa in fairness.) It should be noted both aircraft are available in tricycle gear and are easier to handle – although they are heavier and glide less well due to the increased drag of the training wheel. The alternate Gear for the Europa is a centerline main and tailwheel with outriggers.

Appearances Are Only Skin Deep

Undoubtedly, my Extreme is prettier with her sleek lines, aggressive nose up attitude and looooong sleek wings. (Mind you, that 54.5 foot span is also a detriment during ground handling compared to the Europa's trim 47.25 feet.) Since they have approximately the same glide ratio the Europa planform and wings could be said to be more efficient in total.

The Europa is a rather short chunky flivver, but this is not as bad as one might initially guess. Firstly, the cockpit is considerably wider and the baggage area bigger - and yet the aircraft has an empty weight that is better than 300 pounds lighter. The breadth is countered by slightly reduced leg room such that tall pilots might want to check out the higher canopy option to accommodate their abundance. The adjustable pedals in the Xtreme accommodate more pilot variations and are very comfortable for folks to altitudes of at least six feet.

The new Europa wing utilizes more advanced composites and technology in many respects and the lighter and the overall smaller dimensions of the homebuilt result in a lower basic weight and the ability to carry a hundred pounds more useful load at a gross weight, which is 250 pounds under the Xtreme's. Creator Ivan Shaw hired British Aerospace Chief Aerodynamicist Don Dykins (Airbus wing creator) to design the demanding motor glider's wings and he has succeeded admirably. Incidentally, both motorgliders shed their wings easily for storage and the Europa has the additional benefit of being able to wear the normal Europa XS "stubby" wings for owners who shift between soaring and long distance flights. The glider wings are suitable for both realms in my opinion.

Getting Around the Airport

My Xtreme taxies very well via the direct linkage tail wheel steering as long as one recalls the airliner-like wing span and fairly large turning radius. (The trikes can turn on a dime and provide 11 cents change.) Although differential brakes are a $7000 option, my bird applies the brakes evenly to the two main gears via a linkage at the maximum extension of the dive brakes/spoilers. With the excellent directional control of the rudder and steerable tail wheel this has been quite adequate.

I'm sure the tricycle geared Europa is similar to Xtremes with nosewheels; however, the Monowheel version is slightly tipsy on its outriggers and has been deemed very challenging to control during portions of the take off and landings. More later… Also, there is some sloppiness or delay in the tailwheel steering that leaves it feeling slight less than positive. A hand brake installed on the center console provided adequate braking but could not be locked as a parking brake due to its geom-

etry on the large centerline tire.

The Xtremes use an MT Propeller's constant speed system with settings for automatic governing and full feathering. Europas typically install an Airmaster AP 332 three bladed composite construction propellers with an adjustable pitch system that allows selection of these modes: Take Off, Climb, Cruise, Hold and Feather ($3,990 US). The system worked well in all modes and while it does not have a constant speed capability, none was necessary. The "hold" setting allows pilots to manually adjust the propeller rpm to a desired setting. The Europa three blade had a slimmer leading edge and my guess would be considerably better performance in terms of efficiency due to lower profile drag and a higher solidarity ratio – but I have no definitive data on this.

Runway Considerations

Neither type has flaps, nor do they need them for take offs with their high lift wings. With my Xtreme, one lifts the tail at 40 KIAS and levitates at 45 knots in approximately 600 feet at gross weight. The turbo versions of these motorgliders both use one hundred feet less and climb at better than 1300 fpm compared to my optimum 800 fpm – all according to manufacturer's published data. While I find the Xtremes easily match that published data, the Europa's take off left 1000 feet behind us and yet it yielded a rate of climb in excess of 1400 fpm. It is to be expected that the Europa should out climb the similarly turbo'd Xtreme due to its similar L/D and power while propelling a lighter gross weight. The Europa folks were obviously conservative in stating the rate of climb.

When John Hurst transferred control to me after take off I lowered the nose to improve visibility and climbed at 115 mph with 550 fpm showing on the VSI as this provides an excellent cruise climb configuration. Relatively speaking, Xtremes are considerably quieter in the climb as I usually forget to turn on the electric noise canceling feature of my headset. Visibility over the nose is also much better as the fuselage sits more nose down on the wing planform with the Diamond.

In Flight

Levelling off at 5000 feet (far from the turbo's optimum cruise altitude) approximately 75% cruise power and pitch were selected to provide 152 mph TAS. Control response was good with control forces increasing with speed and the harmony was good between axes and pitch stability was excellent. The Xtremes have light pitch forces but rudder and aileron are heavier. Additionally, pitch stability in my Xtreme is close to neutral at cruise power settings in the 121-128 mph

If you haven't experienced soaring ...visit a local soaring club and arrange to go flying during a day with great lift. Careful, it's addictive!

range. Turbocharged Xtremes cruise approximately ten mph slower than the Europas in my experience. With the turbocharged engines, the desired cruise speed is really a function of altitude. The diminutive Rotax 914 can put out full rated cruise power to very high altitude. Either of the turbo version can cruise in the 180 mph range by donning an oxygen system mask and climbing into the high teens. Of course, we soaring types would rather climb up to those altitudes with the propeller feathered…

Visibility is very good in the Europa during cruise flight. However, it is superior in the Xtremes as they have no canopy structural members blocking any of the view – nor do they have as much obstruction from the wings below. Vibration levels were quite low in both types; however, the Europa was considerably noisier and this might be attributable to the engine exhaust/propeller noise gaining access to the cabin via the center wheel well. Exhaust fumes also found this route on occasion at low airspeeds.

My Xtreme dive brakes/spoilers provide real thrills to myself, passengers and tower controllers with their ability to provide essentially vertical descents without exceeding VNE. This is greatly lacking in the Europa. Instead of spoilers which have the dual benefit of increasing drag and reducing lift for serious descent angles, the Europa uses a trailing edge dive brake. Because this location provides less strength, the brake may only be deployed at speeds below 87 knots – unlike the Xtreme's 141 knot (Vne) limitation. Mind you, one likely wouldn't want to

Diamond Vs. Europa

Specifications and performance data is supplied by the manufacturers.

Aircraft type:	DIAMOND EXTREME	EUROPA MOTORGLIDER
Engine/power:	Turbocharged Rotax 914 of 115 H.P. (both aircraft)	
Approximate Price:	$150,000 U.S	$75,000 U.S.
Wingspan:	54.5 feet	47.25 feet
Wing Loading:	10.3 LBS/SQ.FT.	10.14 OBS/SQ.FT.
Length:	23.6 feet	19.2 feet
Height:	5.75 feet	4.33 feet
Empty Weight:	1189 pounds	880 pounds
Gross Weight:	1698 pounds	1450 pounds
Fuel Capacity:	20.1 U.S. Gallons	18-28 US Gallons

deploy the Xtreme's spoilers at that speed as it would be similar to meeting up with a brick wall whilst having the floor drop out from under you. Nonetheless, the much stronger and infinitely more powerful capabilities of the Diamond's spoilers provide greater capabilities and additional safety. For instance, the Xtreme can land shorter with the extra drag and overcome a monster cloud's attempt to suck the aircraft within its maw in large lift.

