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Newsletter, November 2009

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Notice of Meeting:

Thursday, Nov 26, 2009 at 7:30 PM

Topics:

- 1. Fabricating fibreglass moulded parts by Scott Black**

&

- 2. The Aircraft Certification process with Frank Hofmann**

Location:

**Room 204
Penfield Building
John Abbott College
Ste. Anne de Bellevue**

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Check out our website at: <http://eaa266.org>

A word from our Chapter President...**Michel Moreau**

Please come to our traditional Christmas supper at Le Corail, on December 10. Arrive between 18:00 and 19:00; supper will be served at 19:00, followed by entertainment. Bring your partner. But also don't miss our last technical presentations of the year on Thursday, November 26th with Scott Black and Frank Hofmann: all you want to know about molded parts and aircraft certification.

MM

Highlights from our October Chapter Meeting**David Cyr**

The Canadian Manufactured [Puma Aircraft](#) by BDC Aero Industrie Inc.

Humberto Dramisino of BDC Aero Industrie Inc. is very proud of the aircraft he is manufacturing and distributing here in Canada; St. Lazare for the moment, but he will soon be operating from a new factory on the Lachute Airport. The design originated in Italy in 1985 by Bortolanza Antonio, but many significant changes have been incorporated since then and now the complete aircraft is being built in Canada. It is offered as a complete, ready-to-fly advanced ultralight, and will soon be available as an amateur-built kit (51%) for those who want the building experience.



It features a fiberglass fuselage with a conventional aluminum wing and horizontal stabilizer, and is powered by a Rotax 912, either the 80 or 100 HP model, with the possibility of a 914. It cruises at 105 mph, climbs at 1000 ft/min, stalls at 44 mph with flaps and sips gasoline at the rate of 2.8 gal/hr.



He talked about the financial alternatives to get airborne. In addition to outright purchase at about \$85K, there is an option to buy a block of 40 hours of flying time on a co-owned aircraft for \$4800. This means you get a new, state-of-the-art airplane for \$120 per hour, fully insured, serviced and maintained. Just reserve your time, add fuel and off you go! Humberto is also working on a 3 to 4 year lease program with HSBC, so the aircraft can be leased just like a car.

Presently the airplane requires about 300 hours to build, but when offered under Chapter 549, to comply with the 51% rule, Humberto will increase the work required by the kit builder to about 600 hours.

Humberto is expecting the new 7500 sq ft factory in Lachute to be ready for production in early spring 2010. It will be located on the south side of the airport near the Lachute Flying Club. As a side note, Humberto does dynamic prop balancing for non-certified aircraft.

Thanks again Humberto for a very interesting and informative presentation and discussion!!

Contact Us!<http://eaa266.org>

**Pre-flight Inspection before first Test Flight
Jabiru 2200A powered Titan Tornado II****Bill Evans**

EAA 266 and the Flying Club enjoyed a really terrific fly-in/drive-in at Lancaster Airpark. Gord Larsen generously provided the corn and BBQ and refreshments and I sure it's fair to say the day was a highlight of the flying year.

About 3PM Roberto Cea-Campo, who had his recently completed a Titan Tornado II in the parking area designated for the airshow, wondered aloud whether there was any possibility of his first flight that day. This was away from the dining area.

I took a look around and noticed that the attendees were beginning to depart. It seemed to me that a comprehensive inspection was needed in any event, and there was no good reason not to do it. Roberto had a Pre-flight Checklist in hand. Flashlights, rules and mirrors were available, so I said I'd start an inspection that would take about 3 hours. We could then see whether a flight was possible that day.

The weather was very fair indeed. I hasten to add that the attendees were nearly all pilots and owners and had good common sense. They left us alone to pursue the inspection, which made the task possible.

The term "inspection" means the comparison of any thing to a known standard.

An aircraft inspection consists of dozens of small tasks, which taken together cover everything comprising the aircraft before flight. It is a very solitary task, one that I enjoy even after, say, 35 years.

For aircraft controls we are comparing everything to the standards in ATA 20 and 27 for Travel, Safety and Soundness. Similar standards exist elsewhere for every part and system. I've learned them over a lifetime.

The checklist begins at the fuselage nose, where the nose gear, wheel, tire, fork, steering rod are inspected both at attachments and for condition and the tire for inflation.

