

March - April 2012

RECREATIONAL FLYER

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RAA
RECREATIONAL AIRCRAFT ASSOCIATION
RÉSEAU AÉRONAUTIQUE AMATEUR CANADA



FIRST FLIGHT PREP

This is the time when builders have had their final inspections and are ready to do their first flights. This frequently means that the builder has been devoting all of his time and money to completing the plane and has not flown in a couple of years. In this country a license can be kept valid by sitting in 2 hour TC seminar every two years and being PIC once every five years. Vanity and finances can combine to have a rusty pilot in the pilot seat of an untested airplane. The first flight regs require that a pilot have a minimum of 100 hours in a plane of the appropriate category but that does not mean the same make and model. In most cases it means single engine non high performance landplane, and it does not take into account whether the plane is nose- or tail-dragger. One hundred hours as PIC in a Cessna 150 "qualifies" the pilot to do the test flight in a Harmon Rocket taildragger, but not in the real world.

Find someone in your chapter who is current and has enough experience in the same type or similar aircraft. Have the final inspection done at an airport with a long runway that is into the prevailing wind, has clear approaches, and is surrounded by flat fields in case of an engine-out during the first climb. Tie the tail to a post and run the engine at full throttle for an hour or so the check all engine param-

From The President's Desk

Gary Wolf

eters. When everything looks OK and the day is right do not invite an audience. If something does not feel exactly right, there should not be the pressure of disappointing the crowd. The show can go on some other time when everything is right.

CADORS

The Cadors are the daily occurrence reports of everything that has been observed or reported about Canadian aircraft, Canadian airspace and aerodromes. These reports are published online daily. Just google for "cadors" and choose the daily report and you will get about 100 reports each day. Or you can go to the word/text option and select your keywords and time period. I usually select "narrative" and search for "amateur ultra ultralight sailplane hang glider" and then select "any of these words" in the menu below. That gets most of the non certified reports for the chosen time period. Sometimes the TC personnel forget to say in the narrative how the plane is registered so I do a subsequent search using "private" as the keyword. This is a much looser search but there are inevitably some pertinent reports that were not included in the initial search. Registration letters are not given for privately owned aircraft.

The early season usually has a lot of reports of poor flying practices, and the good weather in March meant that this began early. There has already been an ultralight trike fatality near

Sherbrooke Quebec, and in Ontario someone in a single seat wood and fabric plane decided to land at YYZ Pearson airport. As he taxied in he held up an Air India 777 and caused a KLM 747 to do a go around. If it had been a Mayday and he was on fire, the pilot was correct to fly into Pearson. Otherwise this might be the pilot's last logbook entry.

GYRO TRAINING EXPANDS

For many years there has been no training unit in Canada for the gyroplane license so very few have been built, a shame because they are very nice aircraft that are not expensive to build, and they need very little space for hangaring.

In Quebec Nicolas Horn has been providing training in a Magni gyro and his new training unit is in Lachute Quebec. www.magnigyro-canada.com

In Ontario there will soon be a training unit at Waterloo Regional airport CYKF. Neil Laubach has 1500 hours in rotary wing aircraft and will be opening the school mid summer 2012. 519-573-0066 www.gyroontario.ca

Take the opportunity to get some seat time in one of these aircraft and you might then consider building a gyro. If so, we have a chapter in Toronto that is devoted to these unique aircraft. Contact Jerry Forest at gyro_jerry@hotmail.com.

The season is finally here – let's all enjoy it and fly safely.

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A Tiger Moth sits out the haze, Goderich, 2005.
On the cover: The Pipistrel Virus, photo courtesy
Pipistrel Canada

Gone South

Flying with 41 Squadron, South African Air Force / by Raymond Firer



MY INTEREST IN FLYING goes back to my late childhood, as I suspect, it does for most of you. My heroes were the likes of RAF aces Douglas Bader, Bob Tuck and Sailor Malan, amongst others. But first, a little geography, so that you can understand where I came from.

I was born, and lived most of my life, in what is known as the Cape Peninsula (see page 6) with Cape Town at the Northern end facing an open bay known as Table Bay. The small airfield I began flying from, called Youngsfield, is situated about two-thirds of the way to False Bay, South-South East of Table Bay, and just South of Ottery Road. False Bay is the large bay to the South of the land connecting the Peninsula to the mainland.

The picture on page 6 also gives some indication of the mountainous Peninsula with the flat land connecting it to the mainland. Called "Cape Flats", it is close to sea level. Cape Town International Airport, situated on the Cape Flats, is only one hundred and fifty feet above sea level.

Cape Town is famous for the mountain which backs it to the South of the city. Called Table Mountain for obvious reasons, it rises to 3600 ft at the Western end (page 7), featuring a sheer drop down the front from the summit.

I began assembling plastic model aircraft, mostly of the World War 2 vintage, although I did scratch build a model of the Avro Arrow, until, as a teenager, I had a collection of about 120 models hanging from the ceiling of my bedroom. When the South East wind blew, as it did so often in Summer, my mom said that it looked like the Battle of Britain. However I never mastered the craft of building flying models. My one and only attempt ended in flames, literally. It was a model of a Piper Cub (J3C) and looked quite good but on its first flight it spiraled into the ground, causing a fair amount of damage. That was when a paint thinner soaked rag was added, set alight, and the poor little aircraft was sent to its doom.

Thoughts of actually flying didn't enter my head except in my dreams, as my parents certainly couldn't afford flying lessons, and I was too occupied with school and sport to find work to finance that dream myself.



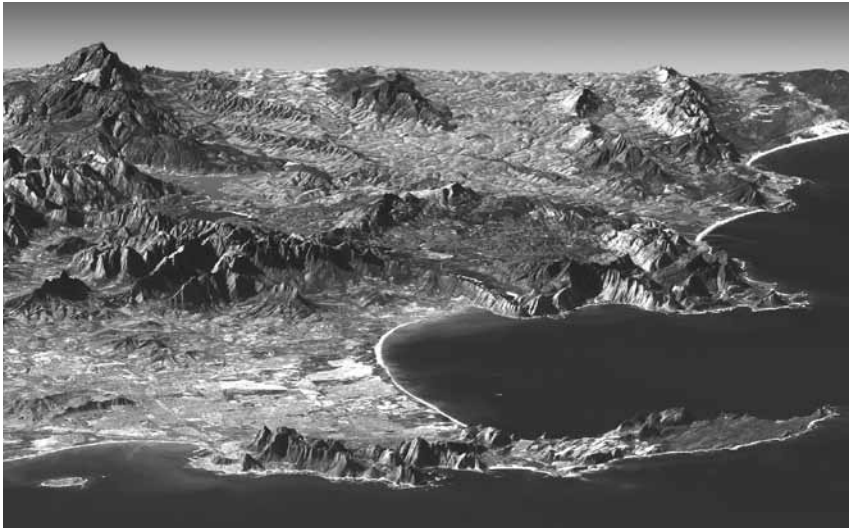
Top left: a topographical map of the region, showing the quite mountainous Eastern and Southern rim, with a high plateau in the center. This plateau is about 4000 ft above sea level.
 Top right: South Africa is bordered by Namibia, Botswana, Zimbabwe, Swaziland and Mozambique, with with Lesotho enclosed within the Republic. You can see Cape Town, Johannesburg, Petersburg, Ladysmith and Mafikeng, all of which feature in the story. Missing is Potchefstroom, situated between Klerksdorp and Krugersdorp, and is also important to the tale. Below: Cape Town and its environs.



On graduating high school, I was drafted into military service, as were all white males in South Africa at that time, and the Infantry was to be my calling for the next year. After basic training, we were asked to volunteer for special force training of our choice. I opted for Paratroopers, only to be informed that for our intake there wouldn't be a Parabat course. I was offered the next best option, officer training, and this turned out to be the best thing for my flying ambitions.

I passed the Officer course at the top of my class, and was sent to 5 SA Infantry Battalion, in Ladysmith, Natal, where I served out my final three months. Towards the end of this time, volunteers for flying training were called for from among the officers, as all pilots in the South African forces at that time had to be commissioned officers. I jumped at the chance, and after undergoing an extensive, three day medical test, I was told that I would be contacted in due course, if I had been accepted for flying training. Soon after that I returned to civilian life, and began my first job with the Weather Bureau. After an initial period at the head office, I was sent to a small weather station in the Northern Transvaal town of Pietersburg, on an airfield used, in part, by the military. It was here that I had my first flight.

As a sideline, I would moonlight by refueling any light aircraft in need of that service, and on a quiet Sunday afternoon, a Tiger Moth landed, taxied in, and asked for fuel. After topping up his tanks, the pilot asked if I would like to take a short flight with him. Would I indeed! I jumped at the chance, and we were soon airborne. I don't remember too much of that first time in the air, except wondering why the pilot had a parachute,



A eastward-looking depiction of the mountainous Peninsula with the flat land connecting it to the mainland. Called "the Cape Flats", it is close to sea level. Cape Town International Airport, situated on the Cape Flats, is only one hundred and fifty feet above sea level. Below: the author, intrepid pilot of 41 Squadron

and I didn't.

All too soon we were back on the ground, and it was several months before I received instructions to report for flying training at a local aero club in Cape Town. I immediately applied for a transfer with the Weather Bureau, and three months later, I found myself, at 6:30 on a cold and rainy Autumn morning, at the Cape Aero Club, housed on a military airfield called Youngsfield, an all grass field without runways, a vintage of the second World War. Youngsfield was also the home of the SA Defense Force's training unit for anti-aircraft gunners. But more of them later.

After being issued with a log book, I was taken out to the hard stand where a lone Cub stood in the driving rain. I was sure that the flight couldn't take place in that weather but I was wrong. Taking off into that heavy rain, it sounded as if we were under machine gun attack. I couldn't see anything forward but the half-hour flight was exciting if uneventful, and after a short debriefing in the clubhouse, and a cup of coffee, I was off to my day job.

That was the beginning of many early morning and weekend ses-

sions, until, at about eight hours I went solo. What a thrill being in complete control of the aeroplane! The usual one circuit and a landing, and it was all over but it was exciting, and I felt very proud of myself. Then followed the usual training. Circuits and bumps. Oh so many circuits and bumps. Cross-wind landings, stalls, spins, forced landings and lots of low flying, and all the theoretical subjects too. At 30 hours I successfully completed the flying and theoretical tests, conducted by an Air Force instructor, and gained a Private Pilot's Licence. This PPL was essential as I was actually flying civilian aircraft in what was civilian airspace but now I could take

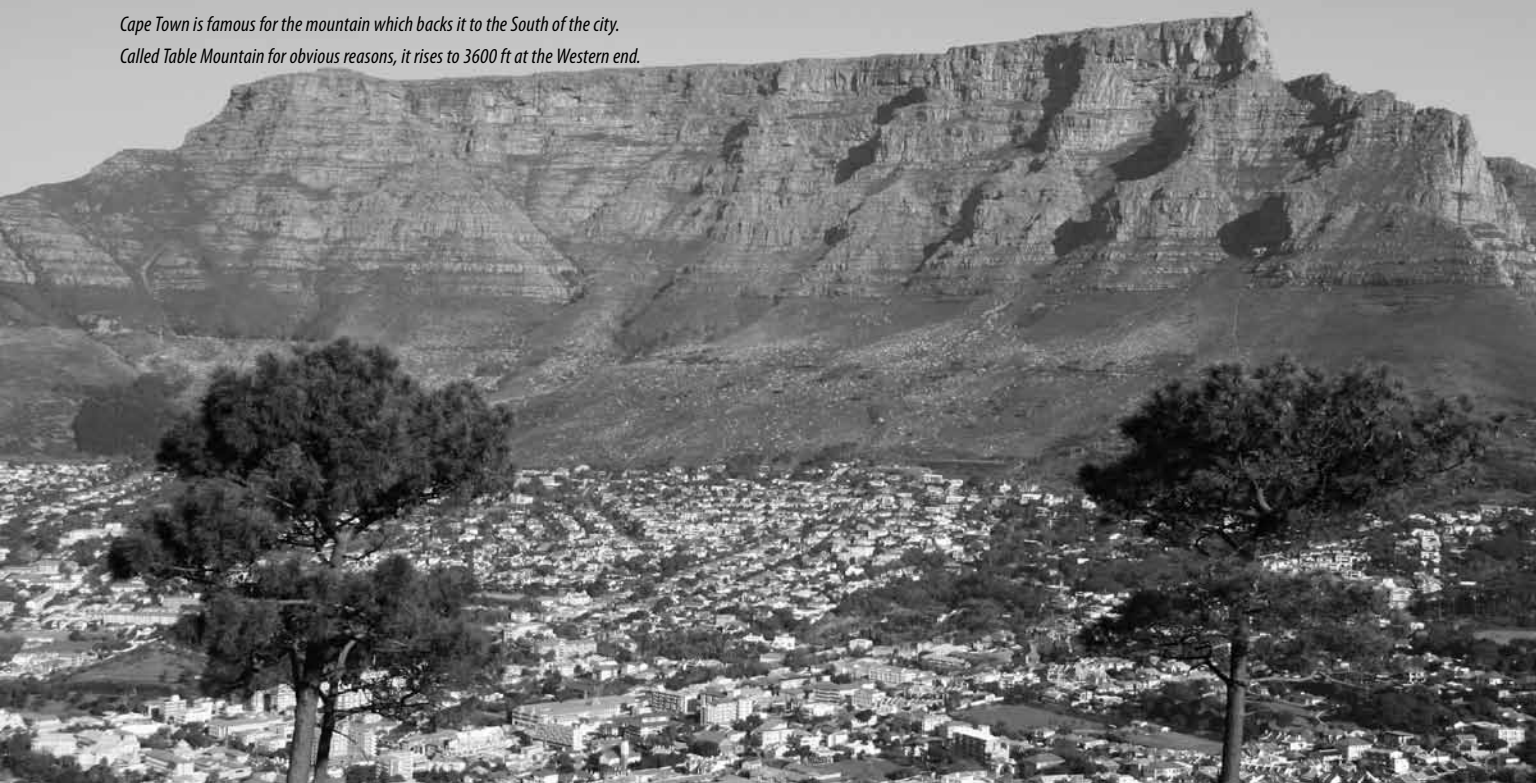


passenger on some of my flights, and several of my friends were the happy recipients of this privilege. At least, I assumed that they were happy about it. There had to be a little wangling to allow me to take passengers, as the Club was being paid by the Army, so if I wanted to take a passenger on a particular day, I would book the flight as a private one until I returned safely, then transfer it to the military log.

