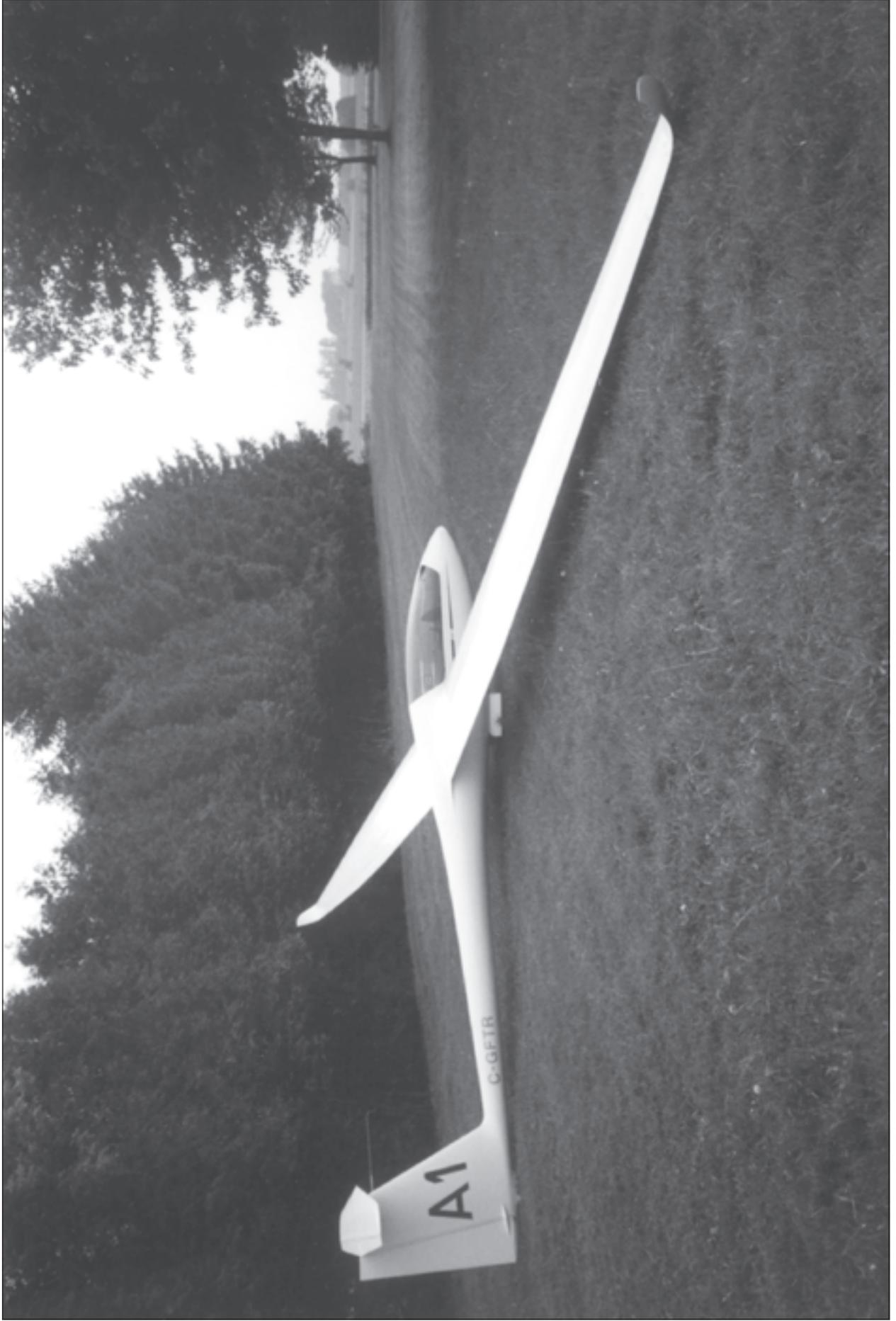


free flight • vol libre



5/02
Oct/Nov

IN MY PART OF SOUTHERN ONTARIO there are definite signs that we are heading into autumn. After a slow spring, the weather we have had this summer has been exceptional. As we know, the usual gliding summer is comprised of clear skies, sunshine, and cumulus streets as far as the eye can see for all of Mondays through Thursdays; overcast Fridays; rain Saturdays through Sunday mornings; and clearing Sunday afternoons in preparation for another week.

In our area it has certainly been the best summer we have seen in the last four years. Not only has this provided good conditions for our members at all levels to hone their skills, but also it should have been a great incentive to growing club memberships. We know from past experience that weather is one factor in getting new students out to clubs, not only for creating the initial contact, but also for providing more memorable introductory flights by being able to demonstrate thermalling and some limited cross-country. It is therefore puzzling that the latest membership statistics show that overall our numbers are down around 100 or 7.5% from last year, and are at the lowest level for the past ten years.

A review of the numbers by club seems to be indicating that the biggest problems are with our larger clubs. Many of these are experiencing a 10-20% drop, while the clubs that showed growth this year are mostly those that were in the 20-30 member size in 2001. Is this an indication of the more complex management issues that face such organizations once they grow through the 50-60 member level? In our clubs, we put together our management teams from the elected volunteers available. We thus have a limited pool of skills, which must be replenished at each AGM. The ability to repeatedly form teams that share a common motivation and can work effectively and in harmony is a common problem.

We look towards the SAC board meeting, which will occur in Ottawa, 19-20 October. We have a number of administrative matters to deal with, most importantly the budget and preparing for the 2003 AGM. There will be a significant changing of the guard, as both eastern Zone Directors, myself for Ontario and Jo Lanoë for Quebec, will be retiring. We are looking for some good candidates to join the Board and continue on its work.

For the time being I shall continue as chair of the Insurance committee. In that regard, I have just met this week with our agent, Grant Robinson, to go over the current year claims and our position prior to going to market for quotes. Our claims currently stand at \$147,000. If no more claims emerge this will be a relatively low loss year for us. However, the loss is not so low as to obtain the premium refund that was earned last year, which helped offset the increase by about 3%. Following the significant premium increases that were instituted by the industry last year, we expect the coming year renewals will be at a more normal level. Factoring in 3% for the effect of the loss of refund, together with a normal increase puts our renewal expectations at around the 10% level.

An item of particular interest is that effective 1 November, Avemco will be closing its office in Canada. All those who were insured by this company (which included a number of private owners) will be covered through to the policy anniversary, but thereafter will have to obtain coverage elsewhere. This is something we had expected would happen but we had no idea it would occur so soon.

* * * *

Le nombre des membres est descendu en 2002. Nous sommes maintenant à peu près 1225, un déclin d'environ 100 membres ou 7.5% par rapport à l'année dernière. Un printemps froid et humide dans l'Est a pu être un facteur. En même temps, il semble que la baisse soit concentrée dans les plus grands clubs. Un club au Québec, par exemple, a perdu la moitié de ses membres. Il est trop tôt de porter un jugement sur la situation, on espère que ce n'est que passer.

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The journal of the Soaring Association of Canada
Le journal de l'Association Canadienne de Vol à Voile

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Cover

An extraordinary homebuilt rises from the "ashes" of four different sailplanes. The beautiful new AFH-3 sits in Ed Hollestelle's backyard.

photo: Ed Hollestelle

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Sporting considerations

- a review of the Nationals -

Jörg Stieber, Sporting committee

Tasking

During the Nationals 2002 the task setting was exclusively based on the Time Distance Task (TDT), first introduced for the 2001 Nationals.

On most days the tasks called were TDT with a number of mandatory turnpoints and a pilot selected end. Typically, about 80% of the achieved distances would fall on the assigned part of the course. Such a task has essentially the character of an Assigned Speed Task (AST) and allows pilots to race against each other. Unlike an AST which ends in a final glide with a high speed finish, the assigned TDT requires a transition from the assigned part to the pilot selected part at the end. Some pilots had difficulties to manage this transition where the focus has to shift from racing directly against other competitors to task planning and energy management.

On the last day which gave us unexpectedly good conditions, a TDT without mandatory turnpoints was called to allow for best utilization of the somewhat unclear weather situation. It turned out to be the right call with achieved distances of 360 km in three hours. Unfortunately, some pilots confused the 100% pilot selected TDT with PST and assumed PST rules would apply. The PST was technically made obsolete by the TDT. It was kept in the rules as a back-up task in case the TDT would be found flawed in practical contest flying. Since there was no need to call a PST during the last two Nationals, it is probably time to think about retiring this task form.

In general, the TDT tasking resulted in better utilization of the contest days, since the task committee only had to estimate the number of available soaring hours in any given day rather than estimating not only the available soaring hours but also the speeds to be achieved to call an appropriate AST. Consequently there were no miscalls.

The exclusive use of the TDT task allows to calculate a meaningful handicapped score, combining all classes.

Errors in turnpoint data

Some pilots found it difficult to update the turnpoint data in their flight computers on short notice in order to correct errors in the posted data. A thorough check of the turnpoint data before posting is very important.

Airspace

With the task area between the Ottawa and Montreal terminal airspace, the options for task setting were limited. Large bodies of water such as the St. Laurent and the Ottawa River further complicated this. On some days the local conditions were influenced within a 10 kilometre band of the rivers.

Airspace data in standard *.sua form for uploading into flight computers were made available by a competitor which was very helpful. For future Nationals, airspace data should be posted along with turnpoint data by the organizers.

Conditions for most of the contest days were weak with low cloudbases. On these days it was not possible to set tasks into the hills north of the Ottawa River. For future contests in this area it would be beneficial to reach an agreement with Ottawa ATC to allow access to sections of the Ottawa class D airspace.

The airspace structure around Hawkesbury is quite complex with floors at 5000, 6000 and 7000 feet ASL. When after several days of weak weather and low cloudbases, the "big day" with lift in the 7 knot range up to nearly 8000 arrived, most pilots received severe penalties for inadvertently entering class C airspace during their initial climbs off tow. The reason was that they had either forgotten about the airspace ceilings → p21



The

SOARING ASSOCIATION of CANADA

is a non-profit organization of enthusiasts who seek to foster and promote all phases of gliding and soaring on a national and international basis. The association is a member of the Aero Club of Canada (ACC), the Canadian national aero club representing Canada in the Fédération Aéronautique Internationale (FAI), the world sport aviation governing body composed of national aero clubs. The ACC delegates to SAC the supervision of FAI-related soaring activities such as competition sanctions, issuing FAI badges, record attempts, and the selection of Canadian team pilots for world soaring championships.

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Images may be sent as photo prints or as hi-resolution greyscale/colour .jpg or .tif files. Prints returned on request.

free flight also serves as a forum for opinion on soaring matters and will publish letters to the editor as space permits. Publication of ideas and opinion in *free flight* does not imply endorsement by SAC. Correspondents who wish formal action on their concerns should contact their Zone Director.

