November - December 2008

RECREATIONAL FLYER

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

RAA at Reno
Sonex: A Canadian Perspective

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

from the president's desk

Gary Wolf

The Year In Review

2008 has been a busy year for RAA interaction with Transport and Nav Canada

Airspace Revisions

In 2008 the airspace has become more crowded, and there have been many Nav Canada consultations. Tom Martin, Wayne Hadath, Rob Schieck and I have attended Nav Canada meetings to deal with proposed changes to the airspace. The London change to Class C was unfortunately well along before Nav Canada let it be known that they were open to some very limited consultation. However in other areas we were able to provide input to limit the changes that would have negatively affected recreational pilots.

Consultation With Transport

RAA's 2008 consultation work with Transport ranged from the Basic UL and Advanced UL categories, to the Amateur, Owner Maintenance, and Limited categories. We continue to ensure that Transport registers Advanced UL's at their manufacturers' correct gross weights, and have proposed that all aircraft be required to have weight and balance as a condition of registration.

The Amateur Built class came in for major revisions to the ability to use formerly certified components in the construction of AB aircraft. A year ago Transport's initial position was that we could no longer use any formerly certified components, and through RAA's continued consultation and pressure Transport has now put in place a document that is a reasonable compromise. This document will allow builders to use formerly certified components and to gain credit for fabrication work that is done to achieve 51% status. There are still a few loose ends and RAA will work to correct these in the upcoming months.

In the past year RAA has lobbied to place more of the responsibility for compliance with the AB regs in the hands of the builders, and less in the hands of the TC inspectors. The 25-hour signoff of amateur built aircraft is an example. Some TC inspectors refuse to release a plane from its restrictions until the builder has jumped through the inspector's personal favourite hoops. One such personal hoop has been that even brand new ELTs must be locally certified before the 25 hour restrictions will be removed. RAA has recently persuaded Ottawa to accept the manufacturer's date of certification for this purpose. We are now working with Ottawa to change the removal of restrictions procedure so that the builder himself can do the signoff without any involvement with an inspector, as builders currently do in the US.

51% blanket evaluations for manufacturers in Canada have been stalled for the past while because the FAA has a moratorium on 51% inspections in the US. This has worked to the detriment of our manufacturers, and early in December RAA has completed consultations with Ottawa to have this procedure reinstated on a limited basis for our country.

There currently appears to be movement by Nav Canada to change airspace to classes that require aircraft to install Mode C transponders. These must be recertified regularly at a high standby cost, a disincentive to installing these units. We are now asking Ottawa to allow builders to self certify their Mode C transponders when they are used only for VFR purposes.

Light Sport Category

The Industry working group's proposal for Light Sport went to Transport two years ago and for the next year it appeared to have been on their back burner. RAA has kept Transport aware that Canadian manufacturing opportunities were being lost because of the lack of this category, and six months ago Transport began the risk assessment to deal with the procedure to install this cat-

continued on page 35

The Recreational Aircraft Association Canada
13691 MCLAUGHLIN ROAD, R R 1,
Caledon, Ontario L7C 2B2
Telephone: 905-838-1357
Fax: 905-838-1359
Member's Toll Free line: 1-800-387-1028
email: raa@zing-net.ca
www.raa.ca

The Recreational Flyer is published bi-monthly by the Recreational Aircraft Association Publishing Company, Brampton Airport, Cheltenham, ON L0P 1C0. The Recreational Flyer is devoted to the aerospace sciences. The intention of the magazine is to promote education and safety through its members to the general public. Opinions expressed in articles and letters do not necessarily reflect those of the Recreational Aircraft Association Canada. Accuracy of the material presented is solely the responsibility of the author or contributor.

features

On the Cover: an L-39 was one of the jet-class contenders at Reno 2008. Below: Photographers at Reno. Don Souter Photos


Don Souter

Reno Celebration

Text and photos by Don Souter

RENO THIS YEAR had a theme of "A Celebration", marking 45 years of racing planes in the desert just north of the "Biggest Little City". Top competition was displayed in all classes of planes and many right to the wire battles - even for second, third or fourth place. All classes were going after their best ever performances with several new records set over the week.

Imagine a kitplane going at 409.3 mph! Jon Sharp in his Nemesis NXT did just that while qualifying for this year's Super Sport class. Plans afoot for Kevin Eldridge are to build a new NXT to put his Trace Engines 495 cubic inch twin tubo-liquid cooled V-8 to even faster speeds in '09. (note: Trace Engines bought the Certified Orenda Piston engine recently and are going to provide engineering assistance to Kevin. In return he will be providing real time race data to improve the well built engine for even greater performance (www.traceengines.com for more information).

The weather even co-operated this year. Quite often you wear every heavy jacket you have with you for early morning and by 10am you are only wearing shorts and t-shirt. At least

Top, Left: Chapter 85's Adrian Cooper at Reno 2008. Above, he earned first place Bronze.
Centre: Biplanes represent another sort-of-affordable way for ordinary people to compete
Below: Jon Sharp's Nemesis NXT was clocked in at over 400 mph while qualifiying.

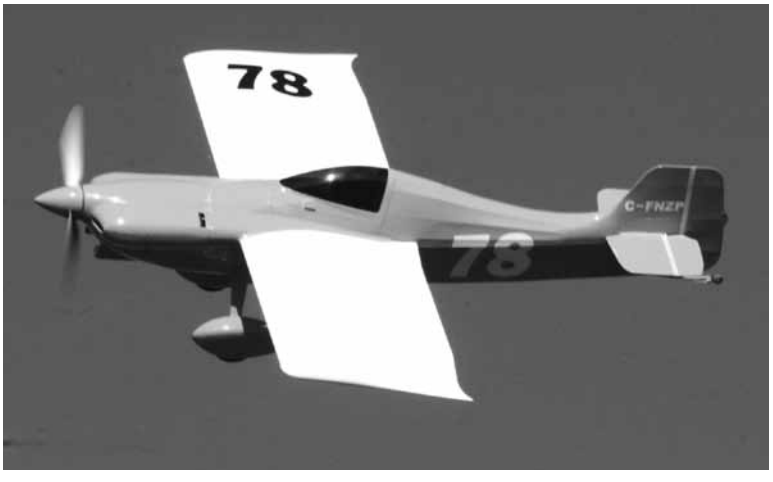
this year I only had to carry one light jacket as mornings were in the 50's, and high temps were in the 80's. Only one day that I can think of was even that blustery. Dust is a never ending fight for all of us taking pictures and trying to watch all the fun stuff going on around the ramp and out on the pylons.

An exciting three plane formation was talked into doing a short ground shoot before leaving for the air to air. Three Grumman Tigercats! Yes, three. I can only think of five that are to be flying at this time, and this year we had three on the ramp. Two of them were in this year's Roll Royce Heritage competition, and the third was racing. Among the photog group very few of us missed the opportunity to jockey for the best shooting place—even borrowing ladders and golf cart roofs for the best angle we could get. All were envious of the one man who got to shoot them together in the air.

Some of the best racing I have seen in many years. From our local F-1Racer Adrian Cooper-- now Bronze Champion, with plans

for more speed yet, to sport class surprises like Jon Sharp blasting the record book by over 20mph. Our local Canadians in T-6 class did not dissapoint either. With the brotherly competition between Vic and Keith McMann going on, it became a fun thing to speculate just how much go-know Keith had given to new racer Vic.

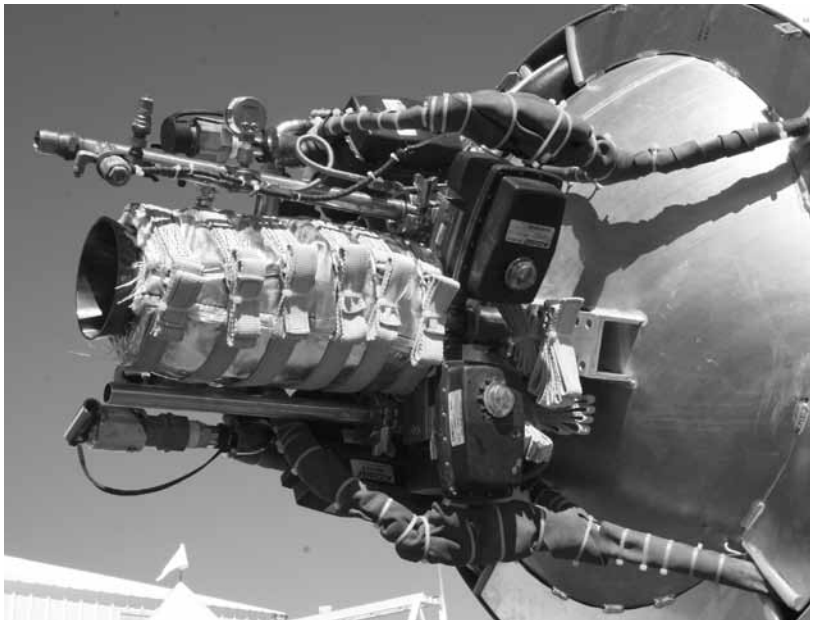
The big boys did not disappoint either. All week the talk was about who was there to race. Several past Gold winners were looking strong and ready. Many times we have not had top guns make it to the end by running out of parts and running out of engines before Sunday. This year we were not disappointed. Any of the four could have won. Rare Bear mayday'd after 3 laps to land safely. The rest fought on to the end. Tiger Destefani won his *seventh* championship this year in *Strega* at 483.062MPH. RAA



Top: Gunslinger, a Canadian Harvard competed in the T-6 class. Centre right, Tom Watkins' Cassutt. Above, left to right: Adrian and Tom with their awards, Brothers Keith McMann (L) and Vic McMann were both awarded for their efforts.

Chris Cox

Jack Pomerleau basks in the cool propblast while an envious Adrian roasts in the cockpit. Sometimes being ground crew has its upside... Centre: Rockets are starting to show up. What's next? Bottom: a rare appearance by a trio of airworthy Tigercats. There are only five flying examples worldwide, so this was a special treat.
More of Don's Reno photos can be seen starting on page 35.



Profiles:

GEORGE NEAL

By Bill Tee

MY BACHELOR FRIEND GEORGE NEAL is quite a remarkable person and not just for achieving 90 years on this planet. Born on November 21 1918 the Toronto Aerospace Museum took this opportunity to not only celebrate this great achievement on November 22 but to celebrate the induction of George's DH Hornet Moth into the Toronto Aerospace Museum in the original 1929 DH factory at Downsview. About 160 friends, relatives and former co-workers showed up to help George begin his ninety first year.

George has worked for deHavilland Canada all his life except for the years of world war 2 when he was a civilian staff pilot for the RCAF.

George followed his family into deHavilland Canada during the mid thirties when he was learning to fly at the Toronto Flying Club then located at the south end of deHavilland's present Downsview airport on Wilson Ave north of Toronto. The flying club site was gobbled up and incorporated into the larger airport in order to accommodate the performance of the hundreds of Mosquito bombers built there during the last 'big' war.

Subsequent to war time duty George returned to deHavilland to resume his job as an engine mechanic. It was not long before George was offered a job by Rus

Bannock, WW2 Mosquito ace, as test pilot which he eagerly accepted. Although Rus did the first flight of the DHC2 Beaver, George did a great deal of the certification flying. George also did most of the Chipmunk production test flying and indeed still has a Chipmunk that he regularly flies. First flights of the DHC3 Otter, the DHC 4 Caribou and the Canadian derivative of the Grumman Tracker of which DHC built a hundred for the Canadian Navy when our navy had aircraft carriers were done by George.

Not only is George a superb pilot but he is also a superb craftsman having demonstrated this by the very accurate 1960's construction of a Sopwith Pup complete with an original rotary engine now owned by our National Aviation Museum. His project for the 70's was the reconstruction of his DH Hornet Moth which he had shortly before imported from the UK. This is the same Hornet Moth that on 1 November 2008 he flew into Downsview Airport for its presentation to the Toronto Aerospace Museum, now its new owners.

Next on George's list was the reconstruction of a derelict Hawker Hind, located in South Asia, for the National Aviation Museum in Ottawa. With dreams of flying this bird for the museum George restored the artifact completely to airworthy condition. Alas, it was not to be. The museum, after a crash of a Nieuport in its possession , decided that it would no longer fly any of its planes.

This led George to his next and present project, a 100% full size Hawker Fury, a popular fighter aircraft for the RAF in the mid 30's. George has just completed a complete rebuild of the Rolls Royce Kestrel engine for this aircraft. A shortage of off-the-shelf parts meant that George had to have some significant parts manufactured new from raw stock. As the engine moves out of the shop the almost complete fuselage moves in for completion before covering, followed by the wings to be assembled from parts obtained from sources in the UK. George hopes to fly this project in about two years.

What's next? George says that he would like to build another Pup! After all he does have an engine for it.