As I was being trained for the Army Air Reconnaissance squadron, there was lots of low level flying, and the section of the general flying area designated for this task was just inland of the sea, and consisted of overgrown sand dunes lying in closely serried rows. I loved flying over these dunes, dipping and climbing to maintain between 100 to 200ft AGL. Later, I would apply this training to hopping over the waves just off the beach, sometimes returning to the airfield with salt spray on the windshield.

Soon I graduated to the Piper Cruiser (PA12.), and I loved the way this aircraft did a spin. Really nose down. You would be hanging in the straps looking at the Earth whirling round, and I now began navigation training. After a few dual attempts, I was sent off on my own for the first time. And good news, I made it safely back home. Doing these two or three hour journeys at 200ft was even more thrilling. This was flying. Watching the ground flash by under the aircraft, until it was time to climb to circuit height and a landing. Often I would plot the return leg along the coast.

*Cape Town is famous for the mountain which backs it to the South of the city.
Called Table Mountain for obvious reasons, it rises to 3600 ft at the Western end.*



That way I could spend the best part of an hour skimming the waves, watching the seemingly endless beach flash by on my left.

Navigation in the Cape was a breeze. With the sea on the Port side heading North, and the Mountains off the Starboard wing tip, who could get lost? And the famous landmark of Table Mountain could be seen from many, many kilometers out. As I progressed, I began to explore a bit more. One of my favorite early morning flights being a tour round the Peninsula, and returning up the back of the famous Table Mountain. At it's highest point Table Mountain is about 3600ft. And I would climb steadily up the back, maintaining 50 or 60ft above the rocky ground, heading North to the front edge of the massive. Shooting over the edge, the 3000ft almost sheer drop was spectacular and thrilling, and once over the edge, I

was well above the regulation 2000ft above the city.

Training continued fairly uneventfully, with testing by Air Force officers at 50, 75 , and finally 100 hours, then I was on my way to 42 squadron (Training Flight) at Potchefstroom, in the Transvaal, for the Wings course. Potchefstroom, situated at about 4000 ft above sea level, had dirt runways; 03/21 and 33/15, and was on a slight incline on both of these main headings, or downhill on the reciprocals, and was the also the home of the Army's gunnery school. There I met three other student pilots who had undergone similar training in other centers. We four were the full intake of pilots for this new Army venture to reinstate the air reconnaissance branch of this service. Both 41 and 42 squadrons were started at the beginning of WW2 but were disbanded in 1944.

I don't remember too much of that first time in the air, except wondering why the pilot had a parachute, and I didn't.

**At the end of the runway,
he would flick to right way
up, pull up into a stall turn,
and land. He had done this
countless times, only this
time he didn't make it**

The day before we arrived at Potchefstroom, there had been an accident. The chief flying instructor of the Air Force had crashed on the runway, in front of several student pilots, three of whom were in the circuit on their first solo. The CFI, flying a Harvard, indicated to the tower that he would be doing a "stealth" approach. This involved coming in over the runway at very low altitude, inverted, with the magnetos off to cut the engine noise. At the end of the runway, he would flick to right way up, pull up into a stall turn, and land. He had done this countless times, only this time he didn't make it, and pancaked onto the edge of the runway. He was killed instantly. So much for the safety, safety, safety we had had drilled into us. The poor solo guys were then diverted to a cross wind runway for their landing! Fortunately nothing else untoward happened.

We were introduced to our instructors, who acquainted us with the Cessna 185's we would be flying. And so we were off, once again being treated as pupil pilots until, after about four hours, we were sent solo on this aircraft. Then we began the more military side of the course.

All four of us did our first solo on the 185s on the same day but for one guy, it was the end of his training. On landing, he ground-looped, ending up on the nose. He was unhurt but he jumped out, ran to his room, collected his gear, and left for home, never to return. That aircraft was repaired in just over a month but we always felt that it seemed to want to fly in circles after that, and no one wanted to use it.

We were expected to always fly on compass headings in the circuit. This meant that often on the base leg, we would drift well away from the runway, and had to power in, always with full flaps and trimmed right back. Quiet a battle. This became known as a "Boeing" approach.

We discovered that Military flying can be quite boring at times, so we tried to liven things up by doing some really low flying. It was, after all, our calling. We were constantly reminded that our operating ceiling was 200ft AGL. Nothing was said as to the lowest we were expected to fly, and as we were operating over corn fields, we would often come back with corn cobs in our wheels. It became standard practice, after one of these hairy escapades, to do a very short landing, hop out, clear the wheels, before taxiing in to dispersal.



Left, above: a rough strip landing. Bottom, left to right: classmates John, George and Raymond with a squadron aircraft



The author during his tour of duty. He had originally selected the paratrooper corps, but with no spots left, took officer training instead - which worked out quite well for his flying ambitions.

And speaking of low level exploits, we had to practice concealed approaches, dodging behind trees and buildings, and dipping into dry river beds, anything that would hide us from the tower until the last moment, when we would pop over the fence, and a short landing.

Another fun exercise was flying a figure eight at 200 feet over a cross road, pulling max. rate turns, making sure that we crossed exactly over the intersection each time, and keeping the ball centered. This was, in fact, to be part of our wings test.

Right from the start of our training on the 185s, it was drummed into us that this aircraft was not in any way aerobatic, although sometime later I discovered that this was not true but we weren't given any aerobatics training. We were not even allowed to do spins. We were expected to practice incipient spins only. This involved pulling the nose up under cruising power until the aircraft was almost ready to stall, then kicking the rudder full over but as soon as the wing began to dip, we would have to recover. We discovered however, that one or two of our aircraft just wouldn't stall with so much power on, so we would cut back on the throttle slightly to initiate the stall. Then I discovered that at this point, with the

rudder full over, and the stall warning blaring, if I closed the throttle just a bit more but quite quickly, the machine would flick on to its back. The first time this happened it scared the hell out of me, but I managed to recover, and after trying this a few times I realized that the "best" way out of this inverted position was to pull it through in a half loop. So this became one of my favorite tricks. It wasn't aerobatics, was it? I was just recovering from an unusual attitude.

Speaking of unusual attitudes, for our IF rating we had to do recoveries from unusual attitudes. Practicing under the hood, the instructor would throw the aircraft all over the sky, and when all the gyro instruments were well and truly toppled, hand it over to us, to get it back to straight and level flight. Often they would try to fool us, and leave the aeroplane in straight and level but with instrument lag, we would imagine that we were nose down, or slipping sideways, or inverted, and try to correct that attitude with rather bad results. We soon twigged on to this trick, and simply waited until the instruments had settled down, and gave us more accurate readings, before trying to make it to that calm flight pattern.

As we became more proficient at instrument flying, we had to do cross country trips under the hood. There was even one time, on returning to the airfield, that I was talked down right onto the runway completely blind. Obviously I had an instructor with me, so I guess that he must have had at least *some* confidence in my flying skills. Building up actual

IF time was a problem, as this part of South Africa didn't get too much in the way of clouds at that time of year, just some scattered cumulus in the mid afternoon. When these appeared, we would rush to the aircraft, take off, and make a mad dash for these tiny patches of fluffy vapor, logging as little as one minute at a time but dodging through them several times before they dissipated or drifted out of our general flying area.

I found that navigating in the Transvaal was far more of a problem for me than in the Cape. The Transvaal is fairly flat and featureless, and the first time I did a low level cross country flight I missed the first turn completely. I know that, as pilots, we were never "lost". We might be uncertain of our position but never lost. Well that day I was VERY uncertain of my position. The turning point should have been easy to spot, a rail line, a road and a small air strip, and if I had been doing some dead reckoning, I should have picked up that I was well past that point some time back. But I soon passed several similar markers, until the instructor called my attention to the fact that I had missed the turn. Only then did I do some calculating, and worked out how to get back on track for the second leg of the flight. All ended well enough, and I returned to the airfield on time. After that I kept a closer watch on where I was. It was a good lesson. Only a couple of years later did I, once again, find myself in a similar position. ¶
Tune in next issue for the conclusion!

Motivation

a motivating force, stimulus, or influence :
incentive, drive



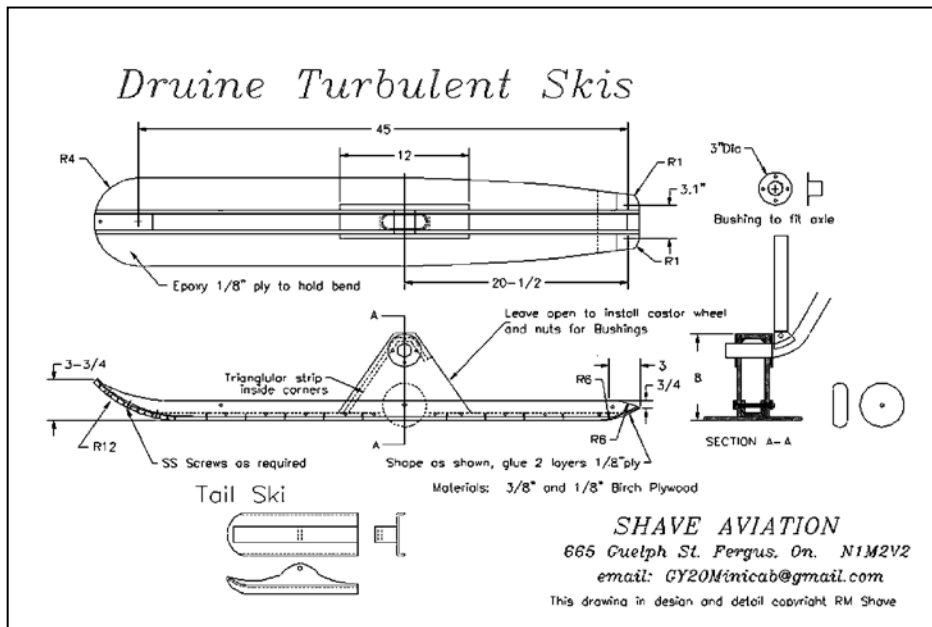
My flying buddy Ed Connors was the inspiration to start this project and he helped me to understand some of the dynamics of skis. I appreciate his friendship and his enthusiasm for flying.

So it's time to grab a brew and a pencil and paper. To design a set of skis for my little airplane it was necessary to look at other planes on skis and try to come up with a method for calculating the area or footprint of each ski. Also taken into consideration were other sports or activities on the snow to get an idea of pounds per square inch to use for airplane skis. Using my own weight (200#) I discovered that X/C Skis are 2 psi, snowshoes about 1.5 psi. I decided to use 1 psi to absorb my usual 2g landing load and give the plane a chance to sit on top of lighter density snow after it stopped moving. The weight of my Druine Turbulent with full fuel, a toothbrush and me, is 650#. So I made each ski area about 325 square inches. A rectangle 8x48 is 384 sq-in. The front of the ski is out of the snow so its area is not counted. The shape in the drawing is 375 sq-in but the area at the front and where the wheel is reduces that to about what we need. The area distribution should be about 60% in front of the axle. Not counting the upturned area at the front, the Homebrew skis have about a 55:45 ratio of areas in relation to the axle centerline.

We share a wonderful hangar at

CPG7 with a concrete floor. Whatever skis I made for the plane would need to include some method of moving the plane around once in the hangar. Sometimes I buy "good deals" at Princess Auto for a future project. Tucked in one of the joists in the basement were a pair of heavy duty roller-blade style wheels 4" in diameter by 1-1/2" across with a 5/16" hole through the centre roller bearing. Perfect. I also had a sheet of 3/8" birch ply 63" x 30". All the parts are shown on the layout drawing.