The lackluster drag from the Europa's dive brakes requires relatively shallow glide paths for landing unless one wants to use the moderate side slipping abilities. My experience is that most pilots are uncomfortable with out-of-balance flight and avoid same. On the positive side, the Europa gear can be extended at any speed up to Vne – although it does not create much drag at approach speeds. The wing outriggers are not retractable (unless you modify the system – remember it is a homebuilt). I should expand on the retractable gear aspect of the Europa. While this drag reduction undoubtedly results in a slight increase in cruise speed, pilot/owners should consider the additional maintenance, pilot workload (remembering to extend same for landing) and the increased insurance rates and proficiency requirements that might apply.

Both aircraft predictably provide prodigious adverse yaw due to their long wings and inertia, however a slight input of rudder easily eliminates this effect. It's good fun to introduce feet-flat-on-the-floor pilots to these lean, long winged machines so they can learn the use of rudders again – if they ever learned.

Both cabins are reasonably comfortable for the typical 3-4 hour flight durations and it should be noted an optional fuel tank that easily fits in the baggage area cutouts can extend the Europa's range a couple of hundred miles.

Landing Handling

I've been told that the Florida Europa office's insurance does not allow for prospective customers to take off or land the aircraft and it might be apparent why. Our take off was a little wobbly on the big "Tundra tire" laterally and it possesses some pitch sensitivity as well. John's landing made the aircraft look difficult to fly and I am not being critical of his piloting abilities as I have been told he is quite competent. Nonetheless, this implies the centerline tire taildragger with outriggers isn't something that leaves a pilot with a warm fuzzy feeling in the runway environment. This large low pressure tire is optimized for unimproved fields – the sort that gliders often land within – but I would recommend the tricycle or optional three wheel conventional gear on the Europa for most builders. Although they will cost 9 mph in cruise speed and add 30 pounds of weight, the re-sale value would be greatly improved.

Conclusions

When considering this apple to orange comparison, readers should take into account that the Xtreme is certified and must meet numerous requirements not demanded of the Europa – for what that is worth – to you.

My personal decision has been to not proceed at this time with the Europa kit aircraft as there are trade offs I am not prepared to accept and of course there is the little consideration of devoting a year or more of my life to the construction when I could be out soaring…. Also, I like to be able to call my supplier, obtain an answer in reasonable time and parts shortly thereafter. As I age, become more conservative and demanding of service providers, this seems to be more important.

Alas, it turned out that while the Europa would offer some improvements in areas I seek, the trade offs for lesser performance in other areas is currently unattractive to me. While neither manufacturer will be delighted with my evaluation results, "the facts are the fact ma'am."

These motorgliders offer a broad spectrum of performance and safety enhancements with their flight envelopes and therefore warrant consideration

Having said that, the Europa series of aircraft enjoy exceptional success with more than 700 flying worldwide – ditto for the Diamond motorgliders. Shortly after my evaluation, the Europa operation went into receivership and then after several months was re-established and has been operating successfully since. Stability is always more of a consideration with kit plane manufacturers – although this phenomenon occurs with certified production as well (i.e. Piper etc.).

These motorgliders offer a broad spectrum of performance and safety enhancements with their flight envelopes and therefore warrant consideration by prospective builders and I heartily endorse both types. At half the price – if you don't count your building time – the Europa is a best buy.

For those of you who would rather substitute your coin of the realm in lieu of building time, may I recommend the Xtreme….

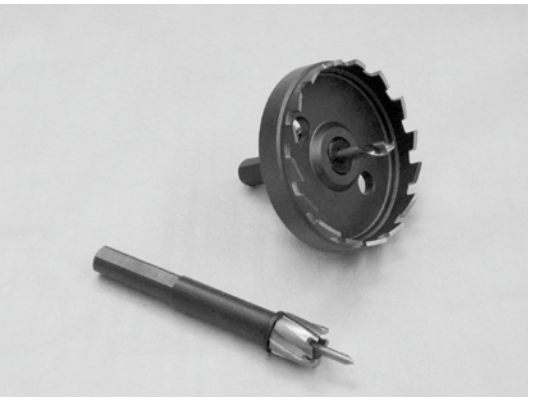
How Do You Get Into Soaring?

You must be at least 16 years of age and able to hold a category 4 medical and complete a minimum of 15 hours of glider pilot ground school instruction and obtain a minimum of 60% on a fifty question exam. Flying qualifications require a minimum of 6 hours of flight time, including: a minimum of one hour dual command instruction flight time and two hours solo flight time; and a minimum of 20 takeoffs and 20 landings. Typically the training will cost about $2000. CARs 401 subsections provide more detailed data. While there are some commercial gliding schools around, most would-be soaring pilots train at a Soaring Association of Canada clubs (www.sac.ca/) found across Canada. A brilliant method of obtaining a huge amount of gliding/soaring data is to purchase the $6 (includes postage and handling) CD of all SAC Free Flight magazines from 1981 to present including all articles and photos from the editor, Tony Burton t-burton@telus.net (403-652-4563). This is a best buy and the CD I most treasure in my collection.

It is not uncommon for elderly pilots, in my age group, to allow more "senior" licenses to lapse to private pilot levels and for still others unable to hold Class one or three medicals to turn to soaring for their aviation pleasures. Mind you, my reason for devoting much of my time to soaring has nothing to do with these considerations; I simply love the freedom of the silent flight and challenges associated with discovering Mother Nature's secrets. Moreover, when it comes to the motorglider version of gliders, I happen to feel that the little speed one gives up at the top end of the spectrum is more than made up for with very short runway requirements, great lifting ability, inexpensive flying and greatly improved safety margins associated with the ability to glide long distances.

If you haven't experienced soaring – or even gliding for that matter, visit a local soaring club and arrange to go flying during a day with great lift. Careful, it's addictive!

Sheet Metal Hole Cutting



By Don Sinclair / We have all used standard drill bits for creating holes in our sheet metal, but as the holes get larger, standard drill bits are not always the best choice. When cutting larger holes there are few items that become more important than when making smaller holes. These considerations include creating a round hole, keeping the centre where wanted, having the finished hole the diameter we intended, preventing the material from being distorted in the work area, and of course safety, both of the operator and the surroundings be it other people, tools, or aircraft structure.

