September - October 2011

RECREATIONAL RFLYER

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RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONEFS AMATEUR CANADA

From The President's Desk

Gary Wolf

Ryan Gomes is a star apprentice AME who has written many tech articles for the Rec Flyer. Last year he competed in the Canada Skills Competition and finished first in Canada in the Aircraft Maintenance division. This qualified Ryan to go to England to represent our country in the World Skills Competition.

Last month Ryan made the trip to England to compete in the Worldskills competition where he earned a Bronze Medal, just a few points from Silver. This young man is a fine example to all young Canadians, and in his early twenties he now has positioned himself for a successful career in aviation.

CHANGES TO THE AVIATION SAFETY LETTER

The latest version of the Aviation Safety Letter indicates that beginning inJanuary 2012 it will no longer be mailed out as a print edition. This will lower the cost and will also allow the length to be anything required instead of being limited by mailing and printing costs. You may sign up for an automatic email notice as each issue is released -google Aviation Safety Letter to find the signup page. For pilots who wish to have the traditional printed copy it looks as if you will need access to the internet - they sell a print-on-demand version in black and white but the price has not been stated.

Many pilots live in rural areas so that they may have their own airstrip, but in parts of the country internet service is still spotty and limited. It looks like a trip into town to get groceries might have to include a stop at the library to read the ASL.

4130 TUBING PRICE RISE

Aircraft Spruce is a major retailer of 4130 seamless chrome moly tubing used in aircraft fuselages, control systems, and fittings. Unfortunately many manufacturers of tubing have closed their North American operations and have moved to lower cost countries to produce more profitable products. Chrome moly tube is a low volume specialty item and the remaining few mills on the continent have recently been increasing their prices with rises of as much as 100%. Aircraft Spruce is not immune to this so they will be forced to raise their retail prices as their current inventory dwindles. They do not plan to raise the price of current inventory but future purchases of stock will of course reflect the new prices from the mills.

AIRCRAFT INSURANCE FOR 2012

There has been a lot of competition in the past year for your insurance dollar and the number of suppliers has just increased again. Last year the Americans entered the Canadian market and it appears that they are determined to buy their way in. This year members who have bought hull-in-flight coverage for their high end aircraft reported that they were saving $500-1000 on their overall premiums. Another change is that recently Copa split from Marsh, and their new Wings plans have an addition - Bronze Wings, specifically for renters and other non-owners. Copa's Silver Wings appears now to be only for owners of aircraft, but the broker assures that liability coverage still extends to other planes flown by the policy holder.

Marsh Insurance meanwhile has not left the aircraft market. In fact it appears that since the split with Copa, Marsh has sharpened the pencil. One member who recently shopped the market for liability coverage reported that he

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features

columns

George Gregory

Above: Chapter 85 Fly-in, July 2011
Cover: the Davis DA-5

The Maverick Flies

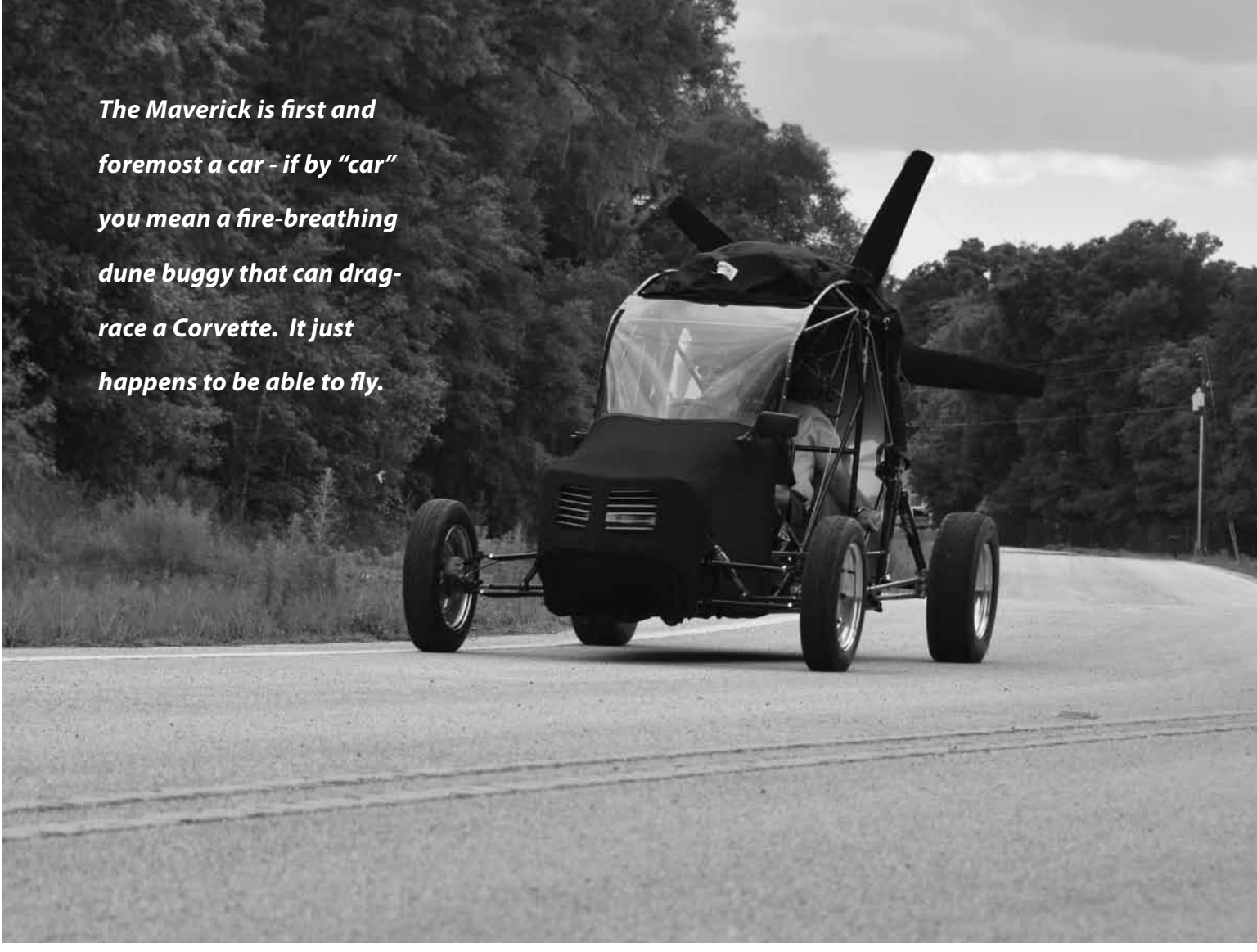
by Steve Saint

[Editor's note: This article details the first flight of the Maverick LSA. Since the writing of this article the aircraft has been considerably refined, driven to Oshkosh and flown extensively. For more information, to order your own Maverick (be the first in Canada!), photos and video, visit www.mavericklsa.com/]

I turned the key and the engine started with a throaty explosion of sound that left no doubt. This machine was designed to go places no other single vehicle has ever gone. Almost immediately after the engine burst to life the unmistakable sound of a giant fan joined in to make it a mechanical duet.

This was to be a day of passage for this unique vehicle. It has already proven that it can drive down an interstate along with other cars and trucks. What it can do that they can't do starts when roads don't go where you want to go. With its high clearance and long-throw suspension, you can simply cut across country to get where you need to go, with this 'Maverick' vehicle. But the off-road capability has also already been proven.

The question we needed to answer now was what happens when roads end in a jungle that even ATV's can't penetrate. And, what happens when you are in the Amazon, certain parts of Africa or even Missouri and New Orleans when vast areas through which you need to travel are flooded? What do you do when you need to find a nomadic group of herders in West Africa who are being decimated by an epidemic and you can't find them without being able to fly? You can carry a small boat on top of a Land Rover but you can't carry the Land Rover in the small boat. What do you do when you get to dry land on



The Maverick is first and foremost a car - if by "car" you mean a fire-breathing dune buggy that can drag-race a Corvette. It just happens to be able to fly.

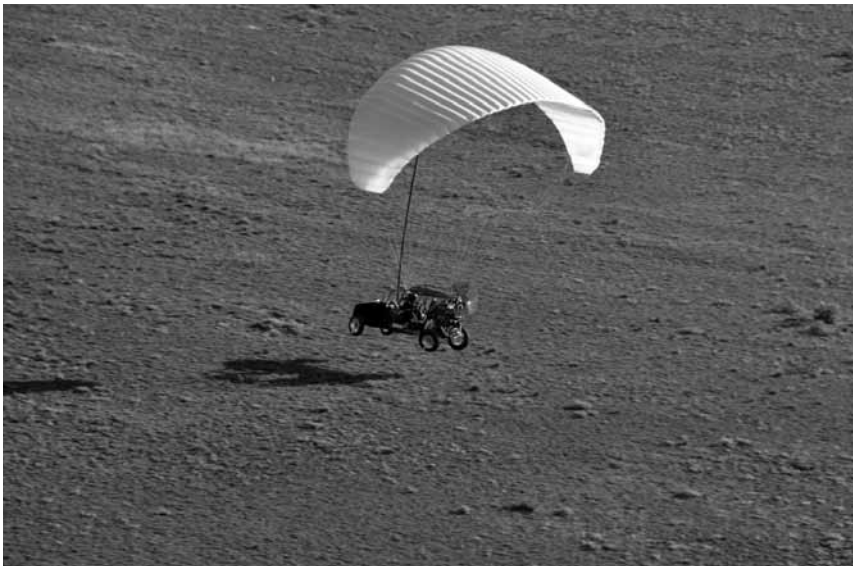
the other side of the flood? And how do you find the Fulani who are dying? You might pull an airplane trailer behind your 4X4 with the boat on top; but that starts getting complicated and expensive.

The Maverick is designed to answer all those questions in one 'easy to drive' machine. That's right, drive highway speeds on highways, transform automatically into an ATV when the roads are primitive and rough, float when the bridge is out or the river has flooded its banks and inundated the roads – and fly when it is impractical to drive or float. Saturday, April 19, 2008 was another 'Coming Out' day for the Maverick. This was the day designated for first flight. Visions of Orville and Wilbur fleetingly crossed my mind as we prepared our dynamic machine for its right of passage.

To add 'plane' to its growing resume, the Maverick would have to fly. It only takes a few minutes to assemble the twenty two foot mast that supports the Maverick's cloth wing which stows in a small duffel bag over the passenger compartment. We took plenty of extra time to make sure that everything was in its place, securely fastened and our check-list thoroughly gone over: steering lines attached at precisely the right length, hydraulic lever set "air controls – ON", drive system transferring power to the five blade composite propeller instead of the trans-axle that drives the knobby, low pressure tires....

Troy gave me last minute reminders as Jesse, Lora and Mark manned cameras to document the first attempt at actual flight. Little Jacob Dyuwi (Little Philip from End of the Spear), my grandson, was standing in the back of the chase pick-up because little arms and propellers don't mix. I pressed the accelerator down (if that sounds like 'car talk', you have the right picture in mind) and the machine began to accelerate, though not nearly as fast as it does when it is not pulling a 550 square foot parachute wing into the increasing relative wind while it accelerates. At about twenty five miles an hour I realized that the front wheels

Unlike most aircraft with ram-air wings, the Maverick's unique mast system keeps the wing above the aircraft so it can't snag on rough ground. It also allows crosswind operations and quick turn-arounds. It takes 5 minutes to convert from drive to fly mode.



were getting too light to steer with. This, we knew, would be the precarious transition point between 'car' and 'airplane'. At about thirty five miles an hour I felt the tires leave the ground for an instant. Then the Maverick settled to lightly touch the asphalt before taking off for a flight that lasted about as long as Wilbur and Orville's first flight at Kitty Hawk just over a hundred years ago. After taxiing back to where I had started, I climbed out to give Troy a chance to fly.

It was clear that we were going to need more thrust or some 'wing' adjustments before I was going to get very high off the ground. Troy is lighter than I am. We were going to see how much difference that would make in a vehicle that our design and construction crew (Jay, Arlen and Tim) have fought to keep as light as possible. As Troy blasted by me loose bits of asphalt and sand were blown clear of the closed runway we were using for our tests. He lifted off just a little bit short of my takeoff point. Like me, he made a slight steering correction (we have to adjust the steering lines to take out a little bit of left turn in our current rigging) and the Maverick began to settle slightly. But, when Troy straightened back out, the machine climbed to about fifteen feet and stayed airborne for about half a mile before he had

[Maverick Specifications]

General

- Drives and Flies like a Car with Integrated Controls
- Drive System: Dual-drive (Transaxle or Propeller)
- Fuel Capacity: 17 gallons
- Engine: Subaru 2.5L 190 hp Fuel Injected and Water Cooled (standard)
- Frame: Welded 4130 Chromoly with Powder Coat Finish
- Suspension: Long Throw Suspension with High-Performance (Fox Float) Shocks
- Wheels & Rims: Low pressure knobby tires on 12" aluminum rims (standard)
- Seats: 2-place Tandem Seating with 4-point Harnesses
- Body Cover: Removable Marine Grade Sunbrella "Tuxedo" with Crystal Clear vinyl sheet windows (color choices available)
- Instrumentation: Ground/air GPS, engine monitor and Intercom (standard)
- Conversion Time: 5-10 Minutes between Drive and Fly modes

Options

- Engine: 2.5L Fuel Injected w/ Turbo (request availability)
- Wheels & Rims: High speed road tires with 15" aluminum rims (15x4 front - 15x6 rear)
- Instrumentation: portable COM radio or panel-mounted flip-flop COM radio
- Fenders

Aircraft Specifications

Airspeed:	~40 mph
Climb Rate:	900 fpm (sea level at gross weight)
Endurance:	2.5 hours
Takeoff Distance:	~300 ft
Landing Distance:	~300 ft
Service Ceiling:	10,000 ft (limited by LSA regulations)
Propeller:	Warp Drive or Powerfin5-bladeComposite

Capable of taking off and landing with a crosswind due to Wing Deployment System

Empty Weight	Gross Weight	Useful Load
Basic - 800 Lb	Standard LSA - 1,320 Lbs	520 Lbs
	LSA w/ Exemption - 1,430 Lbs	630 Lbs
	As Tested - 1,500 Lbs	700 Lbs
Full Featured - 987 Lbs	Standard LSA - 1,320 Lbs	333 Lbs
	LSA w/ Exemption - 1,430 Lbs	443 Lbs
	As Tested - 1,500 Lbs	513 Lbs

Car Specifications

Street Legal (kit car)

Transmission:	Continuously Variable (CVT)
Acceleration:	0 - 60 mph: ~3.9 sec
Fuel Economy:	~25 mpg (highway)
Lights:	Headlights, Brake Lights and Turn Signals (standard)

to land to avoid crossing an active runway. (Wilbur and Orville did not have to contend with that for sure). We aren't planning test flights over dense jungles or large bodies of water, but Saturday was a big day in the development of a unique vehicle that can drive, fly and even float. The Federal Aviation Administration gave us an official inspection and approval for Research and Development flying on Monday and on Saturday we flew.

