

Skywriter

Sat. Sept. 17
Springbanks
Fly-in.

- ① Update members list
- ② Letterhead



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July-August 1989

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Message from the Prez by Gordon Keegan

Thanks to all those who participated in the fly-in to Calgary International for the 50th anniversary on June 10. The day started off with a pre-flight briefing at 6 A.M. which was attended by the 7 ultralight pilots and the Cessna pilot, Rob McCaghren, who accompanied us on the flight.

We decided to fly "line astern" from Indus to Calgary with a VHF radio at front and back for communication with Rob and with ATC if necessary. The people in the tower at Calgary were extremely helpful and made us feel very welcome. The inbound flight was uneventful as we approached runway 25 by way of the McKnight Boulevard right of way. There were more than a few folks almost choked on their morning coffee when they saw us passing over the N.E. part of the city, they thought they were being invaded by the Biafran Air Force. After taxiing to the S.E. hangers by Executive Flight Center, we were marshalled into the Home Oil hangar which was to be our display area for the day.

Hundreds of people came through the hangar during the course of the day, and most of them had never seen an ultralight before. In all, I think it was a great P.R. day for our club and I was proud of how we presented ourselves and how many people we were able to introduce to ultralights. Next month I'll talk about how we got out of the airport on Sunday morning. There are several people that were very helpful in making all of this possible; Gord Lowe and his assistant, Hank in the control tower, Ken Collins, President of the Calgary Flying Club, Home Oil, for the generous use of their facilities, the management of the Calgary International Airport and, of course, Rob McCaghren and his Cessna 170B.

As some of you may have noticed, there has not been a newsletter for a couple of months due to some technical difficulties. I'm grateful to Bob Kirkby for handling the publishing duties for the next while until we get things ironed out.

Hope you are all taking advantage of these great summer evenings to get lots of air time.

See you on top!

Letter from the Editor

by Bob Kirkby

Perhaps you've noticed by now that the letter from the editor is not from the editor. That's because I am filling in for Gord Sorensen to help get this newsletter out. Gord is in Red Deer for the summer and unable to work on the newsletter.

I will probably be doing the September newsletter as well, so please call me if you would like to add or delete any classified ads. An article or commentary for the next newsletter would be much appreciated both by myself and our readers. You can call me at 291-5560 during the day and 226-0720 at night.

Dates to Remember

Meeting night is the first Wednesday of each month, 1930 hours, at the R.C.A.F. Association, 110-7220 Fisher Street S.E.

August 5-6 Red Deer International Airshow, Red Deer Industrial Airport.

August 11-13 Abbotsford Airshow, Abbotsford, B.C.

Safety Corner by Paul Hemingson

Lost in Space?

It's easy to navigate an aeroplane! That's what some people think - after all, you're up high where you can see everything so much better, so there shouldn't be any excuse for getting lost! In fact, when it comes down to it, the opposite is true. It's easy to get lost while flying, or at least disoriented. If it hasn't happened to you yet it will. Just go over some unfamiliar terrain without adequate preparation and watch your anxiety level grow as fuel level shrinks.

Why should it be so easy to get lost while flying? True, you're up high and can see a lot more ... but this adds to your problems. Your lofty perch allows you to take in a lot more landscape; suddenly, every familiar landmark takes on a new shape. The road down there that you thought ran north-south actually trends at some angle. One farm looks like another. Hills and valleys aren't so obvious. Some things look foreshortened. Your visual senses are overwhelmed with so much new information.

This article will relate some tips to safely navigate your aeroplane on short cross-country trips. Getting lost is not the problem, it's how you react to this feeling. Don't panic. You likely know your approximate position - it's just that you don't know exactly where you are. In piloting, knowing approximately where you are is often good enough, but sometimes you need to know your exact location - for example, if you're trying to locate an unfamiliar airstrip. Knowing your approximate position is adequate, 95% of the time. The purpose of your cross-country trip is often for no other reason than pleasure. It's hard to enjoy your flight if you're all pumped up about keeping track of your exact position every single second. A tense pilot concentrating on his exact position is likely to forget some other things requiring his attention - for example, altitude control, other traffic, gauges and fuel level, forced landing sites; fixating on one part of your duties as pilot in command will get you into trouble. The cross-country trip can be a pleasure if the following steps are taken:

- 1) preparation;
- 2) en route checks.

Should I? Shouldn't I?

