Skywriter

Monthly Newsletter of the Calgary Ultralight Flying Club

February 2000

From The Cockpit

by Brian Vasseur

At the last meeting we had a chance to discuss circuit procedures with Ed D'antoni leading us. We also had the benefit of having a representative of Transport Canada, Lenora Crane, with us to help answer any questions.

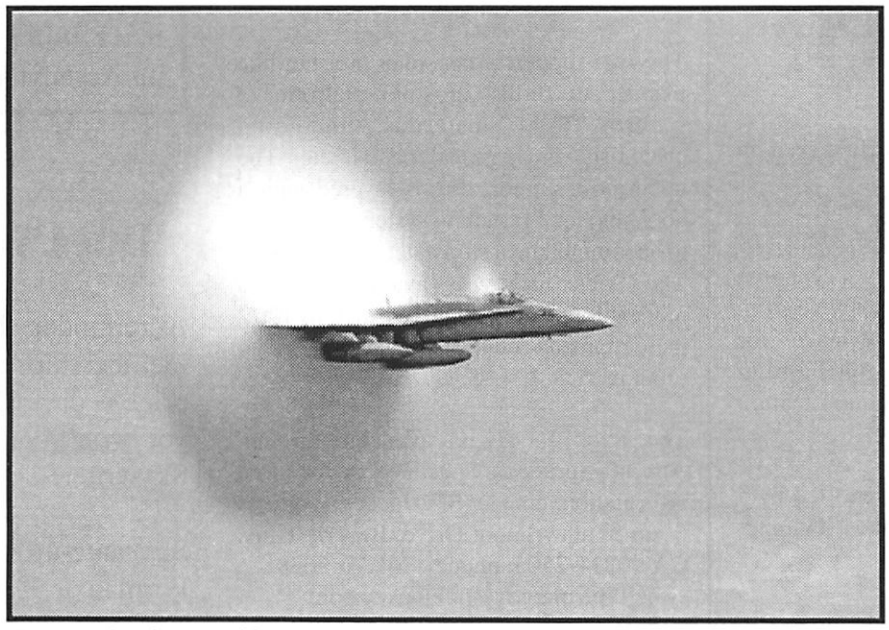
Something that I felt was significant about this review was realizing that the best way to avoid conflict in the circuit is to be doing what everyone expects you to do. Something Wayne Winters always drummed into me at every lesson was that the only situation that you really can't do much about after the fact is a mid-air collision. I think the best way to do that is to be where people expect you to be and make sure your eyes are out the windows looking for those that aren't.

Something else I've been thinking about while I'm building my Volksplane is how many inspection holes I'm going to have to install so I can check all the pulleys and turnbuckles inside the wing. I recall that after building my Minimax I spent numerous hours finding and fixing leaky fuel connections. Fortunately they were installed in a place that was easy to get to and easy to fix. The loose elevator cable in the tail wasn't quite so obvious and was found while doing a walkaround inspection while still doing taxi testing. We only realized the problem because we were intentionally looking for everything wrong and I don't believe I would have caught it on just a regular walkaround. To actually find the problem and fix it required removing the tail and installing loctite on the cable fittings.

We all know we look for the obvious and easy to check things when we're doing a walkaround and we casually assume the hard to check stuff will be OK just one more time. Now that there's a lot of snow outside it might be a good time to do some disassembly and check those places that don't get checked very often. It also might not hurt to see if there's anything you can do to make these areas easier to check.

One other thing you might want to do is to take a long look at your engine. Your two stroke engine is quite particular about timing and bad timing wears out a crankshaft fairly quickly. Take a look at your fuel too. Two stroke oil tends to separate after several months and your fuel also picks up moisture with time. Keep your fuel tanks full if possible and you might consider draining and replacing your fuel if it's been sitting more than a few months with oil mixed.

1999 was a bad year for accidents and especially fatalities with a lot of those accidents being avoidable. Let's make a concerted effort this year to improve our statistics. ✈

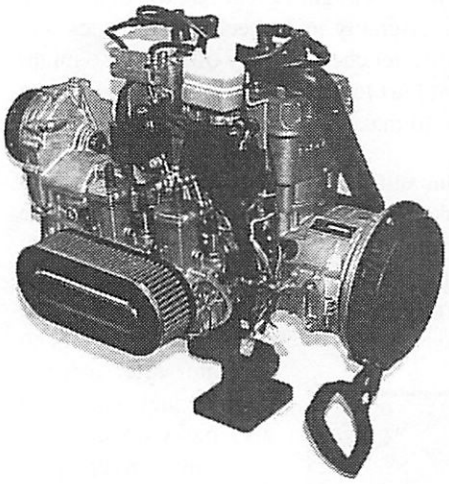


Vapour cloud created by an F-18 just passing through Mach 1.