Congratulations, Jay, Arlen, Tim, (and other members of your team), Eric, Jonathan and engineering students of LeTourneau University, Steve B., Troy, Jesse, Mark, Ron, Gene and other members of the I-Tec team and many others who have supported this project with finances, prayer, and encouragement. Thank you Waodani for having the courage to say "If we are going to help our own people, we need to learn the 'Wood-Bee thing' (flying)". Stay tuned. There are mountains to fly over and rivers to cross ahead. But now we can officially call the Maverick a true "Flying Car". "One small leap for man, a giant step for mankind living beyond roads".

Since the original article was penned, a lot has happened. Steve adds:

The Maverick story has many more chapters in it now. This unique multi-medium vehicle is now FAA certified, as an LSA (Light Sport Aircraft). We have received a weight exemption from 1320 lbs (600kilos) to 1430 lbs (650 kilos).

The ground/air unified control system is refined. The engine puts out a serious amount of power (approx 200HP) in a vehicle with an empty weight in the 1000 pound range. It is high-performance sportscar, quick on the road. Off road it is agile and quick. In the air, it can reach altitudes where prudent pilots/drivers would want to use oxygen.

This is a novel transportation system in a single vehicle. As of October 2011, we have our jigs and fixtures built and are turning out our first production run. We continue to test and prove the various systems of the Maverick as we prepare to ship our first units to the four corners of the world. The first units after our demo model are all going overseas. We anticipate putting some in the hands of U.S customers soon after. There are, after all, places here at home "Beyond Roads" too.

Steve Saint for Team Maverick

P.S - There were passers by who saw two brothers from a bicycle shop trying to fly just over a hundred years ago – who failed to see the historic significance . We think this ' Maverick" vehicle marks a new historic turn in transportation options. Our major roads are full. Cities like Atlanta and LA make their calendars around rush hour. In Mumbai, India, rush hour is almost all day. The old saying "use it or lose it" may be true of our freedom to access both the highway and skyway here in the land of the free and the home of the brave. Don't miss the opportunity to be one of the FIRST!

Bear's Air

Flight in *really* controlled airspace

by Barry Meek

WHEN TRANSPORT CANADA saw fit to turn me loose with a commercial fixed wing pilot's license, most of my flying was done in the area covered by the Vancouver VTA. The flights were with instructors too, so the airspace itself was never really intimidating. Procedures were very carefully explained as the months of training went on. Nothing was shoved at me with the "sink or swim" explanation such as would be experienced by a pilot flying west of Chilliwack for the first time.

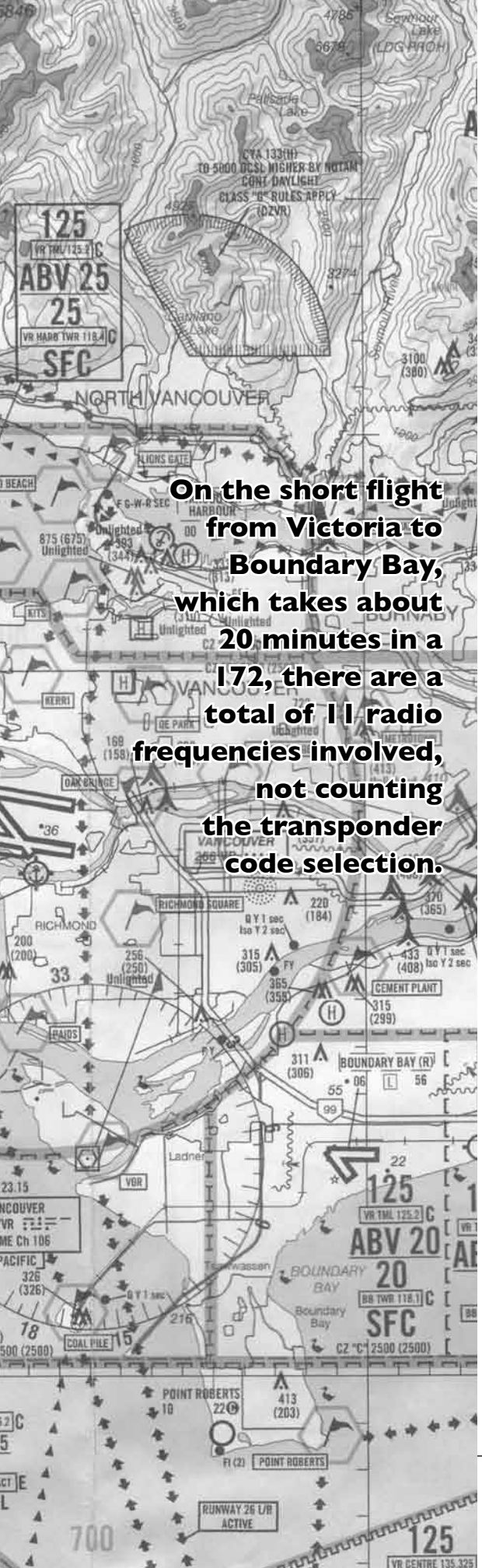
So it is that the ATIS, clearance delivery, ground control, inner and outer tower, terminal and center frequencies, transponder codes etc. are pretty much a matter of course for any flight. Here is an example of how busy it can be in that zone for even a private pilot. On the short flight from Victoria to Boundary Bay, which takes about 20 minutes in a 172, there are a total of 11 radio frequencies involved, not counting the transponder code selection. If you want the fuel truck after landing, that's another frequency.

At the COPA "rust remover" seminar held at Vernon in April, pilots attending were fortunate to have two controllers from the Kelowna tower give a talk about their airspace and procedures. Those responsible for establishing the routes and altitudes in that area, have done a fine job, considering the terrain problems unique to YLW. Although it is nowhere close to requiring it's own VTA, Kelowna has the largest control area in Canada. The Flight Supplement is a good source for information that's not on the VNC.

Pilots have no reason to be intimidated by controlled airspace. Like everything else on the road to obtaining our pilots license, flying in controlled areas can be learned, and with practice, become quite routine. Controlled space is necessary but certainly not a "necessary evil". Controllers can be your best friends, offering flight following, terminal area information, traffic advisories and separation. Sometimes, they're just a friendly voice, which we need at times for one reason or another.

Something really important to remember is that they are not there to hinder or harass us. They're available and seemingly always willing to help. For someone who's never flown into Kelowna or the Vancouver area, LET THE CONTROLLER KNOW it's your first time. Even if you've flown there before but are still a little unsure, let them know. Simply state you are unfamiliar with the airport, or the checkpoints or whatever it is you are confronted with. From experience, I can tell you they pay extra attention to us in that situation. If I get a bad time from a controller, and it has happened, it's only because I've not followed a procedure correctly or busted a clearance.

For pilots who were unable to attend that seminar in Vernon, I'll take this opportunity to pass on a couple of things from Don Edwards and Charly Stratton



of the YLW ATC tower. First, and this surprised many of the fellows, Don pointed out that the telephone number for the tower listed in the Flight Supplement as EMERGENCY only, is available for any reason. Suggestion . prior to your initial flight into Kelowna, call for clarification re: transponder use and procedures listed in the Flight Supplement if you're not sure of them. Don says they would be happy to accommodate. You might be surprised at all the misinformation there is out there.

Second, be careful of the control area extension near Vernon. If you arrive there from Merritt, there's a good chance you'll fly right through that space, and would be in violation with no encoding transponder or prior permission. It's all pictured in the flight supplement.

They have an ATIS at YLW. It's a great tool, which takes some of the workload off the tower, if it is used by pilots. Listen in on 127.5 before takeoff from and prior to entering Kelowna airspace. Then advise that you have "information Alpha, Bravo, or whatever". That way, the tower knows if you have the most current info.

Charly Stratton offered some of the "dos" and "don'ts" that controllers would like us to observe. A big one to her is "Ask for clarification if you don't understand a clearance". After getting it again, and you still don't understand, "Ask again, and again . as many times as required until you do get it". Better to understand than be intercepted by an inbound Jazz Dash 8 flying right through your fuselage.

Please close flight plans with ground control. Don't ask the tower where to park, where to eat, or where the bathrooms are. Ground control is good for that. And one other thing Charly pointed out was that there are more than just two magic words in the English language. Of course "thank you" is always important, but to a controller, the real magic words are "traffic in sight". They stop worrying about you at that point.

Many times we've been entertained by controllers yelling at students, ourselves included if you are honest about it, but in reality, without these people, we simply couldn't run an air traffic system. I for one, feel much better when there's someone watching me on a radar screen and directing things around me to keep us all safe. R

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Don Edwards edwadon@navcanada.ca
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Smoke Systems

The ultimate in personal visibility

by Wayne Hadath, RAA #8793

SEE AND BE SEEN is the watchword for VFR, and what could increase your visibility better than a mile long contrail of dense smoke? Or suppose you have been cleared number five for landing – just pull that lever and billow smoke out, meanwhile keying the mike and casually asking the tower in your best Yeager voice if you could please have a priority landing. When the tower asks if you would like to declare a Mayday, answer thoughtfully and slowly, "No, just a priority landing if possible." These are among the benefits of a smoke system.

A smoke system is comprised of a tank of oil, a pump and valve, and a set of nozzles to inject the oil into the hot exhaust. Simple. Because of time constraints before the Airventure Cup, instead of making my own system I decided to buy a proven system from Smoking Airplanes LLC of Rosamond California for about a thousand dollars.

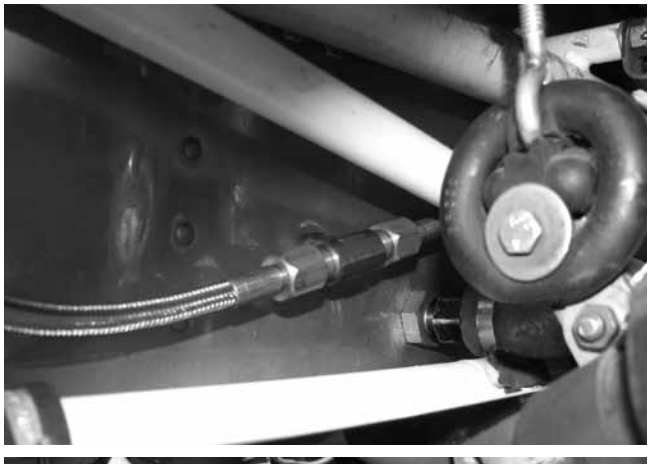
If you have some time you can make your own system. You will need a tank sized to allow for one gallon per minute if you want good smoke. Most recreational systems will be 3-1/2 to 4 gallons. To keep oil from splashing around inside the plane run the tank vent outside to the bottom of the plane.

The pump should be 12 or 24 volts depending on your electrical system. One possibility would be to try a Facet fuel pump, and another would be a 12 volt weed sprayer pump. The oil used looks much like baby oil, clear and fairly thin.

After the pump there must be some means of varying the delivery rate, and a needle valve or ball valve sized for ¼ pipe is in the ballpark. If you deliver at too high a rate all that will happen is that the belly of the plane will become rustproofed.

The Smoking Airplanes system uses a check valve just before the bulkhead fitting, which must itself be lower than the outlet nozzles when the plane is in level flight. The check valve and the low-positioned fitting together prevent siphoning and give a clean cutoff when the power to the pump is shut off.

The power for the system must be fused and be taken from the electrical



Left, from the top down: Wayne demonstroates what you can get with a good system; On-off pump switch with indicator light. Second from bottom, make sure to fuse the system after the master switch. Bulkhead fitting with hose(s) to the exhaust pipe(s), and bottom, The nozzle is located well upstream of the end of the exhaust to ensure good heating. Above, Tank, electric pump, adjustable valve, all in one package.

system after the master switch so that in the event of a crash the system does not keep pumping flammable oil. There should be an indicator light to let the pilot know when the pump is running – he will not be able to hear the pump, nor will he see the smoke when in level cruise flight.

Nozzles are a bit of an art – the nozzle body may be threaded into a fitting that is clamped or welded to the exhaust pipe. The outlet must face downwards and end up near the centre of the exhaust pipe. The outlet of the nozzle looks like larger version of a pressure washer nozzle. To be hot enough the nozzle must be positioned at least one foot from the outlet end. If you have a dual outlet system it is better to have one nozzle for each exhaust.

The smoke system will weigh in the range of 40 pounds so you should check and amend your weight and balance before flight. Also, since the system will be lighter at the end of the flight you should check your CG limits both full and empty. A removable system means that you will not be dragging this weight around when you do not want it.

Google "airplane smoke system" and you will find all sorts of articles about how to build one and where to find components. Apparently there are enough people who want a smoke system that a living can be made supplying components. Don't be the last one at your airport to get one – make yours now!