Opposite: George has owned the Hornet Moth since the early 70's and recently sold it to the Toronto aerospace Museum. He delivered it to the museum at Downsview on Nov 1 '08. When George imported the Hornet from the UK it still had a radio that had a single crystal installed. To change frequencies you removed the crystal from the radio and put it into its slot in a rack and then choose the crystal from the rack for the frequency that you required. No knob twisting here!

Bottom opposite, George sits on a chair at his 90th birthday celebration at the Toronto Aerospace Museum on Nov 22. He turned 90 on the 21st.

He still has his Chipmunk to fly.

AEROSHELL SPORT PLUS 4 AND ROTAX ENGINES

Shell has recently formulated a new oil specifically for the Rotax 912 /914 series engines, and Rotax places it at the top of their list of lubricants for this engine. At one time Motul was in this position but they changed the formulation and some owners have experienced foaming that has restricted the return flow to the oil reservoir. Motul appears to be more concerned with the motorcycle market that has very different operating considerations.

An oil meant for a Rotax must be capable of lubricating a cold engine immediately upon startup, but it must be tough enough to lubricate the integral gearbox. The oil must also be capable of working with both auto fuels and 100 LL. Straight synthetic oils cannot handle all of these chores so Shell has blended this semi-synthetic for Rotax, incorporating additives that keep lead deposits in suspension so that they will not precipitate to block oil passages. Oil is cheap compared to engine parts, so you might as well buy the right stuff.

Several RAA members found that Shell was not intending to bring this oil into Canada so RAA prevailed upon Leavens to import a supply, and they now keep inventory of Aeroshell Sport Plus 4 at their Toronto and Calgary warehouses. Do your Rotax engine a favour and buy it some for Christmas.

Drillin 'Oles

with Ol' Bill

SUPERIOR HOLES

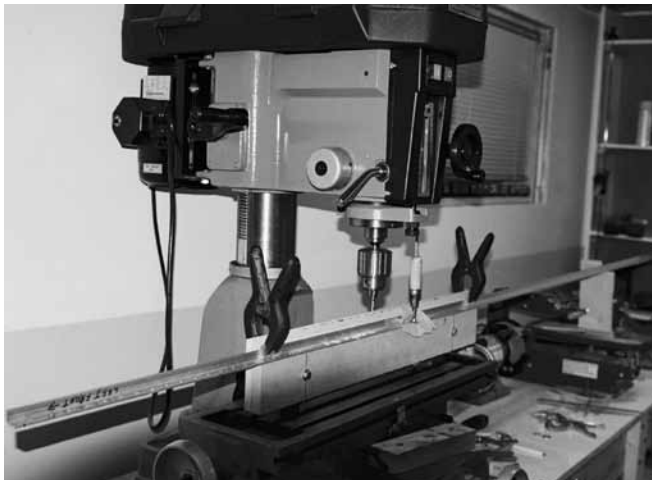
HOLE DRILLING HAS MOVED UP A LEVEL. I have purchased a King Model 30 mill-drill. This has opened a whole new world of hole drilling. As I describe what I have been doing with this machine I have the feeling that I am like John Cabot when he went back to England and reported he had discovered a new world. He didn't mention there were already people living there. In the same way, I have the feeling that RAA members are either engineers, tool and die makers or artisan craftsmen and know all about this sort of thing. But for those who are like yours truly and are biologists, or are intellectuals or whatever, I'll go on with this story. My machine is essentially a drill press. Where it differs from a usual drill press is that the upper part of the machine with motor, spindle, lever and all is the component that is moved up or down the pillar instead of the table. The table is the neat part. It is mounted on the base and has hand wheels to move it left or right [the professional people call this the X movement] and another hand wheel at the front that moves the table forward or back [Y]. Instead of just holes like an ordinary drill press, the mill-drill table has inverted T shaped slots extending right to lefts of the table. Cleverly shaped nuts fit in these slots and bolts screwed into these nuts can hold down the project in hand.

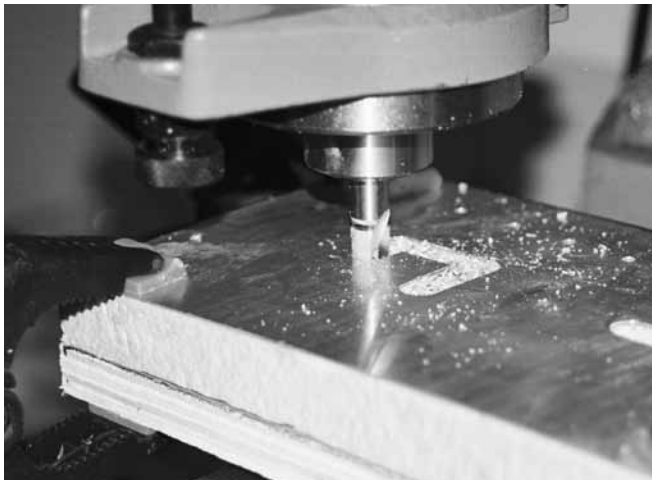
Another feature of this machine involves the spindle of the head. It is hollow with a tapered bore in its lower end to accept a collet. "Collets" are tapered on their outside to fit the bore of the spindle Two special ones came with the machine with their tool already attached. One has a Morse taper to hold a drilling chuck and the other a face cutter. They also have a tapped hole in their upper end that accepts a threaded rod that feeds down from the top of the spindle. When this rod is tightened it pulls the collet up into the spindle where it is held firmly. Collets usually have a bore in their lower end. When the collet is drawn up this bore is reduced in diameter to grip the tool in it. I have set of eight I bought with bores ranging from 1/4 to 7/8 inches. The collet system does a better job of holding a drill bit or other tool than a chuck does.

It is seldom that one would bolt the work directly to the table. Rather, there are vices specially designed for this that bolt to the slots in the table. To make the best use of the vice, it is essential that its jaws be parallel to the X movement of the table. I'm sure there are professional ways to do this, but my way is the clamp my Lee Valley metal meter scale in the vice and then use my micrometer caliper to measure the distance from the edge of the scale to a drill clamped inverted in the chuck. It's tedious, but moving the vice on the table until I obtain the same reading as I move the table left to right brings it into alignment. Now, holes drilled as the table is moved left to right will also be in a straight line parallel to the face of the vice. The hand wheels moving the table have collars calibrated in .001 inches and although I doubt that the low priced machine that I have really does that level of accuracy, it sure is infinitely better than anything I've been able to do before.

The aircraft design that has become the perpetual project in this shop has by by 1/8th aluminum angle extrusions where the side and bottom panels of the fuselage meet. The callout is for one inch spacing of the rivets. The first method that comes to mind is to clamp the extrusion to the panel, mark the rivet locations using a ruler and a felt pen and drilling through the skin and through the extrusion. The mill-drill invites approaching the process from the other end. With the extrusion held in the vice, pilot holes can be drilled with exactly the one inch spacing for which the plans call and they all will all be exactly the same distance from the edge of the extrusion. Now the extrusion can be clamped to the panel and the pilot holes in it used to locate drilling the full sized rivet holes.

The slots in the table lend themselves to bolting special fixtures to them. One of these is a 10 by 20 inch piece of 3/4 inch piece of plywood spaced above the mill-drill table far enough that if a drill goes through it, the table will not be drilled into.





Top: Using a dial caliper to position the vice on the table.
Centre: Holes exactly 1 inch apart are easily drilled in an extrusion using a custom jig.
Above: A router bit does a good job of cutting square or rectangular openings in sheet aluminum
Right: The mill drill shines when one is making an instrument panel with its many different sized holes.

With it, the plywood a is bit bigger that the mill-drill table, and clamps or locking vice grips can clamp work to the plywood. This has worked out very well for making an instrument panel. The first step was to lay out the panel and locate the position of the various holes. Center-punching gives an easy spot from which to work. I've never had much luck trying to use a circle cutter on my drill press. Actually, it was a frightening experience. With the mill-drill turning slowly and the circle cutter gripped firmly in the collet, and cutting evenly all the way around, and with the instrument panel clamped firmly to the plywood, 31/4 inch holes come out perfect. The same is true for all the other holes. The small ones can be done with a bit in the drill and the medium ones with a step drill. The trick with the step drill is to bore a one inch or so hole in the plywood where the step drill goes through the instrument panel.

The maximum speed of the spindle is 2500 rpm. This isn't very much compared to the twenty thousand or so of a router but a router bit in my PDM-30 works quite well on thin sheet aluminum. It seems to work best if I clamp the sheet to house building foam. I can use the X and Y crank-handles to cut squares or rectangles such as the openings for the radio in an instrument panel and the router bit size will determine the radius of the corner. I imagine I could move the aluminum and clamp it again and cut hexagons and so on. I don't have patience enough to follow the formula to cut a circle or oval. I can't pat my head and rub my stomach at the same time so I know I can't do them free hand, either.

The down side of an inexpensive machine such as mine is that the head must be unclamped from the round pillar to raise or lower it. When it is clamped again, the location of the drill can't help but be slight changed. I have seen Rich at Innotech fabricating shop in town go through

this process with his vertical milling machine and pick up his location with a dial indicator but that is beyond an amateur like me. There are entry-level machines that do raise and lower the table but they are twice the price of what I have. Along the way, I was offered a used professional Bridgeport vertical milling machine for $3800 and it was tempting. But for an old amateur that is quite a bit and it was too big to put in the lower level of a raise ranch where I "work".

Busy Bee sells a machine equivalent to my King and I imagine so does Grizzly that we see at Oshkosh. These companies that import from the Far East charge what the market will bear so the dollar price in both Canada and the US always seems so close there is no thought of bringing anything home. Anyway, Grizzly protects Busy Bee and won't send their catalogue to Canada. The local store manager tells me their owners are brothers.

Here is Bob's instrument panel for his Christavia

I never realized how much having a mill-drill compared to a drill press would make the hole drilling so much easier and better. I still haven't figured whether I drill better holes or am drilling holes better.

A Visit To the CAHC

Fran and I attended the annual CAHC's (Canadian Aviation Historical Centre) annual Holiday Get together in Montreal today. The very existence of the CAHC is singularly the most important outside source of inspiration and in fact, basic plans, for me to be able to tackle such a project. My replica will clone RCAF ser. no. 626 which was used in Borden, Ontario for bombing practice with the BCATP and have reserved the correct registration marks YXV for my project.

The CAHC was founded by Godfrey Pasmore,the son of Hubert Pasmore, who has more than once been identified as "Mr. Fairchild of Canada" and was responsible for bringing the Fairchild aircraft development program into Canada, Longueil, Quebec way back around 1928. The Centre is building a display model of a Fairchild FC-2, a flying replica of a Bleriot Monoplane, researches other interesting artifacts of Canadian Flying History and has parts of Bolingbroke's, the very Canadian Fleet Canuck and many other bits and pieces. They have a website here: http://www.cahc-ccpa.com/main_eng.htm

A highlight of our trip today was to present Godfrey with a 1993 Canadian $20 Coin with a Fairchild 71 CF-ATZ on it. ATZ now resides in the Western Canada Aviation Museum in Edmonton. For more information check out http://albertaaviationmuseum.com/index.php?option=com_content&task=view&id=30&Itemid=41

From time to time, it was nice to see some visitors approach us and ask if I was the guy in Ottawa building the Fairchild 51. I got dragged into their shop more than once and had quite a session with an elderly Dutch lad named Jake who had done considerable work on the FC2 replica. I noted that they had to put a spacer into the fuselage aileron split lever to make it match up with the wing's aileron split lever and he admitted to scratching his head many times over this. One trouble with a project like this in Montreal is that they have many volunteers helping from time to time. I took a look at the split lever on the wing side of things and figured that it's lever was inverted according to my plans. That would make a piece of 1" angle iron either match up or be 2" away from where it should be. We both laughed and teased each other about it, but he said with a wink in his eye as we left..."you may be right, but it works right now and I'm not changing the .....thing.! Such are the good times visiting Montreal.

I was pleased to have a picture taken with Pasmore and I when another lad nodded me over and introduced himself. Robert explained that his Dad flew Fairchilds back in about the same era and knows about the FC2's and it's ensuing lineage. His Father was none other than Stuart Graham, the first professional Bush Pilot in Canada. Remarkably, Stuarts navigator was his wife, Marguerite in the old Vickers.

It's a good feeling to be part of this group, while I plod along building my own contribution to Canada's aviation history.

The smoked meat in Montreal is still among the best.....

David Stroud

Female, Flying, & Fifty

"What did you learn about in tonight?"is how I am often greeted after coming home from a ground school class.

By Joan Cox

"Well, I learned about 10 degree drift lines and if I get off track how to correct by using the double track error method... " Ah, you don't need to know that s@%*t, he replies. Keep a good look outside for your landmarks, your finger on your track line and you won't get lost. Besides, if you just follow the magenta line on the GPS you can't get lost. Wow. Thanks dear, with advice like that, I can pass the Transport Canada written test with flying colours. But, I pretty sure there won't be any GPS questions on the written, so I better pay more attention in class.

