Skywriter

Monthly Newsletter of the Calgary Ultralight Flying Club

November 1999

Across the Wing

by Wilf Stark

It was interesting and sobering to hear our November Guest Speaker, Rick Pollock of Transport Canada, remind us of the high costs of the fine for flying without Liability Insurance (up to $1000 per flight occurrence). Since Ultralight Liability Insurance can be purchased for about $145/yr. ($12/month), the risk of flying without it is definitely not worthwhile.

Our various Guest speakers, scheduled over the next few months, will be concentrating on Safety Issues as they relate both to our Pilot Skills and our Airplanes. The main reason for the existence of the CUFC is to support and help each other in promoting Safety in Flight and Safety in our Airplanes. All other activities are bonus to this main Tenet. It's worthwhile to re-iterate this from time to time.

There are some very interesting projects in progress in our club. We have folks hard at work building Evans VP-1 and HummelBird Airplanes, re-building Avid Flyers, and 2 different machinists are independently building/developing 4-stroke radial engines! If any of you would care to drop a brief progress note to the Skywriter, we sure would love to hear more. Of additional interest would be details of any re-building projects that have been completed - it seems that ultralights just live forever, but do get rejuvenated from time to time.

I mentioned at last month's meeting that our quality monthly newsletter, the Skywriter, is now costing us approx. $1.60/issue to create and mail. Since that leaves little change from our $20 annual dues (which we are trying to keep at same cost for '2000), you're encouraged to support our other club fund-raising activities such as the monthly raffle, the large-prize raffle (currently a Magellan GPS 315) and the silent auction at the annual dinner. So far, consensus indicates that we're all still getting a lot of bang for the buck at the Club ! Let's keep it that way - your ongoing support is helping to make this happen.

Clark Seaborn's 1929 Fokker Super Universal

You can expect to see our monthly meetings rolled forward one-half hour to 19:00 start-time, in the new year. As our current facilities need to be cleared by 20:00, this will allow a little more time for quality meetings as well as socializing. A show of hands at the November meeting indicated more than 95% of you would not be inconvenienced.

Just a gentle reminder that we are looking for nominations for President and Director. Forward your names to Ed D'Antoni (and if you're interested in nominating yourself, please, don't be shy!). See you on the 11th. ✈

Upcoming Speakers

November meeting - Jim Creasser will present tips and procedures on Aircraft inspections.

December meeting - Moe Baille, Regional Aviation System Safety Officer, Prairie & Northern Region, Transport Canada Edmonton. He'll present portions of his regular aviation safety seminars pertinent to Ultralights.

January meeting - Ed D'Antoni will present a training session on Circuit procedures.

For Sale

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)

Murphy Renegade Spirit - 250 TTSN, Rotax 532, 50 SMOH, always hangared, ASI, VSI, Tach, T/C, ALT, CHT, Water Temp, Volts, Icom A20 Nav/Com, intercom, two helmets, 3-blade Ivoprop, Red &White Endura, hole covers, $26,000. Call Bob Kirkby 569-9541 (8/99)

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

Head Set - Aviation Communications Inc. head set $100, 3 yrs old, hardly used. Call Bob Kirkby 569-9541 (7/99)

Fuel Gauges - Sky Sports' capacitive fuel gauge for dual tanks. 2 probes and one gauge with switch, $35. Call Bob Kirkby 569-9541 (7/99)

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)

Wanted - Low-time 2-stroke engine between 40 and 65 hp for newly built trike. Call Ron Linkes 250-389-0800. (4/99)

Lazair A-87 - has 3rd engine, 3/4 enclosure pod, wider landing gear, always hangared, includes enclosed trailer, $5500. Betty Whitney 403-684-3459. (4/99)

KR-2 Sport Plane - 35 hr TT, 1834cc HAPI VW conversion with dual ignition, carb heat, oil cooler, cruises at 125mph, full power 155mph, registered as homebuilt. ½ share $7000 including flight training and ultralight pilot permit. J.T. Hibberd 617-1831. (3/99)

Suzuki engine - 3 cylinder, 65 HP @ 5500, with belt reduction drive 2.21:1, can be seen running, $3000. Ken Johnson 546-2586. (3/99)

Rotax 447 - with carb and muffler, low time, $2700. Chuck duff 938-6157 (3/99)

Mini-Max - Rotax 447, GSC Ground adjustable prop, full panel, always hangered, only 114 hours since new. This great flying, well known little airplane can be seen at Transport Canada's photo album at: www.tc.gc.ca/aviation/GENERAL/RECAVI/Pictures.htm Dale 293-3826, e-mail: dacl@cybersurf.net (10/98)

Forward ads to Bob Kirkby 569-9541

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)

Pre-takeoff announcements

"Your seat cushions can be used for flotation, and in the event of an emergency water landing, please take them with our compliments."

"There may be 50 ways to leave your lover, but there are only 4 ways out of this airplane."