To work out the geometry of the parts I like to use card stock or paper to make full size patterns. Once your patterns have been cut out use them to maximize the use of the plywood. Grain direction is important for all wood projects and 3/8" x 5 ply birch is very strong. Cut out all the parts, radius the edges where needed with a router, and sand, I used tite-bond waterproof glue for initial assembly. Later, epoxy and glass cloth will be applied over the joints. Stainless steel #6 x 3/8 flat head screws were used to assist clamping during the glue-up. Some screws were removed after the glue set up. Cut out the hole for the wheel and check the best



Drawings of Mike's Skis.

height of the axle hole before gluing the assembly together. I used some offcuts of the 3/8" ply to set the depth of the wheel below the bottom of the ski. Once this is worked out pre-drill a smaller hole through all the pieces that the axle for the small wheel goes through. (ie 1/4") Changing to the main gear, if your gear leg is steel tube like mine, create the 4 bushings using the drawing as a guide. Use a hole saw to drill the holes to accept the bushings, again before glue up. I made the width of the box the same as the actual wheel so I could use the same method to attach the ski. I needed to remove the brake assembly because skis don't use brakes. :)

Fabrication

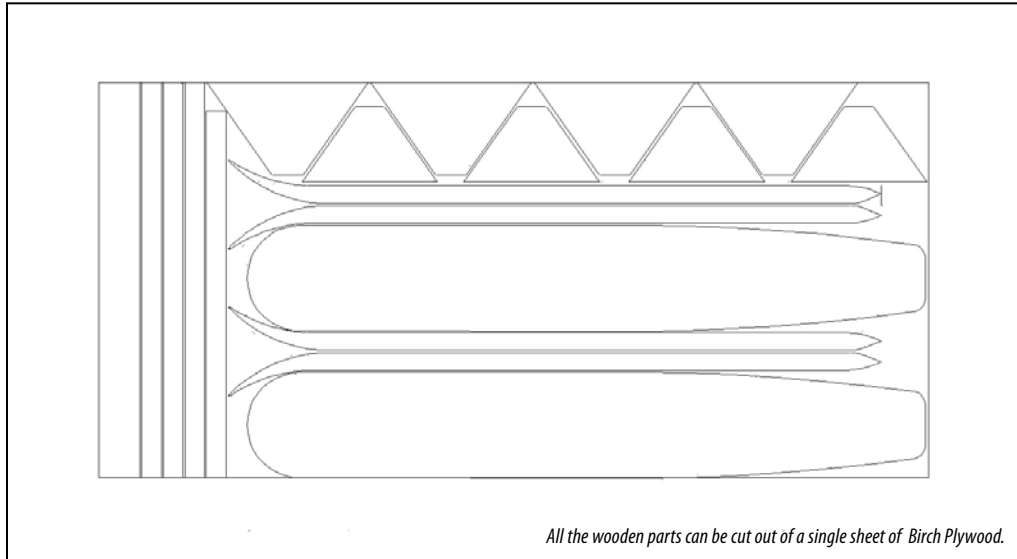
My portable Makita skill saw makes a narrow kerf, ideal for the cuts necessary to make the front end bend up. The cuts are made leaving a 1/16" of wood on the outside of the bend. Boiling hot water will help the wood soften and the gorilla glue will work better if the wood is damp. Screws will hold the wood in position until the glue sets. Start with aligning the centre strip down the middle of each ski shaped to fit the arc at the front. These

are cut out over the centre where the wheel is located. Add the two curved side strips and temporarily screw them into the centre strip. I used one layer of 1.5mm ply cut to fit over the saw cuts in the area of the bend. Apply Gorilla glue and lots of clamps. I find this glue works well in filling large gaps as it expands as it cures. Let that assembly dry overnight. The aft end of the ski is shaped to allow 2 layers of 1/8" ply to be glued on to form an upward bend. This treatment allows the plane to be dragged backwards without the skis digging in.

The next hurdle is assembling the boxes to the skis. Do as much dry fitting as possible to ensure all the parts line up. I used a short bit of tubing and washers with 1/4" threaded rod to block the distance for the small castor wheel, and a 12" length of steel tube through the main gear leg axle bushings. Pre-drill any screw holes and make alignment marks on the wood. Once satisfied, apply the glue and fasten the parts together using temporary screws to hold the parts in alignment, and bar clamps where possible. The over-all ski assembly is now complete.

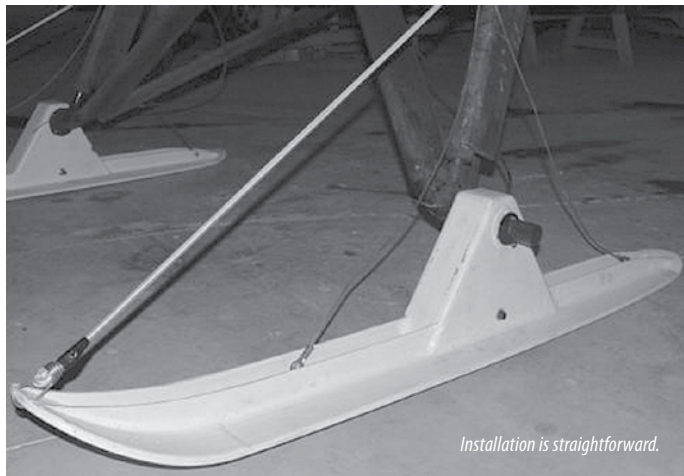
The next step after this has set up

is to bond the whole thing together with fibreglas and epoxy. I started by laying in a fillet of epoxy and micro balloons along the outside joint between the top surface of the ski and the 1-1/2" uprights. The radius of a popsicle stick is a bit too small so I make one with 1/4" radius out of some 1/16" plywood. When this has cured, sand out the lumps and lay in two layers of 6 oz glass cloth about 2" wide along the length of the joint. Lay two 3" wide strips of fabric centred in the trough lapping up the inside of the uprights. (You may want to remove some or all of the screws used here during the initial glue up.) Some folks like to use a peel ply of rayon fabric and some like to use polyethylene over the resin as it cures. Or nothing. I like to work with this stuff in steps so while that is curing I cut the pieces that will fit over the tapered box in the middle. Allow some overlap at the corners. Peel ply does work well here to hold all the cloth bits in place while you smooth the resin, so you can cut those shapes as well. I used two layers of glass cloth over this assembly as well. As a note: polyester resin does not stick as well to wood as epoxy does.



All the wooden parts can be cut out of a single sheet of Birch Plywood.

When it is set up remove the peel ply and admire your work ! Clean out the area where the bushings attach and drill holes for #6 x 3/4" SS flat head screws. Mix up some bedding compound using epoxy and cabosil or talc (synthetic sawdust) You should have marked the bushings for the hole they fit and orientation. Smear some goop where the bushing will mate with the box. The inside of the



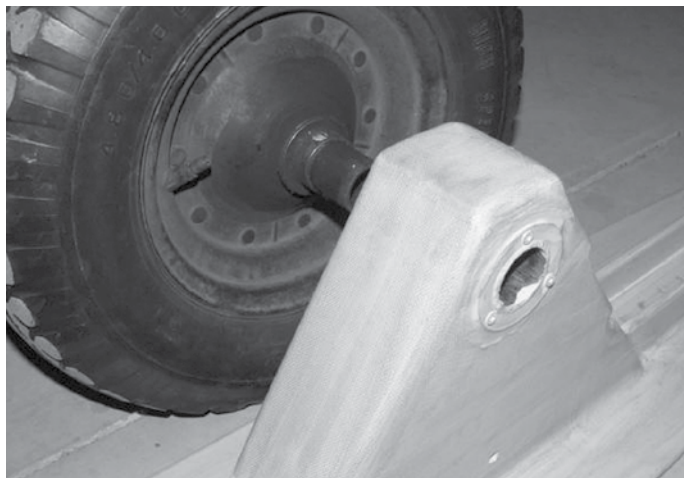
Installation is straightforward.

bushing will be greased so epoxy will not stick as you slide the dummy 12" axle tube into place. Snug up the screws. Let this assembly cure.

Next step is glassing the bottom. Here I used a single layer of glass cloth with epoxy. A peel ply is nice to use here. When this is cured use a smooth file to touch up any sharp glass edges. Tighten up the SS Screws.

I am useless with paint. Here you are on your own. I ended up using an exterior latex paint but the best choice would be an epoxy based paint.

Last steps are fitting a layer of lexan to the bottom of the ski and installing the castor wheel. Again I had some left over lexan from a windshield job. I think it was .090". I'm sure 1/16" would work as well. The lexan was attached with 10 off SS #6 x 3/8 flat head screws spaced along the bottom in line with the uprights.



Rigging skis for a taildragger (verify this method with someone you know and trust)

Having the nose of the ski tip downward in flight would be a bad thing. I worried about this problem with respect to the security of the fittings especially into wood. My experience after flying with skis is that this kind of event is unlikely. The ski "flies" and seems to give the plane a bit more buoyancy in the air. There is more area in front of the pivot of the ski, providing more lift than the aft portion of the ski. This effect along with the safety of the cable rigging and the bungee pulling will make the tipping of the tip downward unlikely. Snow load on the forward part of the ski will add some weight but during take-off most of that snow blows off. There is less drag with the skis

as well. Nevertheless, making the attachments between the ski and the plane needs to be done with confidence in the design. Block the aircraft off the floor so the gear legs are extended. Block the front of the skis 3" with the tail of the skis touching the floor. Raise the tail of the plane to the angle it flies at in cruise. Set the length of the rear wires. After the wires are installed lift the tail to watch them get tight at this angle of attack. Set the tail on the floor. Remove the blocks at the front and place a single 2x4 on the flat at the tail of the ski with the forward arc of the ski tips touching the floor. Set the length of the front wires. Raise the tail and this wire will go slack. With the tail raised, attach the bungee to the front with some degree of tension. It will get longer as you lower the tail but you want it to have some pulling power even in the raised tail position. For attaching the wires to the ski I used AN4 bolts, lock nuts and washers through one of the uprights and the cable thimble without over-tightening the bolt and nut assembly.

For the tail ski I used 12" of plastic deck post cut so that it looked like an inverted U. See the drawing. Use a heat gun to form the front bend. Fasten to a 12" long 2x4 as shaped in the drawing and install in place of the tailwheel. The downturned edges of the tailski provide a bit of purchase in the snow for turning.

Testing:

For those of us who have not had fun flying with skies here are a few observations:

1. no brakes
2. they stick when stopped and take full power to get moving. refer to #1
3. skis are quiet when there is enough snow
4. skis are really bumpy when taxiing on frosted grass.
5. take-off is shorter
6. acceleration better
7. steering is interesting. See #1
8. Have fun ! 🚀



Bushcaddy still flying high

Bushcaddy, Quebec's own brand of rugged Bush plane and their kit manufacturer are doing well; under new ownership and in the new location at the Lachute airport since September 2010 they have continued to see growth and optimism in the world economy.

Tony Watkin moved himself to Quebec from Australia after he acquired the business in 2010 to ensure the brand remained where it had been born 18 years earlier and he has remained in Lachute,

now calling it home. The range has continued to develop, and with access to more technology at Lachute the kits are becoming more assembly friendly, and with more CNC parts available the finish is becoming more consistent and assembly has become a simpler process for the builders.

Over the past 18 months Tony has developed several improvements such as full pre-drilled and pre-cut ailerons and flaps, the R80 has pre-drilled wing

skins and the flap option is now more of a standard with builders due to the ease of installation. Demand for the aircraft and kits is spreading with sales to Australia and Russia, as well as many inquiries from Asia which is a new market due to China opening the skies to private recreational aviation for the first time in history.

The future will see the further development of the current models as well as some new models still in concept stage and will offer buyers a broader range and choice, but in Bushcaddy style they will try to keep the mechanics of the range simple, effective and robust as well as keeping many parts standard among the models. This keeps overheads and prices low to ensure that they are remaining competitive on the world market.

The short term goal is to establish a small dealer network which will assist in growth as well as making delivery of kits and parts more efficient. Tony looks forward to the future and is extremely proud to be associated with such a well known bush plane and is confident the aircraft has many years ahead.

When Do You Say No?

Barry Meek

CONTINUING VFR INTO IMC. We read that short statement in aircraft accident reports far too often. And by now you'd think pilots would know better. You *don't* fly, in fact you *can't* fly visually in instrument meteorological conditions. It's a simple fact. So why then, does it continue to happen and cause crashes? Why are people dying and perfectly good airplanes being wrecked by pilots trying to beat the unbeatable odds?

These are accidents that don't need to happen. They're predictable, and therefore avoidable. It's all about decision making. When to say, "No, I won't fly into that area, those clouds, that weather". Let me try to sort this out.

A young pilot with a brand new license in his pocket will often turn back from bad weather sooner than a more experienced one. At this point in his career, that good decision usually has nothing to do with good judgment, but rather

fear. He is afraid of cloud because in his relatively short time flying, he's been in nothing but clear conditions, supervised by his instructor. Weather distractions are usually not a factor in the learning environment. His low-time is an advantage, and may save his life more often than he could possibly know.

Now put that same pilot in a similar situation after he's built up four or five hundred hours working in a small charter operation. By this point in time, he has no doubt flown in a bit of 'soup', but has made it through without too much trouble. Chalk up the good outcome from each of those flights to good experience. His confidence is increased as long as he's not hurt. It's an important, necessary process. The weather doesn't accommodate pilots or air operators with clear, VFR conditions all the time. Some calculated risks and bending of the rules are a fact of life. The pilot gains experience



quickly, but unfortunately it usually happens too fast, and his age, maturity and good judgment lag behind.

This is not a good thing. This is when he becomes dangerous to himself, his airplane, employer and his passengers. The pilot at this stage, has beaten the weather enough times to figure out the risks have rewards. So he continues to take them. Every one of us has flown into and through something that we know we should not have been in. We do that because there are usually good 'reasons' for continuing on into deteriorating conditions. We push ourselves to complete a flight because of pressures of the job or from passengers on board.

Someone once described a good pilot as one who relies on his excellent judgment to avoid the situations which require his exceptional skills to get out of. A true statement if I ever heard one!

Clear judgment must be accom-

panied by the courage to make the right decisions too. A pilot may judge a situation to be unsafe, but without the courage to say "no" to his passengers or employer, he remains a reckless risk. Both judgment and courage come with experience, and with age. I've always believed that the older the pilot, the safer he will be. Of course that comes with the caveat that there's a point where the mind starts to slow down and have trouble with solid reasoning too.

This is all philosophical ramblings from someone who thinks he's old enough to know better, and not old enough to feel he's on the downward slide. And when I was

younger, I probably thought I was wiser too. But that really wasn't so. I'm a lot wiser now, and I have no problem turning back from weather or conditions that, years ago, I would have proceeded into and may have wound up in serious trouble. Luckily it never happened, because undoubtedly there was some degree of good judgment happening then too.

