November - December 2009

RECREATIONAL FLYER

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

Harish Jadeja's

X-Air

A Modern Day Demoiselle

RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

from the president's desk

Gary Wolf

QUEBEC MD-RA SEMINAR

Pierre Fournier, Quebec Chief of MD-RA will be hosting a seminar for builders and owners of amateur aircraft on January 16th at 1300 hrs in the restaurant at Sherbrooke Airport.

A second information session will be held January 28th in Ste-Anne-de-Bellevue Qc. The location will be John Abbott College, Penfield Building, room P-204 during the hours of 19:30 to 22:30.

A third session is planned for Quebec City in the Spring. Topics will include the Inspection program, regulations, importing, inspections, and continuing airworthiness issues. All members of the public are invited.

Please contact pierre-fournier@videotron.ca or 514-645-4355. Alternatively contact mjmorea@videotron.ca or 514-694-2129.

RAA AGM

Brian Heinmiller and the members of RAA-Toronto Region chapter hosted the well attended 2009 AGM at the dining room of the Brampton Flying Club. Some forty members were in attendance for the meeting and the lunch supplied by the chapter. After the business meeting there was a hangar tour and a demonstration of the chapter's new propeller balancing equipment.

At this AGM the membership passed a motion to amend the definition of chapter status. It has always been a requirement that each chapter must send in an annual statement naming the president, secretary, and treasurer, plus two other chapter members, and all must maintain national RAA membership for status to be valid. Only chapters that have valid status are covered by the $5 million RAA Chapter Liability policy.

RAA recently asked for an update on Transport's progress with Light Sport and they say that the risk assessment has been or is about to be completed.

With this amendment it is now a requirement that each chapter also send in an annual statement with the names of all who are members of the chapter, whether or not they are national RAA members.

SMS and LIGHT SPORT

For the past few years Ottawa has been largely concerned with reducing their liability, and SMS (Safety Management Systems) is how they are managing to do this. Transport no longer accepts that safety is part of their job description. They now write regulations and occasionally enforce them, but it is up to companies to set up their own SMS program. In a recent fatal crash of a Beaver floatplane, Transport was quick to point out that the company's SMS was deficient.

What SMS means to the builders and owners of non certified aircraft is that everyone in Ottawa is too busy to deal with your issues. Light Sport could have been a slam dunk into our regs back in 2005 but instead the mandarins have been busy making sure that they would incur no liability if they allowed this. RAA recently asked for an update on Transport's progress with Light Sport and they say that the risk assessment has been or is about to be completed. Light Sport can soon take its turn going through the CARAC process. There is approximately a two year backlog of items ahead of Light Sport, so in the interim their solution is that if a Canadian must own a Light Sport he may apply to have it registered in the Limited category. Limited is usually for registering warbirds and other aircraft that do not fit into any other category, and the name says it all. The inspector handing the application decides the limits for the individual airplane. If he does not want the plane flown in controlled airspace, that could

continued on page 37

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: Harish Jadeja and his X-Air. Gary Wolf photo.
Below: A Tiger Moth at Goderich 2005. George Gregory Photo.

George Gregory

Getting HIGH

My F1 Rocket has over 425 hours on it now and together we have had many wonderful adventures both locally and to far off lands…well to Canada and the US so far! In my travels and adventures I have been introduced to many new and challenging situations

By Wayne Hadath

One of the latest has been the experience of higher altitude flying. Earlier, when I was flying planes other than my Rocket, it was usually at 5000 feet and below. With my F1, I have on many occasions flown at 8,000 feet and above. I prefer to fly in the 3,000 to 5,000 range but numerous times I have flown higher in order to chase stronger tailwinds, to get over terrain and weather, or in search of smoother air.

THE RULES

The rules for altitude flying are different in Canada and the US. In Canada we can fly at 10,000 feet MSL for as long as we want and for 30 minutes between 10,000 and 13,000 without oxygen. In Canada oxygen is required for any time over 30 minutes between 10,000 and 13,000 and all of the time over 13000 feet. In the US it all starts at 12,000 feet, even if you are a Canadian pilot. The reason for these altitude rules is safety and the altitudes have been chosen to reflect the effects on the average pilot. As pilots, we are all aware that there is a condition call hypoxia. This condition occurs when the oxygen level in our blood drops below 90%. Pilots are also trained that there is less oxygen available for us to use as we fly higher. Most pilots that I have talked to about hypoxia, including ATP pilots and other general aviation pilots who regularly fly at high altitudes, were amazingly uninformed on this subject. This also included pilots who have had training in compression chambers. I fell into the group of the amazingly ignorant. Most pilots whom I have asked have told me that the symptoms of Hypoxia are clear and should be avoided. They describe them as blue coloring under the fingernails and feelings of euphoria, which are indeed severe symptoms. It is my experience that even a minor case of Hypoxia should be avoided due to the mental impairment that results. I feel in my case, and I suspect it's the same with all other pilots, that mental impairment does not improve my pilot-

ing skills or my decision making, both of which I need at optimum.

HYPOXIA FIRSTHAND

I first became aware that altitude affected my judgment on a trip to Sun and Fun with Tom Martin, my fellow F1 Rocketeer and cross country companion. On our flight to Florida we were following the back of a storm system that was traveling west to east. We were experiencing 60 plus knot tailwinds at 8,000 to 10,000 feet giving us grounds speeds up to 260 knots. We did not have weather on board either aircraft so we were making regular stops enroute to check weather, and each time we landed we used the north/south runway. As we were approaching Tuscaloosa Alabama (KTCL) we decided it was time for lunch and a weather check. Tom was in the lead and called into ATC that we were a flight of two F1 Rockets inbound for landing. We were cleared for a left base to 04. All was good, 6500 feet by 150 feet facing the right direction. KTCL also has an opposing runway 11/29 which is 4000 feet by 100. Winds were given by ATC of 15 gusting 24 at 270. Tom was asked by ATC what type of aircraft and he responded homebuilt F1 Rockets. As Tom turn on final ATC said, " F1 Rocket plus one number 2 and 3 for landing, winds 15 gusting 24 at 270." A short time later ATC said, " F1 Rocket flight cleared landing, winds 15 gusting 24 at 270." As I was set up on final I could see the jet ahead of us touching down on 04 and I could see Cessnas and such landing and taking off on the opposing runway. Even with all of this information I was on short final with no understanding that runway 29 would have been a far better place for us to be. Not until I was almost to the threshold did I have any realization that I should be scared and concerned about the wellbeing of my aircraft, myself and my passenger. I had the left wing dropped at an unnerving angle and full right rudder to keep the aircraft straight with the runway. I glanced to my left to see what was causing this situation and noticed the wind sock sticking straight out 90 degrees to the runway. I proceeded with the landing and after numerous skips and much side loading of the landing gear, I eventually got slowed down and exited the runway onto the taxi way. Not good. I almost immediately started asking myself questions about what had just happened and why I had made the choices that I did. I was very fortunate that all ended well but it was way too close for my comfort.

Most pilots that I have talked to about hypoxia, including ATP pilots and other general aviation pilots who regularly fly at high altitudes, were amazingly uninformed on this subject.

Upon reflection I came up with what likely occurred to cause this situation, the first being that the speed we were traveling when approaching Tuscaloosa was around 260 knots over the ground. The controller did not seem to know what a homebuilt F1 Rocket was and I think he mistook us for jets and therefore cleared us for the longer runway which the jets were using. The controller was obviously concerned about the winds as he gave them to us three times. This information I ignored and was shocked when I finally did look at the wind sock. Whenever I approach an unfamiliar airport I always check the particulars such as runway choices, their direction, length and width, pattern altitude and direction, as well as airport altitude. I checked this information but I did nothing with the information. Whenever I set up to land I say to myself, "I am attempting to land. If anything does not look or feel right, I will go around and attempt again." If I am carrying a passenger I say this out loud. I cannot remember saying or even thinking this and the fact that I did not go around but instead took the situation down to a landing means I was not attempting to land, I was landing. Once on the ground I spoke with Tom about what had just happened to me. He had a very similar experience and was no happier about his own handling of the situation than I was. We did exercise better choices on departure and requested

runway 29. I have had a few other situations although not as dramatic which demonstrated to me that flying at or above 8000 feet definitely diminished my capabilities as a pilot. I have since heard Tom describe it as, "His most memorable bad landings have all come after flights at/or over 8000 feet without oxygen".

PORTABLE vs FIXED

I am building a RV 10 for having cross country fun with my wife and our two children. I had decided that eventually I would buy a 4 place portable oxygen system for this aircraft because our plan is to explore Canada and the US as a family. Even though the RV 10 is not ready to fly, I was getting closer to ordering the oxygen system because there were three times in this past year of flying my Rocket that I found that an oxygen system would have enhanced the comfort and safety of the flight. As it turned out Tom and I decided to do the Pagossa Springs 100 Race in Colorado this year, and in order to participate in this high altitude cross country and race I would need an oxygen system. So the decision was made to start the research and buy an oxygen system that I could use in either aircraft. I found there are a number of portable systems on the market and I could spend a king's ransom if I wished. There is a lot of information out there and the decision on what to buy is not as easy as I thought it would be. As with many things in life, including aviation, I soon found out that yes, an oxygen system in the aircraft would solve certain problems but it created equally as many.

Right out of the gate, how much oxygen do you want to carry? Well, that depends on how many people will be using it, at what altitude, and what type of breathing system you purchase.

Here is one consideration that no one mentioned, "It depends on the individual, the condition of the individual as to how much or little oxygen they will require to not go hypoxic." We are not all created equal when it comes to oxygen use. Here I have been flying for 4 years with not one cubic inch of oxygen on board and now it looks like I will need a cylinder made from unobtainium which is worth more money than my first house and would equal the size and weight of the aircraft just to have a barely enough for a safe flight with the family!

Do you want permanent installation or a portable system? A portable system is far cheaper and can be fitted as part of the aircraft. Be careful with just carrying your portable system around unsecured in your aircraft. It looks somewhat like a projectile and I am sure it would make a heck of a mess of the occupants should a landing with a sudden stop occur. Straps can be purchased with the system or fabricated to secure the O2 bottle inside the aircraft. You can purchase a system with one outlet and just pass it around, but I would suggest you get a system that allows each aircraft occupant to have his/her own feed.

CANNULA vs MASK

What type of breathing system do you want? There are different systems to get the O2 from the incoming tube to your lungs. Basically there are Cannulas, which are devices that rest on your top lip with two small tubes approximately ¾" that are inserted into your nose. Cannulas come in two types. One type has a continuous flow which means when you turned it on the O2 flows continuously until it is shut off. The other type uses a diaphragm to control the flow of O2 and uses about one quarter of the O2 that a continuous flow unit does. Cannulas are effective up to 18,000 feet but need to be replaced after 200 hours of use. Then there are masks which are good up to 25,000 feet and they are continuous flow.

How do I know how much O2 do I need? There are a few ways to determine this. One is to purchase a flow meter for each O2 station. It is installed in the O2 feed line and with the flow meter each user can adjust the O2 flow to their particular needs. The flow meter itself has a gauge which shows how much O2 should be delivered for the average individual at a set altitude. It also has different gauges for the continuous flow units or for the lower flow cannula.

OXIMETER

How do I know if the Oxygen system is working? With the use of an Oximeter you can measure the oxygen level in your blood stream. It is a very simple way to test to see if your oxygen system is flowing properly and to test if you are the average individual with the average O2 needs. I think the Oximeter is maybe the most important part of any oxygen system. I recently flew down to the Rocket 100 in Taylor Texas, and Terry Jantzi came along as the man in back. His main duty was navigation but it is always a good idea to carry an accomplished pilot along sometimes to point out any bad habits

you are developing. On the trip back from Texas we decided to go high to take advantage of some tail-winds. We donned our O2 saving cannulas and up we went. At 8000 feet I checked my O2 levels and I was below 90% so I was hypoxic. I turned on my flow meter and tried to adjust it to deliver O2 for 8000 feet. The little indicator ball did not move. I had forgotten to open the main valve on the O2 bottle. The O2 bottle is located behind the passenger back seat. Terry was

We are not all created equal when it comes to oxygen use

able to wiggle around and turn on the main valve. There is an electrically activated solenoid available to open and close the bottle but I did not install that system. I turned on my flow meter again and adjusted it to 8000 feet. I tested my O2 levels and found I was still hypoxic. I had to adjust my O2 flow to 5000 feet above our current altitude to take my blood O2 level above 90% and out of the hypoxic range. It is quite amazing how fast our blood saturation changes with the change in flow of O2. It only takes a few breaths for movement to occur. It is easy to see why O2 loss at high altitudes can almost immediately result in severe hypoxia and death. Terry tested his O2 levels at 8000 feet and he was still at 95%. We continue to test our O2 levels as we climbed and stabilized at 13,500 feet. I had to keep increasing the O2 flow and my flow meter indicated I was flowing at delivery rates as if I was at 18,500. At 13,500 without any O2 flowing Terry indicated 92% which was the lowest he would show over the 4 hours we were at altitude. After a couple hours his body must have acclimatized because he went up to 94%. Terry and I are around the same age but his level of physical conditioning is far superior to mine and I would rate mine as above average. So here we have two different individuals in the same environment with totally different experiences. This experience clearly demonstrates the need for an oximeter to be carried on board any aircraft that intend to fly at altitudes above 5000 feet with or without an oxygen system.