Nobody's Flying School

Good to have you back at Nobody's Flying School. It's time for you to meet the staff, the three primary instructors who will take you through the learning process and whose voices will ring in your ears for as long as you fly.

I'd like to introduce you to our cadre of professors: Doctor Power (who goes up and down), Father Path (who goes round and round) and Miss Pitch (who goes just so far, and that's 'it). Like the three "Rs" of grade school, the three "Ps" of flight school define the separate fundamental skills of fixed-wing flight. And we must learn to make them work together.

Join them now in the bizarre case of Mr. Fester, who discovers early in his flying career that any effort to lay blame on any one focus of responsibility can end with a final, nonstop flight through Nobody's Flying School.

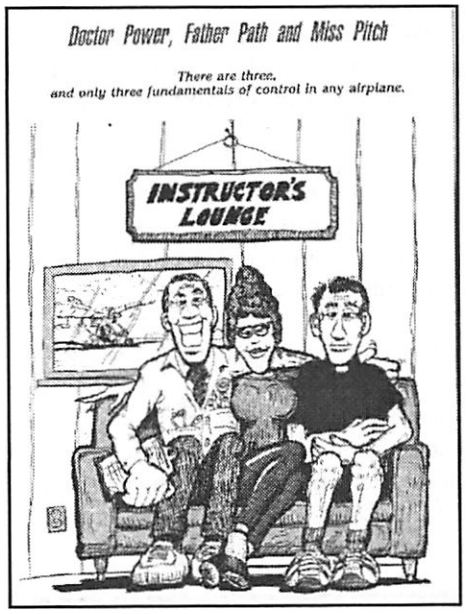
We pick up the conversation over coffee in the instructor's lounge. Father Path has just completed a lesson with one of Nobody's problem students, and is seeking the advice of his co workers.

Father Path: I just don't know, Doc. I've been over the exercise a hundred times with this chap Fester and every time he scares the devil out of me. Maybe I'm not forceful enough. What do you think I should try next?

Doctor Power: I'm glad you asked me, Father. You oughta smash his face in. Or talk him into maximum slow flight and chop the throttle on 'em. Hell, a thing either is or it ain't. If they ain't listening, you gotta get their attention.

Miss Pitch: Now, Doc. Maybe the Father's student has a plateau problem. Have you tried going back to a previous exercise, or . . .

Doctor Power: Look, Pitch. I can only take so much of your psychology stuff. Then I gotta get results, the way I know how.



Pops, you take my advice . . .

Father Path: Now, both of you should be ashamed. We mustn't bicker if we're to get our jobs done. Doctor, you must learn that people respond to constructive criticism, and many will turn you off or leave without a word if they feel like they're being subjected to arbitrary pressure. Miss Pitch, you are probably very sensitive to a student's state of mind, but you must learn to insist on greater discipline from your students. In the case of . . .

Doctor Power: Hey, Pops, let's go ahead and slice this baloney to the quick. You feel that teaching path is harder, that it requires more wisdom, more patience and more skill than what we do, don't you?

Miss Pitch: Well, I hope neither of you are presumptuous enough to believe you could do my job. After all, no one is allowed to learn pitch until path and power are second nature. Doesn't it follow that pitch is most critical, and therefore most important to the student?

Doctor Power: Beggin' the lady's pardon, but how about blowin' that the other way? What you really mean is, you can kill 'em quicker and deader than we can, therefore your job is the most important. Truth is, a really safe plane would have no pitch control at all, right?

Mess Patch: Hummpph!

Father Path: Now, now, Doctor. There is no need to speculate on the ideal. Nor are you correct that any of us might have a more important task than the others. Of course, I feel that training our students to the proper use of the eyes is very important, and training them to think out into the future, to plan and fly through a safe path, is a worthwhile challenge. On the other hand, I see the value in your pragmatic approach, Doc, as well as the (ahem!) alluring light touch of Miss Pitch.
(Continued on page 4)

Nobody's - continued from page 3

Miss Pitch: Why Father!

Doctor Power: Look Father, take it-from me. This little lady will steal your shorts for sport. Now, you tell me. Where could we go without power? If pitch controls altitude why don't we just sit at the end of the runway and pump the elevators until we get off? Power is where it's at!

Father Path: May I suggest we put aside our proud perceptions and go about the business at hand? Now, back to my problem student. I just don't feel confident to pass him on for solo training, until we clear up his problem in overshooting turns.

Miss Pitch (staring out the window): Excuse me Father, but is this student you refer to a big guy, about six-foot three, with a mustache, and is he wearing a plaid shirt and blue jeans?

Father Path: Yes, that's the fellow. Have you met him? - .

.Miss Pitch: No, but I just saw him headed for the trainer, alone. He was wearing his flight suit and carrying his helmet. Shall I bring the chase car around?

Father Path: Great Caesar's Ghost! Surely he wouldn't go off without us. I'm sure he's just killing time. Now, Doctor Power. How would you analyze this latest behavior event?

Doctor Power: Not bad, for a problem student. Say, Pitch, you still think this guy's got a plateau problem?

