



# Skywriter

Monthly Newsletter of the Calgary Ultralight Flying Club

## April 2001

### From The Cockpit

by Brian Vasseur

Well it's springtime so we're finally getting the snow and wind that we didn't get all winter. Nonetheless it's airplane season again so it's time to go flying.

Spring always brings two things, getting your airplane ready to fly again and those who are buying a plane for the season. Don't let the sunshine after supertime get you too excited to cut corners.

First if you haven't flown all winter it's probably a good idea to drain the tanks and the fuel lines, right to the carb. Fuel accumulates a lot of moisture in the winter and loses its kick so it's better off used in the car or the lawnmower. In addition 2 stroke oil settles out and won't remix correctly after sitting for several months. I proved this with a Rotax in a Ski-Doo that threw a crank bearing due to lack of lubrication. This is not a place you want to save \$20.

Second, mice and birds have probably found a home in your airplane somewhere. Mice can slip thru a hole 1/2" x 1/4" so you need to be really thorough. Pull all the ducting, covers and any inspection hole in the airplane and have a really close look. I

once saw the generator in a C150 packed full of grain because the mice found the 3/4" air tube to be a nice tunnel.

If you had your airplane in a hanger then it may not be thoroughly covered in muck and grime but it still should be washed down. Do this out in the sun so you can have a good look at all the surfaces for damage, wear or cracking. If the airplane was parked outside pay particular attention to sealing surfaces and fabric. It might look good but you'll find that it could be rotting from the inside out.

Every moving surface, hinges, axles, cables, etc. all need to be lubricated. If you fly off grass or dirt it's well worth your time to pull the wheels off and all the hinge pins. They tend to accumulate dirt and if these aren't thoroughly cleaned and regreased you'll find that eventually abrasion will damage the part beyond repair.

Now to the engine. I hope you took the battery out for the winter and kept it charged, but if you didn't then now is a good time to throw it on a tricklecharger for a few hours to get it into shape. Pull the plugs off each cylinder and spray in a couple quick shots of WD40, then pull the engine thru a few times. This will cleanup the rust in the cylinders and lube the engine before you start it. It's also a good time to put new plugs in.

Check the carbs very closely to make sure that they're not sticky and that the vents aren't plugged. It's worth the time to pull the top off of the Bing carbs to make sure that they're not sticky or gummed up and that the needle isn't scratched. Spray a couple shots of WD40 into the carbs too as you pull the engine thru to help lube the crank. Check all the other fluids in the engine before you put the cowling back on.

Your first flight should be a short one, just a circuit or a short flight close to the airport. You want to check to make sure that no new leaks have developed and if you stick close you'll be able to land quickly if something unexpected comes up. There's always the possibility that you missed something in your checkout, or didn't recheck everything after you put your airplane back together again.

Finally give yourself a chance to familiarize yourself with your airplane again. Don't jump in right away with a passenger. Give yourself a few hours to get comfortable again before you plan a trip or plan anything challenging.

Ultralights are a safe, enjoyable sport if you take the time to be careful. I'd like to see us get thru this year without a fatality or serious accident. If we all work at it I'm sure we can pull it off. →

# For Sale

**1999 Chinook Plus 2** - Advanced Ultralight, always hangered, 34 hrs TTSN, Rotax 503, DCDI, electric start, oil injection, 3 blade prop, extended cabin, hydraulic brakes, tundra tires, new skis, excellent condition, \$23,000 OBO. Jim (403) 547-6714 or [venturae@home.com](mailto:venturae@home.com). (4/01)

**Rotax 503** - new, OTT, single carb, new muffler, \$3900. Chuck Duff 938-6157 (4/01)

**Flying-Flea HM-293** - famous Mignet Aircraft redesigned by Grunberg as an ultralight. More than 100 flying. French plans and brochure with English translation, \$110.00, mailing included. Paul Pontois, 1890 Rang des Chutes, Ste-Ursule, Quebec J0K 3M0 819-228-3159 (4/01)

**Super Koala** - Rotax 503, DCDI, Culver wood prop. Airspeed, Altimeter, Tach, CHT, EGT, Hour meter, Fuel gauge. Heated cockpit. Less than 200 TT on new engine and airframe. This is an attractive, predictable and easy to fly taildragger. Open to any serious offers. Dale (403)293-3826. (4/01)

**Renegade Spirit** - TT 260, 65hp Rotax 532 60 hrs since rebuild, excellent condition, always hangered, see pictures and details at [www.skywalker.ca](http://www.skywalker.ca), \$25,000 OBO. Bob Kirkby 403-569-9541 (2/01)

**1984 Chinook WT-2** - 6 hrs on Rotax 377, 10 gal tank, ICOM A4 radio, wheels, skis, floats, & more, \$6500. Don Leonzio 250-427-2046. (2/01)

**Rotax 503** - DCSI, "A" box, 228 TTSN by Reg's Engine. 30 STOH. Currently on a Beaver RX 550. Well maintained, strong engine. \$2500. Call Ron at (403) 345-3013 (2/01)

**1998 Fisher Avenger** - 90 TTAF, 200 TTE, Rotax 503 DC, 2-blade wood prop. Many new parts including hardware, fuel system, canopy and more. Canopy converts to open cockpit by pulling one pin. Great handling, great visibility.