Our initial flying often consists of doing circuits at our home strip. The space is well defined and we are always within sight of the runway. You get into the habit of turning over the same landmarks, and judging your final approach by the height and location of well-known features. Eventually, this gets boring and the urge to go further in space takes hold. Maybe it's a flight to a nearby strip; maybe it's a flight over a friend's house; maybe it's peer pressure to go somewhere else and be somebody.

Whatever the reason, there is probably a nagging doubt in your mind about doing this. Don't worry, it's your common sense working. You are probably uncertain about this because it's not taught properly. Somehow, you're supposed to just know how and do it. I wonder you're torn between going and not going - the uncertainty of having to go about it can leave you paralyzed. Then when you do screw up enough courage to attempt it, things seem to go wrong right from the start. Maybe by trial and error, you will succeed, eventually, in flying cross-country. But it doesn't have to be this way.

This article attempts to unravel some of the tricks of navigating your aeroplane without resorting to complex terminology and instrumentation. Even transport pilots keep track of their position by looking at the ground below; it gives them (and me) some comfort to know that they are where their instruments tell them they are. It's not sufficient to know that you're 341.515 miles from the destination, or one hour, 17 minutes and 11 seconds out on a bearing of 315.43 degrees at 30,007 feet. The digital display is great, but it's even greater when you ground-truth it.

Basically, navigation consists of two basic steps:

- 1) preparation;
- 2) en route checks.

Preparation

The Air Canada pilot who successfully force-landed a large passenger jet at an old unused strip near Gimli, Manitoba, some years ago, exemplifies how preparation and knowledge can pay off. It wasn't luck; it was just lucky for the passengers that they had such an astute pilot! With the 'flame out' at 30,000 feet due to fuel starvation, he had to make some quick decisions about what to do; it's not an everyday occurrence. He wasn't lost, but preparation for his cross-Canada trip and en route checks allowed him to take a definite course of action that led to a successful landing. His professional attitude and mindset were developed from years of experience and visualizing (maybe even dreaming) of just what he would do in such a circumstance. This kind of thinking ahead about contingent actions one might take, typifies the way the old pilot thinks. I'm willing to bet it started years ago when he flew aircraft with less reliable motors.

The point of this story is, the importance of preparation before any flight. There is a lot more to preparation than a thorough preflight check. Most cross-country flights will require some form of navigation and may entail an 'out landing' at an unfamiliar airstrip.

Navigation is nothing more than the ability to read a map and relate it to what you see and vice-versa. Practise makes you sharper. Navigation starts with preparing for the flight. You begin to envision the flight, the contingencies to prepare for and what

preventative action to take. Decisions can be made on the ground about all kinds of things and result in a less cluttered mind en route.

Preparation involves a number of things - including:

- 1) map;
- 2) weather check;
- 3) flight plan or notice.

Let's take these one at a time - it's only a short list.

The Map, Please!

This is the first step in preparing for the flight. If you're going to be following highways, a road map might be adequate, but for true, cross-country air maps, something more detailed like the Alberta Aviation Council map is good (Figure 1). It shows the location of a lot of private strips and other pertinent information. But it doesn't show many of the roads and such - I use both. Locate your destination and starting point and draw a straight line between them. Mark the line off in 10-mile increments with heavy marks at the .25, .50 and .75 way-points. Study the map (Figure 1) and try to visualize the landmarks along the way. What towns might you see? Railroads? Highways? Lakes? Streams? What's the round trip distance - in miles, and in time? Will additional fuel be required? What are the alternate strips along the way to which you could divert? What information do you have on your landing site at the destination? What's the heading if you're going to use your compass? What will be your altitude? What's the terrain like? It might seem like a lot of questions, but you will feel more in control if you take a few minutes to get the answers first. When landmarks show up, pretty much as you have envisioned them, at the right place and the right time, you will welcome them like old friends. Your satisfaction and confidence will grow. Study the map of Figure 1 to visualize which landmarks you might line up with to keep your course and which landmarks will pass by on your left and right sides. With a little thought, you can almost see the junction of Highway 21 and the Trans-Canada. Note how you parallel Rosebud Creek.

As your skill grows in cross-country flights, you will develop some tricks of your own - like keeping the relative position of the sun approximately the same to hold a heading, or lining up with a distant point to keep straight, or recognizing a stream by its winding, sinuous course with tree- and shrub-lined banks, since it's unlikely you will see any water until almost overhead, or glueing a digital clock onto your panel and estimating the time to the next landmark or your ETA. These mental games never end and are part of the pleasure of flying VFR.