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Des photos, des fichiers .jpg ou .tif haute définition et niveaux de gris peuvent servir d'illustrations. Les photos vous seront retournées sur demande.

vol libre sert aussi de forum et on y publiera les lettres des lecteurs selon l'espace disponible. Leur contenu ne saurait engager la responsabilité du magazine, ni celle de l'association. Toute personne qui désire faire des représentations sur un sujet précis auprès de l'ACVV devra s'adresser au directeur régional.

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The highest point in Ontario

I recently attended the Ontario Provincial Contest, ably and hospitably hosted by the folks at Toronto Soaring. My assigned task was to sell raffle tickets to raise money for the gas used by the Pawnee towplane that was graciously loaned by SOSA.

They sent out Bob Lepp as a sniffer one day, and he came back much, much later, having completed his 300 km. As we were helping Bob celebrate his flight we began, amongst other things, to debate the relative merits of Pawnees versus winches and where exactly was the highest point in Ontario (Bob claimed it was near Toronto Soaring). There was a rather rude implication that, sooner or later, I would find that point and be forced to land out on it.

We had some kind of a bet going, but I do not have total recall of that evening. Apparently, there was some discussion of what he would have to do if he lost, which included the notion of writing a clarification for *free flight*, and if so, how would he sign it. I suggested "the Wild Turkey", since Bob had dealt with a noise complaint from a local turkey farmer. We weren't flying at the time, it was noise from the bar that was the issue. Bob's son Matt, bless his heart, came up with a winner, even if jeopardizes his allowance forever. He looked at Bob, then at me, then back at Bob, and said, "how about the Balder Eagle"? [Bob lost the bet; see page 16. ed.]

Well, the next day, Bob got out their winch, which, wistfully, (say *that* three times fast!) they have mounted on a Fargo truck, hoping for better results. They found my hiding place, strapped me in a 2-33, and, seconds later, I was at 1200 feet, for the cost of \$5. Now, I do several hundred takeoffs each year and, thankfully, they have become rather routine ... this one was a real eye-opener. To say that I was pleasantly surprised is a gross understatement. To paraphrase Chief Dan George, my heart soared, well, like an eagle. I plan to go back to Toronto Soaring to get checked out on winch launches. You can see a photo of the SOSA towpilot comparing hardware at

<<http://www.aci.on.ca/~boblepp/Winch%20for%20Pawnee.jpg>>

The debate continues to rage on. Bob claims that the satisfaction of having a 300 k, which I do not have, raises his spirits to the highest possible level. While I can understand this, I still maintain that my experience was so exhilarating that, in actual fact, the highest point in all of Ontario right now is me.

Stall/spin accident comment

The two recent stall/spin accidents spurred great discussions on the SAC Roundtable and I wanted to throw my hat into the ring.

First I would like to relate a near accident that I was involved in many years ago. I was a newly minted pilot out of the Air Cadet program flying a 2-33 at Burlington Air Park. I was being checked out for a runway I had not yet flown. On downwind we had to deviate because of power traffic and ended up high on final. I pulled full spoiler and re-evaluated. After sideslipping, I hit some strong sink, quickly recovered from the sideslip and closed the spoilers. I was headed for the trees!

A simple call for "HELP" alerted the instructor in the back seat. Lt. Kennedy took control and dove the aircraft at the ground. With this new airspeed, he pulled up and we cleared the trees, ended up landing long. We all know that on final approach, the slower you fly, the shorter you land and the faster (to a point) the longer you land.

Lt. Kennedy was famous for his "Kennedy's Concord landings" where he would speed up to about 90 in a 2-33 and fly the length of the 6000+ runway at about ten feet. I was very fortunate to have him in the back seat that day. A couple weekends ago I was 'ballast' for a student approaching solo — he let the speed decay on short final and we were headed for the crops. I took control, picked up speed, and arrived on target with enough speed to still fly.

I would also like to talk about determining the appropriate speed to fly a circuit. I was amazed to read Stan Martin's research that showed such a variance in "standards" when choosing this speed. What concerned me more was the fact that several of them were actual numbers (ie. 55 knots). At Great Lakes we use 1.3 x stall (in landing config) + wind: the same formula airline pilots use. So, a stall speed of 38 knots means an approach speed of 49.4 (let's call it 50).

Now, how many times have we said, "Approach speed will be about 55-60" That's a 10% variance. So what is it, 55 or 60? Let's not be vague about this, precision is the name of the game. Sure, an extra 10 knots in a 2-33 or even a 1-26 will not have that great an effect, especially when you have 3000 feet of runway. However, years later with those habits well ingrained, we may approach a 1000 foot farmer's field in our sleek glass ship, and that lack of precision will kill us.

One last thing; we have a hard and fast rule of no turns below 100 feet. If we → p18

the Bald Eagle

Building the AFH-3

Ed Hollestelle, SOSA

a beautiful new homebuilt from the bits of many

JUST A BIT OF BACKGROUND BEFORE I START. I built my first glider, an RS-15, in 1975 in our living room at Komoka, Ontario. The first step of the project was to renovate the garage into a new master bedroom and a family room so we could continue to live in the house with the project occupying the living room! A little over a year and about 1500 hours of building time later I flew the RS-15 and I enjoyed flying this glider for four years.

In the fall of 1987 I started another glider project. This time it was the HP-18 that Ed Jr. still flies. Because I made many changes and modifications to it, this project took until 1991 and about 2200 hours to complete. This time we had a larger house with a basement so there was a little less family stress. Ed Jr. helped with this one and after it was finished many more modifications were made including a new one-piece canopy, higher fuselage and 17.7 meter wingtip extensions as well as a complete new airfoil and winglets designed specifically for these wings. I hate to even think of counting the total extra time the airfoil change took.

The Wortmann 67-150 airfoil on the RS-15 and HP-18 works fine until the bugs start clattering up the leading edge. Performance quickly drops off and in our optimism the change would all be worth the effort. It actually did change the performance for the better but the total time on the glider is nowhere near the extra number of hours spent on the change!

The plan had always been for Ed Jr. to fly this glider until he could afford to buy his own or until I was done flying

serious competitions. Neither happened and so began the next project.

It more or less started in the spring of 1995 when I purchased a set of Ventus 16.6 wings from Stan Montagne. Stan used to fly his ship in California and one day after an off-field landing close to a major highway, the crew decided to bring the glider to the trailer on the side of the highway rather than going into the field. After disassembling the glider on the side of the road and putting the wings on the grass, a wind gust blew the left wing across the road just as a car approached to pass.

The shop doing the repair was willing and able to do the repair but the owner insisted on a new wing. However, the Schempp-Hirth factory replied that the 'B' model was no longer in production. The newer 'C' model had taken over and the molds were changed. Consequently the older style wings were no longer available and Stan made a deal with the insurance company to have both wings replaced with the newer Ventus 'C' wings while modifying the controls of the fuselage to mate with the new wings. After I made the deal with Stan for the old wings, he drove for three days from California and I drove west for three days to meet somewhere in Colorado. We met at a motel and put the wings in my trailer.

When I returned to Canada I decided to make a new glider using these wings. A fuselage had to be build and the plan was to use a very narrow and low profile one with a long enough tailboom to accommodate a wing extension to an 18 metre wingspan.

The old Ventus wings with the trailing edge dive brakes have a complicated control system which override the gas strut in the flap activator forcing the flaps to full positive when activating the divebrakes. It would therefore be almost necessary to have a factory mechanism to accommodate this.

I remembered seeing a Ventus-A cockpit section hanging in the rafters of John Murray's workshop during a visit to his shop at one of the contests in Caesar Creek, California. A call confirmed that it was for sale and I made a quick trip to his shop in early 1996. When I arrived it became clear that not much was left of the cockpit. It looked better from the bottom as it had been smashed on the top. It turns out this was the remains of the Ventus that had a mid-air with Karl Striedieck in the early eighties. The pilot bailed out at about 1200 feet and the glider had gone in upside down. However, all the controls were intact and so was the landing gear and the inside cage (the welded steel assembly with the carry-through for the front and rear spar, etc.) The piece was



This shows the work being done to splice and fabricate the various fuselage sections and to fashion efficient wing root fairings.



Rigged for control system adjustments in the backyard of our Thorndale house.

in half horizontally and all the foam (and bondo) was removed from the inside. The temporary bulkheads were replaced by real foam and glass sandwiched ones and all the control rods and cables for rudder and elevator were installed. This method of horizontally splitting the fuselage had been done by a local homebuilder on a composite glider in previous years and it simplifies the job in many ways. One of the real advantage was that we had all the controls in the bottom half so we could finish all of them permanently without any difficulties, and check them in full view after the installation. (The inspector was also very happy with this solution!)

so small that it actually fit in the back of my mini-van. Once back home I began to plan and draw the project. The local glider guru was consulted to make sure the project was feasible and sound. Karl Pfister, an Akaflieg engineer who was heading Diamond Aircraft (in London, ON) at the time helped with some of the lay-up calculations, choice of cloth and design ideas. But when it was time to involve the local amateur built inspector, it became clear that he was not comfortable accepting the wing with the spar damage.

In the meantime, slowly but surely the fuselage was taking shape in the basement.

Knowing that this was going to be a one-of-a-kind, I never made any molds. The fuselage starts with the damaged Ventus-A front section and ends with an SZD-55 tail section and I crafted the shape for the rest of the fuselage by glueing one inch Davynacel (foam) strips together to form the shape. The glue I used for this was actually a good quality "bondo", and a fully symmetrical shape was attained by always doing an identical left and right. It was a very slow process and when the basic shape was there, I sanded the bondo and the foam to more or less form the desired shape. The next step was to lay up the glass on this positive mold to start forming the structure. After the outside lay-up of this glass, the structure between the turtle deck and the fin was cut

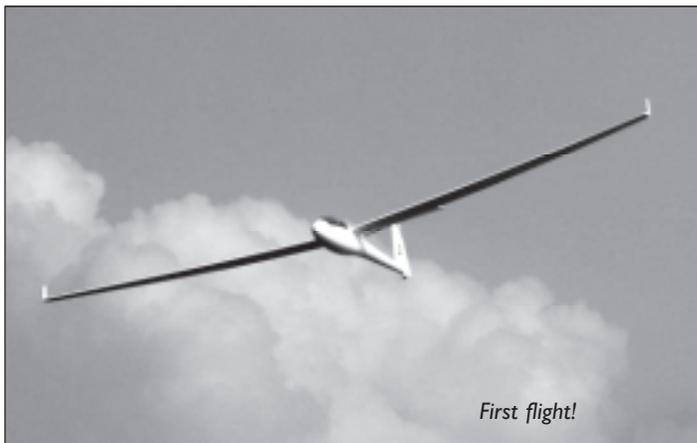
The SZD-55-1 fin I used was part of C-FCYF and the horizontal stabilizer and rudder from an SZD-55 out of South Carolina. All these components had been damaged previously and were repaired to industry standards under the watchful eye of Ed Jr.