\$8500 OBO. Call Stu at (403) 255-6998 or e-mail at [simpsont@cadvision.com](mailto:simpsont@cadvision.com) (1/01)

**VPI Kit** - partially complete. Most materials and hardware to finish. \$2000 invested, \$900 obo. Brian Vasseur 226-5281 (12/00)

**Honcho Nomad** - no engine, needs rebuild, with custom trailer. This is a high-wing, strut-braced motor glider, \$2000. Call Russ White 250-353-2492. (12/00)

Forward ads to Bob Kirkby 569-9541.

## Ads reprinted from the March St. Albert Flying Club Newsletter

**Bushmaster II** - Rotax 503 dual carb, 80 hrs on engine after complete rebuild, tundra tires, skis, bench seat, radio, dual headsets, hangered, \$15,000. Dan Pandur 780-452-2491.

**Penetration skis** - suitable for ultralight or home built, \$500 OBO. Reg Lukasik 780-459-0813.

**Floats** - with lockers, spray rails, water rudders and rigging. Suitable for ultralight or home built, weight 130lbs, \$3000 OBO. Reg Lukasik 780-459-0813.

**Chinook WT II Plus** - single seat, upgraded wing & tail, approx. 35 hours on new Rotax 447, endura paint, brakes, flaperons, skis, cabin heat, Icom IC-A4 radio, cruise at approx. 67 mph with 230 lbs. pilot, always hangered, \$8000, call Dan at 780-906-3472 or e-mail at [d\\_campeau@hotmail.com](mailto:d_campeau@hotmail.com)

**1986 Bushmaster II** - ultralight, high cabin, side by side seating, dual controls, heater. 130 TTSN. Rotax 503, SCSi, 120 TTE. Complete manuals, drawings, & logs. Never a trainer, only 2 pilots. Very good condition, \$16,500 OBO 780-459-0813 or e-mail [tya@compusmart.ab.ca](mailto:tya@compusmart.ab.ca)

**Hirth F-23** - used 6 hrs, 40 Hp, \$2,800.00 Dan (780) 452-2491

**Three bladed GSC prop** - 64", almost new, \$500. Contact Viv 460-8753.

**REDUCED!** 60" x 38 Culver wood prop (left hand) drilled for Rotax. \$250.00 Contact Viv Branson 460-8753.

## Skywriter

Skywriter is the official newsletter of the Calgary Ultralight Flying Club and is published 12 times per year. Forward your articles and letters to:

**Editor:** Bob Kirkby 569-9541  
e-mail: [kirkby@skywalker.ca](mailto:kirkby@skywalker.ca)

**Assistant-editor:** Bernie Kespe (see below)

## Calgary Ultralight Flying Club

Meetings of the Calgary Ultralight Flying Club are held on the second Thursday of every month, except July and August, at 7:00 pm, at the Northeast Armoury, 1227 - 38 Avenue NE.

**President:** Brian Vasseur 226-5281  
e-mail: [vasseurb@cadvision.com](mailto:vasseurb@cadvision.com)

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e-mail: [kooyman-eng@home.com](mailto:kooyman-eng@home.com)

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**Past President:** Wilf Stark 935-4248  
e-mail: [wstark@compuserve.com](mailto:wstark@compuserve.com)

Visit the CUFC web site:  
[www.cadvision.com/cufc/](http://www.cadvision.com/cufc/)

## CUFC BBQ

The Calgary Ultralight Flying Club annual fly-in/drive-in family barbecue will be held at David Boulton's air field. Barbecue will start at 1 p.m.

**Sunday July 29<sup>th</sup>.** (Rain date will be Sunday August 12<sup>th</sup>.)

Maps and additional information will be published in the June newsletter. If you wish to help organize games or a flying event please contact Bernie Kespe at 255-7419

## Letters to the Editor

I look forward to the newsletter that I receive every month down here in California. I know of no clubs in this area that are as active and involved as the Calgary club. Look forward to a visit to Calgary within the next 3-4 months. I will try to visit Calgary when a club meeting is taking place. I communicate with Stu quite regularly and we have become good friends, even though we have never met face to face.

Dennis Rupert

*Thanks Dennis, hope to meet you soon - Editor.*

## Flying Events

**April 8-14** - Sun 'n Fun, Lakeland, Fl. For info call 941-644-2431.

**May 4-6** - Toronto Aviation & Aircraft Show. For info call 877-863-5946.

**May 6** - COPA Red Deer Safety Seminar and fly-in breakfast. Seminars start at 10:00am. For info call 403-886-5191.

**May 20** - Rotax Speed 60 2<sup>nd</sup> annual timed event, St. Albert. See detail on page 7.

**May 27** - Medicine Hat fly-in breakfast at Hangar 1, 9:00am to noon. For info call 403-527-9571.

**June 1-2** - Calgary International Airport Aviation days.

**June 3** - Lacombe's 35<sup>th</sup> annual fly-in breakfast. For info call 403-782-3827.

**June 3** - Hanna Fly-in Breakfast 7am to 11am. For info call 403-854-4522.

**June 10** - Hinton annual fly-in and mini-air show at Hinton Entrance Airport, free camping. For info call 780-865-2159.

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**June 10** - Innisfail annual fly-in breakfast 7:30am to 11:00am. Use Rwy 16-34. For info call 403-728-3457.