The Weather, Please!

Once you've planned the flight, the next step is to get some guideline on the kind of weather to

expect. The weather in Alberta is often unstable and changes quickly. If everything looks O.K. as far as the eye can see, you're probably O.K. for a few hours. What you see is what you get! Maybe, you're planning on going out in the cool of the morning and returning in the cool of the evening. Things could dramatically change in 10 hours. A check with your local flight service centre, declaring your intentions, and getting information on what they expect, will help you plan accordingly. For example, the phone conversation might go something like this:

Pilot: "Hi, I'm planning on flying my ultralight from Indus to Drumheller this morning, and returning in the late afternoon. What can I expect in the way of winds?"

Flight Service: "Well, let's see now, uh ... (silence as he stares at maps and reports), uh, right now we've got winds 270 at 10 and (more silence) an upper cold front moving south from Edmonton ... so we forecast some showers and local thunderstorms in the afternoon with winds switching to 340 at 20, but things should dissipate by evening."

Pilot: "Oh, thunderstorms, eh? I can't take winds more than about 15 mph, but you think things might get better as it cools off in the late afternoon, eh?"

Flight Service: "Well, we expect instability as the thunderstorms build, but they usually dissipate as the sun goes down. It looks like things will pretty much be the same today as they were yesterday."

Pilot: "Oh, I see, O.K., thanks a lot." (You think about yesterday's weather.)

The flight service people cannot and will not make your decision for you. It's your decision. If you decide to go, at least you know what to expect. This is good information. If you see the storms building, you can decide to beat them home, or wait them out and fly home after they've passed. Take their information as a guideline in preparation for your flight. You can compare the 'forecast' to 'actual' along the way. With the current and forecast winds, you can predict how much headwind, tailwind or drift wind to expect, as well as the degree of mechanical and convective turbulence. Good stuff to know!

Who Knows About You? Who Cares?

Once you've decided to go, it's a good idea to let someone know your approximate course, time of arrival and return, and other pertinent information. In fact, it's required if the flight is more than 25 nautical miles from your home base - it's your duty. The simplest way is to inform some responsible friend of your intentions, and check in with him later. If you're overdue, he can/will/should go to the appropriate authorities to take some action once you're overdue by a certain number of hours.