By now, about two years into the project, I was totally committed. During all of this, I had picked up Uwe Kleinhempel's Ventus B 16.6m in BC that had crashed during the Red Deer Nationals. It had a repairable left wing and, according to Schempp-Hirth, the serial numbers indicated identical structures (no lay-up changes). The minor damage on the left wing was repaired by M&H in Elmira, NY to satisfy the DABI (designated Amateur Built Inspector).

In the spring of 1999, Ed Jr. and I took the new fuselage and the right wing to M&H's beautiful shop to have the wings properly mated with the fuselage and the main pin glued in. The next winter I rented a shop that was big enough to put on the wings (unfortunately only one at the time) so I could build the new wing roots on the fuselage and the fairing on the wings. Knowing that the LS-6 and LS-8 have a very good fairing, I concentrated on copying these as closely as I could. It took a few months to make these fairings, again working with foam that was removed on the inside once the shape was there. I made sure to be undersize to allow for the thickness of the epoxy resin and microballoon filler to perfect the shape.

Once the fairings were done and the inside of the tail boom finished it was a matter of carefully smoothing the optics of the surface. (If I were to get paid pennies for every sanding stroke it would amount to a pretty sizable sum of money.) Early that spring the airplane (still with a "green" fuselage) was assembled several times to adjust the controls and the deflections.

The inspection of the fuselage was done before we finally glued the two halves together. Then came the tedious job of finishing the whole glider with Simtec Pres-tec. I was glad to have the help of Kurt Hertwig with all the sanding, taping and other preparations. Kurt was always there during the last stages of the project ⇒ p18



First flight!

Soaring through my passenger's eyes

Kenneth Armstrong

the soaring life of a Vancouver Island motorglider pilot

Although I'm a novice at the thrills of free flight, it's fascinating to see how my passengers react to their first flights in my Diamond Katana *Xtreme* motorglider. My companions have included a wide spectrum of individuals from high time pilots to a carpet cleaner who was collecting on a gift from his brother. (I owed the gift-giver eight hours of flying in exchange for his portable navcom — you know, the one I traded him years ago for a GPS.)

At any rate, my partners in pleasure have all utilized their senses to open my eyes to the way many pilots react to gliding. Their revelations of soaring flight have made me aware of the general reactions of pilots and passengers who have never glided — except steeply to a forced landing ... Their first glimpse of the long-winged *Xtreme* is predictable. Riders-to-be observe how long the wings are and the very graceful lines. Even though it is a member of the basic Katana family, my taildragger looks very natural and sleek compared to the tricycle geared versions. The aerodynamically sculptured lines of the conventional gear with its nose-up stance produce an aircraft that looks like it is flying — even when parked.

Next, my passengers learn to place one foot onto the black, antiskid step atop the main gear and place their other foot directly onto the cockpit floor and then pirouette their derrière into the reclining seat. Very easily accomplished by anyone up to 230 pounds — unless they are wearing a dress — then it just becomes entertaining.

The naturally sloped seats are very firm with their thin padding and I have recently added additional padding for the lengthy free flights that nature often provides. The semi-reclined seats reduce a passenger's effective height and easily allow 6 foot 2 inch pilots and their headsets to sit comfortably with reasonable clearance from the canopy. Four point harnesses are quickly secured and the simple pre-start checks are easily accomplished and with the choke applied the cold engine is quickly purring at 1000 propeller rpm.



The author prepares his Katana Xtreme for a day of soaring. photo: Linda Armstrong

The Rotax starts so quickly, even in cold weather, that pilots of other types of aircraft engines are generally surprised at the engine starting on the second blade. (Remember, the engine is turning 2.27 times faster with the propeller gear reduction system slowing the prop for efficiency.)

My *Xtreme* doesn't have the differential brakes option, so directional control is maintained via very positive tail-wheel steering. The first application of the main gear brakes generally catches the passenger's attention as they are applied by pulling the speed brake handle fully up from the forward part of the outboard arm rest. Passengers watch in amazement as part of the wings pop up as the dive brakes are extended. Later, they will be amazed at their effectiveness.

By the time we listen to the ATIS, talk with clearance delivery, ground control, and trundle out to the active runway, the engine coolant and oil are within their operating ranges. Run-up includes standard magneto checks, carb heat and cycling of the electrically controlled propeller rpm. During takeoff into 15 mi/h of wind one gets the power up to 30 inches of boost just about the time the tail begins to lift and the motorglider reaches the 42 knot lift-off speed. It immediately leaves the pavement vertically and climbs steeply with a level fuselage attitude at the best rate of climb speed of 57 knots. My fellow fliers are always impressed by the climb rate with the ground dropping away at 800-900 ft/min. It's not because the quietly purring 81 hp engine is powerful but rather because there is nearly 55 feet of wing span generating oodles of lift.

Once through 1000 feet (near the end of the runway) we switch to outer tower, I pass control after trimming for 75 knots and 500 ft/min average climb with an attitude that would result in a significant decent on most aircraft. Seasoned pilots almost immediately assume the typical nose up attitude they are used to on most aircraft and when they look at the VSI we are climbing quickly and almost hovering around 45 knots!

Visibility is excellent at any attitude — an attribute most commented on by passengers as they have never had such an all encompassing view. Many remark this is the best visibility they have ever encountered in flight. Eventually, they get the nose placed below the horizon so they can see the entire landscape and we continue our climb to approximately three or four thousand feet over the hills of southern Vancouver Island.

We request a block of airspace from terminal for soaring activities and when we find suitable lift, cool the engine in increments in anticipation of gliding flight. Largely liquid cooled, the Rotax 912 stabilizes well with its thermal mass and the throttle is closed, magneto switches turned off and cowl flap closed. The passenger immediately stares with some consternation at the propeller



Ken is a COPA and RAA director, fixed and rotary wing test pilot and author of many articles in more than 55 magazines. He has logged 15,000+ hours on over 350 aircraft types — none on autopilot — and lives near the Victoria Airport. He has owned 15 aircraft and loves the Diamond Katana Xtreme best.

which stops very quickly due to the gearing. Next, feathering is selected for the prop and the electric motor slowly turns the blades sideways to the relative wind. This results in more intense observation from the passenger as they have never seen the “air slicers” stopped and turned sideways. Pilots then start looking at the VSI which is now showing a positive rate of climb and then back at the prop and back and forth.

This head wagging continues for a number of cycles and then the smile starts to spread from the middle of their face and gradually appears to reach the ears as my fellow aviator realizes the aircraft is actually climbing with the noise turned off. The sleek Katana cockpit is hardly noticed by the surrounding airmass and headsets are quickly removed so we can chat normally. The small cabin speaker mounted on the aft bulkhead provides the constant chatter of fellow aviators who are thrashing through the air with prodigious amounts of power and fuel flow.

After a half hour of give and take with Mother Nature we are typically higher than when the engine was secured.

The Butler/Howroyd airfield co-owner, John Howroyd, pretty well summed it up (a dozen or so times) during an hour of engine-off soaring with, “This is fantastic, flying without an engine is so thrilling, free flight without any fuel consumption, this is fantastic, etc.”

John has flown lots of airplanes and his passion for aviation has driven him to introduce and support many others in their love affair with aviation and it was particularly rewarding to introduce him to “free flight”. The thrill is not lost with non-pilots as they enjoy the complete silence — not even a whistle of turbulent airflow. Soaring in the Xtreme is likely akin to the flight of the eagle and we often join our feathered brethren as they intuitively know where the thermals or wave lift are rising. The low stall speed allows us to formate with various birds — although their nervous looks, aft over their wings, leads me to believe they are not overly happy to share the lift. Since eagles have no predators, they seem to have no fear of us, but they seem perturbed another flying creature does not fear them.

Books I read tell me they know where the best lift exists but my limited experience shows they will soar in minimal lift when superior updrafts are available a short distance away. This may be related to the game they are seeking but it also proves to me that all that is written isn’t necessarily valid.

Glstar builder, Jeff Liot, flew on one of the rare days when there is little lift from convection, ridge or wave. That day, we shut down the engine and feathered the propeller for a flight abeam Victoria International Airport to Duncan airport, a distance of 13 nautical miles, and during the trip lost 2500 feet for an average glide ratio of 31.2 (somewhat better than the published 28:1 for the Xtreme). His primary observation was the immense safety inherent with a glide

ratio that allowed a superior radius of action from any altitude compared to other general aviation aircraft. He also observed that the gentle stall characteristics and low speed of 42 knots suggested very high survivability in the event of a forced landing into trees or mountains (and this has been confirmed in actual crashes).

It seems the longer the soaring duration, the more cockpit occupants are surprised that it all continues unabated — often for hours. On numerous occasions we have departed midafternoon and been forced to land only by the threat of approaching darkness. On other occasions we have intentionally launched in the cool morning with no wind and a shallow lapse rate knowing our altitude would not be achieved without paying the fuel company. But on three gallons an hour of automotive/marine fuel, who cares? We can cruise at 111 knots on 4 gph or loaf along in level flight at 70 knots looking for lift on less than 2 gph. With the eagle’s eye view, the peace and quiet is quite inexpensive. (Well, that’s true if you don’t count all the fixed costs like pilot medical, insurance, hangarage and other fees.)

Still, we fly nearly every day when I am at home to amortize the fixed fees over many hours. There is little doubt that this motorglider is likely the cheapest aircraft to fly at Victoria International Airport in direct operating costs. So much so, that passengers are amazed how little fuel it takes to top up the tank after three hours of soaring. The after-flight thank you’s are always effusive and genuine and I often get phone calls advising me that individuals are available for more flights ...

Since there are no gliders or towplanes operating off the Class C airspace surrounding Victoria it’s a rather well kept secret that there is a lot of lift in the area. The fields of the Sannich Peninsula and black rocky outcroppings nearby provide respectable convection and winds from virtually any direction impinge on mountainous barriers creating ridge lift when the winds exceed ten knots or so. Higher winds and varied airmass stabilities often provide the ultra-smooth and powerful wave lift from the Olympic Mountains or the southern portions of the Vancouver Island ridge line. Victoria — the undiscovered soaring capitol of far western Canada.