I still have to learn how to use the E6B for calculating and solving wind, time, fuel, distance or speed problems. GFA, airspace, WX, AGL, 40 hours of air law, human factors, procedures, engines, are thrust at you in a short period of time. Oh, must remember drag, parasite, induced… Most are just words that don't make sense, though Trevor (flight instructor) says not to worry because eventually some of that "s@%*t" will stick. I hope so as I feel there is a steel wall in front of my brain that the you-know-what hits, and just slides down without sticking. I must admit that some of the stuff is beginning to make sense when applied in conjunction with my flying lessons. Learning about glide angles, power settings, range and endurance all becomes clearer now that I am in the air.

Being in the air requires you to talk on the radio if you fly into a control zone. *I hate talk on the radio.* To a student pilot radio talk is like listening to a foreign language. ATIS messages, why do they have to talk so fast? Not everyone can think as fast as they talk. It must annoy an instructor to no end to have to listen to that message many times before their student gets the info scribbled down. Like me. My brain can't think as fast as they talk. I'm sure that older pilots feel the same.

A close friend that works tower says to just talk like you're talking to a friend or someone you know and tell them who you are where you are and what you want. Easy for her to say as she's been doing it for years. I usually play what I'm going to say over and over in my head what I want to say it all makes sense. But the second I hit the push to talk button I go brain dead. What's with that?

I finally spit out what I want, I expect to hear a clearance for what I asked for and when I get something different in return, well you can probably guess what happens, I read back what I want and not what I heard. Selective hearing, Expectational hearing, call it what you want, I don't think I'm alone.

Radio work is all that much more important when you are in the circuit, especially when doing touch and goes. You have to be on the ball and keep a watching alert. Follow traffic, right downwind or was the left downwind for 19? You're number 2, extend your downwind, I will call your base, your number three. Roger. Got to think fast but sometimes the brain has a fart, hiccup if you will, and I don't always react fast enough. Each time I go out I get more confident but still often second guess myself. Spacing can be a problem too, as it is often difficult to judge distances from the air.

Idle chatter. As I was doing an approach one day, I hear over the tower frequency "That last landing was a nice one, Joan." Thanks, I say. Another day I make my radio call near the 264th street interchange and I get a Hi Joan and I hi back. Trevor gives me a look. Oops. Now tower has a name to go with the voice. Actually, I think I keep them on their toes in Langley because they are never sure what to expect from me and are now on alert.

Prop talk

Part 2 / By Tom Martin

This article is Part 2 of my prop story that began in the last issue. That story dealt with my decision to switch from my old three blade MT prop to a new blended airfoil two blade Hartzell. With my new prop installed I was almost ready for the 2008 AirVenture cup race. This was my first trip to this race and this year, for the first time, it was going to start in Mitchell, South Dakota, and go directly to Dodge Wisconsin. This is a distance of 405 nm. As the race is west to east there was a good chance of picking up a nice tail wind at altitude. It is one thing to know that you have a tail wind up high but how much speed will you lose getting high? Also, the air is thinner the higher you go, which helps TAS but it also means that I lose power from my engine as altitude increases. The only way to really know how my plane, with the new prop, would perform was to do some testing. I secured an oxygen bottle from our local hospital and prepared to do four, four leg trials at four altitudes, 4000, 8000, 12000, and 16000 feet. To do this, VFR, I needed to call Nav Canada at Toronto and get a flow control clearance before the flight. During the flight I had to be in direct contact with Toronto centre and they were most helpful.

It was a beautiful day with moderate turbulence up to 4000 feet and dead smooth air above that. I use a formula that I got from Kevin Horton's RV8 website, http://go.phpwebhosting.com/~khorton/rv8/. It asks that you maintain a steady gps track course and hold altitude until the speed stabilizes. This must be done three

Left: Inside the dome of a constant speed prop is the pistonthat makes the blades rotate.

Below: This protractor is what is used to set the blade angle. It looks about a 100 years old!

Opposite: the airplane that was supposed to win the Airventure cup

times for each flight level at different headings. Entering this data in the formula will give you your true airspeed. I collected four points of data at each level. This allows me to do four sets of calculations at each level. If the answers are very close then I have some confidence that the data collected is accurate. My 8000, 12000 and 16000 foot calculations were all very close and when plotted on a graph they formed a straight line when comparing TAS to altitude. This straight line on the graph, if extended, pointed out that the moderate turbulence at the 4000 foot level was costing me four knots!

The graph allowed me to make a "rule of thumb" for higher altitude flight: In my airplane for every thousand feet of altitude gain I would need a corresponding **one knot** increase in tailwinds to offset the loss of power with altitude. I was pretty pleased to see a straight line when I graphed the data and it was reassuring that when comparing my information with some of the other Air Venture competitors, they were using the same one knot rule for tail winds! For the race I was not at all concerned with fuel economy, (as long as I had enough fuel!), as I would be running at full power settings. However my data collected showed a whopping 55% increase in fuel savings in going from 4000 to 16000 feet. This was at non-economical full power settings but it certainly points out that for normal cross country flights even climbing into a head wind might still save fuel on our aircraft. Obviously I will need to do some more testing at different fuel settings to verify that. I know that during the race I flew higher and with an increased tail wind, I did burn considerably less fuel than did Wayne Hadath. Wayne's plan was to fly at a moderate altitude, 5000 feet, for the whole race, in hopes that I would waste time climbing for tail winds that did not materialize. This time I was lucky and caught some wind but it could easily have gone the other way as well. It is interesting to note that during the race I burned 34 us gallons of fuel. Klaus Savier, in his Vari-eze powered by a 0200, was only 8mph slower than I was but he burned only 13 total gallons of fuel. Clearly there are some fuel economy lessons that can be learned from the competition.

The AirVenture Cup race is the "real deal" and some very interesting planes competed, such as the Polen Special, and Kevin Eldridge in his Nemesis. There were a number of SX300s, a few Lancair's,

Jeff Linebaugh, organizer of the Memphis 100 race poses with a Sea Fury prop.
Opposite: Wayne Hadath's three blade blended airfoil Hartzell prop - and the paint job "loved by woman and children".
Opposite, bottom: Tom's ride features a new two blade blended airfoil prop. Installed in Piqua Ohio

canard type planes and a few RVs. Passing thunderstorms delayed the departure until the middle of the afternoon. The aircraft were staged to leave roughly in the order of fastest first with the final finish line at Dodge Airport Wisconsin 405 nautical miles away. There were 45 planes in the competition in nine different classes. The overall race was not won by the fastest plane but by the pilot who made the right weather choice. Paul Tackabury in his Lancair IV climbed to 17,500 feet and went over some mid course rain storms to beat the favourite Nemesis, who elected to go low through the weather. His winning average speed was 348mph!

It was fun to listen to the leaders talking on the radio. How far out are you? how high are you?, what is the weather like? Some queries got a response, such as rain intensity at certain locations, but favourable wind information was noticeably absent from the conversations! My class, the fixed gear 540 cubic inch aircraft, was headed up with a fixed gear Questair Venture. He had had so many problems with his retractable gear that he modified the plane to be fixed gear. He easily won our class with a speed of 295mph. Next came Steve Hammer with a speed of 266.8mph. He raced one class up for more competition as his four cylinder Glasair is very fast and he wanted to go against the larger engines. I came in close behind him with an average speed of 266.5mph. Following me was Paul Seigel in his EVO rocket at 255.5 mph and then Wayne Hadath with a speed of 251.6. I flew the first half of the race at 11,500 feet using oxygen, while Wayne had stayed with his planned 5000 feet. Before the race I had wanted to go to 17500, however when I reached 11500 I looked ahead about 150 miles and I thought that there was no way I was going to get on top of the clouds that were on the horizon. As it turns out the overall winner did, and I too should have climbed as high as my initial plan. The forecast had shown about a 20 knot advantage at that altitude and that would have made it worth the climb. I had made a spreadsheet before hand to calculate the time to climb, cruise and descent portions of the trip and I guess I should have stayed with the plan, as the winds aloft turned out to be even higher than forecast. As it was I had a considerable advantage even at 11,500 feet. Due to weather at the mid point of the race I had to come down to 8000 and divert a few miles north to remain clear of cloud.

At the end of the day there were 15 out of 45 aircraft that came in with faster times than I did, but I doubt that any of those planes would be able to land at my farm grass strip. That is the compromise we all make with our airplanes, speed vs. utility, but I was very happy with my race results. I believe this to be the fastest official race time ever posted by a Rocket.

I was pleased with how my new prop had performed in the race both in speed and smoothness. However during a descent over Lake Michigan, on our way to the race, the prop speed had started to increase without any input from the governor control. Also I was not able to get the propeller to turn at rpm's lower than 2200 rpm when I was running over 22" of power. Something was not quite right, and after the race I called Les Dowd at Hartzell. He asked me for my HP, rpm, MP and air speeds and confirmed that as set up the propeller would behave as I had

found. Apparently the blades were initially designed for the RV10, and with the slower speed of the RV10 the low pitch stop was not set high enough. In other words, the blades would not turn enough to match my higher speeds. This required a trip back to Hartzell in Piqua Ohio for an adjustment. As with the last visit, the staff was ready to go when I arrived. From start to finish the adjustment took 45 minutes. They had to remove the spinner and then take the dome off the end of the propeller. There is a large piston and a spring in there that keeps the propeller in fine pitch for high power settings unless oil pressure is added. The oil pressure causes the piston in the dome to move. This piston is indirectly fastened by dowels to the propeller blades. As the piston moves in and out they cause the blades to twist in the hub. They had to replace a spacer behind this piston that would allow the blades to turn more. To measure the angle of the blades they used a large protractor that looked to be about 100 years old. I enjoyed watching these skilled professionals work on the propeller. After the change the prop is performing as it should and all subsequent Rocket props will have this new bushing installed.

In October I also raced in the Memphis 100 race. I won my class in that event this year with a faster speed than the previous year. It is hard to compare races speeds from year to year due to weather conditions, but some of the other racers were a bit slower than the previous year and my increase, in my opinion, was again directly related to the Hartzell prop vs. my previous MT.

Where do we go from here? During a recent visit to California I had the opportunity to visit with Paul Lipps. As I mentioned in my previous article he has developed some new props based on mathematical models that he has developed. Although he only has three flying so far, the results are impressive and I look forward to what the future holds for our sport aircraft in regards to new propeller designs.

Don Dutton has sent us these pictures of an extremely interesting cutting edge amphibian concept presented at a recent chapter meeting. Hopefully we'll find out a bit more about this aircraft in the months to come!

The Kelly D and crew: Left to right, Tom Hinderks, pilot; Curtis Peters, pilot; Art Brier President EAHS - ground support, and Rod McLoed President AAMA - ground support

RAA Members Mark Historic Flight

Tom Hinderks of Edmonton is an RAA member with a passion for Canadian aviation history. An expert engine man, Tom has converted many Geo auto engines for aero use and has recently published a manual to rebuild and convert these fine powerplants. For many years Tom was RAA's Regional Director for northern Alberta, recently retiring from that position to devote all of his time to the Alberta Aviation Museum of which he is the Executive Director.

Tom has now begun a project to recreate three historic flights from Edmonton, plus another under way right now, to ferry the open cockpit plane from Winnipeg to Edmonton in the cold of winter. The plane is a Kelly D amateur built biplane that was originally built near Toronto by John Parker, and was now being offered as part of an estate sale near Winnipeg.. Tom was looking for historical information before purchasing this plane for the Museum, and the call went out to the local Oshawa RAA chapter. RAA National Secretary Chris Gardiner and several Oshawa members responded, and Tom was put in touch with Mr. Parker who was pleased to provide the history. The deal was made and the project was on its way.

To follow the progress, and for more information on future flights, go to http://spirit.aviation.ca/

The Kelly D was being kept at Lyncrest Airfield, home of the RAA Winnipeg chapter, and Tom Hinderks and Curtis Peters were treated royally by the members there. The family of Cameron Jay, the last owner of the plane, fed the crew a wonderful sendoff dinner

and helped in more ways than they know. Jill Oakes provided her leather flying helmet with fur to keep Tom warm during the cold flight, and another member provided a rocket heater to warm the engine before starting.

The first leg of the trip was clear and cold, -20 Celsius, and the plane was hangared with Nelson Almey of Neepawa. The pilots are now awaiting for weather that is somewhat less cold, but the plan is to have the Kelly D home in Edmonton before January so that they may begin recreating the rest of the historic flights. Tough people, those Westerners. Friendly too.

