COPA

CANADIAN OWNERS AND PILOTS ASSOCIATION

COPA Guide to Ultralights

Contents

Introduction

This *COPA Guide to Ultralights* is designed for newcomers to Canadian ultralight airplanes. This includes people just thinking about learning to fly and also "general aviation" and other pilots who would like to get into flying, building and maintaining ultralights.

Ultralights in Canada have much to offer both new and experienced pilots looking for fun and affordable flying. If you aren't convinced then read on, there is much here to explain the appeal of these very-light airplanes!

In this guide you will find an introduction to the ultralight category of aircraft and also the *Pilot Permit – Ultra-light Aeroplanes,* some cost numbers for some typical ultralight airplanes and some information on safety and inspections. This Guide is currently short of information on Trike and Powered Parachute flying – but we hope to add some more articles on those types in the near future.

For information on how to go about buying an ultralight or any other aircraft please refer to *The COPA Guide to Buying an Aircraft,* available in the Members Only section of the COPA website.

NOTE
While this guide does discuss the rules for buying, owning and operating an ultralight aircraft it is not legislative. Ensure that you read, understand and comply with the current CARs before buying and flying!

Section I Ultralights - What Are They?

Ultralight Airplanes

Ultralight airplanes constitute one of the quickest growing segments of aviation in Canada. On average, more ultralight airplanes were added to the Canadian register every year than amateur-builts, owner maintenance, certified aircraft or any other category of aircraft. Nowadays, this growth has leveled off and has been surpassed by Certified Normal category aircraft.

There are two categories of ultralights in Canada

- Basic Ultralight Airplanes (BULA)
- Advanced Ultralight Airplanes (AULA)

The BULA basic ultralights include:

- **Fixed wing ultralights** - those with "non-flexible" wings and aerodynamic controls
- **Trikes** - based on flexible hang glider style wings with weight-shift control
- **Powered parachutes** - with wheeled landing gear
- **Powered paragliders** - which are foot launched

Basic ultralight numbers are growing faster than advanced ultralights. The quickly increasing numbers of basic ultralights are probably being driven by the growing popularity of powered parachutes and trikes in Canada.

Why are ultralights so increasingly popular? Cost is certainly one reason. With the least expensive new two seat certified aircraft starting at well over $200,000 compared to some new two seat ultralight kits selling for under $30,000, it isn't hard to see that ultralights can be a lot cheaper to purchase.

Operating costs can be a lot lower, too. Flying 50 hours per year on a certified aircraft like a Cessna 150 will probably cost in the region of $150 per hour. Many new two-seat ultralights can be flown for about $50 per hour. Comparing numbers like those, it is easy to see that, for many people, ultralights don't just provide the chance to fly more hours for the same money they provide the only opportunity to fly affordably.

Cost isn't the only factor. There are many ultralight pilots who could afford to fly bigger aircraft but who fly ultralights because they find them just more fun. Instead of the "car-like" comfort of most certified aircraft, many ultralights provide the adventure of flying open cockpit, flying from short, unprepared fields and flying "low and slow" over the countryside. Ultralights certainly offer more adventure in flying.

The ultralight category covers aircraft from very slow and basic aircraft, like powered parachutes, to fast cross-country speedsters – so there is something for almost everyone in the ultralight world.

Because all ultralights are "owner-maintenance" the owner can do the maintenance or hire someone to do it. The paperwork requirements are much simpler for ultralights, too.

Ultralight Terminology

The terms used when talking about ultralights can be a bit confusing. It seems everyone spells the terms differently and in some cases they are talking about different things! Here is a quick glossary:

Ultralight Airplane – This is the term that is commonly used in Canada to describe these aircraft, including basic and advanced ultralights.

Ultra-light Aeroplane – This is the official term that Transport Canada (TC) uses to describe Canadian ultralights, but it isn't often spelled that way in common writing, outside the CARs and other TC official documents.

Microlight – This is the European FAI term for a similar class of aircraft that has a maximum weight of 450 kg (995 lbs) and a stall speed of 65 km/hr (35 knots).

Ultralight Vehicle – This is the term that is officially used in FAR Part 103 to describe ultralights in the

USA. American ultralights are limited to an empty weight of 254 lbs and a single seat, among other limits, so they are generally much smaller and lighter than Canadian ultralights. They are officially referred to as “vehicles” and not “aircraft” because in the US they are unregistered and the pilot does not need a licence to fly them.

Ultralight – The general term used in most parts of the world to describe aircraft that are lighter and generally slower than conventional general aviation light aircraft.

Ultralight Rules and Uses

Ultralights in Canada are currently governed by CAR 602.29 and the Transport Canada *Ultralight Transition Strategy*. Eventually, once incorporated, these rules will all become part of the CARs and will be found in the CAR 603 and 605 series.

Ultralights are only permitted to be used for private recreational flying and commercially for flight instruction, rental and towing hang gliders. Other commercial uses such as crop spraying, aerial photography, carrying freight or passengers for hire are not permitted.

A Short History of Ultralights

Most early 20th century pioneer aircraft, like the Canadian-built Silver Dart, would be considered "ultralights" under the current rules in Canada. But these early pioneer aircraft grew up and became the modern light aircraft, military airplanes and airliners of today. Really small and ultra light aircraft were largely forgotten by the middle of the 20th century.

The history of modern ultralights actually started on March 15th, 1975. On that day an American pioneer did something no human had ever done before, he achieved foot-launched flight from a level surface. On that day John Moody picked up his Icarus II biplane hang glider, started the 8 hp engine, opened the throttle and ran until he lifted from the frozen surface of a lake in Wisconsin. Modern ultralights were born.

Foot launching these craft didn't last long as wheels provided a lot more safety for take-off and landing. The early ultralights increased in weight and complexity quickly in the early 1980s and remained unregulated in Canada and the USA at first. By 1983 both the US and Canada had introduced regulations to govern ultralights.

The US rules for ultralights, FAR Part 103 froze the US ultralights as very small and light aircraft, limited to:

- one seat
- recreational or sport use only
- 254 lbs empty weight
- 55 knots maximum speed
- 24 knots stall speed
- 5 gallons of fuel

The Canadian ultralight rules introduced at the same time started out specifying smaller aircraft than today but the rules have evolved with time.

Basic Ultralights

The first Canadian ultralights were what we now call “basic ultra-light aeroplanes” (BULA). The rules were designed to be uncomplicated to allow these simple aircraft to fly without too much regulation. They were not designed, constructed or maintained to any particular standards. The aircraft could be single seaters or “two seat instructional aeroplanes” with the intention that they would be used only for dual training.

The minimum pilot document was originally called a *Private Pilot Licence - Ultra-light Aeroplanes* (now called a *Pilot Permit – Ultra-light Aeroplanes*). The ultralights themselves were registered in the “C-I” series and flew without any type of flight authority, such as a *Certificate of Airworthiness*. Because of the absence of maintenance and design standards passengers were not allowed to be carried.

The Canadian ultralight rules have changed over time. A good example of this is the change in gross weights in the category. In the early days there was a complex calculation to fit an aircraft into the category, but it meant that most two-seat ultralights originally had gross weights of about 785 lbs.

Today the Canadian ultralight rules allow basic ultralights to have:

- One or two seats
- 1200 lbs maximum take-off weight
- Stall speed of 39 knots (45 mph) or less
- A minimum useful load of:
  - For a single place aeroplane (Wu) = 175 + 0.5P, in lb, where P is the rated engine power in Brake Horse Power.
  - For a two place aeroplane (Wu) = 350 + 0.5P, in lb, where P is the rated engine power in Brake Horse Power

The current rules still do not allow passengers to be carried in Basic Ultralight Aircraft in Canada, but there are several situations that allow two people to fly together. CAR 602.29 (4)(b)(iii) permits two pilots to fly together in a basic ultralight as long as both hold a valid pilot document that affords them the privilege to fly an ultra-light aeroplane in Canada (excluding student pilots). The rationale is that another pilot should be able to inspect the ultralight and decide if they want to fly in it or not, something an uninformed member of the public could not do. The other circumstance when two people can fly in a basic ultralight is when one is an instructor and the other is a student pilot. Carrying passengers other than in these circumstances is limited to Advanced Ultralights.

Helmets are required when flying basic ultralights.

There are no specific maintenance requirements for basic ultralights, but protecting your investment in the aircraft and yourself means taking good care of your basic ultralight. If the manufacturer of a BULA goes out of business then the owner may have trouble getting parts – or may have to make their own parts. Other than that they can keep flying their aircraft. Owners of BULAs can make any modifications

that they like to the aircraft.

BULAs have no instrument requirements. Under new rules BULAs will need only an altimeter and compass to fly in Class E airspace and a two-way radio for clearance into other controlled airspace.

To register a BULA the owner need only fill out the Application for *C of R* Form, provide a copy of the Bill of Sale and pay $110 to Transport Canada – that is all there is to it. Any aircraft that can qualify for the BULA category can be imported into Canada and registered without any difficulty.

BULAs can be original designs, built from kits, plans and raw materials or purchased ready-to-fly.

BULAs can sometimes be turned into Advanced Ultralights (AULA), but it can be difficult. As long as the aircraft has not been modified without manufacturer's written permission, is on the Transport Canada Listing of Models Eligible to be Registered as Advanced Ultra-Light Aeroplanes (AULA) and the manufacturer still exists and is willing to issue the aircraft with a *Statement of Conformity*, then it can be re-registered as an AULA.

Some manufacturers will just refuse on principle to issue an *S of C* to a flying BULA. They are in the business of selling kits and they would rather that the owner buys a new AULA kit. They do not receive anything in return for allowing an owner to turn an already-flying BULA into an AULA, except more liability exposure from the passengers that would be carried.

When selling a BULA there are no complications to the paperwork – the owner sells it, cancels the registration and then the new owner registers it in their name.

Basic ultralights are all registered in the series starting with C-I.

Advanced Ultralights

By the late 1980s some pretty sophisticated basic ultralights were appearing and many people in the industry, owners, pilots and manufacturers, wanted to be able to carry a passenger in that second seat. TC agreed that if both the aircraft and the pilot could meet an acceptable standard then passenger carrying could be allowed. The standard for pilots required an airplane license with passenger carrying privileges, such as a *Private Pilot Licence* or, later, the *Pilot Permit - Recreation Aeroplanes*. Starting in 2005 the Passenger Carrying Rating became available to be added to the *Pilot Permit – Ultra-light Aeroplanes*.

The Light Aircraft Manufacturers Association (LAMAC) devised a set of standards for the passenger-carrying ultralights called *Design Standards for Advanced Ultra-light Aeroplanes*. TC accepted this document and the "Advanced Ultra-light Aeroplane" (AULA) was born in 1991.

From 1991 to 2001 AULAs were restricted to 1058.2 lbs gross weight. Under revisions to the design standard in 2001, the *Design Standards for Advanced Ultra-light Aeroplane* were amended to define AULAS as:

- Maximum gross weight of 1232 lbs for two seaters
- Maximum gross weight of 770 lbs for single seaters
- Propeller-driven
- Maximum stall speed of 39 knots (45 mph)
- Non-aerobatic operations
- A minimum useful load of:
  - For a single place aeroplane (Wu) = 175 + 0.5P, in lb, where P is the rated engine power in Brake Horse Power.
  - For a two place aeroplane (Wu) = 350 + 0.5P, in lb, where P is the rated engine power in Brake Horse Power

The changes to the design standard made by LAMAC and accepted by TC in 2001, mean that powered parachutes and hang glider wing-based trike ultralight designs may now qualify as AULAs, if they meet the standard.

All AULA designs must be evaluated by the manufacturer against the requirements of the LAMAC Design Standards. If the manufacturer confirms that it meets the standard, then they submit a "Declaration of Compliance" (D of C) to TC and the aircraft will be entered on the Listing of Models Eligible to be Registered as Advanced Ultra-Light Aeroplanes. Because there are currently no trikes or powered parachutes on the list, TC will require a complete accounting for how one of these designs complies with *Design Standards for Advanced Ultra-light Aeroplanes* from the manufacturer.

After constructing the individual aircraft, the owner receives a *"Statement of Conformity" (S of C)* for the individual aircraft from the manufacturer that shows that that individual aircraft was constructed to the type definition and therefore meets the requirements for AULA registration. The *S of C* is the document that allows the AULA to be registered with Transport Canada as an advanced ultralight.

To register an individual aircraft as an AULA, the owner fills out the same form and pays the same $110 fee as a BULA. The owner must also be able to find the aircraft type on the TC Listing of Models Eligible to be Registered as Advanced Ultra-Light Aeroplanes (AULA). The manufacturer will have already submitted a *D of C* for the aircraft type to get it on that list. The owner submits the manufacturer's *S of C* to TC for the individual aircraft stating that it conforms to the type definition and that completes the paperwork. It is a good idea to check over the TC list before building or buying an AULA so that you can be sure the aircraft will make the empty weight that the manufacturer claims. In the recent past, some designs have been removed from the AULA category for being too heavy.

Some manufacturers will issue the *S of C* without inspecting the aircraft – if the builder says that they built the aircraft in accordance with the instructions, then that is good enough for them. Most manufacturers will supply an *S of C* as soon as the builder lets them know that the plane is complete and is ready to fly, with no other requirements.

Other manufacturers require an inspection of the completed aircraft by either a factory representative or a delegated person, such as a local dealer. Those inspections may be subject to a charge in addition to the cost of buying the kit.

An AULA manufacturer is allowed to establish any requirements they like before issuing the *S of C*. The manufacturer will be held responsible for the AULA's continuing condition, something that is not the case for amateur-built or basic ultralight versions of the same plane, so they have to be confident that it was built correctly. Because of this requirement a potential kit buyer should make sure that they know what the manufacturer will need before they will issue the *S of C*.

In the past some manufacturers have changed their requirements over time. Just because the aircraft wasn't going to require a factory inspection when the kit was purchased doesn't mean that it won't by the time it is ready to fly. Some owners have run into some complex factory requirements to register a used plane as an AULA, so it is recommended that buyers get answers in writing before the aircraft kit is purchased. If the manufacturer won't issue an *S of C* then the owner cannot register the aircraft as an AULA.

If an owner buys a used basic ultralight or a "previously owned, but not completed" kit or an imported US experimental amateur-built aircraft and wants to register it as an AULA then the process can get a bit more complex. If the type is on the TC List as an AULA, then the manufacturer may issue the aircraft an *S of C* and essentially "adopt" the plane as one of their own AULAs. Some manufacturers will gladly do that and others strictly refuse to do so. Those that will not issue the *S of C* for the aircraft "as is" will sometimes do so if the aircraft is brought up to current production status for modifications to the design of the airframe or the powerplant. Some manufacturers just see no advantage to themselves in signing off an existing airplane as an AULA. They would rather sell the owner a new kit and they leave that as the only option.

When buying a used AULA, the seller must also sign a Fit For Flight Form (FFFF) that the new owner will need to register the aircraft. This form certifies that the aircraft has been maintained in accordance with the manufacturer's requirements, that it has not been modified without the written permission of the manufacturer and that all mandatory actions have been complied with. If the previous owner cannot truthfully sign the FFFF then the new owner will not be able to register the aircraft as an AULA.