New Rotax 582 Version 1999

The new Rotax 582 version 1999 engine is now available. While the new revision is still rated at 66 Hp. many new features have been added. A new style recoil starter has been increased from 6 to 8 inches in diameter, which should allow the operator to attain up to 25 percent more cranking rpm, which greatly assists in reaching the 400-600 rpm needed for starting. This modification was done without adding weight or length to the engine.

A new water bypass line connects the thermostat housing and the water pump. This large diameter line will allow full circulation of coolant even when the thermostat is closed, greatly reducing the possibility of water pump cavitation and



overheating. This feature was first seen on the Rotax 618.

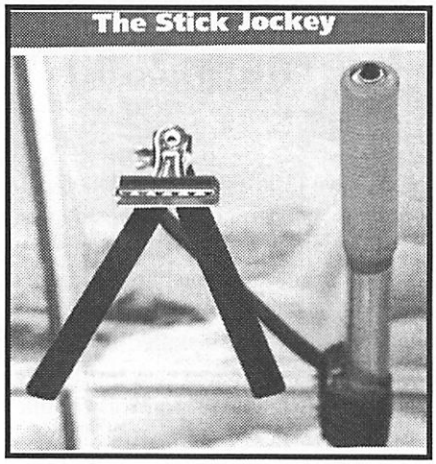
Internal changes to the Rotary Valve area are also now standard on the 1999 version. A new drop-in seal cartridge makes for easy maintenance and more reliability in the water pump seal area, another feature first used on the Rotax 618.

All these new features are identified by a new royal blue powder-baked cylinder head.

The Stick Jockey

Wishing you had a way to hold your maps and charts without taping them to your leg? If so, the Stick Jockey may be the answer to your prayers.

The Stick Jockey is an attachment for traditional aircraft joysticks featuring a clip and supporting strips to hold charts, maps, notes in an easily readable format.



Made of black anodized aluminum, the Stick Jockey can be installed on either side of the joystick and is adjustable vertically and horizontally for pilot utility and convenience. Its angular design allows for freedom of stick movement with ample clearance from cabin structures and other objects in the cockpit.

The two support arms splay in a fan-like manner to furnish a solid platform to secure flight materials, including checklists, navigational charts, etc. The uppermost support arm is layered with a hook and loop fastening system enabling it to accommodate a stopwatch, or GPS unit. The Stick Jockey is available in two models to accommodate 3/4 inch to 1-1/2 inch diameter control sticks. Suggested retail price is $24.95.

The Stick Jockey is available through Aircraft Spruce & Specialty, or for more information, contact Sky-Jockey Products of an South Almont Drive, Beverly Hills. CA 90211-2505, phone 310-276-6638. e-mail: pfrmargo@stickjockey.com

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@telusplanet.net

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

Vice-President: Stu Simpson 255-6998
e-mail: simpsont@cadvision.com

Secretary: Bernie Kespe 255-7419
e-mail: kespeb@cadvision.com

Treasurer: Carl Forman 283-3855
e-mail: formanc@cadvision.com

Director: Dan Mitchell 238-4254
e-mail: mitchell@cadvision.com

Past President: Wilf Stark 935-4248
e-mail: wstark@compuserve.com

Visit the CUFC web site:
www.cadvision.com/cufc/

Upcoming Speaker

February - Don Ward, an Aerodynamics Instructor at SAIT, will give a discussion on Aerodynamics.

Dues...Dues...Dues

A reminder that your 2000 club membership dues are due. The price is only $20.00, but without it you won't continued to receive the Skywriter.

So ante-up to Treasurer Carl Forman or Secretary Bernie Kespe.

The Spiral Dive

by Bob Kirkby

The Spiral Dive, sometimes called the "Death Spiral" for good reason, is something not many pilots understand. A lack of understanding of a manoeuver generally leads to fear of doing it, which in turn leads to mishandling of the aircraft should the pilot inadvertently end up in such a situation. The spiral dive is something that needs to be understood for the simple reason that the instinctive reaction to extricating oneself from a spiral dive is not the correct reaction, and only makes it worse.