One of the least expensive ways to create large holes in sheet aluminum is the single blade fly cutter. There is a reason this is the least expensive (under $20) way to cut holes of various sizes, and while it can create a good quality hole up to several inches in diameter, extreme care must be taken not to injure the operator or damage the work. The material needs to be securely clamped and the tool used in a very slow turning drill press to obtain good results. Attempts to use a fly cutter without taking these precautions or using it in a hand drill can easily become disastrous.

A slightly safer approach is to use a single size bi-metal hole saw (under $10 for each size). This type of tool can create an acceptable hole, but again, there is a reason they are relatively inexpensive. Hole saws are easily dulled after a small number of holes, often resulting in the bit wandering and therefore leaving enlarged or oval holes.

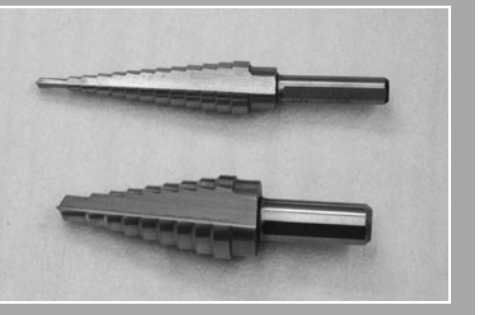
A better quality and significantly safer result from the first two mentioned methods can be obtained using a step drill ($15 each to $75 for a set of good quality bits). Like any type of tool, there are a variety of qualities out there, but versions up to about an inch are readily available. Once you have used this kind of tool, you will not want to go back to a fly cutter or hole saw when making holes of up to about an inch in diameter in sheet metal.

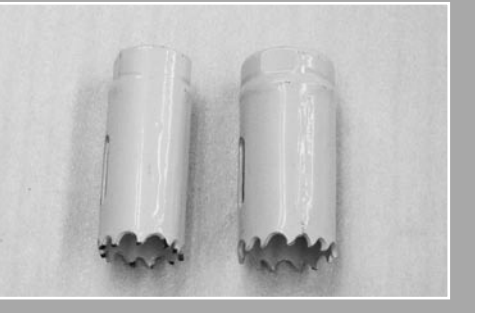
A superior tool that doesn't require much force applied to the sheet metal, thus virtually eliminating the chance of distorting the work area, especially on very thin material, and one that produces a high quality hole with very little burring, are 'Annular Cutters'. One manufacturer of such annular cutters is Hougen (www.hougen.com, picture 1) and is available from a number of sources including the homebuilder tool supplier Avery Tools in Texas (www.averytools.com). Product names from Hougen include Rotabroach, RotaCut, and Holcutters. These cutters safely create accurate and clean holes in sheet metal up to a couple of inches in diameter with little chance of hurtling your work across the shop. Material thickness of up to 1/8" or ¼" can be cut depending on the tool diameter. The smaller sizes (up to ¾" in diam-

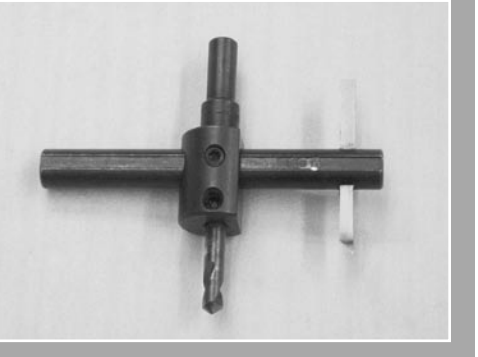
continues

Top Down: Hougen's Annular cutter, Rotacut kit; Holcutter kit; and example of a hole cut by the Rotacut kit.

eter) do not even require a pilot hole, but rather just a small centre punch mark. Unlike most other tools for cutting larger holes in sheet metal, these cutters are to be turned at a high rpm, an important factor in producing excellent results. Kits of six or seven sizes are available from Avery ranging from $75 for the smaller sizes up to $185 for the larger sizes. Like all high quality tools, once you have used these cutters, the lower quality ones in your tool collection gather dust.







Top: a step drill - good for small holes. Centre:A simple holesaw produces acceptable holes but dulls easily and can wander; Bottom: a flycutter. Watch your hands and clamp your work.

Affordable Glass Panels

This is a brief overview of the SensorNetics Aviate! series, a new family of compact lightweight colour graphic "Glass Panel" instruments offering powerful functionality at an affordable price for non certified light aircraft.

Powerful Functionality

Full engine information system (EIS) and VFR flight information system (VFIS) functions are provided in all instruments including:

-24 input channels for standard and auxiliary EIS/VFIS measurements

-2 Tachometer inputs for RPM and/or Fuel injector duty cycles (or twin engines)

-2 Fuel Flow inputs allowing for re-circulating fuel systems (or twin engines)

-2 RS232 inputs for GPS, compass, and/or attitude sensors

-2 RS232 outputs for 3rd party systems including PDAs and laptop PCs

-1 adjustable Audio Output for audible warnings and/or audio feedback

-1 Alarm Output for a panel mount warning indicator

-Optional 4 to 16 EGT/CHT thermocouple inputs, or 8 to 32 high performance inputs

There are virtually unlimited engine, aircraft system, and flight instrument combinations possible, so sensors are available separately. You can use sensors you already have, or choose from a wide selection of standard or custom sensor and cable packages for ready to go installation. Sensor excitation and linearization is built in for simplified wiring.

The system can be extended further with a number of options. A voice annunciator option can provide "eyes free" checklists, readouts, cautions, or warnings. Data can be recorded in a number of standard and custom formats using a secure digital (SD) memory card or USB FLASH drive for initial flight testing, flight playback and review, trend monitoring, or even complete flight and systems history over the life of the aircraft.

Highly Flexible

A variety of display instruments are available to match your panel size and budget, including:

-CC series at 3.25" x 2.75" for tight panel spaces and light weight (from $720 US)

-CC B series round format for standard 3-1/8" instrument knockouts (from $769 US)

-CC E series in a radio stack size of 6.25" x 2.75" (from $769 US)

-MC series popular medium size 6.25" x 4.5" for larger panels (from $1420 US)

-LC series high resolution 8.5" x 6.25" for large display presentation (from $1920 US)

A touch screen option is available for the LC and MC displays to make context sensitive setups and data entry easy and intuitive without wasting panel space with a confusing array of multifunction keypads.

For easier installation an EIS/VFIS data acquisition module can be remotely mounted on the firewall and connected to one or more panel mounted displays with only four wires going through the firewall bulkhead. This allows the (many) engine sensor wire runs to be short and direct to the acquisition module for easier installation and weight saving.

For limited budgets you can use an existing PDA or laptop as a (removable) panel display, including an optional Bluetooth wireless link for convenient cable free connection.