Ultimately, if a buyer wants an AULA with its advantages in passenger carrying, then it pays to do the homework on the plane to make sure that it is currently registered as an AULA or can be made to qualify for a factory *S of C*.

AULAs must be either delivered from the factory complete or built from a kit. Plans-built AULAs are not allowed, due to quality control requirements.

AULAs cannot be modified without the written authority of the manufacturer and they must be maintained in accordance with the manufacturer's instructions. Owners of AULAs must get the manufacturer's written authority to make any modification, no matter how small, to the aircraft. Some

manufacturers are very particular about the modifications that they approve, while others are less so. For instance some manufacturers will only allow the installation of their own brand of floats on their AULAs and will not approve of the installation of other brands of floats. This means that, the AULA has to have the manufacturer's floats or else cannot continue to be an AULA. If an AULA is modified without permission from the manufacturer or not maintained as required then it will lose its Certificate of Registration. If this happens it may qualify to be re-registered as a basic ultralight, losing its passenger carrying status. If it doesn't qualify to be re-registered as a BULA then it is grounded. Maintenance records are required for AULAs as per Manufacturer's Specified Maintenance Instructions.

When the AULA category started in 1991 they were registered in the "C-F" and C-G" series, but since 1997 they have been registered in the "C-I" series, same as the BULAs. Some of the older AULAs still have their "C-F" or "C-G" markings. Any owner who has a C-F or C-G registered AULA who wants to trade the marks in for C-I ones may do so. Transport Canada will issue the new C of R with the new C-I marks at no charge. The owner will still have to pay for the lettering to be changed on the actual aircraft, however. If owners don't want to change the registration, they don't have to. They can continue to keep the existing C-F or C-G marks on the AULA.

Manufacturers of AULAs will issue *Mandatory Actions* when required. These are the ultralight world's equivalent of certified aircraft's Airworthiness Directives! As the name indicates, they are mandatory for AULAs.

If the manufacturer of an AULA goes out of business the aircraft can keep flying, as long as the owner keeps up the Manufacturer's Specified Maintenance Instructions. The owner will not be able to make any modifications to the aircraft, as the manufacturer cannot approve them. On the positive side, the manufacturer will not be able to issue any potentially costly *Mandatory Actions* either!
Under the current rules AULAs must be equipped with complete CAR 605.14 VFR instrumentation if they are flown in controlled airspace. Under the new ultralight rules that will be in effect in the near future the instrument requirement for AULAs will move to CAR 605.116, but will stay essentially the same.

AULAs may operate in any airspace in Canada at the present time (except Class "A", of course) and that will not change under the new CAR 602.29.

AULAs can also sometimes be turned into BULAs. Provided that the aircraft meets the requirements for the category then it can be re-registered as a BULA. Note that currently BULAs have a lower gross weight of 1200 lbs versus the AULA gross weight of 1232 lbs. TC will not allow an owner to lower the gross weight when the aircraft is re-registered in a different category. That fact should be kept in mind when considering registering an AULA above 1200 lbs. In moving an AULA to the BULA category the aircraft loses its passenger-carrying privileges, but the owner can modify the aircraft.

Helmets are not required to be worn in AULAs, but may be a good idea anyway.

Not All Ultralights Can Be AULAs

Some ultralight kits available, like trikes, powered parachutes, powered paragliders and many older "fixed wing" designs can only be registered as BULAs. They either do not meet the "Design Standards" for AULAs or else the manufacturer just hasn't evaluated their aircraft to see if they comply and submitted the required *D of C* to TC for inclusion on the list of accepted AULAs.

Some manufacturers do not want their aircraft registered as advanced ultralights because they feel that carrying passengers increases the manufacturer's product liability exposure or because they find the lifetime responsibility for the aircraft too legally onerous.

For those manufacturers who have had their design put on the Approved List the buyer will have a choice in most cases, as they can be registered as either a BULA or an AULA. Both categories have their advantages.

As of 31 January 2013 there were 5780 BULAs and 1193 AULAs registered. In the year between 31 January 2012 to 31 January 2013 BULAs had grown by 153 aircraft and AULAs by 17. As in the past five years, the number of AULAs added in 2013 was well below the average from the category's earlier years. This seems to indicate that the category is slowly dying out, a trend mostly likely linked to the high price of new AULAs and their American counter-parts, Light-Sport Aircraft.

AULA & BULA Differences Summary

Item	AULA	BULA
Carrying passengers	Yes	No - only two pilots or instructor & student
Maximum gross weight	1232 lbs	1200 lbs
Helmets	Not required	Mandatory
Maintenance	Mandatory	Not required - but highly recommended
Maintenance records	Mandatory	Not required - but highly recommended
Modifications - permission of manufacturer	Mandatory	Not required
"Mandatory actions" (Ultralight "ADs")	Mandatory	Not mandatory
Instruments	Std VFR inst required in controlled airspace	Altimeter and compass for controlled airspace
Airspace restrictions	None if equipped	Soon to be none if equipped
Transborder flying	Not restricted - must carry FAA form	Not restricted - must carry FAA form
Can be Imported	May be possible -requires manufacturer's help	Easy
Allowed uses	Recreational, flight training, towing hang gliders	Recreational, flight training, towing hang gliders
Required paperwork to register when new	TC reg form, S of C	TC reg form only
Resale requirements	require FFFF certification by owner	no special requirements
Manufacturer out of business	eliminates modifications	no effect other than parts supply
Switching between BULA/AULA	should be possible if 1200 lbs or less	very difficult - requires manufacturer's cooperation

Did You Know…Your AULA Could Get Too Fat?

In recent years COPA has received some questions about empty weights for Advanced Ultra-light Aeroplanes (AULAs) that shows that there is some confusion here. Many AULA owners do not realize that there is a limit to how much extra equipment you can add to your AULA before it ceases to become an AULA. It literally gets “too fat to fly” legally.

The rules on this one actually make sense – there is a requirement to make sure that your AULA has enough weight available to carry crew and fuel without going over the manufacturer's gross weight. As some ultralighters have discovered flying over gross weight can lead to crashes.

The CARs definition of an AULA, the manufacturer's *Declaration of Compliance* and the individual aircraft's *Statement of Conformity* all state that an AULA must at all times conform to the Design Standards for Advanced Ultralight Aeroplanes. One of the requirements of that standard is that the aircraft must adhere to a minimum useful load when initially registered and also throughout its life.

That minimum useful load is determined by the following simple formulae:

- For a single place aeroplane (Wu) = 175 + 0.5P, in lb, where P is the rated engine power in Brake Horse Power.
- For a two place aeroplane (Wu) = 350 + 0.5P, in lb, where P is the rated engine power in Brake Horse Power

The idea is that the 175 lbs for single-place aircraft and 350 lbs two-place give enough weight for one or two standard-sized people. The "0.5P" or half the horsepower is to allow fuel to be carried.

For instance, the minimum useful load for a Quad City Challenger II AULA two-seater with a 50 hp Rotax 503 would be 350 lbs + 25 lbs = 375 lbs. With a maximum gross weight of 800 lbs that means the empty weight cannot be more than 425 lbs. It is worth noting that there is no extra allowance for floats or ballistic parachutes.

TC does not allow gross weights on AULAs to be raised without written approval of the manufacturer; so keeping the empty weight low is the only way to keep the aircraft legally flying.

Operating an AULA over the gross weight approved by the factory is not only foolish; it invalidates the registration of the aircraft.

If you add enough extra equipment to the aircraft to reduce the remaining useful load below the Design Standard requirements then the aircraft will no longer qualify as an AULA.

These are all good points to consider when adding equipment to your AULA – remember your minimum useful load!

Building an Ultralight in the Amateur-Built Category

Every now and then an ultralight owner will ask if an ultralight kit can be built as an amateur-built aircraft instead of registering it in the ultralight category. It can be done, by building the aircraft to comply with the airworthiness requirements for amateur-built aircraft in the exemption to CAR STD 549

Most not-yet-constructed ultralights can be made to comply with the requirements of exemption to CAR STD 549 and registered as an amateur-built aircraft with some changes to the aircraft.

Often designs need many changes to meet the requirements including converting all control cables to 1/8" (or showing data that proves that the existing cables are sufficient) and adding fuel quantity indicators, among other changes.

Other requirements that differ for amateur-built aircraft include requirements for:

- A *Special Certificate of Airworthiness - Amateur-Built Aircraft* ($250)
- Journey logbook
- *Annual Airworthiness Report Form* to be submitted to TC
- *Weight and Balance Change Reports* to be submitted to TC
- Requirement for major modifications to be inspected by TC
- Emergency Locator Transmitter (ELT)
- Aircraft checklists
- Hand held fire extinguisher (except in open cockpit designs)
- Time piece available to all crew members
- Aircraft first aid kit
- VFR and engine instruments
- Survival kit (required in parts of the country where survival is not assured at that time of the year)
- Inspections by MD-RA for airworthiness during building process (Fees and Travel costs)
- Cannot be used for commercial hang glider towing (unlike ultralights)
- Have a 25 hour trouble free flight testing requirement prior to carrying passengers or flying cross country

Ultralight aircraft built as amateur-built aircraft do have some advantages over ultralights:

- They can be modified and they can carry a passenger
- They can fly at night or IFR if properly equipped
- Helmets are not required

The fees that MD-RA will charge for airworthiness inspections will vary depending on the number of inspections required and also the distance that the inspector has to travel to do the inspections.

Current MD-RA fees are:
Inspection Services FEE SCHEDULE Effective 01 JAN 2014

	Fee	HST	Total
Letter of Intent	$80.00	$10.40	$90.40
51% Determination	$395.00	$51.35	$446.35
Sub-Assembly (Box Spar)	$395.00	$51.35	$446.35
Pre-Cover / Pre-Paint	$395.00	$51.35	$446.35
Final (Includes $250.00 for C of A)	$935.00	$121.25	$1056.55
Supplementary for any inspection	$240.00	$31.20	$271.20

Travel costs for the inspectors ($0.55/km) are not included in the above and are payable to the inspector at the time of the inspection.

Consult their website for more information on inspection requirements www.md-ra.com.

Converting an Already-Flying Ultralight to the Amateur Built Category

Quite a number of ultralight owners ask if an already-flying ultralight can be converted into an amateur-built aircraft. This question often arises if the aircraft loses its status as an AULA through modifications and the owner wants to retain the ability to carry passengers. Amateur-built aircraft have the ability to carry passengers and the owner can modify them. They do this by complying with the airworthiness requirements for amateur-built aircraft in the exemption to CAR STD 549.

Converting to the amateur-built category can be done if the aircraft will be disassembled, rebuilt and modified to the extent required to make the 51% major portion rule and incorporate all the features required of an amateur-built aircraft, including an ELT, fuel indication system, required instruments, etc.

Essentially you are dismantling the ultralight and building an amateur-built aircraft out of the parts. The additional equipment and inspection requirements will be expensive.

Owners who are interested in converting an already-flying ultralight to an amateur-built should contact MD-RA for details on what is required in their individual situation.

Flying to the USA

Canadian ultralights do not have a Certificate of Airworthiness or any other flight authority and do not meet any ICAO international airworthiness requirements. Because of this they require permission from the FAA to fly south of the border into the USA.

Since July 3rd, 2000 the FAA has given blanket authority for Canadian basic and advanced ultralights to

fly to the USA. All the pilot needs to do is complete and carry a copy of the FAA Special Flight Authorization, and comply with its limitations while in US airspace. The authorization is valid for 180 days and is renewable.

The pilot must hold a *Pilot Permit - Recreational* or higher airplane licence or hold a *Pilot Permit - Ultralight Aeroplanes*, with instructor rating and two hours cross-country experience.

Pilots who hold just a *Pilot Permit - Ultralight Aeroplanes* are not permitted to fly their ultralights in the USA at present. It is anticipated that the rules will be amended at some point to allow holders of the *Pilot Permit - Ultralight Aeroplanes* with a *Passenger Carrying Rating* to be allowed to fly in the USA in the future.

Flying Under FAR Part 103 in the USA

American ultralight rules are very different than Canadian CARs. These US "ultralight vehicles" are not required to be registered and the pilot does not need a pilot's licence. Provided the aircraft flown in the USA meets the Part 103 definition, then it can be flown by Canadians, while in the USA with no further permission required. No helmets are required under FAR Part 103.

Unregistered US ultralights are not permitted to be flown in Canada without a special authority from Transport Canada.

Ultralights and COPA

More ultralight pilots belong to COPA than any other organization in Canada. Data from the COPA membership survey conducted in January 2012 indicates that COPA represents about 55% of the active ultralight pilots in Canada.

COPA provides a lot of services for ultralight fliers, starting with the most effective and affordable aviation insurance program that covers ultralights. The monthly newspaper, *COPA Flight* contains much Ultralight information in the non-certified section. Three of Canada's largest ultralight clubs are COPA Flights – Calgary, St Albert and Kingston. COPA provides many other services for ultralight pilots and owners, ranging from Life Insurance that includes ultralight flying, to fly-ins and annual cross-Canada spring safety seminars – the COPA Rust Removers!

Ultralight owners and pilots also get first class representation in Ottawa from COPA. Whenever new CARs and government ultralight policies are made COPA has a voice at the table – COPA is on all nine Transport Canada CARAC Technical Committees. COPA is also on the NAV Canada Advisory Board, representing you in matters of airspace, flight planning, weather and fees.

You'll find COPA members wherever ultralights are flying in Canada! If you are flying ultralights in

Canada you'll want to belong to COPA – for ultralight news, COPA Flights, insurance, government representation and many other reasons.

The Regulations and Ultralight Airplanes

Ultralight airplanes are exempt from many requirements that affect certified, amateur-built and owner-maintenance aircraft in Canada.

When the ultralight category was brought into being in 1983 in Canada, the aim was to keep it simple – simple airplanes flying to simplified rules. Ultralights are still mainly governed by the Transport Canada Ultralight Transition Strategy (UTS), an interim set of rules in effect until they are incorporated in the CARs. The other specific rules already in the CARs are contained in CAR 602.29. The UTS will be incorporated in the CARs in the near future.

The following is a list of the rules that ultralights are currently exempt from, including the reference to the Canadian Aviation Regulations (CAR) and the Ultralight Transition Strategy (UTS).