Before analysing the spiral dive we must first understand some basics about pitch control. Most aircraft designers go to great lengths to build as pitch-stable an aircraft as possible within the limits of their design goals for C of G envelope, efficiency, etc. In fact most aircraft end up being very stable in pitch - much more so than in roll. The way this is achieved is an interesting discussion of relative angle of attack between the front and read wings. However, this is outside the scope of this article so I will limit myself to discussing the final result. That, of course, is that almost any aircraft will try to maintain it's trimmed angle of attach, all by itself.

Let me explain. Suppose you are flying along in cruise with pitch trim set to maintain the correct angle of attack to keep the aircraft in level flight at your chosen airspeed. Should your airspeed decrease slightly, perhaps by encountering a gust, the lift produced by the wing will decrease slightly and, as we all know, the aircraft will pitch down in an attempt to regain it's lift. The airspeed will increase and likely surpass the previous cruise airspeed at which point the aircraft will pitch up due to excess lift. It has entered a phugoid oscillation and most well-behaved aircraft will continue for 2 or 3 cycles until the oscillation dampens out and the aircraft is back to level flight at its original cruise altitude. The same thing would happen if the angle of attack changed momentarily, thus increasing or decreasing the lift. A simple way of putting this is, the aircraft "knows" what angle of attack it must maintain in order to stay in the air at a given airspeed, and it will try to return to it if disturbed.

So what does this have to do with spiral dives, you say? Hold on, I have two more diversions before I explain that. Let's take a look at how we maintain lift in a turn. Figure 1 shows an aircraft in level flight. The lift exactly equals the weight, otherwise it would rise or fall, right? Figure 2 shows an aircraft in a 30 degree bank. As you can see from the vector diagram, in order to keep the aircraft in the air we must generate 1.2 times its weight in lift (20% extra). This is commonly referred to as load factor. The lift vector has two components. The vertical component holds the aircraft up and the horizontal component cause the aircraft to turn, which is normally what we want from a bank.

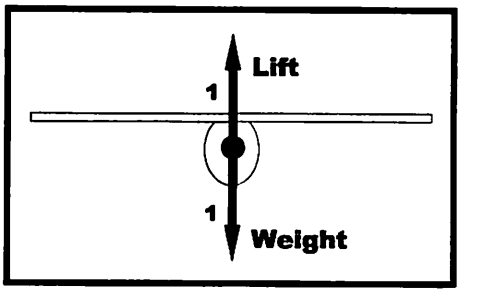


Figure 1 - Level flight

So, when we roll into a 30 degree bank for a turn how do we get this extra 20% lift? There are two ways to generate more lift. We can increase the angle of attack, increase the airspeed, or a combination of both. You might remember your instructor telling you to add power and keep the nose up in a turn that will last more than a few seconds. So a little bit of both gives us the extra lift we need to keep us in the air and make the aircraft turn. Sounds simple.

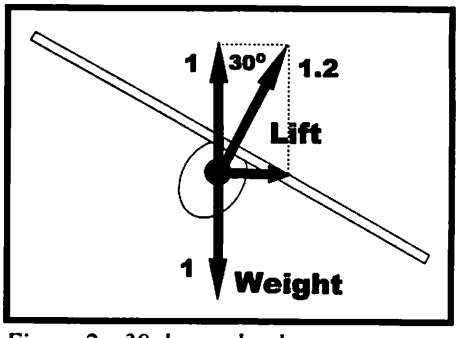


Figure 2 - 30 degree bank

Now take a look at Figures 3 and 4. In a 45 degree bank the wings must generate 40% more lift to keep us from dropping. In a 60 degree bank it must generate 2 times or 100% more lift, otherwise we drop out of the sky. The lift required to keep us airborn increases exponentially with bank angle. At 70 degrees we need 3 times the lift which is beyond the capabilities of most aircraft. That's why your instructor should have told you to never, ever exceed 60 degrees! Unless you are flying an aerobatic aircraft with tons of power you won't even be able to stay in the air at 60 degrees.

(Continued on page 4)

Spiral - continued from page 3

There is one more factor we should consider before getting "into"our spiral dive. In a turn the outside wing has to travel farther than the inside wing. See Figure 5. Since it has to travel farther in the same amount of time it must be travelling faster. Therefore, the outside wing generates more lift than the inside wing, which tends to increase the bank and tighten the turn. In a shallow bank turn this will not be very noticeable, but as the bank angle increases and the turn tightens it becomes much more significant. This is easily calculated. The difference in airspeed depends on the radius of the turn and the wingspan. For example, I've done the calculations on an aircraft with a 32 foot wingspan in a turn with a radius of 500 feet. The outside wing will experience a 3% greater airspeed than the inside wing (as measured at the centre of each wing). Since the lift generated by an airfoil varies with the square of the airspeed over it (other things being equal), the outer wing will generate 9% more lift than the inner wing. That's a lot. In a coordinated steady turn we have to apply opposite aileron to prevent the bank from increasing. The tighter the turn the more opposite aileron we must apply.