**July 14** - Annual Kirkby fly-in breakfast at Chestermere-Kirkby Field. 8:30am to 12:00noon. For info call 569-9541.

**July 15** - Vulcan annual fly-in breakfast 8:00am to 11:30am. For info call 403-485-2633.

**July 11-15** - Northwest EAA fly-in, Arlington, Wa. For info call 360-435-5857.

**July 21** - Nanton Lancaster Air Museum 2<sup>nd</sup> annual invitational fly-in at AJ Ranch. See details on page 6.

**July 24-31** - Airventure Oshkosh. For info call 920-426-4800, web site [www.airventure.org](http://www.airventure.org).

**July 29** - CUFC annual fly-in/drive-in BBQ. Starts at 1:00pm. See details on page 2.

**August 4-5** - Red Deer Airshow with the Snowbirds.

**August 8** - Cranbrook Airshow with the Snowbirds.

**August 18-19** - Lethbridge Airshow with the Snowbirds.

## The Test Flight

Do you realize that test flying your project is much more dangerous than test flying a new super modern Mach 2 plus jet fighter? Why is that you say. Well firstly, during the years(yes years) of building you're probably not flying all that much thus losing some of your skills. Secondly, you may or may not have had a professional to help your with your project. You were pretty much on your own for much of the time working (in most cases) with a less than a complete and detailed set of plans.

That new fighter jet has behind it hundreds of specialist, engineers for aerodynamics, materials, design, you name it they have it. They use super computers, wind tunnels, extensive modeling etc. By the time the prototype is build, they have a good idea of how it will behave. They will also have a fully functional simulator on which test pilots will fly many hours before they are allowed to fly the real plane. You, on the other hand, have none of that.

Regardless of how many books you may have read or how detailed the flight manual is and how familiar you are with it, if you do not use your head along with a large dose of common sense you are bound to make a hole in the ground.. Whether you are flying at 60 or 600 miles per hour, the only difference will be the size of the hole.

Prepare every test flight as if your life depends on it, because it really does.

## The Mystery of Wayne!

by Ed D'Antoni

Why do they put the small wheel at the back of some airplanes? Because it is simple and cheap! How well do they work? About the same as pushing a shopping cart backwards! There is no control problem in driving your automobile down the highway at 100 kph (forward of course). Try driving your car 30 kph backward in a parking lot. Then think about landing a three wheel aircraft at 50 mph (80 kph) with all the control of your backward moving car in a parking lot, or worse yet a shopping cart.

As I assembled my AVID STOL over the last 12 months these thoughts were constantly on my mind. A decade ago Wayne Winters taught me how to fly. The training aircraft was a Merlin taildragger. Since I didn't know any better I soloed in 7 hours. Thank goodness for Wayne's calm, perceptive, and excellent landing instructions. Until recently I hadn't flown a taildragger for 10 years yet Wayne's words are still indelibly etched in my mind and repeat themselves every time I reduce throttle and turn final. "Maintain airspeed at 55, use throttle to get to the runway, keep level with ailerons, use rudder to line up with the runway and straighten out at touchdown". In ground effect over the runway Wayne would repeat "keep pulling back on the stick, back, back ---- that's it", and we would touch the ground in a perfect 3 point landing, the aircraft rolling to a stop in only a few hundred feet.

After the Merlin I flew tricycle gear aircraft, a Cessna 172 then a Rans S-12. Landings became complacent non-events. With the inevitability of flying a tail dragger looming, I took some taildragger dual time. The only taking off I was capable of was taking the aircraft off of the runway and into a plowed field. After about 3 attempts I finally figured it out and was able to stay on the runway long enough to get airborne. Landings! Well thanks to Wayne Winters training, even after all these years, the first attempt was a perfect stall landing. That still didn't

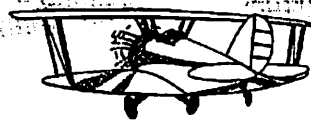
leave me with enough confidence to test fly my newly assembled Avid Flyer. After a couple of hours of taxi tests I asked Jim Corner, a Kitfox builder and owner if he would be willing to test fly and trim out the Avid. Except for the shape of the cowl Jim's Kitfox is identical to my Avid. Jim accepted my request. Prior to the test flight we did a long engine run up, then shut down and thorough engine and aircraft check. Jim then taxied to the runway, increased throttle until the tail lifted, then checked the aileron effectiveness by first lifting the left then right main wheels. Knowing the ailerons were responding properly he broke ground in about 300 feet. After the flight Jim informed me cruise speed was 85 mph at 6000 rpm and that the best approach speed seemed to be 60 mph.

The following Saturday I practiced circuits with the Rans. I did an hour of 60 mph upwind, downwind, crosswind from the left and crosswind from the right approaches and landings. Even though I was flying a tri gear, I followed Wayne's instructions, landing on the rear wheels with the tail just touching the runway grass. With no "bad" landings I was a little more confident about moving up to the dreaded tail dragger. The following day I did 4 taxi runs, then on my 5<sup>th</sup> thought "hell I may as well fly this thing", and within a few seconds I was flying. Airborne, my first thought was "now I have to get this thing down". The Avid tail wheel is quite high leaving the

landing attitude more horizontal than most taildraggers, thus stall landings would be faster than I really wanted. I do not have a lot of confidence about maintaining control of a taildragger at high speed. I remember my friend Al landing his Cessna 180 in a strong crosswind on Calgary International's runway 16. Touching down on his left wheel, slowing until his right wheel settled and then hearing an Air Transport Pilot say, "Heavy 812, N-I-C-E". A year later Al and his 180, upside down on the same runway made the evening TV News. If that could happen to Al, for sure it will happen to me! With the imaginary Wayne Winters at my side, his voice guided me as I turned final. Altitude 500 feet AGL, airspeed 60, throttle setting 4000 RPM, the stationary point on the windscreen showed I would touch down just past the cones at the end of the runway. There was a slight crosswind from the left. I continued the standard power on approach, flared just past the start of the runway, making sure the aircraft was "straight" on the runway at all times, placed the throttle to low and followed Wayne's instruction. "See how long you can keep the aircraft in the air before the wheels touch." The tailwheel touched first and I doubt if the rollout was 150 feet.