C-IPSY

Al Hayduk's

Savannah

High in the Rockies

Here are a few photos from a trip I made into Ram Falls in the Rocky Mountains in mid September. I believe this to be Canada's highest airstrip at 5350 feet; although the strip is technically abandoned I believe it is maintained by the Red Deer flying club. September may not be the ideal time of year to camp out here (It took 1 1/2 hours for the ice to melt off the flying surfaces once the sun finally came over the mountain)!

I built C-IPSY in 2006. In July 2008 I flew her up through Northern Alberta and down the McKenzie river to the Arctic Ocean stopping at every little community I could find on the way there and back. One of the great joys of travelling alone into remote communities is the opportunity to meet and spend time with local folks. I always hitchhike from the airports into towns and back which is also a wonderful way to meet friendly locals and occasionally be invited to learn a bit about an area and the people who live there. Many have amazing stories to tell. It makes for wonderful and highly memorable evenings where the talk is about local history and legends; colourful people, local adventures and activities and only occasionally touches on aviation. In this way flying my little airplane is neither an end in itself, nor a way to meet other aviators but is a magic carpet into the lives of interesting people and remarkable communities that would be difficult to find in any other way. RF

Spark Plug Helicoil Repair

How Do *You* Spell Relief? / RAA

YOU KNOW the sinking feeling – you are trying to tighten a spark plug but it will not tighten. The threads in the cylinder head are gone and there is no pretending that the plug will be tight enough to stay in the head once the engine heats up. The solution is to tap it out and install a Helicoil.

There are many types of inserts but a Helicoil is the least intrusive thread repair method. The damaged thread is tapped out to an oversize using a proprietary Helicoil tap. The Helicoil itself is a thin steel spring of wire that has a diamond cross section. The Helicoil is wound into the tapped hole, and when inserted it will result in a thread that is better than new.

The question with a cylinder head is always whether it is necessary to remove it, or whether the thread repair may be done while it is in place. There is always the possibility that the tap could contact one of the valves or the piston, and there will inevitably be a lot of aluminum chips from tapping out the hole. If you choose to tap the hole in situ you should ensure that both valves are closed but the piston is far enough down the bore that its crown will not encounter the end of the tap.

First thing is to determine if there is already some sort of thread insert in the hole. Heads are aluminum and inserts are almost always magnetic steel, so check with a small magnet. If there is already some sort of insert but its threads are damaged, try reforming the threads with a thread chaser. If this does not work the repair becomes a job for a good machine shop.

The drive square on a Helicoil tap is probably too large for the tap wrenches that most of us own but a 12 point socket can be used, with the square fitting into every third notch of the socket. A T-handle is preferred for driving the socket. A bit of WD-40 works well as a cutting lubricant on aluminum. The lead of the tap will catch the threads that remain in the head and this will draw the larger diameter in, and the thread will be square to the seating surface of the spark plug. Squareness is important to ensure that the plug gasket will compress properly and transfer the heat of the spark plug to the head.

If the threads are completely reamed out this becomes a more difficult proposition, but not impossible. However it would be easier to ensure

squareness by removing the head and blocking it up so that the tap will enter the hole vertically. In the example VW head the lead end of the tap could be threaded into the second spark plug hole and the shank of the tap could be used as an indicator while clamping the head in an angle vise.

Helicoil inserts come in different lengths. The VW uses ½" length but many engines use ¾". Using too short an insert means that carbon will subsequently be able to coat the exposed threads of a spark plug, and removal can become impossible. It is better to use too long an insert and cut it down to length either before or after installation.

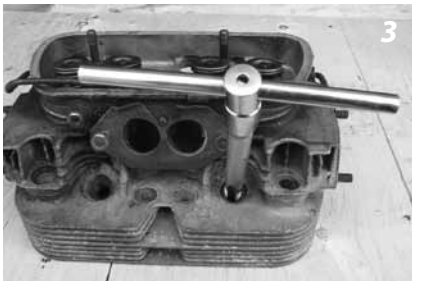
The Helicoil insert is springy and has an OD larger than the hole produced by the Helicoil tap, but the insertion tool corrects this by compressing the insert to the correct diameter. There is a drive tang on the insert that gets driven by a projection on the end of the tool. Wind the tool until approximately ¼ turn of thread protrudes beyond the end of the tool. If you go too far you cannot back up. Instead just keep winding clockwise until the insert falls out and start again.

Present the tool to the tapped hole and slowly rotate the body of the tool clockwise until you can feel that the protruding Helicoil thread has just found its way into the first newly-cut thread in the head. If you pull back gently and find that the tool will not come back, this means that the insertion has begun. Wind the handle of the tool clockwise while pressing the body of the tool gently against the head. After a few turns of the handle begin gently pulling back on the body of the tool. As soon as the last thread has entered the head, the body of the tool will come free.

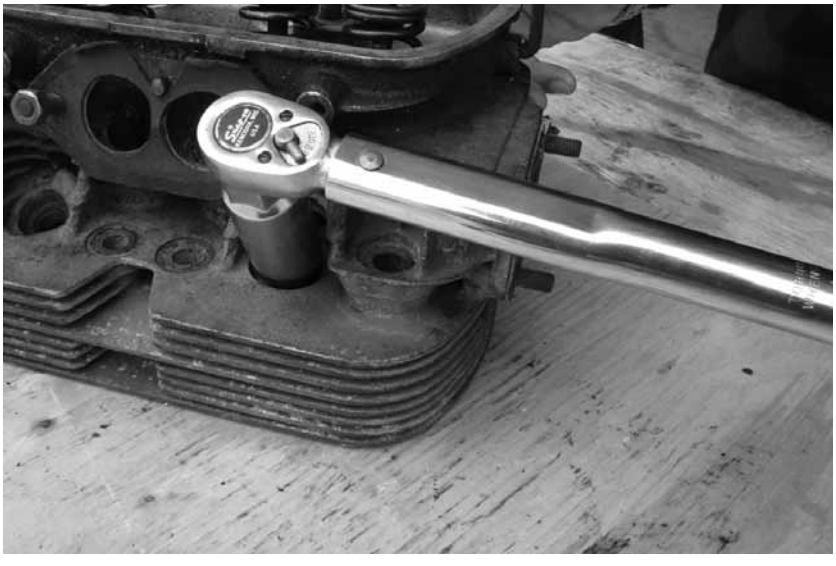
Check that the top thread is sitting just below the seating surface of the spark plug hole. If necessary wind the Helicoil in a bit further using the driver of the tool.

The lower end of the Helicoil has a drive tang that must be removed. Right next to the tang the Helicoil has been factory-notched and if you reach down with a needle nose pliers and wiggle the tang it will break free. This is where it is better to have removed the head, so keep a firm grip on the broken-off part.

Opposite: The inserting tool, special Helicoil tap, and two inserts of different lengths.
Below, upper left: 1) A thread chaser might straighten the threads if only a few are damaged.
2), Check the threads with a magnet. If they are magnetic there is already some sort of insert
3) a T- handle and 12 point socket may be used to drive the Helicoil tap.
4) the Helicoil insert is placed over the driver of the tool
5) wind it in until the drive end projects slightly beyond the body
6) present the tool to the head and begin winding the handle to insert the Helicoil



Below, from the top down: 1) Break the tang off at its notch by twisting with a needle nosed pliers; 2) If the head is still installed, it is possible to reach the tang from the top side, but be careful not to drop it into the combustion chamber; 3) Here is the problem when the helicoil is too long - some of the helicoil can protrude into the combustion chamber; 4) A small triangular file can be used to notch the excess. Then break it off by twisting with pliers.



Top: lubricate the threads of the spark plug and wind it in by hand;
Above, get the torque spec for your engine and use a torque wrench to tighten. All done.

An insert that is too long for the hole will result in some of the Helicoil protruding into the combustion chamber. This must be avoided, and there are two ways to correct this. First is to cut it to length beforehand by pulling the spring open and notching the upper end with a triangular needle file, then breaking off the excess. This is the only way it can be done with the head still installed on the engine. If the head is on the bench it is also possible to install the too-long Helicoil, and then notch and remove the excess that protrudes into the combustion chamber. Either way there must be nothing hanging into the chamber or it can cause a hot spot that will glow and cause preignition.

When installing the new spark plug make sure that you use a tiny smear of antiseize compound on the threads, and use a torque wrench to ensure that the plug gasket will be compressed properly.

Helicoil kits and replacement inserts may be purchased at most automotive jobbers, from Sears, Ebay, and many other outlets. RF

Members occasionally make reference to having performed loops, rolls, and other aerobatic maneuvers in their Amateur Built aircraft. It is obvious that they do not realize that except for a very few designs it is against the regs to use an A-B for this purpose. Transport does make it possible for an owner to have his operating limitations modified to allow aerobatics but the procedure was formerly written in a lengthy and somewhat ambiguous manner, so some TC offices were reluctant to handle a request.

The document below clarifies the procedure and is a step by step method for the owner of an A-B to have his operating limitations modified. Note that the limitations are modified solely on the affirmation of the owner of the aircraft, and ongoing liability is dropped firmly into the lap of the owner who makes this affirmation.

None of the above applies to any aircraft registered in either Basic or Advanced UL categories. Their operating limitations may not be modified to allow aerobatics.

Simplified One-off Aerobatic Demonstration

The owner shall:

1 - apply to the nearest Transport Canada Centre for a Flight Permit - Specific Purpose -- Simplified aerobatic demonstration, and remit the applicable fees;

2 - as required by paragraph (41) of Appendix A - Standards of Design and Construction for Amateur-Built Aircraft of the EXEMPTION FROM SECTION 549.01 OF THE CANADIAN AVIATION REGULATIONS AND CHAPTER 549 OF THE AIRWORTHINESS MANUAL – AIRWORTHINESS STANDARDS - AMATEUR-BUILT AIRCRAFT, dated 2006-08-30, install, in the aeroplane, a peak recording accelerometer;

3 - carry out the mechanical evaluation in accordance with paragraph 5(b) of AMA 549.101A, dated 1996-04-01;

4 - enter the following statement in the aircraft's journey log:

"I hereby certify that I have carried out a mechanical evaluation of aircraft model …… , serial number ……..…. , nationality and registration marks C-…. , using section 6(b), part B of Airworthiness Manual Advisory 549.101A, and found the aircraft in compliance with the requirement.

Signature : ……... Date : …… "

5 - record in the journey log the pilot's qualifications with respect to the aerobatic manoeuvres demonstration.

Signature : ……... Date : …….

Information Note:

The pilot demonstrating the aerobatic manoeuvres should have some knowledge and experience in performing aerobatics. This may include either the holder of a current Aerobatic Flight Demonstration Certificate issued by Transport Canada, a Designated Airworthiness Representative (Flight Test), the holder of a current Statement of Aerobatic Competency issued by the FAA, current aerobatic instructors and members of recognised aerobatic organisations, or current and former military pilots with recognised training in aerobatics.

6 - perform those aerobatic manoeuvres for which the aerobatic authorisation is requested, in accordance with paragraph 5(c) of AMA 549.101A;

7 - note the maximum load factors experienced during aerobatic manoeuvres and enter in the aircraft's journey log;

8 - enter the following statements in the aircraft's journey log:

"I hereby certify that I have investigated and established the flutter, vibration, and buffeting, stall and departure manoeuvres, and spinning characteristics of aircraft model …… , serial number …….…. , nationality and registration marks C-…. , using paragraphs 6(c)(3) and 6(c)(4), part B of Airworthiness Manual Advisory 549.101A".

"I have performed the following aerobatic manoeuvres: (list manoeuvres performed)".

"I am satisfied that no unsafe features are evident.

Signature : ……... Date : ……. "

9 - install, in plain view of the pilot, a placard listing the demonstrated manoeuvres:

The following aerobatic manoeuvers, and combinations thereof, may be performed in this aeroplane:
1. .....…….
2. .....……
3. .....…….

10 - enter the following statement in the aircraft's journey log:

"I hereby certify that I have installed in aircraft model …… , serial number …….…. , nationality and registration marks C-…. , in plain view of the pilot, a placard listing the demonstrated aerobatic manoeuvres which may be performed in this aircraft, specifically, (list manoeuvres).

Signature : ……... Date : ……. "

11 - apply to the nearest Transport Canada Centre, for the issuance of revised operating conditions to the aircraft's Special Certificate of Airworthiness - Amateur-built, providing a copy of the aircraft's journey log containing the above-detailed entries, and remit the applicable fees.

Transport Canada will re-issue the Operating Conditions (24-0090) sheet that is part of the aircraft's flight authority, delete the "aerobatic flight is prohibited" condition and replace it with the following operating condition:

"Based on the owner's declaration that aircraft model …… , serial number …….…. , nationality and registration marks C-…., was the subject of a mechanical and flight evaluation, as per Airworthiness Manual Advisory 549.101A, and that the owner is satisfied that no unsafe features are evident, this aircraft is authorized to perform the following aerobatic manoeuvres : (list manoeuvres)".

Don't Do This

"Winnipeg ACC received numerous ELT reports near Regina. An extensive communication search failed to locate the signal. A Regina CASARA aircraft and 435 Squadron Hercules from Winnipeg were tasked. CASARA subsequently homed the signal to downtown Regina. The Hercules was then stood down, The CASARA aircraft landed back at the airport and searchers started receiving the signal on the ground at the airport. The signal was homed to an incoming Express Post truck with a live, armed ELT inside. The shipper was contacted and it was found to belong to an amateur-built aircraft. The owner apparently shipped the ELT via Express Post without removing the battery. He was informed of the scope of trouble caused. In addition to the time spent on the communication search, the CASARA aircraft flew 0.7 hours, the C-130 Hercules 0.6 hours and the CASARA vehicle searched for 0.8 hours".
ELT mistakes like this are expensive and don't do much to endear recreational flyers to the people who decide where to spend taxpayers' money. **Remember to disarm your ELT before sending it anywhere!**

Across Canada

RAA Chapters in Action

Scarborough/Markham

In June, we saw some further videos supplied by Ed Weeks describing: the development of the B-17 Flying Fortress (like the "Memphis Belle" which survived 25 missions and was then returned to the U.S.); the 617 "Dam Busters" Squadron which employed Barnes Wallis's bouncing bombs to destroy the Mohne, Eder and Sorpe Dams in the Ruhr Valley; The Green Umbrella, i.e. The Guinea Pig Club of patients at the Royal Victoria Hospital recovering from reconstructive plastic surgery following massive burns and injuries suffered in combat, a close-knit group that set new standards for high morale in very difficult circumstances. We thank Ed Weeks for supplying these videos.