SAFETY LIMITS

How high do you intent to go? If you intend to fly above 18,000 feet make sure you get way more information on hypoxia than you will find in this short article. There are altitudes which are referred to as the dead zone because if loss of O2 occurs and there is no backup system, or the backup fails, or if O2 loss is gradual, then death will be the only outcome.

REFILLING

How do I get my O2 bottle filled? I purchased a filling system to fill my bottles from other oxygen bottles. I made a deal with my neighbour to refill from his welding tank. I have not yet had to get my bottle filled away from my home airport so I have no experience with that yet. And so far as I can determine all O2 is created equal. I ended up purchasing an oxygen system made by Aerox (http://www.aerox.com/index.html). I found them very helpful and I am happy with their product. For the RV 10 I chose an aluminum bottle which holds 22 cubic feet with a capacity to flow 46 hours for one person at 10,000 feet. For the F1 Rocket I chose a 9 cubic foot bottle. I use the Oxysaver Cannulas with a flow meter for each Cannula. When I have flown at altitudes of 8,000 feet and above and used my Oxygen system I have found that my pilot abilities, my decision making and my physical well being both during and after the flight have all remained constant. Now that I have experienced an onboard oxygen system, for the type of flying that I do I consider an onboard oxygen system a very worthwhile purchase. RAA

Ready For Final Inspection: Or Are You?

Many times inspectors are presented with final inspection documents which have missing, incomplete or erroneous statements and calculations. I'd like to address a few items which I have commonly encountered. / By Bill Tee

---

Have It Ready

When the inspector arrives to view your new bird the paperwork should be complete and accurate. Also all cowls, fairings, spinner and inspection panels must be removed. Be prepared to run the engine, and if the aircraft has a retractable landing gear the gear must be cycled for the inspector. Make sure that you have the support equipment to do that. You will need it anyway for your annual inspection when landing gear operation must be checked along with everything else.

C of R

One mandatory item is the in-your-hand **certificate of registration** and a photo copy of it for the inspector. This must be applied for and obtained before the inspector can do his job. The process for doing this is outlined in memo form and you should receive a copy of this from MDRA in the builder's final inspection package. If not, ask for it from MDRA head quarters, 1-877-419-2111. Your provisional assignment of registration letters is not the same thing. This certificate is equivalent to the ownership paper of your car. In any case when applying for it you need at least proof that you have applied for your final inspection. You must also have a photographic reproduction of your aircraft and of its ident plate.

Special C of A

The second item is the **application for Special C of A** form [three please each with its own picture showing aircraft registration] filled in on **both sides**. This along with weight and balance forms are probably the most misunderstood forms you will deal with.

Few people seem to realize that a few of the figures on the C of A application form must be ***calculated***. This applies to the figures on **blocks 16, 20 & perhaps 24**. 13.3 or 20.4 is not acceptable in block 20 unless calculations turn out that way. The formulae for these calculations appear in chapter 549 of the airworthiness manual, Appendix 1 sub chapter B and the current exemption to this document. One exception to the calculations is box 24 where the minimum engine power can be obtained from a graph which is also in AWM 549 and its exemption. Ensure that the graph you use is appropriate for your aircraft weight category. If you are building a canard type do not forget to include the area of the canard surface and strakes in your total wing area [block 13]. If you cannot manage the calculations, find some one who can help you. It is not the inspector's job to work these out. You do not have access to a copy of 549? Shame! How did you ever get through your project without it?

Gross Weight

Transport Canada announced some time ago that it is no longer necessary to calculate the figures in block 18**. Block 18** is to be no greater than the designer's gross weight. If you want an increased gross weight over that listed by the designer a letter giving permission for this must be obtained from the designer or the person or agency responsible for the design.

Wing Loading

The figure in **block 20** depends on whether or not your aircraft is fitted with flaps and must be calculated using the formula found in CARs part V – Airworthiness, appendix 'A' Maximum Allowable Wing Loading For a Fixed Wing Aircraft With Flaps A549.1 General Information Note: [Ref section 543.103] or use the old chapter 549 – Amateur Built Aircraft. If you do NOT have flaps your maximum permissible without being in the high performance category is 13.3 lbs. / sq. ft. but this also must be calculated by simply dividing wing area into weight. If your aircraft comes equipped with flaps then the maximum permissible figure is 20.4 lbs. / sq. ft., maximum for a non high per-

formance amateur built aircraft. Anything greater than these numbers puts your bird into the high performance category and this fact must be clearly legible on a specified placard installed on the instrument panel immediately in front of the pilot.

Weight and Balance

The third item and possibly the most complex item the builder has to deal with is the **Weight and Balance report** [two copies]. This requires the empty weight of the aircraft and the most forward and most aft C of G location that the aircraft will be subject to in its operational life. In any case at least one calculation must add up to the requested gross weight of the aircraft.

When filling out the **equipment list** usually associated with the weight and balance report make sure that you fill in the weight of each item listed plus the moment from the C of G longitudinal reference datum. These data are now a requirement!

Do not forget to include a copy of the designer's statement of maximum weight and C of G limits. In the case of no stated limits for your design, very conservative limits will be imposed. One friend of mine built an all metal aircraft but C of G limits were not stated on the drawings. When the designer was contacted about this he informed the builder that "if you build it to the plans it will come out OK". ***Not good enough!***

Few people seem to realize that a few of the figures on the C of A application form must be calculated

For the safety and convenience of its members RAA now has several sets of electronic scales distributed across the country. For a loan of these contact the RAA national representative in your area or the RAA head office.

I am often asked what crew and passenger weight should be used to calculate the ***initial*** weight and balance. Every weight and balance report for an amateur built aircraft must have the statement, signed and dated, that says:

"I certify that this data has been prepared in accordance with AC 43.13.1B and to the best of my knowledge represents the true empty weight and centre of gravity of this aircraft"

What is AC43.13.1B? This is an Advisory Circular [AC] put out by the FAA in the USA to cover the standard repairs and technical procedures for all types of ▶

aircraft. It is the most valuable document you will ever find for guidance on the construction, maintenance or repair of your airplane.. **It is a must!**

Chapter 10 of AC43.13.1B covers the weight and balance report process and you will find on pages 10-1 through to 10-24 that it states "crew and passenger 170 pounds per person". So there you are. **170 pounds per person.**

Other paperwork required for your inspector are a maintenance schedule, a **brief history** of the project, a single copy of the 3 required **log book entries** + title page [Canadian log books only. We're in Canada, eh], a photographic reproduction of the fire proof **data plate** containing only the builder's name, aircraft model and serial number [unless an import]. No "experimental" must have a dust and moisture proof container, a hand book on first aid, bandages, gauze pads, adhesive tape, antiseptic cleansing wipes, pressure dressings and scissors and pins.

Also do not forget that the 25 mile exemption for the ELT is long gone and no longer in effect. You need an **ELT** for your first and all subsequent flights unless it's out for servicing. As of this writing

For the safety and convenience of its members RAA now has several sets of electronic scales distributed across the country.

Of course this is just a nominal figure and the actual operational weights will have to be calculated by the pilot to ensure that any variation from this figure retains the aircraft to within the required C of G range and gross weight. If you are coming up a bit shy on calculating weights to achieve the maximum operating weight of your aircraft on the report it is permissible to up the crew / passenger weight[s] to achieve the desired figure. It is necessary that at least one calculation adds up to the requested gross weight. If you have an aircraft that holds the disposable load [crew, passenger, baggage etc] well ahead of the wing such as the Coot, Osprey and Seawind Amphibians be aware that there may be a minimum weight required to enable the aircraft to be within its aft C of G limits. In some cases ballast may be required in the cockpit or nose baggage compartment if available. This should be noted on your weight and balance report and it may be a good idea to note the fact with a label on the instrument panel.

please. That only applies south of the border and has a quite different meaning in Canada. Very nice blank ident plates are available from the RAA head office. An import will retain its original data plate as-is regardless of its format but we will still need a photo. Also you must supply the inspector with a **fuel flow report** [2 copies] [litres or Imperial gallons preferred by TC], **equipment list** [2 copies] [usually associated with the W & B report] that includes weight and moment arm of each item, and a written declaration detailing any **major modifications**.

Make sure that your **fire extinguisher** is suitable for the category of fire that is likely to be a problem in your aircraft and has a metal mounting bracket firmly attached to your aircraft. Plastic brackets are NOT acceptable!

Need a **first aid kit** for your aircraft? It's required by law for other than hang gliders, gliders, balloons and ultra lights. Can you make your own? I guess so if you follow the prescription. ANO II No 11 states that a first aid kit the 121.5 unit is still acceptable.

Fly carefully and stay safe!

Airtrikes Engine Conversions

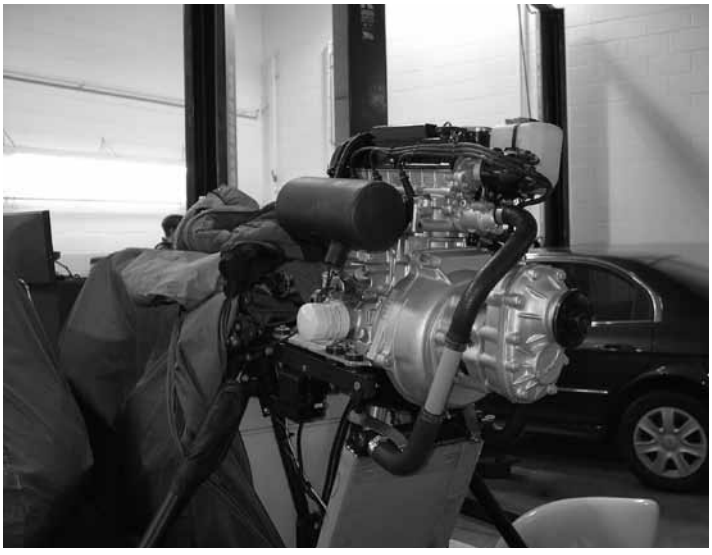
Recreational Aircraft Association

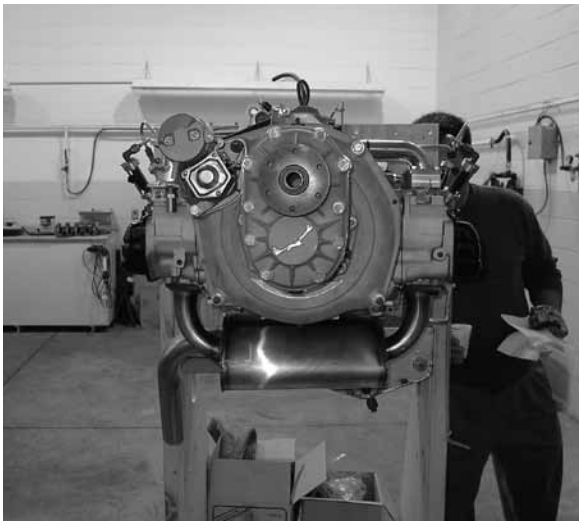
Vassili Tarakanov has been an aviation enthusiast since his childhood in Russia and he pursued a career in this field, graduating with a MSc in aerospace mechanical engineering. His current interest is light aircraft and powered trike hang gliders, but he cut his teeth at the famous Sukhoi Design Bureau, specializing in aerodynamics of military aircraft. Because of the economic downturn in Russia during the nineties, Vassili moved to Montreal ten years ago and set up shop building aircraft, importing gearboxes, and converting engines for use in light planes.