All displays are colour graphic based for maximum flexibility. Multiple standard and custom screens can be configured free of charge by the factory, or via a PC program (available 2008), to display the data you want, when you want it, and in a concise format of your choosing. You can present data as text, bar graphs, trend graphs, and/or analog style dials in familiar or novel formats. All sensors on the market are supported and any unused input channels can be configured as auxiliary sensor inputs.

Timers can be configured for flight timing, in-flight reminders, and maintenance reminders You can also add your own bitmap screens, custom checklists, custom annunciators, and general information screens for in-flight convenience.

Screens can be simplified to display only the data you need for any VFR flight mode from pre-flight, through cruise, to post-flight, with everything else being monitored in the background. Multiple alarm levels are programmable for all measurements, and if an alarm condition develops a bright LED indicator will flash, an audio tone will sound, and the screen

will flash the specific alarm condition so you won't miss it.

If you have one of the popular Grand Rapids EIS systems with a serial output, you can easily add a SensorNetics colour display to show the same data graphically, along with all of the other extra functionality described above.

Smallest Footprint

All instruments are very compact with display areas maximized and bezels minimized to optimize precious panel space while providing the most viewing area. They are typically no more than 1.5" deep for easy installation and are smaller and lighter than any competing system.

Power consumption is also very low to reduce loading on your electrical system and/or operate on small auxiliary battery supplies. The units will operate down to as low as 6 volts, and can be left powered on while you start your engine without dropping out or losing your settings.

Reasonable Cost

Savings through design for manufacture are passed on to you. The EIS/VFIS modules use high density surface mount technology for smaller size and reduced cost to manufacture, and are common to all models to provide savings through high volume manufacture. Flexible input electronics eliminates the need for expensive sensor conditioning circuits and allows for the use of many reliable low cost automotive sensors. You also do not pay for arbitrarily bundled sensors that you already have or that you may not want.

Background

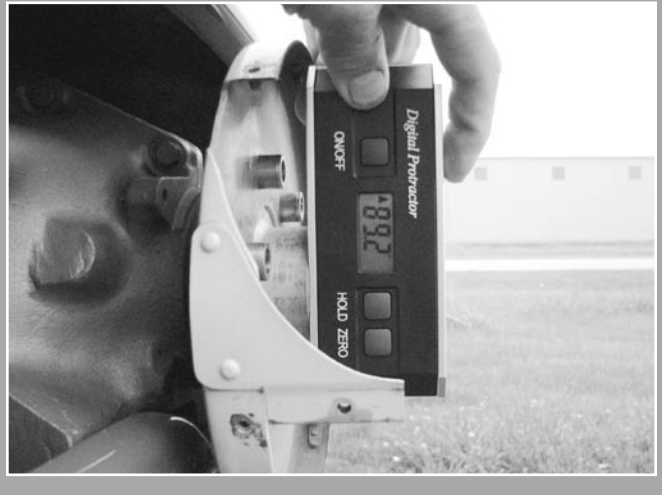
Gary Loubert is the president of Ottawa based SensorNetics Inc. and has over 25 years of design experience in microprocessor based instruments and sensors. He has been responsible for the development of more than 80 products to date, selling in over 100 countries worldwide. SensorNetics Inc was founded in 2004 to design and manufacture products that promote safety, economy, and enjoyment of light aircraft. For more information please go to *www.sensornetics.com*

Filter cutter

As an aircraft owner I have the right to change my own oil, and inspect my own filters. This applies whether the airplane is certified, amateur built or an ultra light. To inspect the oil filters you need a tool to cut the metal containers open. There are commercial cutters available ranging from $50 to over $200. The most common ones used by owners are the $100 variety. I never owned one as it seemed like a lot to spend for something that happened two to four times

Busy Bee's Digital Protractor

Many years ago I had a Smartlevel, and it was accurate and very handy for setting dihedral, checking control surface deflections and wing washout, and for ensuring that a wing building table was not twisted. Unfortunately that tool "grew legs" and I was reluctant to spend $175 for another one. Busy Bee Tools now has a $69.95 version that performs just as well as the original. It reads out to one-tenth of a degree and can be easily calibrated for a true and accurate level. Alternatively it may be zeroed when resting on any surface, whether level or not. This is useful if you are trying to determine up or down thrust on an engine. Even if the plane has not been levelled, zero the tool on the airplane's longitudinal datum. Then apply the level to the prop flange to read its angle, in this case 89.2 degrees. For more info: Busy Bee #B 2647 $69.00 www.busybeetools.com



a year. I borrowed units, which did not work that great and more often than not, I did not inspect every filter.

Filter inspection is a cheap and easy way to have a look and see what is going on in your engine. I did not feel good about not doing this essential job and as I did not like the commercial cutters that are available I decided to see if I could make one to use myself. Most tools work on a pipe cutter principal with a little cutting wheel that gets progressively tightened with each spin around the filter. These work ok but it takes a bit of time.

To build one I used a slightly different approach; I use lever action rather than a thumb screw to apply pressure to the cutting wheel. What I discovered was, that with this method the cutting wheel breaks through the metal within about an inch of movement and then once around the filter cuts the top off cleanly.

The tool worked so well I showed it to a number of mechanic friends who were very impressed with how easy the cutter worked. With this encouragement I had a computer model drawn up and parts laser cut and heat treated so that I could offer this simple tool to other aircraft owners at a economical price of $53. Cleveland Tools will be retailing this tool as well as myself.

Almost all Lycoming filters have an insert that protrudes from the filter and my Tool spins around this threaded insert. For those filters that do not have inserts, such as most Continental and Rotax filters, I include a threaded bolt that will provide this pivot point. I have also incorporated a second lever hole so that the Tool can be used to cut open the small filters that fit the popular 912 Rotax series of engines.

I also provide instruction pages that describe not only how to cut open a filter but also how to actually inspect a filter. The whole process takes about fifteen minutes and should be done each and every time you remove a filter. RAA

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On the web: www.cleavelandtoolstore.com

Technical Stuff

Push or Pull?
Eustace Bowhay on
Fuel Injection vs. Carbuettors

I'd like to pass on my experience with fuel systems over the years and as related to my RV-6.

All of my flying with horizontally opposed engines since the sixties had been with fuel injection until my RV-6. At the time of building the -6 I didn't think I had a choice, with Van recommending only the 0-320 and 0-360 Lycomings.