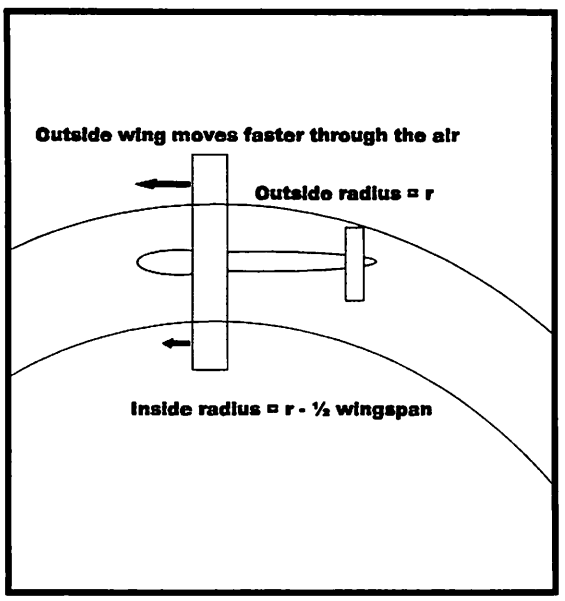


Figure 5 - Differential air flow

Now let's go flying. Suppose we are flying along straight and level and our right wing suddenly drops 30 degrees due to unexpected turbulence. Unfortunately we have our head in the cockpit folding our map at the time with hands off the stick. The airspeed and lift are still the same but the lift vector is now pointing 30 degrees to the right, as in Figure 2. The aircraft does not have enough vertical lift to hold it up so it starts to drop which decreases the angle of attack. Since it is preprogrammed to maintain its trimmed angle of attack the nose automatically pitches down and the airspeed starts to increase. Due to the horizontal component of lift the aircraft starts to turn to the right. As the turn develops the differential airspeed over the wings takes effect and the bank angle starts to increase. An increase in bank angle causes the vertical component of lift to decrease and horizontal component to increase further. Therefore, the aircraft continues to sink and the turn continues to tighten. Reacting to the sinking, the nose pitches down further and the airspeed continues to increases. We now have two factors causing the turn to tighten: the increasing horizontal component of lift and the increasing airflow differential over the wings. The decreasing pitch, increasing airspeed, increasing bank angle and tightening of the turn are now feeding each other and we are deep in the grip of a spiral dive.

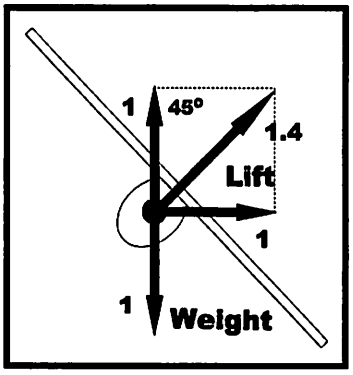


Figure 3 - 45 degree bank

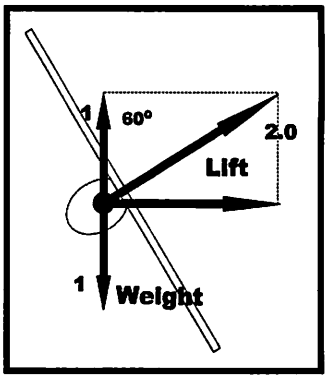


Figure 4 - 60 degree bank

If we had been paying attention we would have noticed the nose dropping below the horizon and the increasing bank right away. However, we are still folding the map and haven't a clue the little bump we just felt is sending us into a death spiral. Luckily there are two non-visual clues we should be sensing by now. The first, and most obvious, is an increasing G load in the seat of our pants. Remember from above that if our bank has developed to 45 degrees the G's will be approaching 1.4, which is very noticeable. The second clue is an increase in wind noise. The aircraft is trying to increase its airspeed enough to produce 1.4 times the lift. Lift varies as the square of airspeed so it is diving to increase airspeed by about 1.2 times. By the time the bank angle reaches 60 degrees, which will happen in a few more seconds, the G's will be up to 2.0 and the airspeed will increase to about 1.4 times our original trimmed cruise speed.