Looking at all the accidents that result from the VFR flight into IMC scenarios, I'm left wondering why it happens so often? In my experience, the one (or two) times I flew into bad weather, it scared the pants off me. Although I made it through in one piece, I wasn't proud of it. In fact I was mad at myself for getting

**Clear judgment must be
accompanied by the courage to
make the right decisions**

**As time passes
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some time has
passed.**

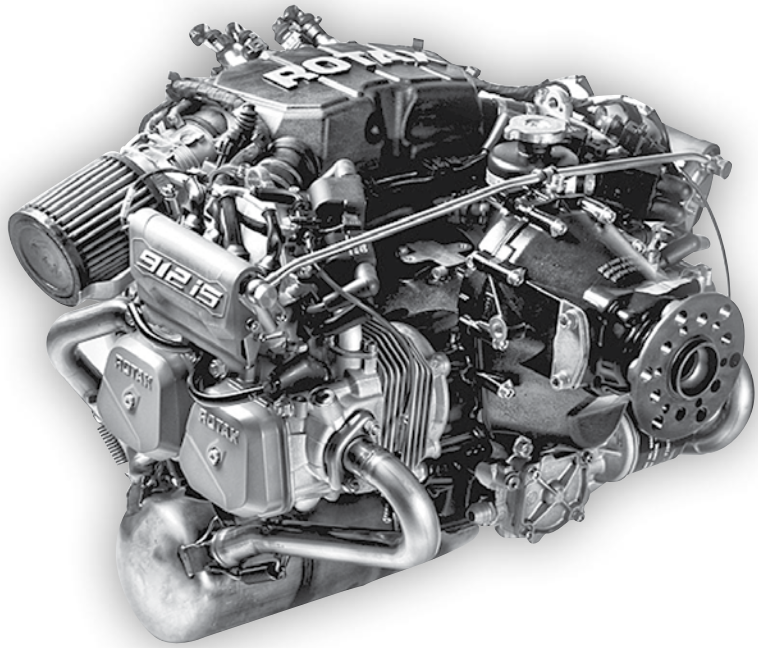
into something I knew I should not have. Then I resolved it would never happen again. And it didn't. Apart from those incidents, there's not been another decision I could still not defend as being the right one. That leaves me out of a lot of hangar discussions that evolve into bragging and boasting about how bad the conditions were, and how the storyteller made it through. They're all interesting, some embellished almost beyond belief, but that's OK. Some people are just plain lucky. They say they've made it through time after time in conditions they describe as something of a nightmare to me. "No thanks" I say. I'll play it safe. My airplanes have never been bent, and nobody ever got hurt. You can't argue with decisions like that.

I'm giving the final word on this topic to someone on the AVCAN-ADA internet forum. I am not a member of the group that writes in the forum, so I know nothing of this person's background or experience. But his words of wisdom say it well. Quote: " This is part of the learning process, as time passes you begin to realize how soon these trips we thought just had to go regardless, were actually of no real importance once some time has passed."

After over a half a century of flying I can not remember even one trip that I refused to do that resulted in someone getting killed because of my decision not to fly.

Barry Meek at bcflyer@hotmail.com





Rotax 912iS

Clare Snyder reports on the latest offering from Rotax

THE ROTAX 912iS is a development of the current 912 series. Internally, the manufacturer has modified the cylinder heads for better cooling, and installed a larger oil pump. It is 4Kg heavier than the 912S, not counting the dual fuel pumps.

Carburetors have been replaced by an injection system that runs at 3 bar pressure and is fully redundant with 2 injectors per cylinder. It uses MAP sensors and throttle position to select full power or eco mode (mapping), and if one injector malfunctions it will switch to full fueling from one injector instead of split fueling. The engine uses four EGT sensors and is designed for MON85 / RON95 octane fuel with an antiknock index of 91.

The engine management system is by Rockwell Collins. It uses the CAN Aero bus for communication and diagnostics, with the pilot mode diagnos-

tic program capable of displaying all diagnostics and instrumentation on a laptop. The system has full electronic ignition timing, and the next software version will implement the knock sensor for octane correction.

The new engine uses dual fly-wheel alternators with a total combined output of 430 watts. The engine starts on battery, and then switches over to the 16 amp alternator, running independently of the battery system - in case of alternator failure the system switches back to the battery. The rest of a plane's electric requirements and battery charging are handled by the 30 amp alternator.

Reported fuel burn is 21% lower than the existing 912S. Peak torque is apparently slightly lower but at a higher rpm, so peak horsepower remains 100 at 5800 rpms for 5 minutes. The engine may be operated on leaded or unleaded mogas, 100LL, and E10 fuel. Rotax has positioned this engine as being the green solution for future aircraft, and even the valve covers are painted in this colour. Rotax is partnering with Pipistrel as the launch customer, to emphasize the fuel economy and low environmental footprint of the 92iS.



Gone are the carburetors, replaced by injection and an engine management system for improved fuel economy and smoother operation. Below left, Clare Snyder checks out the engine management system. Below right, a technician on the Rotax assembly line



The new engine case features a higher flow oil pump, and a recon-toured sump for more efficient oil scavenging. Existing engine mounts are compatible, and all existing configurations will be available (reduction ratios, CS support etc). TBO for the new engine is 2000 hours. A 14 - 17% price premium is expected for the new 912iS engine when it becomes available in six months. **R**

Developed and designed on the basis of the concept of the 912 S/ULS the new Rotax 912 iS engine offers all well known advantages of the Rotax 4-stroke engine series.

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Across Canada

RAA Chapters in Action

RAA Winnipeg Visits North Dakota

The Winnipeg Area Chapter of the Recreational Aircraft Association viewed an amazing collection of War Birds at a recent 2-day tour to North Dakota. The tour included the Fargo Air Museum and Tri-State Aviation, both renown for their significant collection of vintage aircraft and parts.

Stearman pilot Helen O'Connor, Assistant Director of the Fargo Air Museum, introduced the Fargo Air Museum's beautifully restored F4-U Corsair, TBM Avenger, L39 Czechoslovakian military trainer, P51 Mustang, Fairchild PT-19A, a homebuilt T-tail Poly Wagon used to teach the principles of flight to museum visitors as well as a DC3 and another Czechoslovakian jet trainer parked outside were some of the highlights. The amazing 28 cylinder radial Pratt and Whitney Wasp Major engine sitting quietly beside a Merlin GT currently under construction by the local EAA chapter and an award-winning replica of the Wright Flyer connects the early beginnings of aviation with the present. Other aircraft exhibits include a Huey Helicopter, and 1917 Standard. The museum also has a library with 1000s of books, magazines, original drawings and a gift shop. The museum is raffling off a fully restored 1964 Cessna 182. The draw will be made next June, so contact the Fargo Air Museum if you are interested in buying a US\$50.00 ticket; only 2500 tickets are available for sale.

Tri-State Aviation Inc., (TSA) in Wahpeton ND, fabricates parts for, and restores WWII aircraft, specifically the P-51 Mustang. As an FBO, they also service general aviation and agricultural aircraft, as well as manufacturing spray booms (Superbooms) for Ag aircraft. Jon Klein, Shop Manager



John Blackner with fellow Winnipeg gather around the Mustang A-Model engine bearer. Photo credit Jill Oakes.

and Cindy Schreiber-Beck shared the history and current capabilities of the business. TSA was founded by Gerry Beck and has been in operation since 1974 at which time it was an aerial spraying operation and FBO. Since that time it evolved into a shop with unique capabilities including hydro-forming, prototyping, stretch forming, metal shaping (power hammer), CNC machining, sheet metal repairs and welding. With a capable staff of nine, the company has continued after Beck's death in 2007.

The purchase of a TBM Avenger without bomb bay doors was the genesis of fabricating WWII aircraft parts. Bomb bay doors were not readily available thus Beck decided to tool up and build a set of doors. Building the doors proved to be a successful endeavor. Shortly thereafter the transition to Mustang parts occurred with the rebuilding of a doghouse.

Beyond Mustangs, numerous warbirds have been through the shop, including: F4-U Corsair and TBM, that

are on display at the Fargo Air Museum; a Japanese Zero (Nakajima manufactured A6M2) that Blayd Corporation of Carman MB completed the major portion of the restoration; rebuild of a Hawker Sea Fury; and numerous P-51 Mustangs for major rebuilds or component rebuilds, including the Red Tail Mustang (C Model) and fabrication of the A Model, the first A being Beck's "ultimate homebuilt" that is currently under rebuild. Using original drawings, all components that could not be purchased for the A are fabricated. That includes the engine mount that was in process.

Of interest was the metal forming shop. Randy Carlson's expert hands use a variety of machines, including a power hammer, to create compound curves in originally flat aluminum. Using dies that he machines, specific curvatures can be achieved. Many Mustang parts are unavailable for purchase so Randy carefully crafts the parts using drawings from the Smithsonian Museum and /or pieces of



original parts as models. Most recently, Randy completed exhaust pieces for a B-29 and Jon showed us lower cowlings for the A Model that is currently being made.

Another technique that the TSA crew has mastered is stretch forming aluminum using an in-house built stretching machine and concrete dyes. The Mustang air induction scoop is being reproduced by pouring a concrete mold and finishing the concrete until it is as smooth as silk. Then a sheet of aluminum is clamped in jaws on the massive, hand-made table with hydraulic rams that push the concrete dye into the aluminum to form the part.

TSA also uses CNC machines to produce precision parts. Mustang / T-6 tail wheels can be produced along with numerous aluminum parts. Again, the original drawings are utilized to program the CNC machine.

In another workshop the A Model Mustang tail surfaces were being covered with fabric using countersunk screws and counter sunk washers to hold down the heavy-gauge tape. The attention to detail is seen throughout this amazing project, including stitching the fabric to the metal framing openings in the leading edge of the tail surfaces.

Cindy then took us into an adjacent hangar where a room full of antique engines, aircraft and cars greeted us – to include Merlins, Allison, Continentals to name just a few of the engines... plus five Mustang fuselages awaiting customers to finalize the order, tons of aircraft parts, 2 WWII military

vehicles, a B-25 Mitchell Bomber and a Howard. Just when it seemed like there couldn't be anything else vintage to see, Cindy completed the tour with a close look at an amazing antique machine that TSA used to make spools

Tri-State plans to have the A-Model Mustang ready for flight.

RAA Scarborough/Markham Chapter
We wish to thank Chris Gardiner (cgardn628@rogers.com) of the



Larry Brown and John Blackner retracing the wire routing on TSA's antique wire crimping machine. Photo credit Jill Oakes.

of wire fabric clips. The machine produces the Martin Fabric Clips that are used to secure fabric to metal ribs without rib stitching.

TSA specializes in the tools, skills and knowledge needed to restore vintage aircraft with excellence, producing their own parts when it is impossible to buy replacement parts. The shop began as an Ag plane repair shop and now is comprised of a staff of 9 with the capabilities to rebuild warbirds. TSA works closely with similar shops across North America and is known internationally for their exceptional workmanship and ability to fabricate parts. RAA Past President Harry Hill originally planted the idea to tour Tri-State Aviation about 10 years ago; current President Jim Oke picked up the idea this Fall. We look forward to returning next year when

Oshawa RAA chapter for talking to us about building composites in general, and the KR2 aircraft in particular. It dates from 1972; about 2,000 have been built. The KR2 (now the KR2-S) is one of the early composites with some of the following specifications: a taildragger (although a few have been built with tri-gear); wooden frame of Sitka spruce, mahogany and birch, all glued together with no screws; 700 lbs empty weight, 1150 lbs gross; 25.5 ft span with small flaps; 36 inches wide (Chris calls it a marginal 2-place aircraft - no baggage with 2 people!). Chris built his aircraft at a total cost of about \$45,000 with a new 2180 cc VW engine of 75 HP @ 3400 RPM equipped with dual ignition (1 magneto, 1 electronic) and a 54-inch diameter x 48-inch pitch propeller. With this prop, its performance figures are: 145 cruise (all in

Join the RAA Forum

RAA's new forum is online! We hope to add many features over the next while to enhance the value of your membership. The URL is the same at raa.ca - once you're on the home page, simply click on the "forum" tab to get there. You'll find it a useful place to exchange ideas and ask questions - but it's only as good as the people

who contribute to it. Help make this a useful resource for builders and pilots.

Any suggestions and ideas for improvements are welcome and can be sent to George Gregory at gregdesign@telus.net. Stay tuned for further developments!

MPH); approach at 70; touch down at 60; stall at 52; 800 ft/min climb at 100 MPH. Chris says it is somewhat twitchy to fly. The aircraft first flew in 2001 after a 4-year build time. Chris gave us construction details which were very interesting. The fuselage is built like a boat. The wings have main and rear spars, polyurethane foam ribs, and pink foam panels in between; a great deal of careful sanding is required (wear a mask at all times - much dust!). There are 2 layers of fibreglass on the top and bottom wing surfaces, 3 on the leading edge. Each surface requires a one-day, one-piece, continuous lay-up with aeropoxy. The epoxy is applied with a roller over 6 oz BID (cloth layers with a bi-directional weave), finishing with peel-ply to leave a smooth surface. We are most grateful to Chris Gardener for giving us such an excellent insight into composite building.

RAA Ottawa

This month we held our winter Ski Fly-in. Like many of the winter fly-ins this year ours was weathered out. We had clear skies for part of the weekend with but winds of 20 knots and gusting to 32 knots there were no fly-in aircraft this year. In spite of the weather we did have a very pleasant brunch at the club house. Visitors from as far away as Renfrew arrived to share the very tasty brunch and tales of flying did brighten the day. I hope to include a few pictures next month so please send in any pictures that you may have taken at the indoor fly-in.

RAA London-St.Thomas

Phil Hicks reported that he now has wing spars cleco-connected, but otherwise looking like twelve-foot long wing spars. Dave Hertner reported that his radio problem was an incorrect RS-232 connector wire, which is now fixed, and that currently a fuel flow sensor anomaly is being addressed.



Chapter 85: Back row from the left: Mark ter Keurs, David Marsden, Peter Klein, Tom Boulanger, Gary McBride, Roy Taylor, Raymond Colley, Bruce Prior, Tim Nicholas, Tedd McHenry, Gerard Van Dijk, Cyril Henderson.