Kudo's: Winnipeg RAA - fantastic! Nelson Almey of Eagle Agro in Neepawa for hangaring and fueling; John Parks, the Kelly's original builder (great job!); and to Cameron Jay who last owned it before his passing kept the bird and the records immaculate.

The Kelly-D prepares for its historic re-enactment. It looks COLD.

RAA Vancouver

Chapter 85 recently completed the re-erection of their unique clubhouse. It had been taken down earlier in the year as the floor needed extensive repair, but they were performed over the summer and the building re-installed in time for the chapter's Wine and Cheese meeting in early December.

RAA Scarborough/Markham

We wish to thank Will Boles, a CA Safety Inspector for Transport Canada, (BOLESW@tc.gc.ca; 416-952-3858) for speaking to us at our October meeting about the new 406 MHz ELT. Will emphasized and clarified a number of points: your 406 must be registered, and has a personal code embedded; the signal is 100x more powerful than the old 121.5 signal; there is a 2-year window beginning 1 February, 2009, depending on the type of aircraft; the typical cost is less than $1,000; it can be installed in an amateur-built aircraft by the builder/owner; the installation by an AME might take 1-3 hours; some versions can use an existing antenna and cable; the 406 must have a switch for activation from the cockpit; etc. The new 406 is obviously very much superior, although the price is unfortunate. Thank you, Will, for an interesting and informative talk.
Bob Stobie

Thompson Valley Sport Aircraft Club

The weather this last month has not been the best for flying, to say the least. With all the wind we had, I'm surprised my hangar is still there... Because I live only five minutes from the strip, I have been driving there quite often to check the conditions, and many times had to come back home without flying.

At the October meeting, I brought forward a motion about buying a webcam that we could install at Gerald's place and use on a computer supplied by Bill Huxley. The plan was to aim it at the airstrip and enable anyone to access it on the Internet and zoom in on the windsock or anything else to see if it was flying time. I mentionned a price of $170. and the motion was passed. Then I later found out that the webcam I had thought would do the trick had only a digital zoom, which is near useless unless the camera is high resolution.
Camille Villeneuve

Winnipeg

A rough rough draft documenting the history of Lyncrest Airport 1948-2008 has been compiled, we are looking for your stories of events, key accomplishments, notes of interest, and photos over the next couple of weeks. Thank you to Joyce + Tom Stoyka, John Blackner, Leo Menard, Vic Prefonatine, Bryan Kirk, Ken Gowler, George Hartwig, Max Nichols, and the late Don Patterson for their stories, we'd love to include yours!!

Lyncrest Flight Centre - thank you to Joyce Stoyka "attic girl" who installed ALL the insulation in the attic and to Gil Bourrier's crew who installed the drywall on the ceiling and in the washrooms, mechanical and janitor's rooms. Once we get the windows and doors the drywall for the rest of the building will be installed.

Finally, the chapter played host to Tom Hinderks and crew (see lead report) during the re-enactment of a pioneering Canadian achievment.
Jill Oakes

ORGANIZING THE COCKPIT
By Barry Meek / from the
Thompson Valley Sport Aircraft Club

There's always something to learn about flying, whether in your student pilot days or sitting there with several thousand hours in the log book. At this point in time, I'm somewhere between the student and the guy with all the hours, and probably half way to knowing enough about flying to keep me safe.

Every flight is still a learning experience. Flying the right seat with much more experienced pilots can be a great learning tool, if I keep my mind open to it. Some guys will point out little tricks they've learned over the years while others go about the business of flying the plane. From those fellows, I learn about their hobbies, investments, medical problems, girlfriends, holidays, and fishing vests.

I mention fishing vests, because early on in my career when keeping the airplane on track, right side up close to the altitude I was supposed to be at, took a lot of concentration. Throw in other things that tested my organizational skills and the workload went way off the scale. My home, office and my car are usually tidy. But in the airplane, it was a constant battle for me to store tools and items where they were easily accessible and always there. As a pilot, you have to know what I'm talking about. Pens, sunglasses, notepads, calculators, and whatever else you've collected as mandatory items never seem to have a place all their own. Pens fall off the panel, or roll up against the windshield out of reach. Glasses get crushed by the seatbelt while tucked in a shirt pocket. The camera, cell phone and snacks end up under a seat. Spare batteries, because they roll around can only be found when you land. Anything in pockets in your jeans is unavailable anyway, given the problems of moving out of the seat in a small airplane.

That's where the fishing vest comes in. A pilot I was flying with once, a fellow with several thousand hours who could simultaneously fly and talk about other things, told me about them. They're full of pockets, compartments and little spaces that can handle anything a pilot stuffs in. Mine has been modified a bit for personal requirements and yours can be too.

The vest works well when you fly any airplane, but their true value shines in an open-cockpit biplane and in ultralights. Everything is safely and neatly stored, yet easily accessible.

It's really such a simple solution to a universal problem, I don't know why it hasn't been used by more pilots. In a quick internet search I was unable to find a pilots vest, however fishing and photography outlets sell them.

As a working pilot, my vest is the answer to my clutter in the cockpit. Check out this list and see if there's a better answer. Cell phone, digital camera, two pens, a pencil, glasses, sun glasses, notebook, calculator, a couple of work-related checklists, glass cleaner cloth, aspirins, lip chapstick, several spare AA batteries (for GPS, AFF transmitter & digital camera), granola bars and a trash pocket. There was even room for a sandwich. This was all stuff I used daily on every flight. Another advantage of using a vest is that everything stays in one place when you're finished for the day and is right there when required in the morning. Just put the vest back on.

Most pilots have a system that works for them to keep things organized in the cockpit. But it doesn't hurt to be open to new ideas. A fishing vest will cost anywhere from $40 to $100. Similar vests are available for photographers, and I've seen much higher prices. I'd suggest you assemble everything you utilize while flying your aircraft, lay it all out, then shop for an appropriate vest. You could also put it on your Christmas or birthday wish list. RAA

Sonex:

A Canadian Perspective

The Sonex is a basic and economical all metal two place monoplane, efficient, fast and a practical first time build. What's not to love?

By Graham Luckhurst

And yes, you've probably heard it somewhere, the plans are excellent! Contributions to this article have been made by some of our local Southern Ontario Sonex builder community. There are many other Sonex builders in Canada, a total of thirteen Sonex's are registered, eleven as amateur built and two are ultra-lights with more in progress.

Sonex History, Progress, Product & Company

What sets this plane apart is that it is a product of the collaboration between John Monnett, designer of the Sonerai, Monerai, and Moni, and Peter Buck of the Lockheed Skunk Works. John has brought to the project years of practical experience in designing and building sport and competition aircraft, and Pete brought his impressive CAD skills to produce the best set of drawings in the light aircraft business. John also has the marketing skills of his son Jeremy who certainly supplies a lot of energy at shows and at the Sonex schools that he and his family operate at their facility at Wittman Field. These three have turned a simple airplane into a full service company that can supply education, tools, materials and kits, upholstery, and engines and carburetors, in short everything except the paint and final assembly labour.

When the Sonex was first introduced the price of fuel was a minor consideration for most pilots. The Sonex is capable of 35 mpg, a number that has great attraction these days. It attains this by having a very low coefficient of drag, achieved by the laminar wing airfoil and by the very smooth airfoil shape of the fuselage itself. Monnet's influence is seen here –the side view is very similar to his earlier Moni motor glider that achieves a fast cruise on 25 hp. The interior has the same width as a Cessna 150 and will easily accommodate a six foot tall pilot.

Opposite: Jay Davis in his recently completed Jabiru 3300 powered plans built Sonex. Instrumentation is nearly all digital, GRT EIS with all options except fuel pressure. He does have an analog a.s.i. xcom radio, spot locator, and eventually a Becker transponder.
Below, right, Terry Holek's leading edge former.

The Sonex was initially marketed as a $10,000 plans built airplane, and for a serious scrounger this still might be an attainable number. Most will prefer to buy some of the more labour intensive components, and for those wishing to buy everything in one box, the plane may be built for as little as $25K with everything brand new.

Many designers have moved away from selling sets of plans, preferring instead to sell kits with assembly instructions. The Xerox machine is always the greatest enemy of any designer. Sonex supplies large format CAD drawings with many parts drawn full scale. What keeps the copiers honest is that the design requires the Sonex proprietary spar caps that are available only from Sonex, and which are sold only to registered owners of plans.

Sonex sells their parts in progress kits, and anyone building from plans would be well advised to buy the engine mount and landing gear legs, the steel control system group, the fuel tank, and of course the bubble canopy, the fiberglass cowl, and the wing and tail tips. The formed aluminum package is worthwhile too. For those wishing to make their own wing ribs, Sonex sells a set of laser cut form blocks and injection molded plastic hole flanging dies. Alternatively they sell a package of laser cut formed wing ribs. The drawings are dimensioned in both metric and inches, and all parts will fit if they are made according to plans.

A Survey of Our Local Sonex Builders

A short survey of our local Sonex builders was conducted to get a broader understanding of who is building this exciting little plane and their experiences during the build process and flight, if applicable.

A common theme was everyone bar one pair is/was building alone. Most are plans builders making no significant changes to the design. Generally they are polishing to save weight and cost. The Aerovee engine kit is popular as you can build it yourself, save on cost and it has a good reputation. All are going the amateur built path. Everyone comments that Sonex support is excellent.

Terry Holek was looking for an economical metal airplane with a well-proven and well-engineered design. He liked the fact that Sonex provided "one stop shopping" (ie. engine options and installations fully supported). The Sonex mission fit his profile very well....primarily a close to home, few hours at a time fun stress reliever, aerobatic capable, but also, rugged enough to handle long cross country adventures too. Like me, Terry chose to purchase a kit as build time was and remains somewhat limited and he decided the trade off in dollars versus time was worth it. Critical to his success has been access to the internet....there is a wealth of information out there. He's found being able to view build logs and pictures from other builders to be an invaluable source of information. The

more technical oriented types have maintained some excellent project-based web sites.

So *that's* how its done! Though Terry built from a kit, unfortunate damage to a lead edge skin meant he had to form another. He borrowed this jig from Brian Heinmiller who got the idea from a posting by Tony Spicer.

Chris and Joe McNally scratch built ther Jabiru 2200 power tail dragger, including the welded

The Sonex airframe is entirely constructed from 6061-T6 aluminum sheet, angle and plate. This makes it less expensive, easier to build, and less likely to corrode than projects using 2024-series clad aluminum.

parts! Chris says the plane flies very well. It has lots of control surface area so it is very responsive. It will roll fast and turn fast. Input on the stick is very little to do anything. He built a tail dragger and said at a little over 600 pounds dry you have to pay attention to landing and taking off. In flight you have to fly it all the time. Overall mastering the plane doesn't take too long. He taught himself to fly it and had no tail dragger time. However, he recommends that all pilots get checked out in the tail wheel model before taking off alone. So far Chris and Joe have put 200 hrs on the plane and really enjoy the whole experience.

David Witt, a mechanical engineer, is plans building and chose the Sonex as it was all metal and the plans are fantastic. A mechanical engineers acknowledgement of the quality of the plans certainly gives them credit. David had no previous experience. He enjoys the satisfaction of looking at completed parts. On occasion he finds it frustrating when he ends up making the same part three times to learn how to do it. An example he gave was one of the turtle deck formers. It turns out that some fluting details were missed on the plans that caused the frustration, a rare omission by Sonex. But the plans details were sufficient for David to work out the true requirements.

Doug Raby is an IT Professional turned TV Cameraman, and documentary filmmaker. He is plans building and finds perseverance is going to be most critical to success, something we all find out fairly early. Like most surveyed, he attended the builders work shop and finds the Sonex user groups very useful. Doug says it helps to look ahead at possible pitfalls, techniques, and tools required.

Fritz Deininger is 1600 hours and five years into his plans built project with more than a year to go. He really enjoys taking a pile of parts that may have been built 4 years ago, put them together and everything actually fits as per the plans. One reason he chose to build a Sonex was their position (Sonex) that no priming is required due to the good corrosion resistant properties of 6061-T6 alloy. He built nothing but parts for about a year or so, and noticed that from fingerprints alone, lots of the finished parts were starting to get white deposits (corrosion) on them. He's decided that he will prime ALL internal parts/skins before assembly. He DOES NOT like messing with primer, but is doing it.

Garth Knowles has lots of handyman experience but had none with metal until completing his plans built Sonex. Currently he is in the transition phase flying off the first 25 hours. It is the first Sonex he has flown. His engine choice was the Jabaru 3300 engine as he wanted to be sure he ended up with a plane that would be "fun" to fly. He didn't ever want to be thinking "I should have gone with the bigger engine." He enjoyed everything except the last 100 or so hours of polishing and also indicated he "enjoyed" building his third canopy even less than he did the second! Sonex say the canopy can be the most challenging part of the build and for many Sonex builders there is a lot of anxiety around fitting and installing the canopy. It seems a fairly high percentage of builders end up doing this more than once. Garth experienced some cracking with his first canopy he was not satisfied with and the second broke during an unfortunate incident during ground testing the engine where the canopy was not quite closed.