Miss Pitch: He very well could have, smarty. But I guess that's all moot at this point. Say, Father, take a look out the window. Is this guy supposed to be taxiing around on his own?

Father Path: Do you suppose I was holding him up, unnecessarily? Oh, saints preserve us, I hope he returns in one piece.

Miss Pitch: Whatever is wrong, we'd better get to the problem at hand, I think that guy is headed for the runway, Father, and he hasn't. even learned to finesse a landing.

Doctor Power: Don't worry, Pops. . He hasn't learned to take off yet, either. Say, I m starved, wanta order a pizza or some . .

.

Just at that moment, Nobody; walked in, lit his pipe and stared out the window. Without turning around, he asked all three instructors at once: "Who gave Mr. Fester permission to solo today?"

A silence gripped the air as Nobody wheeled around on one heel, turning to face an empty room.

SUMMARY:

There are three, and only three fundamentals of control in any airplane:

POWER is the control of potential energy through the powerplant and the acquisition of altitude. Power is equivalent to altitude, altitude to power. Power controls the ability of the aircraft to climb, cruise or glide. When power is not available at the prop the aircraft will spend the energy in its altitude until the altitude runs out. It's that simple.

PATH is controlled through banking, to choose a horizontal path, and power, to choose the vertical path. Path control is the subject of most of the- planning we do as pilots, and should receive the bulk of our attention during actual flight. Proper path control requires analysis of information gathered by the eyes. The better this information, and the sooner we get it, the safer we fly.

PITCH we control through elevator or elevon (or some arrangement) to vary the angle of attack of the wing. Pitch is a fine-tuning control for the most part, and good pitch control usually shows up in landing approaches, during those critical seconds of flare.

Some powder or energy, is contained in the pitch axis, and we use it during landing to cancel our normal sink rate at the instant of touchdown. At high speeds, the energy contained in the pitch axis is significant. Beyond Vne speed (velocity never to exceed), the energy can be enough to pull the wings off!

All aircraft control boils down to some combination of these three fundamentals.

Most problems in learning can be traced to a student's concentrating on one at the expense of another. If this happens to you, don't be afraid to go back a step and practice some more. The acquisition of habits will free your consciousness for new experience and new learning. Eventually, the task of flying will become mere creative management of those habits.

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Destination Stettler

by Andy Gustafsson

Late August. The summer has not been kind to either the farmers, holidayers or us Ultralight pilots. It has been raining, blowing and nature was late to get the summer on track. The later part of August however has treated us to summer and warmer weather. I had been planning a trip to Stettler, Alberta for several months to visit our oldest son Kris, who is working there for the summer. August 28 seemed to be the day that I had been waiting for. Light S.E. winds in the morning, and light winds later in the afternoon and evening was forecasted. I had been studying the charts and planned to do the leg to Stettler in one flight. The distance is 92.2 miles from my strip just east of Calgary. If I'd cruise at 60 miles/hr it would take approximately 1 hour in calm conditions. I planned to strap a 25 litre can of fuel in my back seat for unexpected events plus spare oil to mix another 50 litres of fuel. Little did I know how foreseeing I had been by bringing the extra oil.

The alarm clock brought me out of my dreams at 5:30 AM on the 28 of August. Two cups of coffee, that would make me do an unscheduled stop at Three Hills, and toast started the day. I had lots of stuff to load in the truck before I could drive the half hour it takes to get to my strip. Once out of the city the early morning fragrance of feedlots and mist from warm sloughs stuck in my nose. Not a breath of wind spoiled the sleeping windsock on my hangar roof as the sun rose at 6:41 on this glorious morning. A thorough walk around and close inspection of my Challenger II did not reveal any flaw in the airworthiness of the aircraft. All the bolts and nuts were there and tight. No flaw in fabric or flight controls. The engine needed a little tightening of the fan belt but nothing else needed adjusting. The fuelling was done and the extra gas can strapped down with the rear seat belt. I also strapped in my little plastic container holding spare plugs, a spare drive belt, and various tools and other spare parts. This was also the true test for the new seat cushion that Winston Brown had made for me. I yelled CLEAR PROP, that made the neighbour's horses throw their heads up in sheer terror, pulled the starter rope once and with a growl my Rotax 503 came to life.

While the engine was warming up I strapped in, and once again tuning my radio to Calgary Int. for the latest weather report. "Winds calm". The early morning dampness fogged up my windshield both inside and out, and I could not see straight ahead. I figured that if I would start my takeoff run the wind would clear the Lexan and I would be fine. Don't ever try that, all you pilots out there. I felt like Charles Lindberg on his takeoff run in his Spirit of St. Louis on May 21, 1927. His forward view was blocked by the firewall gas tank. I thought of him as I opened up the throttle and laboured down the runway. I followed the edge of my groomed grass strip and before I knew it I was off and flying. The fog on my windshield disappeared immediately and I was off.