Front Row: from left: Alex Routh, John Macready, John deVisser. Missing: Francois Leh, David McIntosh, George Gregory

Talks are underway with a prospective test pilot at this time. Denny Knott reported the Skyhopper flew on January 7th, with no other flights since then. At 8:00 PM Denny Knott introduced the speaker, Wilson Boynton. As an aircraft maintenance technician he began to encounter composite aircraft structures, realized this was where the future of aircraft structures

They do advanced composite materials training for students that come from countries all around the world. Wilson presented a one hour slide show which touched on a tremendous number of fascinating subjects regarding material composition, the way the composite material is applied and how the carbon fibers are applied to fuselage and wing structures by computer controlled robots. The accuracy and complexity is way beyond human capability as we saw from his slide presentation. If we took nothing else away from his presentation, he stressed the extremely toxic nature of many of the composite ingredients, and warned us that breathing respirators, masks, and protective clothing *must* be used. These chemicals have effects that may not show up for months or years after use and can have detrimental effects on your DNA which may not show up until the second or third generation. Remember the Thalidomide deformities in babies years ago? Thalidomide is an ingredient in some of the composites which he described. His presentation was intensely interesting and certainly informative.

RAA Calgary Annual breakfast. The RAA Calgary Chapter and the Cu-Nim gliding Club are having our fly-in/drive-in breakfast again at the Cu-Nim Gliding Club Airport (CEH2 Black Diamond) on August 25, 2011. Cost is \$7 per plate. Last year we had about 10 planes fly out; we should try to beat that number this year. Overnight camping facilities! Several people came out last year on Friday and camped over.. There will also be discounted gliding again, so do not miss it. Contact Don Rennie at DRennie@hemisphere-eng.com

was heading, and took training in the field. So much so in fact, that now he and his staff are qualified in Canada and the USA to repair composite structures of all kinds. He has worked with Great Lakes, Air Ontario, and Jazz here in London. In 1992 he started his company Renaissance Aeronautics.

Chapter 85 (Vancouver)

President John Macready:

I am very happy to be the President of our chapter this year. I have been associated with the RAA for about
continued on page 34



Catching a **Good**

Reinhold Dresler's Pipistrel

Virus



Virus SW / by Gary Wolf



FOR MANY YEARS a cross country plane has been a Mooney, a Cardinal, or one of the retractable Pipers, powered by a large engine and capable of quickly covering a lot of distance between fuel stops. Although these have four seats they rarely carry more than two crew plus a weekend's worth of luggage, but they are roomy and comfortable like an SUV, with SUV-style fuel consumption. More efficient are the two seat RV's, Glasairs, and other fast glass aircraft, trading interior space for speed, but still getting less than 30 miles per gallon of 100LL. In the past decade a new category of high speed personal aircraft has been emerging from Europe, high tech lightweight two seaters built from composites, and powered by smaller, more efficient engines.

The cost of fuel in Europe has forced manufacturers to design aircraft that have much less drag so that they can achieve good cross country speed. High strength composites are being used to create lightweight wind-cheating airframes, and light weight means that smaller engines may be used. The Rotax 912S engine appears to have most of this new market, largely because of its low fuel consumption, light weight, and compact dimensions. At cruise rpms it is not uncommon for this engine to use fewer than four US gallons per hour, and it runs happily on much less expensive unleaded auto fuel.

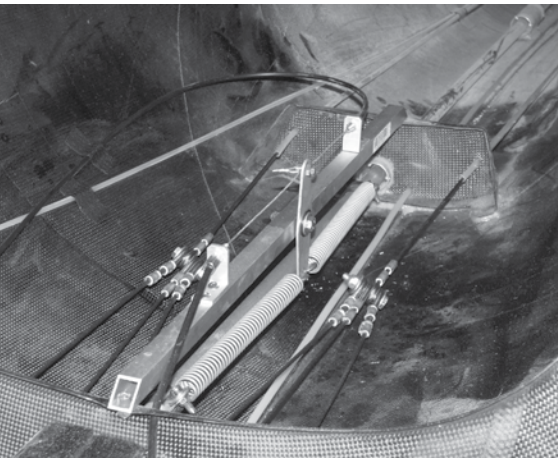
There are dozens of European manufacturers now building two seat sport planes but the one that stands out above the crowd is Pipistrel. This company has embraced new technology like no other. They have been designing and manufacturing high performance sailplanes for many years so they have their low drag, low sink rate act together. Their powered aircraft benefit from what they have learned from sailplane design and manufacture, so less of the

engine's power is used to overcome gravity and more can be used to make it move forward.

Pipistrel's manufacturing process is very clever. In Eastern Europe there are many manufacturers of aircraft components, so Pipistrel carves out their moulds on CNC machinery and sends them out to the subcontractors who then make the parts. Everything is tracked, right down to the last bolt and the name of the technician who tightened it. Pipistrel tests everything to certified standards and documents it all for their civil aviation authority. Their intent is to be producing certified aircraft in the near future.

Have a look at the Pipistrel Virus (pronounced vee-rus when calling the Tower) and squint a bit and you will see a sailplane with a prop on the front. The wings are long and have a high aspect ratio, even on this Virus SW (short wing) version. Thirty five feet of span with a short chord means low drag. The fuselage begins with a spinner, and the tightly fitted engine cowls are round in cross section for minimum wetted area. These cowlings flow seamlessly to the cabin that is essentially an oval shape, closing again to become a small diameter tail boom with a T-tail. The wings and empennage are smoothly faired to the fuselage and nothing sticks out anywhere. The main and luggage doors fit flush and tight to the cabin and only the fasteners holding the landing gear stick out into the airstream. The watchword is smooth.

The laminar flow wings of the Pipistrel Virus SW are carbon composite, cantilevered as they would be in a sailplane, and they plug into the carrythroughs and may be removed quickly. The full length gap-sealed flaperons have a range of +18 degrees down to 5 degrees reflexed, and the tips are drooped to minimize vortex losses.



The T-tail is quite small but quite effective. The top mounted horizontal stab operates in clean air so it can be smaller than one mounted low on the tailboom. It also provides an endplate benefit to the vertical tail, improving the effectiveness of the rudder. Both the rudder and elevator have flush gap seals to minimize leakage through the hinge area.

The cabin and tail structures are of carbon composite sandwich construction with inner and outer skins bonded to a foam core, and a composite wing carrythrough traverses the top of the cabin. Steel tube triangular weldments are fitted ahead and behind the carrythrough to give diagonal stiffness to the top of the cabin, allowing large skylights for good sight lines in the circuit. These also provide the mount for the harness of the BRS. The seat frames are structural in this plane so they cannot be moved. Instead the pedals are mounted to tubular subframes that may be adjusted fore and aft to fit the crew. Luggage space is provided on a low shelf behind the seats, with room

for 100 pounds. Even this removable shelf is made from foam clad both sides with carbon fibre and it weighs only a few ounces. The BRS chute is mounted behind the passenger's seat and there is a sacrificial composite plate in the roof and a rocket exhaust port in the floor. The harnesses are taped to the top of the fuselage and fasten to the rear carrythrough structure, and if deployed the plane assumes a slight nosedown attitude.

The two control sticks are well placed and the throttle quadrant is centrally mounted. Prominent on the panel is the control knob for the optional Pipistrel-manufactured variable pitch prop. This knob requires a lot of turns during transition to cruise flight, and then some fine-tuning along with throttle adjustments to optimize manifold pressure for minimum fuel burn. An electric constant speed prop is also available. Elevator trim is between the seats and it is a bit coarse in operation, but stick forces are so light it is entirely possible to leave it in place for the entire flight. This trim is a

cable-operated spring bias rather than a trim tab so it cannot be used as a secondary elevator control if one of the elevator cables should ever break.

Landing gear is a composite hoop that has an airfoil shaped cross section. Since this plane was being ferried home in snowy weather the main wheel pants were removed. As expected, they weigh nothing. The steerable nose gear is a steel tube with an aluminum fork at the bottom. The nose wheel pant is so enveloping that it is necessary to remove the wheel to check the tire pressure. In the walkaround the tire pressure check is for three fingers of vertical space between the ground and the bottom of the wheel pant. Hydraulic brakes with toe actuators are at both crew pedals.

The engine compartment is an example of good packaging. Rad and oil cooler are fed through submerged ducts, and the exhaust system is very effective. The 912S engine is almost silent with this system, and its outlet projects only slightly into the air-stream. If more planes had a system

Spoilers and the Virus

WHEN REINHOLD DRESLER ORDERED his Pipistrel without the spoilers two years ago it was from a US dealer because at the time there was not a Canadian importer. It quickly became apparent that spoilers would be very desirable for landing in short fields. Unfortunately the structure and mechanism must be part of the factory manufacturing process and they cannot be retrofitted. Presently the Canadian dealer does not sell a Virus SW without them; here's his description of what it's like to land with spoilers.
RAA

TO LAND THE VIRUS SW, you throttle to idle in the downwind, work your flaps through the different stages as you bleed off the speed (from -5° to 0° to +9° to +19°. Final approach is at 50 knots with full flaps (19 degrees) and use the spoilers to increase the descent rate just like you would reduce the throttle in most other aircraft. (Rotax 912 is liquid cooled, so shock cooling is not a concern). Once the wheels touch the runway, immediately go to full spoilers and the airplane is almost instantly firmly planted on the runway. Without



Far left: Elevator trim is a spring bias system. Left, A look inside demonstrated the cockpit is well placarded. The trim control is a slider and locknob. Centre, The BRS chute sits behind the passenger; Above, the luggage compartment door fits flush and locks. Right, Nick Jones holds the carbon fibre luggage floor and tailcone cover which weigh almost nothing.

like this there would be no complaints about aircraft noise. The Pipistrel prop also contributes to the low noise footprint, and even in climbout the Virus is almost unnoticeable.

This particular Pipistrel is registered as an Advanced Ultralight, and the process was anything but simple. Reinhold Dresler placed his order nearly two years ago, and at the time there was no dealer in Canada so he was to take delivery from the dealer in New Mexico. Although Transport Canada does not do any sort of physical inspection of an Advanced Ultralight, they are fastidious about whether t's are crossed and i's are dotted in the paperwork, and at the time there were a few question marks about the factory documentation, a problem that has now been solved. Finally in December of 2011 after his plane had been sitting in a hangar in New Mexico for two years, Reinhold and his friend Nick Jones took

an airline flight to Albuquerque and began their trip home to Ontario in midwinter conditions. The familiarization flight was brief but Reinhold and Nick are experienced pilots, and they focused mostly on approach and landing techniques. They also spent a full day in the hangar getting familiar with the avionics including the Dynon D180 combined EFIS/EMS, Garmin 496 GPS, TCAS, Transponder and 406 MHz ELT.

The recommended takeoff procedure is to use 18 degrees of flap and 52 KIAS to 50 ft, and then begin reducing flap in stages. The plane will be off the ground in only a couple hundred feet. Best angle airspeed is 52 KIAS, at 60 KIAS the flaps must be raised to 9 degrees, and at 70 KIAS they must be raised to zero. Best rate is then 75 KIAS and at 80 KIAS the flaps are reflexed to -5 degrees.

In level flight the Virus SW can cruise happily on 75% power at 147

KIAS (170 mph), and at full throttle the pilot must be careful not to lower the nose or the plane can go past the 163 knot true airspeed Vne. At 8000 ft this is 145 knots indicated airspeed. 115 KIAS gives a fuel consumption of 51 miles per US gallon of 91 octane auto fuel. This is 55% power at 4300 rpms, a very low number for a Rotax, where the burn rate is 2.7 gph. Pushing the speed up to 147 KIAS results in a burn rate of 4.3 gph and 41 miles per gallon, pretty good for two people, full fuel and up to 100 pounds of luggage going fast across the country.

Although Rotax allows the use of E10 alcohol-bearing fuel Pipistrel will not, because the fuel is kept in the wet wings and they do not wish to risk any damage to the structure. Esso and Shell 91 are OK but Reinhold and Nick check for alcohol before every fillup.

The stick forces are light and controls are coordinated, their responsiveness varying with airspeed. At cruise

spoilers it likes to keep flying for a few hundred feet.

Videos of myself playing around landing, flying by, taking off etc. in different locations (the landings are with the use of spoilers) can be viewed on Youtube at <http://youtu.be/xopFS1AzCJk?t=1m11s>

Things I like about spoilers...

1. when you touch your wheels to the runway, full spoilers keep them there, planted firmly even in direct crosswinds up to 30 knots.
2. Circuits. I can honestly do 5 circuits in the time it takes the students in the 172 at the local flying school to do 1 circuit.
3. Descent rate. With negative flaps, throttle to idle, full spoilers,

holding the nose down at 130 knots the descent rate is 5000 fpm. The airspeed will not increase.

4 spot landing, even a bad pilot like me, can land on the numbers every single time using the spoilers!

5 landing distance is reduced significantly, to an average of 350 feet if brakes are used. (about 650 feet if you keep your feet off the brakes)

6. Obstacles. You can drop down rapidly after clearing the power lines or trees that block an otherwise perfect landing field.

Jonas Boll



Reinhold's Virus (pronounced vee-rus) is a pretty airplane in flight. Lower right: The upper cabin is braced by a triangulating structure made of steel tube. Another is on the forward side of the carrythrough. Bottom: the glare shield drops down at the corners for better sight lines. The prop pitch knob is on the panel and the throttle and choke are centrally located on the floor. The foot pedal assemblies may be adjusted fore and aft.

speeds it is usually enough to simply think about moving the stick to make slight corrections, actually moving the stick can result in over-control. Roll rate is very fast at 1.6 seconds from 45° to 45°. The rudder does not self-center so it's important to check the ball to minimize drag. At low airspeeds right down to stall the stick is still well coordinated and light, but requires more movement, as one might expect. There is never any feeling of inadequate control.