By way of thank you’s, I must credit my wife and partner, Linda, for fully accepting my need to invest in a Katana motorglider — such mates are likely rare. My appreciation to COPA flight captain Roger Damico for storing my aircraft over the winter while I travelled to collect stories for upcoming aviation articles and to an AME who saved our weekend last Sunday. A new tube and tail-wheel had been installed days before but the tube was pinched and on our next flight to a Nanaimo barbecue a flat tire was evident in the after-landing roll. A group of COPA/RAA members saw our predicament and helped to move the aircraft to a parking area hundreds of yards away. Coincidentally, Cassidy Aircraft Maintenance owner Bob Hodgins was working that Sunday — who does that any more? He graciously sold me a tube and took the time and trouble to expertly install it on his day off — at no extra cost. The good old days still exist. Hopefully these good days will continue and I will have the opportunity to introduce many more people in the Victoria area to the thrills of a self-launched glider and soaring. ❖

Vol d'onde

Gain de 5000m à Baie St Paul

Pierre Brousseau, CVVQ

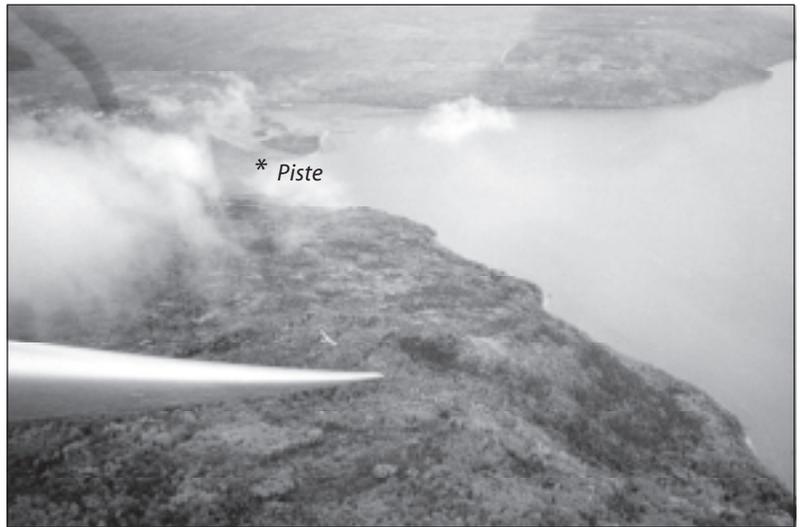
ARRIVÉ À BAIE ST PAUL vers 15:00 h, je discute avec Georges Cousineau et Jean Provencher à propos de tout et de rien. La soirée passe et nous nous couchons vers minuit après un bon repas et une bonne marche. Nous avons décidé de nous lever tôt pour décoller de bonne heure. Comme d'habitude, le matin nous ne sommes pas toujours prêts à nous lever, bien sûr, je parle pour moi car j'aime un peu, beaucoup, paresser au lit le matin. Et ce matin-là, je réussis à me lever, café en premier, bon déjeuner et enfin j'assemble mon planeur.

Pour votre information, je possède un magnifique Cirrus Standard CF-SIR. J'en profite pour remercier l'ancien propriétaire, Monsieur Alexandre W. Krieger, que la plupart d'entre-vous connaissez par son implication pour le vol à voile autant au Canada qu'au Québec.

Baie Saint Paul est situé à 100 kilomètre au nord-est de Québec sur la route 138, la route qui vous mène au casino du Manoir Richelieu. Notre piste est orientée nord sud près du quai municipal de Baie St Paul. À cause du vent dans la vallée, les conditions de la piste en usage changent durant la journée. Nous décollons sur la 010 pour atterrir 019 en après-midi, on doit toujours être attentif à cette particularité. Malgré le fait que les sommets environnants sont au maximum de ± 4000 pieds, un phénomène d'addition d'onde se produit de temps à autre, pour atteindre des altitudes de 20,000 pieds à 25,000 pieds. À 10:38 h, le 11 octobre 2001, je suis en remorquage derrière UCD, un Pawnee que Claude Rousseau et d'autres membres ont su apprivoiser. À Baie St Paul, compte tenu des conditions très difficiles à certains moments, notre Pawnee est l'appareil tout indiqué. Cette journée là, le temps était couvert dans la baie avec percée de soleil au nord-ouest, vent ouest nord-ouest, en travers $\pm 20^\circ$ de la piste de 20 à 30 kilomètre/heure.

Jean venait de décoller, et avait largué au nord-est de Petite Rivière St François à 5600 pieds, il se bagarrait avec le rotor. J'avais demandé à Claude de suivre le Cap Madame en direction ouest, (pour ceux qui ne sont pas familiers, il suivait le fleuve en direction de Québec au-dessus des caps). Après plusieurs minutes de chute, Claude me demande si je voulais aller vers le nord. Affirmatif, va vers l'endroit ensoleillé au nord-ouest. C'était ± 10 kilomètre de notre position. La chute avait diminué sensiblement mais pas la turbulence.

Mentalement je calculais l'équivalence de 3000 mètres en pieds parce que mon objectif, pour cette année, était de faire un gain si les conditions s'y prêtaient. Tous avaient pris



CF-SIR au-dessus du Cap Madame, profitant d'un vent du sud-ouest, en haut à droite "Cap aux Corbeaux" et notre piste dans le fond de la baie près du quai municipal.

l'habitude de décoller avec oxygène / barographe / nourriture / eau et vêtements chauds.

Aux alentours de 6000 pieds, tout devint plus calme et je me suis dit que si je voulais atteindre ce gain je me devais de larguer. J'attendis quelques centaines de pieds et je finis par larguer à environ 6200 pieds dans du rotor faible.

Par tous les moyens, j'essayais de rester calme et de piloter avec délicatesse pour ne pas perdre d'altitude inutilement. Malgré cela, je me suis retrouvé à plus ou moins 4800 pieds. Il y avait beaucoup de turbulence, autrement dit du rotor. C'est à ce moment que je me suis dit: "je risque le tout pour le tout, le pire c'est que je me retrouve au champ un peu plus tôt si cela ne fonctionne pas". Je décide d'être très agressif et bien coordonné. Quand mon vario s'affolait vers le haut, inclinaison à plus ou moins 40 à 45 degrés, augmentation de vitesse pour la réajuster à la baisse un peu plus tard, avec une boussole de Bolée c'est plus facile.

Je réussis après quelques reprises à me centrer et à prendre de l'altitude. Je dois vous mentionner qu'à chaque endroit propice, je prenais une marque sur mon GPS et quand cela allait mal je revenais sur l'un de mes points. Comme vous voyez, parfois des discussions peuvent vous servir, ici je fais référence aux discussions avec Denis (Pépin) sur la façon de faire des "marks" sur mon GPS. N'allez pas croire que j'en avais des dizaines, non j'en ai repéré que quatre. Et ce n'est qu'après une heure que je réussis à prendre de l'altitude. Comme je n'étais pas encore sûr que j'étais dans l'onde bien établie et au bon endroit, je travaillais à localiser d'autres points où l'ascendance était forte. J'approchais les 10,000 pieds. J'entrepris d'installer mon masque à oxygène, ce ne fut pas facile, parlez-en à ceux qui ont des lunettes, un peu d'eau, quelques grenailles (fruits séchés). Et dans ma tête, je commençais à répéter ce que j'allais dire au contrôleur de NavCanada. Je regardais autour de moi mon vario, mon GPS, et j'allais de gauche à droite avec sensibilité et délicatesse pour ne rien perdre. J'approchais 12,500 pieds, j'avise Baie St Paul que je quitte la fréquence pour le 125.1 "Montréal terminal". Et calmement, j'appuie sur le commutateur: ➔ p19

Citizen – 1, Bureaucrats – 0

eking a narrow victory from the definition of “impossible”

Walter Weir, COSA

EXCITING E-MAIL! My new ASW-27B, ordered two and a half years ago, was on the boat bound for Montreal. It was already mid-May. It should be easy to have it licensed and ready for the Nationals at the end of June. Oh yeah?!

I had opted to have it shipped to Toronto to avoid the long trip to Halifax. That meant it had to come in a container, get off the boat in Montreal and go by rail to the CN yards in Brampton. Nothing to it — I just drive my car up to the container, open the doors, hitch the trailer to the car and drive away to XU Aviation for the licensing. Wrong!

My first problem was a fax from the CFIA. They are holding the container in Montreal and won't release it until I call. What the devil is the CFIA? A quick check on the internet suggested it was the Canadian Food Inspection Agency — and this turned out to be true. It was Friday afternoon and their answering service said I would have to wait until Monday. When I talked to them on Monday morning they asked if the trailer was new. I pointed out that the shipping document they were looking at listed the contents of the container as NEW TRAILER. "Please Mr. Weir, write on your copy of the shipping document, 'The trailer is new', sign it and fax it to us." I did that. The trailer was released.

I never did find out why "NEW" was important, but I assume if it was "USED" it could have had mud on it and therefore foot and mouth disease on it. I was billed \$80 for "lifting fees" because my quarantined container had to be moved out of the queue for the train. And arrival in Toronto was delayed three days.

Then the CN freight department told me it would be impossible for me to enter their yard and remove the trailer from the container. I would have to hire a trucking company to take it to a loading dock where it could be unloaded. I didn't know any trucking companies and didn't have a loading dock. I kept talking and eventually got the name of the yard foreman and pleaded my case with him. He did his best to be helpful. If I paid \$100 cash for the removal of the empty container and if I arrived at their yard with steel-toed boots, hard hat and reflective vest, he would let me unload it myself even though this had never been done before.

All I needed to do now was pay the shipper and clear Customs.

So I went to pay the shipping, US\$2255 for the boat and train and C\$80 for the CFIA hold. The agency manager said it was impossible to release the shipment to me — it had to be released to a trucking company. She "has been in this job for 13 years" and has never ever released to

the owner — impossible. I explained over and over that CN had OK'ed it.

Finally she found on her computer that it was possible to release to "unknown", so she did, but warned me that I may never see my container and made me sign my name to that effect.

Then to Customs where I had expected to pay GST. I was told that they had to collect PST as well as GST — they had been doing that for two years. They wanted over \$14,000 and this amount was refused on my MasterCard (to which I had deposited enough for GST the day before to avoid going over my limit). They had no idea how to call MasterCard to clear the payment. My debit card was also refused, and they would not accept an uncertified cheque for more than \$2500. They did not know where the Bank of Montreal was and they did not have a phone book so I could look it up.

Fortunately an agent came to my rescue and found the nearest bank branch for me. I turned up there in shorts, ragged running shoes and a sweaty tee-shirt with only my bank card for ID and they gave me a bank draft for \$14,423.70 — the exact amount. Amazing!

Customs seemed overwhelmed by the large amount they were collecting — most people were paying a few hundred. Now the funniest part. The cashier noticed that the bill totaled \$14,423.76 — the agent had added the total and written \$14,423.70. The cashier asked me for six cents. I thought that was a good joke but she was serious. I gave her six cents and she wrote me a receipt for it. True story!

Next to the gate at the CN yards where the clerk told me it was impossible — but finally I managed to pay my \$100 cash and received a hand-written receipt from a no-name receipt book.