We also wish to thank Dave and Anne Austin for hosting our summer BBQs in July and August at their home on Rouge Hills Drive. It was very kind of them to answer the call yet again. We were again blessed by good weather. We should also commend Dave's timely operation of a powder fire extinguisher!

We are grateful to Les Edge of Qtech Aviation Inc. (q.tech.aviation@cogeco.ca) for his presentation about the crash of an Air France A340 Airbus at Pearson International on 2 August, 2005 when it slid off the end of the runway and down a slope; all 309 people on board successfully evacuated the aircraft in 90 seconds with 50% of the exits blocked. The cabin crew and their state of training deserve great praise. The aircraft sheared off two concrete columns housing the approach lights. This was a salvage operation, not a recovery. A variety of environmental issues, safety issues and hazards were involved (contamination of a small creek, fibreglass and carbon fibre waste - the fin is 100% carbon fibre, glass shards, sharp metal, fuel spills, charged pressure bottles, hydraulic fluid). The problem was to remove the entire wreckage to a secure site using 26 40-foot containers. The two outboard engines were salvaged, and there was no damage inside the cockpit. The biggest mobile crane (650 ton) in Ontario was employed. Les also talked about the B667 Gimli Glider (23 July, 1983). We wish to thank Les Edge for giving us a very interesting and informative evening.

Assembled chapter members, relatives and friends gathered at Delta Heritage Airpark to remember Terry Wilshire

Chapter 85 Vancouver

In September we had a gathering at Delta Heritage Air Park to celebrate the life and accomplishments of member Terry Wilshire who passed on due to ALS. The weather was perfect, and the event was attended by family, representatives from local governement as well as Kevin Psutka, president of COPA, who flew out for the event. It was about as perfect a send-off as one could wish for.

RAA Toronto

President Brian Heinmiller welcomed 27 members to hangar 41 and called the first meeting after a good summer to order at 7:30. There were no newsletters sent out by snail mail due to a miscommunication. Humble apologies offered.

There were no new flights, or new projects started. The guest speaker was Jim Crawford (ECI Insurance, Burlington,tim@ecinsurance.on.ca) to clarify the mysticism of insurance. Fred Grootarz introduced the speaker who is just off getting a new float rating to add to his 2200 hr IFR. His review of insurance terms was enlightening while he outlined

the business built on the premiums of many to pay the losses of a few. Surprisingly, there are only 5 aircraft insurers in Canada. His caveat was to never underinsure. The complications are a nightmare if anything occurs.

Tim also covered the future of Burlington renovations which include two paved runways, heliport (Eurocopter/Bell/R44) and eventually double the number of hangars.

Safety Officer Alain Ouellet mentioned the Canadian Airport Chart available free from the NavCanada website (they should be considering the fees they charge!). Alain demonstrated an easy print out format to fit the kneeboard and emphasized you always have the latest information. Unfortunately, not all airports listed in the CFS are included yet. Up-to-date information is a foundation of safe flying!

The Minute for Maintenance presentation was again presented by Bernie Wuster on airspeed indicators was very enlightening as he explained the pitfall of IAS vs. CAS vs. EAS vs. GS. Note: Stall Speed is in CAS! But manufacturers like to quote performance in TAS because it is a bigger number and increases with altitude.

Treasurer Jim Donald reported the take on all the summer's activities (BBQ's, PEO day, BFC, Father's day Brecky, and Fall Feast) has brought in enough cash for the return of the 2K borrowed from the rainy-day fund. Jim reported 35 people at the Fall Feast and wanted to note that while the crowd was predominantly the same as the burger night crowd, the people organizing need our heartfelt thanks for the considerably more effort required to pull off the event. Alain O. the FF organizer made a point of mentioning Art K. Al Perkins, Fred G., Wayne B. and Bill T for their help in what turned out to be a crazy weekend.

Alain O. reported the BFC Open House went much better than last year with about 20 people being toured every 20 minutes. Julie mentioned to Alain that next year, the club will provide the tractor to tour the PEO members around the airport (less likely to have wanderers!). Note the cover picture which was presented by PEO President David Adams to Bob Colamotto of the GWFM.

RAA Calgary

President Don Rennie reports in the latest issue of Calvalcade on is trip last summer to Newfoundland.

Member Calvin Thorne survived a forced landing in the Rockies in his recently purchased Q-2. Calvin has considerable experience with composites and feels the aircraft is repairable.

RAA London St.Thomas

At around 7:30 PM on October 4th the RAA Chapter membership gathered at the door of the Advanced Facility for Avian Research, (AFAR) at the bottom of the hill on Wellington Drive, on the University of Western Ontario Campus in London. There we were met by Wayne Bezner- Kerr and led upstairs to a conference room. The attendance was thirty-one persons, three of whom were guests for this presentation.

Wayne works with students from UWO of course, but also with professors and very advanced researchers from all over the world! Prior to this position Wayne was involved with teaching trumpeter swans to follow an Ultra-Light for a migration flight. The problem he noted was to get the birds to follow the plane, but not become attached or bonded to the humans doing the teaching.

Wayne showed film clips from his computer of a robin in flight, made as the bird flew against the airflow within the wind tunnel, captured at extremely high speed via a strobe flash sequence in the darkened wind tunnel. The movement of the wings full up to full down travel and even the disturbance to the birds feathers caused by turbulence and airflow stall showed clearly in the unbelievably clear slow motion film clips. The

Dave Johnson: Aviation Inventions in Manitoba

Manitoba is the home of aviation inventions - from the world's second helicopter, built by Homewood's Froebe brothers in 1937 to the first reduction drive for a Subaru engine in Dave Johnson's shop on the outskirts of Winnipeg. For years, Dave Johnson met with a group of aviating friends every Thursday at a restaurant in Oak Bank. Recently aviation enthusiast and inventor, Dave Johnson, passed away and Jim Goold, one of the regulars on Thursday evening kindly connected the RAA with a long term aviator and colleague who provided the following insights on Dave's contribution to the homebuilt aircraft industry.

Initially, Dave Johnson worked as a photographer for the Winnipeg Free Press. He enthusiastically accepted assignments, including riding with the Blue Angels while madly taking photographs during their aerobatic routine – some of Dave's photographs are included in the Museum of Man and Nature! While working at the Free Press, Dave invented a speed reduction system to convert high rpm engines for aircraft use. His systems used a toothed rubber belt similar to the one that drives the camshaft on most cars.

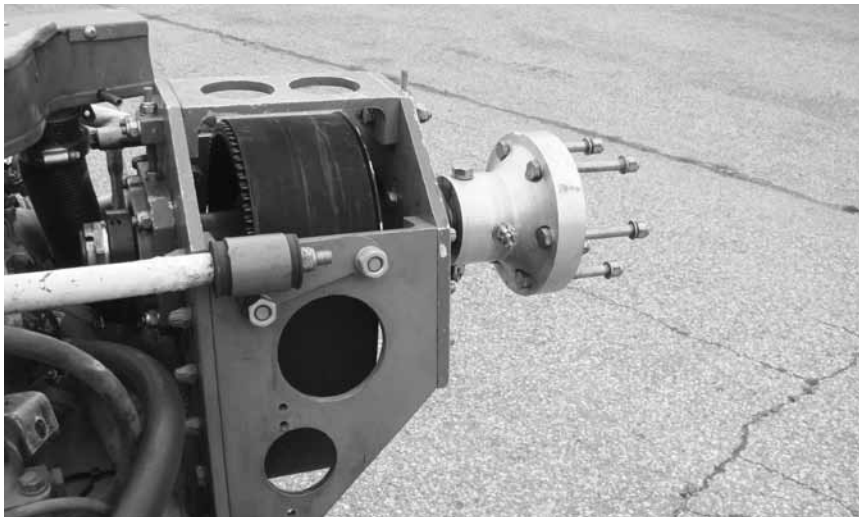
Harry Hill, a long time President and Director of the local RAA chapter, recalled Dave manufacturing the system in his home shop and "Early in my meetings with Dave he said that he had a "secret source" that cut his cogs." The advantage is that a rubber belt redrive can be made with lower tech, and Dave even sold plans so that amateurs could make their own, and get into the air with less expense. Dave was one of the pioneers in this field. His first reduction system was developed

bird appeared to use its tail feathers of course, but also its beak in some control movements.

A large starling, one of Wayne's all time favorites, showed a beautifully clear wing-beating pattern for the laser and cameras. By spraying atomized olive oil into the air stream, upstream from where the bird was flying, the patterns of the essentially mass-less particles following the turbulent air behind the birds beating wings can be mapped by the computer, allowing the very precise calculation of the affect of all areas of the bird's wing, including pressures, velocities, and power generated by the wing in the fast flowing air stream.

The study of hummingbirds is a recent project. A flower shaped cup, (more like a thimble) placed in the airflow in the tunnel, is illuminated by ultraviolet light. A second red light in the cup tells the hummingbird that nectar is now available, and the bird flies against the oncoming airflow at whatever speed is required, and into turbulence generated by the wind tunnel operator so that it can push its beak deep into the cup. (Much like jet fighters during mid-air refueling).

When fully into the cup, the laser lights and camera are triggered to start recording. By measuring the CO2 and Oxygen levels in the bird's exhaled breath, the oxygen used by the bird in this strenuous flight situation can be measured! Energy used, and even expendedhorsepower can be calculated.



One of Dave Johnson's cogged-belt redrives.

The wind tunnel air speed can be set by the operator, and a very large (60 Horsepower) Vacuum pump applied to the sealed wind tunnel can simulate higher altitudes. Test experimenters are locked into the tunnel during high altitude tests by the large difference in air pressure. They must wear oxygen equipment for extended periods above 10000 feet, just like flying in an un-pressurized aircraft.

The very last thing, Wayne Bezner-Kerr dug into the cupboard and pulled out the cup and turbulence generator used in the hummingbird studies, showing it lit just as the bird would see it. Wayne presented a truly fascinating presentation in a very professional way, and it was an extremely interesting and worthwhile evening. Also Wayne is an RAA member, and is awaiting the Canadian registration for his glider and RV 4 any time now. Wayne keeps his flying equipment in a hangar at St.Thomas Airport.

Jim Tyler called an extremely brief meeting after the wind tunnel tour. (Angus McKenzie was Moose Hunting). Three guests were present. The minutes from the previous September meeting 9 were approved. Dave Hertner reported that he has done successful running up of the Corvette engine on his RV-10.

on a Honda motorcycle engine and then he applied it to the Subaru engine. By the early 1980s, Dave and his wife traveled to Oshkosh to display his reduction system and formed "Reductions Inc"
Dave Johnson's 'Reductions' were ideally suited for any home built aircraft using up to a 100 hp engine. Dave manufactured the reduction systems entirely on his own in his own machine shop, from engine mount to all the gears. He applied his system to a wide variety of engines, including the EA81 and EA82 Subaru, and the Suzuki Swift. His redrive-equipped engines were installed in just about every type of aircraft, including the scale P51 Mustang, a scale P-38 Lightning, KR-2, Murphy Maverick, and many Zeniths – just about every airplane that uses up to a 100 hp engine! Over the years he has completed reduction systems for well over 300 engines!
In addition, "he was heavily involved in the development of hovercraft and their propulsion right down to carving his own props" added another aviation enthusiast, Grant Pronishen, who concluded with "Dave's most recent project, the plans built Storch which has many of Dave Johnson's improvements, equipped with a Geo Auto engine… Dave never got to complete it, but it is now in the hands of another local aviator from Anola and perhaps he will get to help lift it into the sky from above someday soon." Dave's creative, innovative reduction drive system will continue to evolve from where it began in one of the hubs of recreational aviation in Canada.
Recently Dave passed on and he will be sadly missed by the aviation home builders; however, his creative, innovative reduction drive system will continue to evolve from where it began in one of the hubs of recreational aviation in Canada.
- Jill Oakes, Winnipeg RAA

Thunder Chicken

Flying Canada's only Davis DA-5A

by Bill Brubacher (RAA #2165) and Gary Wolf (RAA #7379)

There are a lot of little single seat airplanes out there ranging from the tiny VW powered Teenie Two to the O-320 RV-3, fulfilling many different missions and taking greatly varying amounts of time and skill to build. In this pack are the Hummels, Zenith 100, Sonerai, Thatcher CX-4, Midget Mustang, and RV-3. They all look similar because airplanes end up looking that way when they are designed for the same purpose. One that stands out from the group is the Davis DA-2A, a somewhat ungainly looking square-cornered little nickel rocket with a V-tail like a Bonanza and a canopy that fits the pilot's head like a helmet. Herb Spilker had already built a Davis DA-2A and wanted something faster and more like a fighter, so he decided to build a Davis DA-5A and named it Thunder Chicken.

Leeon Davis was a metal fabricating expert at Aero Commander when he began designing and building his own aircraft, always with an eye on the possibility of production. He reasoned that if an airplane was simple and inexpensive to build it would attract a wide market. A low parts count would mean fewer assembly steps, and if done right it could also mean lower weight which in turn meant that smaller engines could be used and less fuel would be consumed.