Ultralights do not have to have:

Flight Authority (C of A or Flight Permit) UTS 2.2

Destination Fuel requirements (destination plus 30 minutes worth of fuel) CAR 602.88

Aircraft Logbooks CAR 605.01 exempts ultralights from all CAR 605 requirements including the logbook rule CAR 605.92

Survival equipment CAR 602.61(2)(a)

Annual Airworthiness Information Report CAR 501.01

Maintenance schedule CAR 605.01 exempts ultralights from all CAR 605 requirements including the maintenance schedule requirements of CAR 605.86. **Note:** AULAs require a maintenance schedule to be provided by the manufacturer and followed by the owner UTS 3.6

Operational and emergency equipment including: (CAR 602.60(1))

- Operating checklist or placards
- Aeronautical charts and publications
- Fire extinguisher
- Timepiece
- Flashlight
- First aid kit

Emergency Locator Transmitter (ELT) CAR 605.01 exempts ultralights from all CAR 605 requirements including the ELT requirements of CAR 605.38

VFR Instrumentation CAR 602.29

Nav Canada Air Navigation Service Fee (annual ANS fee) except if they land at seven major airports after 01 March, 2008 (Nav Canada Charging Policy)

Ultralights are not exempt from the following rules, to name just *some* that are applicable:

Flight plan and flight itinerary requirements CAR 602.73(2)

Life Jacket requirements CAR 602.62

Certificate of Registration (C of R) requirement CAR 202.01

Pilot Licencing and medical requirements CAR 401 & CAR 404

Aircraft nationality and registration markings CAR 202.01

Helmets for all occupants (basic ultralights only) CAR 602.29 (1) f(ii)

Liability insurance to a minimum of $100,000 CAR 606.02

VFR weather minimums (visibility and clearance from cloud) CAR 602.115

Minimum Flying Altitudes CAR 602.14 & CAR 602.15

Did You Know about Ultralight Placards?

Looking at ultralight airplanes at fly-ins is an interesting hobby. It is amazing that while walking around and admiring all the ultralights it is common to find that none of them have the required placard installed.

CAR 602.29 (1)(d)(iii) says – No person shall operate a hang glider or an ultra-light aeroplane… unless the aircraft is equipped with…where the aircraft is an ultra-light aeroplane, a placard that is affixed to a surface in plain view of any occupant seated at the flight controls and that states, "THIS AEROPLANE IS OPERATING WITHOUT A CERTIFICATE OF AIRWORTHINESS/CET AVION EST UTILISÉ SANS CERTIFICAT DE NAVIGABILITÉ"

Now, not having a placard doesn't make the airplane fly better, but it is a common item that TC inspectors look for when doing ramp checks. The maximum fine for not having the placard is $3,000 for individuals and $15,000 if the airplane is owned by a corporation. It seems kind of silly to risk that large a fine by missing the one placard you are required to have.

There is no standard for size or materials, so the placard could be made of plastic, paper, or even handwritten in magic marker.

Don't get caught on a ramp check missing something as easy to comply with as a placard.

PS Yes it has to be in both English and French – the person that it warns may only read one of those languages!

Did You Know…About Installing Parts?

Installing parts on your plane is a subject that confuses a lot of people. What parts are you allowed to install and what paperwork is required for which parts?

In the case of basic ultralights the answer is easy – you can install any parts from any source, aeronautical or otherwise. There is no standard, which is why you can't carry passengers in BULAs! There is no requirement to document, certify or sign for parts installed on a BULA either, although keeping a record of parts installed is certainly recommended.

In the case of advanced ultralights (AULA) you are permitted to only install parts that are approved by the manufacturer, as explained in the TC Ultra-Light Transition Strategy. Non-manufacturer approved parts would be a modification and would thus require manufacturer approval! While AULAs are not required to have logbooks, maintenance records are required and so a record of the installation of all parts, new or used is required.

Build Your Own Basic Ultralight?

By Rem Walker

Calls are regularly received from fellows interested in building their own ultralight and they want to know what the requirements of Transport Canada are as to Airworthiness Standards, Design Standards, etc. The answer is very simple and usually takes the caller by surprise. There are no standards for airworthiness or design. The only criteria a basic ultralight must meet are:

- the aeroplane shall have a maximum take-off weight (or gross weight) of 1,200 pounds or less.
- the aeroplane shall have a stalling speed, in level flight, at gross weight, of 45 mph or less.
- the aeroplane shall have no more than two seats and no passengers can be carried.

This means that you can build your own basic ultralight using your choice of materials, your own ideas for the design and no inspections at any time during the construction period.

There are no requirements as to the materials you can use and there are no standards regarding the workmanship used to build the ultralight. However, it is suggested that you acquaint yourself with

aviation-accepted practices that have proven, over time, to work. Since you will be flying in the ultralight you have built, it is in your best interest to be sure you have done it correctly.

Some of the areas you may wish to consider are cables, pulleys, bolts, nuts, quality of materials used, etc. For example, you can purchase cable from any number of non-aircraft suppliers. The cable may be strong enough but how will it function when it has to be routed over several pulleys to go from the control stick to the control surface? How much stretching can be tolerated before you must replace the cable?

Using several small-diameter control pulleys in the system can be very hard on the bending or fatigue life of the cable. Some pulleys should not be used in aircraft control systems to bend the cable more than 15 degrees from a straight line. Some pulleys are designed for use as guide and secondary-control pulleys only.

If you are making your own cables, are you using a “go-no-go gauge” to make sure the nicopress sleeves have been squeezed properly? It is also a good idea to paint a slippage mark on them.

If you use cables in the wings of your ultralight it is suggested that you have an inspection hole at each termination point so that you can inspect for any slippage of the joints, in the drag/anti-drag wire assembly.

Hex head aircraft AN bolts are made of high-quality steel and heat treated to a minimum tensile strength of 125,000 PSI. They are cadmium plated and available with drilled shank for use with a cotter pin or plain shank for use with a lock nut. They are also available with drilled head for special applications.

Many different styles of AN nuts are available. Elastic stop nuts are used where the bolt is loaded primarily in shear. All-metal stop nuts are designed for use in high temperatures of up to 450 F. Castle nuts are used on drilled-shank bolts for use with a cotter pin to safety the part against the possibility of the part loosening by rotating. The torquing of nuts is important otherwise over-or-under-torqued bolts will not do their job properly. Under-torque can result in unnecessary wear of bolts and nuts. Over-torque can result in the failure of the bolt or nut from over-stressing the threaded areas.

Some builders have indicated that they are building their basic ultralight to the same standards as an amateur-built aircraft but registering it as a basic ultralight. This eliminates the cost for inspections during the construction period.

To be on the safe side, they are having experienced builders or technical counsellors have a look at their project. In this way they have an aircraft built to the airworthiness standards of an amateur-built but without the costs for inspections. The only cost required by Transport Canada for a basic ultralight is the registration fee of $110.

If you are considering the construction of a basic ultralight, from scratch, not from a kit, the EAA Canadian Council can provide you with a no-cost copy of the requirements for an amateur-built

aircraft. You can see what the standards are and incorporate them, as you see fit, in your own design.

Ask for the Handbook from this address: 2348 Garnet Street, Regina, Sask., S4T 3A2. Tel: 306-352-6442; Fax: 306-565-0694.

Rem Walker is a member of the EAA Canadian Council. Rem learned to fly in 1946. He has constructed a Jodel D-9 beginning in 1958 and is presently working toward the completion and flying of a replica 1929 Gipsy Moth that will fly in 2003 (he hopes). You may contact him at: 2348 Garnet St., Regina, SK, S4T 3A2; Tel.: 306-352-6442; or Fax: 306-565-0694.

Licences To Fly Ultralights In Canada

Ultralights are *aeroplanes* in Canada and as such can be flown by anyone who holds a valid licence for flying *aeroplanes.* These are:

- *Airline Transport Pilot Licence – Aeroplanes*
- *Commercial Pilot Licence – Aeroplanes*
- *Private Pilot Licence – Aeroplanes*
- *Pilot Permit –Recreational Aeroplanes*
- *Pilot Permit – Ultra-light Aeroplanes*
- *Pilot Permit – Ultra-light Aeroplanes* with a *Passenger Carrying Rating*

No other licence will allow a pilot to fly an ultralight in Canada. Licences that **do not** qualify include:

- *Airline Transport Pilot Licence – Helicopters*
- *Pilot Permit – Gyroplanes*
- *Balloon Pilot Licence*
- *Glider Pilot Licence*

To occupy the second seat on a basic ultralight a person must either be a student with an instructor or else have a licence that qualifies the pilot to fly an ultralight in Canada.

Pilot Permit - Ultralight Aeroplane Requirements

From CAR standard 421.21

An applicant shall be a minimum of 16 years of age and shall hold a Category 4 Medical Certificate valid for a Pilot Permit - Ultralight Aeroplane. An applicant who meets the medical conditions specified and signs the Civil Aviation Medical Declaration shall be deemed to have met the Category 4 Medical Standards. The medical validity period for the permit holder is 60 months. The Ultralight Permit is maintained by a valid Category 1, 3, or 4 Medical Certificate.

Knowledge
An applicant shall have completed ultralight aeroplane ground school, and obtained a minimum of 90 per cent on the written examination Pilot Permit - Ultralight Aeroplane (ULTRA).

Experience
Within the 24 months preceding the date of application for the permit, an applicant shall have acquired in ultralight aeroplanes under the direction and supervision of the holder of a Flight Instructor Rating - Ultralight Aeroplane (or Aeroplane) a minimum of 10 hours of total flight time, including: a minimum of five hours dual instruction flight time and two hours solo flight time, and a minimum of 30 takeoffs and landings, including a minimum of 10 as sole occupant.

Skill
Within the 12 months preceding the date of application for the permit, an applicant shall submit to the Minister a letter from the holder of a Flight Instructor Rating - Ultralight Aeroplane, or the holder of a Flight Instructor Rating - Aeroplane certifying that the applicant has demonstrated the ability to perform both normal and emergency maneuvers appropriate to the ultralight aeroplane used for the training program, and with a degree of competency appropriate to that of the holder of a Pilot Permit - Ultralight Aeroplane.

Powered Parachutes
When the experience requirements for the Ultralight Permit have been met, in whole or in part, on powered parachutes, the permit, when issued, shall be restricted to powered parachutes. The restriction shall be removed when the experience requirements have been met on ultralight aeroplanes, other than powered parachutes. For the issue of a Pilot Permit - Ultralight Aeroplane restricted to powered parachutes, the 10 hours total flight time shall be reduced to five hours and the five hours dual instruction flight time shall be deemed to have been met.

Credits
Pilot permits or licences higher than the Ultralight Permit carry the privilege of flying ultralight aircraft. This is not a good idea without training on an ultralight. The majority of ultralight aircraft are very different from conventional aircraft.

Passenger-Carrying Rating – Ultra-Light Aeroplane

The *Passenger Carrying Rating* was introduced 01 December 2005 in CAR Standard 421.55. It says:

Medical Fitness
An applicant holds a Category 4 Medical Certificate valid for a Pilot Permit - Ultra-light Aeroplane. An applicant who meets the medical conditions specified on the Civil Aviation Medical Declaration and has signed it is considered to have met the Category 4 Medical Standards, providing a physician licensed to practice medicine in Canada has signed Part C of the declaration.

The medical validity period for the permit holder under 40 years of age is 60 months and for a permit

holder 40 years of age or over, is 24 months. The permit is maintained by a valid Category 1, 3, or 4 Medical Certificate.

Experience
An applicant has completed a minimum of 25 hours pilot flight training in ultra-light aeroplanes under the direction and supervision of the holder of a Flight Instructor Rating - Ultra-light Aeroplane or a Flight Instructor Rating- Aeroplane.

The flight training includes a minimum of:

- 15 hours dual instruction flight time, including a minimum of 2 hours cross-country flight time, and
- 5 hours solo flight time.

Skill
Within the 12 months preceding the date of application for the rating, an applicant has successfully completed a flight test in accordance with the requirements outlined in the Standard titled Flight Test Standard-Ultra-light Aeroplane (TP13984E).

Credits
An applicant who holds a Pilot Licence - Aeroplane or Pilot Permit – Recreational - Aeroplane is considered to have met the skill requirement specified in above.

Privileges
The Passenger carrying rating allows you to carry a passenger in an aircraft that permits passengers to be carried. This means that passengers cannot be carried in Basic Ultralights! Even though the pilot may be qualified – the aircraft is not.

What Aircraft Can You Fly On A Pilot Permit – Ultra-Light?

Most people think that answer to this question is easy – it is a *Pilot Permit – Ultra-light*, so you can fly any ultralight, right? Actually that is true, you can fly any Canadian ultralight, but you have more privileges than that! Here is what the CARs actually say:

Ultra-light Aeroplanes - Privileges

CAR 401.21 outlines the things that you can do with this permit:

The holder of a pilot permit - ultra-light aeroplane may, under day VFR,

(a) act as pilot-in-command of an ultra-light aeroplane with no other person on board;

(b) act as pilot-in-command of an ultra-light aeroplane with one other person on board if

(i) the holder's permit is endorsed with a passenger-carrying rating,

(ii) the ultra-light aeroplane has no restrictions against carrying another person, and

(iii) the holder has completed training, including dual instruction and solo flight, on the class of ultra-light aeroplane being operated;

(c) act as pilot-in-command of an ultra-light aeroplane with one other person on board if the other person is a holder of a pilot licence or permit, other than a student pilot permit, that allows them to act as pilot-in-command of an ultra-light aeroplane; or

(d) act as pilot-in-command of an aircraft for the sole purpose of the holder's flight training or flight test if

(i) in the case of flight training,

(A) it is conducted under the direction and supervision of a flight instructor qualified in accordance with section 425.21 of the personnel licensing standards, and

(B) no other person is carried on board, and

(ii) in the case of a flight test,

(A) it is conducted in accordance with section 401.15, and

(B) no passenger other than the person referred to in paragraph 401.15(1)(a) is carried on board.

The definition of basic Ultra-light Aeroplane in CAR 101 says:

"basic ultra-light aeroplane" means an aeroplane having no more than two seats, designed and manufactured to have

(a) a maximum take-off weight not exceeding 544 kg, and

(b) a stall speed in the landing configuration (Vso) of 39 knots (45 mph) indicated airspeed, or less, at the maximum take-off weight; (avion ultra-léger de base)

So this includes any certified or amateur-built airplane that meets the definition and not just those aircraft that are registered as an ultralight airplane.

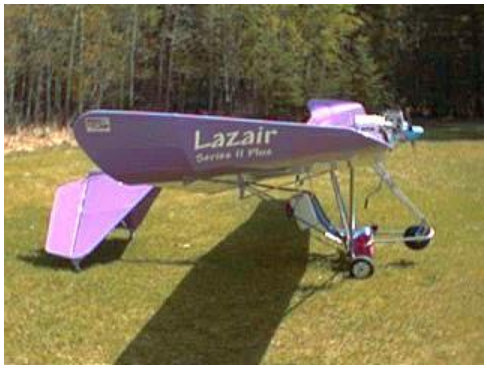
More Information on Ultralight Regulations

Ultralight regulations, including the whole Transport Canada *Ultralight Transition Strategy*, rules on registering and modifying ultralights and much more can be found on the TC website.

Section II Ultralight Costs

Introduction

This section contains some articles on what it costs to own and fly newer and older ultralights. These articles have been updated to reflect costs for 2006.