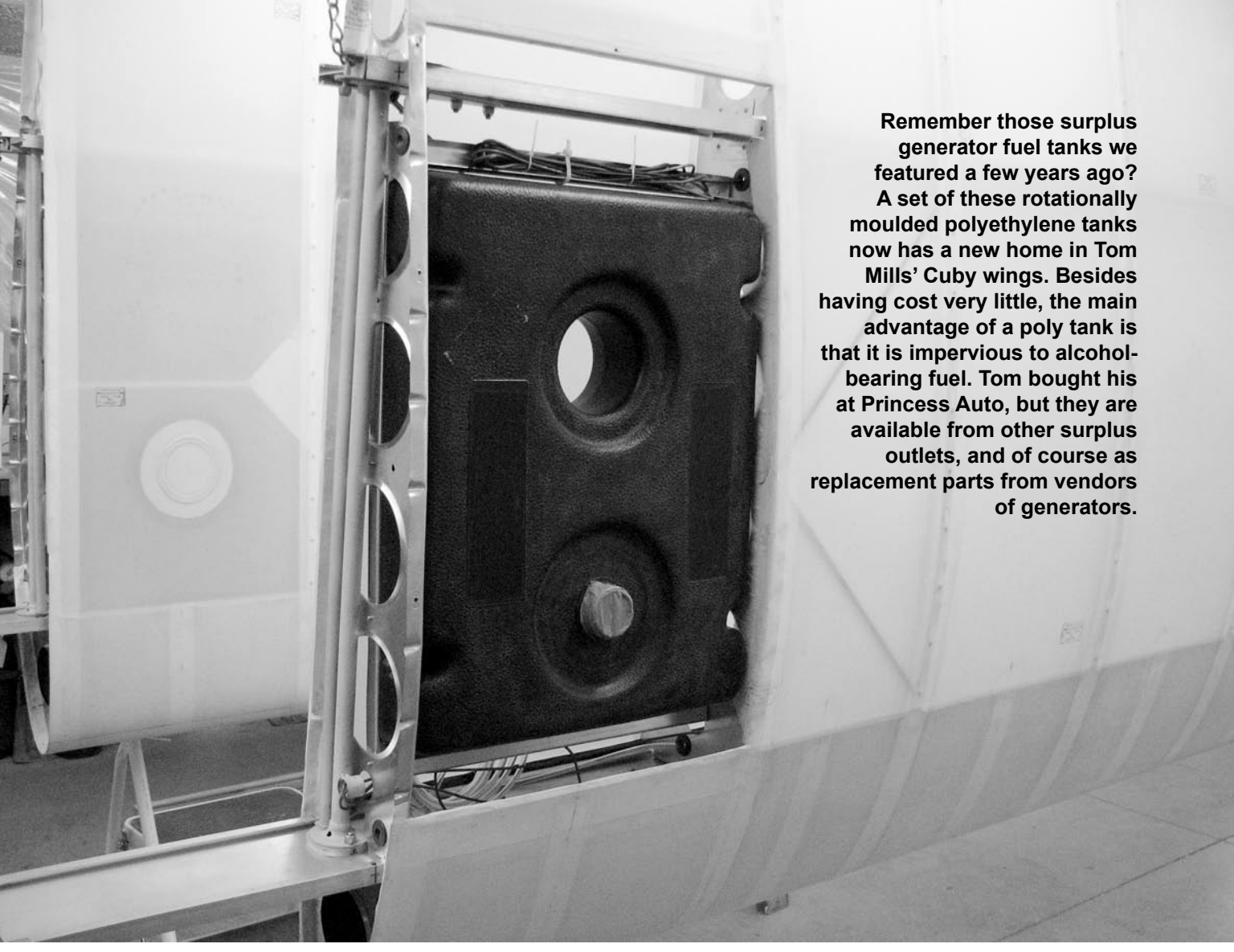
My choice was the 0-360. With most of our flying here over hostile terrain and sparsely settled areas, I decided to install the Gem graphic display. This would give me advance warning of any valve problems, as well as mixture and ignition info. This is when the wide spread in mixture to the four cylinders showed up, and having to lean to the leanest cylinder wasn't really the most efficient.

Carb icing was a bit of a concern, with the difficulty of getting what I felt was adequate hot air for carb heat. Turned out to be a non-issue, with the crossover exhaust system located over the alternate air door.

I had my engine overhauled in 1996, and decided to give the Bendix Fuel Injection a try- a system I was familiar with. This is a big change, requiring a change in both the engine driven pump. and the boost pump, because of the higher pressure and the extra plumbing required. This was another reason for moving the gascolator into the wing root (so that the gascolator would not be pressurized). I mounted the Weldon pump on the fuselage side of the firewall above the rudder pedals. That wasn't ideal, because of the lift, but didn't want it in the engine compartment because of the heat and starting problems associated with fuel injection on short turnarounds. This problem was completely solved with the installation of an AirFlow Performance purge valve this year.

Flying with the fuel injection system is a real treat, to see the EGTs straight across, and the CHTs almost the same. The leaning is now the same on all four cylinders. Carb ice is a thing of the past.

So which system is the best? Here again I think it is a matter of personal choice. Cost is certainly a major factor with fuel injection. I believe fuel injection is more reliable but can honestly say I haven't



Remember those surplus generator fuel tanks we featured a few years ago? A set of these rotationally moulded polyethylene tanks now has a new home in Tom Mills' Cuby wings. Besides having cost very little, the main advantage of a poly tank is that it is impervious to alcohol-bearing fuel. Tom bought his at Princess Auto, but they are available from other surplus outlets, and of course as replacement parts from vendors of generators.

had any trouble with either. It's hard to beat the simplicity of the carb system, and in my opinion a carb gives easier all around starting with less wear and tear on the starter and battery. However, fuel injection has to be better for the engine because of its even fuel distribution and better leaning, and has the added benefit of no carb icing problems.

I am looking seriously at the Airflow Performance system for the -6A because of the pump ($300 versus $1000) and the purge valve. It uses a large capacity inline filter (I believe between the pump and the throttle body) that I would like to know a bit more about. I'll also use the Andair gascolator for its better quality and easier servicing.

Elevator Rigging
EAA Technical Counsellor/Coot Builder's Newsletter

It's a good idea not to have too much play in your elevator system. One way to test for this is to tie the control stick in the full forward (nose down) position. Place a straight-edge on top of the stabilizer at the outboard hinge position and let it project out over the elevator. While holding gentle downward pressure on the trailing edge, measure the distance from it up to the straight edge. Repeat this measurement with gentle upward pressure on the trailing edge, keeping the control stick secured full forward. The difference is the approximate free play in the elevator sytem. My old Coot had 1" of play from this measurement. Even with only 50 percent static balance weights on the elevators, I never had any flutter in the system flying at 100 mph. Carl Anderson brought this to my attention, and he wonders how much play other builders are finding with their Coots. My new on has only half as much play, and I think that would be a much better criterion to shoot for, especially if you expect to exceed 100 mph. RAA

Safety

Propeller Safety / Gary Wolf

Another non certified in-flight adjustable prop failure, this time on an O-360. It appears that the crack started from one of the internally-drilled holes for the blade retainer. In this case the engine mounts broke immediately, but fortunately the engine stayed within the cowling. The damages to the plane and floats will approach $50K. RAA prevailed upon this low-production manufacturer to recall all of his props, and he has done so. There were only two examples of this prop in Canada. The manufacturer has also agreed to remove the O-360 as a recommended installation. We have sent photos and a cautionary note to the TSB and to MD-RA. Since there is no more risk to Canadians and the manufacturer is acting responsibly, we are not naming him at this time.