Thanks Wayne! →

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## An Adventure

by Carl Forman

I was attending the Calgary Ultralight Flying Club social on Saturday night and couldn't resist the opportunity to set up a trip to Linden the next day for lunch with Glen Bishell. The weather on Sunday was forecast to have a 40 % probability of snow showers, high of minus 12 C and light winds. Given the forecast, I probably shouldn't have planned to fly but I had not done much flying in the last couple of months and I really wanted to go.

Sunday morning I got to Kirkby Field early and took a side trip to Indus. After some hangar talk, I returned to Kirkby Field and phoned Glen to see if we were still on. Glen was all set to go but I hesitated a little with low ceilings and a real possibility of snow showers later that afternoon. I finally elected to go ahead and was soon off the ground heading the forty miles to Linden. Announcing my location and intentions as I neared the Biesecker area drew a lone response from Glen who was doing a little sightseeing east of Linden. Before long we were both on the ground, heading for the restaurant. We shared a Chinese dinner and got into interesting conversation about Glen's recent trip to Mexico. Time flew. Too much time flew!!

Finally about 2pm we headed back to the airfield. The weather looked a little worse to the south. Still I was confident that it was sufficiently clear to make it home. In the minus 10C weather the Minimax departed Linden like a homesick angel and I took delight in wagging my wings in response to children below who were waiving their arms so hard I was afraid they would come off. As soon as I made my turn to the south, I could see the clouds had descended and they looked even worse further south. Conditions to the South continued to deteriorate each passing minute. There didn't appear to be much hope for improvement. In fact, there were snow showers ahead and lowering ceilings.



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I decided to detour to Beiseker. I set my GPS to "goto" Biesecker. It was six miles further south on a heading of 167 degrees true. If I couldn't get there I would go back to Linden or put down on a road. The ceiling was now down to 800 feet AGL and descending, forward visibility was 2 miles and diminishing. To the west visibility was about three-quarters of a mile and to the east it was 3 miles. I called out my position and intentions on the Beiseker frequency. There was no response. No one would be dumb enough to fly in this stuff anyway. Two miles from Beiseker the runway suddenly appeared. My biggest immediate concern up to this point had been avoiding towers. I was pleased to see how clear it was for my intended route into the circuit and on to the runway. The landing was uneventful. I sat in the Minimax for a moment congratulating myself on my decision to land. I turned off the radio, shut down the engine and got out of the airplane just as the light snow started to fall.

Two men exited their hangars and looked in my direction and then at each other. They talked a bit, glancing my way. I presumed they were not

impressed with anyone out flying on a day like this. Eventually they came over and offered assistance. One was Jack Landage who owns a Waco biplane and the other is Bill Beagle, the owner of a Piper Pacer. After a short discussion they agreed to let me leave the Minimax in a spare hangar overnight. Jack fired up his tractor and cleared the snow. Next Jack and Bill drove me back to Kirkby Field. On Monday Bob Kirkby drove me to Biesecker and the flight home in the crisp clear conditions was delightful.

I haven't stranded myself much over the last 35 years that I've been flying and I don't plan to start making a habit of it. However, it is nice that a situation which could have been very aggravating turned out to be an opportunity to meet two nice guys. I don't wish anyone bad luck in the future but I know I would like to return the favor to some other pilot if I'm given the chance. →



Carl and his MiniMax along the same route on a much nicer day.  
Photo courtesy Stu Simpson.

# Tower warning!

by Bob Kirkby

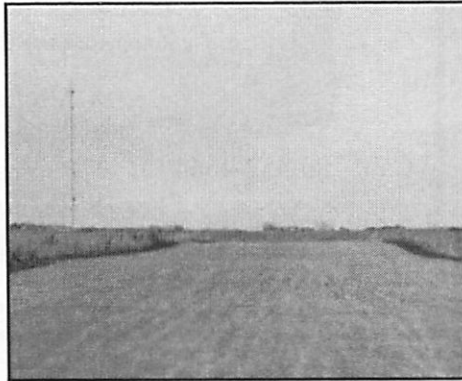
Chestermere-Kirkby Field has a new lawn ornament. Exactly 1.5 miles north of the threshold of runway 16 you will find a new 360 foot communication tower. Although it is painted white and orange it does not have a daytime strobe on top and is not very visible from the air.

The tower is 700 feet west of runway centre-line. When doing a left hand circuit for 16 you should easily clear it by ½ mile but when doing a straight-in on 16 or departing 34 you will fly right past it. The tip of the tower is at 3700 feet.

I have written the company that erected the tower twice asking that they install a daytime strobe but so far have had no response. Transport Canada, Aerodrome Safety, has endorsed this request so I am hoping they will "see the light" before

long. I intend to keep up my barrage until I get some action.

Meanwhile look closely for the tower and its guy wires when you're in the vicinity.