Affordable Flying
Pricing Antique Ultralights – Ultraflight Lazair
by Adam Hunt & Ruth Merkis-Hunt

We have received quite a bit of e-mail as a result of writing this column. Many readers have sent us their ideas on saving money flying and as time goes by we will include their thoughts here. A few readers have written to say "Hey if you are so cheap, what are you flying?" Actually there is a distinct difference between being "cheap" and "poor". We have met many people who used to fly, but now cannot afford it and so have given up flying. This is a shame, because there are so many ways to fly quite inexpensively. That is what this column is all about, after all.

So in response to the polite heckling that we have received we thought that we would write this month about the economics of our airplane.

As many readers will have noted from our recent articles in this distinguished publication, we have been engaged in rebuilding a pair of antique Ultraflight Lazair Series II ultralights. We spent last winter working on them and after 254 person-hours the first one, C-ICKY, emerged from our workshop in the late spring, ready to fly. Since then we have been test flying the plane and getting it all tuned up. We have also been gathering the numbers on the plane, both performance and cost figures. There is no doubt that the Lazair is one of the most economical aircraft ever produced. They are also one of the most impractical airplanes ever built - slow and short range, with a climb rate that can only charitably be termed "leisurely". So what is the attraction of this plane? After all about 2,000 of them were produced between 1978 and 1984 and according to the mail that we have received, there are a lot of pilots that still have very fond memories of their days flying Lazairs. Many who have written to us expressed the wish that they still had theirs.

Despite its limitations the Lazair is one of the nicest flying airplanes ever designed. Predictable handling, combined with very gentle stall characteristics, great visibility and unconventional looks make the plane a perennial favourite. It is a plane to slow down and relax in, no point in being in a hurry, after all. The sheer number produced makes the Lazair series a classic Canadian aviation

achievement. There aren't too many Canadian civil aircraft that have been produced in those numbers. Some people have written to say that they have flown them cross country. One former Lazair flyer wrote to say that he had done several 200 mile flights. But, most have spent their whole lives within 25nm of home base. The performance figures show why:

Lazair Series II (Two Rotax 185 engines 9.5 hp each)

Cruise speed	45 mph
Top Speed	55 mph
Stall Speed	20 mph
Take off distance (sea level)	150 feet
Landing distance (sea level)	150 feet
Rate of climb (sea level)	400 fpm
Range (with 1/2 hour reserve)	90 sm

Empty weight	207 lbs
Max gross weight	450 lbs
Fuel (20 litres)	30 lbs
Full fuel payload	213 lbs

These are the actual performance figures that we have determined from our test flying. What about the costs? Lazairs are still around in some numbers. Many have been stored for some years, the victims of increasingly bigger and more sophisticated ultralights appearing in Canada. Many can be bought for around $2000 and can be back flying with about the same amount again put into their renovation. Our actual operating costs for our first Lazair, C-ICKY are:

Fixed Costs per year (adjusted to 2006)

Insurance liability (1 million limit, see note 1)	$ 101.00
Hangarage (see note 2)	$00.00
Maintenance (not including overhaul reserve)	$100.00
Nav Canada ANS fee (exempt due to gross weight under 1328 lbs)	$ 0.00
Total Fixed Costs	$201.00

Hourly Costs

Fuel (our local cost is $0.849/litre for regular mogas) x 8 litres/hr	$ 6.79
Oil (0.32 litres per hour at 25:1 two stroke oil)	$ 0.52
Engine overhaul reserve (two Rotax 185 engines 300 hr nominal TBO)	$ 1.50
Total hourly costs	$ 8.81

Cost per year based on 50 hours per year	$641.50
Cost per hour based on 50 hours per year	$ 12.83

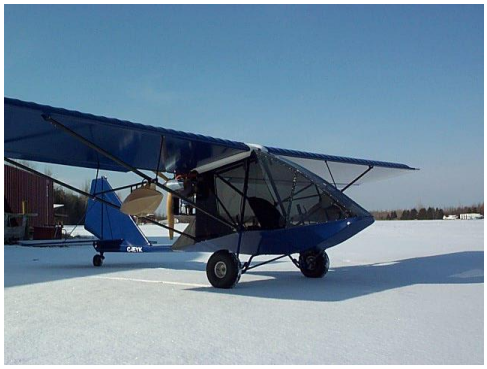
Note 1: This represents liability insurance purchased for May-December only (one advantage of the COPA insurance plan, you don't have to buy a whole year's insurance if you don't need it). The figure is halved because we have two planes sharing one insurance plan - another benefit to the COPA insurance plan.

Note 2: We managed to trade some airfield maintenance labour for free hangarage at a local strip. Convenient hangarage was accomplished by putting the Lazair on a dolly and sliding it in under the wing of a larger Cessna in the hangar. A simple dolly can make a plane such as a Lazair cheap to hangar!

As you can see it would be very hard to find another plane in the price range of the Lazair to buy and operate. Certainly there are no other twin engined airplanes that compare. This month we will forgo the comparison with the traditional Cessna 150, as the two planes are so different. In fact the single seat, twin engined Lazair is really in class by itself, a piece of Canadian aviation history that is a lot of fun to fly.

Equally obvious is the fact that planes like the Lazair just aren't for everyone. Many pilots look at the Lazair and just shake their heads. That's what makes flying so interesting in a lot of ways, there is a great diversity to the way people fly. Restoring antique ultralights isn't for everyone, but for some of us it gives an interesting and inexpensive way to get flying.

For more information on the Lazair, check out www.lazair.com and http://www.angelfire.com/ca2/ulflyer/



Affordable Flying
Pricing Modern Ultralights – ASAP Chinook Plus 2 – Rotax 912

By Adam Hunt & Ruth Merkis-Hunt

This month we thought that we would take a look at a modern ultralight and see what the pros and cons are...and how much they cost to own and operate. We had the opportunity in July 2000 to be in the Okanagan Valley and made our way to Vernon, home of Aircraft Sales And Parts. ASAP manufacture the Beaver line of single and two seat ultralights and the two-seat Chinook Plus 2, as well as GSC propellers and the Summit line of powered parachutes. We couldn't resist the chance to fly their new Chinook advanced ultralight demonstrator, equipped with the Rotax 912 engine. We knew that this was going to be fun.

We met Paulette Holomis at the front desk on a warm July morning. The day was perfect, even at 9 am it was warm, as Vernon can be. The afternoon promised to be convectively bumpy as temperatures were heading for 30C, so we wanted to fly early to miss the rough part of the day. Paulette gave us a short tour of the impressive ASAP facility and introduced us to our demo pilot, Larry Williams. Larry is an experienced pilot, with lots of time in ultralights, particularly in the Beaver and Chinook. He took us on a walk around of the 912 powered Chinook. The demonstrator, C-IGJP, is a beautiful machine and the 912 tucks in nicely in its pusher configuration. Larry told us that they needed to make some centre of gravity adjustments to the Chinook to accommodate the heavier 912 engine. The Chinooks are more typically powered by the 50 hp Rotax 503 or the 64 hp 582 models. The main motivation in putting 80 hp into the Chinook was to make it a sterling floatplane, although today we would be flying it on wheels from Vernon's paved runway.

The Chinook has an interesting history. It was originally designed in the early 1980s in Edmonton and produced by Birdman Enterprises there. The early models included the single seat WT-11, as well as the two seat Chinook 2S that we flew and reviewed in the October 1999 issue of C*anadian Flight.* The early models included a Dave Marsden designed, University of Alberta airfoil, in a tapered wing. The first two seaters were powered by the Rotax 447 engines, which produced 42 hp. With 80 hp the 912 Chinook nearly doubles the original installed power! The early Chinooks were prized for their exceptional visibility, pleasant handling and very wide cabin. The "diamond-shaped" cross section of the tandem cockpit gave a remarkable 38 inches of elbow room. This made it very popular amongst the "wider" pilots. After Birdman went out of business the Chinook design languished for a few years before being picked up by Brent Holomis and ASAP. By 1988 they had redesigned the Chinook, modernizing it and giving it a whole new wing, while keeping the trademark cabin shape that proved so popular. They renamed the plane the Chinook Plus 2, the "plus" referring to the new wing. What has emerged is a truly mature aircraft design and a popular seller, not just in Canada, but around the world.

One option with the Chinook Plus 2 involves how you licence it. In Canada the plane can be built as a basic ultralight, an advanced ultralight or as an amateur built airplane. That gives lots of flexibility as to how an owner registers and flies the Chinook. Most of the recently produced kits that stay in Canada end up registered as Advanced Ultralights. As Paulette explains, that option combines the best of the other two categories. You can carry passengers, don't have to wear a helmet if you don't want to and avoid the inspection fees associated with amateur-built licencing.

After a good walk around we each took turns going with Larry for a blast around the local area in the high-powered Chinook. Due to the lack of brake pedals in the backseat, we were offered that seat while Larry flew from the front. Even from the back the visibility from the Chinook is breath-taking. For those used to Cessnas and the "wrap-around metal" feeling, the Chinook is an eye-opener, you can see in all directions very well. Larry did the take-off which is a good thing. Applying full throttle results in a considerable amount of yaw and the aircraft accelerating very, very quickly. Were at a take-off weight of about 894 lbs, giving a power loading of 11 lbs/hp and the Chinook accelerated very much like a Tutor jet. It was off the ground in about 3 seconds, having used about 200 feet of runway. With the nose quite high the Chinook climbed at well over 1000 fpm. It is literally possible to reach circuit altitude prior to the end of the runway! Taking the controls we found that the aircraft was very responsive. The full span ailerons and large rudder, combined with a sensitive elevator make the plane react quickly to control inputs. Levelling off at 4500 feet and setting 5000 rpm gave an indicated airspeed of 83 mph for an approximate TAS of 91 mph at the well above-standard temperatures we had that day. Larry informed us that we were burning just 3 gallons per hour (14 litres/hr) at that speed with the economical 912 engine.

The Chinook Plus 2 is definitely not a beginner's airplane and Larry reports that students take quite a bit of extra time to adapt to its handling. The plane is very responsive to control inputs and exhibits close to neutral static stability in roll. The pitch and yaw axes both exhibit notable negative static stability and the aircraft likes to diverge from straight and level flight in both pitch and yaw. It isn't hard to control, and many aerobatic planes are similarly unstable, but it is an airplane that needs to be flown positively at all times and so would make a less than ideal trainer or plane for a low time pilot.

We made good use of the Chinook's superb visibility and did a bit of sight seeing on that clear summer day. C-IGJP is equipped with the extra "chin" Lexan panels that give a great view, even almost straight downwards. This makes the Chinook almost a perfect sightseeing platform. After a nice flight around the desert scenery of the north Okanagan valley which gave us a good opportunity to fly the plane, we returned for a landing at Vernon. Larry did the landing. A long final was flown with an over-the-fence speed of about 55 mph. The landing roll was reasonably short and without use of brakes took about 500 feet of runway. The unique bungee sprung gear soaks up all the bumps that anything that passes for an airfield can dish out. The very fat tundra tires help in that regard, also, and besides, they give the Chinook a very serious "all-terrain" look to it!

Back on the ground we crunched some numbers to see what owning and flying a Chinook would cost. At the time of our visit ASAP had not completed pricing-out the mounting package for the 912 engine on the Chinook, but Paulette informed us that the plane, in quick-build kit form would be about Cdn $35,000. There are lower powered models of the Chinook still available for less money, but we focused

on this new top-of-the-line Chinook. The actual numbers came out like this:

Fixed Costs per year (adjusted to 2006)

Insurance liability (1 million limit, through COPA's plan)	$200.00
Insurance (passenger seat, through COPA's plan)	$185.00
Insurance Hull, not in motion only (through COPA's plan)	$490.00
Insurance total	$875.00
Hangarage (recommended for this fabric-covered plane)	$1800.00
Maintenance (not including overhaul reserve)	$200.00
Nav Canada ANS fee (exempt due to gross weight under 1328 lbs)	$ 0.00
Total Fixed Costs	$1645.00

Hourly Costs

Fuel (our local cost is $0.959/litre for premium mogas) x 14 litres/hr	$13.43
Oil (consumption plus 25 hour oil changes)	$ 0.35
Coolant changes	$ 0.20
Engine overhaul reserve (Rotax 912 engine 1500 hr TBO)	$ 4.67
Total hourly costs	$18.65
Cost per year based on 50 hours per year	$2577.50
Cost per hour based on 50 hours per year	$51.55

The numbers look pretty good for an aircraft with the capabilities of the Chinook Plus 2. Having a gross weight under the Nav Canada limit of 1328 pounds is a bonus; that saves $72 per year right there on the Nav Canada ANS fee alone. The plane, being fabric covered, would really benefit from being hangared and we will look at bargain hangarage in a future column.

Let's go back to our standard Cessna 150 and see how the Chinook compares for costs.

Cessna 150 comparison (based on current prices, as of 2006):	
Cost per year, based on 50 hours per year	$5751.13
Cost per hour, based on 50 hours per year	$115.02

As can be seen the Chinook is pretty economical to operate, especially when you consider how much performance you are paying for. While the 150 will cruise faster than the Chinook by some 17 mph, it is hard to find a 150 that will climb with the 912 powered Chinook. One interesting area of comparison is that both planes have the same amount of cabin width. The only difference is that the Chinook is a tandem seater - you don't have to share that 38 inches of elbow room, like you do in the 150!
For more information on the ASAP Chinook Plus 2 and some great photos, have a look at ASAP's website at www.ultralight.ca.

Section III Ultralight Cross Country Flying

Can ultralight airplanes really be flown serious distances? The short answer is “yes”. Many Canadian pilots have flown ultralights on remarkable long distance cross country flights.

The main differences between taking an ultralight on a long flight versus a more capable general aviation aircraft are:

- Ultralights are generally slower so the trips take longer
- Ultralights generally have less range and so require more stops
- Ultralights can generally carry less baggage and equipment so many trips are done with someone driving as “ground support”
- Ultralight cross-country flights are almost never routine! They tend to be adventures!

This section contains inspiring cross-country stories that give a good flavour for flying these small aircraft on long trips. It is never dull!

Ultralight Pilgrimage to Kitty Hawk

By Henry McKinlay, Tom Reavell and Claude Roy

Every year, Canadian members of the International Challenger Owners Association (ICOA) expand their horizons by promoting and organizing exciting group flights to faraway ultralight destinations.

In this Centennial Year of Powered Flight, a worthwhile float flying adventure should carry the essence of what keeps us reaching for the skies. Hey guys, what about flying all the way to Kitty Hawk, NC? Wouldn’t that be great to visit this world famous Aviation Shrine and pay our due respects to the Wright Brothers?

This very idea was officially launched at ICOA’s 2002 Annual Winter Weekend Rendezvous in Montebello, QC. Participation rules were kept to a minimum: (1) Participants are to be equipped with amphibious ultralights; (2) To fly in the USA, pilots are required to have either a General Aviation (GA) Pilot License, a Recreational Pilot Permit (RPP) or a Pilot Permit Ultra-Light (PP-UL) with an Instructors’ rating; and (3) pilots are required to have a minimum of one year’s experience on floats.