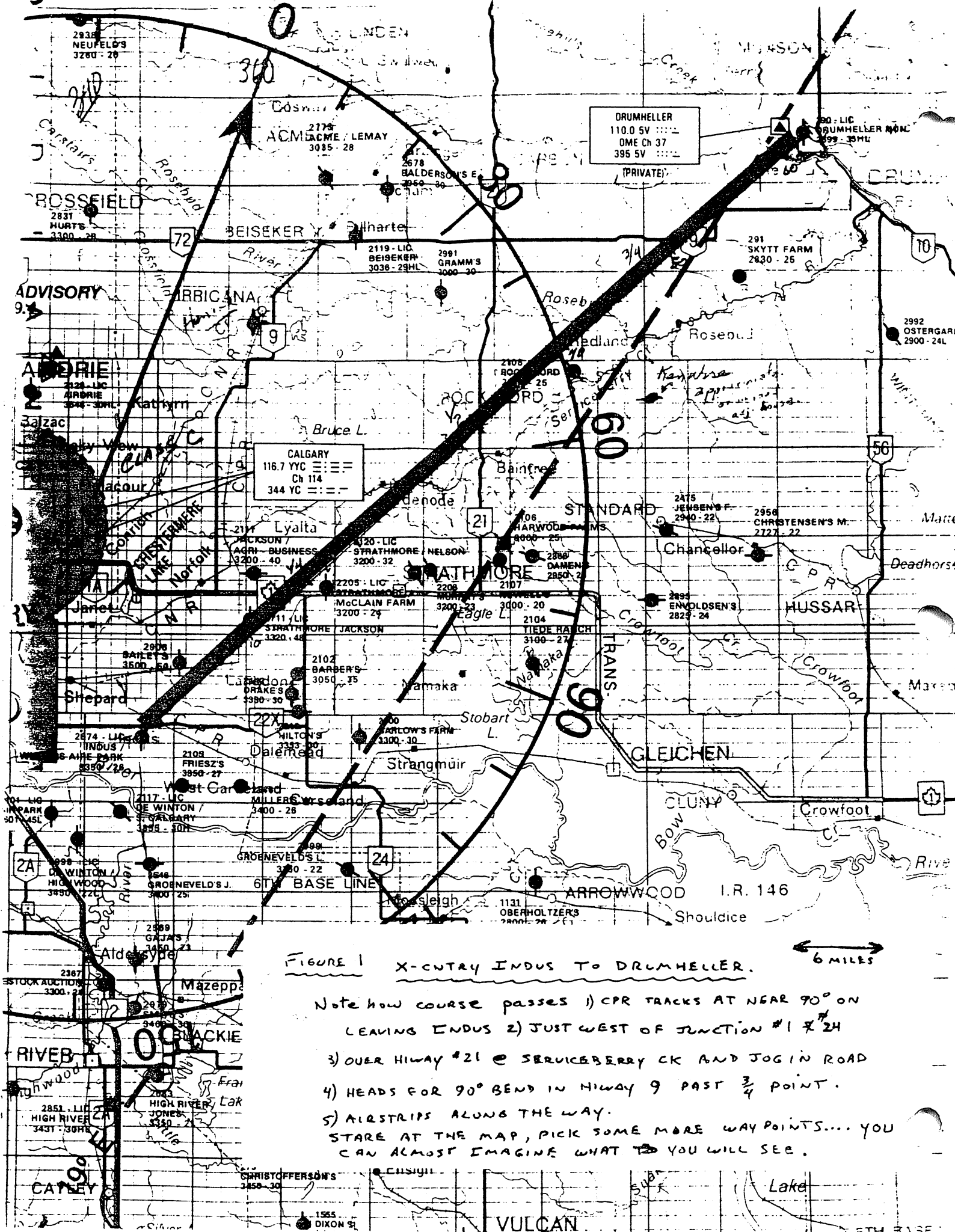


FIGURE 1 X-ENTRY INDUS TO DRUMHELLER.

6 MILES

- 1) CPR TRACKS AT NEAR 90° ON LEAVING INDUS
 - 2) JUST WEST OF JUNCTION #1 & 24
 - 3) OVER HIWAY #21 @ SERVICEBERRY CK AND JOG IN ROAD
 - 4) HEADS FOR 90° BEND IN HIWAY 9 PAST 3/4 POINT.
 - 5) AIRSTRIPS ALONG THE WAY.
- STARE AT THE MAP, PICK SOME MORE WAYPOINTS.... YOU CAN ALMOST EMAGINE WHAT YOU WILL SEE.

VULCAN

5TH BASE

En Route

Half of Being Smart is Knowing What You're Dumb At

Pilot navigation is simply map reading. Relating what you see on the ground with what's on the map. With proper preparation, you know what to expect; you're related what the map shows to what you expect to see.

I like to keep the map in the cockpit oriented with the longitudinal axis of the aircraft, so that if I am going north, the top of the map is to the north; if I'm going south, the top, or leading edge of the map, is south. This way, I don't have to do the gymnastics of mentally turning things through so many degrees. I follow along my flight path, checking the landmarks along the way. If you can, look ahead, aside and behind to keep yourself on course. Reorient yourself with upcoming and passing landmarks to help you 'stay on course'. Keeping track of drift allows you to make the appropriate corrections. Keep one eye on the weather too. If it seemd prudent to do a 180, do it, or divert to a previously chosen alternate location to think things over.

While approximate position is adequate for most cross-country flights, the real test is finding an unfamiliar airport. In this case, exact position is needed. It's not easy to spot an airstrip that you're never used, but if you know your approximate position and what to look for, it's easier. With your preparation, you know the length, width and orientation of the strip. Look for a darker patch of grass oriented in the fashion. Other aeroplanes? Now locate the position of the windsock, if available, otherwise determine wind direction from whatever clues are available. Plan your approach. The standard circuit at uncontrolled strips is left hand. Do a practice run and plan to overshoot and go around if everything doesn't look just right. There is no rule that says you have to land on the first attempt. Once you've landed, check yourself out and think about the return flight. Congratulate yourself on getting there - you know you can get back. Prepare for the return flight in the same way that you planned the first leg. It only take a few minutes, while things are fresh in your mind. Things will look different with a different sun angle on the return heading.

Summary

Essentially, successful navigation depends on two things:

- 1) adequate preparation;
- 2) en route checks.

If you become disoriented momentarily, don't panic - simply maintain your heading and it's likely some identifiable landmark will appear. Mentally retrace the flight to the last known position. If you kept track of time and distance covered, it's unlikely that you're lost in space - just temporarily disoriented. If nothing identifiable shows up in a while and you're low

on fuel, then a precautionary landing might be in order. The precautionary landing will be the subject of future articles. For now, it's sufficient to include it in your list of contingencies when planning a cross-country flight.