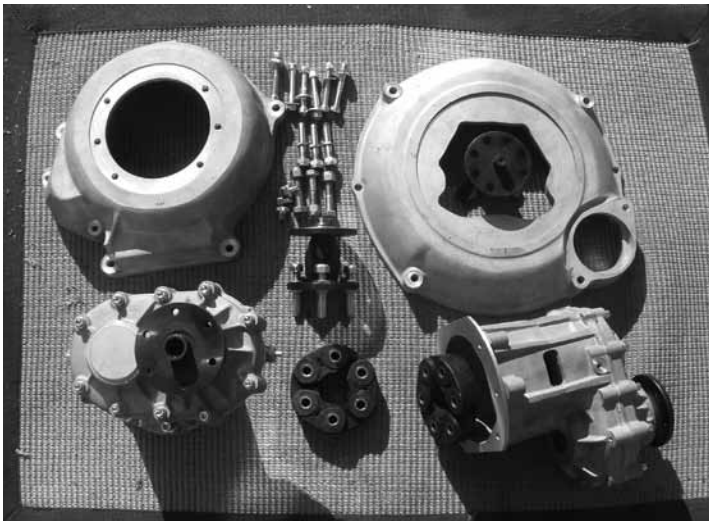
The key to his conversions is the Russian-made gearbox which is now in its third iteration, the SPG-3 that is even lighter than earlier versions. Weight is now in the 25 pound range, depending on the bellhousing for the engine chosen. Vassili sells complete gearbox packages that include the bellhousing, requiring only a few hours work for installation. For builders who wish to do their own conversion the gearbox is very adaptable to other engines, and installations have been made on Corvair, Honda and other light auto engines. Vassili also sells a complete conversion for the flat twin BMW motorcycle engines. The SPG gearbox is suitable for both tractor and pusher applications.

Geo/Suzuki engines are Vassili's favourite because of their light weight, low fuel consumption and good horsepower. One problem with these engines when using a belt redrive is that the ignition distributor interferes with the upper pulley of a belt drive. By comparison the SPG system places the gearbox far enough ahead of the flywheel that there is no need to make any change to the ignition, and Vassili even uses the stock computer with a shortened wiring harness for his Geo installations.

The simplest and lightest Geo/Suzuki conversion is the 55-60 hp 3 cylinder, a good replacement for many 2 stroke 503/582 installations. The turbo ▶







Previous page: Subaru EA 81 with earlier SPG 2 gearbox. The footprint of the package fits nicely within that of the Continental. This is a Jaime Alexandre conversion with port injection.
Clockwise from top, left: The lightest engine package is a conversion of the 3 cylinder Geo, a replacement for 503/582 Rotax 2 strokes; Vassili Tarakanov (l) and Bill Weir inspect a gearbox at Jaime Alexandre's engine seminar; the SPG (Suzuki) conversion kit. Above left, the thrust line offset is minimal on the Subaru.
Right: an Airtrikes conversion on a BMW engine.

3 cylinder can even replace the 80 hp 912 Rotax at less than half the cost.

Vassili prefers above all the four cylinder 1300cc Geo/Suzuki that has a single camshaft and four valves per cylinder, the G13BB model. This engine can almost match the horsepower of the 912S at low cost, with only a small weight penalty.

All parts are available separately or Vassili will build complete ready-to-install engine packages. For more information:
www.airtrikes.net
6043 rue Clark Pierrefonds
QC Canada, H8Z 2G3,
phone/fax (514) 685-2856
(514) 685-2856 ,
E-mail: info@airtrikes.net

Affordable Oxygen

Wayne Hadath

Aerox makes it clear in their literature that medical and welding oxygen are drawn from the same manifold, with the difference being the paperwork and insurance for medical oxygen. If you have access to a tank of welding oxygen and you buy the connecting piece from Aerox, you can refill your own cylinders. There are some cautions however. First is that the outlet of the supply tank must be clean of dirt and dust. Normal procedure before attaching a welding regulator is to crack the tank valve open briefly to blow out any dust or dirt. Do the same before fitting the Aerox elbow connector. Also be scrupulously careful to keep all surfaces including the threads free of all oil and grease. At minimum either one will burst into flame upon contact with oxygen, and at worst there can be an explosion. Diesels depend on this phenomenon but for refilling a cylinder it is to be avoided.

The Aerox connector elbow has a screen on one end, and this end should be fitted to the supply cylinder. Tighten the nut with a wrench and the crack the cylinder valve open again to blow the elbow clean. Inspect to be certain that your breathing tank is clean, and thread it onto the elbow and tighten with the wrench. Make sure that you can see the breathing tank gauge.

Close the valve on the breathing tank and fully open the valve of the supply tank. Listen for leaks and do not let anyone smoke nearby - remember the glowing splint test for oxygen in Grade 11 Chemistry class? Place one hand on the breathing tank to monitor its temperature and open its valve gently. You should hear oxygen flowing at this time and the temperature of the tank will rise. Keep the flow rate slow enough that the tank gets no more than barely warm to the touch. Watch the gauge on the breathing tank and stop filling when the gauge reaches 2000 psi. When the breathing tank is full, close the valves ▶

Top: Wayne shows the essential equipment. Right: The INLET end of the elbow has a screen. The screen end goes onto the supply cylinder.

on both tanks and remove the connecting elbow.

If your supply tank has less than 2000 psi you will not be able to fill your breathing tank completely. Next time make friends with someone who has just taken delivery of a full welding tank and use that tank until it too gets too low to be useful. A full tank of welding oxygen costs less than $30, so refilling breathing tanks is fairly inexpensive. RAA

Left, top: Fit the cylinders to the elbow making sure that the gauge is visible, finger tight first, then tighten with a wrench. Right top, monitor the temp with a hand on the breathing tank and never let the breathing tank get more than just warm. Close the breathing tank valve at 2000 psi max, then close the supply tank. Left, You can now refit your breathing regulator.
Right: The oximeter is a vital part of the oxygen system. It displays oxygen percentage, pulse rate, and strength of the heartbeat.

A Manually Operated Bi-Fold Door

Recreational Aircraft Association

Bifold doors provide a nice tight fit against winter winds.

WITHOUT QUESTION the best type of hangar door is the bifold. It seals tightly against the face of the hangar, and when raised it becomes an awning for rain and sun protection. There are alternatives - many use barn door rails and slide their door sections along the inside walls. These are difficult to seal, take up valuable wall space, and narrow the effective opening of the hangar. Others split the door at the centreline and slide the halves laterally on wood or metal rails. On a forty foot wide hangar there will be twenty feet of door projecting laterally on each side, real wind catchers, plus in a row of hangars with the same setback no two hangars can be closer than the space required for the doors. By comparison the bifold is no wider than the hangar, and when lifted it projects forward only half the height of the hangar opening. Depending on where the top is hinged a bifold can steal a bit of vertical opening, but the main problem with the bifold is that it usually requires electricity to power the door up and down.

Jill and Rick Oakes wanted the advantages of the bifold but at the time the Lyncrest field did not have electricity available in their section of the field, so they set out to build a manually operated door. The philosophy was the same as for an airplane - keep it light. The doorframe was built from light gauge square steel tube, welded by a frend at the field. The framework was hung from a series of hinges attached to the front beam of the hangar and then clad with light gauge corrugated metal, using self tapping screws for attachment.

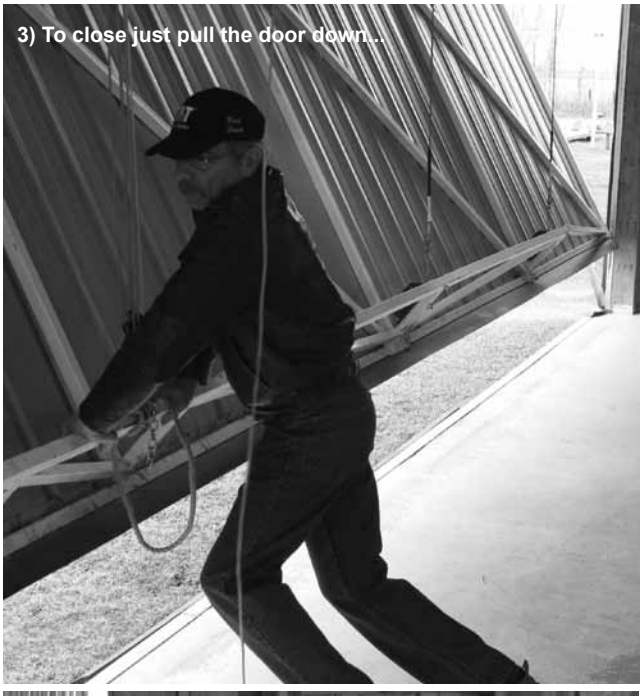
Power to lift the door is supplied by good old gravity. Five boxes of steel slugs hang from pulleys on the rear wall of the hangar, and ten pulleys and a few hundred feet of cable link these boxes to the lower edge of the door. Initial lifting of the door is by sash cord and pulley using the Armstrong method. Once the door has toggled open, the weight boxes take over and balance the weight of the door nicely. Fine tuning was achieved by adding and ▶

subtracting slugs. On the Oakes' hangar the weight is balanced so that either Rick or Jill can position the door by hand at any height, and it will remain stationary.

To close the door it is necessary only to pull it down to within a few feet of the floor, and a boat winch with a strap is then used to ratchet the door closed. Note that attached to the end of the strap is a bit of chain. This chain is there for security reasons - a strap can be cut with a knife slid in from the outside, but a chain cannot. Once the door has been pulled flat against the hangar the winch and the weight of the door effectively lock it down.

Top down: Each cable runs up to a pulley on the hangar beam, over the trusswork, and then to the rear wall; centre, cables are attached at intervals to the lower truss of the door frame; Left, five plywood boxes hang from cables at stations along the rear wall.

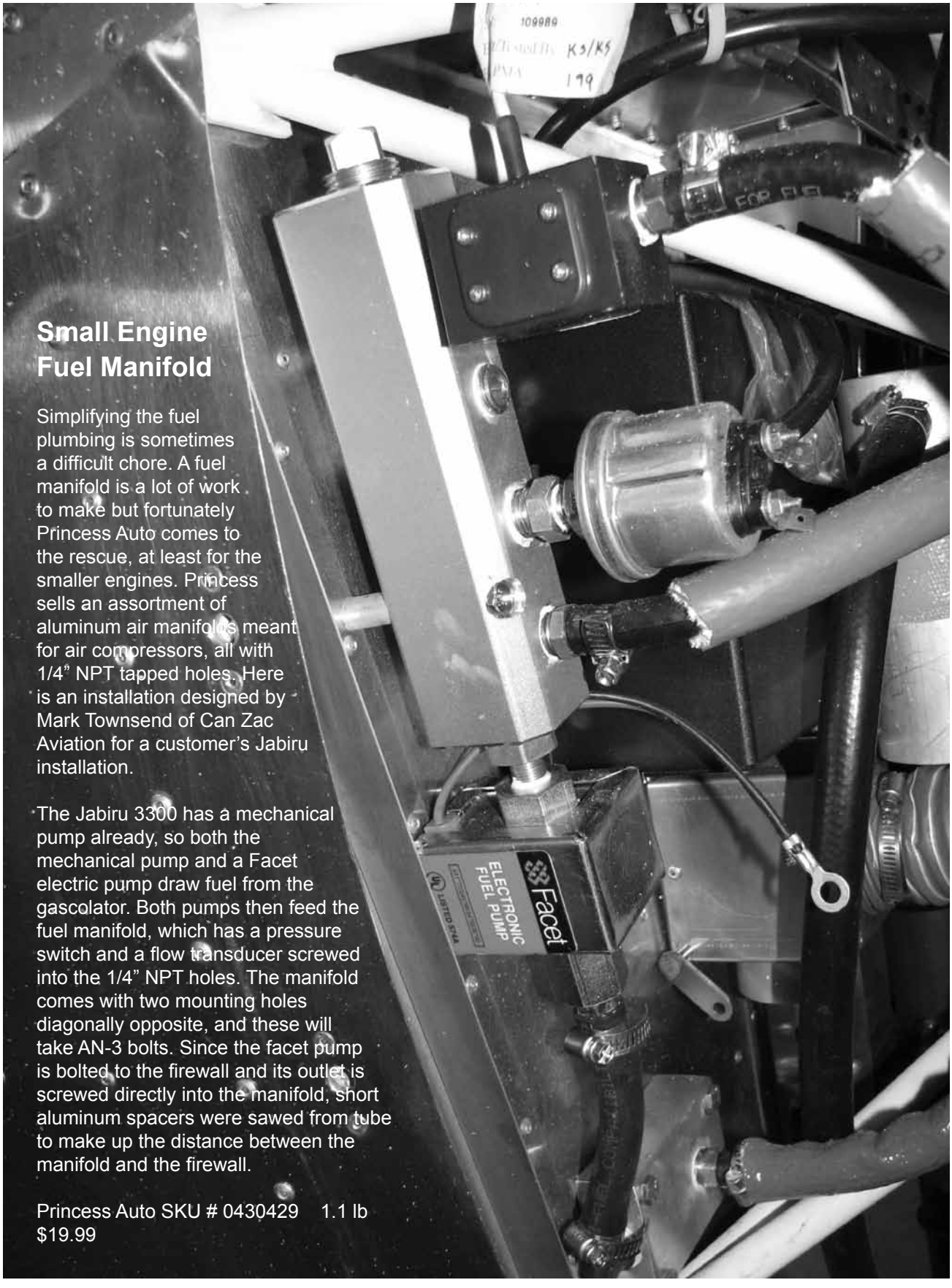
1) Initial lift is by a light rope with pulleys...