*New 360 foot tower is to the left of centre looking north along Runway 34 at Chestermere-Kirkby Field..*

# Ignition - the Spark of Life

by Torello Tacchie

The first, and most important concern of every pilot is that his aircraft's engine displays all the virtues of the Energizer Rabbit, it must keep on going, and going, and going.....

For the sake of discussion, and in an attempt to make this article incompatible with a Tolstoy novel, we'll discuss auto engine conversions.

After years of observations, and an "hands on" conversion or two, I have found that all too many "convertors", attempt to alter a perfectly reliable auto engine, into a perfectly unreliable aircraft engine. Based on personal experiences, observations, and the experiences of numerous aircraft owning friends, I find aircraft engine reliability to be, at best, questionable. So why do they take a perfectly reliable Chevy, Ford or VW, and try to make a Lycoming or Continental out of it? Damned if I know.

The question of redundancy is always paramount with "convertors", to wit, dual ignition for that back up, curse be the point ignition, be gone distributors, and sophisticated electronic ignition systems. Ya gotta have 2 spark plugs for redundancy, praise Allah for the (unreliable) magneto, praise Buddha for two (unreliable) magnetos.

I've logged some 1600 hours of flying, the last 1100 are ownership hours, converted into miles, about 148,000 miles, during which I've had two engine failures. I have replaced 6 reliable magnetos since repairing the old ones was nearly as expensive as new ones, and have purchased 7 sets of spark plugs, at a cost of nearly \$900. All works including the engine overhaul were performed by genuine, certified A&Ps.

During the same period of aircraft owning ecstasy, I've owned 4 automobiles, including 2 "beaters". I have had minor engine problems (Olds diesel, lucky me), have replaced no major ignition component and replaced 4 sets of spark plugs (due to guilt), at a cost of (continued on page 7)

## Nanton Lancaster Air Museum 2<sup>nd</sup> Annual Invitational Fly-in

Saturday July 21, 2001

Pancake Breakfast: 7:00 - 9:00, Lunch: 11:00 - 1:00

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Email: nanton@lexicom.ab.ca

## Ignition - continued from page 6

about \$35. The Olds diesel was traded in, and all work performed by my wife's favorite mechanic, me. Total mileage for all autos, 450,000+. Anyone for a discussion on reliability?

Though there are many well meaning "convertors" that impose aircraft modifications on their reliable auto engines, no modification is more prevalent than the ignition system. Builders will remove the distributor and replace it with a reliable magneto. Two spark plugs, of course, and some of the more daring ones with more money than brains, will go through the expense of adapting aircraft spark plugs at nearly \$20 a copy. I've seen a VW engine conversion at the Sun N' Fun fly-in with dual aircraft spark plugs, and a reliable dual magneto with a common drive, now that's reliability???? Just imagine, all that aircraft reliability in your auto engine, including hard starting, rough idle, high fuel consumption, etc. etc., and, yes, even a proclivity to self-destruct. How grand!!! Sounds extreme? Let's look.

We all know what the function of the ignition system is. At a pre-determined time during the power cycle event of an internal combustion engine, we ignite a mixture of smog (air) and Arabian extract (gasolina, gringo). The purpose of which is, to push the piston down in order to turn the crankshaft which in turn spins our propeller (weed wacker for you grass strip aficionados). Regardless of whatever type of internal combustion engine it is, 2 cycle, 4 cycle, gas or diesel, weed wacker or Rolls Royce Merlin, ignition always occurs at a pre-determined time. This pre-determined time varies from engine to engine. There are a myriad of considerations which determine the timing any given engine requires, such as bore, stroke, compression ratios, valve timing, fuels, etc., etc., just to name a few. For the purpose of discussion, most of today's short stroke designed engines deliver their maximum power near 34 degrees before top dead center, that is, when the piston, on the compression stroke, reaches a point measured at 34 deg. of crankshaft rotation before it reaches top dead center, the compressed fuel/air

mixture is ignited. Why 34 deg.? There are many reasons. During this period, 34 degrees BTDC, a flame produced by ignition, needs ample time to propagate, and complete the combustion process. The exploded mixture expands rapidly, and exponentially A few degrees are left to compress the expanded mixture even more, and when the piston "gets over the hump", TDC, it is pushed down with tremendous force. The force produced, then calculated, is called horsepower.

It is important to remember, "time required to propagate and complete combustion". This amount of time remains relatively constant, regardless of engine speed. When starting and idling, the time required to achieve complete combustion, will occur later, since the engine is turning slower, or retarded, ie closer to TDC. As the engine's speed increases, the process must be started sooner, or advanced. Therefore, if we attempt to start the engine at 34 deg. BTDC, it would certainly try to push the piston opposite the sense of rotation.

Ask an old timer motorcycle rider, or a Model T Ford owner. The biker usually sailed over the handlebars, and the Ford guy ended up with a broken wrist (hand crank, you know). So, what did they do to start their engines? Simple, the biker simply moved his reliable magneto to the start or retard position, and the Ford guy did the same, and voila, the engine would start. No unscheduled flights, and no HMO claims at ER. There's a problem, neither vehicle has the power to push, now what? Simple magneto breath, move the timing lever to the run position. Now we "haz powah". The start position is retarded i.e. ignition occurs later. For the sake of discussion 2 deg. BTDC, would be common. The motorcycle achieved this by moving the ignition point opening cam position, and the Model T moved the entire magneto to that retarded position. As technology moved forward, automatic advances and retards were devised. In the last 25 years, this is all accomplished electronically, no more movin' parts to wear out and fall apart like reliable magnetos. This example is oversimplified, to be sure, but basically all engines must be able to advance and/or retard as the need occurs. There are exceptions such as stationary engines,

but even in today's technology, even these lowly engines have some sort of ignition "timing management".