P.S. Don't forget to pack a few extras - like your tools pouch, spare plugs and oil, tiedown rope (dog stake are good), a few chocolate bars, maybe a thermos of coffee, pencil and paper, and your maps. A few quarters for a pay phone and dollars for extra gas. Your logbook and license. Anything more than this and you'd begin to look like a tourist with two pieces of checked baggage!

The main thing is, have fun. Don't push too far on your first few cross-country trips. Once you've done a few trips successfully, it's unlikely you will be content to practise circuits. Enjoy!

Fly safe!

The Renegade Spirit Takes Flight

by Bob Kirkby

In the October 1988 issue of Skywriter, I reported my progress on building my Renegade Spirit. This is a followup report on the last half of the project, now that it is finally in the air.

Notice I said "last half". Before starting to write this I reread my last report, at the end of which I said I had put in 280 hours and expected to complete the project in about 350 hours, total. I wonder what I was smoking that day! By the time the Renegade made it's maiden flight I had accumulated a total of 630 hours, and have since put in another 50+ hours before calling it completed. What was the name of that dealer who told me the Renegade could be built in 350 hours?

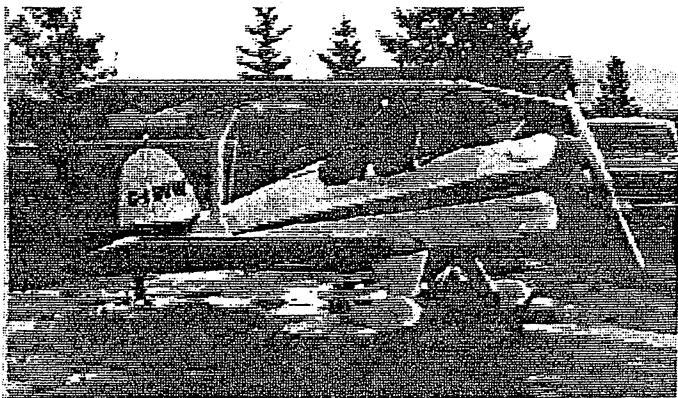
At last writing I had just completed the construction phase and was preparing to cover. There were still a few construction items left, like fairings and cover panels, which I decided to leave until after covering because when the fabric is tightened, some openings and edges distort; so it is better to cut and fit them later. So I charged ahead with covering using the Hipec process. I am glad I chose Hipec. Although I have never used the Stits method, I have watched the Stits video and listened to tales from other builders, and the Hipec method definitely seems easier and quicker.

Preparing the aluminum for covering was fairly time consuming. The wing ribs, and there's a lot, had many dimples due to the compound bends in the aluminum. I used the Hipec recommended method to fill these, which is to mix micro-baloons and sun-barrier to make a slurry, resulting in a very light and tough filler when dry. It can then be sanded smooth. This can be used to coverup a multitude of errors as well.

The process of fitting and glueing on the fabric, although time consuming, was not difficult at all. Patience is required to do a good covering job, because it does become quite tedious after a while. Once the fabric is on, it is tightened by heating with an iron. Again, after spending a few minutes to get the knack of it, this step is easy and goes very quickly. Now it is time to paint. This is a major step.

My biggest challenge was finding a way to support the four wings so that they would fit in my 24' x 24' garage along with four ailerons, the elevator, horizontal stabilizer, rudder, engine cowling halves and wheel pants for painting. I built two vertical stands and mounted the wing halves on either side, leading edges up, so that they balanced like a huge mobile. When I was mounting the upper wings on their stand I had trouble stabilizing them because of the 10 degree sweep, and they actually did become mobile at one point. Having solved the logistics problem of suspending all these things in a small space I cracked open the can of sun-barrier. This is Hipec's multi-purpose miracle compound that attaches the fabric to the aluminum, gives the fabric the strength needed to support the loads and provides ultraviolet protection to the fabric.