Brian shows us the true meaning of a 'light aircraft'
Below: The panel is big enough to get the essential VFR instrumentation installed comfortably.

Robert Johnson is one of our accelerated builders. He started in November 2007, has completed his pre-cover inspection and is working on the fire wall forward components. This required about 25-35 hours of effort a week. The Sonex is the 7th aircraft he has worked on. Robert mentioned that the cowling was a challenge. After fitting around gear leg and sides, there was not enough material to overlap for a proper fit down the center on both top and bottom. Fill in glass work was required on the top side around forward prop flange area and the bottom seam had to have hinge installed in reverse to fill a gap. Both halves required additional material along center edge as supplied.

Brain Heinmiller went one step further and provided a very detailed history of his build and flying experiences sufficient to make a very interesting article in its own right. Brian has an electrical engineering background with experience building the wood structure of a KR-2 and performing a fabric recovering for a Jodel D-11. He tells his story:

In November 1999, I purchased all the aluminum sheet, angle and plate for the project from a Brampton metals supplier for less than $1,200. Sonex Aircraft PLC now sells a high quality complete, pre-punched airframe kit, but it was not available in 1999 so I was committed to a scratch-built project. I did subsequently purchase from Sonex Aircraft the "formed aluminum kit" which comprises pre-bent control surface skin material, glare shield and spar tunnel panels and 8' lengths of the various aluminum channels used in the airframe. This kit eliminated the need for a long bending brake. I subsequently purchased the welded steel motor mount, control stick components, pushrods and tail wheel weldments from them as well as the plastic fuel tank and the fibreglass blanks for the cowling, tail tips and wheel pants which were later trimmed and fitted. The Sonex-supplied components are of excellent quality and came well crated and protected for shipment.

The Sonex airframe is entirely constructed from 6061-T6 aluminum sheet, angle and plate. This makes it less expensive, easier to build, and less likely to corrode than projects using 2024-series clad aluminum. There are only two sheet thicknesses used - .025 for wings, tail and aft fuselage and .032 for the forward fuselage and wing spar webs. Other parts such as gussets and inboard spar web plates are made from .060, .090 .125 and

.163 6061-T6 plate.

The airplane is assembled with 1/8" dia. Cherry "N" pulled rivets. These rivets have stainless barrels and mandrels and have comparable shear strength to the AN470AD-4-x solid rivet. They are available in protruding head (CCP-04-xx) and flush head (CCC-04-xx) styles. Pulled rivets work well on a one-person project and can be installed rapidly using an

economical pneumatic puller.

I built my Sonex in a 2-car garage, but only used one bay until the time came to fit the canopy. My work table was 8′ long and 40″ wide and this was sufficient to build everything except the wing spars. For these, a temporary 12″ wide "bridge' was built from the work table to the bench along the back wall. I kept the table exactly level, so by using a bulls-eye level RTV'd to the butt end of the drill I was able to drill vertical holes freehand. I used a Taylor 1/4″ air drill which was excellent - light, compact and speed-controllable. It was moderately priced at about $100. Much better than an electric drill. I was able to make straight cuts in sheet without "snip marks" by cutting 1/8″ outside the cut line with snips and machining off the extra with a flush bit in a router along the edge of the MDF bench top.

The 3mm polycarbonate windshield was a very straightforward job and caused no problems. It is not preformed but bent to shape on installation. The canopy was another matter. It was probably the most tedious task on the whole airplane and one that even the kit builders will have to do. I purchased the blown acrylic canopy blank from Sonex Aircraft. The canopy was trimmed using a support stand

Brian's Jabiru 2200 engine installation clearly showing the battery location on the engine mount to get it as far forward as possible. Below, Brian's 6 foot frame can fit with enough room to spare to be comfortable.

Sonex Specs

Length: ..... 18' 1"
Wing Span: ..... 22'
Wing Area: ..... 98.0 sq. ft.
Tail Configuration: ..... Conventional
Tail Width--with tail tips: ..... 92"
(interior width required for enclosed trailer)
Air Foil: 64-415
Primary Structure: ..... 6061 aluminum
Cockpit Width: ..... 40 in.
Fuel Capacity: ..... 16 US Gal.
Stall Speed (full flaps): ..... 40 mph
..... [64 km/h]
Stall Speed (clean): ..... 46 mph
..... [74 km/h]
Max Flap Ext. Speed (Vfe): ..... 100 mph
..... [161 km/h]
Maneuvering Speed: ..... 125 mph
..... [201 km/h]
Never Exceed Speed (Vne): ... 197 mph
..... [317 km/h]

which was well padded and the approximate shape of the canopy frame. At least 50 trial fittings and trimmings requiring two people were needed to get it fitting right. In the end, the fit is good, but not perfect. Unlike a few unfortunate builders, I had no cracks or over-trimming. Sonex is now supplying canopies in a more compliant material they call "Sonplex" which should make the installation task easier. Sonex Aircraft provides comprehensive instructions on how to handle and install the canopy. I followed them as closely as I could.

Sonex Aircraft supports 3 engine choices:

-80 HP Aerovee (by AeroConversions, a subsidiary of Sonex Aircraft)

-85 HP Jabiru 2200

-120 HP Jabiru 3300

Installation drawings including baffle designs are provided for all 3 in the plans. Engines such as the Rotax, Subaru and Corvair are excluded by the design weight limitation of 200 lbs firewall forward. I chose the Jabiru 2200 engine to power my Sonex. Acquisition and operating cost was more important to me than speed, and I believed that I would find the performance of the airplane to be adequate with one of the 80 HP engines. So this ruled out the Jabiru 3300 for me. My assumption of adequate (to me) performance with the smaller engine proved to be correct. I judged the Jabiru 2200 and the Aerovee engines to be equivalent in all respects except weight and cost. The Jabiru weighs ~30 lbs less than the Aerovee but cost ~$4,500 more. So the only question for me was whether the weight was worth the money. I decided that, in my case, it was. My reasoning was simple - with the Jabiru I would be able to carry a ~200 lb passenger with a full tank of gas and with the Aerovee I would be limited in who, or how much fuel, I carried. While I am happy with my engine selection, in retrospect, I could have considered

Sonex Performance

	80 hp Aerovee	80 hp Jabiru	120 hp Jabiru
Avg. Empty Weight 620 lbs.	620 lbs.	620 lbs.	
Range	550 miles	550 miles	400 miles
Cruise @ Sea Level*	130 mph	130 mph	135 mph
Cruise @ 8000 ft (TAS)	150 mph	150 mph	170 mph
Pwr Loading GW/HP: 13.12513	13.12513.	1259.583	
T.O. Distance	400 ft	400 ft	250 ft
Landing Distance	500 ft	500 ft	500 ft
Utility Category			
Gross Weight	1100 lbs	1100 lbs	1150 lbs
Baggage (Max)	40 lbs	40 lbs	40 lbs
Useful Load	480 lbs	480 lbs	530 lbs
Rate of Climb	800-1000 fpm	800-1000 fpm	1200-1400 fpm
Positive Load Factor	+4.4 Gs	+4.4 Gs	+4.4 Gs
Negative Load Factor	-2.2 Gs	-2.2 Gs	-2.2 Gs
L/D	11:1	11:1	11:1
CG Limits (% wing Chd)20-32%	20-32%	20-32%	
Aerobatic Category			
Gross Wt950 lbs	950 lbs	950 lbs	950 lbs
Baggage (Max)	10 lbs	10 lbs	10 lbs
Rate of Climb	1000-1250 fpm	1000-1250 fpm	2000+ fpm
Positive Load Factor	+6.0 Gs	+6.0 Gs	+6.0 Gs
Negative Load Factor	-3.0 Gs	-3.0 Gs	-3.0 Gs
CG Limits	25-29% Wing Chord	25-29% Wing Chord	25-29% Wing Chord

registering my Sonex at a max gross weight of, say, 1130 lbs. Had I done so, I'm sure I would have picked the Aerovee which I think is also an excellent aircraft engine.

My Sonex is equipped with an altitude-compensating Bing carburettor because it was supplied with the engine. It has worked well, and I have no complaints with it. It is equipped with a choke (no primer) which allows a cold engine start in about 4 blades. I have yet to install their "econo kit" which might reduce my fuel burn a bit. However, my eventual plan is to replace this Bing carburettor with the gravity-fed Aerocarb from AeroConversions (a division of Sonex Aircraft) and thereby eliminate two fuel pumps and provide the operating flexibility and economy of an adjustable mixture.

I'm about 6' tall and I find that my head is quite close to the canopy but it's not uncomfortable or problematic. I plan to experiment with an "in-the-ear" headset to see if this helps. I have found that I need to keep the seat belt really snug or I will hit the canopy in really bumpy air. The Temperfoam seat cushions compress with body heat and re-tightening the seat belt is a good pre-takeoff checklist item. I have not yet installed cabin heat because I only have one heat muff (on the muffler) and that air goes to the carburettor when selected. On a sunny day in winter there is so much plastic that I still have the vents cracked open.

Sonex specifies a sea level cruise speed and top speed of 130 mph and 150 mph respectively. My airplane exactly matches these numbers. Sonex claims an empty weight of 620 lbs. My Sonex originally weighed 612 lbs, but I have since a radio, transponder, encoder, seat covers, interior panels, floor mats and a baggage compartment so my airplane now weighs 628 lbs - pretty close to spec! They specify a rate of climb of 800 to 1000 ft/min. I can achieve that when flying solo, but my best rate of climb at gross weight is closer to 550 ft/min. I have yet to calibrate all the performance points with the current propeller. My take-off and landing distances are longer than specified due to technique and not an airplane limitation. To be comfortable I would want a paved runway at least 1200 ft long. I don't have any grass field experience yet but expect good performance there as well.

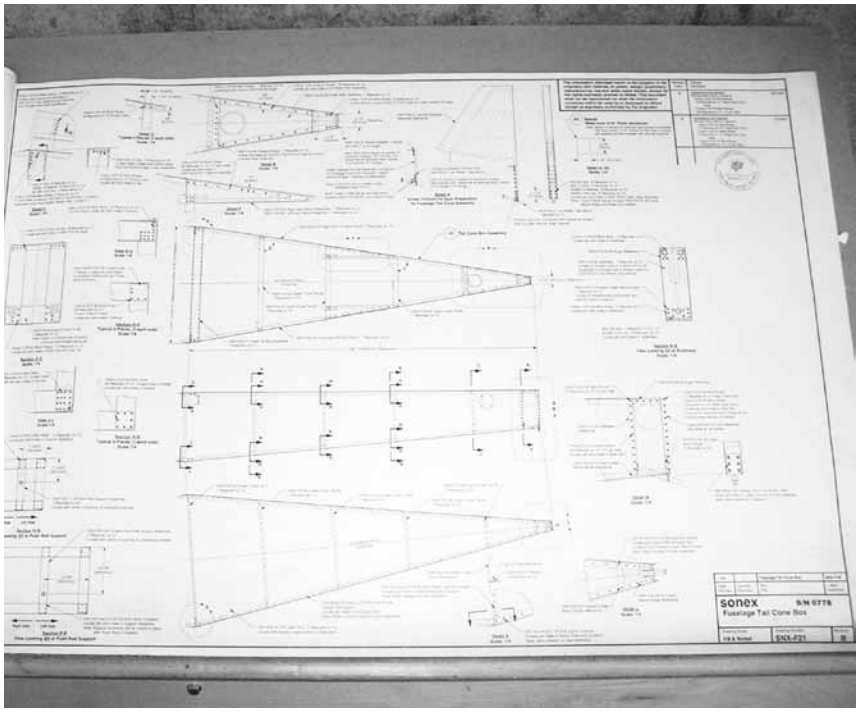
The centre of gravity must stay between 20% and 32% MAC (utility) and 23% to 29% MAC (aerobatic). Because fuel is carried in a tank in the forward fuselage, the C of G moves aft as fuel is burned. My Jabiru 2200 engine weighs just 132 lbs and a Sonex with this engine tends to have an aft C of G challenge. Realizing this, I did a number of things to keep weight forward - battery on the motor mount, ELT under the pax seat, no airframe paint, etc. As a result, on my airplane when flying solo, my C of G is at 23.8% MAC and moves aft to 28.2% with zero fuel - centred within the aerobatic range. With a 180 lb passenger and 20 lbs of baggage, the C of G of my Sonex hits the aft limit (32% MAC) with 4 litres of fuel remaining. I can live with that. It should be noted that with the Aerovee or Jabiru 3300 engines, C of G is not an issue due to the higher engine weight.

Ken McLeod brings another fine Sonex example to our Canadian skies.

Please note that these impressions and opinions are solely based on my experience and situation and aircraft. Other pilots may experience the Sonex differently than I have described.