Three courageous people answered the call: Henry McKinlay from Honey Harbour, ON, in his Challenger II C-IHYM; Dr. Tom Reavell from London, ON, flying his own Challenger II C-ITAR; and Claude Roy, a retired Air Force Officer from Ottawa, ON, also in his own Challenger II C-IROY.

Having extensive experience in long cross-country flights aboard ultralights, Claude took the lead and prepared an initial flight plan. Once circulated and discussed amongst the group, the proposed flight

plan became the expected routing to Kitty Hawk and back. From the onset, the plan called for a different return route from the selected path to Kitty Hawk. The idea was to maximize the group's exposure to a wide array of airports along the way.

All three pilots were able to count on excellent family ground support. Yvonne McKinlay would drive their SUV with Cathy Reavell assisting her as navigator, while Claude's wife, Joan Armstrong, would ride her red Harley-Davidson, equipped with matching trailer and stuffed animals, there and back.

The first order of business was to get all the paperwork ready for the trip. This paperwork included flight planning, customs and immigration advisories, transponder waivers and ultralight cross-border flight authorities.

Second on the list was to coordinate a point in space and time for a rendezvous from which a cross-border flight would be performed. The third and most difficult part, from all accounts, was to actually pry away from our daily lives and, at the very last minute, race towards the agreed rendezvous point. Once away from home, it was mentally easy to switch to the "full adventure" mode.

During the whole trip, all six participants felt upbeat and confident about measuring themselves against the many unknowns. Overall, the group safely covered over 1,700 air miles in 14 days, landing at 22 airports and visiting one Canadian Province as well as 5 American States. Here is a brief account of each one of these 14 days.

Day 1, Friday, 12 September

Tom does not have to rush to meet with Henry, as the McKinlays are not available until noontime as their Toronto condo sale was closing that day. So Tom leaves the London (ON) Airport (Identifier CYXU) just before noon. He arrives at the Midland (ON) Airport (Identifier CYEE) at about 1:30 PM, only to find out Henry cannot take off from his home at Honey Harbour, just a few minutes' flight northeast of Midland. The winds and waves are too great for him to lift off. So they wait until Henry gets airborne at about 3:50 PM. They meet over Lake St-John, near Orillia, and proceed to the Lindsay Airport (Identifier CNF4). From there, they fly to the Kingston Airport (Identifier CYGK) against strong headwinds. They arrive in the waning light of the day with the help of the Kingston radio Operator and other planes, which left the pattern to allow the two ultralights to land before dark. Good folks!

Day 2, Saturday, 13 September

The idea is, wherever we would be, that we would fly and meet at 09:30 hrs over/near the Gananoque Airport (Identifier CNN8). From there, we would cross the American Border as a flight formation. With the help of Tom's transponder aboard C-ITAR, the plan works very well.

Claude departs at 9:00 AM from the Carleton Place (ON) Airport (Identifier CNR6) and meets the guys over the town of Gananoque. From there, the formation flies southeast to land on time at Maxson Airfield in Alexandria Bay, NY (Identifier 89N), just across the St-Lawrence River. The two young Customs Officers, really, are more interested in our machines than in our passports.

The day's second flight to Richland, NY (Identifier 1NY3), just down Highway 81, is uneventful. Jack, one of the airport owners, is there to greet us with his wife Hope. We all feel very welcome. The forecasted occasional rain starts as we are on the ground, but the isolated rain cloud quickly passes away, having no influence on our original schedule.

During our third leg to Cortland, NY (Identifier N03), we contact Syracuse for Radar Advisory. Their Controller brings us over the City and slightly to the West of the Syracuse Intl. Airport, until we are well clear to the South. The landing at Cortland is made shortly after suppertime. The Airport is very quiet and secure. The ground crew meets the flyers at all three airports and our night quarters at the downtown EconoLodge are very good.

Day 3, Sunday, 14 September

Today's flying, mostly south along Highway 81, is slowed down by strong headwinds. On the first leg to Seaman's Field in Factoryville, PA (Identifier 9N3), Claude's electric starter would not work. That is not a big problem, as Claude's engine is very easy to start by hand-propping. The flight departs on time and goes through the Binghamton airspace easily through radar following. Occasional rain and low ceilings do not threaten the VFR status of our flight.

The second portion involves a bit of mountain flying, from Seaman's Field to Schuylkill County Airport in Pottsville, PA (Identifier ZER). Again, radar following through the Wilkes-Barre/Scranton Intl Airspace helps us go through the area, rather than all the way around. The landing on Pottsville's grass runway (1,734 feet ASL) is accomplished in a 30-km/hr headwind.

The day's last flight brings us out of the mountains and into Pennsylvania's rolling farm fields. The flight is not without incident, as Claude finds himself firmly holding the whole throttle quadrant in his left hand soon after departure and for the rest of the flight. After 750 hours of straining between a friction lock and a spring-loaded throttle, the aluminum bracket holding the throttle quadrant just failed without warning.
When questioned by his two companions as to why he is so quiet, Claude simply transmits: "I have my hands full here, I'll show you something when we get on the ground." The flight just carries on and the landing at Smoketown Airport (Identifier Q08) is very smooth. Once out of their aircraft, Henry and Tom curiously walk over to find out what Claude's flight predicament was. All get a good laugh.

Day 4, Monday, 15 September

We knew we were going nowhere today. Heavy rain is forecasted and it shows up on cue. This gives Claude plenty of time to fashion a new throttle mounting bracket without holding up the whole group. Mel, the Airport owner, knew where to look. He finds just the right piece of discarded 2-inch angle aluminum.

Using the old piece as a template, Tom and Claude are given full access to the local AME's shop equipment and produce an improved bracket by lunchtime. The whole group goes out for a big lunch at a local Amish restaurant, shops for road supplies and all relax for the rest of the afternoon.

The day's main event turns out to be an agitated evening discussion in Cathy and Tom's room, looking at maps and nervously checking the Weather Channel, learning all we can about Hurricane Isabel and its progress along the Atlantic Coast. The storm is expected to pass right over our destination, North Carolina's Outer Banks.

Friends of Henry and Yvonne's, Alma and Bob Fallon, had arranged a cottage for us on the Outer Banks, where they were going to meet us for a couple of days of R&R. Our telephone conversation with them that evening confirmed that they were not going to be able to meet us in NC as their home (off Chesapeake Bay) was expected to be in the path of Hurricane Isabel as it turned northward and they would probably be evacuated. They expressed serious misgivings about our decision to continue on our quest to get to Kitty Hawk. We reassured them that we would only go if we could get in and get out before Isabel and do it safely.

Talk about bad timing! Can we beat the bad weather and get to the Wright Brothers Memorial before Hurricane Isabel gets too close? We all agree to leave this tough decision for tomorrow morning's 6:00 AM briefing with the Flight Specialists.

Day 5, Tuesday, 16 September

Very early, all eyes are glued to the Weather Channel. Tom confers with the US Flight Planners. All day, they keep saying, "You know about Hurricane Isabel, don't you?"

Nevertheless, the weather looks good for a push towards Kitty Hawk. We agree to review the overall plan every time we land. With a good tailwind in our favour, the ladies urge us to make speed and not worry about meeting with them at each airport. We then depart Smoketown at first light and head towards Newman Field in Easton, MD (Identifier ESN) and a good breakfast. The flight is silky smooth and the landing is uneventful. The airport restaurant delivers a solid meal and the weather is still holding for us.

The next flight requires precise navigation. It involves flying 20 miles across the Chesapeake Bay, going around and south of the Washington Air Defense Identification Zone (ADIZ), but staying north of the Patuxent River Restricted Military Airspace. With the combined help of 3 separate GPS units, we successfully thread our way through the maze of restrictions, landing in Tappahannock, VA (Identifier W79).

All are upbeat and the weather will hold for another round of flying. We immediately call the ladies to have them bypass Tappahannock and carry on towards our next landing goal, Wakefield, VA (Identifier AKQ).

The Wakefield leg is a bit bumpy. The ground underneath looks like perpetual flood plains and ocean-swept marshes. If anyone has to land in this desolate area, it's "game over" for the airplane!

In the meantime Claude's radio signal is getting weaker, another sign that his aircraft battery is not charging properly. At this point, Claude advises his companions he will limit his radio transmissions to

clicks only: one click to say “NO” and two clicks to say “YES.” This procedure works well and was, in fact, maintained during the rest of the trip. Claude would also recharge his handheld radio and GPS batteries every night. Again, the Wakefield check on the weather proves positive. Minutes later, the ladies show up, so our next move gets properly coordinated. The tailwind is holding and we are within flying range of Kitty Hawk, NC.

It already is 4:00 PM, so here is the deal: the guys, with their tanks full and gas on the back seat, will fly direct to Kitty Hawk’s First Flight Airport (Identifier FFA). They will take their “proof” pictures and depart from there at about 6:30 PM, backtracking their way to the continent and landing at Elizabeth City (NC) Regional Airport (Identifier ECG). Meanwhile, the ground crews will drive direct to Elizabeth City and wait for the planes’ return expected at about 7:30 PM.

The execution of this last-minute plan is flawless. Any attempt to receive Prior Permission from the U.S. National Park Commission to land at the Wright Brothers Memorial proves fruitless. Since the whole region is under an evacuation order, the Park is closed and all U.S. National Park Commission phones are silent. In a sense, this facilitates our decision to go: better to land there and plead forgiveness later, if required, than to be recited the evacuation order over the phone.

The flight to Kitty Hawk is delightful. With a quartering tailwind from the seaside, we are coming down the coast at a good clip. We can observe a lot of road traffic going away from the Outer Banks, where the hurricane is expected to land. As expected, the Wright Brothers’ Memorial is completely deserted and no one is in the flying pattern.

We make our landing in a 30-km/hr headwind, pretty much the same kind of wind direction and speed the Wright Brothers experienced on their first flight. We quickly go around, taking pictures and doing the essential gestures to celebrate our accomplishment.
To some we are either courageous or downright foolhardy, but we are the very last three airplanes to leave the First Flight Airport before Hurricane Isabel hits the place. The 5th and last flight of the day brings us smoothly back to the Elizabeth City Regional Airport, itself a now deserted U.S. Coast Guard Station.

The ladies are at the rendezvous to pick us up and bring us to our rooms at the local Quality Inn. The rest of the evening is spent at Grouper’s, a nice seafood restaurant with a fine selection of Pinot Grigio wines.

Day 6, Wednesday, 17 September

We are now in a rush. We’ve got to get the hell out of Elizabeth City and fly as far west as we can to get away from the hurricane’s path. We take off on our first flight just before 8:30 AM. Winds already are picking up, but it’s still manageable. With a good quarter tailwind, we fly 152 miles inland to the William A. Tuck Airport in South Boston, VA (Identifier W78).

While finishing up our refuelling procedure, the winds pick up some more and our airplanes now start moving on their own. This is getting hairy; let’s get out of here! Our takeoff from South Boston is the

most difficult to date. We experience lots of wind and buffeting, severe downdrafts, slow climb rates, etc. Tom even has to change runway directions on takeoff when his airplane is not likely to clear some trees at the end of the grass runway.

Once past this takeoff episode, we gradually climb, finding absolutely no relief in the turbulence all the way up to 3,000 ASL. Along our flying path, Tom asks every airport's Fixed Base Operator (FBO) if there is any hangar space available for three small homebuilt aircraft. The consistent answer is "No."

After about 30 minutes of high airborne turbulence and going by an airport the size of Kingston's, Henry literally says: "Screw this, we are landing here!" That's how we get to land at the Danville (VA) Regional Airport (Identifier DAN). Once on the ground and parked at a good set of tie downs, we meet Mike Rembold, who with his wife Libby, run the local FBO.

We tell Mike our story and we ask him if he could have a place sheltered from the wind where we could take our wings off so to be able to put our airplanes inside somewhere. Upon hearing our plight, Mike says: "Wait for me here; we may have a place for your machines."

He goes out, talks to a pilot and comes back after a few minutes, saying: "You have a place if you can get your airplanes behind the Citation Jet in this hangar." The hangar and airplane belong to Ward Burton, one of the NASCAR drivers on the top-of-the-line Winston Grand National Series. The NASCAR officials are unsure if the coming weekend races at Dover, Delaware, will take place or not.

The pilot and two other helpers move the low-wing Cessna business jet off the centerline a bit and we slide our three high-wing Challengers right around and behind it without having to remove the wings.

We are very grateful and feel lucky to have come down in such a friendly place. Thanks again, Mike Rembold, General Aviation Inc., Danville Virginia, you saved our collective Canadian bacon. Hurricane Isabel is left as an empty threat to our Challengers outside the hangar walls.

Our ground crews, after chasing us all day, catch up with us at the Danville Airport. In the meantime, Tom has already phoned many hotels in town to discover the Stratford Inn, one of the best places with luxury suites and a reputed restaurant. We all retire to plush comfort and thank our good fortune to have landed in Danville.

Day 7, Thursday, 18 September

We go nowhere today. We spend most of our time sleeping, relaxing and watching Hurricane Isabel on TV. She actually made landfall at 1:00 PM almost exactly where we were supposed to be staying with Bob and Alma at the cottage they had arranged for on the Outer Banks. Glad we're not there and sorry for the folks who are. In our area, 60 MPH winds and falling tree limbs are the only evidence of her passing by. Another reason to celebrate: today is Yvonne's eleventh 39th Birthday!!

Day 8, Friday, 19 September

Another slack day is in store for the whole team. Early afternoon, the three guys go to the airport to refuel and prepare the airplanes for tomorrow's flying. Supper in a downtown Japanese restaurant is soon followed by a heavy map & weather session. The plan is to fly further west and cross the Alleghenies mountain range.

It makes sense to fly back to Canada on the west side of the mountains and be sheltered by the mountains from Hurricane Isabel's influence.

Day 9, Saturday, 20 September

The day starts with ground fog, but the forecast calls for sunny skies later. We take off from Danville with the Virginia Tech University Airport in Blacksburg, VA (Identifier BCB) as our destination. At 2,132 feet ASL, Blacksburg definitely is in the mountains. As we get closer, it is evident that Blacksburg and any mountain passage is still closed due to fog.

We have no choice but to backtrack to Woodrum Field in Roanoke, VA (Identifier ROA). Once on the ground we immediately leave phone messages to the ground crews, telling them our morning plan has just changed!

Instead of flying on the west side of the mountains, we will stick to the east side and make our way northward along the Shenandoah Valley. Our next destination, Bridgewater, VA (Identifier VBW), is on a plateau at 1,165 feet ASL and should be fog-free by the time we get there.

We are not entirely sure if Joan on her Harley has received our change-of-plan message or not. The worst-case scenario is Joan will parallel our own way north on the opposite side of the mountains and will hook up with us again tomorrow. With this in mind, we quickly refuel our airplanes and get airborne northward.

Today's second leg brings us over the flooded plains of the Shenandoah River. Due to Hurricane Isabel, the whole valley is in shambles. The river has overstepped its bounds by a height of at least 12 feet and the color of the floodwaters is a decisive muddy brown.