The beautiful Red Deer river valley south of Stettler - by author

As soon as I turned northeast I could spot the "Three Hills" on the horizon. This was my first longer flight, out of the familiar surroundings of the home patch. I was solo and this was to me the dawning of an adventure. My GPS told me that it would take me 1 hr and 27 minutes to get to my destination, and I matched the heading with my charts. Low and behold, they jived. I climbed to 4500' and settled in for the trip. The old saying that, the range of any aircraft is limited by the size of your bladder started to make sense to me. As I said earlier, I had to divert to Three Hills airport to eliminate an accident. Three Hills airport was deserted and all facilities locked up. Two flying students at the Prairie Bible Collage gave me a passing glance as I rolled on runway 11 for my next leg. My radio calls fell on deaf ears this morning, but there was some activity at Olds-Didsbury skydiving centre. I wrote down the names of the towns, and the times that I passed them, and kept track of the way points. Trochu, Huxley, Elnora... Getting lost was not in my plans. The Red Deer river valley opened up to my right and I followed the jagged river canyon north. Flying at a safe altitude was my insurance should I have an engine out. The air was smooth as glass and the Challenger flew straight and level with the help from my flapperon adjustment. Indicated airspeed was 70 miles/hr and ground speed showed a healthy 80 miles/hr. Fuel burn seemed to be minimal at 5700 rpm.

I crossed the river valley just north of hwy 590 with its green bridge spanning the river. I had been driving the highway 590 east before and then said to myself, this I have to see from the air. Visibility this morning was limitless and the town of Stettler soon emerged out of the deep green landscape. I announced my intentions on 123.0 and proceeded to join the right down wind for runway 07. Descending to below 4300' I encountered really rough air.

The Challenger happily handled the punches from the weather gods and I touched down at 10:21 am. A crop duster

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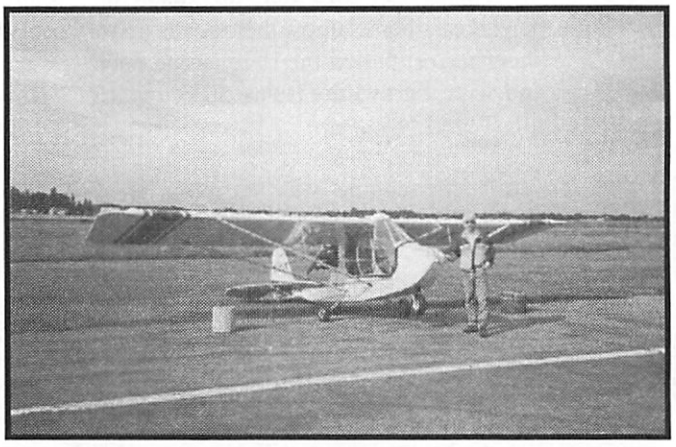
Stettler *- continued from page 5*

pilot greeted me and wondered where I was flying in from. When I told him that I just came in from Calgary he said, " You mean to say that you flew your Ultralight all the way from Calgary"? I said, " It's an airplane isn't it"? To which he replied " Yea, you are right, it's an airplane". We talked for awhile and he showed me where to tie down. He also proudly showed me his Grumman AG-plane with the big 9 cylinder Pratt & Whittney radial engine. Crop duster pilots are a breed all their own. They talk airplanes and nothing but. Friendly people up there. I registered inside the terminal and read the names of the pilots from CUFC that had passed through here three weeks earlier. Our club members really gets around.

I spent a nice day in the company of our son Kris. We went to the swimming pool and had a blast in the diving tank, trying all kinds of new tricks from the diving board. We had fried smokies and mashed potatoes for supper before Kris took me back to the airport. The wind was blowing more than had been forecasted. A call to my wife in Calgary, who was my weather office liason, reported manageable winds. I decided to start my flight home. The windsock was flapping in the wind but it did not concern me too much. Waving goodby to Kris I started my takeoff roll and immediately after I was airborne I encountered the bumpy air of the afternoon. I climbed back up to my cruising altitude of 4500' and was greeted by perfectly smooth air. I was on my way. The ground speed seemed a little sluggish. My GPS showed 44 miles/hr but with a full tank of gas and my 25 liter spare I could not see any reason but to keep going. Navigating was not an issue as I spotted Three Hills with its famous landmarks on the horizon. The airspeed did not improve with the setting sun. The further south I flew the slower my ground speed became.



The author and his Challenger in Stettler - photo by Kris

I was soon down to 35 miles/hr. I crossed the river valley again and the ground speed dropped to an amazing 21 miles/hr. My fuel gauge was telling me that I was not going to make it all the way to Calgary without refueling. I decided to descend to try to get out of the strong flow from the S.E. As soon as I got down to around 4300' I encountered the churning turbulence again. My ground speed picked up some but not enough to warrant me staying there. Back at 4500' I could enjoy smooth flying and a relaxing flight. After having crossed the river valley I picked up some ground speed again. Two hours in to the flight I set up for runway 11 at Three Hills. My spare gas was eagerly swallowed up by the main tank and I was confident of making my home strip.