I have not found the Sonex to be a difficult aircraft to fly right from the first flight. The Sonex always feels very solid in flight and on the ground. I have never been surprised by its behaviour or found myself any flight condition where I was concerned about what was going to happen. I have noted no

Sonex plans are excellent in detail and quality...Each major assembly starts from the basic details of each part with higher level assemblies working backwards through the plans



Exceptional detail means you can usually figure it out. Shown is the lower tail cone assembly.

bad habits or "tricky" behaviour.

The elevator on my Sonex is quite sensitive, uncomfortably so initially for some pilots I have flown with. My Sonex initially flew hands off with the ball halfway out of the cage to the right. A small trim tab solved that issue and it now tracks straight at 130 MPH. I think every Sonex I've ever seen has a rudder trim tab - right rudder on the Jabirus and left on the Aerovees - because the engine is not offset.

I find the rudder is always effective but not used a lot in flight. Rolling into a turn and maintaining it requires very little rudder, but rolling out of a turn quickly can require some out-of-turn rudder to keep the ball centred.

My Sonex performs exactly as the factory specifies. At 2,500 feet I cruise at 130mph IAS at 2950 RPM (~75%) and 150 MPH IAS at 3300 RPM (100%). These speeds correlate well with GPS data.

Although Jabiru approves the use of 100LL as well as premium MOGAS, I use the 100LL because it's available on the airport. In 65 hours of flying I have averaged 17 litres per hour. This is higher than the expected 15 lph likely because of the break-in period and a slightly rich mixture.

The Sonex can be securely tied down outside using the eyebolt tie down anchors under the wings. However, the airplane has no control locks so you have to make your own and apply them externally.

I find my Sonex is a fun flying machine. It flies the way a sports car drives, if that makes any sense. The airplane is being used in the US as a training aircraft for the Light Sport category and low-time pilots have not reported significant difficulty transitioning to it. I think it is an excellent first building project for someone that wants an economical sport aircraft.

Around the Circuit with Ken MacLeod

Ken MacLeod says his kit built Jabaru 3300 powered tail dragger Sonex flies great. It's a little pitch sensitive at high speed, greater than 150mph, but has good slow speed handling and therefore good in the pattern, landing and takeoff. View over the nose is good at cruise speeds and attitude. Ken describes a his typical circuit as follows.

"I line up on the centre line, trim nose down, no flaps, pull the stick back so that there is a load on the tail, and keep a strong foot on the right rudder, add power slowly, as speed builds and as rudder authority builds I slowly release the down pressure on the tail wheel, keep a strong right foot on the rudder to maintain center line. I slowly move the stick forward so that the tail comes up but avoiding

large rudder corrections, I make gentle consistent corrections as required. By this time I'm at full power, applying slight back pressure on the stick and airborne at approximately 50 MPH. Speed builds rapidly, climbing out at ~120 mph, I trim and keep a fair amount of right foot on the rudder to keep the ball centered. I turn cross wind at 500 FT AGL and down wind, throttle back to 2800RPM, then trim. About mid down wind I slow the plane to ~120MPH and do down wind checks and continue to slow down. Approximately 45 degrees of the end of the runway I throttle back to ~1500RPM and pull the nose up gently to get the air speed below 100 MPH, When below 100 MPH I add 10 degrees of flaps and continue to slow down flying the approach base and final at 80 MPH dual, 70 MPH solo at which time I'm at idle, triming for the approach. Once the field is made, I apply full flaps and trim as required. At this time I should be pointing where I'm are going to land, managing airspeed either 80 or 70. I add power only if I don't have enough height. I'm over the numbers at 70 dual and 60 solo approximately 50 ft above runway. When it looks like the ground is really big, ~ 15 -20 feet off the ground, I flare, gently. If the airplane starts to climb I still have too much air speed and decrease the back pressure on the stick (finesse the stick) slightly so that I don't climb, but stay more or less in the landing attitude. I should be approximately 5-10ft off the ground as the plane starts to settle making sure I'm pointing straight down the runway and on the centre line. Continuing to bring the stick back I make a three point landing. Once on the ground I bring the stick all the way back to keep a load on the tail wheel making gentle rudder corrections to maintain the center line. The roll out should not require brakes."

About Those Plans...

You may have previously read or heard Sonex plans are excellent in detail and quality. They start with a well organized hierarchical approach to the plans organization. Each major assembly

Though jigs are not specified, they sure do help keep everything square and true. Here, an extruded aluminum product typically for industrial enclosure and support frames is used.

starts from the basic details of each part with higher level assemblies working backwards through the plans. The complete hierarchy is detailed on one of the first pages. All components and part numbers are determined from the page numbers which include a meaningful designator/section reference such as F12-03, a fuselage part on page 12, third component. This ensures the fabrication details of a component referenced on an assembly drawing can be quickly found. The plans include all the written details on how to fabricate or assemble each component. The assembly sequence is accurately reflected in each drawing where details such as holes not to be drilled out or riveting not be performed at a particular stage are clearly shown. Where an assembly sequence is required, details are included on the relevant page. The use of computer aided design (CAD) has allowed them to include a lot of detail for each assembly step. Every dimension is in inches and millimeters allowing the measure twice, cut once rule to be conducted in each of the units for additional level of cross checking. Make sure all your rulers and measuring tapes included both scales. Each page has a revision history which demonstrates good engineering discipline.

*Note: All Models meet FAA Sport Pilot Regulations at maximum continuous power at Sea Level, as required. Read More...

Sonex Aircraft, LLC Supported Engines include AeroVee 2180 (80hp), Jabiru 2200 (80hp), and Jabiru 3300 (120hp). Read More...

And a Few Last Words from the Author

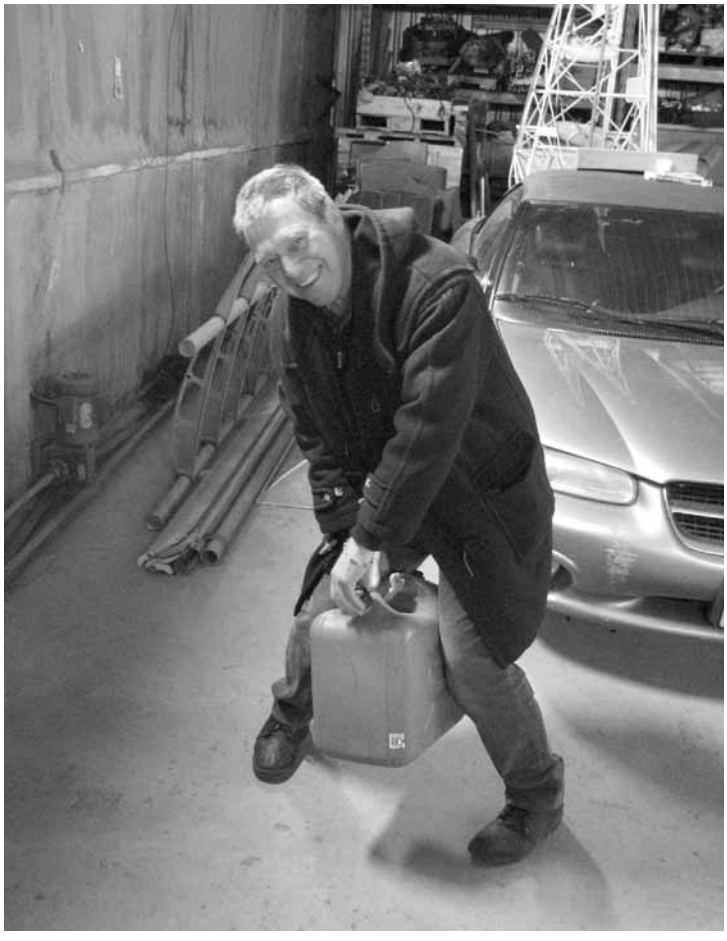
I am 850 hours into my Sonex kit #778. All flying surfaces are basically finished and inspected and the tail cone is well on its way to completion. I recently read in a major publication that someone had completed their Sonex kit in 690 hours. I guess we all work at our own pace. After all this is my first experience building a plane and working with aluminum in a small workshop with a basic set of tools. I must be having twice as much fun. Putting this article together has been very educational as it gave me additional exposure to my fellow Sonex builders successes and challenges experienced, what to look out for and problems they solved. Thanks to all those who contributed to the article and special thanks go to Brian who essentially wrote half of it! RAA

Graham Luckhurst has written two articles for the Recreational Flyer, 'Riveting Experience' about building the Sonex spars' and 'The First Mission, Build It!' regarding work shops in small places.

TRANSPORTING FUEL

Many aircraft can be run on both 100 LL and auto fuel. With the current price of auto fuel being nearly half that of 100 LL, some pilots are now filling up 5 gallon plastic jerrycans and transporting them to the airstrip. The problem arises during transportation. When the cold fuel becomes warmed up during the drive to the airport, the vapour pressure rises and the fuel begins to push past the cap's O-ring or the vent. This is smelly and dangerous but it may be avoided. When filling the jerrycan do not go right to the top. Most 20 litre cans will hold 20-22 litres, but stop filling at 20 litres. Give the can a good squeeze with your knees while tightening the top and the vent so that the sides remain noticeably concave. If the can becomes warmer during transportation and the vapour pressure rises inside the can, the pressure will still be below atmospheric so there will be no gassing off or leakage. Problem solved!

RAA Technical



Checking Auto Fuel For Alcohol

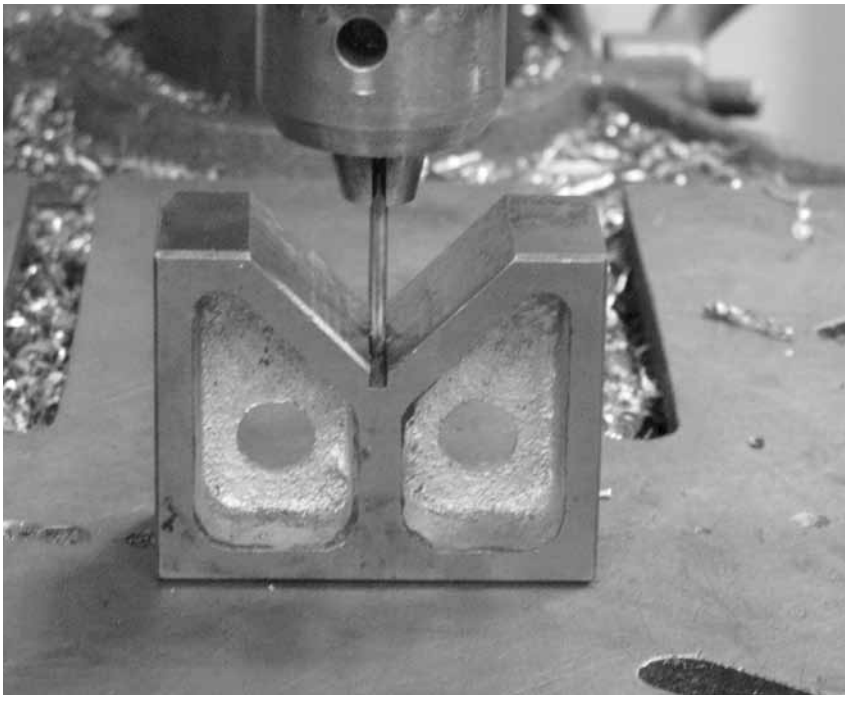
As we all now know, ethanol in gasoline can be a problem for fuel system components. It also absorbs water quite readily, and when the temperature drops it can precipitate all this water at once, a process called phase separation. Fortunately there is a simple way to test auto fuel for ethanol, and this test can be done at the gas station before filling the jerrycan.

A test tube or other slim glass bottle may be used as the test flask. A 250 ml seafood sauce bottle works well for the purpose. Before heading to the gas station put an inch of water in the bottle and mark the level with a pen. At the station add gasoline to somewhere near the top, and cap the jar tightly. Shake this mixture vigorously and let it settle.

If the water level has increased, this means that there is alcohol in the fuel. The alcohol that was in the gasoline has now become dissolved in the water, raising its level above your reference mark.

What do you do with the swill in the bottle? One possibility is to decant the gasoline and pour it into your car. Alternatively you could take it to the airport and put it in the can you use for the swill you have drained from your plane's gascolator. And what do you do with all the swill? I keep mine until the Spring, then dilute it with fresh gas and run it all through the Honda lawnmower that trims the grass around the plane.