The first coat of sun-barrier must be brushed on to insure that it penetrates the fabric completely. The Hipec manual says it can be sprayed on, if desired, but I have seen this done and it produces an unacceptable result. The second coat must be applied about 8 hours later and can be brushed or sprayed according to the Hipec manual. Since the first coat came out very smooth, I decided to brush the second coat. This was a mistake, as I ended up with brush lines. I sprayed the top coat, which is an Endura paint, but this did not eliminate the brush lines which carried through the final top coat and make it look somewhat amateurish. Although the Hipec manual gives you alternatives, I strongly recommend that you brush the first sun-barrier coat, spray the second within 12 hours, and spray the top coat within 24 hours of that. Aside from the brush lines, I am very pleased with the covering and paint job. The final result is a very tough yet



The Renegade ready for the test flight. Note wingroot fairings yet to be installed.

flexible finish. One final comment, if you are going to use the Hipec process you must use a respirator with filters designed to eliminate isocyanates when you spray. Otherwise you may not live to fly your project.

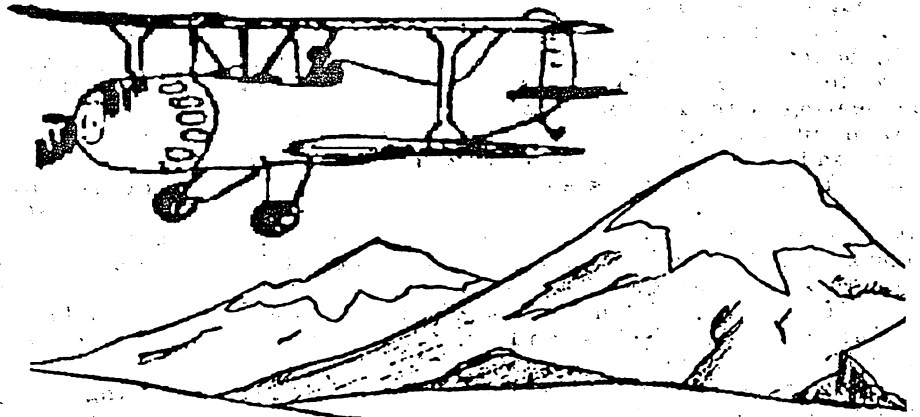
Once the paint was dry and the mistakes touched up, I switched to finishing the inside. I decided to upholster my seats and the upper halves of the cockpits myself. (The bottom halves are open to the aircraft interior. This helps to remind the pilot that he is still in an ultralight.) Never having upholstered before, this was a bit of a challenge. It went well but took a long time. I used a very tough nylon type fabric for the seats, since they get stepped on during entry and exit, and a vinyl material, designed for marine applications, to cover the instrument panel and surrounding cockpit. I also made two snap-on tauna covers to keep the birds out when the airplane is hangared, or the weather out if, heaven forbid, I should have to park it outside. Once the panel was covered I installed the instruments, which had been pre-wired during construction. For instruments I had chosen a tach and ASI in both the front and back cockpits, water temp gauge, altimeter, slip indicator, hobbs meter, and volt meter. I thought the latter would be useful to monitor battery condition in cold weather. I have since decided to add a CHT gauge because the water temp gauge is very slow in responding to temperature changes.

Now I was finally ready to put the pieces together. After only a few more hours I had a fully assembled Renegade in my garage, and then spend as many hours admiring it. The next step was to cut, fit and paint the many fairing pieces and access covers. Many hours were then spent checking and adjusting the wing rigging, aileron linkages, etc. before I pronounced it ready to fly.

Murphy Aviation has a very good policy of sending their pilot, Robin Dyck, to test fly a newly constructed Renegade for the price of the air fare. I had long ago decided to avail myself of this facility. Fortunately for me, I was ready for the test flight at the same time that Robin was on his way back to Chilliwack from the Toronto Ultralight Show in May, so it didn't cost me anything for him to stop by on his way through.

And so on May 4, 1989 I watched proudly as Robin climbed aboard my Renegade, parachute strapped to his back, ready to put his life in the hands of yet another builder. Three or four pumps of the primer knob, ignition on, push the starter button. After what seemed like three revolutions the Rotax 532 sprang to life, belching a cloud of blue smoke just to add to the nostalgia. A short taxi to the end of the strip, check the controls and he's ready. Robin opened the throttles and began to roll. It seemed awfully quiet! I thought to myself, "Give her full throttle Robin, don't fool around with my airplane!". Then I realized he was at full throttle. The illusion was created because the 532 was so quiet with the after-muffler Jim talked me into using, that all I could hear was the prop beating its way through the air.