With our butt pressing firmly into the seat we finally realize something is wrong and look outside. The windshield is filled with a kaleidoscopic view of the ground. Our instinctive reaction is to grab the stick and pull back. Unfortunately this is precisely the wrong thing to do. Pulling back on the stick will increase the angle of attack and if we are at a 45 degree bank or more most of the resulting increase in lift will go towards increasing the tightness of the turn, making the spiral worse. We will already be getting close to our critical angle of attack and this action might just push us over the limit, and we all know what happens when we reach the critical angle! Yup, the wings stall and now we're in even more trouble. In fact we'll likely flip into an inverted spin any second with the stupid map wrapping itself around our head as we auger in.

Fortunately you're sitting in a comfortable arm chair reading this so we've got a second chance to figure out what we should have done. It should be obvious by now that there is only one way out of a spiral dive. One thing you can't do is

(continued on page 5)

Spiral - continued from page 4

nothing. As we've seen, once started a spiral dive will continue to get worse all by itself. The only way out is to get the wings level, and this will take lots of opposite aileron deflection, and rudder will help too. Most flying schools and training manuals instruct you to reduce the power first to slow the speed buildup, then roll the wings level. Unless you are very close to the VNE this is not the correct order to do things in. The first reaction must be to level the wings. Of course, we should be able to roll the wings level and reduce the power at the same time, but our drilled-in instinctive reaction to a spiral dive must be to ROLL WINGS LEVEL and reduce power. If you have to think though the recovery steps you are wasting too many valuable seconds.

Once the wings are level, the aircraft will take over and bring the nose up automatically due to the high airspeed. Once level we actually have to begin applying forward stick pressure to prevent the aircraft from pitching up too high and possibly stalling. In other word, we need to start to dampen the phugoid oscillation that will ensue. The aircraft will soon slow down to its original cruise speed and we can then attend to gaining back our lost altitude.

The Transport Canada Flight Training Manual, third edition, states, "the spiral dive is not a manoeuver to be practised, but for recognition and recovery action purposes the flight instructor will demonstrate it." I couldn't disagree more. Something that could kill you so easily must be practised in order to drill home the proper recovery technique. However, first practice with an instructor.

Getting into a spiral dive is a lot easier that getting into a spin. Controlling the spiral dive is equally easy if you know what to do. And that is to "roll the wings level, reduce power, and DO NOT pull back on the stick or yoke." The secret is knowing when you are entering a spiral dive. Anytime you feel an increase in G's on your butt check if the nose is dropping and the wings are rolling. If so you know what to do.

I often use a controlled spiral dive to lose altitude without going anywhere. A good example might be when I'm above a layer of scattered clouds that are beginning to turn into broken clouds. I pick a big opening and spiral down below the layer, then continue on. First I reduce power, then roll lightly into a descending turn. The aircraft will automatically try to tighten the turn as the airspeed increases. By applying just the right amount of opposite aileron I can control both the speed and the tightening of the turn. I am very careful not to apply any back pressure until after I reach my desired altitude and have rolled wings level. Caution: please don't try this until you've done it a few times with an experienced instructor in the other seat.

Getting trapped in a spiral dive can happen very easily if you get caught inadvertently flying into cloud. Once you lose visual reference the only clues you've got left are your flight instruments, if you have any, and the feeling in the seat of your pants. And according to the experts you have an average of 178 second before you lose orientation and exit the clouds down the old spiral staircase.

I hope this discussion has shed some light on the Death Spiral and will someday help one of you avert disaster. Remember the two key points: know you might be in a spiral dive when you feel the G's increasing in the seat of your pants; then roll the wings level without applying back pressure. ✈

Emergency landing

An airliner was having engine trouble, and the pilot instructed the cabin crew to have the passengers take their seats and get prepared for an emergency landing.

A few minutes later, the pilot asked the flight attendants if everyone was buckled in and ready.

"All set back here, Captain," came the reply, "except one lawyer who is still going around passing out business cards."