The two seat DA-2A was Leeon's foray into the world of marketing aircraft, and many sets of plans were sold and many planes built. A few years later Davis wanted a fast single seat plane and he designed and built the DA-5A in seven months. In Canada we have ten of the -2 series on the TC registry, but only one of the -5. The example plane was built in the eighties by Herb Spilker, a prolific builder who fifteen years earlier had built a DA-2A, so he was very familiar with the construction techniques of the -5. At the time Davis was offering a kit for the DA-5A so Herb drove to Texas and trailered home his new project. When he returned, Herb and his friend Bill Brubacher set to work on the new project, the first and only DA-5A in Canada

The Davis DA-5A is a simple aircraft in concept. The fuel tank is in the cowl, actually it is the cowl, and feeds the engine by gravity. The wing is one piece from tip to tip, so there is no aligning or reaming of spar splice holes. There are no flaps, just ailerons that are directly actuated

Left to right: Rob Tamasfi, Charlie Cetinski, Bill Brubacher, and Thunder Chicken

The DA-5's unorthodox tail works just fine, thank you very much.
From the top down: the tail in straight and level position;
left rudder, elevator neutral;
up elevator with rudder centered
Bottom: the tiny canopy fits like a helmet but visibility is great.

by torque tubes. The forward fuselage is framed in square 4130 tube, while the tailcone is a folded aluminum sheet box with a bulkhead to take the tail control components. The only complicated part is the empennage, which is a V-tail with ruddervators and antiservo tabs, actuated by a mixer.

Davis chose a basic airfoil, the Clark Y, reasoning that it was forgiving of construction inaccuracies by amateurs, and since the plane was light it would not be using much wing anyway. The wing spar is unusual for metal planes – it has dihedral but since the wings do not detach, the nearly full span spar caps made from aluminum angle must be bent 5 degrees per side. Bending thick angle stock is not easy but the Davis plans outline his method that uses wood blocks and a vise. The cap tops are machined to a taper for lighter weight as they progress toward the tips, and the outer spar sections are formed sheet metal C-channels where the lift loads are lightest. The spar's shear web is unusual in that there are vertical stiffeners pressed into the web between rib stations. Many designers instead rivet a vertical stiffener but Davis' design is lighter and has a lower parts count. The left and right shear webs overlap at the centerline of the wing where they are riveted together. The rear spars are straight sections of formed C-channel that attach to a carry-through at the side of the fuselage.

Wing ribs are the conventional formed aluminum type, six per side with an extra rib at the root of the right wing to support the weight of the pilot while entering the cockpit. For those who wished to scratchbuild, the Davis plans give the X and Y coordinates to lay out the ribs, and of course with a rectangular wing all are the same except for flange direction.

Wing skins are 4 x 8 aluminum .025" sheets bent around the nose and meeting at the rear spar, two sheets per side with an overlap at a centre rib. This method is simple and does not result in a step at the spar line to trip and detach the airflow.

The ailerons are simple triangles folded from sheet metal, hinged at the 11% chord point. The hinges themselves are made from 2" angle stock, bolted to the rear spar. The ailerons are counterbalanced by weight on short stalks at their outer ends, while their inner ends are directly actuated by a torque tube that sneaks through the trailing edges of the inner wing bays.

Various wingtips have been used including one set that added extra area for a heavier pilot who was flying it for awhile. The design wing without any tips has a wing loading just above the current Canadian limit of 13.3 for a flapless wing, so unless the pilot has a high performance rating a newly-built DA-5A will require some sort of tip.

Fuel gauge is direct reading and right in the pilot's view. Being a nosedragger, the view over the nose is quite good.

The slab-sided fuselage gives the impression of being a rectangular box but for less weight and wetted area Davis actually made it a trapezoid, narrower at the base. In plan view the forward section is a rectangle from firewall to the roll bar. The cockpit upper longerons are made from 5/8" square 4130 tubing and to these are welded crossmembers and vertical members at the firewall and the panel bulkhead. At the seatback there is a complete 4130 steel roll hoop welded to the longerons. The lower cabin longerons are aluminum angle riveted to this steel weldment after the aluminum floor has been attached. Sheet aluminum sides are riveted to this framework to make a strong and light structure with a minimum of material. The cockpit is completed by an aluminum and fiberglass side-hinged canopy with a flat wrap of lexan as the windshield.

The tail cone is a marvel of simplicity and low parts count. Since the Davis DA-5A is not a taildragger the tailcone is not designed for tailwheel loads, just flight loads, and can be much lighter. The turtledeck is pressbraked to shape, and the many crease lines act as stiffeners to prevent buckling. The sides of the turtledeck extend downwards to the belt line of the tailcone where they meet the lower section. The forward edge of the turtledeck is riveted to the 4130 roll hoop for added stiffness.

The lower section of the tailcone is made from two full length L-shaped bent sheets that overlap on the bottom centerline. At this overlap the floor is stiffened by a keel made from two formed L-sections riveted to the bottom, to prevent oilcanning under elevator loads.

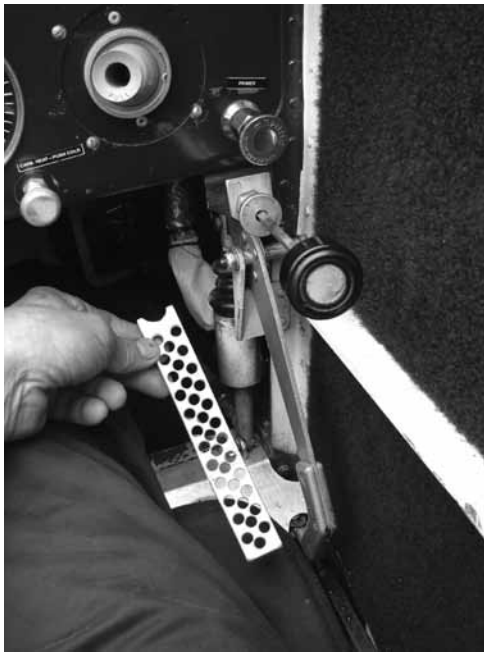
The sides of a tailcone would normally need some sort of longeron to keep them from huffing in an out but this would add to the parts count and result in more work. Instead Leeon Davis has an elegant solution – he press brakes stiffeners into the sides at the belt line where the turtledeck rivets to the lower section. There is a bulkhead halfway down the length of the tailcone, and this is used to hold

A minimalist airplane if ever there was one. The small frontal area allows a pretty decent cruise on 75 horsepower. Below, The steam gauge panel requires no generator, and the cockpit of this little fighter provides good legroom.

the mixer that controls the ruddervators. The result is a light and rigid component made with a minimum of parts and material.

The V-tail defines all Davis designs. Two all-flying tail surfaces are made to do the work of three by using a mixer to combine the inputs from the rudder pedals and the stick. The ruddervators are aerodynamically counterbalanced by positioning of their pivots at 20% chord, and antiservos are used to give increasing stick force at increased deflection of the tail surfaces. Long stalks protrude forward from the tips where weight is added to give 100% static balance. The spars of the ruddervators are 4130 steel tubes that are solid riveted into the skins. To buck solid rivets inside a tube is a good trick, and Davis does it by using a piece of steel stock as the bucking bar and supporting it down its length with a firm urethane block pressing against the opposite inside wall of the tube.

The tail is supported by a complex steel weldment that is essentially two large tubes, each 50 degrees from vertical. These tubes are machined for bearings at their top and bottom ends to provide low friction support for the ruddervator spars. The ruddervator support assembly has small diameter



A swiss cheesed piece of aluminum is the parking brake and it fits in place to lock the handbrake

tubes emanating in all directions to be bolted into the aluminum tailcone.

The control system of the Davis is conventional right up to the mixer. Cables for rudder, elevator, and pitch trim go under the seat to the mixer at the tailcone centre bulkhead. The mixer is essentially two rectangles, one inside the other. The outer rectangle pivots on the horizontal plane and accepts the elevator cables. The inner pivots in the vertical plane and accepts the rudder cables. From the top of the inner rectangle there are two pushrods that take the mixed inputs to the control horns of the ruddervators.

Aileron control is by lateral pushrods, with differential bellcranks to turn the corner at the front corners of the pilot's seat. Pushrods from these bellcranks go to the control horns of the torque tubes that extend from the cockpit, through the trailing edges of the wings, to the ailerons. The system is simple, light, and positive.

The landing gear is tricycle with a telescoping nosegear that uses Ercoupe rubber donuts for suspension. Pushrods from the nosegear leg go straight to the rudder pedals for direct steering. The main gear attaches to the spar just outside the fuselage and originally it used square tubes encapsulated in urethane at the top. An amended drawing shows Wittman style rod gear and this is what Herb and Bill used for Thunder Chicken. This Wittman gear was no heavier, and was a lot simpler to make.

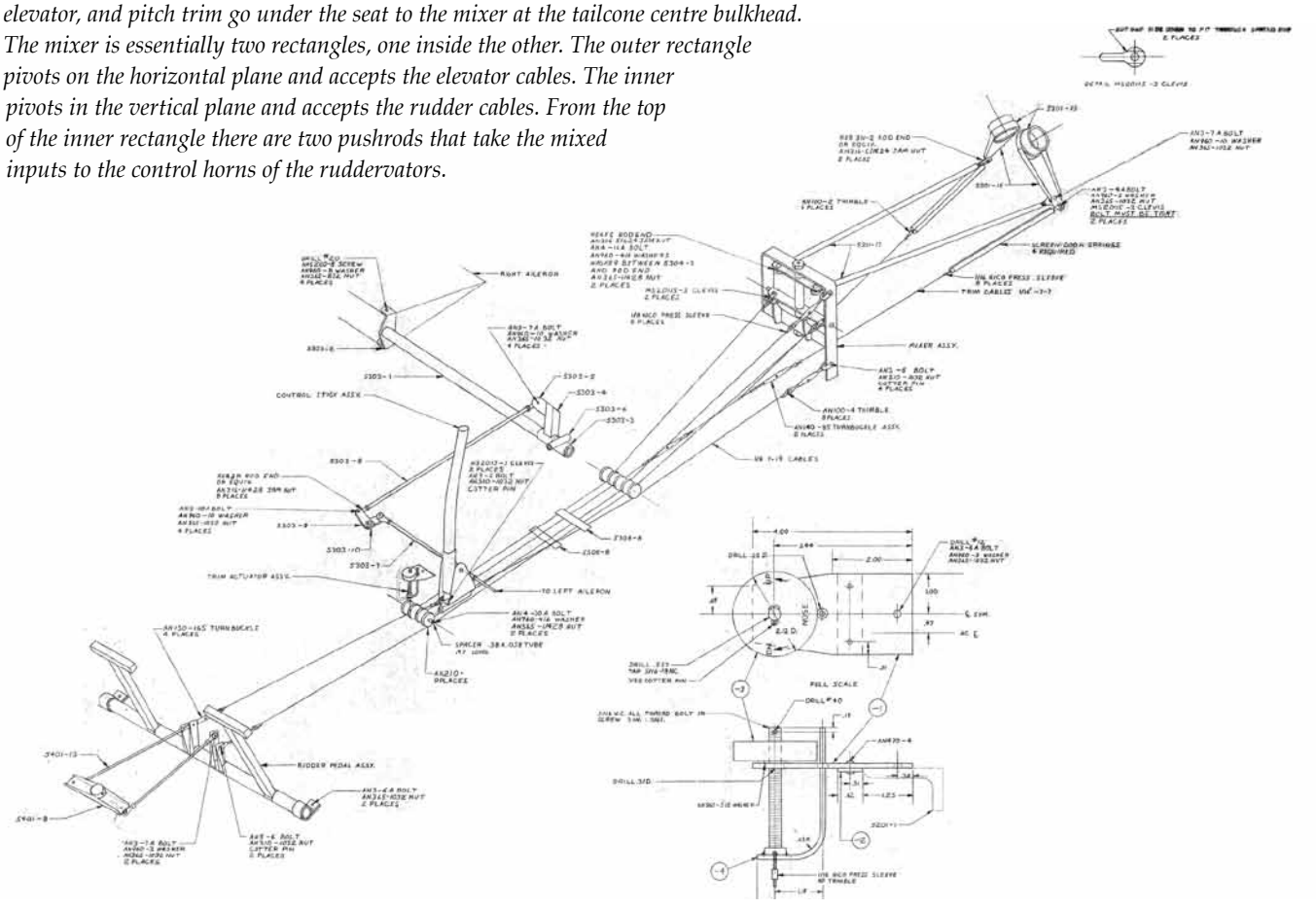
The fuel system is a cowl tank that feeds the carb by gravity, so no pump is required, either mechanical or electrical. The tank is riveted aluminum with a curved top that extends past the tank sides to be fastened into the fuselage as the upper surface of the cowling. The fuel indicator is a cut down Cub float and wire type, directly in front of the pilot.

Thunder Chicken has no electrical system at all so Armstrong is the starting method. The panel is simple day VFR with steam gauges that require no power source, so as long as the two mags keep sparking and there is fuel in the tank, the engine will keep running. Brakes are Rosenhans hydraulic with a single master cylinder, and a small aluminum plate is dropped into the linkage to lock it for parking.

The engine that Bill and Herb initially installed was an A-65 pumped up to about 70 hp and the plane was capable of 140 mph. The low drag cowl contributed to the impressive airspeed – all engine cooling air enters through the annular space around the spinner, and carb air is separately admitted through a small snorkel. Air leaves along the sides of the fuselage from gaps immediately behind the cylinders, so the air moves smoothly in and out of the cowl. Herb used to delight in diving down towards a supposedly faster plane and outrunning it, then peeling off for a landing. No one ever knew Thunder Chicken's real speed but it became somewhat of a legend in Ontario.

After Herb passed away Thun-

The control system of the Davis is conventional right up to the mixer. Cables for rudder, elevator, and pitch trim go under the seat to the mixer at the tailcone centre bulkhead. The mixer is essentially two rectangles, one inside the other. The outer rectangle pivots on the horizontal plane and accepts the elevator cables. The inner pivots in the vertical plane and accepts the rudder cables. From the top of the inner rectangle there are two pushrods that take the mixed inputs to the control horns of the ruddervators.



der Chicken was bought by Charlie Cetinski who had previously owned a Cassutt, so he was very familiar with fast little airplanes. Charlie owns the Flamboro airfield where Bill Brubacher and a few other builders have formed an informal Skunk Works, and Thunder Chicken fitted in very well with that crew.