The sun was starting to get close to the jagged blue Canadian Rockies when I spotted the "twin stacks" N.E. of Calgary. Running the engine at 58-5900 rpm the fuel burn was higher and I was now cruising at an indicated 75 miles/hr and a dizzying 44 miles/hr ground speed. Calgary Int. reported 140 at 15 - 20 kts when I lined up for 09 at my home strip. I carried extra speed coming over the fence and I negotiated the cross wind for a trajectory straight down the runway. The Challenger sure handles those cross wind landings with ease.

It had been a new experience for me with this longer cross-country flight. I have been somewhat a little apprehensive about these flights where I lose sight of familiar surroundings of the home turf. With proper planning and a well maintained aircraft it is very relaxing, and to me the only way to travel. The whole trip had taken me 4 hours to accomplish. The navigation was easy even without my GPS. A radio is a very worthwhile investment on trips like this. I also carry my Cell-phone just in case I have to set down somewhere. Oh yes, the "Winston Brown-made" seat cushion sure made my flight comfortable. I would not fly without it. Now I'm looking for that next "faraway" destination.

Happy landings. ✈

Lots of lakes near Stettler - Photo by author

BUDDY TWIN 4 STROKE ENGINE

Amtec Corporation

The Buddy Twin is a lightweight, 40 horsepower, four-stroke, air-cooled, two cylinder horizontally opposed engine with low vibration characteristics. At 75 cubic inch (1229 cc) displacement, the power per cubic inch is typical of GA engines, such as the 200 cubic inch O-200 which is rated at 100 HP at 2750 RPM . The Buddy Twin has slightly less than two cubic inches per HP, rated at a 2900 RPM. The stroke of this engine is within 2 mm of that of an A65 and within 6.5 mm of the O-200. This was done so that the torque characteristics of the Buddy Twin would be similar to those GA engines. The unique design of the engine resulted from an interest in vibration reduction. One of the biggest sources of vibration in a conventional twin is the "couple" that results from the offset of the two cylinders, which comes from having them mounted on different journals. Amtec has eliminated that source by mounting the cylinders on a common centerline. The pistons always move in opposite directions at exactly the same speed. This way, the inertial forces of one piston offset those of the other piston, eliminating balance weights. The basic engine (fig 1) is the lightest configuration offered. For that reason, it is pictured without starter or alternator. Those features and others will be added in the near future.

DESIGN DETAILS

Cylinder Head:
The prototype used "Scat" heads (as used by Mosler). These weigh 9.5 pounds each and were deemed too heavy for the engine. Amtec designed their own with a hemispherical combustion chamber, overhead valves and room for large (40 mm) valves (see Fig. 3). The rocker arms are sometimes referred to as Z-type rockers because of their shape. They were chosen to eliminate side loads on the lifters and valve guides. Grease was chosen as a lubricant for simplicity and weight reduction. Keep in mind that Lindbergh flew across the Atlantic behind a Wright J5 with greased rocker arms. The greasing interval is expected to correspond to the oil

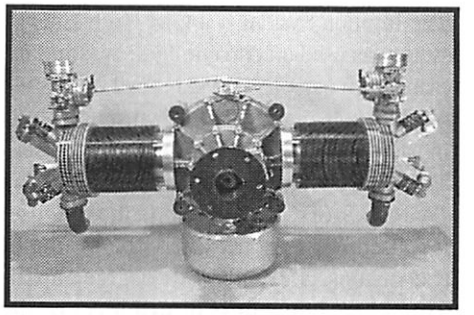


Figure 1 - Basic Engine

change interval (25 hours).

Lubrication:
The lower end is oiled by a gear pump with a pressure regulator of Amtecs design which resides in the oil pan beneath the engine as shown in Figure 4. The dry-sump

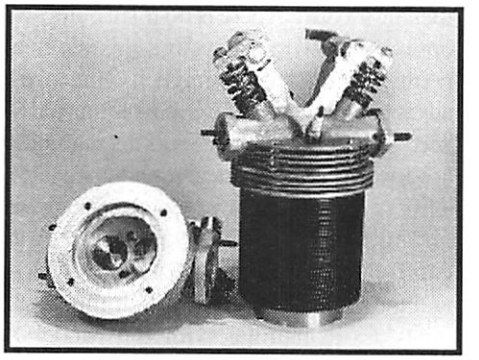


Figure 3 - Cylinder and Head

design of the early prototype engine was abandoned for two reasons: first, it did not offer any advantage that was worth the extra weight. Second, the best position for the oil tank in the old design happened to be directly behind the engine. This added unwanted length to the engine bay and obscured the crankshaft extension at the rear of the engine. The current oil pump location, has two main advantages: first, the suction side of the pump is submerged in the engine oil, insuring immediate priming at engine start and second, any leaks that occur are recycled back into the engine oil supply.