Unclear Concepts

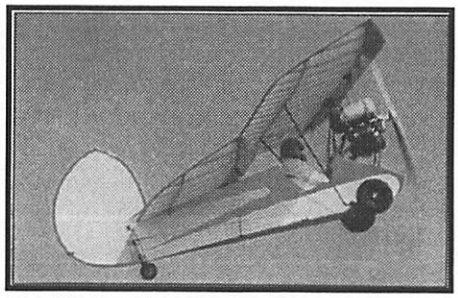
Some people seem to be rather unclear on certain concepts. Channel 9 news in LA reported on a single engine plane (identified as Aero Commander) that went down short of Burbank airport, where both people on board had survived. The Pilot was lucid as he was being cut out of the wreckage and reported that he ran out of fuel over Eagle Rock and was trying to make Burbank airport. Remarking about the lack of fire, the Fire Marshall in charge of the rescue said, "They are just lucky there was no fuel on board".

Feature Kit

The Flying Flea

The Flying Flea was designed in 1934 by Henri Mignet. It features an 18 ft. pivoting front wing and a 13 ft. fixed, tandem rear wing, and two-axis controls. Originally powered by low horsepower motorcycle and auto engines, modern Fleas can utilize a variety of engines including Rotax, Citroen, DAF, etc. The earliest version of the Flying Flea, 60 years ago, had problems leading to a dozen crashes. However the problem was resolved and since 1936 they have flown accident-free in large numbers in countries all around the world.

Wing Span:	18.00 ft.
Wing Area:	100.0 sq.ft.
Wings Fold:	Yes
Length:	13.50 ft.
Seats:	1
Cabin Width:	20 in.
Max Gr. Wt:	500 lbs.
Empty Weight:	260 lbs.
Fuel Capacity:	6 gal.
Range:	180 sm
T/O Dist:	150 ft.
Lnd. Dist:	150 ft.
Vmax:	70 mph
Vcr:	55 mph
Vs1 (stall clean):	25 mph
Climb Rate:	500 fpm
Std. Eng./HP	Various/ 35 hp



The Flying Flea

HP Range	25-45
Mtrl.:	Wood & Fabric
Est. BuildTime:	300hrs.
Plans:	$45(US)
Kit:	No
Info Packet:	Yes
Video:	$49(US)

Contact:
Flying Flea Archive USA
P. O. Box 892
Wooster OH 44691 0892
Tel. 330-377-5013
Fax 330-377-5013

For Sale

Yarrow Arrow- Enclosed heated cab, dual control side by side seating, 55 HRS TT on new 503 dual CDI dual carb,100 CH Alpha/100 radio, alum. skis, hangared. $13,000. Located in Lac La Biche AB. PH: 780-798-2404 FAX: 798-3011, e-mail: rckb@telusplanet.net (1/00)

MiniMax - Rotax 447, GSC Ground adjustable prop, full panel, always hangered, only 115 hours since new. $9,500. OBO. Dale 293-3826. (12/99)

MiniMax - Rotax 377, $5000 with ballistic chute. $7500 including skis and floats. Don Leonzio 250-427-2046 (10/99)

CH701 STOL - Rotax 912, 190hrs TTSN, always hangared kit cost $36,000, labour to build 815 hrs, offers. Bob Campbell 403-934-3657 (10/99)

Oil Injection Pump - for Rotax 582. Call Dave Dedul, 403-823-2214 (8/99)

Chinook WT II - single place, 1983, warp wing, "0" time 277 Rotax, can be seen at Indus Airfield, $3,500 OBO. Dan 403-243-7934 H or 403-230-6415 W (6/99)

Forward ads to Bob Kirkby 569-9541.

Raffle Winner

The winner of the Magellan 310 GPS raffle was Gord Tebbutt of Calgary Alberta.

Congratulations Gord and thanks to all that participated. The proceeds of the raffle ($393.00) will help subsidize the newsletter along with other fly-in events to be held this summer and at the same time keep our annual membership at $20.

The next raffle will be held at the June meeting and will propably be a portable transceiver - either a ICOM A4 or the Delcom Air 960. Look for details in the April issue of the Skywriter.

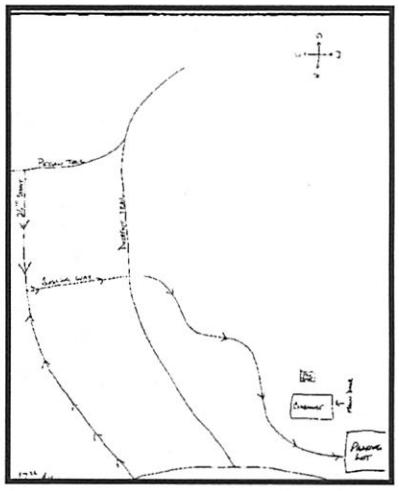
CUFC Annual Dinner - Sat. Feb 19/2000

Our Dinner will be held at the Inglewood Golf and Country Club. Cash Bar opens at 6:00 PM and Dinner will start at 7:00 PM. Tickets will cost $25 per couple or $13 single. Please purchase your tickets at our Feb. 10th meeting. If unable to do so, kindly mail a cheque to Bernie Kespe or Carl Forman.