At last! With steel-toed boots from my neighbour, hard hat and reflective vest borrowed from CN, I got to the container. I had been told I needed only a hacksaw to cut wires. Took fifteen minutes with the hacksaw just to get the seal off the door. A BIG bolt cutter would have been better. A wrecking bar with a BIG hammer was needed to remove the seven beautifully made wooden retaining brackets fastened to the floor with giant power driven Philips head wood screws. Fortunately I had anticipated problems and had loaded my car with every tool I owned. All removed material had to be taken away by me. Took me just over two hours of hard labour.

Getting Transport Canada to issue a C of R is another story — too long to tell. But it was all done in time for the Nationals — I even had time for two practice flights! ❖

Strictly for the birds

Jean O'Neil

ALAS, like many other journalists, I'm often a know-nothing on the topic I'm writing about. Such is the case today as I tackle the subject of gliding and soaring, hence the reason why I have just one question in mind: can people really get fed up going out there in the true blue — spiralling, floating, and streaming with a buoyancy and elegance akin to an albatross, maybe an angel? From what I've gathered by reading here and there, the answer is no.



Hicham Hobeika

Of course, I can't forget the assertion of Leonardo da Vinci:

"Once you have tasted flight, you will walk the earth with your eyes turned forever skyward, for there you have been, and there you long to return."

The thing is, Leonardo never tasted flight that I know of. I did for the second time this spring courtesy of a friend, Hicham Hobeika, the CFI of the Montreal Soaring Council. I didn't need that to have my eyes turned forever skyward. The moon, planets and stars call at us insistently. I've answered the invitation countless times, but to look up at them is not like really having been there, save in sleep, when Morpheus cares to give you a free ride through heaven's lights.

Of course, I've often flown in airplanes but I won't teach to any glider pilot that a roaring behemoth bouncing here and there on "air pockets" is no treat for he who weekly soars his plastic bird in the silent vicinity of the clouds, over a green and fertile Champlain seabed grooved by the winding Ottawa River and its tributaries.

What a treat it is for me, the aerial version of a landlubber. My first surprise will be the quasi-religious ceremony of preparing the bird in the early morning hours: the pull-out of the fuselage and wings from the trailer, the meticulous assembly of the whole gizmo in the wet, sparkling green grass, right up to the taping of the gaps for the utmost aerodynamic efficiency. All this, of course, amid masterly exchanges on the weather that was and will be, and a few curses for the pooch who barked all night in the nearby trailer campsite.

Soon, the renunciation on liabilities is signed, the craft is handhauled to the runway where the L-19 Bird Dog tug is ready to take off and then it's time for the strapping-in ceremony in the cockpit:

"Now, Jean, this cushion is really a parachute and if you must use it, you first eject the canopy, then unstrap yourself, jump out, and pull on this handle."

"You have to be kidding! I'll hit the ground before I can succeed in doing all that!"

"Oh, come on. You'll know how to jump when you have to. And see this yellow knob. Your important job in this flight is to pull it when we've been towed up to 3000 feet — but wait till I tell you. That will sever our umbilical cord with the tug. It will then turn to the left, we to the right, and we'll be on our own."

It's when I pull the knob that Leonardo proves to be right as we gently negotiate our way up on the warm ascending currents. You people call it soaring and it's some kind of a heavenly bliss, a rare elation surging calmly from deep inside. Am I floating or is the world floating under me? Who cares!

It's Hicham at the controls who keeps asking, "Are you okay, Jean?"

Up and up we climb with other sailplanes in the same gaggle, screwing ourselves clockwise to the ceiling of 5200 feet this morning, and I can't help a trivial thought creeping through my brain — there are people in bars downstairs, sipping vodkas and orange juice in quest of the same feeling.

Now we've been soaring for some time, in search of another invisible escalator that will extend the margins of the map unfolding beneath. We aim at the horizon but the wind brings us back above the runway as if it knew that the allowed hour is about to end. Here we are, now spiralling down into our real life. The glider gently kisses the grassy ground and the dream has come true.

Most certainly, it was strictly for the birds, but only you, Reader, know with Leonardo that "strictly for the birds" has no trivial meaning but some kind of celestial one. ❖

Jean O'Neil is a Québec writer and journalist who has authored some thirty books and is currently a columnist for the Géo Plein Air magazine.

A Tortoise among the Hares

Charles Yeates, Bluenose Soaring

THE WORLD CLASS US Nationals contest at Uvalde, TX this summer was marked by a strong sense of fellowship amongst the sixteen PW-5 racing pilots and their crews. Competitor ages ranged from seventeen to seventy-five and they came from the United States, Canada, Poland and Australia, prepared to do their best. Separately, eleven technically superb and exotically instrumented Open Class ships gridded at the same time for their fray.

Charlie Spratt, the best ever CD, ran a no-nonsense competition — the rules were the rules — no discussion. Andy Gough, Willem Langelaan, Brian Milner and I remarked on the side that such an approach was almost un-Canadian. Charlie successfully divided the giants from the gnats by using different task areas each day. His skill at devising suitable tasks for each class, given their vastly different performance characteristics, was remarkable.

The weather was strange for Uvalde. Preceding weeks were wet enough to leave airfield grass green and the Frio river flowing. Locals spoke of not seeing so much August green for at least fifteen years. However both classes flew nine out of nine competition days. The World Class opener required a 41 mile push into a 20 knot wind to the first turnpoint, using moderate thermals, no streets and an altitude generally under 4000 agl. You get the picture — only three of us completed the 131 mile task. Unfortunately, Mike Robison landed short in the only reachable open area, a boulder-strewn river bed, damaged the landing gear and had to withdraw from the contest.

The following day required survival flying that was the most miserable I've experienced in years — hot, humid and low. We started no higher than 2700 agl and moved toward the first turn where haze was forming and thickening. The air was so unstable that cu still formed occasionally. After two turnpoints we were free to go our separate ways, but it was obvious that turning toward home was the only practical choice under weak and now blue thermal conditions. Six returned, soaked with perspiration and amazingly slow.

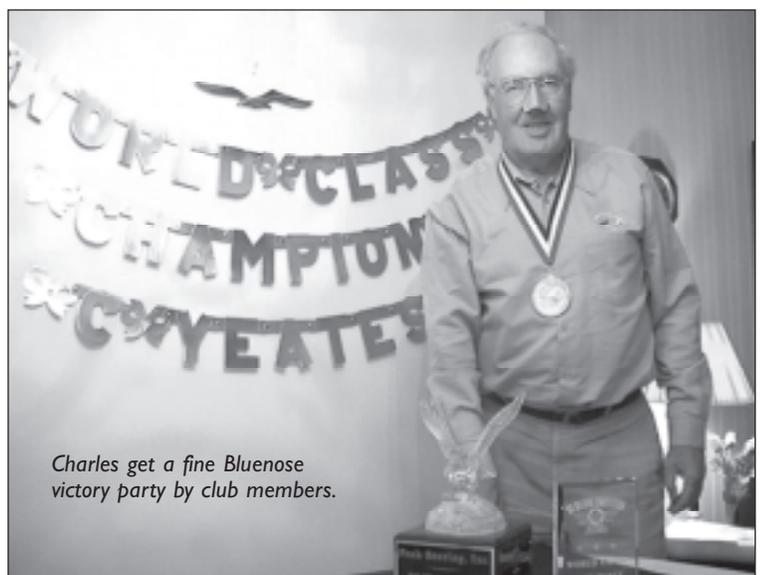
This account is not a day-by-day playback. Our experience at the beginning did not match the high, strong, cloud-topped thermals we all had anticipated in Texas. However, as the competition progressed, soaring conditions strengthened until the last two days matched the dreams of all. In the meantime, I won the third day. The overall leader on the fourth day, François Pin, went down at the second turnpoint — generally one cannot do this and win a hard fought contest. The second leg was

difficult because of an infusion of cooler air from the Gulf of Mexico, enough to make clouds scarce and thermals weaker. This micrometeorological feature affected some later days too.

These events moved me into first overall and my efforts during the final days became more conservative, tortoise like, with an underlying motive — do not land out. The hares in the group continued their speed-seeking ways without seriously threatening my lead. Winning a USA Nationals was satisfying. I owe it to my American mother and Canadian father who had me pop out in Rochester, NY. Dual citizenship is handy when only US citizens can win their National contest.

Safety was in everyone's mind. Heat, possible dehydration, and daily hours of mental concentration were all recognized risk factors. All knew that drinking copious amounts of water before and during flights was essential but, in retrospect, acute fatigue each day may not have been recognized as such. Glider assembly, waiting on the grid, long hours of hard concentration while flying and shutdown at the end of a day took their toll. Landouts and time on the road during retrieves aggravated the condition. Even though there was a compulsory rest day in the middle of the competition, daily relaxation and sufficient sleep were required. Those of us who arrived back at the airfield each day and tied gliders down overnight (no threat of thunderstorms) had a real advantage. The daily load of work was significantly lowered.

I found a new use for duct tape. Starting with Day 4, to keep my big nose from frying in the sun, I covered it with a tailored piece of duct tape. It worked → p19



Charles get a fine Bluenose victory party by club members.

the PERLAN project

flight into the stratosphere – some engineering and met details gathered from several sources

THE PERLAN PROJECT is an endeavour to research, with the use of a sailplane, high altitude atmospheric phenomena including:

- the structure of stratospheric mountain waves (SMW),
- breaking waves (possibly),
- the tropopause and the changes in its structure during SMW activity
- the interaction among the “polar vortex”, the tropopause, and SMW activity.
- side benefit – the world altitude record.

New Zealand and Sweden were chosen as the field locations for Phase 1 of the project to take place during the active phase of the polar vortex because active SMWs have been documented in these locations. Further research will include investigation on the ozone and its dissipation in these regions. The attainment of a world altitude record will be the outcome of this research project of most interest to sailplane pilots.

What is the polar vortex?

The polar stratospheric regions of both hemispheres are surrounded by a narrow band of fast-moving air at high altitudes. The winds around the vortex develop along a zone of sharp temperature gradient in the winter and they can reach 150 knots at the outer edges.

This polar jet provides the energy required for the “normal” tropospheric mountain lee waves to propagate into the stratosphere. The polar jets lie at about 45°S over the



Steve Fossett (rear) and Einar Enevoldson ready for takeoff on 11 August 2002, at Omarama, the last flight of the season. They had a wave flight to 30,000 feet near Mt. Cook. The project is slated to resume in June 2003.

South Island of New Zealand and about 68°N, the latitude of Sweden. These stratospheric waves were first noticed in high latitude locations by the observation of night time noctilucent clouds illuminated by the below-the-horizon sun. These mother-of-pearl clouds give the name to the project, *Perlan* is Icelandic for pearl.

The polar vortex develops during the long polar night from radiation cooling of the atmosphere just as the surface cools during a calm clear night, but this stratospheric cooling takes several months. The outer edge winds are important because they act as a barrier to transport between the polar region and mid-latitudes, blocking mixing of air between regions and allows the polar ozone loss process to occur unimpeded.