Timing management is an essential factor in the operation of any internal combustion engine. The automotive industry, motorcycles, outboard motor, etc. now have timing management systems of some form which promotes longevity, fuel economy, and performance. Compare a 100 hp Rotax with only 78 cubic inches displacement with a Continental 100 HP. requiring 200 cubic inches to produce the same power. I know... the Rotax has a gear reduction, but it does so with about 1/3 the displacement of the Continental, and I might add reliably. It is electronically controlled i.e. managed. Some auto conversions in this power range use timing management, in most cases electronic.

What about airplane engines, how do they alter their timing for start and running? With very few exceptions, they do it the old fashioned way, they don't. One exception is the Arrow, it has a certified electronic ignition system. It starts at 0 to 4 deg. BTDC, and runs up to 32 degrees. It has three electronic inputs which alter its timing for proper performance at all times, start, idle, climb, cruise, loaded or not. This timing management is referred as a timing map.

Research information relating to aircraft ignition shows nearly all applications, were and still are using magnetos. There were a few exceptions, but it is safe to say that they had and still have magnetos. All these engines had 2 mags, and of course, two spark plugs. There were certified engines with only one magneto and one spark plug. Some had points and coil systems similar to that used in the automobile. In 1917, the Fiat company in Italy, yes, they made aircraft engines, boasted the largest (3500 cubic inches) aircraft engine of its time, and had no fewer than 4 spark plugs and 4 magnetos. All had one purpose for multi-magnetos, reliability and redundancy. Not so electron breath!

Human nature, as always, demands more.. .. more reliability, more speed, (continued on page 8)

and easier starting. The automotive industry answered the call. Better designs and materials, higher compression ratios for mo' powah., and yes, even electric starters. It was found that the magneto would not allow the every day driver to accomplish all of these "demands". As demands and technology marched on, magnetos were no longer capable of advancing or retarding timing, and were better suited for competition uses, race tracks you know, airplanes, and industrial engines, where engine speeds are constant. Push starts, and pedal to the metal, airplanes, no stop and go, and constant speeds. It was obvious that as an every day driver, the magneto was doomed. What did aviation do for reliability, more speed, and easier starting? In the case of reliability, materials and designs improved as well. Compression ratios went up, more electric starters appeared. I have to admit that at this point of this treatise, I've reached a blank wall. I find that reliability, in aircraft engines is questionable, materials and designs are stuck in the 1930's. With compression ratios reaching 9:1, aircraft engines are on the brink of disaster. Starting, even with electric starters is still not so great, especially for the fuel injection boys. Yeah, but it's still reliable, it has a back up magneto for redundancy. Simply not true.

Two for reliability may have been a noble goal eighty years ago, but not the real reason. As the demand for more performance became paramount, so came hard starting, rough idles, just to name a few. You will recall, the ignition timing is retarded for starting, and advanced for running, reason. . . to propagate and complete a flame for combustion in order to give us maximum performance, from start to full power. Motorcycles and some autos had manual retard and advance features on their magnetos. Airplanes didn't, at least I couldn't find any in my research. Oh yes, there's shower of spark, booster coil, vibrator (how erotic), and last but not least, the impulse coupler. What a neat name. The primary function

**Rotax Speed 60**  
**Second Annual Timed Event**  
**Open to ALL Rotax Powered Aircraft**

Sponsored and hosted by LIGHT ENGINE SERVICES LTD. and the  
ST. ALBERT FLYING CLUB.

**Date:** Sunday May 20th, 2001  
**Place:** St. Albert Airport  
**Time:** Pilots Registration @ 8:00 a.m./Event starts @ 9:00a.m.  
(Rain Date: Monday May 21st. 2001)

"Rotax Speed 60" is a timed event consisting of a 60 mile triangle course. Start and Finish lines are at the St. Albert Airport. Observers will be at each turn point to verify that participants make the turn point correctly ("no cutting the corners").

Participating Aircraft will depart the St. Albert Airport at two (2) minute intervals on a random basis. The course will be flown at no less than 500 ft AGL above the highest obstacle and all rules or airmanship will be observed.

The Finish Line will be overhead of taxiway ECHO at 500 ft. AGL followed by a circuit and landing. Surface winds will determine left or right and circuits. Finish Line personnel will advise active runway on 123.2

Prizes Will Be Awarded in Three Categories:

CLASS I	All aircraft powered by ROTAX 277, 377 AND 447 engines.
CLASS II	All aircraft powered by ROTAX 503 SC and 503 DC engines
CLASS III	All aircraft powered by Rotax 532, 582,618 and 912 engines.

This year the Rotax Speed 60 will be followed by a BBQ in the afternoon @ Robyn Aviation. We will be inviting the Calgary Ultralight Flying Club and other interested aviators to participate in this event.

P.S. We need volunteers for the turn points and start/finish line.

Dan Pandur/Bob Robertson 780-452-2491 (Days)  
780-481-2822 or 780-460-2075 (Evenings)

for these gadgets was for starting, idling, accelerating, and full power was accomplished at full advance.