Fortunately, the Bridgewater Air Park is on high ground and the landing is problem-free. Nobody is there to greet us, but we have plenty of gas with us on our back seats and several hangars to hide behind for physical relief.

We also have important business to do at this time. Prior to the start of our trip, we knew Quad City Ultralight Aircraft Corp. would hold its 20th Anniversary celebration on the afternoon of Saturday, 20th September. Therefore, we had pre-arranged for a live conference call, as we wanted to do a special tribute to Dave Goulet, the designer of the Challenger aircraft series, for the wonderful contributions he made to the flying world. The live conversation was to be piped-in through loudspeakers for all dignitaries and guests present at the ceremony to enjoy.

The presentation would be supplemented with a selection of electronic pictures sent in advance by e-mail, so they could be shown in the background. These background slides would show our whole group, plus several airborne and ground shots taken of our visit at Kitty Hawk.

Thanks to digital cameras, portable computers and cellular phones, the links are made and we get to personally thank Dave Goulet and present him with a special T-Shirt. Sent in advance, the T-Shirt bears Dave's own name and links the Challenger celebrations to the 100th Anniversary of Powered Flight.

After this "feel-good" moment, we contact Yvonne and Cathy to let them know of our present situation and intentions. We also learn that Joan only received our message once she got off the Harley on the other side of the mountains. Wherever we are, she will try to catch up to us later.

We therefore embark on our trusty Challengers and fly up the valley to Winchester, VA (Identifier OKV). The flight is without a hitch. By the time we land there, Yvonne and Cathy already have made room reservations in town and are waiting for us on the tarmac. Soon after supper, Joan finally catches up with the rest of the group and we have an excellent evening stay at the local Travelodge.

Day 10, Sunday, 21 September

The plan today is to fly close enough to the Canadian border so as to be able to enter Canada on our very first flight tomorrow morning. We set our goal on the Chautauqua County Airport in Jamestown, NY (Identifier JHW). From there, we backtrack our plan with intermediate stops, so we are able to fly to Jamestown without the need for any road support. Since Joan is not feeling so well, she decides to keep on going down Highway 81 straight towards home. Claude gets a farewell kiss and inherits a few more aircraft parts to carry with him for the rest of the trip.

The first leg is planned to the Potomac Airpark in Hancock, PA (Identifier W35), but a good tailwind carries us further to Bedford, PA (Identifier HMZ). The Bedford County Airport is less than 5 years old and already boasts a paved 4,100-foot runway. Better still; construction is underway to extend the runway to 5,000 feet to accommodate jet traffic to be generated by a Wal-Mart distribution center recently built at the end of the runway.

From there, we fly to the Jefferson County Airport in Du Bois, PA (Identifier DUJ). Again, airport accommodations, including the Flight Deck Restaurant, are wonderful. We enjoy the notoriety that our three amphibious Challengers create on the ramp.

Today's third and last flight brings us to our expected destination, Jamestown, NY. The territory we fly over is less than friendly, but we climb to 4,000 feet ASL to compensate for the lack of landing spaces. Our ground crew, once again, has enough time to make hotel reservations downtown before coming to pick us up. After a visit at the local Chinese buffet restaurant, we settle for the night at a brand-new Best Western hotel, opened only two months prior.

Day 11, Monday, 22 September

We rise early and meet downstairs in the hotel lobby for breakfast and a serious map & flight planning session. The weather is OK for our morning departure, but bad weather is expected. Rain and low ceilings will be upon us from the west by noontime.
We decide on St. Catharines, ON (Identifier CYSN) as our Canadian Customs Point-of-entry. The skies over Jamestown already show signs of low ceilings, but we do enjoy smooth VFR conditions on takeoff.

The tactic is to go straight north, intercept Lake Erie's south shore and follow it eastbound and around to Niagara Falls. From there, St. Catharines is only minutes away to the north.

The flight proceeds as planned. Buffalo Radar Advisory helps us through along the lakeshore. Once northbound and over to the Canadian side, we prefer to remain 5 miles west of Niagara Falls, as we don't want to mingle with all the sightseeing traffic that normally circles around there.

The landing at St. Catharines is uneventful. The airport is slowly recuperating from an Air Show weekend and it gives us an opportunity to take a couple of quick pictures of our aircraft against the CF-18 Flight demo aircraft from 433 "Porcupine" Squadron, based in Bagotville, QC.

Upon take off from St. Catharines, we proceed westbound along Lake Ontario's south shore. The idea is to follow the lakeshore around and, from the Burlington area, continue north towards Brampton. At the very west end of Lake Ontario, just past the Skyway, the visibility drops to marginal VFR, so we decide to land at the nearby Burlington Airpark (Identifier CZBA).

Once on the ground, we hear from the locals of incoming heavy rain and high winds expected over the next two days. Not wanting to push our luck, we decide to stay in Burlington and take advantage of locally available hangar space. By the time all three aircraft are safely put to bed, Yvonne and Cathy catch up with us and the merry group disappears downtown for a festive Italian meal. Do we ever eat well during this trip! Around the table, we collectively readjust our plans once more. We abandon the idea to fly to Yvonne and Henry's place in Honey Harbour on Georgian Bay. It would have been nice to fly around Georgian Bay for a couple of days, but the weather won't let us. As we see no point in sticking around Burlington any longer, the decision is Yvonne and Henry will drop Cathy, Tom and Claude at the GO Train Station and carry on towards Honey Harbour by road. A 3-hour trip in the driving rain and Honey Harbour is finally in sight.

In the meantime, Claude gets invited to stay at Cathy and Tom's place in London, ON. The weather is supposed to improve to good VFR conditions by Thursday afternoon or Friday morning at the latest. Claude will use that opportunity to fly home to the Ottawa area. So, when the weather conditions improve, Tom will go back to Burlington with Claude and will bring his own airplane back home to the London Airport (Identifier CYXU).

The train ride to London is very comfortable. At the London Train station, the trio gets a short cab ride. A few minutes later, Cathy and Tom have the pleasure to welcome Claude into their "Home, Sweet Home".

Day 12, Tuesday, 23 September

We do very little today. A few sleep in during part of the afternoon and all generally recuperate from accumulated fatigue from all this trip-related excitement and commotion.

Yvonne and Henry wake up to the mess in their living room from moving out of their Toronto condo (the sale closed on Sept. 12th, the start date of the Kitty Hawk trip). Both are suffering from terrible chest colds and feel less than enthusiastic about tidying up the moving mess dropped there at midnight on Sept. 11th.

Day 13, Wednesday, 24 September

Tom takes Claude on a relaxed and informative city tour, as Claude does not know anything about the London area. A few minutes later, he stops by Bruce Cooper's place. Bruce is Tom's Challenger buddy and local electronics expert/consultant.
Bruce gladly accepts Tom's proposed change to his daily routine. The tour gets a definite aviation flavour when Tom brings Bruce and Claude to the London Airport. Since we are there, a side-visit to the Flight Specialists also confirms the weather will be clearing overnight and tomorrow looks good for an early train ride to Burlington to retrieve our planes.

The group also visits two other local ultralight airfields. John Kvepps owns an ultralight farm to the northwest of the London Control Zone. Bruce knows this field very well, as this is where his own Challenger II is based. The second stop is made to the North of London at Bill Rice's farm, where the local EAA and RAA chapters met for many, many years. Both John and Bill are local legends and obligatory stops for homebuilt pilots visiting the London area.

The slow-paced evening is complete with a nice Vietnamese supper downtown, followed by a pool/hot tub/sauna combined session at Tom's place.

Day 14, Thursday, 25 September

The weather continues to clear and a good west wind is expected all day. After an early breakfast, Cathy brings Tom and Claude to the local train station for the boys to catch the 7:50 AM train to Burlington. The pair of flyers arrives at the Burlington Airpark at 10:30 AM. By the time the aircraft are refuelled and pilots are ready for take off, it is close to noontime.

Tom has a perfect excuse to follow Claude all the way to Campbelford, ON. His father lives there and Tom knows of a local fellow flyer, Don Laver, who has a private strip within walking distance from where Tom's father resides. So Tom intends to stay overnight in Campbelford and come back towards London on the next day.

Henry is still not happy with the weather in Midland where he will be returning his Challenger. Winds are strong, 15-20 MPH, and across the runway. Forecast looks better for Friday so plans are made to get an early start the next morning. Due to a strong tailwind, the flight to Campbelford makes excellent

progress over Lake Ontario's north shore and along Toronto's Harbourfront. By 13:30 hrs, both Challengers are safely on the ground in Campbelford. Don is there with his friend Cliff Steacy to greet the two visiting flyers and point out where the tie-downs are situated. While Tom puts his machine to bed, Claude eats a bit, refuels and gets ready for his last leg home. Again, strong tailwinds prevail and Claude enjoys his Challenger's 90+ MPH ground- speed. Now in familiar territory, Claude's lonely flight does not carry any of the excitement and discovery of the past two weeks. "Do I really have to go home?" Claude is thinking…

Day 15, Friday, 26 September

In the meantime, Tom has two good visits to the nursing home with his Dad. On Friday morning, the weather is ideal and his flight home is uneventful and smooth. He has a 10-knot tailwind from the southeast, so he flies Lake Ontario's shoreline in ground effect from Cobourg to Oshawa. There, he climbs a bit to contact Oshawa Tower, then it is back to lake level until it is time to contact Toronto City Center Tower prior to entering the zone.

Floats allow you to do so much more. Tom just lands in the Leslie Street spit to transfer some fuel and appreciate some of the Toronto waterfront architecture. From there, he continues along the shoreline to the Burlington Skyway and climbs the escarpment direct to London from Hamilton Harbour.

Upon contacting the London Tower, it finally strikes home: Tom's adventure has ended. He recognizes the London Tower radio Operator, Alia, by voice when she asks where he last departed. Tom replies: "Kitty Hawk, North Carolina, via Toronto Harbour". They don't even question stuff like that any more from Tom and his Challenger.

Henry and Yvonne drove from Honey Harbour to Burlington Airpark on the Friday morning under blue skies and sunshine. They arrived at 9:30 a.m. and Henry was airborne by 10:00 a.m. As he flew home similar thoughts to Claude's crossed his mind. He was heading home but already thinking about the next flying adventure. Bahamas here we come!

Fortunately, the seeds of wonder and adventure are firmly planted. Let's hope group flights such as this one will reproduce many times over.

Conclusion:

All told, not counting individual travel, the group flight covered 22 airports and over 1,700 statute miles in 15 days. Such distance was covered in about 35 hours of engine time for an all-inclusive average speed just above 50 miles per hour. The trip's longest leg was 152 miles and the shortest was 33 miles.

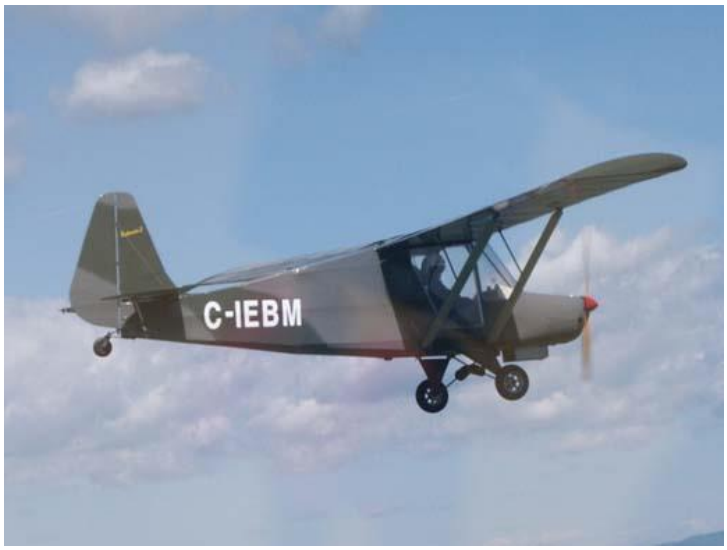
What conclusions can we draw from such an adventure? First and foremost is the fact you can travel long distances in a well-equipped ultralight. Granted, you travel slower and make more pit stops if you fly an ultralight, but many pilots see that as a definite plus. It's simply "more bangs" for your proverbial buck.

In a purely recreational context such as this, measuring yourself against the elements gives you a great opportunity to exercise proper judgment in a multitude of individual and group situations without any of the usual commercial pressures. A cross-country flying experience such as this one is invaluable and stays with you a long time.

The genuine friendliness and helpfulness of our neighbours to the south were reinforced at every new airport we landed at. From our perspective, there was no such thing as US/Canada tension, just the opposite. We were extremely well treated and look forward to our next venture to the US. Our trip served to confirm that our closest neighbours are also our closest friends.

Possibly less tangible, but most important is the human aspect of group flights: it is getting to know others and getting to know yourself. At every stop, we all gain an appreciation of how we function as individuals as members of a cohesive group. With a common bond, common interests and complete freedom from the vagaries of normal life, we all have our eyes and ears open to absorb the taste and feel of a true adventure we created by ourselves for ourselves.

Our group flight was a real privilege, but no luck was involved here. Our group dreamed this adventure, prepared for it and accomplished it with great resolve.
Let us leave you with one final thought: the nature and extent of your future flying adventure does not matter as much as this: if you can dream it, you can do it.



...And Lived On the Wind

By Stu Simpson

It's tough to believe but I was the only one there. On a nearly calm morning with a high, cool overcast and promise in the wind, I was the only guy on Kirkby Field. Admittedly, this was because the others have jobs. But some of my flying mates are retired, and so I was puzzled. I resolved not to concern myself over it, though, and instead set about readying the Giant to fly.

Linden would serve well as a destination. I'd have breakfast and buy a pie for my wife. One of the immutable truths for married pilots who fly for fun is that it never hurts to have a few extra air miles in the bank.

Once aloft and climbing strongly, the Giant felt sure and solid as it always does. It'd been too long since I'd had the controls in my grasp, nearly a week. That was when some of us wound up at a rancher's strip in the foothills southwest of Calgary. The rancher's name is Butler.

I love places like Butler's for a number of reasons. They're often set in beautiful places, in Butler's case a shallow but narrow valley running roughly northeast to southwest. Airstrips like these practically throw a gauntlet at a pilot's feet, so blatant is their challenge. But a pilot must be cautious answering the dare because such strips' approach regimens require care and imagination to defeat any obvious and less obvious dangers.

The biggest problem at Butler's is how the west end of the runway abuts a road. Naturally, the road has power lines beside it - lines without marker balls on them. Thus, the pilot bears the responsibility to see the road, spot the lines and take every pain to miss them on landing. If you're unwilling to shoulder such a burden you're well advised to fly to another, less demanding runway.

As testing as places like Butler's are, the real reason I like them so much is that I've never been there before. I must now confess to a barely contained aeronautical wanderlust. I'm constantly at odds with myself over flight. Part of me wants to load a few belongings and tools in the Giant and just fly away to places where I've never been before, and then keep going. Of course, my logical side recognizes the folly of such action and keeps me on a reasonably satisfying, though occasionally chafing tether. Places like Butler's, and other treasures that few pilots know of, turn up close to home with just enough regularity to keep me here.