Questions and answers on the project

(reported in the *NZ Gliding Kiwi*)

The project team:

Einar Enevoldson	The brains
Steve Fossett	The money
Ken Briegleb	Chief engineer
Pat Seamount	Manager & engineer
Mike Todd	Life support specialist, pressure suits & chutes
Michael Gallagher	Support engineer
Ed Teets / Elizabeth Carter	Meteorology
Jim Murray	Instrumentation

Structural changes to the DG505:

- Major mods to cockpits to allow for pilots wearing pressure suits.
- Canopies double-glazed.
- Front panel, everything detachable to allow the pilot to bail out if required.
- Motor removed to allow fitting of Lithium Sulphur dioxide batteries. Batteries can run at 14 or 18 volts and operate everything for about 8 hours with everything switched on continuously.
- Liquid oxygen bottles are about 40 litres. The oxygen is at -300°C, goes through a radiator/regulator system to get back to warm gas and then into masks. Bottles should last about eight hours.
- All systems are switched and have pressure relays to stop high-altitude arcing.
- Glider is fully IFR.
- All flight instruments and avionics systems are duplicated.
- Mounted PalmNav computers for navigation are all hooked to a Volkslogger for flight recording.
- Installation of a 12 ft tail drogue chute.

Financial support – Where did it come from?

Who is contributing to the expedition costs?

The project is the idea of Einar, and the financial backing comes from Steve Fossett as far as the glider aspect of the expedition, but also from NASA as a research project.

What is the estimated cost of Phase 1?

“Who knows, probably around US\$1M.”

What is the [phase 2] high altitude sailplane that is to be built likely to cost and when will the construction of it be started?

Estimated cost likely will be about US\$3M, but no start date looked at so far. It will be purpose-built and probably a joint effort by a few manufacturers. The wings will most likely be built by the ETA wing makers.

What previous soaring experience has Steve Fossett had?
Steve owns the DG-505 and also a Stemme S10, but does not have huge gliding experience.

Why was New Zealand (Omarama) the final site selected?
Mainly for the time of year required due to presence of the upper vortex and stratospheric wave system. Also the ability to fly generally during the day, and probably not quite as cold as the northern hemisphere during equivalent season, not to mention the facilities and the great southern hospitality!

Value of the pressure suits? Are they on loan from NASA?
The suits are on loan from the USAF through NASA and are valued at US\$250K second hand. New ones cost around US\$450K.

Any form of heating used? Socks? Boots? Pressure suits?
Just about everything: foot heaters, visor heaters, instrument heaters, avionics heaters, pressure suit vent heaters, LED screen heaters, battery heaters, battery heaters for the battery heater batteries ...

Have you brought your own forecaster?
Yes, Ed Teets was here for the first two weeks but has returned to the USA. Elizabeth Carter is here to do the met job. Both have worked on projects studying mountain wave systems and particularly upper atmospheric waves. The project research looks at modelling how the waves work, applications for high altitude aircraft, global atmospheric circulation and atmospheric chemistry. They are working closely with the NZ National Institute of Water and Atmospheric Research who are sending up balloons at similar times to the flights so the information can be compared.

The DG-505 arrived in Omarama in early July. The glider looks just the same as any other glider at first glance, but on closer inspection you start to see some of the many "techno-things" not normally associated with gliders.

What are all those switches for? What is in the bulbous bit on the side of the fin? What are those round green thermos flasks for? Why the extra vents on the side of the cockpit? I got a chance to ask Ken Briegleb, one of the three engineers and the chief engineer on the project. (Ken is an aerospace engineer for NASA and spent 18 months working on the glider to get it prepared; it has been a big effort.)

The answer was, "Yep – just a normal DG-505M ... well, nearly. We had to take out and modify the seat pan so the pilot can get in with his pressure suit and parachute, then we had to modify the front instrument panel so he could bail out if ever necessary. The extra vents on the side are for the pressure suits to exhaust through and the vents are heated. The suits pump up to 3.5 psi automatically when the glider climbs through about 40,000 feet and will maintain a pressure equivalent to 35,000 when up at 60,000 feet, which is the height they hope to reach. The visors on the helmets have heaters to stop fogging and the boots of the suits have heaters too."

"We even fitted a high altitude transponder that Garmin have produced for us – it is good for up to 65,000 feet, all the normal lower altitude units would give up. There are two of just about everything like radios, gyros and instruments and the glider is approved for IFR and night flying, and there are nav and strobe lights fitted."

"Just about everything is vented or heated and everything has been cold-tested to minus 60°C. All the instruments have heating pads – even the LED screens have heaters."

Where does the power come from?

"Well, we took the motor out – that's where 26 Lithium Sulphur dioxide batteries go, plus two ten litre green flasks, which are filled with liquid oxygen, not the normal compressed breathing stuff. The batteries can power everything for about eight hours and then we throw them away – they aren't rechargeable. We use gel-cells for the low altitude test flights to save the others."

"Every system switch is fitted with a pressure relay to prevent it shorting when used at high altitude and there are enough switches here to keep a 747 pilot happy for hours. The canopies are double glazed with desiccant packs attached [to prevent fogging]."

"We had to modify the control sticks so the pilots can still handle them with their pressure suits pumped up and with gloves on, and we came up with an ingenious way of operating the instruments and switches when up there – we use a long Popsicle stick!"

"The bulb on the fin is the new drogue parachute that we fitted as a final safety backup, but it doesn't work very well yet so one of the other guys is working on fixing it up."

How did Ken get involved in the project?

"Well I've known Einar since about 1950 when he was at UCLA and he would come out to the El Mirage Soaring School that my dad ran and do some instructing for him. So we have worked together on various things since then."

The aerodynamic challenge

Although the goal of Phase 1 of the project is to reach an altitude of 62,000 feet, much will be learned about how to get to an altitude of 100,000. One of the significant feats will be getting the aircraft through the tropopause into the stratosphere via the linked wave systems.

The aerodynamic challenge is to get a sailplane wing to work at extreme altitudes. At sea level the glider's true airspeed Mach number is about 0.07 – it increases to 0.66 at 100,000 feet – a sea level stall speed of 88 km/h will increase to a true 740 km/h! The Reynolds number of the airfoil will also decrease by a factor of seven.

Soaring at high Mach number and low Reynolds numbers causes lift, drag, and control and stability problems that need to be analyzed and solved in the Phase 2 sailplane before the design maximum altitude can be obtained. It will be similar to flying at low level on Mars, and could even add weight to the proposal that gliders could be used for transportation on the Red Planet in the future.

⇒ p18

hangar flying

Bob loses a bet!

[Referring to the letter up front in this issue] and jumping in with both feet aimed squarely at my mouth, I must admit that with the quantity of Creemore on tap and single malt consumed following my 300, that I did agree that upon losing the bet I would write *free flight* and DEMAND more articles by the immensely popular Bald Eagle.

So, please, may we have more Bald Eagle articles very soon? I love them. They bring me joy and give some hope that there are people in this sport with a sense of humour.

Since he had confessed to a certain problem involving never flying higher than absolutely necessary, I had to warn him that the highest point in (southern) Ontario was very nearby and that he should be extra cautious on tows. He bet me it was much further north. It was, I lost, and it was mainly due to web research done by my own wife and conveyed to all by cell phone, all services paid for by myself. This is the true definition of "loser".

Below is the Bald Eagle getting ready for his first winch launch with me at Toronto Soaring (and it did not cost him 5 bucks — I graciously took care of that).

Bob Lepp



I get a vacation; you must wait for free flight

This editor is taking a long-awaited and long-planned vacation in New Zealand this winter.

So, after a generation of regular issues, readers will find that the 1/2003 *free flight* will not be appearing. A combined 1&2 spring issue (with more pages if enough extra material arrives over the winter) will be mailed at the usual time. All non-SAC subscribers of *free flight* will have their subscription extended one issue so they get their normal six. I encourage everyone to e-mail stories to me over the winter as inspiration strikes — I'll be checking my in-box often.

By the way, the plan now is to have a colour cover for *free flight* every June/July issue —

think about that, keep your camera handy at the club, and keep your eyes open.

Please note that most digital cameras on the market today can't take a photo with a pixel count large enough to fill a 7" x 10" space at 350 dpi, the resolution required for the cover photo.

Tony Burton

Reviewing the duel

Pilots flying out of Invermere since 2000 have turned the Free 3-Turnpoint Distance record into a real blood sport, with active attempts against each new increment. Since this FAI record replaced the 3 TP distance category in 1999, here is how it has progressed in the Open category:

Bonnière / Werneburg	(joint record)	ASW-20	July 98	559.7 km
Tony Burton	RS-15	May 00	607.3 km	
Trevor Florence	ASW-20	July 00	680.0 km	
Tony Burton	RS-15	May 01	740.1 km	
Tim Wood	LS-3a	June 01	776.1 km	
Mike Glatiotis	HP-18	June 02	860.7 km	
Tim Wood	LS-3a	July 02	871.9 km	

How many more record flights will occur until the 1000 kilometre mark is surpassed? It's probably just a matter of (a short) time given the growing local knowledge and the hot competition.

Overnight wave flight in Norway

Two German pilots, Helmuth Rohs and Robert Fessler, made an extraordinary flight on 19 June, flying a Nimbus 3DM. They intended to fly 1682 kilometres with three turnpoints and finish 100 kilometres northwest of the Starmoen airfield start point. At the time of their takeoff, around noon, they declared: "Don't wait for us to come home tonight" — as it turned out — for good reason!

They began the first leg of the task, as such, around 2 pm, heading southwards towards Notodden, which they reached around 7 pm.

DG-303 Elan Club/Standard	1:41.5/43, acro +7, -5g
DG-800S 15/18	1:46/51.5
DG-808B 15/18 SOLO 53hp	1:46/51.5
DG-505 ORION 17/18/20	1:acro/40/44
DG-505 MB 20/22 SOLO 64hp	1:44/47
DG-1000 18/20	1:acro/43/46.5



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E2 is Tony Burton's Russia AC4-C waiting for the thermals to get closer at Cu Nim.

The second turnpoint was 500 km north of Røros; but, at 11 pm, with 380 covered on this leg, the team decided to change their route, returning southwards. As a result, they spent the night in the "Tesse wave", reaching 5000 metres around 2 am. At 7 am, after a third leg of 430 kilometres, they turned north again. Eventually, the pilots had to start their engine at about 11 o'clock because weather conditions had deteriorated. Around noon, the day after their departure, they landed at Elverum.

This flight was equivalent to a free distance of 1200 kilometres. At an average speed of 59 km/h, it was without doubt the slowest ever flight for this distance, but certainly one of the most spectacular ones. The first five hours were spent in thermals, the rest in wave at "night".