Fifty feet and the tail was up, another 100 feet and the nose tilted skyward and she was airborne for the first time. It flies! After a year and a half of cutting and assembling pieces of aluminum with a million rivets, it really flies. That was my dominant thought for the next 10 minutes as Robin did gentle turns, stalls, slow and fast passes overhead. It looked magnificent; I could have watched it all day. Apparently satisfied that all system were functioning, Robin brought her in for a gentle landing, ending the first of hopefully many flights for Renegade Spirit number 55.



I'll end here since it's time to get the newsletter out. Next month I'll continue with what it's like to fly the Renegade.

Classified

Mirage - 100 hrs TT, always hangared, instruments, parachute, 37hp Kawasaki, CB antenna and connections, helmet with headset, excellent condition, good beginner airplane, \$3000.00. Bob Kirkby, 226-0720.

ABC Ballistic Chute - never used, hermetically sealed, excellent, new \$1900., asking \$1200. Paul Hemingson 931-2363.

Fisher FP101 - fantastic flying ultralight yet looks like a conventional aircraft. New, fly it away. \$7000. Ralph or Wayne Winters 936-5347 or 238-0406.

R/C Scale Modeller - magazines 1970-1989, A1 condition, 260 available, \$1. each. Dave Bendall 278-9175.

Boom Mic - M-87 low impedance dynamic microphone, fits most headsets, new, 2 available, \$25. each. Bob Kirkby 226-0720.

Hagar Wheels - 1 pair of 6" Hagar wheels, new, \$50. Bob Kirkby 226-0720.

Classified ads for aircraft and related equipment are free to CUFC members.

Announcements

Video tapes are available for rental at each meeting. \$5.00 each.

Library material (U/L magazines galore) can be borrowed by calling Bernie Kespe at 255-7419.



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CHECK LIST FOR THE HARVARD

MAXIMUM PERFORMANCE

- CLIMBING - 0 TO FULL THROTTLE ALT. 32"/2250 RPM - 100 KNOTS
- FULL THROTTLE ALT. & HIGHER, REDUCE AIRSPEED 2 1/2 KNOTS/2000'

- ### SLOW FLYING - WHEN
- FLYING IN RAIN OR POOR VISIBILITY NEAR THE GROUND
 - 15° FLAP / 2000 RPM / 96 KNOTS
 - USE CARB. HEAT & PITOT HEAT AS REQ'D

SPECIFICATIONS

- ENGINE - PRATT & WHITNEY WASP R1340 - 53HP OR R1340 - AN - 1 9 CYLINDER SUPERCHARGED RADIAL ENGINE - 550 BHP
- PROPELLOR - HAMILTON STANDARD WITH CONSTANT SPEED RANGE FROM 11° (FINE PITCH) TO 27° (COARSE PITCH)
- DIMENSIONS
SPAN 42'-14" LENGTH 28'-11 1/8"
HEIGHT 9'-9 3/8" (TAIL DOWN)
WING AREA - 255.72 SQ. FT.
- WEIGHT - EMPTY 4075 lbs.
- MAX 5750 lbs.
- MAX AEROBATIC 5490 lbs.
- WING LOADING
AT MAX WEIGHT 22.8 lb/SQ FT
" AEROBATIC " 21.7 " " "
- POWER LOADING - 9.5 lb/BHP.
- FUEL & OIL CAPACITIES
- FUEL - 80/87 OCTANE
R.H. TANK - 42.5 IMP. GAL
L.H. " - 42.5 " " INCL
14.5 IMP. GAL. RESERVE
- OIL 8.5 IMP. GAL.
- PERFORMANCE
MAX SPEED AT 5000' - 178 KNOTS
OPERATING SPEED " - 147 KNOTS
LANDING SPEED - 58 KNOTS
RANGE - 650 NAUTICAL MILES
(750 STATUTE MILES)
- STALLING SPEEDS
u/c & FLAPS UP - 61-64 KNOTS
u/c & FLAPS DOWN - 52-56 KNOTS
- ALL ELECTRICAL EQUIPMENT MUST BE OFF WHEN PII COMPASS IS SWINGING

SHUTTING DOWN

1. PARKING BRAKE - ON
2. 1200 R.P.M.
- CYL. HEAD TEMP 205° OR LESS
3. POSITIVE COARSE PITCH
4. MIXTURE FULL LEAN, THEN WHEN ENGINE STOPS -
5. SWITCHES - OFF - BUTTON PRESSED
6. FUEL - OFF
7. THROTTLE CLOSED
8. BRAKES SET
9. GYROSCOPE CAGED
10. RADIO - OFF - INTERPHONE - OFF
RADIO COMPASS - OFF
GENERATOR SWITCH - OFF
11. CONTROLS - LOCKED
12. PITOT HEAD COVER - ON