A stall with stick held full back is just a mush with a healthy sink rate, and the ailerons still work. Stall speed with full flaps is 35 KIAS, and even with them reflexed 5 degrees it is still only 46 KIAS. Service ceiling is 22000 ft and the glide ratio is 15:1, impressive for a plane that is flying on 102 square ft of wing at a loading over 12 pounds per square foot, a testament to the efficiency of the Virus SW. There is a good reason for the prominently displayed NASA stickers on this plane – for two consecutive years it has won the efficiency competition sponsored by NASA.

The circuit presents some unique problems for this particular example of the Virus SW. Spoilers were an option when this plane was purchased and it looks as if they should have been standard. The plane is so slick that with a 3 degree obstruction the minimum field



Virus

Specifications

Wing area	102.36 square feet
Wing Loading	12.03 lb/ square foot
Gross Weight (AULA)	1232 lb
empty weight	~632 lb
Useful Load (AULA)600 lb
Fuel capacity	13.2 US gal
Fuel use (170 mph, observed)	4.3 gph/41mpg
Fuel use (132 mph, observed)	2.7 gph/51mpg
Best L/D	17to1 at 73 mph
Sink Rate (1232 lb, observed)	450 fpm max
Rate of climb (1041 lb)	1200 fpm
Range	1025 miles
Stall, clean	49.8 mph
Stall, flaps	39.76 mph
Cruise (75% power)	152.8 mph

length without spoilers is 1640 ft, and this assumes that the pilot has been exact in maintaining correct airspeeds and flap settings. Approach to the circuit is at no more than 80 KIAS and then the flaps may be at zero. The downwind speed is 60-70 KIAS with 9 degrees of flap. At the base turn the

throttle is pulled to idle and on final the indicated airspeed must be 50 knots with the flaps at 18 degrees. At this setting the sink rate will be 450 fpm and a very aggressive slip will



Many who have a hangar at a rural strip must do without electricity. It can be rather expensive to bring it in from the main road, and then there is the monthly meter charge, all for a few hours of usage per year. Still, it would be nice to have electric lights, a couple of 110v outlets, and perhaps an electric bifold door. Len Litwiller built his own Zenith 701 fifteen years ago and at that time solar panels were onerously expensive, so he used a 12 volt drill, wired to his truck's battery with twenty feet of lamp cord. A few years ago he decided to electrify his hangar using solar cells from Harbor Freight. Two 3-cell sets cost under \$400 and provide 90 watts of power. He mounted heavy copper buss bars to a panel in his building and uses three deep cycle batteries to store the electricity. The system has two inverters, 3000 watts and 1000 watts, and their output runs to his shop wiring.

Len's hangar workshop now has 110 volt outlets all around, and from these he powers his table saw, drill press, and the usual grinders and hand drills. The hangar also has a small apartment with a student-size fridge, a radio, and compact fluorescent lights. Well water is delivered to a plastic storage tank by an inexpensive 110 v immersion pump. Daytime lighting for the hangar is by ambient light that shines through half a dozen translucent panels. The cells have so far been sufficient for the modest demand that Len puts on the system. For local ground transportation Len uses an electric bike/scooter with lithium-ion batteries, charged from his solar system.

result in 800 fpm.

In gusty conditions or a cross-wind, the approach is usually flown at 60-65 KIAS with 9 degrees flap, but a longer float in ground effect should be expected. Nick has landed with crosswind components up to 15 knots and also in winds gusting to 26 knots – taxiing in those conditions is more of an issue than landing. Nick has had to do three go arounds so far due to falling back on old habits and flying a tighter circuit that is no problem in a Cessna, and subsequently crossing the threshold at several hundred feet. If the tower wants the speed picked up the plane can cross the threshold at 80 KIAS at 30 feet but will require several thousand feet to bleed off the speed and touch down – this is simply not an option at most airports. Remember too that the flaperons must be reconfigured for each airspeed limit, so the pilot must be on his toes. Spoilers will cure the problems of floating in ground effect and low sink rate; Reinhold is investigating the possibility of having them retrofitted.

Because the Pipistrel Virus SW can be registered as an Advanced UL it may be legally flown by a newly minted Ultralight Pilot with just ten hours of flight time in a little fabric 2 stroke. Planes like the Pipistrel were never even imagined back in the early nineties when the Advanced UL category was set up and the privilege of flying them was given to the holders of the PP-UL. Fortunately the over \$100K price of these planes will keep them

out of the hands of most novices.

In the US the Virus SW can be a Light Sport, and the higher gross weight allows another 88 pounds of payload. With an empty weight of 640 pounds, this means a payload of 680 pounds. Unfortunately for those who want speed, the Light Sport category does not allow in-flight adjustable propellers, and the maximum allowable airspeed is 120 KIAS. Manufacturers usually specify a prop that will limit the plane to the category limit.

Jaime Alexandre of MD-RA recently attended at the Pipistrel factory in Slovenia to see if the kit version of this plane would qualify for the 51% requirement of the Amateur Built category. The plane does meet the requirements so it may be built as an Amateur Built aircraft. There is not much money to be saved compared to buying a factory built, but the advantage is that the builder can then have the higher gross and payload, and equip the aircraft for night and IFR flight.

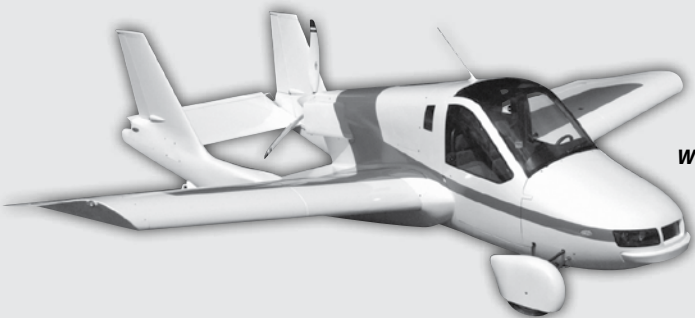
Rotax has recently announced their new fuel injected 912iS engine that uses 21% less fuel. Pipistrel has been chosen as one of the launch customers for this new engine, so real world fuel mileage will be in the 50-60 mpg range, even better than a tiny hybrid car. Just be sure to put an "X" in the box for the spoilers. ✈

For more information:
Pipistrel Aircraft Canada Inc.
Box 1828 Whitecourt AB T7S 1P5
780-779-8907
info@pipistrel.ca www.pipistrel.ca



Half a dozen solar cells are mounted to the roof at the appropriate angle to the sun. Wiring runs through grommets holes sealed with silicone rubber. Simple mounting system

A bank of deep cycle batteries powers everything, including the pump for the water tank. Local ground transportation is solar powered too.



Transition Production Prototype Flies

We've been following this for a few years. In spite of the economic troubles of the day, Terrafugia has upped their game by flying the next version of their street-legal airplane. The canard is gone, and the entire vehicle has a much more finished look to it. A video of the aircraft in flight and on the road can be seen at: <http://bit.ly/HdQcMG>

Dutch Personal Air Vehicle Takes to the Sky

The Dutch Company PAL - V recently announced the successful flight of their first model, the PAL-V One, (Personal Air-Land Vehicle). The vehicle is a delta tricycle - two wheels in the back, one in the front - and leans when cornering, driving more like a motorcycle. The prototype has a very finished look and the styling is exquisite. They are now looking for investors to move to the next stage.

The PAL-V-1 is an autogyro. This is actually a very sensible option for a dual-use aircraft as the rotors are considerably smaller than wings and less complex to stow; couple that with an autogyro's low landing speed and invulnerability to stall and you have a winning combination. It even has two seats. When can I have one? For more information, check out their website (and videos!) at <http://pal-v.com/>



Carter PAV Continues to Meet Milestones



From Carter Aviation Technology's Website:

The PAV (Carter's Personal Air Vehicle Prototype) continues to expand the flight envelope during Phase II Flight-testing. One of the major milestones during the most recent series of tests was to accomplish zero-roll, jump take-offs with the wing extensions added to the airframe. Vertical take-offs are not the most efficient way for any aircraft to take flight, but they allow for complete runway independence, a key advantage of our technology. The PAV has now demonstrated its capability for zero-roll take-offs even though the rotor has yet to reach optimum rpm in testing for a significant, high altitude jump. Phase II Flight-testing will continue next week with an aim to increase cruise speed, altitude and time in air. The ultimate goal for the PAV in testing is to exceed a rotor advance ratio of 1. This would position the PAV as only the second rotorcraft in history to achieve this impressive milestone.

A video can be found at http://www.youtube.com/watch?v=Bw8TIFENPuc&feature=digest_fri

Carter's prototype during Phase 1 testing. It has since had its wings attached as the test program explores cruising flight. The heart of the Carter concept is to generate cruising lift with conventional wings, allowing cruising speeds in excess of those rotorcraft are capable of while retaining the vertical takeoff and landing capabilities of helicopters in a simpler aircraft. Photo by Carter



Drill Doctor

Can the good doctor beat hand sharpening your bits? / RAA

Building an airplane means drilling a lot of holes, and these must be drilled to accurate diameters to provide the bearing area to transfer the load from one part to another. Unlike motorcycles, boats, and other toys, aviation cannot afford the weight penalty of oversized fasteners.

The materials we use can sometimes wear out drill bits quickly, and they must then be sharpened or replaced. Drill bits are not expensive but it can be a bother to run out to the tool supply, so a good drill sharpener is a handy shop item.

The Drill Doctor 350X purports to be able to sharpen any size drill up to 1/2" so I bought one for testing. It consists of a motor with a small diamond wheel, and a collet chuck with alignment fingers to ensure that the drill bit will be properly presented to the diamond wheel at the correct angle and clocking. The bottom of the chuck has a cam that causes it to rise and descend as the operator rotates the chuck. It normally takes a dozen to twenty rotations to renew the tip of a drill, about one minute.

I took pairs of brand new drills and resharpened one of each pair on the Drill Doctor to see how well the machine worked, and unfortunately the results were not as good as a factory-sharpened drill. The diamond stone is a bit coarse but this is not the real problem. With the unit I had the problem seemed to be the accuracy of the chuck itself. On the 3/8" drill the cutting edges became unequal in length, suggesting that the drill was not positioned in the chuck's exact centre. A test drilling in mild steel showed that the drill cut .012" oversized, even when there was a pilot

hole, so I tried sharpening the drill again and got the same results the second time.

On a 5/32" drill the clocking of the bit was also a problem and it appears that the indexing points in the collet chuck were inaccurately positioned. This resulted in a bit that did not have enough relief behind the cutting edges. A test drilling in mild steel required a lot more effort than with a new drill bit, and the bit made grumbling sounds; again the hole came out oversized. The bits would have been good enough for the usual household work but not nearly good enough for aviation.

A friend has the same machine and he is happy with his but he is drilling through sheet metal for pulled rivets, and a few thou over-size does not matter. He sharpened a drill bit for me and I did another test hole in the steel block. This drill came out of his Drill Doctor with the flutes closer to the same length, and the test cut in the steel block produced a hole that was still oversized but not nearly as much as on my machine. The sharpened bit still had too little relief behind the cutting edges and grumbled as it cut the steel. A member who is a retired tool and diemaker had a look at the results and gave a knowing smile. He took the bits over to the bench grinder and sharpened them by hand, and all three then cut like new. It is hard to beat experience.

Verdict: for aircraft, not recommended. **R**



Top: The collet chuck has indexing fingers to clock the drill bit. Left, the collet chuck is rotated and the cams on its bottom cause it to rise and fall to provide back clearance for the cutting edges.

Buying a Drill Press

Is it worth buying? Here's a few things to check before you lay down your cash / RAA



DRILL PRESSES COME in all qualities and prices and builders buy these machines expecting that they will be more accurate than a hand held drill.

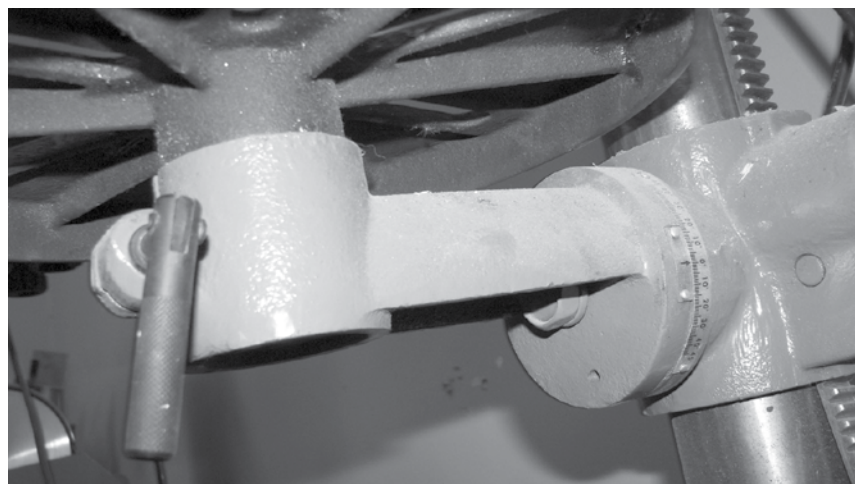
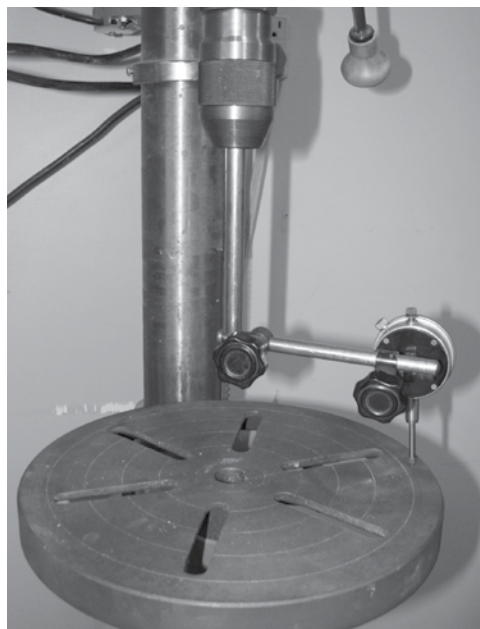
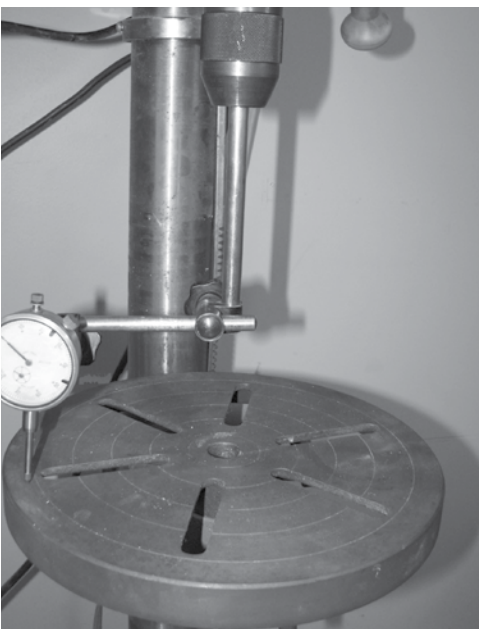
A drill press can be more accurate if everything is set up properly, but before buying one the builder should open the box and do a basic check of the fit of the quill in the headstock. This can be done by extending the quill and giving it a shake to see if it is loose. If it is, open another box and try that drill. A drill press with a loose quill is not worth buying. If you wish to know how much slack there is in a drill press that you already own, use a magnetic stand and dial indicator to determine how many thou of slack there is. A good one will have only .001" or .002", and a loose one will have over .010". Drill bits tend to self centre so if there is a good centre punch divot or a pilot hole even a loose drill press can do a reasonable but not a great job of drilling a hole that is on size. Where the slackness really shows up is

when using a holesaw, and especially when using a single point flycutter. A loose drill press will experience a lot of vibration and runout with these.