This flight brings to mind the decades-long bar conversations in Swedish and Norwegian gliding clubs, as in June at these latitudes the night is short and never totally dark. The flight has inspired the pilots to cross the Arctic Circle, from Starmoen to Kiruna and return, a flight of about 1700 km.

from "Vol à Voile"

Passenger sues after glider mishap

And you thought this could only happen in the USA. A glider passenger in Australia who witnessed a mid-air collision is taking legal action against the estates of the two pilots who plunged to their deaths because he has now become afraid of heights! Also being sued is the Waikerie Gliding Club and the pilot of the glider giving him the intro flight when the tragedy occurred in 1999. The passenger claims psychological injuries and is now afraid of heights and flying in aircraft and is seeking \$30,000 in costs (at least that sum is nothing like the usual size of American claims).

In the accident, a visiting Japanese pilot flew into the towrope of a Pawnee doing another tow. That glider released, but the Japanese pilot became entangled in the rope and both he and the Pawnee crashed.

The passenger is claiming negligence on everyone's part and that the Japanese pilot's inadequate English made him incapable of understanding warnings being given to him over the radio.

from "NZ Gliding Kiwi"

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follow this rule for takeoff (rope breaks) why should it be any different on landing?

The percentage of accidents that happen during the landing phase of flight will always outnumber all other phases. Although we need to fly with precision at all times, if we stall/spin at altitude we can recover. It's landing where we need the most precision.

As for instructors encouraging short landings, I have never met one who prefers a short landing. Let's not confuse a short landing with a *precise* landing. That said, we need to lead by example. Hot dogging in low and 'taxiing' into position in line for takeoff should be strictly forbidden.

It's easier (and cheaper) to push a glider back than carry the pieces forward. Let's arrive safe and under control.

David Donaldson
Safety Officer,
Great Lakes Gliding

Schweizer on Cadets

I was very pleased to see the invitation to the Air Cadets to join SAC in "Priorities" and the article "Flying with the Air Cadets" in the Jun/July issue of *free flight*, and that they will get a copy of your magazine. I am happy to see that SAC is involved with the ACLC.

I suspect that many SAC members do not know that Schweizer Aircraft Corp. has provided post-graduate soaring for the best cadet of each region in the Air Cadet League of Canada glider program for many years.

Just about all cadets who attend here get some soaring and we encourage them to apply for their "C" badge from SAC when they return to Canada. It is great to see how enthused they become about soaring after nothing but circuit flights in their training program. They are logical candidates for SAC membership.

I have tried for years to get the ACLC to expand into soaring but they are mainly interested in bringing cadets up to soloing a glider. When I used to get up to Canada years ago to attend your annual SAC meetings I kept trying to get SAC to tie in with the ACLC and encourage cadets to join SAC and get into soaring.

I hope the two items I mention above mean that SAC is getting involved. Several paragraphs on page 18 about the new continuing scholarships for recent graduates of the ACLC training program confirm this and it is great! Keep it going!

Best wishes to my many soaring friends in Canada.

Sincerely, **Paul A. Schweizer**

Einar Enevoldson bio

Einar started gliding about 1948 and instructed at the El Mirage Gliding School in 1950 for Ken Briegleb's father. He has done most of his gliding in the US, has about 4000 hours logged, and owns a Nimbus 3 which he will fly again when he gets the time!

Einar studied aeronautical engineering at UCLA and the University of Wyoming, where he gained his degree. He then spent 13 years in the USAF flying mainly the F-86 and the F104 and in 1965 went to Farnborough to the Empire Test Pilot School.

In 1966-67 Einar was based at Boscombe Downs, UK as a test pilot during the later stages of the Lightning jet development. In 1968 he joined NASA as a test pilot working on a variety of aircraft development projects including testing the F111, F8 supercritical wing, F8 digital fly-by-wire, XF-12a, the predecessor to the SR7, X24 Lifting Body developments, F14 stall & spin testing program, F18 high angle of attack aerodynamics flight test program, the Skewed Wing test aircraft, and the F15 engine development program.

In 1988 Einar retired from NASA and went to Germany to work for Grob, where he carried out test flying on the *Egret* spy plane, an aircraft that never went into production (due

building the AFH-3

from page 7

and he is also one of the few people that can sand gelcoat without going through at the wrong spots. Late in the fall of 2000 we did the final assembly in the backyard of the house in Thorndale for control throw allowances and more fine-tuning.

The next job was to do the weights and moments of all the control surfaces, mass balance the rudder and finally install and secure all of them permanently. When that was completed the glider was once more assembled (this time inside) to complete the weight and balance, re-check and record all the control throws and travel. Finally all of this was recorded as part of the paperwork in preparation for the final inspection.

The final inspection was scheduled for January 2001 and all the necessary paperwork was submitted. The inspection of the glider went quite well and other than a few small snags, the test flight should be authorized without any delays. After a few minor paperwork problems a test flight permit was indeed issued and a test flight at Brantford Airport was organized. Ed Jr. had the honors of the first flight.

Since then I have completed the 17.5 metre wingtip extensions and we have now had a chance to compare the performance in both the 15m and 17.5m against known types of

to the collapse of the Iron Curtain) as well as the *Strato 2C*, a reciprocating prop atmospheric research aircraft which he flew up to 61,000 feet. In 1997 he became "semi-retired" and has been busy ever since.

Einar has been working on the high altitude wave project since he conceived the idea in 1992 and has been working on the theory of the project until 1999 when he sought financial backing for the project. He met Steve Fossett about two years ago and with some ongoing interest from NASA on the high altitude research angle, the project has developed. Steve purchased the glider, and testing went on for six months in California before the glider was shipped to New Zealand.

In the early stages of equipping the glider, Einar brought Ken Briegleb in on the project because of his engineering expertise.

At the time this report was written, Einar has had six flights in the glider at Omarama. Two were local test flights, two were mainly for the media and the last two on July 20, the second of which the glider was flown up to 29,000 feet over Lake Pukaki. [*The last flight of the 2002 project season was on August 11.*]

For the future Einar would like to see Phase 2 of the Perlan glider project started with construction of a glider. This will obviously be based on the Phase 1 results. ❖

gliders. Extensive testing will be done in the near future but I am very happy with the preliminary results.

This was one of the longest and most demanding projects I have done, but I have to admit that I really enjoy the challenge of building this kind of mega-project and the satisfaction of its completion. I would like to take full credit for this one and name Ed Jr. as the supervisor of the project. (There were some lay-up sessions and problem areas that I could not have done or resolved without him!) Please understand that one builds a glider for the pleasure of doing so — it's really cheaper to purchase one while making a living with a "normal" job.

The glider type on the Certificate of Registration reads AFH-3. These are my initials and it was the third glider built. A few more changes still have to be made this winter and I hope to have more time to fly it next season — I only flew it five times this year while competing in the Dustbowl at SOSA and at the Ontario Provincials, flying together with Ed Jr. in the LS-8.

My next project, an RV4, is already well on the way. With an IO360 and a constant speed prop, it will be a power pilot's dream. We now also have a 2000 foot strip behind the house, a barn big enough for this project, and a newly completed, insulated 64x40 workshop for Ed Jr. ❖

perfectly. The next morning when standing at the front describing how I had managed a win, all the World Class pilots suddenly put duct tape on their noses "because it is obvious that it worked for you". Do you think 3M might become a soaring sponsor?

Landout stories were sometimes lurid. One pilot landed on an airstrip in property owned by a hunting club. It took a local sheriff, the State Police, a club custodian and a search for the gate key to get the crew access. Eight hours were consumed making only a thirty mile retrieve. Another was met with rifle toting guards after landing on a ranch strip. He was held under guard until his crew arrived and "the Boys" watched closely until the trailer was back on the highway and hustling out of range.

Deserving special mention is Sebastian Kawa and his wife/crew Anna. A Polish medical doctor (so is his wife) in his late twenties, he is his country's champion, sent over to do his thing in Uvalde. He was the most skilled pilot in the group. His ability to use a deep height band and to swiftly locate thermal cores proved remarkable.

Unfortunately, the planned arrival of a new Bielsko B-1 PW-5 for his use went astray and he missed the first two contest days while a loaner was being arranged. Sebastian handily won five days in a row while Pat Tuckey and I beat him once each. Sebastian said at one point that he likes competing in the World Class but he prefers the 18m class. If they didn't cost three and a half times more than the PW-5, I might agree with him.

When presented with the winner's cup, medalion and plaque, I seemed worth pointing out that I must be a slow learner because it took fifty-one years of soaring experience to reach the podium. Well, it's all fun, eh? ❖

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- Sierra - india - roméo ... Montréal terminal, autorisation jusqu'à 18,000 pieds, veuillez afficher le code 72 ... pour identification radar, "cherchez l'erreur!!"

Je continuais à monter et plus je m'approchais de mon objectif, plus je m'énervais. Je n'arrivais pas à me rappeler précisément mon point bas. Je calculais et recalculais, 3000 mètres (10,000 pieds) à laquelle je devais additionner mon point bas ± 5000 pieds pour être plus certain, allons 16,000 pieds minimum.

Une fois mon objectif de 3000 mètres atteint, j'entrepris de continuer de monter dans le but d'atteindre le 5000 mètres, après avoir reçu l'autorisation de Montréal terminal pour le niveau de vol 230. L'ascension fut lente, tout

au long du vol. J'explorais les environs, toujours avec prudence et gardant mon point de référence. La vue sur Québec et les environs était voilée, comme si je regardais à travers des rideaux plein jour. Je me laissais dériver avec prudence sur le lenticulaire derrière. J'ai pris quelques photos. Rendu à 22,000 pieds indiqués sur mon altimètre, je plafonnais et après un certain temps j'entrepris ma descente lentement ... en savourant chaque minute ... quelle satisfaction après tant d'essais et d'efforts !

J'avais des remords pour ceux qui ce jour-là n'ont pu atteindre leur but. Merci à Jean (Provencher), à Georges (Cousineau) et à Jean-Guy (Hélie), une personne qui m'a entraîné à Baie St Paul dès mes débuts dans le club... et qui, malgré lui, m'a transféré la responsabilité du camp d'onde à Baie St Paul depuis quelques années. Et tous les autres qui de près ou de loin m'ont aidé à atteindre mon but, merci pour leurs supports.

Si vous passez dans le coin venez-nous voir, juste vous rappelez, que nous opérons près du quai de la municipalité de Baie St Paul, à l'arrière de l'Hôtel Belle plage. ❖



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The following badge legs were recorded in the Canadian Soaring Register during the period 7 July to 7 September.