DRILLING SQUARE HOLES

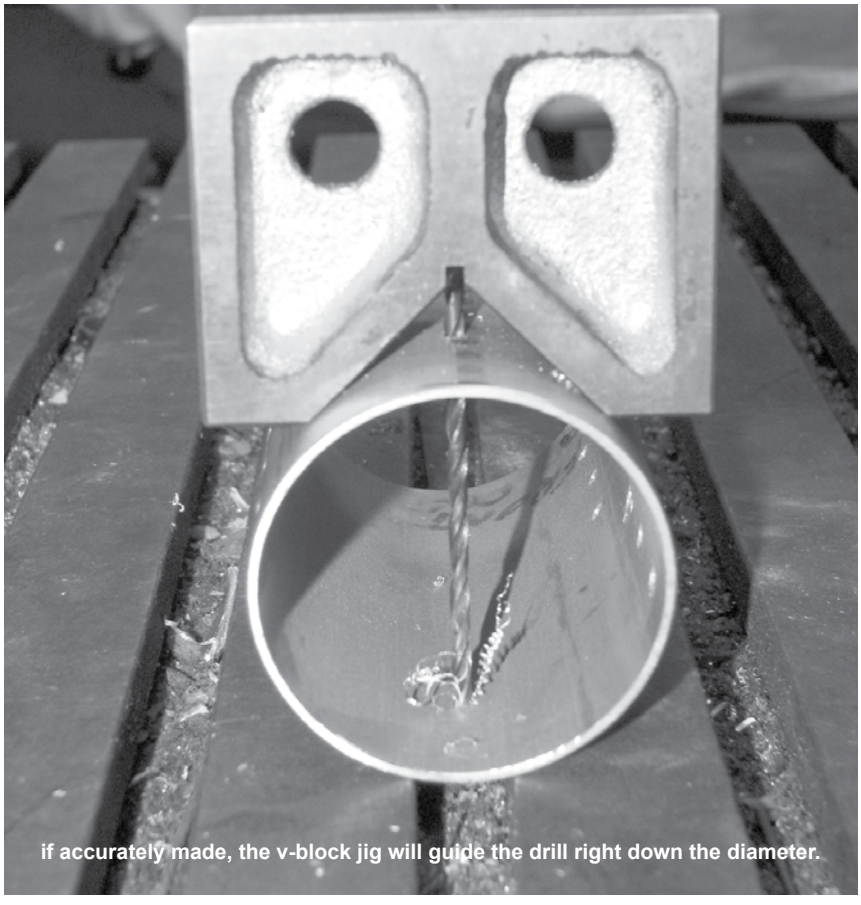


Actually, this is about drilling holes square to a surface, when that surface is round. When building an airplane there are many occasions when the fabricator must drill into tubes for rivets, and sometimes straight across the tube for bolts. The hard part is always to find the center, and then to drill straight. You can make a handy jig for this purpose and it will save you a lot of wasted time and materials.

Head to your local machine shop supply and buy a couple of cheap V-blocks. Busy Bee Tools sells a 3" pair for twenty dollars. While you are at the machine shop supply, get some real drill bits made from M2 tool steel – 3/32, 1/8, 5/32, and 3/16". Also buy a drill bit that is a good fit in the groove at the root of the V-block. It is important that this drill be a good fit so that it will be centered in the groove.

First make certain that the table on your drill press is set up perfectly square. If your press is sloppy, there will inevitably be someone in your chapter with a good one, or even better – someone with a vertical mill. Centre a drill bit in the groove of the V-block and drill several pilot holes right through the block.

Top: Choose a drill that is a good fit in the groove and drill through squarely Above, bisecting the angle of the v-block means a hole that is centered on the tube Right: reverse the v-block and drill through to finished size.



if accurately made, the v-block jig will guide the drill right down the diameter.

Invert the V- block, and using these pilot holes drill your 3/32, 1/8, 5/32, and 3/16 holes. You might have to use both blocks to accommodate all sizes.

To drill a hole square to a tube, the V automatically positions the drill bit on center, and the guide hole keeps the bit square to the tube, assuming of course that you worked accurately when you made the jig. If the jig has been properly made, even a hand drill will then be able to drill squarely across a tube.

I used this jig to bore the wing spar root bolts on a Kitfox with 2.5" tube spars, and later to drill for cross bolts on the lift strut end fittings of an ultralight with aluminum tube lift struts. The drill jig made both jobs easy.

Gary Wolf # 7379

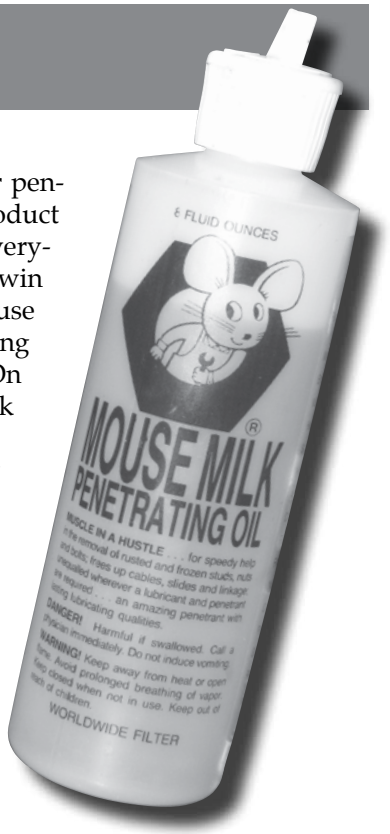
Product Review

MOUSE MILK

For fans of WD 40 it might come as a surprise that there is an even better penetrant and lubricant that goes by the improbable name of Mouse Milk. This product has the ability to free up rusted parts and then to remain in place to keep everything lubricated. The local charter operator says that on their turbocharged twin the AME keeps the turbo wastegates operating freely by applications of Mouse Milk every 25 hours. Otherwise the yaw during takeoff roll can be a bit exciting if one wastegate has stuck open while the other engine is making full boost. On homebuilt planes it is good for door latches, Bowden cables, and loosening stuck carb heatbox butterfly shafts.

Besides having good penetrating oil properties, Mouse Milk is an excellent cutting and tapping oil for steel and aluminum, and the squeeze bottle has a tip up spout that allows accurate application of the product without a lot of waste.

Mouse Milk smells as if it is a petroleum distillate but no information is given except the usual cautions about swallowing or prolonged breathing. Aircraft Spruce and other suppliers sell Mouse Milk in handy 8 oz plastic bottles for under $10 CDN.



Mouse Milk is available at Aircraft Spruce #09-39608
8 oz Cat price $5.25 US #09-39632 32 oz Cat price $16.70 US

President's Message (Continued from page 2)

egory into our regs. I have had weekly phone meetings with the Ottawa to answer the concerns of those doing risk assessment, and we are now very close to having this category in Canada. If all goes according to plan, Canadians should have this category during the 2009 season.

ELT's

ELTs are still a contentious issue, especially for Northern pilots who do not enjoy the two-year transition period. If you live north of the 55th parallel and west of 80 degrees longitude, or north of the 50th parallel and east of 80, you have until February 1st to install your 406 ELT. There have recently been some rumblings of doubt in Ottawa about the wisdom of the whole 406 decision, and the proroguing of parliament might delay the date somewhat. My advice is that if you do not need to fly during this winter, you should wait until the last minute before buying your 406 ELT. The much-promoted SPOT locators do not meet the current requirement.

Chapter Insurance

RAA's blanket liability insurance policy continues to be a valuable asset to chapters. Without this policy most chapters could not hold their meetings and fly-ins. Our chapter events have an enviable safety record and in 2008 we were able to negotiate a 10% reduction in the premium. The premium still approaches $10000, and this fee is paid from your membership dues and from the $15 fees of non-national members. Please make certain that your chapter has submitted its fees for 2008 as the annual premium comes due early in January.

Kudos

The Recreational Flyer magazine is the only Canadian publication that deals solely with national issues of interest to Canadian builders of aircraft. I would like to thank the many members who contribute to its publication and distribution. Special thanks go to George Gregory for turning the raw material into the colourful magazine you receive as a benefit of your RAA membership. I would also like to thank Ron Seyffer for accommodating our timeframe when he prints the magazine, and the members of Barrie-Orillia RAA for handling the mailing of every issue. These dedicated members have been volunteering their labour for longer than I can remember. RAA Canada is a volunteer organization and without the work of all, there would be no RAA. Thank you everyone for all that you do.

Aircraft Spruce Panel Builder

Aircraft Spruce and Specialty Co., a leading supplier of building materials, parts and avionics for experimental aircraft, has introduced its new Aircraft Spruce Panel Builder. This online tool allows a builder to plan their instrument panel without having to search the internet and keep track of findings from a variety of sources. Using drop down menus, the builder can easily search the ACS inventory of avionics and instruments by category. The Panel Builder displays everything a builder needs to complete a panel, whether the builder wants to assemble the panel themselves or have Aircraft Spruce produce a ready-to-install custom panel. Panel Builder will quickly provide quotations on any variations in the panel that the builder wants to consider. The avionics specialists at ACS will then work with the builder to finalize the layout of the panel and provide a final quotation and production time. Aircraft Spruce Panel Planner can be accessed on the Aircraft Spruce website at www.aircraftspruce.com. For more information visit the website or call 1-877-4SPRUCE.

Two planes arrived at flight control at exactly the same time. Flight control said, "Delta, Continental, you both arrived at the same time. Who wants to go first?"

The Continental pilot immediately heard, "Go ahead, Delta, I'll wait!"

More scenes from Reno 2008:
Top, Adrian Cooper and crew towing T'witchy to the flightline.
Centre, Adrian and crew: left to right, Chris and Joan Cox, Jack Pomerleau (T'witchy's builder), a victorious Adrian Cooper, and Alex Fuchs.
Bottom: such events are always magnets for interesting ex-military types. Here a Beech 18 in US Navy regalia.
Below: couldn't agree more.

Keep in Touch With Your Board of Directors!

Gary Wolf ..... President
..... 519-648-3030 garywolf@rogers.com
David Moore ..... Vice President (programs)
..... charlotte.moore@sympatico.ca 905-659-3454
Wayne Hadath ..... Treasurer
..... whadath@rogers.com
Chris Gardiner ..... Secretary
..... 905-668-5703 cgardn628@rogers.com
Ed Butler ..... landed@sympatico.ca
Dave King ..... kingdws@shaw.ca

RAA Regional Directors

Mainland BC:
BC Coast ..... Terry Wilshire terwil@telus.net
604-721-7991

Interior BC/Technical Director: ..... David King
contact best between noon-10pm 7days work
ph. 250-868-9108 homep ph. 250-868-9118.....
..... emailKingDWS@Gmail.Com

Alberta North:
Tom Hinderks ...780-453-1078 or leave a message at
780-451-1175 .... e-mail eahs.execdir@interbaun.com

Alberta South:
Gerry Theroux ....403-271-2410 grtheroux@shaw.ca

Saskatchewan:
Curt Halpenny 306-934-2965
cth.saskatoon@sasktel.net

Manitoba:
Jill Oakes....204-261-1007 jill_oakes@umanitoba ca

Ontario SW:
Tom Martin ..... fairlea@amtelecom.net

Quebec:
Raymond Fiset .418-871-3761 rayfiset@videotron.ca
..... 7925 Hamel Blvd., Ste Foy, PQ G2G-1C8

Appointed Positions:
Translation: ..... Pending
Magazine Mailing: ..... Dave Evans
Ultralights: ..... Wanted
Web Page ..... Nicholas Grose
Insurance Committee ..... Gary Wolf
AirWear ..... Dave King

Classified Ads

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

The Recreational Flyer is pleased to offer you colour advertising within the magazine. Previously limited to the back cover, we have added 4 new colour pages which will be available with limited space for your advertising needs. Our rates for both black and white and colour ads remain very competitive and you reach a captive and qualified audience.

Ads can be emailed to : ***classified@raa.ca***

Deadline for submissions is the first of the month preceding date of issue.
Artwork: Rates apply to camera ready artwork. Digital files are preferred and should be sent as email and in .txt format, PDF, JPEG, MS WORD, Photoshop or other common file types. Advertising is payable prior to printing of magazine unless other arrangements have been made. Payment is in Canadian funds. 10% Discount applies to one year (6 issues) insertion paid in advance. Commercial Classified ad rates 1/8 page minimum.

Advertising Policy
The Recreational Flyer Publisher reserves the right to refuse any or all advertising for any reason stated or unstated.
The Recreational Aircraft Association Canada does not assume responsibility for advertisements, but does exercise care to restrict advertising to responsible, reliable individuals.
Please note: Ads running more than 3 issues must be renewed to guarantee continued display in the magazine.