A Hartzell or other certified constant speed prop costs only a few thousand dollars more than a non-certified prop, and the Hartzell comes with thousand of hours of testing. Many of the non-certified prop manufacturers do their testing on the customer. In this case it was a false economy - this pilot will miss the entire flying season while he rebuilds his airframe and dismantles his engine for inspection.

Top: The rebuild of the airframe begins here.
Above: the prop hub.

President's Message

continued from page 2

they can deal with the rest later.

Transport Canada Recreational Aviation

RecAv is in charge of Basic and Advanced Ultralights, and the department is composed of two people. One knows the regs well, but these days is spending most of the time on UAV's, a much more promising career path at Transport. The other is new at the job, unfortunately has only a passing knowledge of the regs, and makes the decisions. Three would-be importers of UL motorgliders discovered to their cost how capricious RecAv's decisions can be these days. There are already UL motorgliders on the Aula Eligible List, and these three applicants meet the requirements, but RecAv refused to list them anyway. It finally came out at the recent Industry meeting that RecAv's concern was that an Ultralight pilot might not have the skills necessary to fly a motorglider if the engine were shut off. We asked if the required risk assessment had been perfomed, but it appears that it had not. Heaven help our manufacturers, when the written rules can so easily be overridden by people with so little concern for the industry and so minimal a knowledge of regs and procedures.

Advanced Ultralight manufacturers may make changes to their Eligible List information by sending to RecAv a blanket amendment to their type definition. One manufacturer does not list "seaplane" as a landing gear configuration for his aircraft, yet recently there was a fatality in a float equipped example of his product. RAA's investigation into the matter revealed that the manufacturer had sent to RecAv a one-off permission for that owner to install floats. An Aula is supposed to meet all requirements of DS10141 in whatever configuration the manufacturer supports, whether he has given blanket or one-off permission. Further investigation brought forth that this manufacturer had actually given three one-off permissions within a two month period this spring. Now, it has not been unknown for a manufacturer to bend the rules a bit when issuing a one-off, knowing that his risk will be limited to that particular plane. One might well ask why RecAv would blindly accept three on-offs in rapid succession instead of a single blanket statement. Do the planes meet DS10141 with floats or do they not? The passenger was killed in this fatal accident, and at the very least Transport should be asking some serious questions; I am not holding my breath while I wait for an answer. Another dubious manufacturer awhile ago killed two people in one crash in his shoddily-constructed Aula, but there was no investigation by RecAv. The photos of the welds and the wing construction would make any pilot cringe. Transport RecAv made one phone call to the manufacturer, who assured them that everything was OK, and that was good enough for RecAv. Despite RAA's demands that Transport at the very least should call in his engineering documents for a review, nothing was done and this manufacturer is still on the Aula Eligible List. The fact that an airplane is on the Aula Eligible List should not be taken as any guarantee that it meets any standard at all. You must make your own determination of suitability for flight, especially if you plan to carry passengers.

Heaven help our manufacturers, when the written rules can so easily be overridden by people with so little concern for the industry and so minimal a knowledge of regs and procedures.

Rec and UL Permits

Members have been calling to ask about using a driver's license as medical for our Rec Permit, in the same way that Americans can use theirs for the Sport Pilot license. This will not be happening anytime soon, as Transport and the CAME's are dead against it. The US now has three years of experience with the Sport Plot license, and after a few more we might just be able to convince Transport that a driver's is enough. Not right now, though.

The UL Permit has some amazing privileges, especially when you consider that the regs require only ten hours of flight training. These requirements are a holdover from the early Eighties when no one had a license, and the typical UL was a flying lawnchair that landed at 20 mph and topped out at fifty. The planes were single seaters grossing under 600 pounds, or two place training planes of about 900 pounds gross, and the wing loading meant low landing speeds. Float flying has always been a privilege of the UL permit, and even now there is no training standard or signoff requirement. Later the definition of the Basic UL was expanded to 1200 pounds and the wing loading requirement was dropped in favour of a maximum landing speed of 45 mph. When the Aula category arrived in the early Nineties, the planes grossed at 1058 pounds, and flight in these was

added as a privilege of the ten hour license. When the category weight limit was increased to include 1232 pound aircraft, the privileges of the UL permit were again expanded to include these, on wheels or on floats, still with no requirement for formal float training. The latest crop of carbon fibre Aula's can reach 140 mph, and these too may be flown on the UL permit. The privilege of the UL permit also extends to any plane that meets the 1200 pound UL definition, no matter how it is registered. Some Cubs, Champs, Taylorcrafts, and other early light aircraft are all available to the holder of the UL permit, all after ten hours of training. No wonder the RecAv people have reservations about expanding the privileges futher to include motorgliders. It might be time to have another look at the training requirements and privileges of the UL permit.

By comparison the US Sport Pilot Permit has graduated training and privileges. The entry level allows the plot to fly planes that top out at about 85 mph, and its requirements are marginally more rigorous than our UL permit. The second training level is the equivalent of our Rec Permit and allows the holder to fly aircraft that are faster, not a bad way to gear the skill level suitable to the privileges. We should be looking at something similar here.

End of Season?

For most it is now the end of the flying season. We all tend to go into denial, and ignore the requirement to winterize our planes for storage. It is time to warm the engine and change the oil and filter, remove the plugs and oil the bores, plug the exhaust against condensation and critters, and remove the battery to be charged occasionally until spring. Jacking the plane to take the weight off the tires is a good idea, and maybe the tail should be raised to help keep the mice out. Buy a few boxes of mothballs and distribute them throughout the plane, especially at the wing roots and in the engine compartment. Check any nearby trees for branches that might hit the hangar during a winter storm, and then make your list of repairs and improvements that you could be doing while the snow is on the ground. Hug your plane. RAA

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Deadline for submissions is the first of the month preceding date of issue.
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0320 cylinders, complete. $1,000.00 OBO Phone 519 -323 -0026
Wanting to buy a 150 hp Piper Pacer. 604 536 5155, or email ddanylyshyn@hotmail.com

For Sale or Trade Pegasair project. Tackwelded fuselage, stainless firewall, subaru engine with gear reduction "O" time ,including engine mount and 3 blade ground adjustable propellor.$12000 O.B.O or trade for Rotax 912 engine. Heinz Genrich 905 648 0766

Lycoming for sale $6000. Lycoming LTO 360 A1A 180 HP, with accessories (constant speed governer and turbo not included), fiberglass pressure cowling included, stored for 12 years, 800 hours, no logs. Contact George at (647) 588-8544, Oakville, Ontario

For sale, 68" 3 blade GSC prop. 75mm pattern for Rotax 2 stroke pusher or early Rotax 912 tractor application. Appears to be unflown. $300 or best offer. Clare@snyder.on.ca or 519 574 4322

For Sale Fleet Canuck project. Serial No. 225. 4600 hours in logs.Fuselage and tail pieces recovered in Polyfiber. Wings to do. New bungees, aileron and fuselage cables. Some instruments, Narco 111B VHF. Polyfiber for wings, 18 gals plus Polyfiber coatings. Just like a Quick Built gives you a classic Canadian trainer for half the price of todays kitbuilt airplanes. No engine, but on-condition 0-200 can be had separately. $12,000. Kelowna 250-764-0880.