1000 km DIPLOMA

10	Larry Springford	SOSA	1033.2 km	(World # 412)
11	Tillmann Steckner	London	1005.4 km	(World # 413)

GOLD BADGE

299	Anthony Firmin	York
-----	----------------	------

SILVER BADGE

948	Dennis Pizzardi	Erin
949	Mark Mozel	Vancouver
950	Denis Moore	Pemberton

DIAMOND GOAL (300 km goal flight)

Anthony Firmin	York	310.9 km	Discus CS	Arthur East, ON
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GOLD DISTANCE (300 km distance flight)

Anthony Firmin	York	310.9 km	Discus CS	Arthur East, ON
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SILVER DISTANCE (50 km distance flight)

Dennis Pizzardi	Erin	70.9 km	1-26	Erin, ON
Denis Moore	Pemberton	51.3 km	Blanik L-33	Pemberton, BC

SILVER ALTITUDE (1000 m gain)

Denis Moore	Pemberton	1735 m	Blanik L-33	Pemberton, BC
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SILVER/GOLD DURATION (5 hour flight)

Michel Jobin	Quebec	5:10 h	Grob G102	St Raymond, QC
JF Le Houillier	Quebec	6:33 h	Grob G102	St Raymond, QC
Mark Mozel	Vancouver	5:19 h	Grob G102	Hope, BC
Richard Snow	Vancouver	5:27 h	Grob G102	Hope, BC
Nicholas Kirschner	Vancouver	5:52 h	Grob G102	Hope, BC
Denis Moore	Pemberton	5:18 h	Blanik L-33	Pemberton, BC

C BADGE (1 hour flight)

2718	Wayne Hewison	York	3:08 h	1-23	Arthur East, ON
2719	Ray Perino	SOSA	1:05 h	SZD-50-3	Rockton, ON
2720	Wayne Store	Great Lakes	1:25 h	Ka6CR	Golgan, ON
2721	Pat Rolfe	Vancouver	1:18 h	L-13	Hope, BC
2722	Jean-Pierre Avoine	Vancouver	1:05 h	L-33	Hope, BC
2723	Joseph Snowie	Vancouver	1:10 h	L-13	Hope, BC
2724	Steve Crutcher	Vancouver	1:12 h	L-33	Hope, BC

Notes from Walter

Claims submitted after 15 November will not be processed until April 2003 so please submit any you are holding right now.

And more: a few recent claims have been made invalid by problems with electronic declarations. Some flight recorders are very user unfriendly in this respect and I have been advising pilots to use a paper declaration instead. All you have to do is write out your declaration on a letter size piece of paper being careful to include all items which would be required on a photo declaration. Give it your OO before takeoff and you have no more worries about whether or not your electronic declaration is valid.

Read the Sporting Code paragraphs 4.2 and 4.2.1. You can download the Code and the photo declaration form from <www.sac.ca>. Click on "Documents" for the new Amendment List 3, Oct 2002 version of the Sporting Code and the Annex C Pilot & OO Guide.

SAC records

Roger Hildesheim

49 Maitland Street, Box 1351, Richmond, ON K0A 2Z0
(613) 838-4470, <lucile@istar.ca>

The following Canadian record claims have been approved as of 9 Sept 2002:

Pilot	Dale Kramer
Date/Place	29 November 1999, Julian, PA
Record type	100 km Triangle speed, Open, citizen
FAI category	3.1.4h
Sailplane type	LS-4a, N7LR
Speed claimed	168.1 km
Task completed	3 GPS turnpoints
Previous Record	Peter Masak, 141.4 km/h, 1985

Pilot	David Springford (Pat Templeton)
Date/Place	24 January 2002, Tocumwal, Australia
Record type	200 km Triangle speed, Multiplace & Club, citizen
FAI category	SAC only
Sailplane type	Duo-Discus, VH-GIE
Speed claimed	108.5 km/h (Multiplace), 95.9 km/h (Club - David only)
Task completed	Tocumwal, Urana, S 35° 14.16' - E 145° 39.67', return
Previous Record	Multi: Charles Yeates (K Yeates), 79.5 km/h, 1987 Club: Spencer Robinson, 81.6 km/h, 2002

Pilot	Pat Templeton (David Springford)
Date/Place	24 January 2002, Tocumwal, Australia
Record type	100 km Triangle speed, Multiplace & Club, citizen
FAI category	3.1.4h
Sailplane type	Duo-Discus, VH-GIE
Speed claimed	112.7 km/h (Multiplace), 99.6 km/h (Club - Pat only)
Task completed	Tocumwal, Savernake, Berrigan NW, return
Previous Record	Multi: Charles Yeates (K Yeates), 102.7 km/h, 2001 Club: unclaimed

Pilot	Bruce Friesen
Date/Place	1 June 2002, Chipman, AB
Record type	Free Out & Return distance, Open & Club
FAI category	3.1.4b
Sailplane type	Std. Austria, C-FPDM
Distance claimed	315.4 km (Open), 425.8 km (Club)
Task completed	Chipman, Kitscoty, Chipman
Previous Record	Open and Club: both unclaimed

Pilot	Mike Glatiotis
Date/Place	3 June 2002, Valemont, BC
Record type	Free 3 TP distance, Open & Club
FAI category	3.1.4c
Sailplane type	HP-18 (mod), C-FETQ
Distance claimed	860.7 km (Open), 869.3 km (Club)
Task completed	start McBride ridge, TPs at Lussier Hot Springs, Willowbank summit, Radium Hot Springs, land Invermere
Previous Record	Open: Tim Wood, 776.1 km, 2001 Club: Trevor Florence, 770.4 km, 2000

Pilot	Mike Glatiotis
Date/Place	3 June 2002, Valemont, BC
Record type	Free distance, Club
FAI category	3.1.4a
Sailplane type	HP-18 (mod), C-FETQ
Distance claimed	480.6 km
Task completed	McBride ridge to Lussier Hot Springs, BC
Previous Record	unclaimed

Pilot	Tim Wood
Date/Place	24 June 2002, Invermere, BC
Record type	Free 3 TP distance, Open
FAI category	3.1.4c

Sailplane type LS-3a, N57SS
 Distance claimed 871.9 km
 Task completed 3 GPS turnpoints
 Previous Record Mike Glatiotis. 860.7 km, 2002

Pilot **Tony Burton**
 Date/Place 21 July 2002, Black Diamond, AB
 Record type 200 km Speed to Goal, Club
 FAI category SAC only
 Sailplane type Russia AC-4C, C-GJEC
 Speed claimed 113.2 km/h
 Task completed Black Diamond to Warner a/p, AB
 Previous Record Trevor Florence, 80.9 km/h, 2002
 Club: unclaimed

Notes from Roger

Barograph calibrations and flight recorder serial numbers

In order for a calibration to be valid, the serial number of the FR must be referenced on the calibration certificate. Otherwise, there is no objective evidence that connects the accuracy of the altitude trace to the claimed flight. The serial number of your FR forms part of the *.igc file name. The third through seventh character (4 digits) of the file name (which is automatically generated by the FR when you download your flight) give a manufacturer code letter and the serial number. This four digit character set is the one that must be referenced when a calibration is performed and when filling out your claim paperwork.

This may not seem like a big deal but please remember that world (and domestic) record claims have been rejected for more trivial issues.

Also, please include the raw data file for your flight (prior to *.igc file conversion) along with the *.igc converted file with your record claim submissions.

Finally, Mike Glatiotis wins the best closing line of a flight narrative award for the following:

"Total time for the submitted flight was 9:13:12 with a total flight time of 9:43:18. A ConForm foam seat was purchased shortly after landing!"

Sporting considerations

from page 4

in their euphoria of finding a good solid thermal at long last or they had misinterpreted the airspace representation on the sectional chart which is somewhat ambiguous. A number of questions arose in conjunction with the airspace penalties:

Number of penalty points per violation

It was decided to follow the penalty guide and penalize first (day) violations with 100 points each.

What lateral and vertical tolerances should be applied

It was decided to use a vertical tolerance of 250 feet which is the approximate equivalent of one turn in a 500 ft/min thermal and a lateral tolerance of 300 metres which is the equivalent of a half turn in a thermal.

Multiple violations

It was decided that multiple violations within a short time, such as during thermalling at the edge of the zone would be counted as one violation. However, if a pilot left the area, any subsequent violation of the same airspace would attract an additional 100 point penalty. In order to avoid this somewhat arbitrary application of penalty points in the future, it was suggested to apply scaled penalties based on the duration of the violation (ie. one point per second).

During analysis of the individual files and handling of protests it was discovered that the barometric sensors in flight recorders seem to become inaccurate as the units age. There can also be significant hysteresis errors. It might be necessary in the future to require pilots to produce the calibration curves for their FRs. Some FRs produced completely erroneous altitude readings which deviated as much as 2000 feet from the GPS altitudes.

In the past, pilots using FRs without a barometric sensor such as Nick Bonnière's, and most handheld GPS units, were not allowed to fly over or under class C or D airspace. However, in areas with complex airspace structures such as inverted wedding cake terminal areas, this is not practical. In future contests it may be necessary to require at least GPS altitude data for these types of FRs. ❖

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Check the data!

All clubs and SAC committees should regularly check the data that appears in *free flight* for errors or required changes. For example, Rocky Mountain Soaring had been in Innisfail, AB since April, until a sharp-eyed reader pointed out the mistake.

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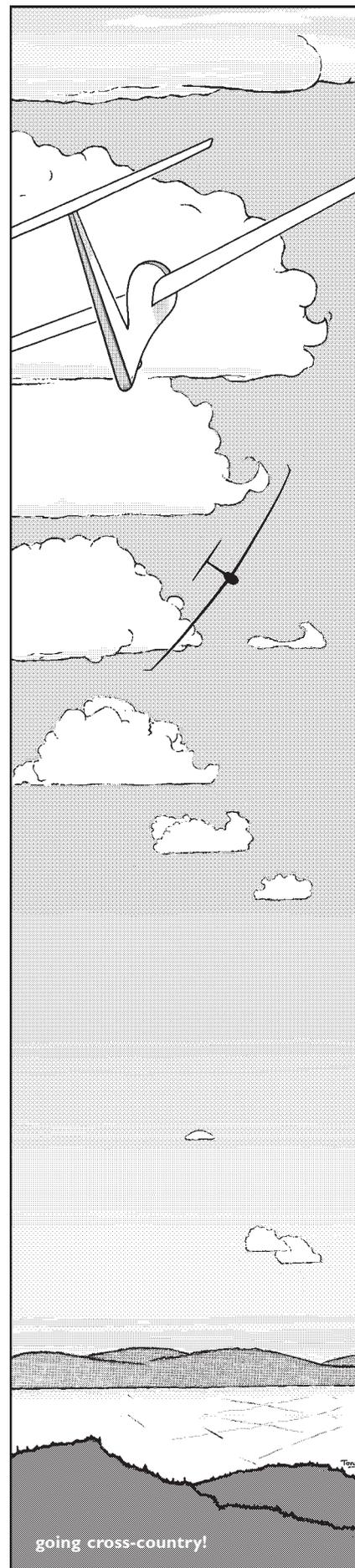
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