Charlie and crew built a fresh A-65 and got it up to 75 hp with high compression and a good exhaust system, and with wheel pants the Davis could easily see 150 mph in level flight. Charlie flew Thunder Chicken all over Ontario and even made one fast trip to his winter home in Florida, with his toothbrush in his shirt pocket. There is actually a bit of space behind the seat but a logbook and a change of clothes will fill it. At 4 US gallons per hour in cruise Thunder Chicken can cover a lot of ground on little fuel, so for out and back day trips it is an economical traveling machine. There is lots of legroom even for a six footer and visibility is excellent, even to the rear.

The Davis DA-5A is a simple aircraft in concept.

The pilot can see the tips of the ruddervator balance stalks and the wings are short, so visibility in the circuit is excellent.

The Davis has one foible – because of the small tail it cannot be taken off using a soft field technique or the P-factor will yaw the plane. The nosewheel must be kept on the ground to keep the plane tracking straight until at least 30 mph, and then there is enough airspeed for the ruddervators to overcome the P-factor. At 2500 rpms Thunder Chicken will easily climb at 1000 fpm, and a relaxed 2300 rpm cruise gives 130 mph. The plane trims well and has positive stability in all axes so the pilot load is not excessive. Stick forces are the same for pitch and roll and very light because all pivots are in bearings, but the plane is not twitchy. Surprisingly the glide is pretty good for such a short wingspan, 700 fpm power-off. The plane slips nicely for landing over trees, and 70-75 mph is used as the approach speed. The plane stalls at 55 so the wheels are usually on the ground at 60. A soft field landing

technique may be used because there will be no P-factor, but even without it the rollout is only 800 feet.

The current owner of Thunder Chicken is Rob Tamasfi, a young pilot who enjoys the speed and economy for flying all around the province. He trained on Cessnas and flew other GA aircraft before the Davis, but it took little time to become accustomed to the improved agility and the light control forces. Flying a little fighter plane is a lot of fun, especially when it can be done on pocket money. Thunder Chicken is still hangared at Flamboro so Bill Brubacher, Charlie Cetinski, and the others at the Flamboro Skunk Works keep the plane tuned up and running.

The only thing that Robert would change on the plane is that he would like to have two seats so that he could take his wife for flights. Well, Davis does sell plans for the two seater and it goes together easily, so there might yet be another DA-2A on the Transport Canada registry. RF

Tanis announces Partnership

Tanis Aircraft Products announced on October 17 that the company has entered into a business partnership with *Bruce's Custom Covers* to fabricate Tanis brand insulated aircraft covers for protection of aircraft in harsh and demanding winter conditions. Tanis is known as the leader in providing aircraft preheat systems to the global aviation industry. Bruce's Custom Covers is the renowned global leader in supplying aircraft covers.

With over 8,500 patterns, Bruce's Custom Covers offers the most comprehensive line of custom made covering systems for airplanes, jets, helicopters, and gliders. Together, Tanis and Bruce's will manufacture and sell the aviation industry's broadest line of custom-fitted aircraft covers—both insulated and non-insulated—for a full range of fixed and rotary wing aircraft.

Operators in cold climates have known for years that preheating is a winter season best practice that is mandated by both engine manufacturers and certain government jurisdictions. Combining preheat with insulated covers not only enhances operational safety but saves on operational costs, enhances scheduling and decreases downtime during winter operations. Preheat and insulated covers fit hand-in-glove as a system to increase the efficiency of preheating an aircraft. A complete preheat system combined with an insulated cover allows an operator to keep both aircraft and engine warm, thereby minimizing ground time. In combining forces, the Tanis and Bruce's partnership delivers cost-effective solutions for saving money and increasing aircraft utility and longevity.

Bob Krueger, President of Tanis, commented, "We are pleased to be partnering with Bruce's Custom Covers as we consider them the best in the industry. Bruce's has developed patterns and methods of manufacturing that really work. The quality of a Tanis designed insulated custom cover built by Bruce's is second-to-none."

Covers are available for Engine Cowlings, Propeller/Spinner, Fuselage, Cabin/Canopy, Wings, Empennage/Tail, and Cowl Plugs. Covers protect engines and propellers from frost and condensation, and paint and windows from harmful ultraviolet light and weather anomalies such as hail and airborne debris.

For further information on Bruce's Custom Covers, contact Bruce's at: Aircraft Covers, Inc., 989 E. California Ave., Sunnyvale, California 94085; call 408-738-3959, or toll-free 1-800-777-6405; log on to www.AircraftCovers.com; or email bruce@aircraftcovers.com.

For further information on Tanis Aircraft Products, contact Tanis at: 14871 Pioneer Trail, Suite 200, Eden Prairie, Minnesota; call 952-224-4425 or toll-free in U.S. and most of Canada 1-800-443-2136; log on to www.TanisAircraft.com; or email christine@tanisaircraft.com.

Checking for Alcohol

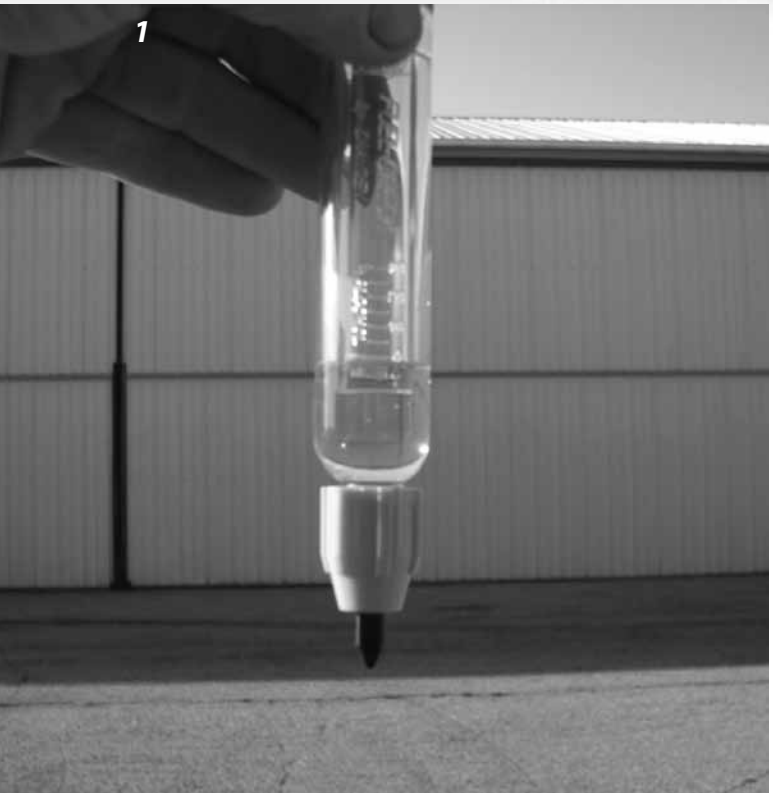
RAA

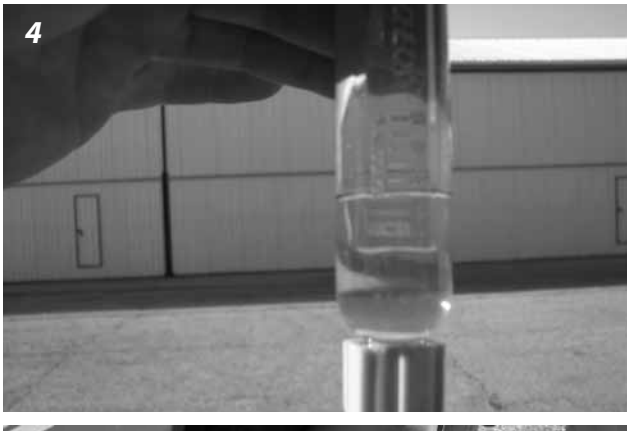
AIRCRAFT SPRUCE sells a handy $6.00 tester that can be used to check for water in the gascolator and at other drain points in the fuel system. It is also usable to determine if there is alcohol in auto fuel. On the side of the gauge there are two fill lines. Pour water into the tester until it is exactly at the water line. Then add the fuel to be tested, filling to the upper line.

Put your thumb over the end of the tester and shake it vigorously. Let the tester stand for a few minutes and check the height of the water line. If it has risen, this means that the fuel has alcohol in it, and the scale on the side tells the percentage.

Besides testing for water and alcohol, this tester has a chuck on the end that holds a double ended screwdriver bit, one end straight and the other end Philips.

Transporting fuel in a vehicle can be a smelly exercise as the fuel





1) fill with water to the lower line, and then with fuel to the top line. 2) shake well. 3) let stand for a few minutes. The screwdriver end can be jammed into the ground. 4) If there is any alcohol, the water line will have risen and the percentage of alcohol may be read on the graduations. 5)Squeeze the gas can between your knees or against the car's wheel while tightening the caps.

warms up and expands, and its vapour pressure rises. Most important is to resist the temptation to fill the can to the top. To allow for expansion, instead stop at the fill line that is usually a few inches below the top. Next, just before cinching the caps tight, squeeze the can's sides with your knees and while doing this tighten the caps. This will ensure that even if the fuel warms up it will not gas off, and with good planning this will not happen until after you arrive at the airport.

Some provinces have a law to limit the amount of fuel that may be carried. Check the law in your own province.

Wooden Gas Tanks

George Elliott

IN CANADA, we have the greatest freedoms in the world to incorporate originality into our Amateur built airplanes. It is a freedom that I appreciate and use, knowing that the system will cross check my errors and bad ideas. I need the RAA, MD-RA, TC and my friends to keep me going in the right direction and to stay alive.

In a recent issue of the RECREATIONAL FLYER, I wrote about the building of my Cyclone. The project was a great learning experience and I certainly enjoyed the freedom to do things my way. This attitude came from being an Amateur radio operator from the vacuum tube days. Commercially available equipment did not exist so we had to design and build our own transmitters and receivers. The governmental regulations for both hobbies are designed for the well being of the individual and the public; this is good. The biggest difference is that I used to be *on* the air; now I'm *in* the air.

REQUIREMENTS

The Cyclone wing is a little bit bigger than a Cessna 180 so the fuel tank area is non-standard. Also, I did not want to fill the tanks from the top of the wing. Wing tanks should be filled from a more convenient location like the fuselage side, especially for a senior citizen like myself. The builder's manual casually mentioned that I would need fuel tanks, so don't forget to do something. This was the starting point. There was nothing I could buy so now I had to make them; this is what the hobby is all about.

SOLUTIONS

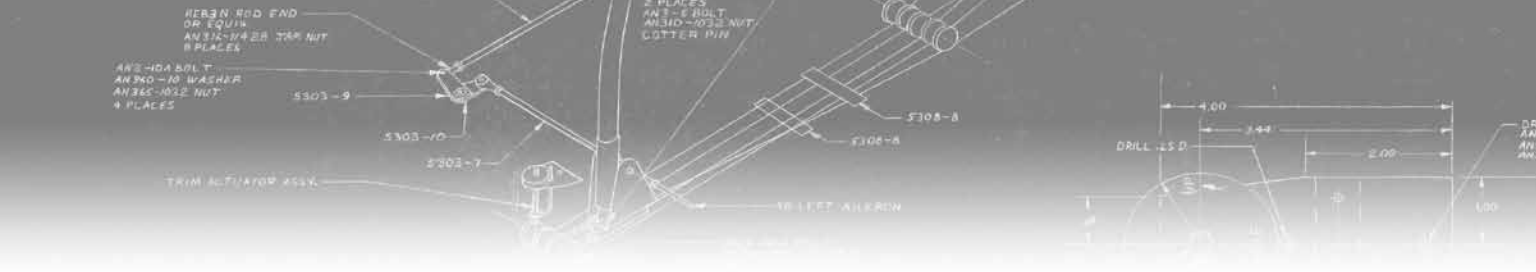
There were lots of choices: aluminum, rubber bladders, wet wing, and fiberglass. In order to construct an aluminum tank I took a welding course at the local community college. To weld properly you need lots of practice and I decided that I would never let my best friend fly on my welding product.

Next idea was rubber bladders. They can be custom made for a cost that was out of sight, and in too many cases fuel starvation accidents blamed collapsing bladders.

A wet wing was very attractive and inexpensive; it also maximizes fuel volume. I spent a lot of time on this concept but got stopped cold in knowing how to fix a leak.

Fiberglass would have been the correct answer but I had zero experience in this area so the idea was held as a last resort.

The final solution was clear: if people could build airplanes out of



wood, why not gas tanks? I selected oak plywood for its strength then cut ½" x ½"oak strips for the corners and edges. The epoxy was East Systems, but I understand West Systems from Aircraft Spruce is the same stuff (at least it's the same manufacturer, looks and smells the same and tested as identical).

In mixing the epoxy, the required ratio is 1 part of A and 5 parts of B. This ratio gives you the perfect match for the epoxy to meet spec. Too much of the hardener (A) will result is a more brittle mixture. I kept the ratio light on the hardener to keep the final product softer. Epoxy, wood and the aluminum fittings all have different thermal expansion rates and I wanted flexibility to avoid problems with temperature. Cabasil was mixed with the epoxy to thicken it up and add strength. Mix small batches at a time otherwise things get messy in hurry and the epoxy mixture will go through an exothermic reaction and harden in seconds. When I had leftover epoxy, I put it in the freezer and that way it would keep for several weeks. This epoxy comes in two speeds for hardening, I used the slow stuff.

A final note on epoxy. East Systems can take a day to harden properly but years to cure. Epoxy does not immunize from chemical attack until it is cured. Curing can be effected if you keep the finished product at 140 degrees F for 10 hours. We are fortunate to have a dry sauna in our house that goes to 150 degrees F.