The impulse coupler is the mostly widely used for starting. This little gem has two functions. It works as follows. When the engine is being started, a detent built into the coupler momentarily prevents the magneto from turning, just before the piston reaches the pre-determined firing timing. At a prescribed moment designed into the coupler, the detents releases a spring loaded device connected to the magneto's armature, and flings the armature at an accelerated rate This

flinging increases the armature's speed which intensifies the spark (remember magnetos produce hotter sparks as they spin faster), of course the piston has moved closer to TDC or retarded, and fires the mixture in a retarded state. Once started, the detents are held by centrifugal force in the advanced position. Hopefully the engine started. Now the engine is running, and idling, and doing so fully advanced. Not a good idea, but O.K. for the engine at operating speeds. At idle, and at 34 degrees, this engine would certainly try to beat itself to death. Solution, retard the timing.  
*(Continued on page 9)*



*Ignition - continued from page 8*

So how do we start, idle, and develop full power with retarded ignition timing? Remember, the object is to propagate, and complete the flame. How does we do that Kemo Sabe? Simple faithful companion, we start flame in two places, we do it with two spark plugs, and two magnetos. So now, we can set the timing at 20 to 25 degrees (a la Lyc/Con), this will give the impulse coupler firing instructions for starting, at around 0 degrees. The engine will start, it will idle somewhat respectably at 1000 to 1200 Rpm's, and produce maximum power as if the timing was set at 34 degs. Igniting the mixture on two fronts, when running will propagate and complete combustion as if the magneto were set at 34 degrees. This is the reason for the obligatory "mag drop". If you have any doubts, simply take your Lycoming or Continental, most have one impulsed magneto and one without (some Lycomings have the epitome of redundant ignition, dual magnetos with a common drive), set the impulsed magneto to normal timing, and the unimpulsed to 34 degs. You'll have to interpolate 34 degs. Start the engine, and perform your mag check, and you will be amazed to find that one magneto will drop (the normally timed one), and the advanced one will almost not. I must caution you, this is not good for the engine, particularly when they are both in use. During starting, most likely, mixture will not be stoichiometric. Most assuredly, the flame will start at 34 degs., not be completely burned and ignite again later at 25 degs. It gets complicated, and can even be costly.

Dual magnetos are not for redundancy. We in aviation have been programmed with this notion, all our lives. Yet there isn't an ounce of thought in it. Two spark plugs are used to propagate a flame completely during a shorter length of time. 25 degrees versus 34 degrees. The time for a complete burn remains fairly constant, therefore we must find a point to achieve complete combustion in order to start the engine, idle, and develop maximum performance. During the late sixties, a major manufacturer built a one cylinder version of a racing engine they were developing. Its combustion chamber was "stuffed" with as many spark plugs

as area would allow, 12 was the number if I recall. The engine developed nearly 3 horsepower per cubic inch of displacement, at 0 degrees BTC. Three per inch is equivalent to a Continental 0-200 developing 600 HP! It was impractical to build, but it proved the theory. Just imagine, 12 shots at redundancy.

In the words of Carl Sagan, "billions and billions" of miles have been flown on magnetos. Two world wars were won with two magnetos and two spark plugs, and two conflicts after that. Sagan would also say, "billions and billions and billions" of autos, trucks, motorcycles, and boats have won the same conflicts, and billions more are running around today, plus...the weed wacker, snow blowers, etc. etc. They all have two things in common, ONE spark plug, and NO redundancy, also, in today's world these engines run on unleaded fuel, yet do not have valve guide wear. They use multi grade oils and do not burn oil. Just two more aviation myths. They also operate under the most adverse and diabolical conditions ever imposed on internal combustion engines. Most of us would be appalled if our Dodge or Ford wiggled a little when idling, or dared to overheat while crossing the Mojave desert or not start without preheating in Alaska. Prime, mag check, long warm ups, what's all that? Turn the key, and haul ass. Two spark plugs per cylinder every 200 hrs, are you nuts? Yet we all do it.

I'm sure that some of you reading this critique have watched a Formula One race on TV. The governing bodies for this form of racing have rules so strict, that even the FAA would balk. The engines are limited to 183 cubic inch displacement (3000cc). The engines must have their speeds limited to 18,000 RPMs (no misprint), most makes develop maximum power at 15,000. Their fuel and ignition management cannot have redundancy or self diagnostic capabilities. Maximum of 10 cylinders, and maximum of 5 valves per cylinder. These engines develop upwards of 800 HP, and most weight about 275 pounds. They can only run on pump gas, the same unleaded stuff you and I use in our Dodges and Fords. They all have ONE

spark plug, and ONE ignition system. NO magnetos. The spark plugs do not cost \$20 per. Occasionally a driver will crash his car, but rarely does his engine fail, if ever. My second engine failure (Lycoming) went south 280 hours after the "certified overhaul shop" fixed my engine. My redundant ignition didn't help me. The idiots didn't build redundant exhaust valves in the Lyc's cylinders.

The five valves in the F1 cars are for breathing, not redundancy.

So I pose the question again, why does a well meaning, well intentioned builder want to take a perfectly reliable Chevrolet, Ford, or Volkswagen, and turn it into a perfectly unreliable Lycoming or Continental?

Answer: I just plain don't know.