In the forward section of the cockpit, we begin inspecting the rudder pedals, brake lever, rods, connections, cables for condition and attachment. Once the cockpit rudder controls are determined to be sound, then the travels can be checked against the assembly manual. At this stage, we are not paying any attention to the inspection done by the Delegate from Transport Canada. (Our inspection is not for the Regulations it is for our lives. We must miss nothing.)

Similarly, we go over each of the remaining controls in the cockpit: aileron, elevator, trim mechanisms and flaps. These are inspected one by one and done carefully. No defect may exist here. I watch, listen and feel with my hands for any trace of resistance, ratcheting or sticking throughout their travels. One by one, the safety devices are inspected for security, i.e. cotter pins, lockwire, tab washers and jam nuts.

At this point, we perform the first wig-wag check. Are each of the control cables, rods and links installed such the correct control operates in the correct direction? (remember the story of the fellow who keyed the mike and the nose gear retracted.) Nothing similar will be allowed here. Ours is a very quiet time.

The landing gear legs pass through the fuselage and we are very interested to see that they are correctly attached and very secure. The brake lever is inspected and operated while I try to

move the aircraft. It stays put. The brake linkage and cylinder are inspected, to see they are correctly installed and secure.

The brake master cylinder area is wet with brake fluid. A closer look reveals that the Plexiglas brake reservoir is empty. The reservoir is removed to reveal several tiny cracks at the base. Gord Larsen provides some structural epoxy and Roberto begins his first repair. The area is wiped clean. An absorbent shop towel is wrapped and tied around the filled reservoir to soak up any drops that might occur before the reservoir can be replaced. The reservoir will be checked again before each flight.

The main tires, wheels, brakes and attachments are inspected for safety and security. However, the brake lines are found to chafe on the landing gear leg fairing. Suitable tubing is used to protect the brake lines on both sides. The wheels appear to rotate normally. Tire inflation is checked. Later, a taxi test will tell us more.

Behind the cockpit there is the main fuel tank. The fill neck is in the aft fuselage, as are all the fuel system components. The area is a struggle to access and some items are hard to see. Once again, it's time to slow down, to handle and visually inspect everything. We sniff for fuel. The storage and delivery system appear to be tight. The fuel pump is switched on and the system checked again. I note to Roberto that there is a filter at the fuselage fuel tank. I recommend he replace the filter every 100 hours or at annual inspection whichever ever is first. It goes on the Annual Parts List.

Rudder and elevator cables pass through this aft fuselage area. Their routing, as well as pulleys and fairleads, are checked. Nothing may interfere with their movement. The rudder control arm is also closely checked. The elevator cables are checked and their attachments to the control horn.

The Titan has a stabilator. Its attachment and controls are checked. There is also an anti-servo tab. This seems to be similar to a geared tab. Its attachment, condition and control rod are inspected. It operates as the drawings say it should. All the tail controls are checked for travel against the drawings. Beneath the fuselage, one finds a tail wheel. It's a solid wheel, used to keep the tail off the ground once the pilot exits the cockpit.

Throttle and engine cables must pass through this tail area, since the Tornado is a pusher. These are all checked for condition and security.

Nick has volunteered to be the event photographer. He inquires whether a flight remains possible and I allow that nothing has been found yet to preclude flight.

Engine – engines also have systems: fuel and control, ignition, engine mounts, fairings, electric power, propeller, oil and cooling, cylinder cooling, exhaust and muffler.

There are also engine controls, throttle, fuel, choke, and carb heat. In this, there are no cowl flaps because there are no cowlings. The last item is the engine itself. I take my time.

Engine systems are inspected one at a time, each component is mentally checked off until each system is complete. This is not like a walkaround. A final inspection involves moving back and forth, side-to-side, front to back until every part is inspected. I've spent an hour in the fuselage and may spend that much time again on the engine.

No only must the engine run throughout this flight, it needs to run smoothly. All the controls need to operate smoothly and through their respective travels. The engine needs to generate takeoff RPM and sustain it.

I find that simple plastic connectors are used to join the electric harnesses from the fuselage to the engine. There is no cowling, so the connectors need to be secured and the harnesses need to be laced and tied at short intervals. The throttle conduit jam nuts are found not to be tight and this is rectified. I ask Roberto to install tab washers on these nuts so that they may have greater security and safety. If the throttle conduit moves, some throttle travel will be lost. I find that the oil cooler hoses need to be secured. Roberto uses Ty-raps to tie the hoses to structure at frequent intervals. Thus, Roberto is quite busy with these tasks and is to remain busy for the rest of the inspection.