1/7 share in limited corporation owns C172-I based at Buttonville. No sales tax. Basic IFR. Price negotiable. For insurance reasons prefer 250+ hours. Phone 416-431-7282. Bob Stobie RAA 6816

Cougar (like Tailwind) frame and tail feathers welded, on wheels, Lycoming 0235 zero time mounted, some instruments installed, spars and a/c plywood for wings available$16,000, (519) 945-8731 nseiler@netcore.ca.

Rotax 582 2 stroke parts. One cylinder and piston $200, dual ignition complete $200, water pump shaft $50, misc other 503/582 engine parts, send email with your needs. garywolf@rogers.com

For Sale: 1967 Beechcraft Musketeer, fixed gear, fixed prop, low maintenance, stable IFR platform. Call Ian @ 416 318 4541 days, 905 693-0298 evenings for details

ZENITH ZODIAC 601 XL $49,900 ESTATE SALE Well built, flies great, Fun! 200+ hours. Jabiru 3300 120 HP, Sensenich composite gnd-adj prop, 5 g/hr cruise. Full 6 pk flight instruments, CHT, EGT, & FF, King com & xpndr. Options incl: dual sticks, strobes, nav/taxi/landing Lts, wheel pants, +more. Featured in RAA Mag. Owner/builder passed away. Contact Colin D. Noseworthy - located Callander, ON Canada Ph. 705-752-3665

Re-drive and components for Subaru EJ 2.2. Ross 2.17:1 Re-drive with flywheel and starter, Warp Drive 3 Blade 72" HPCF prop with spinner, all less than 200 hrs total time with original documents, also includes custom 4 into 1 SS header system. Package for $3500.00. Also have an Andair FS20-20-D2-6 duplex fuel selector for $250.00. Located Cochrane, AB, contact Gene at 403-932-4238.

EUROPA FOR SALE
Featured in the May-June issue of the Recreational Flyer. Rotax 914(turbo)Monowheel with 500 hours total time.Dual alternator,King transponder/comm.Garmin 295.Cream coloured interior.Located at London airport,hangared. Asking $58000 , call 519-494-2741, leave message.

For Sale: Dova Skylark kit, firewall back. All metal kit complete with undercarriage and blue tint canopy. Critical components like wing spars pre-assembled by the factory. Contact Dave at skylark4@telus.net or 780 434 8859. For more information on the Skylark see www.dovaaircraft.ca

SHARED HANGAR SPACE for rent, Brampton (NC3). Backs onto parking lot. Insulated, propane heat avail. Excellent work environment. Ideally suited to high-wing amateur-built. Avail immed. $315/mo. 905-857-3218 or kennan@rogers.com.

Continental O-200A for homebuilt. Bead blasted and painted,full electrics.C/W Log Book, accessories and baffles. 1400 Hrs. SMOH 0 STOH $5900.00 . Video clip running on test stand available. Barrie On. Jim @ joloan@csolve.net 705-721-9276

N3 Pup,1/2 VW engine,skiis,three gas tanks(main and two wing tanks),single seat.C-IBBE;hangered at Redeau Valley Kars south of Ottawa.Asking $11,500 cnd negotiable.Call Harvey Rule at 613-739-5562 or email me at harvey.rule@bell.ca

Cessna style axles bolt on type lenght 5.75 in. four 1/4 holes on1 5/16 circle with 4 spacers $50.00 pr. 2 Gerdes master brake

cylinders built in park brakes $100.00 pr. Wagner HVLP never used $400.00.
Dillon M/K3 welding pistol with eye shield $225.00
Victor style welding torches with hoses & regulators 3 tips & cutting torch. $150.00. used vacuum pump modell 211cc $75.00. 2Scott master cylinders $150.00 pr. Hummelbird a/c never flown engine run 100 hrs to finish. asking $9000.00 Glen Marsh 59 Glovers Shore, Summerside P.E.I. phone 902 436 7139 or 902 836 3702

1977 Wood & Fabric, side-by-side, 630 TTAF, 110 TTE, Lycoming O-290D2B, VFR panel, night VFR approved, 8.00-6 tires, brand new seat belts, new seat cushions, new interior (7/10 exterior, 9/10 interior), This airplane has float option built into it. Located at Brampton Aprt. Contact: Peter 905-884-8598 Peter@MarandaForSale.com $30,000 OBO. www.MarandaForSale.com

Tools For Sale: Chicago Pneumatic Rivet Squeezer $400 (reg. $599.95) Sioux Rivet Gun with beehive retaining springs $130 (reg. $299.95) Hand Rivet Squeezer $75 (reg. $131.95) 90 degree angle drill $10 (reg. $24.98) Twister/Swivel Head Rivet Tool $10 (reg. $21.99) Heel/Tow Bucking Bar $10 (reg. $17.95) Anyone who's interested can email Nikki at antenbring@shaw.ca or call 652-8895. 10/07

HANGAR RENTAL: Hangar space available for winter storage at Emsdale airport (CNA4). $500 for winter season (Nov. 1 - March 31). For information contact George Pudsey, 705-636-7260 or gpudsey@aviall.com. 10/07

Corben Baby Ace built from kit. EA 82 OHC Subaru w/reduction. Wooden fixed pitch, prop by Props Inc. Orginal Haida Eagle logo on side, Blue-White ceconite fabric Stitts brand paint. $10,000 OBO. Contact Norma Swaim at 250-765-0234 or njswaim@shaw.ca also airplane plans and misc. 10/07

C-85 cylinders complete, $500.00
Phone Terry 519--323--0026 10/07

I have the plans for a Mustang II that is partly assembled. The center section wing is assembled in a jig but isn't covered in skin. The main wing spars are assembled and one rear wing spar. Parts angle 3/4 * 3/4 - 2024, angle 1" * 1" – 6061, sheet metal .025"& .040",rivets and a few other parts. Wedge ,trailing edge (magnesium). Email address: valentine@kw.igs.net Phone: 519-745-6463 10/07