Assuming that the quill is reasonably well fitted, the magnetic stand and dial indicator may be used to check runout of the quill. Place the ball end of the dial indicator against the Morse taper shaft of the chuck and turn the chuck by hand. If there is runout it is likely that the Morse taper hole in the quill is not concentric with its outside diameter. Mark the high spot with a magic marker.

Next step is to use a good bolt or a piece of shafting, and insert it into the chuck. Place the ball end of the dial indicator at a radius to the bolt or shaft and again rotate the chuck by hand and check for runout. A used chuck might be filled with chips so remove the bolt and blow the chuck clean, and try again. Make a mark at the high spot and compare to the one on the quill. It might be worth removing the chuck by using a Morse taper drift in the slot in the quill. Try the chuck clocked 180 degrees from its original location and again use the dial indicator to check runout. Try a few more locations to see which produces the best runout and when you are satisfied use a brass hammer to rap the Morse taper smartly back into the quill.

The table of a drill press frequently is adjustable for lateral tilt and there is usually a label with degrees and a zero line, but this zero line can be inaccurate. Remove the shaft from the magnetic stand and install it in the drill chuck, then set the ball end of the dial indicator against the table. Rotate the chuck by hand to see how much vertical runout the table has. Loosen the clamp on the drill press knee and adjust it so that left and right are at the same number. Then scribe a new zero line on the tilt label.



Opposite: Check the total runout with a bolt or shaft in the chuck. Top left: Check lateral tilt of the table; Top right, Compare left and right readings. Above: Loosen the knee bolt with a wrench and when satisfied scribe a new reference line for zero.

The hardest thing to correct is table tilt in the fore and aft plane. The dial indicator will show if the table is leaning out or in. With the shaft of the magnetic stand in the chuck, again set the ball end of the indicator on the table and rotate the chuck. Note the difference in readings right next to the column compared to farthest from it. A difference can mean a warped table or an inaccurately machined knee, the part that protrudes out from the column. Try rotating the table to many locations, checking each time to see if warp in the table can compensate for a mismachined knee. If you are lucky this will work. If it does, then make a mark on the table nearest the column so that if you ever have to rotate the table you can bring it back to the position that makes it the most level. If rotating the table does not work to level it, loosen the tilt clamp and insert a thin shim at the top or bottom as necessary to bring the table into level. Real machinists would scrape the mating surfaces but a shim works well enough for hobbyists.

P.S. Buy a magnetic stand and dial indicator, usually well under \$50 together and very handy. ♣

Denso Iridium IK 24 C11 Spark Plug Failures

The HKS 700 E engine specifies as its spark plug the Denso IK 24 C11 AND Unfortunately there appears to be a manufacturing problem with these. Harish Jadeja, the member who flew his X-Air to Oshkosh last year has already had three failures of these spark plugs.

The ceramic insulator of these plugs comes loose in the threaded steel housing and leaks out combustion pressure, and also allows fresh air to be sucked into the combustion chamber.

This fresh air leak is uncarbureted so the mixture becomes lean and the cylinder and exhaust temperatures rise.

The first failure experienced by Harish was quite pronounced, with the ceramic pushing out 1/4" and causing a rapid and dramatic EGT rise. Harish did a precautionary landing and upon pulling the plugs he found that one had failed. Since then he has had two more failures on subsequent spark plugs, including the one that was recently found while doing his annual. This one was blowing around the insulator as evidenced by the carbon tracks, and the cylinder was showing EGT's at the maximum allowable. temperature. The insulator was loose enough that two fingers can spin the insulator in the housing. The insulator can be easily rotated within the steel threaded section, indicating an internal seal failure. Note the carbon tracks blowing up from the engine.





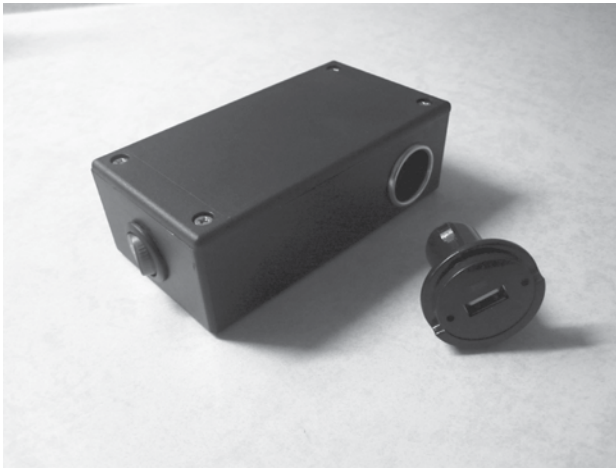
Portable Power

Power you can take with you / by Terry Jantzi

FOR THE PAST COUPLE OF MONTHS I have been involved in building a recumbent tricycle to satisfy my cycling needs, as I grow older and less able to balance those silly newfangled safety bicycles. My project has grown from the simplest possible to one with turn signals, horn, cell phone GPS and an MP3 player (with speakers). All these devices, besides adding weight, require a plethora of batteries. I came to the conclusion that some sort of electrical system was in order. I played around with a single 9V battery which powered my horn and turn signals. However, my cell phone with the GPS application running drains the phone battery very quickly. When I use it in the car, I keep it plugged into a 12V to USB adaptor for continuous use and charging. If I use this power supply while cycling, it will outlast my rubbery legs.

First a very important disclaimer: I have little understanding of electronics and anything beyond simple circuits, other than they work because of the magic smoke that's sealed inside. I often accidentally let the magic smoke out, and then my devices don't work. Therefore this box is very simple, with off the shelf parts. The complicated electronics came out of a blister pack, ready made. That would be the USB adaptor.

I mounted an 8 cell battery holder, switch, 12V accessory socket and a 1 amp fuse and holder into a small electronic project box. The batteries are in series, so provide 12V. I can run or charge most low draw devices from it. I've charged my Blue-tooth earpiece and with the 12V to USB adaptor, can get three full charges into my cell phone. I'm currently using NiMH rechargeable cells, which




My project has grown from the simplest possible to one with turn signals, horn, cell phone GPS and an MP3 player (with speakers).

provide 10-11V but seem OK. It is tempting to plug higher load stuff into the accessory socket which quickly results in that "magic smoke" syndrome, hence the fuse wired into the circuit.

All parts were purchased at a local electronic surplus store. With a dollar store pack of batteries, the total cost came to just over \$12. The switch in the circuit isn't really needed. I think it makes the project look more complicated and the builder more intelligent. But, I do leave the USB adaptor inserted most of the time so it doesn't go travelling. Apparently it and my reading glasses are buddies and have a touch of the wanderlust. When inserted, it does have a minor current draw which does eventually deplete the cells.

The AA battery version of the box weighs 370g (13oz). This project could easily be scaled up with bigger batteries. I have used an eight series D cell pack to run a small electronic picture frame all day at a trade show.

NOTE: the picture on the phone is my "cover model" wife of 31 years. Makes owning a phone worthwhile, just to have the photo with me all the time. 



Many of us fly single seat aircraft without electrical systems and the remedy is sometimes a hodgepodge of wires. Terry Jantzi has designed a tidy and simple solution that can be used to power a handheld radio, gps, and cell phone.

His aircraft building pursuits go back to the early nineties when he began the build of his first plane. In 1997 Terry Jantzi completed his RV-6 and won an "outstanding workmanship" award at the 1998 Oshkosh event. Next he set over 20 world speed records and finally a Canadian altitude record of 26137 ft. He enjoys sharing his pursuits with others, evidenced by the 312 first time passengers he flew in his aircraft. Lately he has designed a solar oven that is now being used in third world countries as well as (in his words) "numerous less useful" inventions.

An avid cyclist and marathon runner, Terry's current project is a self-built recumbent tricycle that he will use for commuting to work and general recreation.



10 years and have served in positions such as Custodian and Program Director. Previously, having been a volunteer and a member at large on DapCom, I was known as "John the Grass Cutter"! One of my projects in those days was the creation of an ornamental meadow and "Loadstar Park". I have a picture of our group dedicating Loadstar Park during a past July Fly In. Don Watson, a previous park caretaker and I started the Remembrance Day Ceremony and our group has kept it going successfully for 8 years. Although I have never actually built a homebuilt airplane, I do fly and look after my Cessna 140, C-FPJP at Delta Heritage Airpark.

The position of President is not one I take lightly. I am aware of the trust you have bestowed in me and I will do whatever I can within the limits of my abilities to maintain your trust. I ran for the position because I had some ideas about how we can maintain the integrity of our chapter and tidy up some organizational issues. We at Delta Heritage Air Park have a lot to be thankful for. We have great facilities, almost our own airport, a beautiful little place to hang out and some great people to associate with. It's in this context that I believe we have a good future and I am optimistic that we can keep our Chapter active and engaging.

We have observed recently that our organization appeared to be floundering in our ability to describe ourselves and our purpose. To rejuvenate and reorient our members I thought the first step would be a meeting to discuss what it is that we should be doing to efficiently run our organization.

One of the first ideas involved meeting the executive committee to talk about what we actually do. I have noticed in previous years that

new executive members do not fully understand or agree about their respective roles and responsibilities on the committee. With this idea in mind and recognizing the limitations of regular meeting times I decided to organize a Saturday morning seminar to give our executive members a chance to meet and discuss what each person's duties were to be.

The chapter constitution and that of the national organization were used as basic references for our discussion. In addition each individual member was requested to prepare a list of duties they thought were required for each of their respective positions. During the course of the discussion other fellow members contributed what they thought the position ought to be.

The executive of Chapter 85 is composed of the usual four mainstream positions, plus a Past President, seven Directors, a Custodian and a Program Chairman. In addition the chapter appoints several individuals into non elected positions such as the Aircraft Chairman, Hangar Chairman, Membership Chairman and Newsletter Chairman. The airpark Caretaker and a check pilot are two other non elected people invited to serve on the committee.

In all this year we have a group of eighteen eclectic individuals from various backgrounds some of whom are ex career aviators. We have former military and commercial pilots, ex-academics, engineers, financial specialists, a pharmacist, a graphic designer, painters, mechanics and several self employed business persons. In all a very interesting and dynamic group of individuals who share the love of flying and building airplanes. It would be inconceivable to think our chapter couldn't succeed with all this talent. Notably however, no women are on our executive committee this year!

Despite the managerial nature

of the topic most discussions were robust and dynamic. It seemed that most if not all individuals were very keen on defining their role and that of others in the group. We all wanted to describe what it was we should be doing and were eager to tell the other person what he should be doing.

Chapter 85 is and has been a very active Chapter of the RAAC in the past. We have a long and distinguished history of aircraft development and construction. Some very fine home built aircraft have come from the hallowed halls of Delta Heritage Airpark, most notably two extremely fine examples of scale Spitfires and many others. The chapter is very involved with participating in the operation and maintenance of an airfield, an activity which takes some of our time and energy but which pays enormous dividends in terms of having the right facilities to pursue our hobby.

We hope to keep Chapter 85 going for the foreseeable future. In the months ahead our executive will look at all aspects of our organization its responsibilities and activities to maximize the benefit to our members. Our major object will be building and taking care of airplanes but right now I recommend some effort be put into the basic building blocks of running an efficient organization. In the short term I propose we review where we want to go, who we want to be and how it is we are supposed to get there. This means identifying activities, setting standards and defining our goals and objectives, some less fun topics but overall a dividend paying benefit for the chapter in the future. ✚

John Macready, President RAA Chapter 85 and RAAC Regional Director, BC (Mainland).

Coming Events

Governor General's Cup Caribbean Air Challenge 2012 / Martinique Air show.

April 14-April 28 A full program will be posted on www.airrally.com soon. For more information: 450-969- 2247 or ctobenas@airrally.com.

Winnipeg Learn To Land Seminar

Harv's Air, RAA and SFC are co-sponsoring the "Learn to Land Course". The course begins with a ground school, April 13 and 20th from 7:00 - 9:00 at the Lyncrest Flight Centre. To register contact jill_oakes@umanitoba.ca

Annual COPA Rust Remove

April 29, Hanover, ON (CYHS) -Sunday. For more information contact Phil Englishman at penglish-man@copanational.org or 519-377- 3777.