Wegerich and I found Butler's strip last summer, but declined to land. I returned on my own one winter day to locate it again and mark it on my map. I considered a landing then, but I was alone and didn't want to alight when there were no other friends with whom I could share the adventure.

As I drew overhead of Butler's this time, I spotted the road and power lines and thus warned my wingmen, Huzzey and Bishell. Huzzey piloted his Challenger II carrying his lovely wife, Chris; and Bish was in his Bush Caddy. It's a shame Wegerich wasn't around.

I cleared the power lines and set down on the surprisingly smooth runway. I knew I'd very much like any man who keeps a runway so well. After my wingmen landed we met Pierce Butler and I did like him. He was very down to earth in his muddy rubber boots and flannel work jacket. He built the airstrip to harbour his Cessna 182, a suitably capable craft for such a locale. Butler mentioned how he enjoyed reading my stories in COPA's newspaper and I immediately liked him even more.

Our takeoff from Butler's was exciting as we clawed our way up between the heavily treed hills from his runway's 4200' elevation. The Giant handled it well but I'd be reluctant to try it on a hot day at gross weight.

The memories of Pierce Butler and his airstrip brought a smile to my face as I steered the Giant a bit to the right for Linden. It seemed the wind was pretty hefty aloft and a quick check confirmed it to be about 17 mph, but right on the nose. Good, I'd get to fly a little longer.

The village of Irricana peeked into sight ahead. I'd stay west of there and consequently of Beiseker, too, about 5 miles further up the road. That would leave sufficient distance to clear Beiseker's ATF because there'd be training flights landing there for sure.

A few little rain drops splashed onto the windscreen and skittered back in the propwash, leaving tiny droplet trails. But the clouds, benign in their appearance, showed no sign of spewing more. Perhaps a breeze had simply dusted these drops from a cloud the way someone sweeps crumbs from a table top.

Irricana passed beneath my right wing with its toy-sized houses, streets and cars. One house was oddly arranged, clearly defiant of the village's architectural conservatism. Triangular in shape, like an alpine chalet, it was also canted at a rakish angle to the perfectly squared property boundaries. It would take some courage to build a house like that in Irricana. All the other houses nearby were much less adventurous being staid, square and parallel with the streets and each other.
I wouldn't have seen that house if I flew higher or faster. I'd have never known for sure there's at least one person in Irricana who likes things a little different than his neighbours. And I wouldn't have admired the owner's bravery like I do now. You come across interesting people when you're flying low and slow, even if you never meet them.

I avoided the power lines landing at Linden. They have balls to mark them, which is very considerate of whoever hung them there. A beautiful young Mennonite girl served me breakfast. Then she sold me a banana cream pie to take home to my wife, who loves them, and hopefully me, for bringing them.

I turned sharply right once airborne again from Linden's runway and headed for some land to the east that I wanted to see before I turned for home. Presently, the farm my uncle owned when I was a boy was clearly visible. Adventure then was riding dirt bikes with my cousin Byron through pastures and

coulees, and camping among the gigantic poplars out back of the farm house. We'd fish from a row boat on a small reservoir nearby. I suppose when you're twelve most things are an adventure, but even then I couldn't wait to be up here.

Things have changed down there since I was a kid, but not everything. The farm house has been painted and the trees cut down, but the reservoir still bears trout. And I still can't wait to be up here.

My ground speed was measurably higher heading home. From east of Linden the route back to Kirkby's would certainly impinge on Beiseker's airspace. On Beiseker's frequency a young Asian-sounding man in a C-172 stated he was approaching from the southwest. He sounded a little unsure, but still brave in his efforts to conquer the Cessna at Beiseker, or perhaps Beiseker in the Cessna. Either way, he seemed admirably determined.

The student inadvertently keyed his radio mic on final so that anyone listening heard his instructor patiently talking him through the landing.

"Bring the airspeed back to 60 knots for final approach and adjust the ...” He suddenly released the mic button, maybe as he stretched his fingers trying to relax. The instructor, apparently a young woman, sounded forgiving and tolerant as she shared with him her gift of wings.

I envied the student for the challenges ahead and silently wished him well. I wanted to radio and tell him so, but thought it might distract him in his conquests.

Where will he go with his flying? Will he be one of so many who learn to fly and then get bored and quit? Can he even afford to keep flying after he achieves his licence? I hope so. I like pilots and would like to see more of them.

I sailed the Giant back to Kirkby Field completely enraptured with airplanes and flight. Occasionally, I'd giggle to myself just from pure joy. For a couple of moments I could hardly believe my luck being up there flying - and in my own airplane, too! Grinning incessantly, I hauled the Giant around Kirkby's circuit a couple of times, telling myself I needed the practice. Truth is, I just didn't want it to end.

My first approach was way too fast and I touched long, but with barely a tremor from the landing gear. Very pleasing, that. Ultralight pilots, though, admire short landings more than smooth ones. It's neither vanity nor exhibitionism. At the places we land such skill might one day separate a pilot from his demise. There's never been a runway that's too long.

My next landing was a peach. I set the Giant down firmly and still made the intersection turn-off a few hundred feet from the button. I remained completely saturated in satisfaction and contentment as I taxied the Giant in.

It dawned on me for the millionth time - this must be what it was like. This has to be how the barnstormers felt as they cast themselves to the clouds and lived on the wind. They'd have reveled in the absolute wonder and freedom of just being up there flying. They'd feel giddy and thrilled, knowing

they'd just lived a whole minute in the sky and were about to do so all over again. And every breath they took aloft would be the most precious they'd ever drawn. I just know they felt that way. My God, how could they not?

Section IV Ultralights – Some Thoughts And Opinions

How Safe Are Ultralights?

This is a question that is often asked by newcomers. Many of the aircraft that are flown in the ultralight category look unusual and very different from conventional aircraft. Many non-flyers find them interesting to look at from a distance, but wouldn't want to fly in one. But how safe are they really?

One way to consider this question is to look at the fatal accident rates. Fatal accident rates are the most reliable rates available since some smaller "fender-bender" accidents don't get reported, even though they are required to be reported. That makes the "total" accident numbers less reliable than the fatal accident data.

Because there are no "hours flown per year" statistics collected on ultralights in Canada, the numbers used will be *number of fatal accidents per year per aircraft registered*. The actual number of fatalities will not be used, just the number of fatal accidents. This helps provide a more accurate comparison with general aviation aircraft that have more seats.

For this study we will use recent data, from the past five years (1997-2001) and compare rates to two well known general aviation aircraft that are considered by most people to have an excellent safety record – the Cessna 172 and the Piper PA-18 Super Cub.

1997-2001 Five Year Data

Total number of fatal accidents on ultralights in Canada 1997-2001:	30
Total number of fatal accidents on Cessna 172s in Canada 1997-2001:	22
Total number of fatal accidents on PA-18 Super Cubs in Canada 1997-2001:	5

Number of ultralights registered in July 2002:	4691
Number of Cessna 172s registered in July 2002:	2448
Number of Piper PA-18 Super Cubs registered in July 2002:	405

The average number of fatal accidents per aircraft per year over that five year period was:

All Ultralight aircraft	0.0012
Cessna 172	0.0018
Piper PA-18 Super Cub	0.0025

Ultralights have proven over the last five years to be 50% safer than Cessna 172s and slightly better than twice as safe as Super Cubs. To put it another way - this means that you would, on average, have to fly an ultralight for 833 years to be in a fatal accident compared to 555 years for a 172 or 400 years for a Super Cub.

Why would this be when 172s and Super Cubs are certified aircraft often flown by more experienced pilots? Those general aviation aircraft look stronger than most ultralights – why aren't they safer?

There are probably two answers that explain the good safety record of ultralights compared to GA aircraft:

- Stall Speed – Research done by NACA in the 1940s showed that the chances of surviving an accident increase dramatically as an inverse relationship to stalling speed. In other words the lower the stalling speed, the safer the aircraft. This research led the US FAA to limit the stall speed on certified general aviation aircraft to 70 mph (61 knots). Most general aviation aircraft have stall speeds that range from 45 to 60 knots. Most ultralights have stall speeds that range from 20 to 35 knots. They just land slower, which adds up to more survivable accidents.

- Weather – The majority of fatal GA accidents involve weather. Typically it is continued visual flight into instrument conditions or IFR loss-of-control accidents that account for many fatalities. Many GA aircraft are used for serious travelling and that means that sooner or later the pilot will be faced with poor weather enroute. Ultralights are typically flown for fun, in good weather with light winds, good visibility and ceilings. They aren't often used for serious travelling. That means that ultralights mostly avoid the biggest danger in GA flying – the weather.

So what does this information tell us? While it is possible to kill yourself in an ultralight, overall they have a better record than the two leading GA aircraft surveyed here. Just like any aircraft, the safety of any particular flight depends greatly on the behaviour and decision-making of the pilot. With proper training flying ultralights can be reasonably safe.

Where are Canadian Ultralights Going?

By Adam Hunt

In 1984 the Australian ultralight writer Gareth J. Kimberley wrote a book called *Fun Flying! A Total Guide to Ultralights.* In this book he made some observations and left us with a warning. In ultralight terms 1984 was still the "early days". It is interesting to see how his predictions have panned out in the world of ultralight flying in Canada.

In describing the days when ultralight aircraft burst onto the scene in the late 1970s, Kimberly said, "In the few short years of its existence, aviation has become the most expensive and the most automated and regulated form of transport on Earth; private sport flying is becoming so complex and costly that if nothing is done it will soon be out of reach of all but the very rich. It is hardly surprising that there should be an upsurge of interest in low-cost, hassle-free ultralight flight. Certainly the advent of the [ultralight] represents a delightful return to the good old days of early aviation when flying machines were magical and pilots were heroes. We can once again savour the romance and adventure of flying purely for fun. But perhaps there is more to it than this. Perhaps the ultralight boom is a kind of

backlash – a protest against those forces that would seek to deny the amateur the use of the sky."

Kimberly looked back at the simple airplanes of past years. In their days they were known as "ultralights" and many countries called them that. In Canada amateur-built aircraft were called "ultralights" at one time. Kimberly observed: "The "old" ultralight aircraft had, over the years, gradually become heavier, faster, more sophisticated, and extremely expensive. They require higher levels of training and skill to maintain and fly them. In addition to the high basic costs, they become subject to a range of increasing government charges and restrictions. Obviously, they were no longer "ultralight aircraft" and could hardly be treated as such. Somewhere along the way the original concept was lost.

Kimberly continues: "It would be a tragedy if this should happen with the "new" ultralights but already there are some disturbing trends and, after all, they do say that history repeats itself.

"Where the early ultralights [of the 1970s and early 80s] were floating around at 30 to 35 mph the new machines [of the mid-1980s] are capable of 60 to 70 mph. Greater speed creates the need for more streamlining and increased protection for the pilot, particularly in areas with a harsh environment; fully enclosed cockpits and the inevitable result.

"If the present trend continues, with ultralights…steadily increasing in weight, power and performance, it will become increasingly necessary to introduce more and more rules and regulations to control their operations, with the attendant increases in costs, paperwork and bureaucracy that all this will entail. This, in turn, will have the inevitable effect of restricting the sport to an ever-diminishing segment of the community.

"If this happens then [ultralight] flying will once again become a lost and forgotten art and all we will have done is re-invent the aeroplane."

In Canada in 1984 the Lazair II was the premier state-of-the-art two seat ultralight. It cost $8795 in kit form. It cruised at 55 mph and had two 22 hp engines and no windshield. Today the premier two-seat Canadian ultralight might be something powered by a Rotax 912S engine of 100 hp and cruising at 133 mph. It would cost about $100,000 to put one in the air today. There are virtually no Canadian-made two-seat ultralights that can be put in the air for under $30,000 and many will cost you much more than that. The modern Canadian ultralight features a windshield, an enclosed cabin, heat, an 80 to 100 hp engine, brakes, instruments, GPS and often many other features. We have truly "re-invented the aeroplane" along with aeroplane prices. What happened to bring us to this point and can anything be done about it? Both are good questions.

How did we get to this point? There are lots of views on this. Probably all of them are right to some extent.

The early ultralight boom lasted from 1978-84. During that time many dozens of North American companies poured a myriad of designs into the market place. The planes were all simple, cheap and light. They were of limited horsepower, speed and range. They were also of limited cost. Amongst the

single seaters of their day a typical cost was $5500, which was the cost of a single seat Lazair kit in 1983.

The ultralight boom went bust in 1984. Many companies closed their doors and only a few survived. In the early days ultralights appealed to hang glider pilots and others who liked ultralights for what they already were not what they could become in time. After all, ultralights were not born by shrinking airplanes; they were born by putting an engine on a hang glider.

That is not to say that ultralights did not appeal to general aviation pilots. A March 1984 study done by the Canadian Lazair manufacturer, Ultraflight Sales Limited, showed that 75% of their Lazair sales were to general aviation and airline pilots.

Ultralights had a wide appeal, but by 1984 the market for simple, light and inexpensive airplanes was saturated. American ultralight philosopher and designer Jack McCornack feels that the explanation for the bust is simple. After six years of high volume sales, virtually everyone who wanted an ultralight had one, he says.

After 1984 the whole airplane market changed dramatically. Even Cessna had stopped producing light aircraft in 1984, too. Hardly any “light” or “ultralight” aircraft were produced in North America between 1984 and the mid-1990s. It was a kind of aviation “dark-ages”. The main forces that brought an end to small aircraft production were a saturated market and the crisis in American law suits and product liability.

Many people who got into ultralight flying after 1984 were general aviation pilots, but this was mostly a different group than the earlier ex-hang gliders and GA pilot buyers. In the economic recession of the early 1990s, they were looking for a cheaper way of getting a real airplane. Something with speed, range and comfort. It was probably a combination of that factor and the changing tastes and age of the existing ultralight flyers that pushed designs faster and heavier.

The studies are pretty clear that the early hang glider pioneers of the 1970s were young baby-boomers. Born after WWII, they were looking to define a new culture for their generation, in every way. In aviation that meant "hang gliding", really “doing your own thing”. Powered hang gliding lead to ultralights, as we have discussed. By 1984 the culture was starting to change. The social rebels of the 1970s were changing, aging and altering their priorities, getting married and getting serious jobs. Every year the age of the average hang glider pilot increased by a year. The data is sparse but the same thing was probably happening in ultralight flying, too. It was the same group every year, just getting a year older each year.

Open cockpit flying with 20 hp, doing 35 mph without a windshield was pretty cool when you were in your late 20s. By the mid eighties the population was getting closer to 40 years old. Open cockpits were “too cool” and an aging population demanded more creature comforts. It cost more to put on a windshield and doors, but the manufacturers were making more money, so why not? It wasn’t just adding the windshield that changed things. Adding anything to those early designs added significant weight. That required more horsepower to lift it. The added horses burned more gas, so fuel weight

increased and gross weight went up again. Stall speeds went up, too, along with weight and the related wing loadings. Suddenly it was smarter to fly from airports instead of fields. In 1983 25 hp ultralights were common; by the late 1980s 50 hp engines were the norm. By 2000 many were trading in the 80 hp engines for 100 hp ones. Older ultralights were just parked and stored, replaced by newer faster ones.