The engine controls are all operated and I inspect the carburetor parts carefully. Also, the carb heat mechanism is operated. Roberto and I discuss the fuel shutoff valve and Roberto makes plans to improve control.

I recall paying special attention to the muffler and muffler springs. I recall checking for safety wire inside the muffler springs.

A fuel flow test is done and we find that the flow exceeds by many times the fuel flow required at takeoff.

The wing is a single piece, attached by four bolts to the fuselage at the spars. Those four bolts and nuts get a long cold look, as do the attachment lugs. They matter.

Similarly, the ailerons are inspected for attachment, control, travel and condition. It is found that the ailerons should both droop 1/4" when the stick is at neutral. This puts a positive control load on the ailerons, which helps to eliminate wear, fretting and flutter. Many light aircraft and some transports use this feature. My notes say that the aileron differential was not quite to the rigging instructions, so Roberto corrects this as well.

Nick asks again whether it will fly today. He accepts my "it's still possible", though sunset approaches. (When pressed to sign, take your time).

The flap push rods are inspected for condition and attachment. Flap and aileron hinges are inspected for cracks or other flaws. I note that each aileron has just two hinges. I ask Roberto to consider third aileron hinges this winter. (If one fails, you still have two.)

I note a small dent in the right upper flap surface aft of the center hinge. It appears to be a manufacturing anomaly rather than accidental damage. I do a tap test to see whether any delaminating exists. The flap appears to be OK. The flap up position and each of the travel positions are checked against the rigging instructions. There was some doubt that the ailerons needed rigging. This confirmed, the inspection continued.

Roberto breaks out his oil can and applies just a little to each hinge, eye-end and control attachment. The controls are moved, hoping to work it in a little.

Once again, we perform a wig-wag check, this time from the wings and tail. Roberto operates the controls and I ensure the controls move as commanded. All is well.

Three hours have passed, yet daylight remains. Roberto has been fixing these items one by one and his confidence is not as sure as it was when we began. I recheck all the snag items I've found and they are now OK. I tell Roberto that when an aircraft is unsafe, there are warnings you feel, red lights that come on in your mind. In my mind, the snags we found are credibly fixed. The documents are in order. IMHO, the aircraft could fly.

I suggest that Roberto do the next step and carry out an exhaustive cockpit check and I will verify the aircraft as he does it. This takes perhaps another half hour. All is well. The sun is still in the sky.

Thus, he decides to fly. We discuss a very short test flight, how to take off, climb, how high to climb, what maneuvers to do and to come back down in 10 to 15 minutes maximum, for leak and condition checks. Much of this is what I've learned from Gord Larsen, and others. I recall Michel Moreau piping in when high-speed taxi runs are mentioned. Michel says, "This is a 1700 foot runway. There are no taxi tests. When you open the throttle on the runway, you take off!"

The cameras are switched on.

Roberto all the rest of the First Flight story is yours...

Bill Evans

Titan Tornado II First Flight

Roberto Cea-Campo

There were two main things I wanted to accomplish just before going ahead with this flight:

1. A complete, thorough pre-flight inspection per the Manual and preferably done by someone else than myself, with lots of experience.
2. Fly the same type and model of aircraft just before flying mine.

For the first one, I was very happy to have a knowledgeable and experienced member of our chapter like Bill Evans, to inspect nose to tail for several hours as explained above. This is what I was hoping for, to boost my confidence on this kit. I was glad to find Bill helping me here...



As for the second one, after looking around for an available one near by from the Titan Aircraft Yahoo Group, I finally was able to meet an owner of an exact same model and even the same engine as mine. André Nadeau was very helpful in giving me tips and preparing me for my coming task.

More information was gathered from Titan Aircraft technical support, other Tornado owners and dealers. An experienced and varied source indeed.

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<http://eaa266.org>

There, I confirmed the Tornado II was what I had expected, quite a fast aircraft compared to other advanced ultralights I had flown. In the United States, it is not an ultralight, but a certified LSA. No wonder, it flies at or faster speeds than several GA airplanes, it can be flown with a variety of engines and is a very strong, well-made kit in that price range.