Sale or Rent: 30' x 40' hangar at Brampton CNC3. Heated. Power bi-fold door. Pull-in winch for larger aircraft. Mezzanine, wash water, and secure tool lock-up. Park right outside the back door. Lots of natural light. Very clean. Excellent work environment. $590/mo; $295/mo shared; $73,000 sale. Ken 905-857-3218, kennan@rogers.com 10/07

Filage neuf (HARNESS) jamais utilisé pour moteur LYCOMING 0235. Prix $250.00. - Détecteur monoxide de carbone. $ 5.00. Alain Lacasse (819) 563-8622 10/07

AVID MK IV STOL. SN 1474D. Subaru EA 81 engine. Warp Drive 3 blade ground adjustable propeller. Icom IC-A200 air band transceiver. AmeriKing ELT Model AK-450. Tundra Tires. Apart from final propeller pitch / cooling adjustments, aircraft ready for final inspection. Always hangared. 2 x 14 gall fuel tanks, one each wing. Blue & white colour scheme - beautiful construction. Reason for sale & low price - lost medical. Cdn $20,000 negotiable. Graham @ 604-983-3588 or seacap@shaw.ca 10/07

Wanted

Wanted - one pair of metal spar wings for a Wag Aero 2+2 (PA 14). Frank Jaenicke 250-768-5691 10/07

Wanted to purchase good or rebuild able IO 540 for Steen Sky bolt project, also any airframe or parts for the same. OFFICE 1-705-653-4525 or davidcarlaw@prototyperesearch.com 10/07

WANTED
Aeronca Champ. Preferably 85 to 100 hp Continental. Located Ontario or Quebec. Contact <tingle@ionsys.com

Wanted set of lightweight floats with or without rigging suitable for Beaver RX 550. Any type considered except Lotus. garywolf@rogers.com

Ads run for a maximum three issues depending on space available. Please direct all classified inquiries and ad cancellations to: classified@raa.ca and place "RAA ad" in the subject line.

RAAC has sets of electronic scales that are available to all members for doing the weight and balance calculations on their aircraft. Only $30 for weighing. Contact the RAA office at 1-800-387-1028 to reserve a set.

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

New In Canadian Skies

John van Hattem's

Beaver

I have just completed and flown my new Beaver SS with a twin carb 503 Rotax. I received my kit from ASAP in late December 2006 and assembled it at home in my basement workshop. I was able to do everything indoors except the paint. The water based 3M glue took a bit of practice - placement of the fabric with this cement has to be more accurate than with a solvent-based glue that can be softened. The Endura paint was supplied with the kit, as was everything else down to the last bolt and the instrumentation.

Final assembly and setup was at Charlie Cetinski's field in Waterdown, with the help of Bill Brubacher, Mlke Crutchlow, Jim Anderson, and Ron Taborek, the Flamboro Skunkworks crew. First flight was August 28th and performance was as good or better than expected. Climb is better than 1000 fpm. Landing is uneventful, but it sinks a bit faster than my previous 2 seat Beaver 550. Stability in the air is good, and cruise is 65 mph at 5500 rpms.

John van Hattem, Burlington Ontario

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. President Pierre Fournier, pierre.fournier@cmcelectronics.ca (514) 645-4355

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. Contact Pres. Ray Fiset, 418-871-3781. rayfiset@qc.aira.com

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: Fourth Monday 7:30 pm, Lake Simcoe Regional Airport. Contact Treas.Gene Bemus 705-325-7585 gene@encode.com

COBDEN: Third Thursday 8:30 pm at Club House, Cobden Airport. Contact Pres. Clare Strutt, 819-647-5651.

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. Keith Weston at 705-444-1422 or e-mail at kcweston@georgian.net

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 Editor Frank Ball fdnmeball@sympatico.ca 905 822-5371

HAMILTON: Second Friday 8:00 pm Months of Feb, April, June, Aug, Oct, Dec, at Hamilton Airport. Contact Pres. Brian Kenney, 905-336-5190

KENT FLYING MACHINES: First Tuesday 7:30 pm at various locations. Contact President , Mac Mazurek 519-692-5309 macmaz@mnsi.net

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

LONDON-ST. THOMAS: First Tuesday 7:30 pm. At the Air Force Association Building, London Airport. Contact President Angus McKenzie 519-652-2734 angus@lweb.net

MIDLAND-HURONIA: First Tuesday 7:30 pm Huronia Airport. Contact Tom Massey 705-526-5304, fax 526-5310

NIAGARA REGION: Second Monday 7:30 pm at Niagara District Airport. Contact Pres. Len Petterson swedishcowboy29@aol.com http://home.cogeco.ca/~raaniagara/

OSHAWA DISTRICT: Last Monday at 7:30 pm at Oshawa Airport, 420 Wing RCAF Assoc. Contact President Chris Gardiner 905-668-5703 cgardn628@rogers.com

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

OTTAWA/RIDEAU: Kars, Ont. 1st Tuesday. Contact: Secretary, Bill Reed 613-831-8762 bill@ncf.ca

SAUGEEN: Third Saturday for breakfast at Hanover Airport. Contact: Ed Melanson 519-665-2161 meled@wightman.ca

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 8 pm at Ch 41 Hangar on north end of Brampton Airport Contact: President, Earl Trimble 905-787-8524 northerntailwind@aol.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.

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. Contact Jill Oakes 204-261-1007 raa_wpg_executive@yahoogroups.com

SASKATCHEWAN

NORTH SASKATCHEWAN: Third Monday 7:30 pm at Westwind, Hangar #3. Contact President Garth Pippin for info at 306-666-4476

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 Calvin Thorne at 403 932-4325 or email: cbthorne@telus.net

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

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

MEDICINE HAT: Last Thursday of the month 7:30 pm RAAC Club Rooms, Airport. Contact Secretary, Boyne Lewis 403-527-9571 handblewis@thehat.ca

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 Kelowna Yacht Club. Dinner at 6:00pm, meeting at 7:30pm Contact President, Cameron Bottrill 250-558-5551 moneypit@junction.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 8pm, Delta Heritage Airpark RAA Clubhouse. 4103-104th Street, Delta. Contact President Gerard Van Dijk 604-319-0264, vandijkg@yahoo.ca. Website http://raa85.b4.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 - Dick Suttie Phone 250-374-6136 e-mail - richard_suttie@telus.net

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 Richard at 782-2421 or Heath at 785-4758.

Chapter executives please advise of changes as they occur. For further information regarding chapter activities contact RAA Canada, 13691 McLaughlin Rd, R R 1, Caledon, ON L7C 2B2 Telephone: 905-838-1357 Fax: 905-838-1359 or call toll free: 1-800-387-1028 email: raa@zing-net.ca www.raa.ca

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