Cooling:
Air Cooling is provided by fins on the cylinder and head. The fine-pitch fins of the head were achieved through the use of a special casting technique called plaster casting. It's more expensive than sand casting but sand casting results in thick

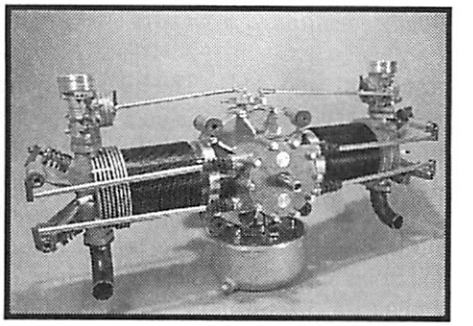


Figure 2 - Three Quarter Rear View

fins. If one chooses thick fins, there's room on the head for only a few , so to get the required cooling area, the fins would have to be large. Large, thick fins weigh more than smaller, thinner fins. That's one reason our head weighs only six pounds. The cylinder fins are extremely fine and have a cooling area of 637 square inches. This was achieved by machining an aluminum jacket out of thick-walled aluminum tubing. This was then shrunk onto a centrifugally - cast iron cylinder. Through the use of CNC machining, costs are compatable with those of cast cylinders while realizing all the advantages offered by high precision machining. The finned jackets are anodized and dyed black to enhance their thermal properties. Engine testing will be done in both tractor and pusher modes to ensure that the engine receives adequate cooling..

The Crankshaft:
This is really the only unorthodox part of the engine, but its beneficial effect rippled throughout the whole design and resulted in more weight saving than was

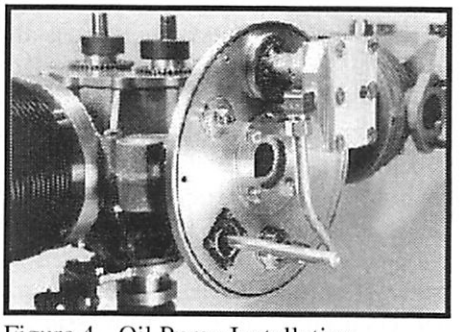


Figure 4 - Oil Pump Installation

immediately obvious. Figure 5 shows a sequence of four positions of our patented

(continued on page 8)

Buddy *- continued from page 7*

crankshaft and rods. The idea is quite simple but it has some important advantages: a) It has higher torsional stiffness than any other configuration, b) the rods are made in one piece instead of the usual two pieces held together with bolts, c) it is highly producible , d) it has a straight 1/4" boring all the way through the crank from front to back. This boring will be used later for in-flight control of the

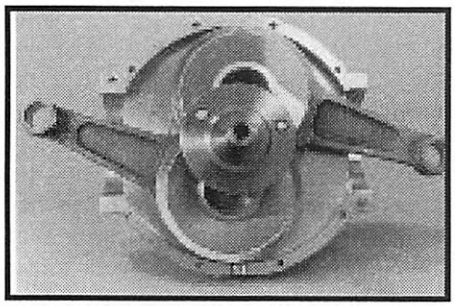
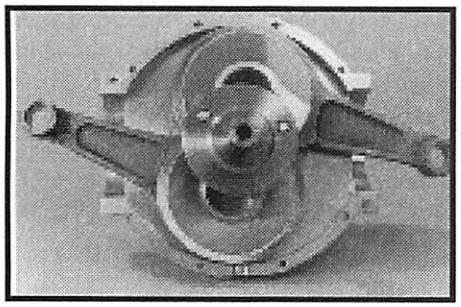


Figure 5 - Patented Crankshaft Shown in Various Positions



propeller pitch. Since the diameter of the journals is twice that of more conventional journals and the width is half, the bearing area is the same as more conventional journals. The increased diameter of the journals leads to higher bearing surface speed for any given RPM , but because this is a slow-running engine, the surface speeds are well within the limits for this kind of bearing. The bearing material is babbitt, the same as used in the long-running Model A. The bearings should outlast those of the Model A for two good reasons: a) the balance of the crank is far better, resulting in less "squirm" and deflection under load and b) pressurized oil is used to lubricate the bearings instead of the "dip-splash" method of the Model A.

Ingition System:

The Ignition System is a GM High Energy system as used on current cars. A standard crankshaft sensor, two standard coils, two off-the-shelf modules and two spark plugs in each cylinder for dual ignition are used. The ignition system used is known as the "Wasted Spark" system and is in wide use. It is useful on engines where the timing of the pistons is exactly 180 degrees apart. The spark plugs in both cylinders of the Buddy Twin (all four plugs) are fired simultaneously. Since this is a four stroke, one cylinder is on the compression stroke while the other is on the exhaust stroke. The plugs in the cylinder on the exhaust stroke are surrounded by ionized gasses and carbon, so breakdown occurs at a low voltage and does not absorb much energy. The plugs in the other cylinder, though, fire with normal energy, igniting the fuel/air mixture. There is no distributor, no optics, no moving parts and no electrical points. For the sake of simplicity, the spark advance is manual. The engine is started at zero degrees advance and manually advanced up to thirty degrees after it starts. This is exactly the way motorcycles were arranged until about 1950. Spark was controlled by twisting one handlebar grip and throttle was controlled with the other. Also, those familiar with the Model A know that there are two levers on the steering column. One for spark and the other for throttle. This arrangement makes for an extremely easy-starting engine with minimum likelihood of a jolting "kickback".