Please don't forget to bring items to the silent auction: either aviation-related, or items that you think will be of interest to our not-yet-aviators significant others.

Although the Inglewood club can be seen on the west side of Deerfoot trail, access to it is via Peigan Trail.

Take Deerfoot to Peigan Trail. Drive east to 26th Street (about ½ km). Go north on 26th, and you will see a sign for Gosling Way and the club, on your left. Turn left (you are crossing back over the Deerfoot) and follow Gosling Way right into their main parking lot. The Clubhouse main door is on the west side of the building.



Club Crest Contest

The Calgary Ultralight Flying Club crest has retired. After 10+ years the crest decided to call it quits and allow a new patch to carry on into the new century.

After much discussion at the last exec meeting it was decided to hold a crest contest. The contest is open to anyone with any artistic talent - club member or not. The winner of the selected design will receive $25 for his/her effort.

Have some fun with those paint programs or just pickup the crayons and let those creative juices flow.

All entries show be mailed to:

Bernie Kespe
6 Spokane Street S.W.
Calgary, AB
T2W 0M5

e-mail to: kespeb@cadvision.com
or vasseurb@cadvision.com

All entries should be submitted by no later than March 6th.

The entries will be voted on at the March meeting.

Member Profile

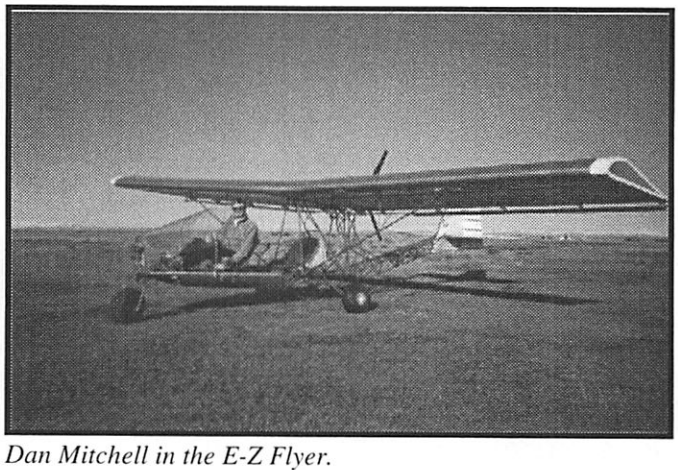
by Wilf Stark

Dan Mitchell

It's been awhile seen we've done member profiles. Hopefully we can do a few during this year.

Dan Mitchell is not unlike many of us, whose passion for flight simmered in the background for a long time, while taking care of life's other priorities. Although Dan managed about 6 hours of flight training and ground school while still in high school it was not until about 20 years later, that the passion was re-kindled while watching a Flightpass Program on TV featuring our intrepid 'Wayne at Indus'. This time, Dan was quick to realize that since his family and his career as a Geologist were sufficiently stable and mature, it was TIME TO GO FLYING!

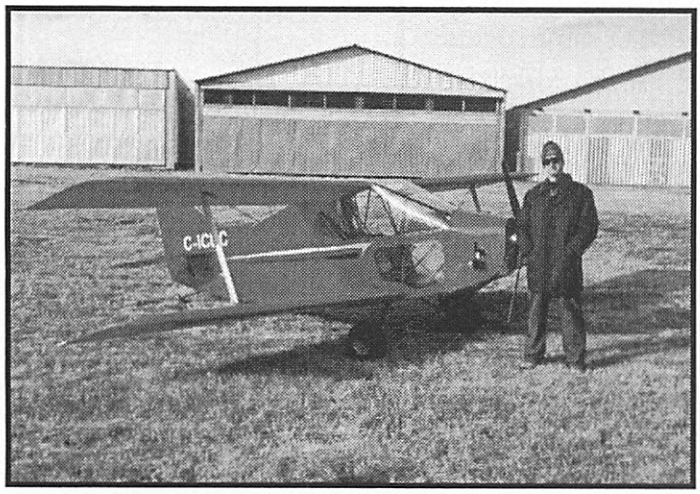
Although Dan has been flying Ultralights for only 3 years, he has managed to accumulate about 80 hours per year. He bought a Beaver from fellow club member Winston last year, and his having the time of his life with it. Dan tries very hard to go flying every weekend, both days, if at all possible. This clearly indicates that either his refrigerator is not capable of sustaining the weight of a 'honey-do' list, or he has learned something about the fine art of husband-wife time-negotiation that has eluded some of us.