Recreational Aircraft Association Canada

President: Gary Wolf
Vice President (Programs): David Moore
Secretary: Chris Gardiner
Treasurer: Wayne Hadath

Recreational Flyer Magazine

Registration Mail Publication No. 09869

Contributing Editors:
Owen MacPherson
Don Dutton
George Gregory
Art Director and Layout:
George Gregory
Printed by Rose Printing Orillia, ON
The Recreational Flyer is published bi-monthly by the Recreational Aircraft Association Publishing Company, Brampton Airport, Caledon, ON L7C 2B2. Toll Free line: 1-800-387 1028 email: raa@zing-net.ca. Purchased separately, membership in RAA Canada is $35.00 per year, subscription to Rec Flyer is $35.00 per year; subscribers are elegible for reduced membership fees of $15.00 per year. Rec Flyer to have a single issue price is $6.95.
The Recreational Flyer is devoted to the aerospace sciences. The intention of the magazine is to promote education and safety through its members to the general public. Material in the Flyer is contributed by aerospace engineers, designers, builders and restorers of aviation devices and vehicles, used in an amateur capacity, as well as by other interested persons, publications and organizations. Contributions to the Recreational Flyer are voluntary and without remuneration. Opinions expressed in articles and letters do not necessarily reflect those of the Recreational Aircraft Association Canada. Accuracy of the material presented is solely the responsibility of the author or contributor. The Recreational Aircraft Association Canada does not guarantee or endorse any product offered through articles or advertising. The Flyer and its publisher welcomes constructive criticism and reports of inferior merchandise or services offered through advertising in the publication.

For Sale

Sonex TD project for sale: Precover inspection done, all surfaces now closed, partially polished, Flight and Engine instrumentation included, New Aero-vee engine assembled and mounted. Experienced builder. Everything included to complete. Could be flying this fall $30,000.00 Cdn. (cost of materials) Lost medical. 905 892 9649 or bestofbo@cogeco.ca Aug 08

Zenith CH-250 Project For Sale. Tricycle configuration First inspection done. Ready for rigging. Have 3 in 1 engine gauge, VSI, ALT, Compass, Tack, and air speed gauges. Have a dinafolcal engine mount for 0320 engine, prop, some pneumatic tools. Plus lots of old news letters for the project and pictures of different configurations. $10,000.00 Ph. 604-859-6884, John.

CAVALIER 102.5; 700 TTAF (airframe rebuilt/97), AERO Sport, O-320-B2B, 75 TTSN (seeing 1500 ft/m), Sensenich metal prop, 1750 lbs gross weight, 622 useful load, VFR instruments + GarminMode C, kept in heated hangar. Flies fantastic! $32,000. moneypit@uniserve.com or 250-558-5551; ask for Cameron. Oct08

Parts for sale: Low hours Colin Walker wooden prop a 7256 off an O-290D ($600); New ROTAX 9" UHS 2 blade spinner ($80). If you are interested, I can be con-

tacted at: moneypit@uniserve.com or 250-558-5551; ask for Cameron. Oct08

Rotax 912 80 hp, 850 hrs TT. Overhauled gearbox with overload clutch. New reduction gearset. Overhauled carbs, new rings, valves and seats ground. $9500 OBO 519-648-2044 Oct08

RV-6 Wing and Tail Kit. Tail is finished and has passed inspection. Wings are ready for closure. Tanks completed, sealed, and installed. Flight controls are finished. This wing kit has the Phlogoston spars and excellent workmanship throughout. Tail $1500. Wings $4000. Both $5000. 519-648-2044 Oct08

PARTS FOR SALE: Low hours Colin Walker wooden prop a 7256 off a O-290D ($600); New RAPCO dry air vacuum pump model # 211CC ($80); New Flightcom model 403mc voice activated intercom ($100); New ICOM IC-A200 VHF Transceiver ($600); New ROTAX 9" UHS 2 blade spinner ($80). moneypit@uniserve.com or 250-558-5551; ask for Cameron. Apr08

FOR SALE McCauley Propeller Model 1A101/DCM6948 fits Continental 0-200. Certified and zero time since overhaul. Also available overhauled Directional gyro and altimeter. Don Bentley 250-764-0880 Apr08

Christavia Mk1, 2 place rag & tube; all major structures & engine mount complete; Subaru auto conversion with NSI reduction drive and dual electronic ignition; graphite 3 blade prop on gear; elevators, ruder and control table complete; wings and ailerons fitted and complete; pull-up and cables not attached; 100 hours of flight time on proven engine; instruments, fabric, tape, cord, hardware enough to finish; cowling complete; (no chemicals for fabric covering); used instruments fitted to panel. Contact Bill Weir. billweir@lom.imag.net Apr08

Rotax 582 firewall forward with motor mount and rad, GSC 3 blade prop, cowling. oil tank, some engine instruments, exhaust. All were removed from a Zenith 701 being repowered by a 912S. Everything to get flying for $3500 OBO. millfly@sympatico.ca 519-822-6693 Apr08

Geo/Suzuki 1300 firewall forward package including dynafocal engine mount and rad, to fit Zenith 701. Includes cowling, starter, alternator, carb, exhaust, GSC prop, and some instruments. Package was replaced by a 912S. $3500 OBO millfly@sympatico.ca; 519-822-6693 Apr08

Zenith 701 project. All formed parts made, spars riveted, jeep landing gear, Matco wheels and brakes, dash and most of the fuselage components, pedals and some welded assemblies, $6500 millfly@sympatico.ca 519-822-6693 Apr08

All parts to convert an RV-6A to RV-6 taildragger configuration. 519-372-1383 kinger@bmts.com Apr08
Compete Zenith 701 kit, only the rudder done, Warp Drive prop, 912UL engine with 245 hrs, logs complete with mount. Includes engine instruments, ELT, transponder mode C, tundra gear, exhaust, oil tank, rads, radio, wing tanks. No cowl or air instruments. $19,000 obo. Call Don 519-372-1383 or email kinger@bmts.com Apr08

HP with Engine Mount, custom 4130 Prop Hub and rolling engine stand to ship.$1750.00 obo. New Colin Walker wooden Prop 6856 with fibreglass L.E. SAE 1 $500.00 G.B. Lewis wooden Prop 7441 metal L.E. very good, no nicks or damage. SAE 1 $500.00 Super Cub 8:00 X 4 wheels, tires, brakes and reservoirs. $500.00 for set. C85 starter and NAS3 carb. $200.00 each, or will trade one for C85 generator. 780- 460- 6841 Aug08

Parts For Sale--- Corvair 110 HP with Engine Mount, custom 4130 Prop Hub and rolling engine stand to ship.$1750 obo. New Colin Walker wooden Prop 6856 with fibreglass L.E. SAE 1 $500.00 G.B. Lewis wooden Prop 7441 metal L.E. very good, no nicks or damage. SAE 1 $500.00 . Super Cub 8:00 X 4 wheels, tires, brakes and reservoirs. $500.00 for set. C85 starter and NAS3 carb. $200.00 each, or will trade one for C85 generator. 780-460- 6841 Oct 08

O235C LYCOMING ENGINE, Ground crank nitroed new bearings, seals, rings, seats, and guides. Can be seen running PA12 exhaust. metal prop. $4,800 Maxwell Say 519-941-9698 Oct 08

Lost medical. Partially completed (right wing some tail feathers) Murphy Rebel kit $10,000 OBO. Call 250 658 2046 or email breathnach@shaw.ca Oct 08

Christavia IV fuel tank for left wing, per Ron Mason drawing. 14 Imp gals [63 litres] all fittings in place. Peter James 416 282-2186 Oct 08

Avid Catalina amphibian complete kit. factory prewelded powdercoated fuselage and parts,fiberglass hull and all fairings,folding wings constructed and fitted to fuselage,control systems installed,retractable gear fitted, engine mount,hardware packaged and labeled, all Avid construction manuals and newsletters. We moved,no place to build!! Asking $13,500. Call 613-543-0594 Oct 08

For sale due to health -aircraft engines and an Aeronca Champ project. The three engines are zero-timed: two 0-235, one 0-0-290DQ. Some mags might be missing, but the prices will be very low... The project is a Champ awaiting the MOT final approval. For details, contact George ASAP at 250-768-3585. Oct 08

1992 MURPHY RENEGADE Professionally built and maintained.

Excellent condition, powered by Rotax 618. $23,000. Still flown by retired Air Force pilot Tony Bellos from his own strip in Knutsford, near Kamloops, BC. 250-374-6591 or tbellos@telus.net Aug08

Aeronca Champ wing hardware [except drag wires], rudder horn, 3 pc tail wheel spring, parking brake handle unit and nose fuel tank all for 7 AC/ Peter James 416 282-2186 Oct 08

Toucan basic ultralight, a rare twin-boom 2-engine Canadian aircraft. Front is a Rotax 377, rear is a Rotax 505. Large disc brakes. Smooth flyer, will cruise at 60mph on rear engine only. $7000 . Call LeRoy at 250-547-6211 Lumby, BC. Oct 08

1943 Luscombe 8C for sale. $15,000. Contact Bruce Prior for details and photos. (604) 437-4219 or email at b.prior@ieee.org. Oct 08

FOR SALE - 2006 CHALLENGER 2. 150 Hrs. TTSN, Rotax 503, 55 H.P., electric start, full enclosure and most options. Dual flight controls and dual engine cyl. instrumentation, intercom, and vernier elevator trim tabs. Priced well below replacement cost at $22,000 Cdn.or B.O. for quick sale. Built by experienced builder (Bob Johnson-Niag. RAA chapter) and well maintained. Also fully enclosed aluminum transport/storage trailer available $1500 Cdn. Call Dave Webb at 905-871-3411, or e-mail dwebb@iaw.on.ca for additional information and pictures. Dec08

Lycoming O-320 H engine, $6000 certified with logs, and pickled. This engine is near 2000 hours but it recently had new a new case and most internal components replaced. The previous owner bought the plane and immediately repowered it with a new 180 hp for float flying. With not much more than a top overhaul this would be nearly a zero time engine. kinger@bmts.com Dec08

Sonerai 2 project - Wings are built, fuselage is welded. Engine - I have over 100hrs into the new cylinder heads alone! (cc'ing chambers to get the squish clearance and compression ratio right). Between the plane and the engine I have well over $10,000 invested but will take much less than that if anyone is interested. It's the lightest Sonerai that you'll find. contact jill_oakes@umanitoba.ca Dec08

1977 Cessna 150M 10K TT, 2000 SMOH, Icom A200, Garmin 320A, Garmin 296 panel mounted, overhauled prop, air/oil separator, new strobe kit, new panel covers and door posts, new alternator, new mags and wires, spin on oil filter, Auto fuel STC, New tires and brakes, just replaced many gaskets and hoses in last annual, new exhaust. This plane runs and fly's great, low fuel consumption, full winter covers and winter kit, $21,800 or best offer. Call Chris 905-495-2383
Also, have some parts for sale:
Parts from 1976 C150M including damaged wings, main and nose landing gear (Zenith owners often use C150 nose gear), brakes, cowl, newly rebuilt engine mount, seats and rails, intercom, fuel tanks and other misc parts. Call Chris at 905-495-2383 Dec08

Wanted

Do you have a 12 ft table taking up valuable space. I need one for my Pegazair project. Toronto area but will travel distance to pick-up. Also need an assortment of clecos. Larry 416 526 2602 or larry@patronproducts.com Feb08

WANTED Aeronca Champ. Preferably 85 to 100 hp Continental. Located Ontario or Quebec. Contact <tingle@ionsys.com Feb08

WANTED: Alternator or generator for C90. Must have gear intact. Contact Jeff Deuchar 780-352-4268 or f1rocket@telus.net Aug 08

WANTED Zenith 601 or 701 project. Preferably located in Ontario. Contact Jesse (705)429-6530 jbeauchamp_bell@hotmail.com

Looking for a port side wing for a 1989 Avid Flyer H.H. STOL. if any one has one they can email me @ wcsorell@northwestel.net or phone Wade Sorell 250-500-3775 Fort Nelson B.C. or is there anyone out there who rebuilds AULA

Ads run for a maximum three issues depending on space available and then must be renewed for continued display. Please direct all classified inquiries and ad cancellations to: 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.

Portrait of power: A Bearcat fires up.
Don Souter photo.

Classifieds On The Internet:

http://www.ocis.net/tvsac/buyandsell.html -more ads from our Kamloops chapter

http://www.lyncrest.org/sfcclassifieds.html -more ads from our Winnipeg chapter

RAA 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 , Jim Easter 519-676-4019 jim.easter@teksavvy.com.

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

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

SASKATCHEWAN

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

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

AIRCRAFT SPRUCE

The Parts Supplier Aircraft Builders Worldwide Have Depended on Since 1965!

Same Day Shipping!
Guaranteed Lowest Prices!
Premium Quality Products!

OVER 60,000 PARTS IN STOCK!

1-877-4-SPRUCE
7 7 7 8 2 3

ALL NEW FREE
750 page Parts Catalog!

Open Weekdays 8am - 5pm,
Closed on
Saturdays & Sundays

Aircraft Spruce Canada
150 Aviation Avenue
Brantford Municipal Airport
Brantford, ON N3T 5L7
Ph: 1-877-795-2278

info@aircraftspruce.com

www.aircraftspruce.com