Pressure Pulses in the Crankcase:

Engines of this general type can share a common characteristic with respect to pressure variations in the crankcase. As the pistons move out toward top dead center (TDC), the volume of the crankcase expands. If air is permitted to be drawn into the crankcase during this time, then when the pistons reverse direction at TDC and start back toward bottom dead center (BDC) a pressure buildup in the crankcase occurs. The ferocity of this buildup depends in large measure on the ratio of the crankcase volumes with the pistons at TDC, to that with the pistons at BDC. Engines with large crankcase volumes have less trouble with this than do those with tightly confined cranks like this engine. To overcome this, the oil pan is equiped with two standard PCV valves that let air out, but keep it from re-entering the crankcase. This causes a partial vacuum to be formed in the oil pan and crankcase which tends to prevent oil leaks. The PCV valves are vented through tubes that lead up to the mouth of the carburetors so that any drippage that occurs right after starting is vented into the carburetor where it is burned in the engine. The partial vacuum in the crankcase does not rob power from the engine because whatever energy is lost as the pistons move toward TDC is regained on their return to BDC.

Carburetion:

The carburetors that you see in brochure are Tillotson "Pumper" types. They contain a built-in fuel pump that operates on the suction formed by the intake stroke. There is no bowl, but instead, a small diaphragm regulator is built in to the body of each carburetor. These were used because with the carburetors mounted on the heads, rocking of the engine at slow speed, caused by torque reaction, would tend to froth the fuel in a bowl-type carburetor. Also - radiated heat from the head prevents carburetor icing.

SPECIFICATIONS - Basic Model

POWER [hp] 40 @ RPM 2900
TORQUE [ft-lb] 70
DRY WEIGHT [lb] 69
COOLING free air
OIL CAPACITY [qt] 2 2
TBO [hr] 1000
FUEL BURN (75%) [gph] 2.6(US)
PROP ROTATION RH direct drive
PROP HUB 6 holes/4-inch circle 4130
MOUNTING Continental conical or bed
FUEL Regular Auto Fuel (87 Octane)
PTO SHAFT 1.5" diameter, 3 degree taper
PRICE: $6,900(US)

CONTACT: Amtec Corporation
500 Wynn Drive
Suite 314, dept UF
Huntsville, AL 35815
PHONE: (256)722-7200
FAX: (256)722-7212
Email: epreston@amtec-corp.com
web site: http://www.amtec-corp.com/buddytwin/Buddytwin-Main.htm

Destinations

by Andy Gustafsson

In previous months we have revisited many airstrips. This month though I have a brand new place to add to the list. The immaculate A. J. Ranch, located 3 miles straight east of the little town of Cayley, Alberta. Stu Simpson heard of this place from a friend of his who knows the owner of the strip. A complicated story, but let me take you there.

Stu and I decided that Sunday morning, the day before Thanksgiving was the day to explore new vistas. I could tell as soon as I rose out of bed and had a peek out the window that the weather gods where finally going to give us one of those rare perfect flying experiences that will be long remembered.

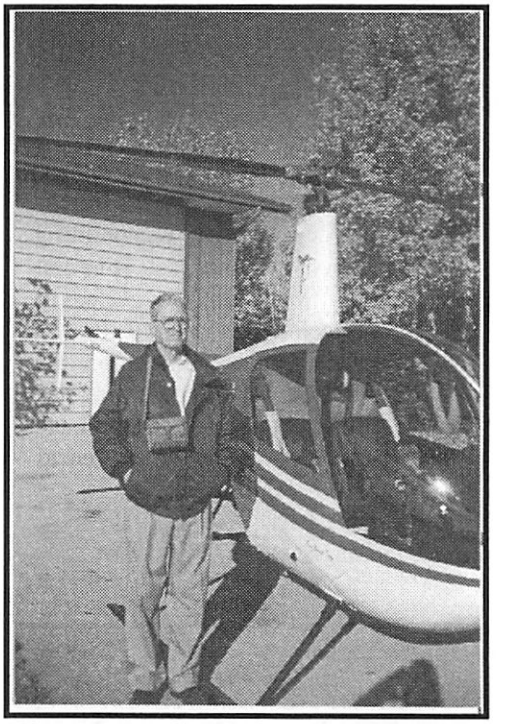
I have been working on my new strut fairings, with the help of Carl Foremans ingenious way of attaching them to the struts, and today would be the perfect day for testing. Whenever I leave my home in Silver Springs to go flying, I always glance at the large Canadian flag at the top of Canada Olympic Park. It is a very good indicator because of its location. The red and white maple leaf symbol was hanging limp as a necktie this early morning.