OHFC and COPA Flight 53 Spring Fly-In Breakfast.

May 13, Stirling, ON (CPJ5) Event held rain or shine. For more information, please contact Rob Burns 613-475- 0867 or Robburns2002@hotmail.com. <http://www.oakhillsflyingclub.ca/ohfc/Welcome.html>

Rideau Lakes Flying Club/COPA Flight 56 Breakfast Fly/Splash-In. May 26, Westport, ON (CRL2) Located at N44 40.012, W076 23.799 using 123.2 for communication. For more information, please call 613-273-5282.

Chatham Seminar, Brekkie and TC Safety Seminar

May 26, Chatham, ON (CNZ3): Breakfast/TC Safety Seminar/Fly Market. The Kent Flying Machines branch of the R.A.A, is pleased to present the 10th Annual Fly-In/Drive-In/ For more information contact Gerrit van Vrouwerff at 519-674-3851 or gerritvan@aol.com

Capital Classic Wings & Wheels (formerly Classic Air Rallye)

June 9, Ottawa, ON held at the Canada

Aviation and Space Museum grounds at the Rockcliffe Airport featuring warbirds, classic aircraft and vintage cars and flying displays. For further information, please contact Michel Cote at 819-684-9160 (aircraft) or Ben Loiselle at 613-829-2203. Check out our website at Flightworks.ca

St-Lazare Flying Club/Copa Flight 43, Annual Fly-In Breakfast

June 10, St-Lazare, QC (CST3) from 7:00 a.m. to 11:30 a.m. New unicom frequency 123.5. For more information, contact Michel Moreau at mjmoreau@videotron.ca or 514-694-2129. www.aeroclubstlazare.org.

COPA Fight 124, Champlain Flying Club

host their Annual Fly-In Breakfast June 10, Cobden, ON from 07:00 until 11:00 hrs. CPF4 in the Supp. For more information, please contact Larry Buchanan at 613-638-2792 or lbuchan@nrtco.net.

Kawartha Classics Flyin

All pilots are invited to fly in to Lindsay Airport CNF4 on June 9 2012 9-5 Please call or email Flavelle Barrett 705-887-3414 f.barrett@rogers.com

Zenair Open House and Fly-in

Saturday, June 16, 2012 10:00AM - 4:00PM Huronia Airport (CYEE), Midland,, ON, Canada A gathering of builders, owners, pilots

and friends of everything Zenair-related: Experimental, LSA, ultralight, floats and more! Come tour the kit manufacturing facilities, look at the finished planes of fellow kit-builders and flyers. This event ties in with the annual Huronia Airport Day and local RAA fly-in: All are welcome! Drive or fly-in. <http://www.zenair.com>

Cornwall Flying Club/COPA Flight 59

Annual Father's Day Fly-in Breakfast June 17, Cornwall, ON (CYCC) 08:30 a.m. until noon. For more information, memail@barryfranklin.com Barry Franklin at barryfranklin@sym

Les Faucheurs de Marguerites

Sherbrooke airport, June 30th and 1 July, les Faucheurs de Marguerites, For more information, visit their web site at: www.lesfaucheurs.com

Delta Pancake Breakfast

Second Sunday of each month - Delta Heritage Air Park, Vancouver. Monthly fly-in pancake breakfast by RAA Chapter 85 and DAPCOM. Air Park location is in the CFS. Full breakfast for \$4. Breakfast served from 9am until the food is gone or 11am, whichever comes first.

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copa@copanational.org

Web site:

www.copanational.org



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 Ibergville, 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 19Aileron in the airport terminal. Contact Ms N.C. Kroft, Gatineau Airport, 819-669-0164.

ASSOC DES CONSTRUCTEURS 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.ca
COB-DEN: 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 Phil Hicks p.hicks@tvsb.on.ca 519-452-0986

MIDLAND/HURONIA

Meeting: First Tuesday, 7:30 pm at Midland/

Huronian 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 rpfooster@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 kris_browne@hotmail.com

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

TORONTO: First Monday 7:30 pm at Hangar 41 on north end of Brampton Airport. Contact: President Fred Grootarz - Tel: (905) 212-9333, Cell: (647) 290-9170; e-mail: fred@acronaav.com

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

WIARTON: Bruce Peninsula Chapter #51 breakfast meetings start at 8:30am on the second Saturday of each month in the Gallery of Early Canadian Flight/Roof Top Cafe at Warton-Keppel Airport. As there are some-time 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/sfcrac.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, Chantelle 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 mon-eypit@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: jjwanhalderen@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



John Macready jmacready@shaw.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 - Wally Walcer 250-578-7343

ALASKA HIGHWAY: meetings held every third Thursday of every month (except July & August) at the Taylor Fire Hall at 7:30 p.m. For more information call 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, Waterloo Airport, Breslau ON NOB 1M0 Telephone: 519-648-3030 Member's Toll Free line: 1-800-387-1028 email: raa@raa.ca web: www.raa.ca

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Deadline for submissions is the first of the month preceding date of issue.

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

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

For Sale

MINI-MAX ttn 217 seoh 29.8. Rotax 447 new GSC prop. skis. radio. always hangared. excellent condition \$11,900.00 obo Dec11

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 Dec11

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



2002 CP 301-A Emeraude. First flew June 2003. TTAF 50 hrs. 0 290G Lycoming 396 hrs. since major. Sensenich metal prop inspected and refurbished by Hope Aero June 15/09. Dual controls (pedals, sticks throttle) custom interior. Annual due May 2012. Always kept in a hanger. Contact Jim Demerling 519-348-9655 (Ont.) \$ 21,500.00

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 disassembled 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

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> \$5000. Owner deceased so I am handling the sale. Contact Dave Smith davecsmith2002@yahoo.com Sep11



STITS 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

9187 AERO GRINDER M 92 with directions, plus drill guide #d 92. This machine refaces exhaust ports without removing cylinders from the engine. 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

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

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

CHAMP FUSELAGE, ribs, fuel tank, complete tail and numerous other parts \$ 1000.00 . Sprint fuselage, spars, ribs, \$ 1000.00 Bill Donig 705-842-0801 Dec11

SKYBOLT FUSELAGE with Marquart Charger cantilever U/C., tail feathers, rudder/ brake pedals, metal fittings, axles, wheels.

Offers. Bill Phipson #3954. Phone 416-431-2009 Dec11

VW engine and many parts. Engine was disassembled after 10 hours for inspection and is still open and appears to be in good condition. Engine has prop flange and one mag. Ten boxes of parts include enough to assemble another complete long block engine. Includes spare oil coolers, spare sidedraft carbs, and there will still be parts left over. Located near Hamilton ON w.brubacher@sympatico.ca Dec11

Sportsman 2+2 Project for sale ; owner has passed away. This is a nice four place super-cub style amateur built suitable for short field work or floats. Nicely welded fuselage is painted and almost ready for cover. Wings are all aluminium structure and almost ready for fabric .Most airframe parts included . No motor, prop or instruments. Call Richard 705-652-6307 \$17,000. OBO



Europa XS monowheel with Rotax 914 turbo engine and Airmaster constant speed prop, 87 hrs total time. VFR panel with Mode C transponder, KMG GPS, Becker 720 com with intercom and headsets. This is a fast and efficient cross country aircraft with low fuel consumption. Asking \$65K, no reasonable offer refused. Contact Hazel Pererym at 250-672-5587 snowgoose@telus.net

For Sale: Zenith CH601XL , airframe 80% complete, controls installed. Canopy mold. No landing gear. Subaru 2.2L no re-drive.

\$3000 or best offer. Call 705 279 4399 or 519 351 6251

Many parts from Dave Johnson and Cross-flow Subaru belt re-drives including shafts and prop flanges, bulkheads and separators, bearings in their housings, also starter mounts, but no gears. If you are a national member and you need parts and show up on a Wednesday morning, they are free. If they must be boxed and shipped there will be a charge for this. garywolf@rogers.com 519-648-3030

Zenith TRI-Z CH300-1983. Lyc. O-320 Sensenich prop, ICOM 2000/intercom. Nose wheel mod. Toe Brakes. Nav/Strobes/Bcn. TT 273 \$19,500. albanus@rogers.com 905-686-7546

Zenith CH300 for sale First flight 1990 265 hours TT airframe and engine. Lycoming O320 E2D 150 HP engine professionally "zeroed" by Leavens aviation with all documentation. New McCauley cruise prop installed 3 years ago (cruise all day at 135-140 mph on 8gph). Professionally painted by flying colours in peterborough. \$10,000. New sliding tinted canopy installed 5 years ago..flawless..with no cracks.

New interior installed top to bottom..seats..doorskins..panel..dash ect. Full IFR steam gauges. blue mountain EFIS light. 3 axis auto pilot. True Trak pictorial pilot AP coupled to Garmin 396 to track a flightplan or approach..super accurate. Truk Trak Altrav VS altitude hold with verticle rate..aircraft can be flown hands off from takeoff to short-final....trust me ive done it....amazing amazing unit!

Flo scan fuel management system computer with opitical transducer....super accurate...with fuel remaining...fuel used....endurance for given power setting and of course fuel flow.

King digital 720 radio. Narco mode C transponder with encoder. Ammeter and Volt meter. 4 place intercom for front and back seat headsets. Full lights inside and out for night flying. New tires 2010.12 volt recepticals front seat and back seat for PAX. Reiff full pre-heat system for winter operations.. (oil pan heat and cylinder bands for each jug..very effective). Air Wolfe remote oil filter system installed for 50 hour intervals and added engine protection.

New Marvel carb installed 2007. All builders logs and plans..complete journey and tech logs..all owners manuals and professionally produced POH documenting every aspect of aircraft operations as well as placarded checklists. Always maintained to highest standards...\$ 35,000....(certified and e-tested!!). I would have no qualms selling this aircraft to anyone.....a joy to fly. Warren 289-259-6460

Cavalier 102.5, "Aero Sport Power" O-320-B2B; 152 TTSN. Sensenich metal prop. Airframe was totally rebuilt in 1997; 1750# GW, 622 lb useful load; VFR instruments + Garman GTX 327 TXP Mode C & Val Radio; Trutrak Turn & Bank; Kept in heated hangar; 8/10 inside and out. \$29,000 OBO. cavalier102@uniserve.com or 250-558-5551. Ask for Cameron.

O-235 Experimental TSO-87, smooth 3 blade Warp 77-since new, mags 77hrs, carb70hrs, high compression pistons, presently on aircraft. Runs great, upgrading to O320. Ask\$12000. Jamie Richarjs@xplornet.com

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.

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 13691 McLaughlin Road, R R 1, Caledon, Ontario L7C 2B2...or email us the information and a high resolution digital picture (jpeg format please) to: raa@zing-net.ca



Kasper Naef's Rans S-7

A Turbo'd Geo Engine helps with mountain operations

There is always a lot of talk about auto engine conversions and not much actual building or flying. By contrast Kasper Naef of Nelson BC has built and flown several Geo engine combinations for his modified Rans S-7 Basic Ultralight floatplane. In 1997 he began with a turbocharged 1 litre Geo three cylinder engine and an early Raven HTD belt drive. The power was good but high temperatures were always bothersome. Later

the Geo G13BB four cylinder 1300 cc engine with single cam and 16 valves became available, so Kasper modified the redrive to fit this engine and began flying behind it in 2005. The result was about the same power as the 1 litre turbo engine but without the cooling problems

Kasper next added a Garrett T 25 turbo to this engine and it took nearly two years to get everything sorted. One major improvement was the installation of the Simple Digital Systems engine management system from Calgary AB. www.sdsefi.com This system made it possible to dial timing and mixture in properly. With the firewall of the S-7 being only 24" wide and 26" tall it was a challenge to fit the oil and water rads plus the intercooler inside the cowling and still get rid of the heat radiating from the turbo but he did succeed in this. Kasper now has 200 hours on this engine and turbo combination and everything works well. With the Czech amphib floats his cruise speed is just over 100 mph at 31" manifold pressure (~1 pound of boost). Above 9000 ft the true airspeed of the S-7 is 125 mph.



Climb is 1000 fpm at 35" MP and the wastegate is set to a very conservative 38" limit. Takeoff rpm is 5200, and with everything pushed forward in level flight the engine turns 5700. Normal cruise is around 5000 rpms at 4.5 to 5 gph.

Kasper Naef's current project is a Rans S-6 that he is building for the Amateur Built category. He has again chosen the G13BB Geo engine but this time it is fitted with the SPG gearbox from Airtrikes in Quebec (www.airtrikes.net). Because of the short offset between crank and output shaft he has laid the engine over to be able to raise the thrust line. The turbo is rather low and it is necessary to have its oil drain by gravity so he has built a new sump below the engine. The stock geo oil pump handles all lubrication and test runs with a clear oil pickup tube show immediate pickup from the low sump.

Kasper is again using the T 25 turbo and SS engine management system as they have been proven on his S-7. A video of the engine running on the test stand may be seen at http://youtu.be/lq6z0_ep9q4

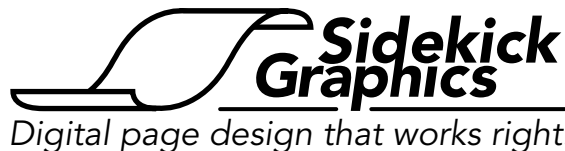
Above: Despite the tall inline engine the cowling has pleasing lines. Louvers assist in removing turbo heat.

Upper left: The rad, oil cooler, and intercooler are well packaged with the belt redrive.

Lower left: The fabricated exhaust manifold feeds the Garrett turbo which is itself an effective exhaust silencer.

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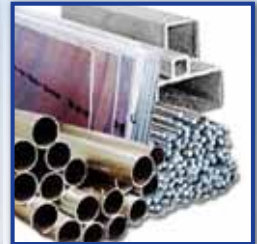
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