3) To close just pull the door down...

2) ...and a walk to the rear of the hangar.

4)...and pull it tight with a boat winch.



Small Engine Fuel Manifold

Simplifying the fuel plumbing is sometimes a difficult chore. A fuel manifold is a lot of work to make but fortunately Princess Auto comes to the rescue, at least for the smaller engines. Princess sells an assortment of aluminum air manifolds meant for air compressors, all with 1/4" NPT tapped holes. Here is an installation designed by Mark Townsend of Can Zac Aviation for a customer's Jabiru installation.

The Jabiru 3300 has a mechanical pump already, so both the mechanical pump and a Facet electric pump draw fuel from the gascolator. Both pumps then feed the fuel manifold, which has a pressure switch and a flow transducer screwed into the 1/4" NPT holes. The manifold comes with two mounting holes diagonally opposite, and these will take AN-3 bolts. Since the facet pump is bolted to the firewall and its outlet is screwed directly into the manifold, short aluminum spacers were sawed from tube to make up the distance between the manifold and the firewall.

Princess Auto SKU # 0430429 1.1 lb
$19.99

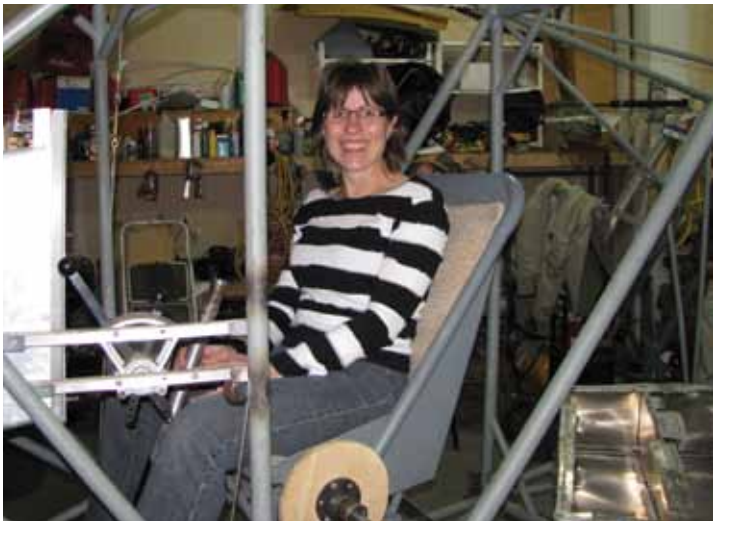
Across Canada

RAA Chapters in Action

RAA Scarborough/Markham

We extend our thanks to our president, Bob Stobie, for stepping in to address the meeting after a couple of last-minute speaker cancellations. As a current instrument-rated pilot, Bob talked about the techniques of flying IFR. Perhaps this will encourage some of us to practise some instrument flying against the day when we might have to use it.

On Saturday, October 3, RAA's Annual General Meeting was hosted by RAA- Toronto Region at Brampton Airport. Our national president, Gary Wolf, made a strong plea that all chapter members must pay $15 for insurance coverage if they are not a national RAA member. A motion was passed to the effect



Ottawa-Rideau (Chapter 4928) December meeting was held in David Stroud's garage where his Fairchild restoration project was featured. Look for more progress reports in future issues. Top, Far left to right, Mike Prescott, Ann Barr, Tom Bennett, Jack Steele, Vic Thompson, Bill Reed, Alfio Fierra and Ron Uloth. Centre, Shirley Mackey seems happy to be in the front seat of the Fairhcild project. Thanks a bunch Shirley, for bringing the beautiful selection of Christmas goodies to the meeting. Bottom, an original 1929 Control Stick Assy installed in the Farichild 51 project. Note the beautiful bronze castings. The stick assembly was a gift from Marlin Horst of Pennsylvania who is restoring a Fairchild 71.

that all chapters must report their membership list to the RAA headquarters by the beginning of March each year. Not surprisingly, the insurance premium took a substantial jump after 9/11. The financial picture of RAA was presented by Wayne Hadath, our national treasurer. Gary's contribution was recognised by the membership at the meeting. We owe a great deal to Gary and to Wayne (and others) for all the work they do on our behalf. After a nice lunch, we were invited to witness a dynamic propeller balancing at the RAA-TR hangar.

We wish to thank Larry Woods (lwoods102@cogeco.ca) for giving us a very interesting talk at our October meeting about the Aeroprakt-24, a 3-seater, high-wing, amphibious flying boat powered by a Rotax 912S (100 HP). This aircraft is an Anatov design from the Ukraine. It has an empty weight of 1,036 lbs., gross of 1,653 lbs., 90-95 MPH cruise speed, with a wingspan of 36 feet. It can be obtained as a quick-build kit for registration in the amateur-built category. Larry has landed it in 16-inch waves; on wheels, it is a taildragger where the main gear swing up into the sides of the hull. There are some excellent detailed pictures in the web site given below. We wish Larry the best of luck with this exciting venture of bringing this aircraft to Canada, and thank him very much for his presentation.

Member Rob Prior's new ride. Pretty slick!

Vancouver Chapter 85

Member Francois Leh gave an interesting presentation about flight instruction in Canada. Francois framed his talk as a series of answers to questions from the membership. The topics addressed were:

-Why is training time now so much longer.

-Why don't instructors sign off flight checks in the logbook (in the US, instructors DO sign off in the pilots log book. In Canada they sometimes don't but they should. If you take a check ride, insist on a logbook entry by the check pilot).

-Why is language proficiency not required of student pilots.

-His worst experience with a student. The most memorable was a student who was absolutely fearless under conditions which would frighten any knowing pilot. He seemed completely unaware and unappreciative of dangers of proceeding into zero visibility conditions.

-Is spin training required in Canada. Yes, for both private and commercial training. Spin recovery is included in the flight test for commercial licences but not for private.

-The risks when high performance airplanes are flown by inexperienced pilots. Night flight is a major concern. The training for a night rating in Canada is more comprehensive than in the US and few high- performance-aircraft-inexperienced-pilots accidents have occurred in Canada.

Francois promised he would save "Transborder Crossings" for another night. Following Francois's talk, there was a short break and then the general meeting resumed at 2026.

Planning continued for the Rememberance Day Fly-over that chapter members participate in each year.

Member Rob Prior has recently purchased an RV-6 from an undisclosed location in the Excited States. The editor and fellow chapter 85 denizen fervently hopes for a ride so he can pen a subsequent article on this beauty.

The chapter exective has posted the following update to the exective:

President: Tim Nicholas vibraanalysis@shaw.biz.ca
Vice President: John Macready jmacready@shaw.ca
Secretary: Gerald Ohm g_ohm@telus.net
Treasurer: Carol Foley wfoley9@shaw.ca
Custodian/Librarian: Robin Macnamara remhbh@aol.com
Program Chair: Cyril Henderson cdhenderson@telus.net

Directors: (dates are inclusive)
Francois Leh (2010-2012) francoisleh@hotmail.com
Roy Taylor (2010-2012) taylor.rp@

telus.net
Gerard Van Dijk (2009-2011) vandijkg@yahoo.ca
Robert Prior (2009-2011) rv7@b4.ca
Eric Munzer (2008-2010) eam.consulting@telus.net
Jean Prior (2010) jb4@telus.net

Thompson Valley Sport Aircraft Club

Newsletter editor Cam Villeneuve reports:

"The wind and turbulence lately have made it hard for me to fly the Beaver as often as I would love to, but I got the chance to fly with Gerald in his Kitfox to Quilchena on September 23. Gerald did the take-off and landings, and let me fly the rest of the time. I found it nice to fly at 90mph instead of 60! Larry was there with his Kitfox, and also Bill and his Challenger.

On September 25 I went to the strip with the intention of flying the Beaver to have a look at Highland Valley where I used to work. There was already too much wind for my small aircaft, but Bill Huxley offered me a ride in his Challenger; it was great again to fly faster. But over the mine we experienced some severe turbulence; the Challenger had no problem with that, but if I had been flying the Beaver I might have left some fingerprings in the joystick!

Nine aircraft came in from the Valley. It had been quite a while since I saw that many at Quilchena!"

Wind damage to hanger #1 is being repaired and it will soon be ready for occupancy. Larry L'Heureux and then Bill Huxley dragged the runway a little while back, and it's looking better, though the pocket gophers are back. It's "an ongoing battle".

Barry Meek contributed an article to the chapter newsletter on VFR aircraft flying into IMC conditions. He pointed out that sometimes newer pilots make better decisions than more experienced pilots because they are sensible enough to be scared of bad weather.

The Christmas dinner is scheduled for the ABC Restaurant once again, on December 12.


Bill Huxley


Bill Huxley


Cam Villeneuve

Who's flying the the Thompson Valley? Top down: a Pober Pixie and a Zenith were encountered at Quilchena; above, James Shepard's Coyote II.

Have you ever been on a plane and seen some uniformed pilots sitting in the passenger cabin? This is not at all uncommon, since most airlines at one time or another need pilots to cover a flight at an airport other than the one at which they're based. When pilots ride this way as passengers, this is known in the industry as "deadheading." In some cases, due to weather, mechanical problems, or crew flight-time legalities crews are called out at the very last moment to catch a deadheading flight. And so begins our story...

While taxiing out for takeoff, the Boeing 727 suddenly came to a stop. With the aircraft still on the taxiway, the flight attendant in the back began to lower the aft stairway. Behind the plane, a van with flashing lights came to a screeching halt and out jumped three deadheading pilots. They grabbed their bags and ran to the plane.

As they ran up the stairs, the pilot in front continued running up the aisle shouting, "I can't believe the stewardess got the plane this far. I didn't know she even knew how to start the engines!"

For a number of passengers it took quite some time before they realized they had been had by these jokers, you couldn't believe the startled looks on their faces!

X-Air

A Modern-day Demoiselle from the land of Hindustan

Harish Jadeja has been an aviation enthusiast since his days as an Air Cadet in India. He would bicycle to the local airfield for his lesson, just to experience the thrill of flight in a sailplane; he earned his glider license at age 16. As happened to many of us, the demands of education and then family caused his aviation pursuits to be put on hold for many years, but once established in Canada he decided to get serious about building his own plane / By Gary Wolf

The plane that Harish chose is an Indian-built X-Air, powered by a Japanese HKS flat twin fourstroke engine. The architecture of the X-Air harkens back to Santos-Dumont's Demoiselle of 1907. The Demoiselle had a flat twin Darracq fourstroke engine mounted to the nose of the keel tube, wire braced wings, and a small seat below for the pilot, right over the main gear. The pilot sat out in the breeze, right in the prop blast, fine for the odd trip around the Eiffel Tower but a bit chilly for much else. The X-Air is similar in architecture except that it has lift struts to replace the king posts and wires, and instead of bamboo and wood the main structure is aircraft aluminum tubing and 4130 steel. And the pilot and passenger sit in a cabin with a wraparound windshield to protect them from prop blast.

X-Air is manufactured by Raj Hamsa, who began in the eighties manufacturing hang gliders. Then with backing from Indian industrialist JRD Tata who founded Air India, Joel Koechlin of Raj Hamsa designed the X-Air line of light aircraft. The design considerations included the requirement for good handling characteristics, a safe structure, simple assembly, and economy of operation.

Harish ordered his X-Air from Speedwings, the Canadian dealer based in Quebec near Montreal. He had the opportunity to take a test flight before purchasing and he was impressed with the handling and the ease of landing; he liked the side by side seating, plus it was easy to build and it fit his budget.

The plane was already on Transport Canada's Advanced Ultralight List, so it would be legal to carry a passenger once the dealer signed the plane off after assembly. Harish preferred a fourstroke engine

Actual hours spent assembling the airframe were several hundred, but family, a house move, and work considerations spread these over nearly four years.

and he chose the HKS 700cc flat twin, a lightweight engine that has a good spec fuel. Although the manufacturer claims 60 hp, most credit at about 55 hp. However compared to available twostrokes it consumes very little fuel, so the fuel load can be much lighter for any given length of trip.