Weight added to an aircraft design always starts a spiral upwards. More weight, more horsepower, more gas, more weight….

In Canada the original Transport Canada ultralight rules of the early 1980s allowed two seaters to weigh about 785 lbs gross weight. The weight was actually a complex formula that included non-aviation terms like “launch weight”, but it worked out to a gross of about 785 lbs. Early two seaters, like the Lazair II and Chinook 2S, had no problem flying within those weights. The demand for more speed, range and comfort pushed the legal weight limits in Canada.

In 1991 the new Advanced Ultralight (AULA) category allowed two seaters of 1058.2 lbs gross weight. Basic ultralights leap-frogged the AULAs in the mid-1990s when their gross weight was increased to 1200 lbs. In 2001 AULAs were bumped up to 1232 lbs to align them with the new US Sport Airplane category. Inevitably, soon Canadian Basic Ultralights were also nudge up from 1200 lbs to 1232 lbs. Canadian ultralight designers, long used to a government mandated “moving target” of gross weights in this country have been designing 1400 lb gross airplanes for some years. They wait for the rules to advance, giving them more useful load when they do.

But when is an ultralight no longer an ultralight? When it hits a certain weight, or when it ceases to conform to the original philosophy? Each country has a different weight definition. In Europe they have to weigh a maximum of 450 kg (993 lbs). In the USA they can weigh no more than 254 lbs empty weight. That puts the US ultralights around a gross weight of 500 lbs, for comparison purposes. Today in Canada, any single seat or two place piston-powered airplane under 1200 lbs with a stall of 45 mph or less meets the definition of an ultralight. We have the heaviest ultralights in the world. Many of them are closed cabin, tractor-engined monoplanes that look and fly like Piper Cubs. Many of them are a good deal faster than Cubs. We have indeed, as Kimberley warned us, “re-invented the aeroplane”.

So, who cares? Who does it hurt if our ultralights are bigger and heavier than other country’s ultralights? Who does it hurt if ours are more comfortable, especially with our more northern climate? As Kimberly warned 22 years ago, it makes the sport, in fact it makes the sky, less accessible to those who want to fly in Canada. In many ways aviation, even its economically lower ends, has become only available to the rich. The original concept has been lost and the delight of flying simple aircraft at low speed and altitude has been lost for many people, too.

That brings us to the second question – can anything be done about it? Perhaps the question should really be “does anyone care enough to do something about it?”

During Transport Canada’s *Recreational Aircraft Review*, published in 1996, one of the goals was to create a Sport Airplane category. Some people have pointed out that that has been one of the few

aims in the *Review* that hasn't been met. It is true that we don't have a category with that name in Canada, but we have grown the ultralight and especially the passenger-carrying AULA into becoming that category. The US has created a new category called the Sport Aircraft category. Other than its 1320 lb limit it looks very much like our original AULA. With the recent change in weight for the Canadian AULAs from 1058.2 to 1232, the two categories are pretty similar. This is obviously a big boon to Canadian and US manufacturers, because the same aircraft will fit into both categories across the border. It can only help commerce in that way. I think that this is a good thing, but the US has a big advantage over us. While we have grown our ultralight category into their Sport Airplane, they have preserved their ultralight category as it is. In fact the US ultralight category hasn't materially changed since it was introduced as FAR Part 103 in 1983. That unchanging category, a very much "non-moving target", has allowed inexpensive ultralight flying to flourish in the USA. Today there is a new generation of FAR Part 103 ultralights coming to market in the US. They still offer affordable flying in increasingly well-designed single seater ultralights. Because the category hasn't changed since it started, many of the original designs from the late 1970s and early 1980s are still available, many in refined forms and at reasonable prices.

The US Part 103 rules in many ways resemble some of the more successful sailboat classes. The fixed rule gives room to be innovative, within very fixed boundaries. That guarantees some control over costs and keeps the sport available to more people. More "open class" rules, like the Americas Cup Class create boats costing many millions of dollars. Very tight rules, like the Laser class, create very inexpensive types of boats that almost everyone can afford to sail.

Perhaps there is a parallel with ultralights here. I don't think that there is anything wrong with having available $100,000 airplanes that carry two people at 133 mph, but these are not ultralights, in any sense of the original philosophy of "inexpensive, low and slow" flying. The only reasons that there are any reasonably priced ultralights available in Canada is because of the great demand for Part 103 single seaters. It is kind of sad that we, as Canadians, need to rely on US rules to keep these types of aircraft available in Canada and mostly from US manufacturers. At the same time US-rule aircraft are available in Canada, we have more regulation, in the form of aircraft registration and pilot licencing in Canada. We always seem like poor cousins to the US when it comes to aviation. This always seems a bit sad to me, because so many of the great early ultralight designs, like the Lazair and the Chinook, came from Canada. Then, we were leaders, but our own market demands and regulation have made us followers.

What can be done? Perhaps nothing at this point. Once you increase the weight limits and build bigger aircraft you can't chop the limits again. Perhaps we do need a smaller, lighter category, one that will be closer to the US FAR Part 103, one with less burdensome regulation. Maybe all we need to do is not forget that many of those planes are still out there – parked in barns and hangars, not having flown in years. They are still as much fun to fly as they were 20 years ago. Many are still available from manufacturers catering to the US market. Maybe what we need, to get Canadians flying again in greater numbers is to remember what ultralights were originally all about, what the dream was. A concept that is closer to Kimberley's original dream: "a delightful return to the good old days of early aviation when flying machines were magical and pilots were heroes. We can once again savour the romance and adventure of flying purely for fun".

Section V ANNUAL INSPECTION GUIDE

FIXED WING ULTRALIGHTS

By Peter Fransham

Introduction

Ultralight aircraft are not subject to annual inspections as are conventional certified aircraft. It is up to the owner/operator to ensure that his/her ultralight aircraft is fully functional and safe to fly. Most manufacturers provide maintenance schedules and recommendations for regular maintenance. There are likely cases where such documents have been lost or were never provided. This generic inspection report covers most of the common inspections that should be carried out on an annual basis. The inspection has been divided into a number of sections and blank space has been left for the owner to write in inspection items specific to his/her aircraft.

When completed the inspection form is to be signed and kept in a safe location other than in the aircraft. During the year there are other maintenance items that will arise and this inspection guide is not intended to limit inspections and maintenance to a single annual event. It is up to the pilot to ensure that the aircraft is fully functional prior to the start of every flight. Pre-flight inspections are an integral part of safe flying and defects identified in the pre-flight must not be left until the annual inspection and maintenance before being tended to.

ANNUAL INSPECTION REPORT
FIXED WING ULTRALIGHTS

Aircraft Registration: _____Type:_____ _____

Date: _____

Airframe Serial # _____ Engine Type:_____

Engine Serial Number:_____

TT Airframe:_____ TT Engine:_____

TSOH Engine:_____

ENGINE:

Fuel/Carburetion System

1. Check fuel lines for leaks, wear and tightness ☐
2. Change fuel filter ☐
3. Clean fuel tank ☐
4. Check intake manifolds for cracks and carburetor(s) for tightness ☐
5. Install carburetor rebuild kit(s) ☐
6. Check that carburetor(s) reach idle and full throttle positions ☐
7. Check fuel tank and lines for chafing, kinking and integrity ☐
8. Clean and re-oil air filter(s) ☐
9. Check throttle and coke cable assemblies for wear ☐
10. Check impulse fuel pump for leakage ☐
11. Check wiring and capacity of electric fuel pump ☐
12. _____ ☐
13. _____ ☐
14. _____ ☐
15. _____ ☐
16. _____ ☐

Ignition/Electrical System

1. Replace spark plugs (ensure threaded plug tips are tightened) ☐
2. Check timing and points and adjust as necessary ☐
3. Check spark plug leads for condition and tightness, replace if necessary ☐
4. Check battery fluid levels ☐
5. Check wires for abraded spots and loose wires at connectors ☐

6. Check electric starter brushes and replace if necessary ☐
7. Check and grease bendix on electric starter ☐
8. Check CHT wires for abrasion ☐
9. _____ ☐
10. _____ ☐
11. _____ ☐
12. _____ ☐
13. _____ ☐

Exhaust System

1. Remove exhaust manifold and check for carbon build up on port and rings, de-carbon ☐
2. Check entire system for cracks and leaks ☐
3. Install new manifold gaskets ☐
4. Reinstall manifold and torque bolts ☐
5. Check EGT probes for wear and clean tips of excess carbon ☐
6. Replace exhaust springs ☐
7. _____ ☐
8. _____ ☐
9. _____ ☐

Engine Block

1. Check engine mounts for integrity
2. Check block for leaks
3. Tension Cooling Fan ☐
4. Replace cooling fan belt ☐
5. Check wear and tight fitting of cooling fan bearings ☐
6. Check air guide for cracks ☐
7. Remove cylinders, cylinder heads and de-carbon head, pistons and rings ☐
8. Check bearings for signs of wear ☐
9. Check and replace cylinder and cylinder head gaskets ☐
10. Check starter cord for condition (recoil starters) ☐
11. Check and regrease starter clutch bearing (ADS electric starters), reinstall starter turning casing bolt counter clockwise only ☐
12. _____ ☐
13. _____ ☐
14. _____ ☐
15. _____ ☐
16. _____ ☐

Final Assembly

1. Retorque all external fasteners (nuts, bolts, screws, clamp etc. ☐
2. _____ ☐
3. _____ ☐
4. _____ ☐

DRIVE SYSTEM:

Belt System

1. If cog belt has 100 hours or 1 year in service, replace ☐
2. Check belt(s) for wear and tension ☐
3. Ensure tightness of top pulley nut (125 ft/lbs), lockwire or cotter pin ☐
4. Check top pulley for excessive bearing play, replace bearings as necessary ☐
5. Check marks on lower pulley bolt for signs of turning ☐
6. _____ ☐
7. _____ ☐
8. _____ ☐

Gearbox System

1. Replace oil in gearbox ☐
2. Retorque gearbox bolts ☐
3. Check oil level in gearbox ☐
4. Check centrifugal clutch for wear ☐
5. Check dampener in gearbox for wear ☐
6. _____ ☐
7. _____ ☐
8. _____ ☐

Propeller

1. Check propeller for nicks, cracks, cleanliness and balance ☐
2. Check propeller mounting bolts, lockwire ☐
3. _____ ☐
4. _____ ☐

AIRFRAME:

Cockpit:

1. Check operation of all controls and adjust tightness of pivot points ☐
2. Check rudder, aileron and throttle cables for condition, lubricate with WD 40 ☐
3. Check pushrods, stick(s) and cable safeties and lubricate pivot points ☐
4. Check nosewheel shaft bearing, lubricate with grease and retighten ☐
5. Check instruments, lines and wiring for integrity ☐
6. Check seat and seat belt condition and attach points ☐
7. Check windshield, (doors) for cleanliness, cracks ☐
8. Check fuel tank cap vent hole is unobstructed ☐
9. Check strut attach brackets, nuts for tightness ☐
10. Check fabric for condition and cleanliness ☐
11. _____ ☐
12. _____ ☐
13. _____ ☐

14. _____ ☐
15. _____ ☐

Wings:

1. Check wing and aileron leading and trailing edges for dents, straightness ☐
2. Check fabric (and dope) for condition and appearance ☐
3. Check polytips and attach rivets for condition (Dacron wings) ☐
4. Check wing spar attach bobs for play, safeties ☐
5. Check struts, jury struts for dents, straightness ☐
6. Check strut attach brackets for cracks, play, safeties ☐
7. Check aileron hinges for condition, ends pinched, lubricate with WD 40 ☐
8. Check aileron pushrods, bellcranks for condition, safeties ☐
9. Check clearance sufficient between pushrods, gap cover (Stitts wings) ☐
10. _____ ☐
11. _____ ☐
12. _____ ☐
13. _____ ☐
14. _____ ☐

EMPENNAGE GROUP: ☐

1. Check stabilizers, fin and dorsal attach points for play, safeties
2. Check strut attach brackets for cracks, play and safeties ☐
3. Check stabilizers, elevators, rudder, fin, and dorsal frames for dents, integrity ☐
4. Check stabilizer fin welds for integrity ☐
5. Check elevator, rudder hinges for integrity, play, safeties ☐
6. Check rudder cables and attach points for wear, cleanliness, lubricate ☐
7. Check elevator pushrods, bellcranks, horns for play, safeties ☐
8. Check fabric, dope for condition and cleanliness ☐
9. Check tailwheel for integrity ☐
10. _____ ☐
11. _____ ☐
12. _____ ☐
13. _____ ☐
14. _____ ☐

LANDING GEAR:

1. Check main gear legs for straightness, cracks ☐
2. Check main gear welds for integrity ☐
3. Check main gear axle welds for straightness, integrity ☐
4. Check nose gear shaft, fork for straightness, integrity ☐
5. Check all wheel bearings, wheels, tires for condition and integrity ☐
6. Check tire pressures, free rotation of wheels, clearance from wheel pants ☐

7. Check brakes, cables for wear, proper adjustment ☐
8. Check wheelpants, attach brackets for cracks, and cleanliness ☐
9. _____ ☐
10. _____
11. _____ ☐
12. _____ ☐

GENERAL:

1. Service bulletins, advisories complied with ☐
2. Registration, stainless steel data plate on board ☐
3. Journey log entries current, this inspection signed out ☐

IMPORTANT NOTES.

Use only aircraft AN type aircraft hardware on your ultralight – not "hardware store" bolts. Do not reuse nylock nuts or cotter pins. Ensure that at least one thread protrudes through nylock nuts for secure attachment. Do not overtighten fasteners. Use only castle nuts and cotter pins on rotating pails. Where locking type fasteners can not be used, use Locktite on the threads of fasteners. Use only stainless steel rivets for all structural applications.

REMARKS:

I hereby certify that all requirements in this engineering and inspection report have been met, and I have determined the aircraft to be airworthy.

DATE: _____ SIGNATURE_____

LICENSE _____

OTHER RECOMMENDED SERVICING

Items to be inspected and replaced on high-time airframes
Control cables should be replaced with new ones at approx.: 500-1,000 hours (sooner if not properly lubricated)

Elevator hinge pins	300 hrs.
Rudder hinge pins	500 hrs.
Elevator pushrod pins	300-500 hrs.
Aileron pushrod pins	500 hrs.
Rudder & elevator control horns	300-500 hrs.

Remaining control system parts should be inspected carefully and replaced if necessary at 500-1,000 hrs.
Check all clevis forks for hole enlargement or elongation and replace if necessary.
Check dorsal fin brackets for cracks between rivets and replace if necessary.
On high-time/high usage air frames (500 hrs. or more per year) is recommended that the fuselage covering be stripped off and the airframe and especially the control system be carefully inspected and any worn parts be replaced.

The importance of regular maintenance, inspection and lubrication of high time & usage airframes cannot be stressed enough-someone's life depends on it!!