MAXIMUM GLIDE

FULL COARSE PITCH - NO WIND

| GEAR | FLAPS | IAS KNOTS | GLIDE RATIO | RATE OF DESCENT |
|------|-------|-----------|-------------|-----------------|
| * UP | UP | 83 | 9.6:1 | 857 fpm |
| DOWN | UP | 74 | 7.5:1 | 966 " |
| UP | DOWN | 65 | 7:1 | 930 " |
| DOWN | DOWN | 61 | 6.1:1 | 1004 " |

* 1.29 STATUTE MI FOR EACH 5000' ALT. LOST

EMERGENCY TAKE-OFF

- LINE UP - LOWER 15° FLAP - OPEN UP TO 32" ON BRAKES, RELEASE & OPEN UP TO 36", GET TAIL UP FAST - TAKE OFF STRAIGHT AHEAD

FIRE IN THE AIR

1. THROTTLE CLOSED
2. PITCH FULL COARSE
3. FUEL OFF - WAIT UNTIL ENGINE HAS SLOWED TO MIN. RPM
4. SWITCHES OFF
5. OPERATE FIRE EXTINGUISHER
6. DO NOT ATTEMPT TO RE-START

FIRE ON THE GROUND

1. THROTTLE CLOSED
2. MIXTURE TO IDLE CUT-OFF
3. FUEL OFF
4. SWITCHES OFF
5. EXTINGUISHER OPERATED IF NECESSARY

EMERGENCY - RADIO

121.5 MC / 3023.5 KC

DISTRESS - MAYDAY

URGENCY - PAN

SAFETY - SECURITY

FLYING LIMITATIONS -

- MAXIMUM SPEEDS - IAS
 - DIVING 211 KNOTS - MAX WEIGHT
 228 " - AEROBATIC "
- u/c LOWERING - 130 KNOTS
 - u/c LOCKED DOWN - 147 KNOTS
 - FLAPS DOWN 110 KNOTS
 - SIDE SLIPPING - 78 KNOTS
 - INVERTED FLIGHT NEG "G" - 58% MAX
 - FULL AILERON - 165 KNOTS
- LOADING LIMITS
 - MAX. WEIGHT (5750) + 4.9 "G"
 - AEROBATIC " (5490) + 5.67 "G"
 - 2.33 "G"

ENGINE LIMITATIONS

| | RPM | MP. "HG" | TEMP °C | OIL °C | MIXT. |
|-------------------------------|------|----------|---------|--------|-------|
| - MAX. TAKE OFF (5 MIN LIMIT) | 2250 | 36 | 260 | 85 | RICH |
| - MAX RICH CONTINUOUS | 2200 | 32 | 260 | 85 | RICH |
| - MAX LEAN CONTINUOUS | 2000 | 26 | 230 | 85 | LEAN |

- DESIRED NORMAL TEMPS 205° 50-70°

- OIL PRESS - MAX 90 PSI
- NORMAL 70 - 90 PSI
- MIN. CRUISING - 50 PSI
- " IDLE - 10 PSI
- OIL TEMP - TAKE-OFF - 40°C
- CYL. HEAD TEMP -
MIN. TAKE-OFF - 120°C
MAX. " " 260°C
MAX - STOPPING ENGINE - 205°C
- FUEL PRESSURE 4-6 (5 DESIRABLE)
- AMMETER OVER 50 AMPS SHOWS OVERLOAD OR BATTERY LOW - TEAR OFF RADIO AND RADIO COMPASS ETC. IF EXPEDIENT TO ALLOW BATTERY TO BECOME MORE FULLY CHARGED.

PRECAUTIONARY LANDING

1. DESCEND TO 500' (LOOK FOR FIELD)
2. 200' EXAMINATION RUN
3. DO POWER ASSISTED APPROACH, - SETTLE IN (NOSE HIGH)
- ADDITIONAL POWER IF REQ'D. JUST BEFORE TOUCHING DOWN.

OVERSHOOTING

- POWER 28"-32" - KEEP LEVEL
- 78 KNOTS - u/c UP - CLIMB
- FLAPS UP - IN STAGES OVER 300' RE-TRIM BETWEEN STAGES.
- 28" / 2000 RPM / 96 KNOTS CLIMB AWAY

Editor's note - Here is part of the Harvard's check list card carried by the pilots. There is only room for half of it in this newsletter. I will include the other half next month.