The order was placed in 2005 and the kit arrived six weeks later. Harish did an inventory and found that the kit was complete except that one elevator cable was for a different model. The factory couriered a new part immediately. Workspace was cleared in his garage and Harish began putting together the subassemblies. The manual was well organized but it appears to have been translated from French to English. Nevertheless assembly proceeded quickly with the assistance of a DVD by Michael Coates of Australia.

The X-Air is an assembly kit, not a fabrication kit, and almost every hole is already drilled to size. Only a few wrenches are necessary for assembly and everything fits together in a straightforward manner. The only difficult parts were installing the windshield assembly and the pod, which required extra hands and more direction from the DVD. The original windshield was in two pieces but Harish sourced a new piece of Lexan and made his a one piece for improved aesthetics.

The wings were assembled as tapered ladders of tubing, with aluminum compression struts bolted in place. Drag-antidrag is by a pair of cables in the root bay of each wing.

The wing fabric is a sewn sock with semi-rigid foam to shape the leading edge. Each sock is pulled onto its ladder and when the two wings are installed the fabric covers are tensioned towards each other.

Wing ribs are simple formed aluminum tubes slid into sewn pockets in the upper wing fabric. At the rear end of each wingrib is a plastic fitting that presses against the rear spar, and this is sufficient for the light wing loading.

Actual hours spent assembling the airframe were several hundred, but family, a house move, and work considerations spread these over nearly four years.

The vertical fin and rudder required assembly and installation of the sewn covers, but the horizontal surfaces came all finished. The lower braces required drilling once everything was installed on the fuselage.

The fuselage consists of a large diameter boom tube to which the tubular bulkheads are bolted. Everything was cut to size and already drilled, including the lower tail boom tubes. The fairing tubes had to be trimmed to fit and then riveted in place. As mentioned earlier, the only real work was in fitting the fiberglass fairing and windshield. The tail covering is a sewn envelope that required progressive tensioning over a few days to get a proper fit.

The landing gear came already faired, the brake shoes were already on the backing plates, and the tires were factory installed. All that was necessary was to install the parts and connect the brake cables to the pedals for differen-

Opposite, A thrust test was performed prior to first flight; a Steerable nose gear has an effective trailing arm suspension and a light aluminum wheel. Note the Princess Auto landing light. Right, fuselage is a simple bolted assembly of aluminum tubes. No parts need to be fabricated; construction is essentially an assembly operation. Inspection is easy with velcro-attached covers.

tial braking.

The X Air nose gear has trailing arm suspension that comes factory assembled, and Harish had only to drill the final holes in the steering links to align the nose gear with the rudder.

Twin sticks are provided and again everything was already drilled, ready for bolting together. The wooden floorboards came factory painted and Harish glued rubber backed carpet to them for better appearance and scuff resistance. All cables were factory cut to size, requiring only installation and tensioning with turnbuckles. The seat cushions came premade and even the headrests were provided as part of the kit. The cabin is very comfortable with plenty of space for legs and elbows, and the controls fall readily to hand.

Two fiberglass fuel tanks are fitted behind the seats, and Harish had some concerns about alcohol in the pump gas that the HKS engine prefers. He buys his super grade fuel from Shell because he has a letter from Shell stating that all their 91 octane fuel is alcohol free. A Facet fuel pump is fitted below the front of the passenger seat with a fuel shutoff before the filter and pump. Plastic fuel lines came with the kit but Harish sourced all fuel lines locally to be sure that they were rated for alcohol, just in case…

The fuel pressure sender failed during ground testing but Clare Snyder diagnosed it and a new sender corrected the problem.

The engine mount was fabricated by Harish, using specs provided by X Air. His daughter took the specs to create a soft file and Harish gave it to a water jet cutter to blank out the parts. The mount bolts to the engine and rubber Barry mounts are used to connect the assembly to the airframe. The oil cooler and all plumbing including the remote oil tank and exhaust came with the HKS engine. Harish also bought their throttle and choke cable assemblies and they fit directly to the X Air controls.

The kit came with only an ammeter and ignition switch. Harish replaced the ammeter with a UMA unit and sourced the rest of the instruments from Aircraft Spruce, except for the tach which came from HKS. Harish selected analogue instruments for his panel, preferring the reliabil-

Only a few wrenches are necessary for assembly and everything fits together in a straightforward manner.

Top: Main gear is trailing arm type with faired lateral links and motorcycle type shocks. Brakes are cable operated. Above, left: Elevator trim is simple and effective; right, The cockpit is spacious with good rollover protection from two tubular bulkheads.

ity of instruments that would continue working if there were ever an electrical failure. One addition that is unusual for an ultralight is the Mode C transponder. ATC are always pleasantly surprised to find that an ultralight plane is so equipped and he is very welcome in controlled airspace. The panel blank itself was part of the kit, made from fiberglass with rolled edges for stiffness.

Harish did his layout the old fashioned way with paper patterns, and then cut all the holes with holesaws and drills. The panel is solidly mounted to the fiberglass pod's glareshield. Except when the HKS is cold and the engine is at low rpms, there is no discernible vibration to affect the panel.

Harish rented a hangar at Waterloo Airport for final assembly, and did thrust tests, weight and balance, and taxi testing over a period of a few months. Many of the local RAA members lent a hand during this period.

Weight and balance was done using the RAA scales and as assembled the plane was already within the envelope. Whether the

tanks are full or empty has negligible effect on the CG. Similarly the passenger load has little effect on CG position.

First Flight

Harish performed his first flight one calm June morning with zero wind and unlimited visibility. The plane lifted off almost immediately and established a positive rate of climb. Once at altitude Harish tested his stall speed and found that with power off there was no tendency to drop a wing. Power on stalls resulted in a slight tendency to drop the left wing. Indicated landing speed was then established at 50 mph for the first flight, but now Harish is comfortable with 45 except in gusty conditions.

Climb speed is 45 mph and at that speed the plane makes 600 fpm solo with half tanks. On a warm day with a heavy passenger the ROC deteriorates to 400 fpm. Cruise speed is usually 55 mph at 5200 rpms, when the engine never consumes more than 2 gallons per hour. The plane actually averages 7 litres per hour of pump gas, making for very economical flying. Pushing the throttle all the way for-

Liftoff is quick, after only a few hundred feet

MD-RA will hold an information seminar on Thursday January 28, 2010, from 19:30 to 22:30 hrs at John Abbott College, Penfield building, room P-204, Ste-Anne-de-Bellevue, Qc.
For directions refer to EAA Chapter 266 web site (www.eaa266.org/eaa266-meetings.htm).
All persons interested in Recreational Aviation are invited.

Discussion Topics:
MD-RA Mandate, Inspection Program, Regulations, Importations, Inspections, Continuing Airworthiness (Log Book, out of phase items, equipment calibration etc)

If you need additional information, please contact me at pierre-fournier@videotron.ca or at (514) 645-4355, or Michel Moreau mjmorea@videotron.ca , (514) 694-2129.

Le RM-AL (MD-RA)va tenir une session d'information au Restaurant de l'aéroport de Sherbrooke, le 16 janvier 2010, à 13h00 heures

Toutes les personnes concernées par l'Aviation de Loisir sont invitées.

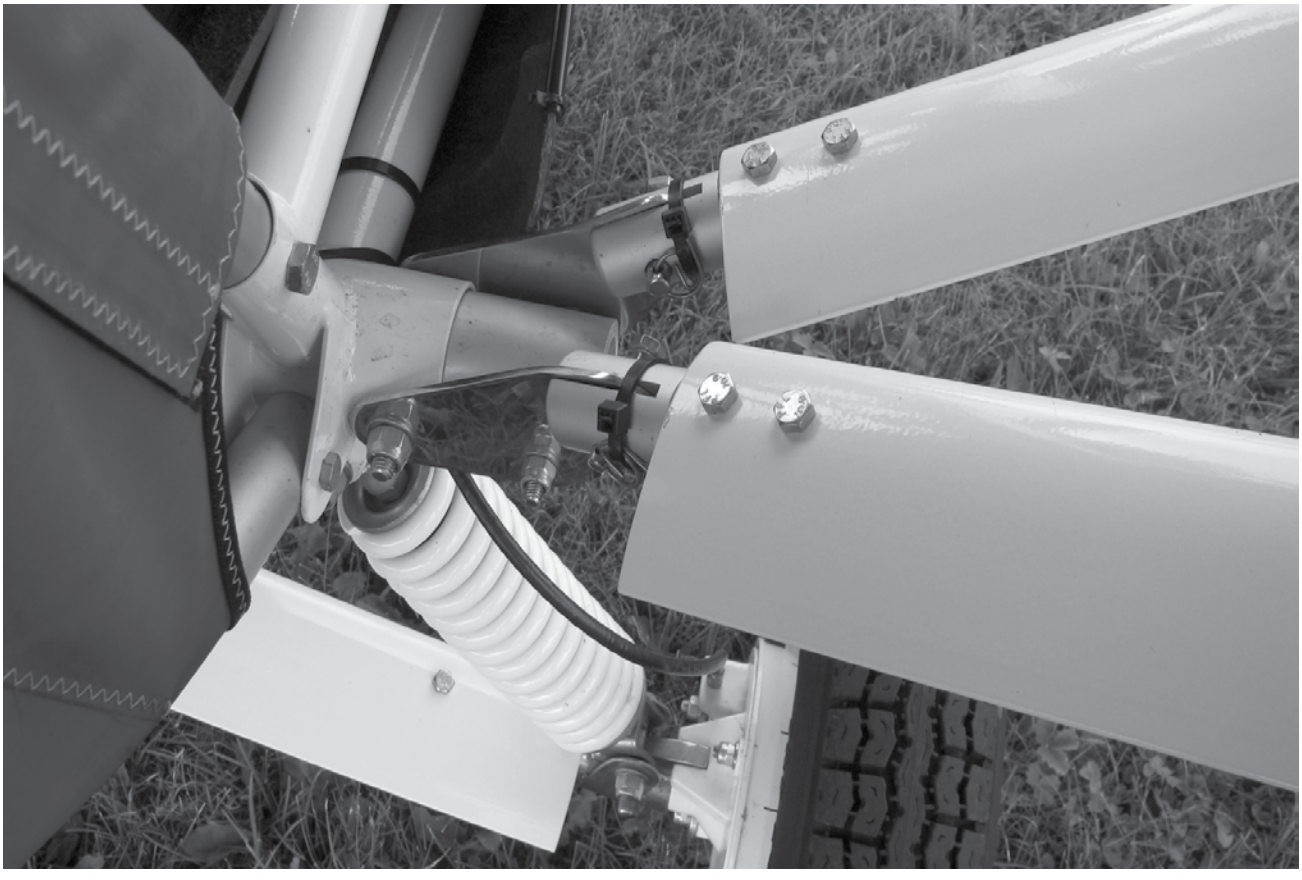
Sujets discutés :
Mandat du RM-AL,Règlementation,Inspections, importations, maintien de la navigabilité (Carnet de Route, équipement avec calendrier, calibration)

Si vous désirez des informations additionnelles, contactez moi à pierre-fournier@videotron.ca ou au (514) 645-34355

ward is allowed for no more than three minutes. Harish has never measured the full throttle consumption but the manual calls it 12-14 litres per hour. Full throttle results in 6800 rpms and 75 mph. 5800 is the usual fast cruise at 70 mph. The HKS has a very quiet muffler and combined with the Powerfin prop the plane is pleasantly quiet both in the cabin and when heard from the ground.

Handling of the X Air is a bit stiffer than a Cessna 150 but the control forces are balanced. There is hardly any adverse yaw and it is possible to fly with the feet on the floor, as Harish found when testing for rudder failure. Roll rate is slower than a 150 and requires more pressure. The X Air has no flaps but it cross controls easily and the rudder has more than enough authority.

The X Air has a manual elevator trim and it is very effective to lessen stick pressures. In fact if there were an elevator cable failure the plane could be flown on the trim system. The X Air trims easily for 55 mph and may be flown hands-off at that speed. It



has positive stability in all axes, making for relaxed flying.

Crosswind landings may be easily performed with a 15 knot crosswind at 45 degrees, and the manual claims a maximum of 15mph at 90 degrees. Harish finds the plane comfortable to fly and has made many flights of three hours, with some as long as four. Since June 2009 Harish has flown 72 hours all over Southern Ontario, dropping into both rural strips and controlled airspace.

Pricing of the X Air has recently increased as the US dollar's value has deteriorated. Still, the price shipped to the dealer in Quebec is just over $13K US. The current price of the HKS is reported to be in the range of $11K, so with panel it is possible to put together a flying machine for $27,000.

For next winter Harish intends to make his own doors or buy the optional kit items. He also intends to make a set of penetration skis so that he can fly in every season. His future fight plans include a trip to Oshkosh, going around the south with his Mode C transponder on the outbound leg, and over the north on the way home. Harish is very satisfied with his X Air and he enjoys the economical open air experience.