WOOD

The plywood was cut into a rectangular shape to fit the cavity at the wing root. Leave enough space for fittings and straps; you can always fill the open spaces with foam. The MD-RA required that the fuel tank and all the straps could survive a 10g load. In my case, the fuel tank was OK but I had to put a doubler on the aft spar to meet the requirement. There was no actual physical test at 10g: everyone accepted my calculations. The aft spar allowed for a gas tank with a thickness of 5" so I made the whole tank 5" for simplicity. The main spar allowed much more and in hindsight I should have maximized this opportunity for more volume. There are two baffles forming a V that are identical to the outside walls. This is for structural integrity, to pass the 10g test and to keep the fuel from sloshing around too much. Intercompartmental pipes are copper plumbing pipes plus Home Depot check valves. This encourages fuel to flow towards the root areas.

The final solution was clear: if people could build airplanes out of wood, why not gas tanks?

Opposite, top: The large view is the open PORT tank with half of the hardware installed (top is forward). Above, the starboard tank in a more complete form (top is rearward).

ASSEMBLY

The plywood sheet was tested with epoxy to determine adhesion. The epoxy penetration was superb and the typical break test tore the plywood apart. I used standard 3-ply plywood and no preparation was required (no sanding, no chemicals). I did wipe it down with tap water for normal cleanliness. The wood strips were cut from an oak board and I found that the rough cut of the table saw left the surface rough enough for adhesion. In gluing the strips to the edge of the oak sheet, I used moderate pressure on the clamps that were placed every six inches. If the pressure is too light there will be excess epoxy that does not help the strength. Too much pressure will crush the wood and possibly create an area of too little epoxy. I liked the spring-loaded clamps.

Every edge of plywood is epoxied to a ½" x ½" strip. The internal baffles were made and installed after the box was built. It's just like building a wooden aircraft – cut & fit, cut & fit then glue. I never used staples or nails in the assembly. Just think – no drawings, no measurements, no special tools, and no problems.

On a personal note, I used rubber gloves and wore old clothes. Good ventilation is important since in my view, any

chemical may be dangerous. There are no breathing caution notes with the epoxy - it's a personal attitude.

HARDWARE

The filler pipe (top of starboard picture) is more copper pipe soldered at the end with lots and lots of 1/16" holes drilled in it. This of course serves as a legal screen. The tube penetrates a large opening in the top of the baffle in order for fuel to fill the 1st and 2nd sections. The check valves have a small hole (1/8") drilled in them to allow fuel to balance between the sections. More hindsight - the drilled hole should have been ¼" to balance the levels more quickly without reducing the advantage of the check valve. There is a copper pipe with no check valve between the middle and outboard sections (top of port picture – pipe hidden).

On the PORT picture the small copper pipe at the top is the overflow. I used standard AN hardware for this and used lots of epoxy to hold it in place. You really don't want the pipe to fall down to the bottom of the tank and drain it. At the bottom of the same picture is the same hardware configured as a drain.

The copper wire that runs all over the place goes through several air vent tubes, which equalizes the air pressure. The wire is connected to a sealed electrical fitting, which in turn is grounded to the aircraft. This is a legal requirement. The wire is spot glued to keep it in place.

The starboard picture shows another copper pipe bent to the bottom of the tank. It was built just the same as the inflow pipe above it, holes and all. This is one of two exits for the fuel to go to the engine. These fuel out fittings are plumbed to the bottom of the fuselage to a T fitting and will safely supply fuel in all attitude configurations. The forward fitting is at the very front of the tank. The copper pipe is soldered to a short piece of plumbing pipe and threaded from the outside into the aluminum base. It is easily removed for inspection, cleaning etc. I made the aluminum base from some stock aluminum and tapped it to match the threads on the pipe.

The fuel level indicator is mechanical and was bought from Aircraft Spruce. Installation is simple – epoxy the mounting plate to the outside of the tank, remove the wood in the central area around the hole, seal everything, and mount gauge. Removing the gauge for annual inspection is easy. By using a flashlight and small mirror you can see everything in the first section. All the fittings were wire brushed and cleaned with Varsol before installation; nothing else was done.

It was a great challenge, a fun thing to do - and just think about the bragging rights!

WOOD FINISH COAT

To protect the wood itself from the fuel, all surfaces were painted with epoxy (no Cabasil). A second coat was applied before the first coat hardened in order to assist with the bonding. In attaching the lid, lots of epoxy was used then the tank was inverted to guarantee proper sealing.

Many clamps were used to keep everything together and tight.

PRESSURE TESTING

Attach a bicycle tire valve to one opening and a balloon to another, then seal all the other openings. Pressurize the tank to no more than 2 psi and wait 24 hours. If the balloon stays inflated you win. I have no idea what I would have done if the balloon deflated. I guess I was lucky.

FUEL FILLING

In the aircraft I installed a 40 litre marine fuel tank in the fuselage along with two low psi pumps to get the fuel up to the wings. It takes 2 psi just to get the fuel to the wing height and the tank was tested to 2 psi only; therefore, I installed pumps that were less than 5psi. In case of a blockage, I didn't want to blow the tanks apart. Unfortunately, the filling of empty tanks is a 20-minute exercise. This is a shortcoming that I just manage.

MD-RA INSPECTION

My first pre-cover inspection included the wings, fin, rudder, stabilizer, elevators and gas tanks. The snags were minor that I could fix without a revisit. A lot of time was spent talking about the tanks and it was all very constructive.

PERFORMANCE

These tanks are in the wing of my Cyclone amphibian (C-FTMV) and have been holding fuel for 2 ½ years. The aircraft has just passed 100 flight hours and about 50 water landings. I use 100LL fuel only. At one point there was a minor leak but that was traced to the fuel level indicator. I drained the tank, changed the rubber seal to cork and have been trouble free since.

I'm sure that a lot of people question my decision process and maybe my sanity to build wooden gas tanks. It was a great challenge, a fun thing to do - and just think about the bragging rights! RF

President's Message/ cont'd from page 2

could now buy $1 million third party liability for only a few dollars more than $100K had previously cost, and it did not matter whether he owned a plane or not. He was also able to insure his plane for third party liability only, despite that the plane has two seats. At least one other company is requiring that if the plane is a two seater the owner must insure the passenger seat or remove it from the plane, a physical impossibility in some aircraft. Some companies also indicate that you must be a member of their affiliated aviation organization just to be quoted.

Independent brokers should not be ignored. They can buy policies with the same wordings from the same underwriters, and in some cases they can custom fit a policy to the aircraft owner's particular needs. You have a lot of choices this year, so start early and get the wordings and quotes to see which company best satisfies your requirements.

TIME FOR A CHANGE TO MEDICALS?

For five years the FAA has allowed the pilots of Light Sport aircraft to fly on a Sport Pilot license that is very similar to Canada's Rec Permit. The Sport Pilot license has been very succesful, in no small part because the medical requirement may be satisfied by an automobile driver's license. At the December 2006 meeting of the aviation industry two of our reps were charged with approaching Transport Canada to see if we could have the same medical requirement for our Rec Permit but TC dismissed this out of hand. Transport Canada was willing to allow Americans with Sport Pilot certificates to enter Canada's airspace, but only if they obtained a real aviation medical, and in exchange they wanted our Rec Permit to be accepted in the US. There has been an impasse and the answer has always been that they are working on it.

In Canada the holder of an Ultralight permit may sign his own Category 4 medical but he may not carry a passenger on this permit wth its self-declaration. If a pilot wishes to carry a passenger he must obtain ether a passenger carrying rating or he may take more training to earn a Rec Permit. Both paths require a Category 4 medical signed by a doctor, but unfortunately most family doctors do not want the liability of signing an aviation medical. The intent had been to make medical requirements easier to satisfy but in many areas of the country this is not happening.

Transport Canada has in the past shown that they respond to political pressure

In the US the EAA and AOPA are approaching the FAA to allow the use of a driver's license as medical for even the Private license as long as only one passenger is carried in the plane. They now have five years of experience with driver's licenses and Sport Pilot permits to substantiate their request. If this approach is successful it will be interesting to see how Transport Canada handles the situation when Americans wish to fly their Cherokees and Cessnas into Canadian airspace and they find that they are being required to have an aviation medical. Tourism is important and Transport Canada has in the past shown that they respond to political pressure, as in 2007 when they allowed two factory- built jets into the Amateur category because the manufacturer was promising a factory in one of the provinces. Transport Canada is political.

There is already a good precedent in Canada for a relaxation of the medical requirements. Anyone who earns a glider license is allowed to sign his own Category 4 medical. Passenger carrying is an automatic privilege of the glider license so we already have pilots carrying passengers on a self declared medical. Further, a motorglider is considered by Transport Canada to be a glider with an alternative means of launching. Once a glider pilot has a signoff from his instructor for an engine launch and subsequently completes three takeoffs and landings, he may legally fly a motorglider with a passenger anywhere in this country, and do it on a self declared Category 4 medical that lasts for five years no matter what the age of the pilot. Keep in mind that the flight test for a glider does not require a TC Designated Flight Training Examiner, just an instructor signoff similar to the process for the Ultralight permit. For a Private pilot wishing to earn a Glider Pilot License the groundschool is waived as is the requirement for the written exam. A minimum of three hours and twenty solo flights can earn the Private pilot the privileges of a glider pilot.

One might well ask why one sector of powered aviation can have these privileges when the rest are held to much higher standards. It just might be time for Transport Canada to have a look at our medical requirements and rationalize them, and as usual it will take a push from the Americans to make something happen. Meanwhile, if you are building an RV-7, you could try having it designated as a low aspect ratio motorglider.

Aurora: "Moncton, TRIALS08, we'll be working VFR at 4,500, loitering over the city of Saint John for about the next 10-15 minutes. We'd like radar flight following."
CZQM: "TRIALS08, roger, you're radar identified. Are you aware the city has bylaws against loitering?"
Aurora: "Ah... roger that"

RAA Chapters and Meetings Across Canada

The following is a list of active RAA Chapters. New members and other interested people are encouraged to contact chapter presidents to confirm meetings as places and times may vary.

ATLANTIC REGION

HAVELOCK NB: Weekly Sunday morning get together year round, all aviation enthusiasts welcome. Havelock Flying Club - 25 mi west of Moncton. Contact Sterling Goddard 506-856-2211 sterling_goddard@hotmail.com

QUEBEC REGION

COTE NORD (BAIE COMEAU): Meeting times to be advised. Contact Pres.Gabriel Chouinard, 418-296-6180.

LES AILES FERMONTOISES (FERMONT): First Sunday 7:30 pm at 24 Iberville, Fermont. Contact Pres. Serge Mihelic, 418-287-3340.

MONTREAL (LONGUEUIL): Chapter 415, Meeting in French second Wednesday at 8 pm, at CEGEP Edouard Montpetit 5555 Place de la Savane, St. Hubert, PQ. Contact president Normand Rioux at NRIOUX@lapresse.ca

OUATOUAIS/GATINEAU: Every Saturday 9:00 am to noon at the restaurant l9Aileron in the airport terminal. Contact Ms N.C. Kroft, Gatineau Airport, 819-669-0164.

ASSOC DES CONSTRUCTUERS D'AVIONS EXPERIMENTAUX DE QUEBEC (QUEBEC): Third Monday 7:30 pm at Les Ailes Quebecoises, Quebec City Airport.

ASSOC AEROSPORTIVE DE RIMOUSKI: First Saturday at 9:00 am, La Cage aux Sports, Rimouski. Contact Pres. Bruno Albert, 418-735-5324.

ASSOC DES PILOTES ET CONSTRUCTEURS DU SAGUENAY-LAC ST JEAN: Third Wednesday 7:00 pm at Exact Air, St Honore Airport, CYRC. Contact Marc Tremblay, 418-548-3660

SHERBROOKE LES FAUCHEURS de MARGUERITES. Contact Real Paquette 819-878-3998 lesfaucheurs@hotmail.com

ONTARIO

BARRIE/ORILLIA CHAPTER Fourth Monday 7:30 PM Lake Simcoe Regional Airport Contact Secretary Dave Evans 705 728 8742

E-mail david.evans2@sympatico.caCOBDEN: 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. George Elliott gaelliott@sympatico.ca 705-445-7054

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

FLAMBOROUGH: Second Thursday 8:00 pm at Flamborough Airpark. Contact Pres. Karl Wettlaufer 905 876-2551 or lazykfarm@sympatico.ca

KENT FLYING MACHINES: First Tuesday 7:30 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 p.m. At the Air Force Association building at the London Airport. Contact President Angus McKenzie at 519-652-2734 or angus.mckenzie@sympatico.ca

MIDLAND/HURONIA

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

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

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

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

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

SAUGEEN: SAUGEEN: Third Saturday for breakfast at Hanover Airport. President: Barry Tschirhart P.O. Box 1238 27 Ridout Street Walkerton, Ontario. Home: 519-881-0305 Cell: 519-881-6020. Meetings are held every second Tuesday evening, at 7:30pm. Location(s) Saugeen Municipal Airport, Kincardine or Port Elgin. All interested pilots are welcome. Email: barry.tschirhart@bell.net

YQG AMATEUR AVIATION GROUP (WINDSOR): Forth Monday, 7:30 pm Windsor Flying Club, Airport Road, Contact: Kris Browne e_kris_browne@hotmail.com

SCARBOROUGH/MARKHAM: Third Thursday 7:30 pm Buttonville Airport, Buttonville Flying Clubhouse. Contact Bob Stobie 416-497-2808 bstobie@pathcom.com

TORONTO: First Monday 8:00 pm at Hangar 41 on north end of Brampton Airport. Contact: President Brian Heinmiller 905-877-7947 b.j.heinmiller@sympatico.ca

TORONTO ROTORCRAFT CLUB: Meets 3rd. Friday except July, August, December and holiday weekends at 7:30 pm Etobicoke Civic Centre, 399 The West Mall (at Burnhamthorpe), Toronto. Contact Jerry Forest, Pres. 416 244-4122 or gyro_jerry@hotmail.com.