The conversion I helped a friend with, was in a Pietenpol powered with a Corvair, which had all the "converter" symptoms. He was using 100W aviation oil, and aviation fuel (ate the valve guides), rough idling, uncontrollable heating, a hole in one piston, and point ignition. Sooooo...after determining the reason for the holed piston, plus a few other problems, we reassembled the engine to use recommended lubricants, recommended factory specs, auto fuel, threw the points away in exchange for electronic ignition. We built a "textbook" exhaust system, and incorporated one or two racing engine assembly techniques (not parts), and voila, a hot rod, truly reliable Pietenpol Aircamper. How about them apples!

The Pietenpol keeps on running, and running, and running.....→

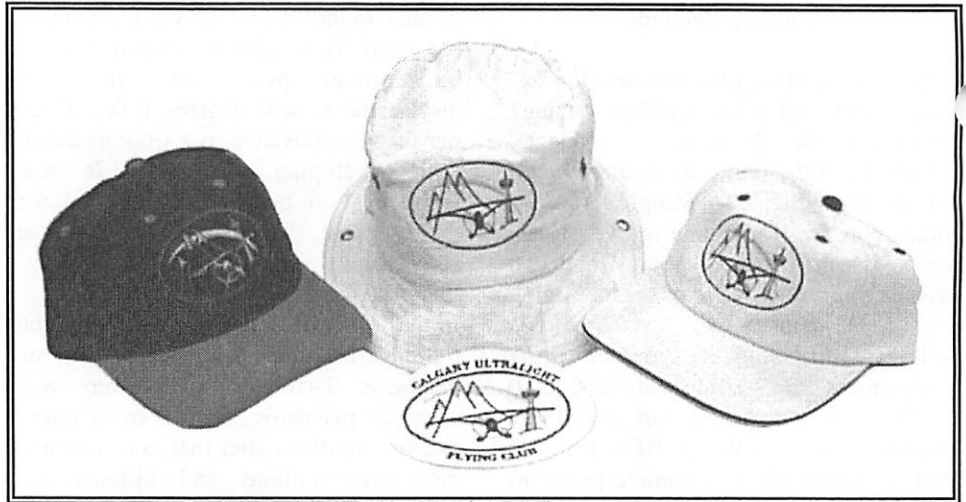
## Wheels, Skis and Floats

by Any Gustafsson

Spring weather is very unpredictable, to say the least. In the last few weeks we have seen heavy snow and rain, but also some good sunny days. The wind has been a big factor. It can be calm and warm one minute and the next we can have wind gusts to 50 km/h. We really have to be vigilant and listen to what the weather office has to say. If they say that it's going to be windy, they are usually right.

This past winter I have flown with skis just once. However, the two inches of snow that fell in late December was excuse enough, for me to swap the wheels for skis. As usual, ski flying is the best. The first touchdown in the snow at Kirkby field has become an annual ritual. The smoothness of Bob's airfield together with the soft snow is almost a dreamlike experience on touch down. Usually I taxi around his airport, around the hangars and get going again without stopping. This is freedom at it's finest. Bob can tell that "it was Andy that made those tracks". In and around Calgary the snow never stays to long, either we get waterlogged fields, because of the Chinook or the same winds dry the ground to a dust bowl. I have set my airplanes gear up for really quick change between wheels and skis. My Challenger is great on both sets and maybe someday I will get a set of amphibious floats. A good aircraft should be able to handle all three. The problem with float flying around here is the lack of bodies of water. Yes, we have Ghost Lake and Chestermere Lake but lake country, it is not.

I have been out to my little airfield several times lately, just chomping at the bit to go flying. The thought of having to do a complete wash down job on the entire aircraft because of the wet and muddy runway has kept the plane in the hangar. I have been thinking about making a set of splash guards over the



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Club crests 4" x 5" - \$6.00 each (50 left)

Hats:

Stone color (beige) bush hat (Tiley style with draw string and snaps) - \$13.00 each. (only 9 left)

Stone color with black rim inlay low profile golf style cap - \$10.00 each. (only 24 left)

Black semi pro cap with red rim inlay - \$12.00 each. (only 12 left)

Postage not included.

If you are interested in purchasing any of the above items and can not attend the next meeting contact: Bernie Kespe 403-255-7419 (home) 403-259-5498 ext. 233 (office)

Hats - while quantities last, will not be re-ordered until fall or next spring.

wheels that would keep the mud from splashing all over the clean aircraft, but it

has not materialized yet and I don't know how this would affect the flying qualities of the plane. Wheel pants is of course another option. In the meantime I will have to wait for the weather to stabilize and my field to dry up. Then I will look forward to calm early mornings or those beautiful warm evenings in the months to come.

A word of caution is the arrival of the migratory birds. Canada geese have been around more or less all winter but what we have to be on the lookout for is the myriad of ducks moving in to our area. These birds are fast and very hard to spot, especially in the twilight of the evenings. The other day I finally got up flying. The first thing that happened at altitude was a very close call with a loose formation of ducks. I was heading south for Indus airport and just north of Chestermere Lake this group of ducks came out of nowhere. They crossed in

front of my airplane and scurried across my path and disappeared low to my left, maybe 50' away. It was totally unexpected. It really jolted me to attention and I climbed out of their flight level to above 1000' agl. They seem to occupy the 500' flight level and below. Be very vigilant. A direct hit in the windshield could ruin your day.

So go out there and enjoy the secret of ultra light flying. I have seen a dramatic increase in numbers of ultra light aircraft around Calgary. I have a suspicion that the word is getting out. The airplanes that we are flying these days are light years away from the early generation of "Very light planes". The general aviation community has seen the light and is joining us in droves. Be careful up there. →