Opposite, top:The HKS engine sits on a boom in front of the wing. Pretty handy for servicing. Centre, Clare Snyder assisted with the diagnosis of a duff fuel pressure sender. Left, The owner of the Moth commented on the quietness of the HKS powered X Air.

Above: faired lift struts are pinned instead of bolted. Harish runs cable ties through the circlips.

X-Air

Performance:

Stall speed	30mph
V.N.E	95mph
Cruise speed	55mph
Climb speed	45mph
Rate of climb	600 ft/min
Glide ratio	7 @ 40mph
Fuel consumption (cruise)	
HKS 700 cc 4-stroke	7litres/hr

Specifications:

Length	5.7m/18ft 8ins
Wingspan	9.8m/32ft
Max height	2.55m/8ft 4ins
Wheel track	1.6m/63ins
Wing area	16.00m2
Wing loading	28.13 Kg/m2
Wheel base	1.45m/57ins

Testing Rivet Shear Strength

Graham Luckhurst

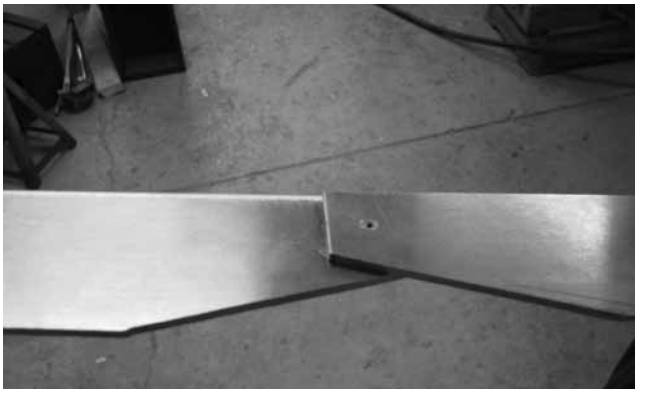
The Sonex uses pulled 1/8" stainless steel rivets throughout the aircraft, other than in the main spars. The pulled rivets can be involved in joining parts that experience some significant loads, and one area is in the vicinity of the main spar tunnel where it joins the cabin side walls. This is where the main spar bolts are located that join the wings to the fuselage.

Gussets which are penetrated by the main spar bolts have to be flush riveted to the side wall assembly and spar tunnel with the rivet heads inside the tunnel where space is very restricted. CCC44 rivets have to be used so you can insert them when loaded in the rivet puller. However, the material thickness being riveted is at the maximum 1/4" recommended for this size of rivet. Sonex therefore indicate the gusset on the formed side of the rivet should also be countersunk to ensure proper rivet retention.

My thoughts were just how strong is this arrangement, considering the sensitivity of the areas being riveted? I therefore set up a simple test in which I joined two 1/8" plates with one CCC44 rivet with countersinks in both plates as per Sonex instructions, and did some shear testing to see just what this arrangement could handle.

One side of the assembly was secured to a table with screws and the other end had a large hole which supported a loop of heavy rope into which I could step and apply a significant shear force. I stood with my other foot on bathroom scales so I could see how much force I was applying by observing how much the indicated weight dropped. I went up to applying my full weight of 200lbs with no apparent deformation of the rivet or material, which surprised me considerably for such a small retaining device.

I had increased the gusset size to include all 24



Top Down: The test piece; the countersunk factory head of rivet; and the shop head pulled into countersunk hole.

rivets in this area. Simple logic would say this plate could take at least a 4800lbs of shear load from the main spar bolt, though this would not be the case as loads would be supported by other components. The area of each gusset would actually see about of the load from everything associated with the fuselage. Under 6g maximum, this would be about 1500lbs. Clearly there is significant margin even under these extreme worst case conditions where the gusset took the entire load, which it should not.

All the fuselage load into the main wing spars is taken by one 3/8" x 4 -15/16' bolt at each side of the cabin. It sure looks minimal. Perhaps I worry too much? Maybe I should just keep building as per the plans developed by folk who know a lot more than I do.

Avia Propeller Vibration Survey

Thomas Michael Thomas

When a new type of propeller is installed on an aircraft, it is necessary to do a vibration survey on the prop to ensure its compatibility with the airframe. This is routinely done with new aircraft/propeller combinations on certified aircraft. Homebuilders often do not have access to that service, and it is generally expensive.

My Murphy Moose C-FTTD has an M14-P engine with 360hp and a type K propeller flange. I bought my propeller from Avia Propeller of Prague, Czech Republic, for this Moose, and wonderfully, a vibration survey is required and offered with the sale.

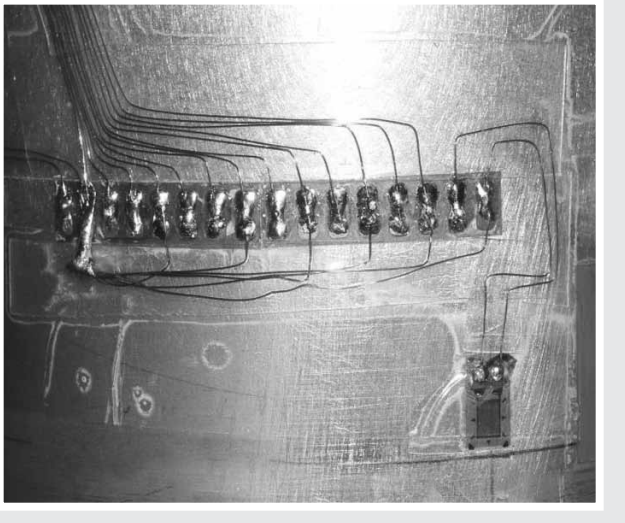
I installed the propeller and flew the Moose for the pre-survey requirement of maximum 50 hours of operation. The Avia performed much better than other props I had tried on the Moose. The vibration survey was scheduled at my hangar in Alberta with the Avia engineer in October 2008 for 10 days. I expected he would do half a day's work and tour Banff Park the rest. Not so.

Five crates preceded engineer Zbynek Tvrdik's arrival. These held digital measurement instruments, a propeller hub and six propeller blades. One set of blades was new; the other set was prepared to the minimum overhaul dimensional limit.

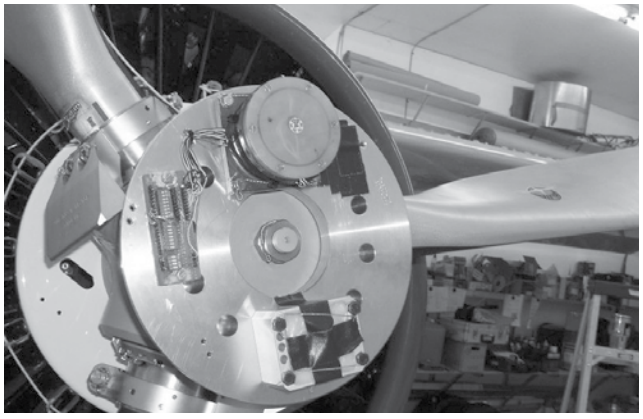
Vibration surveys would be done on the hub with these two sets of propeller blades to insure the propeller is safe thru its full service life.

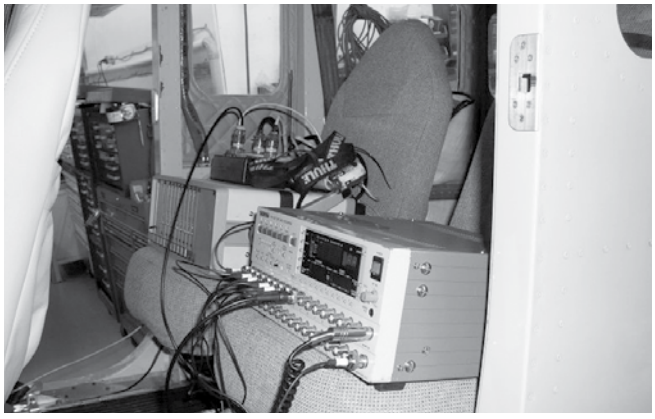
We installed the new prop, and Zbynek placed eight strain sensors on one blade. Strain sensors were also installed on the prop hub and on several bolts.

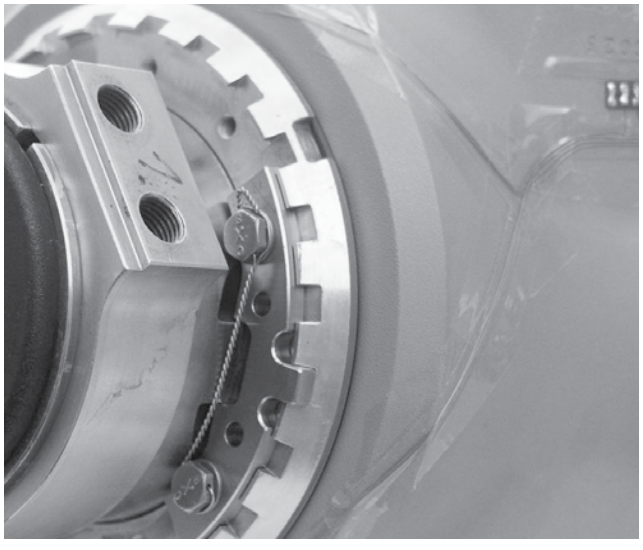
On the prop hub, a radio transmitter and battery were installed. On the engine cowl, the receiver antenna was placed and wired to the recording instruments which were set on the

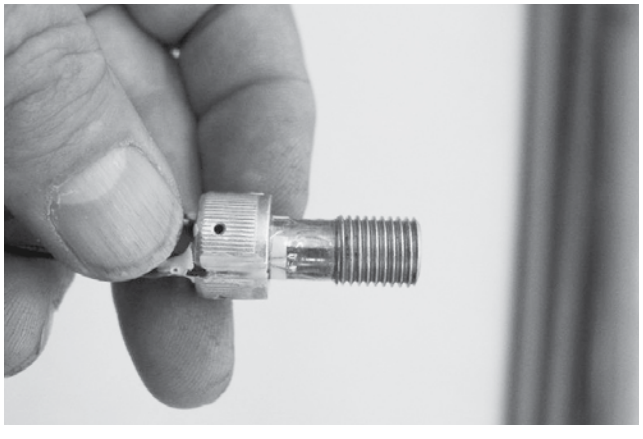


Left: AVIA Propeller Chief Designer with the Moose. Note the strain gauges on the propeller. Above, Strain gauge and wiring on blade butt.









Left, from top down: Radio Transmitter, Antennea, and Battery Mounted on Hub; Strain gauges on hub, and bottom, strain gauge on counterweight bolt. Right top: Recording Instrumentation.

back seat of the aircraft.

We performed several ground runs and flight tests, with Zybnek verifying and downloading data for analysis between runs.

The new prop blades were then removed, replaced with the at-limit overhauled blades and wired again as previously to the radio transmitter. All ground runs and flight tests were repeated. With excellent weather, we were able to complete all the testing in eight 10-hour days. Then we successfully performed dynamic balancing on my Avia propeller.

This engineer's diligence, competence, graciousness, customer service excellence is remarkable. This Avia propeller is the only one so precisely systematically examined, and pronounced safe on the Moose. RAA

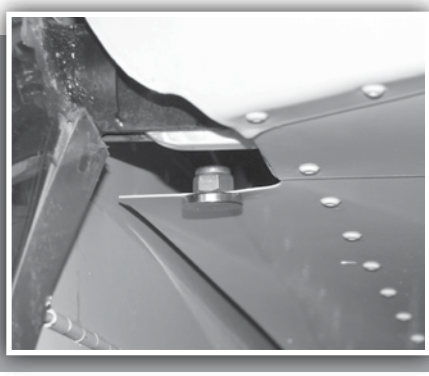
Prop Manufacturer: Avia Propeller
Type of prop: AV-803-1-K-C
Engine: Zendeyev M-14P
Moose serial # SR120

RARE EARTH MAGNETS

Rare earth magnets are very strong for their size and they can be useful when building an airplane. Even a dime sized magnet stuck to the heads of a bolt can keep a -4 nut in place while you rotate it with your fingertips to catch that first thread.

Wing attach and control pivot bolts and nuts always seem to be placed to make it difficult to get the nut started, a perfect place for a magnet to help out.

Have you dropped a nut inside a difficult to reach area? Run a rare earth agent over the outside surface and drag the lost nut to an opening where it can be retrieved. At right, some examples of their uses.