It was a crisp - 5C when I rolled my Challenger out of the hangar and did my pre-flight. I primed the engine and with a gasp for fresh air the 503 came to life eagerly breathing through both carbs. The harnessed warm air filled my cabin as I opened up the throttle for the take-off run. The morning sun was still hanging low over the horizon when I set my heading for Chestermere-Kirkby. I could see that Stu's hangar doors were wide open from several miles out. Calgary International reported CAVOK. This had all the right ingredients for a great day in the air.

We had a pre-flight briefing and at 09:30 off we went. Stu had a lead of a quarter mile and now was the time to test the new fairings. Opening up to just below 6000 RPM the air speed indicator showed 80 mph. The fairings works.

The air was smooth as silk and visibility unlimited. On days like these navigation is easy with the help of your handy CUFC laminated map. Don't leave home without it. We passed over Indus airport, which was deserted this morning, and crossed the Bow river. This was the first flight together with Stu, after his new engine was installed. The two identical 503's produced the same speed at the same RPM in two very different aircraft. 70 mph at 5600 RPM. What more can one ask for? Close formation flight was easy in this stable air and before we knew it we spotted the 5000 foot smooth gravel strip of A J Ranch. 25 - 07 runway, altitude of 3450 feet. We flew the circuit and landed on runway 25. The runway was so long that I held off the touch down until I was just 100 feet from the turnout to the apron in front of the ranch house.

Mr John Hugel, the owner, came out to greet us and to snap some pictures of our aircraft. The friendliest gentleman you would ever want to meet invited us to see his private Robinson 22 helicopter parked outside his big hangar. The hangar housed another marvel of aviation. A German built Stemme motorglider. Built out of composite material and a folding wing span of 75.5 feet, this two seat, side by side glider, has a glide ratio of 50 to 1. The engine is a Rotax 914 Turbo and is mounted behind the cockpit and hidden deep within the fuselage. The oxygen tank allows a ceiling of 33000 feet for the pilots. This is an engineering marvel and we spent a long time checking it out. And yes, it has a folding variable pitch propeller. (Visit the Stemme home-page at www.flight3.com/stemme.html)



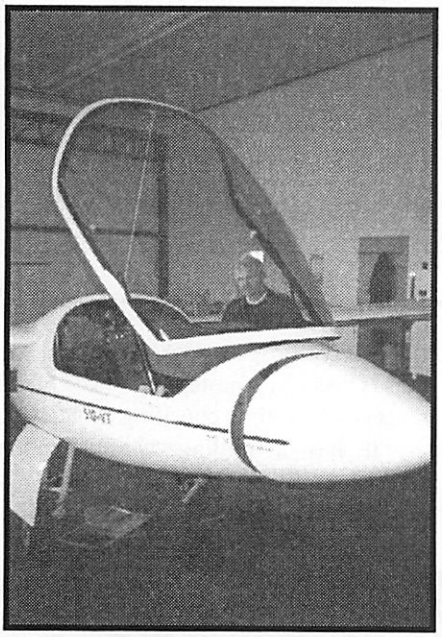
John Hugel and his Robinson 22 - by Stu

John invited members of the CUFC to visit at any time. We had a great visit and we promised to return. Okotoks was our next stop on our flight and we landed on a

(continued on page 10)

Destinations *- continued from page 9*

newly paved runway with new lines and numbers. The place was very quiet this morning. We checked out the impeccably built P-51 Mustang¼ scale home built aircraft. Very nice job.



Andy admires John's Stemme motorglider *Photo by Stu*

The day wore on and we departed for our home bases. The turbulence was building and we danced on the soft thermal bubbles all the way home. Stu peeled off just west of his home strip and I flew on over harvest weary combines on the golden fields below. Flying on calm autumn days are the icing on the cake before the harshness of the winter breezes grounds even the hardiest of pilots.

Happy landings. ✈

Andy prepares to depart A.J. Ranch

Magellan GPS 315 Draw
January 13, 2000

Once again the Calgary Ultralight Flying Club will raffle off another GPS unit. Tickets for this draw will be $5.00 each or 3 for $10.00. Draw date will be at the January 13th meeting and will be limited to members only.

Since all memberships expire at the end of January you may consider renewing your membership at the same time.

For those that live out of town/province send your membership renewal and raffle cheques to:

Calgary Ultralight Flying Club
c/o Bernie Kespe
6 Spokane Street S.W.
Calgary, AB
T2W 0M5

Raffle tickets will be filled out for you and placed in the drum.

Proceeds of the raffles are used to defer the costs of the news letter thus helping to keeping the membership dues to $20. At present the news letter costs just over $18 per year per member. This leaves only $2 to cover hall costs, fly-in events and the annual dinner not to mention other incidental expenses.

Help support your club - who knows, you may win the GPS - it's a heck of a deal for $10.

Bernie Kespe
Secretary