WIARTON: Bruce Peninsula Chapter #51

breakfast meetings start at 8:30am on the second Saturday of each month in the Gallery of Early CanadianFlight/Roof Top Cafe at Wiarton-Keppel Airport. As there are sometime changes, contact Brian Reis at 519-534-4090 or earlycanflight@symptico.ca

MANITOBA

BRANDON: Brandon Chapter RAA meets on the second Monday of each month at the Commonwealth Air Training Plan Museum at 7:30 PM except in the months of July and August. Contact Pres. John Robinson 204-728-1240.

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

SASKATCHEWAN

Chapter 4901 North Saskatchewan. Meetings: Second Tuesday of the month 7:30pm Prairie Partners Aero Club Martensville, Sk. info at www.raa4901.com. Brian Caithcart is the chapter president. Contact email: president@raa4901.com.

ALBERTA

CALGARY chapter meets every 4th Monday each month with exception of holiday Mondays and July & August. Meetings from 19:00-22:00 are held at the Southern Alberta Institute of Technologies (SAIT) Training Hangar at the Calgary Airport. Join us for builder discussions, site visits, tech. tips, fly out weekends and more. Contact president Don Rennie cgmmv.skylane@gmail.com 403-874-0876

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

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

BRITISH COLUMBIA

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

DUNCAN: Second Tuesday 7 pm members homes (rotating basis). Contact Pres. Howard Rolston, 250-246-3756.

OKANAGAN VALLEY: First Thursday of every month except July and August (no meetings) at the 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 7:30pm, 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 R

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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

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For Sale

MINI-MAX ttsn 217 seoh 29.8. Rotax 447 new GSC prop. skis. radio. always hangared. excellent condition $11,900.00 obo

For sale KR-2 fuselage in boat stage and metal kit for retractable landing gear castings $300.00 call Ian 604-856-1159 or email tri-pyramid@telus.net

Propellers, wood, new, never mounted, tractor cwise (view from cockpit), priced OBO plus shipping: One 42x23, weight 2 lb., Lepper, conventional outline, 4 bolts on 70 mm b.c., $195. One 43x34, 4 lb., squared tips, 6 bolts on 75 mm b.c., $295 Call Frank, 905 634 9538

Bede-4 for sale! 380+ hours TTSN, Lycoming 0-320 E2D McCauley FP prop 75x53 2000 lb GW, 1285 empty. Murphy ext. metal wings, 30 ft with droop tips. Vortex generators, Extended flaps and ailerons. Wing fold mech. built in! Complete set of fairings - all design improvements complied with. Cessna gear legs with solid link in gearbox. Murphy type nose wheel (5x4) Towbar (2 pc) New brake discs and linings! Endura paint - 2002. Complete upholstery, adjustable seats, headliner, door panels, carpets. Instruments: A/S, A/H, Alt., VSI, Turn Co-ord., Slaved mag compass. Tach, Vac. Gauge, Cyl. Temp (2) Fuel (2) oil press., amp. meter, clock/air temp and heated pitot. King KX145 NavCom with KI205 Ind., ValCom 760, Flybuddy Loran, RT359 Transponder with Narco AR850 Encoder (mode C) Magellan GPS with expansion card/software, Sharc ELT, 2 place Flightcom intercom, 2 headsets. Maintenance records, builder manual, some spares, etc., halon fire ext. first aid kit. Any serious offers near $27,000 considered. No tire kickers please. Located CYNJ. Contact Fred Hinsch fred7@shaw.ca

For Sale. Lycoming 0-360-A4A. 279 SMOH c/w mags and carb. Recent prop strike inspection by Pro Aero Engines in Kamloops. Yellow tagged. New bearings, rings, gaskets, inhibited and crated, ready to ship. $15,000. Barry Holland 250-785-6431. w-b-holland@uniserve.com

CP 301-A Emeraude, first flew June 2003. TTAF 47 hours O290G Lycoming 393 hours since Major. Sensenich metal prop inspected and refurbished by Hope Aero June 15/09. Dual controls (pedals, sticks, throttle), custom interior, Annual due may 2011. Hangared at Stratford Ont. $23,000. Jim Demerling 519-348-9655

O-200 engine 2000 hours in running condition with accessories. $4000 Ron Fleet fleetair@wightman.ca 519 -364-5975

VANS RV7A, by owner and 6 times Van's builder. TT A/F and E 183.3 hrs. Lycoming 0320/ 160, AP, EFIS, KLX 135 with GPS and Moving Map,GRT Engine Monitor, 3 blade Catto comp prop., etc, etc, list of eqpt and more pic avble on request, Prof paint., new FlightLine int, superb workmanship throughout. Manitoba, $110,000 204 371 5209, burtloewen@mts.net

AVID AMPHIBIAN KIT FOR SALE $5,000 Complete kit; tube fuselage and tail, all wing parts, wheels, tires, hardware. Left wing started. No engine, no mount, no instruments, no fabric. Contact Don, located near Owen Sound, ON Telephone: 519 372-1383 . email: we3kingers@yahoo.ca

FOR SALE; MURPHY REBEL KIT, Serial #515. Wings and Empennage complete,also Fuselage from Cabin back. All closure inspections completed. Spring type Landing gear. Reason for sale, lost Medical. Available in Edmonton AB. $12,000. OBO. Ted Taylor,780 455-2524
ted.taylor@shaw.ca

AMPHIBIOUS HOMEBUILT Floats approx 1400'S in need of modification water tight bukheads not watertight.with rigging for installation 2 rudder config Floats too small for my aircraft $6000.00 Larry Taylor 250-492-0488 days ltaylor@pacificcoast.net

The original Pegastol aircraft built by the owners of Dedalius Aviation in 1997. Aircraft is registered as an amateur built aircraft @ 1200lbs gross weight and can be flown with a ULP. Rotax 912S x 100 HP, with slipper clutch gear box and 68" Warp Drive Propellor. Engine has 20 hours on it since coming back from Rotax (Tri-City) for starter sprag clutch replacement. The gear box was also overhauled considering it was on their bench and was done as a precautionary inspection considering it was already there. New engine Barry Mounts upon engine reinstall. New Custom aluminum main fuel tank spring 2010. New windshield and upholstery in 2009. Floats have Lake n Air pump out cups (that are rarely needed as floats are tight). 1/2" sound deadening foam throughout cabin. Wheel gear and forks also included. Airframe Total Time equals 620 hours, 912S Engine Total Time = 380 hrs, Propellor Total Time = 532 hrs, Total Time on Amphibs = 442 hrs. Has new $700 Heavy Duty starter as well. LIMITED TIME ONLY $42,000, so he can put that + winter storage fees towards a 4 place.
For more details view at www.irishfield.on.ca or send us an email oifa@irishfield.on.ca

0320 E2C currently mounted on my Osprey which could be included in sale. Osprey has 175 hrs since new engine has 1850 but was dissassembled for a propstrike inspection 200 hrs ago Compression 125 lbs cyl on all four jugs oil pressure good complete with accessories. $6000 for engine $9000 for all aircraft needs refinishing and recover Larry Taylor 250-492-0488 days ltaylor@pacificcoast.net

Stitts Skycoupe with O-290 125 hp, 240 hrs TT. Garmon 195, Escort 110, ICOM A5, intercom, wing tanks. Located at Burlington Ont CZBA. Must sell due to financial constraints. $16,900 OBO. 905-332-7331

FOR SALE C-GTYZ ZENITH CH-300 on floats (land gear available) Engine O-320-C2A zero timed in 1999 now with 170 hours. Prop McAuly 1A175/GM8241 new in 1993 Floats, Zenair 1850. Location Lake Muskoka. $20,000 George 705 445 7054 Collingwood
Super Cub project with fuselage and wings ready to cover. Includes Ceconite cover kit, glass, Lycoming 135 hp O-290 D2 and Macauley metal prop. Most parts to finish included. $27,500, serious inquiries only. Located Alliston Ontario 705-435-9460 Sep11

For Sale: 1997 Pazmany PL1. C-90 Cont. Total Time: 220 hrs. (Airframe and Engine). Side by side seating. Low wing, tip tanks (24 gals US total). Full inst. panel with mode C. Always hangared. Pictures available. $24,000.00 or Best Offer. Call: Ed at 204-642-9485 or email: edira@mts.net Sep11

FOR SALE Teenie Two, completed in spring of 2011 and has taxi time only. New Great Planes 1835, icom handheld, beautiful construction. Registered as ultralight and currently hangared CYPQ. See the youtube video at http://www.youtube.com/watch?v=d89Gg0TvJ98 $7500. Owner deceased

so I am handling the sale. Contact Dave Smith davecsmith2002@yahoo.com Sep11

T-hangar for sale at Springbank (Calgary) airport, so if you know anyone who is interested let me know. This is the lowest priced hangar and most economical to operate at Spring Bank. Total monthly cost including, natural gas, electrical, insurance, and lease is about $100. There is nothing else. The capital cost for the hanger is $105,000 which you can get back at any time. Don Rennie 403 874 0876 or rennie.don@shaw.ca Sep11

9187 aero grinder M 92 with directions, plus drill guide #d 92. This machine refaces exhaust ports without removing cylinders from thenengine. It has a drill guide for removing broken exhaust studs on Continental and Lycoming engines. Air powered. asking $800 647-298-4461 Toronto area. Sep11

Zenith CH20 65 hrs TF 100 HP Cont 1800 STOH, trigear, sliding canopy Full panel, unpainted $10,000 416-431-2009 Sep11

1946 Ercoupe 415-C, changed to 415-D. 85 hp with full electrics, 860 empty, 1400 gross. 1800 hours total time with 700 hours on engine. Spin on oil filter, nice upholstery and wing fabric, metal shines and is in good condition. Plane is hangared and annual runs to July 2012. This plane turns 65 on Sept 11 2011. Fly open cockpit with the windows down and elbows out, using only 4 US gph. $26K OBO garywolf@rogers.com. Sep11

Aeronca Chief project, 1160 TT A and E Original 65 Cont, McCauley metal prop Interior, panel, instruments, refurbished, new tires, New ELT, rejuvenated ceconite, requires windshield, Work on wings and assembly to complete. No runout on engine shaft. $10,000 or offer. 416-431-2009 Sep11

Parts from a scrapped 1972 Grumman AA5. Some parts are specific to this aircraft such as split nose bowl, windshield, canopy, gear legs and brackets, wings, ailerons, flaps, flap motor and wiring, fuel sending units, fuel selector valve, flight control assy.,interior plastic panels and more. Other parts may be useful for any plane or project: set of 6" Cleveland wheels and brakes, TKM flip flop radio, Narco 150 transponder with encoder, Davtron digital temp. gauge, PM6000 audio panel, various VHF antennae, belly strobe, 121.5 Pointer ELT, complete set of rudder pedals with brake cylinders, misc. switches and circuit breakers, throttle and mixture controls, misc. flight instruments.
Other items for sale: tear down engine stand for various prop flanges, home made wing cradles, a bunch of wheel pants, C150 fuel tanks, hydraulic hand pump with large gauge, C150 doors, C172 door, C172 rudder ect. Please note that HST applies to the Grumman parts. Price list and pictures available, prices are negotiable within reason. Contact Rudy at rudyhane@gmail.com or 519 648-3006 Oct11

Double axle trailer, all axles serviced, new electric brake, newly re-wired. 8'x16' with 12" side boards.Airplane NOT included! $1500.- OBO contact rudyhane@gmail.com

Front portion of RV6 Tilt Type Canopy new, covered with protective material. $60 or offer. Misc chief and champ parts. Call for details. 416-431-2009 Sep11

FOR SALE two disassembled VW engines from station wagons, one with flanged crank, enough parts for 2 engines with parts left over. Appear to be in good condition. One magneto and a couple of distributors, intake manifold and carbs. Also set of Firestone wheels, brakes, axles and 700x6 tires. Reasonable offers. Contact Bill at 905-628-2304 or w.brubacher@sympatico.ca. Oct11

Wanted

I need some clecos, rivet spacer, clamps, pull rivet gun, air pull rivet gun, driven rivet gun, rivets (aircraft rivets, not Canadian Tire!!) and what ever other uncommon tools and equipment someone want to get rid of.
I also need a 3/8 air ratchet, drill and 1/2 impact gun.Tony Lam, tylm@vipnet.ca 416-782-3405 Oct11

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: raa@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

New In Canadian Skies

Brian Parson's Zenith CH 701

This is the first CH701 flying in North America powered by the UL Power 260Is fuel injected engine producing 107 hp. The panel is Dynon Skyview, ICOM A210 and Garmin 327 GTX Mode C transponder. Brian flew off his 25 hour restriction at CYKF, then flew the plane to his home it Italy Cross, Nova Scotia. He plans to install floats next summer, and reports that the UL Power engine matches the perfomrance of a 100 hp Rotax.

Send us Photos of your completed projects

Share your accomplishment with others - you've earned it!
Please include a brief description of your aircraft and any other details you want to include, and send us a colour print with it. Mail to: Recreational Aircraft Association of Canada, Waterloo Airport, Breslau ON N0B 1M0
...or email us the information and a high resolution digital picture (jpeg format, 300dpi please) to: raa@raa.ca

Stu Duncan's Zenith CH 701

Here is a picture of Stu Duncan's CH701. Completed under the Can-Zac Builder Assist program that helps builders finish stalled projects, or gets then started in a hurry on new projects. Power by the Rotax 912S 100 hp engine this CH701 is a "fixed wing helicopter". The panel has a Dynon Skyview, ICOM A210 radio and Garmin 327 GTX Mode C transponder. Stu has completed flying off his 25 -hour restriction, and flown home to the Napanee area. Stu has about 75 hrs on his CH701 and loving every minute.

Classifieds On The Internet:

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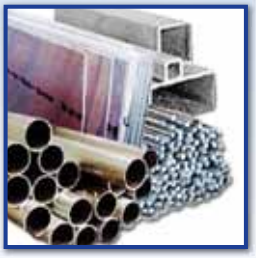
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