Hummelbird Wing Spar Failure

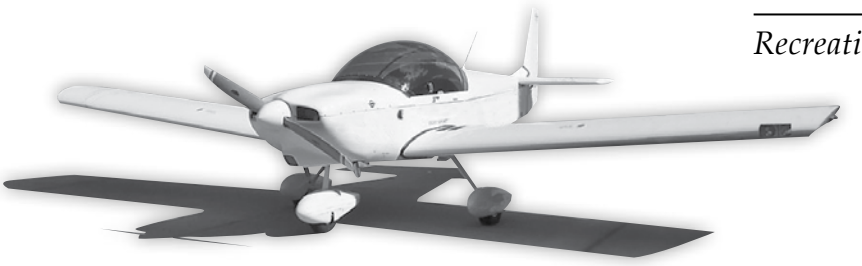
Recreational Aircraft Association

IN JUNE WE REPORTED that a Hummel Ultracruiser ultralight had lost its right wing immediately after takeoff. Fortunately the crash was not fatal and the pilot is now recovering. With the help of RAA Calgary member Ed D'Antoni the cause of the failure has now been determined. The failure was a result of an inadvertent material substitution. The owner had formed up a temporary angle from .016 and later forgot to install the correct .125 wall material in the area of the rear carrythrough. The plane flew several times with this piece of .016 angle and then suffered a LH landing gear failure resulting in a ground loop. It is likely that the RH rear carrythrough was damaged at that time, and on the subsequent takeoff the RH main spar broke just outside the cockpit. Fortunately the failure was at very low altitude and although injured the pilot did not die in the crash.

Congratulations go to Terry Hallett of Hummel Aviation, Ed D'Antoni of RAA Calgary, and Wayne Winters of Blue Yonder Aviation for persevering until the cause was found. RAA

Zenith CH 601XL and CH 650 Revisions

Recreational Aircraft Association Canada



What do you do if you are an aero engineer and one of your designs starts losing its wings? In the case of Chris Heintz and his Zenith 601 XL, he hired an independent engineering firm with a wind tunnel to do a full arms-length investigation. Aileron flutter was thought by many to be the culprit.

On the 601 XL (and the similar 650) the ailerons are not counterbalanced, so some thought that adding these might be the cure. Heintz maintained that if the aileron cables were tensioned even as low as 5 pounds there would be no flutter, and the independent engineering firm's testing confirmed this belief, even at airspeeds of 400 mph. Further it was found that some builders had not installed stops against which to park the flaps, and these too could then experience flutter. The engineering firm confirmed that if the flaps were parked against the stops they too would not flutter. At that point it seemed that the answer had been found, but unfortunately various aviation authorities around the world had meanwhile come up with their own requirements for the planes, and in some countries the planes had been grounded. As an example, the British required aileron counterbalances and they also lowered the allowable gross weight for UK planes.

Heintz maintained that if the aileron cables were tensioned even as low as 5 pounds there would be no flutter, and the independent engineering firm's testing confirmed this belief

In the US it looks as if the NTSB is unhappy with the FAA for having allowed a Light Sport flutter standard that is lower than that required in FAR 23, and rightly or wrongly the NTSB has tried Zenith in the press. Of course planes registered in the amateur category do not have any flutter standard at all because in that category there is only a build standard, not a design standard. Accordingly neither the FAA or Transport Canada has issued an AD for planes registered amateur built.

In some countries the authorities have grounded the planes, so Heintz has recently released a set of drawings that satisfy every aviation authority that has raised an eyebrow, and these are available on the www.zenithair.com website. The revisions are extensive, requiring the removal and reinforcement of the carrythough. The wings and ailerons must be opened up and the British aileron counterbalances must be added, plus the spars must be reinforced. Stringers are added to the skins in the area of the bellcranks, and new spar splice plates with larger bolts must be installed. Zenith will shortly be releasing a kit of parts to perform this refit, and the Canadian dealer Can-Zac Aviation will be hosting a seminar in January to walk owners through the process.

RAA Canada has contacted its Regional Directors and chapter members in the areas where there are owners of flying examples of these planes, and with their help we are now fairly sure that every owner has been contacted.

Builders who do not yet have their flight authorities will have to incorporate the factory changes, even if they have already had their precover inspections and their wings etc have been closed. Again, go to www.zenithair.com for all the details.

Please note that the earlier CH 601 UL, HD, and HDS models are not involved in any of the above.

The Impossible Turn

In a 1982 paper presented to the AIAA 20th Aerospace Sciences Meeting in Orlando. Florida, Mr. David Rogers contended that the turn-back manoeuvre can be successfully completed provided that you are expecting the failure and have received training in the correct flight profile. He conducted a series of simulator and airborne trials to prove the point. Using 20 pilots of varying experience, he conducted a series of tests from a 3000 foot runway, both in a simulator and airborne.

During the first series, the pilots were not prewarned that the engine would fail at 500 feet. Eightyfive percent successfully landed straight ahead. Of the three who attempted the 180, two "died" in the classic stall/spin. One reportedly was successful.

Trials were then conducted with the pilots prewarned of the impending engine failure and using either 30 degree or 45 degree bank turns for a 210 degree heading change to return to the departure runway.

The trial contended that a 45 degree bank turn, just barely above the stall, is the most efficent manoeuvre. However, it is also a very high risk that leaves little room for error. A light wind-gust could easily result in the fatal stall/spin at an altitude from which there is no time to recover (the simulator and limited airborne tests were conducted under calm conditions - not all that common in real life). In addition, the simulator tests provided data only for airspeeds, altitude and bank angle. No data was provided for distances covered over the ground ▶

Coming Events

RAA FABRIC SEMINAR CONFIRMATIONS

The Tiger Boys's fabric seminar on January 9-10 is nearly fully subscribed. However occasionally there are some who at the last minute must cancel. For this reason we ask that all who are attending or who wish to attend please confirm by emailing to clare@snyder.on.ca Please put RAA in the subject line of your email.

The tuition is $200 payable upon arrival. Lunch is usually a la carte at the airpark restaurant. The event will be at Guelph Airpark at the Tiger Boys' hangar and www.tigerboys.com gives the location . At present they are in Florida working on the Weeks collection, and they will be returning in time for this seminar, so please send confirmations to Clare Snyder's address. Please confirm by december 21st.

QUEBEC MD-RA SEMINAR

Pierre Fournier, Quebec Chief of MD-RA will be hosting a seminar for builders and owners of amateur aircraft on January 16th at 1300 hrs in the restaurant at Sherbrooke Airport. A second information session will be held January 28th in Ste-Anne-de-Bellevue Qc. The location will be John Abbott College, Penfield Building, room P-204 during the hours of 19:30 to 22:30.

A third session is planned for Quebec City in the Spring

Topics will include the Inspection program, regulations, importing, inspections, and continuing airworthiness issues. All members of the public are invited.

Please contact pierre-fournier@videotron.ca or 514-645-4355. Alternatively contact mjmoreau@videotron.ca or 514-694-2129.

during the manoeuvre, either for the simulator tests or for the tests at altitude.

Nevertheless, with prewarning and training provided to the pilots, the 30 degree bank simulator tests were claimed "successful", as were the tests at altitude. But the low level airborne trials were not. The results revealed that the "test" pilots had to add power the the "failed" engine, or else they would have touched down 200 to 300 feet short of the runway.

The 45 degree bank trials were also claimed as "successful" both in the simulator and at altitude. But again, no ground distance data was provided, and therefore, this data is suspect. No 45 degree low level airborne tests were attempted, or if attempted they were not documented in the presentation. Perhaps no pilot was brave enough to try.

There are many options in dealing with an engine failure after takeoff, depending on the length of the departure runway, the surrounding terrain, and the altitude at which the failure occurs:

-landing straight ahead on the remaining runway available;

-landing on a crossing runway, if one is available;

-landing straight ahead, if the terrain is suitable;

100 percent of the pilots who elected to land straght ahead did so successfully, and in real life, landing straight ahead seldom results in serious injuries

-turning in either direction, altitude permitting, if the terrain left or right is more suitable for a forced landing; or

-attempting the 180 back to land downwind on the departure runway.

If you are operating from a longer runway, and if your engine fails at higher altitude, you may be able to successfully trade that altitude for the turn-around manoeuvre. However, many private pilots operate from small strips in the 1500 to 3000 foot range. These are often grass or gravel surfaces, and aircraft performance will not match that shown in the aircraft operating manual. Hence, the original ASL article calculated from the starting point of 50 feet, over the end of the runway, and at the specified climb speed.

The accident files are replete with occurrences whether on wheels, skis or floats, in which the pilot at low level (below 1000 feet) attempted the impossible 180-turn, and unfortunately there were rarely any survivors.

In Mr. Rogers' study, 100 percent of the pilots who elected to land straght ahead did so successfully, and in real life, landing straight ahead seldom results in serious injuries. It's hard to argue with success.

President's Message
continued from page 2

be one of the limits. Similarly if he decides that the plane should have maintenance performed by an AME, that could be another of the limits. It is a roll of the dice and most prospective owners will not take the risk on an investment that approaches $100K. Would-be Canadian manufacturers of Light Sport aircraft are still left without a domestic market, and there is difficulty in selling into the US. Tough luck for the public and for Canadian manufacturers.

BASIC AND ADVANCED UL

Basic and Advanced UL categories remain unchanged except that it is unclear who at Transport has responsibility for them. Bob Bancroft took over these categories in 2006 but lately maintains that he gave them back to Arlo Speer to handle, although recently Arlo maintained that they are outside his area of responsibility too. Admission to the Advanced UL category is still a matter of trust – Transport does not verify any of the manufacturers' paperwork to be certain that the planes are safe for the carriage of passengers. It is not even a requirement of registration that these aircraft have a weight and balance. RAA has several times requested that Transport correct this but no one there seems to be concerned despite that for many years there have been fatalities attributable to CG problems.

AMATEUR BUILT AIRCRAFT

The amateur category is the best-administered in Canada, due largely to the efforts of MD-RA. Their application of the regs is consistent across the country and the quality of inspection is high. However from a manufacturer's point of view for the past two years it has been impossible to receive a blanket 51% inspection for a new design, only because the FAA in the US had been overhauling the requirements for their category and Transport did not wish to do anything that might have to be undone at a later date. Recently the US has resumed inspections, so Transport through MD-RA has also now resumed performing blanket 51%'s.

NEW FORMAT LICENSES

For holders of a Private license the deadline to convert to the new passport format had been Dec 31 2009. However for a while blank documents had been in short supply, and Transport has now put the deadline off to June 30, 2010, and they ask that everyone not wait until the last few weeks. While it is still fresh in your mind, head off to Shopper's Drug Mart to get a passport photo, then download the application form from the TC website. Alternatively pick up an application from your local TC office. By the way, there is no fee for issuance of the new license. RAA

Keep in Touch With Your Board of Directors!

Gary Wolf ..... President
..... 519-648-3030 garywolf@rogers.com
Wayne Hadath ..... Treasurer
..... whadath@rogers.com
Ed Butler ..... landed@sympatico.ca
Dave King ..... kingdws@shaw.ca
Tom Martin.....fairlea@amtelecom.net
Ed Perl..... ed.perl@sympatico.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:
Laura Drinkwater..... 306. 955-1361
lauraprd@shaw.ca

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

Ontario SW:
Jim Tyler.....tyler@orc.ca

Quebec:
Raymond Fiset .418-204-9448 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
Treasurer: Wayne Hadath

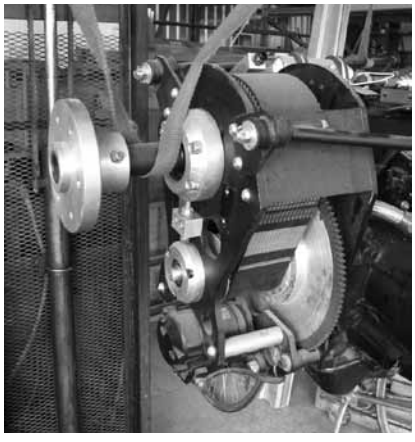
Recreational Flyer Magazine

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

RAA DONATION FOR SALE: 6 cylinder Continental IO 470 J engine as a core for rebuilding, condition unknown. This engine was in a Debonair that had a wheels up landing. Best offer but be reasonable as the proceeds go to RAA. I can email photos to you if required. garywolf@rogers.com Jun09



Brand new Crossflow redrive for Subaru EA 81 with flywheel and starter. RAA is handling the sale of this redrive for the estate of the late Mike Davy. $1200. This is a complete bolt-on unit. Please contact garywolf@rogers.com or call 519-648-3030 Jun09

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.