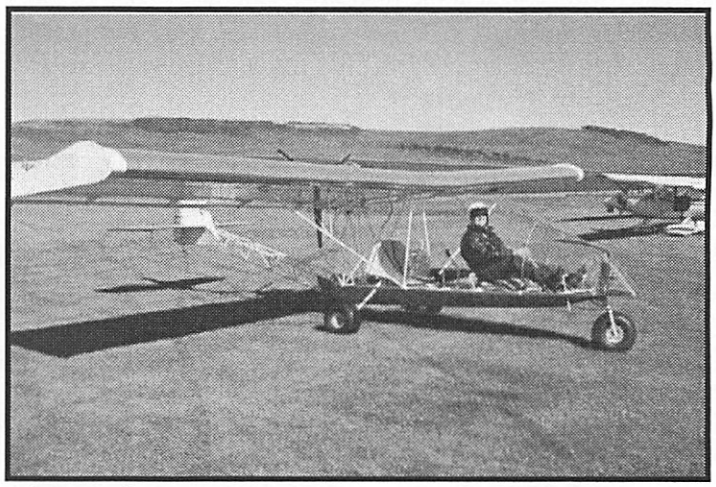
Dan Mitchell in the E-Z Flyer.

Dan is also our Club's Internet Webmaster. For those that haven't perused our website recently, check it out. His imaginative hand and high standards have resulted in complimentary comments from many who have visited. This has most certainly helped as well, in maintaining our club's high image.✈

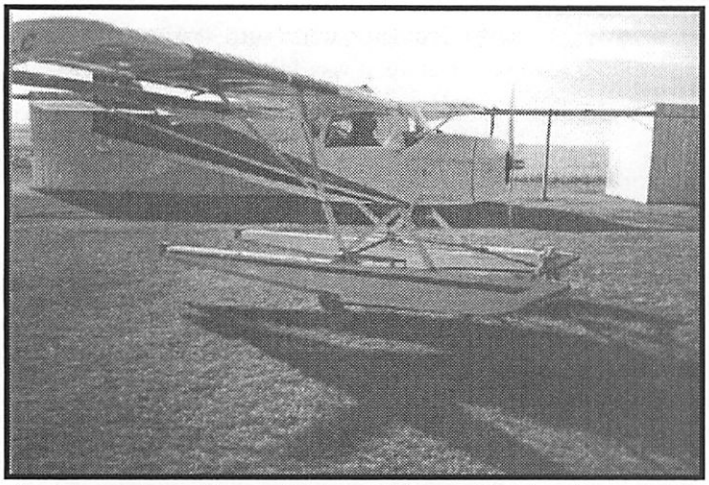
Some CUFC members at play



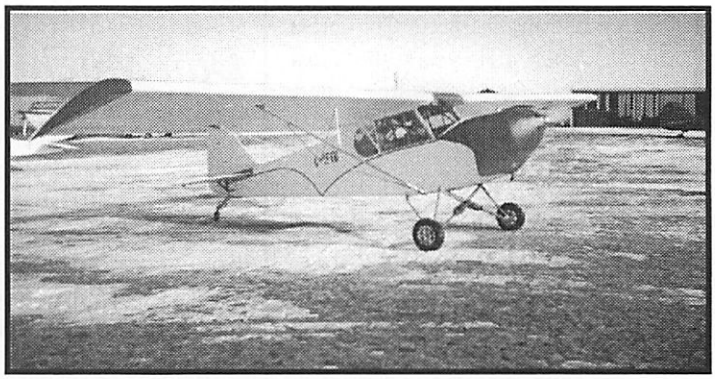
Chuck Duff keeps his 1984 Sorrel Hiperlight at Dave Boulton's strip



Adrian Anderson rents an E-Z Flyer at Indus. Rumour has it he's looking to buy his own aeroplane.



Jim Corner keeps his amphibious Kitfox at Airdrie, although this photo was taken at Kirkby's place.



Dale Robertson keeps his Fisher Koala at Kirkby Field.

Bob Cameron and his former Beaver RX550.

Dave Boulton keeps his Rotax 277 powered Quickie at his own strip.