SIDEWINDER: All metal; seats two. Equipped with Lycoming 0-290D (110

hrs STOH), engine log, 3-blade ground adjustable Wrap Drive Prop. Bendix/King KY 97A radio, Icom portable standby radio; intercom, transponder/c. Full cockpit and panel lighting, strobes, L/L, and nav lights. Ready for MDRA final pre-flight inspection. All drawings and building manuals are included. Selling for material cost only ($20,000 cdn.) Call Norm at 519-745-7971 or email at ldservice@rogers.com. Apr09

Project Assistance 15 years of aircraft sheet-metal/fabric/ composite construction/ mechanical. can help your project. Have helped on RV projects.and other home-build aircraft. 1-519-777-7084 ask for Robert April09

FOR SALE: Bushcaddy R120 kit for sale. Tail section completed, cabin 85% completed. Rexton NB. Asking $24,500.00 For more information & pictures, please call 506-523-9614 or 506-523-9056 e-mail ahudson@nbnet.nb.ca

FOR SALE: Cuby project at precover stage, on gear with controls, seats, engine mount, struts, wood wings. $3500 gpeees@hotmail.com 519-831-5350 Jun09

1969 c-172,2800 TTAF,590 SMOH,original paint,Mk12D with glideslope,Mk12,loran March annual, Transponder with encoder.$60M Ted Strange 1-250-762-4924 ted.strange@gmail.com Aug09

FOR SALE: Zenith Zodiac 601 C-FZOF. Subaru powered, warp drive propeller, A22 ICom portable, flightcom intercom. Flight authority valid to Aug 11/09. 13 hrs total time on airframe. Presently located at St. Catharines airport. Asking $25.000. 905 295 4906 Jun09

RAA DONATION FOR SALE: 6 cylinder Continental IO 470 J engine as a core for rebuilding, condition unknown. This engine was in a Debonair that had a wheels up landing. Best offer but be reasonable as the proceeds go to RAA. I can email photos to you if required. garywolf@rogers.com Jun09

FOR SALE: 1969 Stitts Playboy.135hp. Lycoming. Fuselage & tail surfaces covered with ceconite in 2006. Gross 1450 lbs. Net weight 945 lbs. $12,500. Call 1-519-294-6118. E-mail mtlarkin@sympatico.ca. Jun09

McCauley prop from a 150 hp 172, CTM 7553. Removed July 06 for inspection/overhaul. Asking $700 flyadler@golden.net 519-648-3886 Aug09

Falconar "F11A" project, Fuselage complete, wing 90% complete, empenage complete, 1st inspection done, EA 81 Subaru with re-drive included. $3000. (905) 649-1376Aug09

Four Subaru EA81s and one EA82. one partly converted. Will not be undersold. FOB my shop. Bill Weir 519-461-0593 Jun09

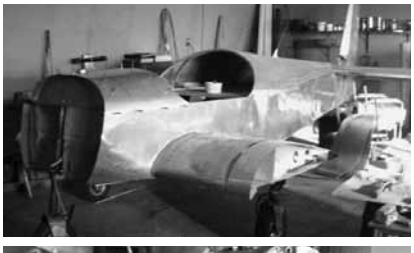
FOR SALE: ZENITH CH-300 on floats First flight, Sept 1983, total hours 575 (300 on floats since July 1993). Engine O-320-C2A zero timed in 1999 now with 170 hours. panel, no radio. Prop McAuly 1A175/GM8241 new in 1993 Floats, Zenair 1850. Location Lake Muskoka. $45,000 George 705 445 7054 CollingwoodAug09

I have too many RV projects on the go…
1. RV-4 project well on the way with the tail feathers finished, wingspars finished and all ribs drilled, primed and numbered in the box. Flaps and ailerons finished. Fuselage on the jig. All primed. Good workmanship. $9500 OBO . Call for more details or e-mail for pictures. (519) 461-1464 or ed@solaire-canada.com. Jun09

FOR SALE: Lycoming engine-Model IO-360-B1B--Last annual 5-8-73 at 646.0 hrs since top O/H--in storage since removal from Beechcraft--C/W Hartzel C/S prop. Dynafocal mount , Exhaust,--Logbook--Located in Edmonton,Ab. $8500 OBO forestind@mmipro.com Cell 780-499-1724 Res: 780-460-7420 Jun09

1969 Stitts Playboy.135hp. Lycoming. Fuselage & tail surfaces covered with ceconite in 2006. Gross 1450 lbs. Net weight 945 lbs. $12,500. Call 1-519-294-6118. E-mail mtlarkin@sympatico.ca. jun09

(1) 1967 C-172, 3155 TT, Cont. 0-300, 1005 SMOH, new windshield, new battery in 2007, new paint in 2005, a working DME, two 720 com. radios, a ELT, current annual until Nov.09. $41,000. (2) 40' X 30' Calhoun structure hangar at Earlton,CYXR, 5' high steel walls, 10' high doors, fabrene roof, put up in Nov. 2004, will hold a C-172. $12,000. Phone 705-544-8743 or whiteheadbj@msn.com Aug09



FOR SALE _ Zenair 601HD tricycle gear built from plans. Wings and empennage finished. Fuselage 90% done. Electric elevator trim operational. Control cables finished. Hydraulic brakes operational. Fuel tank

installed. Radio antenna and cable installed. Logs up to date. Also included; plexi for canopy, radio, extra aluminum sheeting and some tools. Asking $8000. ALSO FOR SALE_ Corvair Monaza 6 cylinder 110 Hp engine. Prop hub, ring gear and starter installed. Needs carburation, ignition, and exhaust. Logs complete. Asking $4000. Both items for $10000. ph; 403-665-2482 Hanna, AB. e-mail; mcdonell@netago.ca Jun09

For Sale: Avid Flyer Mark IV STOL wing. 800 TT, folding wings, 1150 lb gross, 540 lb useful load. Engine liquid cooled 582C 50 SOH. Registered as homebuilt, restored 2005. 720 channel Com, ELT, new 3 blade GSC prop, new wheels, tires and brakes. Cruises at 90 mph, stalls 32, low cost and lotsa fun flying. Skis and some parts included. Asking $16K. Email planes1057@hotmail.com. Phone Tom 780-632-9396 days, Lowell 780-632-2931 evenings. Oct09

For sale/trade: 0290D2, good but scored crank journal, no accessories, dismantled $2000.00. Also, Revmaster mount and electrics $500.00. Bendix dual mag $500.00. Call 519-692-5309 for details. macmaz@mnsi.net Oct09

For Sale: Avid Speedwings new and uncovered, at the ladder stage,with factory made flaperons. $500. Avid stabilizer $100. Avid stab lower braces $75. One jury strut assy $30. As a batch - $575. garywolf@rogers.com 519-648-3030 Oct09

For Sale: Rotax 912F for sale $5700.00. 1490 SMOH Many new parts. From well maintained certified A/C. Contact: Keith Charest , intev@bellnet.ca, 519-240-3064 Oct09

For Sale: McCauley propeller 1A101DCM6948 modified to a GCM6948 that takes a prop extension. Prop is in good condition and removed from Cessna 150 for age. Last major overhaul by Western Propeller Jan 1991 and has about 1090hrs since then. Because of the modification for a prop extension, prop cannot be recertified. Good for your homebuilt powered by a Continental O-200. Price $700 Cdn. Call Don Bentley 250-764-0880 Oct09

For Sale: Pegazair factory made wing rib kit, with ribs and skins for slats. Includes nose rib doublers, rollers, and stalks for moveable slats. Also includes the main spar shear web and caps, plus the full length rear spar. $2600 for all. garywolf@rogers.com 519-648-3030 mornings. Oct09

For Sale: McCauley metal prop removed from 150 hp Lycoming on C-172. No damage but it failed its annual by .005" on the chord width. $700 OBO. 519-648-3886 Oct09

For Sale: Ballistic Recovery System Model BRS-5-1200-VLS complete with harness,rocket,installation guide and owners manual. New $3400.00 US. Never used--needs repack only. Price $500.oo Call 613-543-0594. Oct09

For Sale: I have an Rv 6A, nose wheel and main gear legs, fairings, gear attachments,motor mount etc would like to sell or trade for complete tail wheel components, if you know of anyone interested please have them contact me at rosymury@aol.com. Oct09

Murphy Super Rebel Kit SR2500 (Moose) Complete airframe kit. Tricycle landing gear. In factory crate. $15,000.00 Larry 905 460-0880, work 905 677-8300 or email lawrence.strilchuk@sympatico.ca Oct09

Zenair Zodiac 601HDS Tricycle gear, registered 1993, Rotax 912 UL, ARPLAST flight adjustable prop.. 756 hrs TT. ICOM A-4, 2 headsets, GARMIN 95 GPS, Vacuum AH. Stainless exhaust, new upper paint 3 years ago. Canopy cover. Cruise 120 mph. Asking $28,000 CDN. At Oshawa. Dave, 416-282-5252 Oct09

Cessna 150H, 3980 TTAF, 1820 SMOH, KX145 NavCom, Icom 200 Com, Narco Mode C, paint 8/10, interior 7/10, 4 new cyls/321hrs $19500 gbemus@rogers.com Dec09

CESSNA 150G, 1967 • $27,000 •• 3400 TT, 1680 SMOH, 80 hours since full engine repair, lower portion and prop overhaul in 2007 & 2008, Very Well Maintained, Always Hangared, New Paint (all white - perfect blank canvass!), Mode C Transponder, Intercom, Nice Interior, Rudder Stops (Feel free to spin!), Complete Logs since new, Handles Great! More pictures available on request; hangar space included (Niagara District Airport) until at least the end of January, 2010. Private sale - no GST. • Contact murphage@cogeco.ca located St Catharines, ON Canada 905 397-5131 905 397-5131 Dec09

Wanted

Wanted- Great Plains only VW dual spark plug heads, Aerovee 29mm Injector Carb or similar Revflo in good condition, or even Ellison ESF 2, low time Slick 4316 mag, Great Plains only complete Force One Prop Hub. John Donaldson, 519-426-8583, jdonaldson@kwic.com near Simcoe ON. Dec09

Wanted: Geshwender redrive for my Spitfire project. 519-692-5309 macmaz@mnsi.net Oct09

I have finished my RV-6 and now need a new project. What have you got? All types considered, preferably in Ontario. I have a Lycoming O-320 H engine available as part trade or the deal can be all cash, your choice. Email kinger@distributel.net. Dec09

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.

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@cmc-electronics.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 ckweston2@sympatico.ca

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@teksavvy.com 905 822-5371

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 dahatch@rogers.com

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, CARES Building. Contact Pres. Elizabeth Murphy at murphage@cogeco.ca, www.raa-niagara.ca

OSHAWA DISTRICT: Last Monday at 7:30 PM at the Oshawa Airport, South side, 420 Wing RCAF Assoc.

Contact President: Jim Morrison ,905 434 5638 jamesmorrison190@msn.com

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

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

SAUGEEN: Third Saturday for breakfast at Hanover Airport.

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.ca

MANITOBA

BRANDON: Brandon Chapter RAA meets on the second Monday of each month at the Commonwealth Air Training Plan Museum

at 7:30 PM except in the months of July and August. Contact Pres. John Robinson 204-728-1240.

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

SASKATCHEWAN

Chapter 4901 North Saskatchewan. Meetings: Second Tuesday of the month 7:30pm Prairie Partners Aero Club Martensville, Sk. info at www.raa4901.com. Kevin Drinkwater 306-955-1361 lauraprd@shaw.ca

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 President Gene Lukan at 403 932-4238

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, 7:00PM, RAAC clubrooms, airport. Contact Boyne Lewis at (403) 527-9571or E mail balewis@shaw.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 President: Tim Nicholas vibraanalysis@shaw.biz.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 & SPECIALTY CO.

FREE

800+ pg. Parts Catalog, also on CD, and full color Pilot Shop Catalog!

Aircraft Spruce SINCE 1965 & Specialty Co.

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

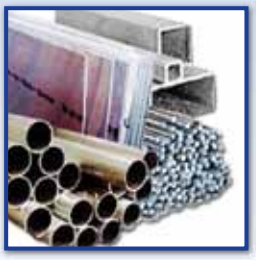
info@aircraftspruce.com

Store Hours:
Monday - Friday
8:00am to 5:00pm
Saturday
8:00am to 3:00pm

AIRCRAFT SPRUCE CANADA (CYFD)
150 Aviation Avenue
Brantford Municipal Airport
Brantford, ON N3T 5L7
Ph: (905) 795-2278
(877) 795-2278


Composite Materials


Wood Products


Metal


Hardware


Airframe Parts


Landing Gear


Engine Parts


Polyfiber / PTI Paints


Instruments


Batteries / Chargers


Electrical


Avionics / GPS


Headsets / Intercoms


Tools

Books / DVDs

www.aircraftspruce.com