I found myself acclimatizing to the Tornado faster than expected and I wanted to keep that training fresh for my upcoming test, as mentioned by Jay at Titan Aircraft. It wouldn't be like previous flight tests on Quicksilvers.



So, having achieved both, I'll (try) to put into words a little bit about the first flight experience, the pictures and mostly the video will do the rest!

As I finished all pre-take off checks and checking them again, I prepare myself for take off. Several taxi runs were made before finding no issues.

As I accelerated and started monitoring instruments and runway, my hands started sweating more than before (they were already when doing the inspection!), the increase in speed just started to match that of the adrenaline running through my blood vessels!

I reached take off speed and started to lift off, and thought "Yep, it's actually flying as expected". I continued the climb following the Titan Aircraft recommendations, but with all the excitement and monitoring of the engine management system (EMS), I did not reach the pattern altitude! (at least this I was told later). Maybe I had instinctively followed my ultralight crop-dusting experiences! I responded (For this test in particular, the higher the better).

Being a lot faster than I'm used to, with previously owned ultralights, downwind came to be a long one with the Tornado! As I started to look for the runway, I found it was left way behind! I guess monitoring and "feeling" the airplane kept me busy and excited at the same time.

After landing, no major issues were found but a few corrections needed in the settings of my EMS, a little bit of an adjustment to the flaps and perhaps a prop pitch change for the near future. Here's a link to the maiden flight video: <http://www.youtube.com/watch?v=i2ebwDYIW24>

As I start to fly a bit more, I approached Doug Remoundos so that we can follow up and review together the suggested FAA Advisory Circular 90-89A titled "Amateur-built and Ultralight Flight Testing Handbook"; a complete and thorough reading for this purpose, to add to my flying in the coming year.

So I take this opportunity to thank everyone who helped me, one way or another, to a satisfactory completion of this project, it feels so good to finally take it up to the skies! You might probably know that feeling... and so in Leonardo da Vinci's words:

When once you have tasted flight, you will forever walk the earth with your eyes turned skywards, for there you have been, and there you will always long to return.

Unclassified**Free Ads for Paid-Up Members**

Power Tools For Sale: Call Georges Laporte at 450-661-4711 (or 613-528-4582):
 3 H.P. 220v. air compressor, 30 gallon tank, on wheels - \$250. Sandblaster with tank - \$30.
 Small sandblast gun - \$25. Atlas 4 inch metal lathe, on bench - \$300.00. Logan 6 inch metal
 lathe on bench, some gears missing - \$300. Unimat jeweller's or model maker lathe, with
 accessories, almost new - \$300. Oxy-acetylene welding outfit with tanks - \$400. Miller 225
 amp. welder, 220 volts, with tig welding accessories, for steel and aluminum, argon tank -
 \$400. Horizontal Band Saw for cutting metal, almost new - \$225. Very sturdy steel
 workbench, all bolted together, 8 feet long - \$200. Bench drill press - \$65. Band saw - \$75

For Sale: Citabria Restoration Project and hangar at Cedars Airport. C-FABI, a 7GCBC-
 Citabria sustained some damage and is partially restored, but requires additional work.
 Airplane and hangar can be sold together or separately. For more information, call Eddy
 Dumalo at 514-453-4123

For Sale: Two Rotax 912F certified engines at 2000 hours (on condition). One shows metal in
 filter (probably gear box). Complete logs with 50 hour oil analysis. Less oil tank, radiator and
 oil cooler. Asking \$6000 & \$5500. Call Larry Loretto at 613-675-2301 or email
loretto@hawk.igs.net

For Sale: 1980 Pober Pixie P9 Built by Dale Lamport. C-GTLQ.
 1 Place, open-cockpit, parasol wing, 65 HP Continental. TTAF & ESOH = 521.
 Registered "Amateur Built". Visit www.greatplains.com/pixie.html for basic data (VW Engine).
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Lark sailplane parts for sale plus a semi-finished K6 fiberglass fuselage with canopy. The
 aluminum lark has been repaired for storm damages but not certified for aerobatics. The wings
 were cut short in preparation for engine installation. They could be rebuilt and the rudder
 also, which was missing when the parts were supplied. All parts are mounted on a glider
 trailer, which is also for sale. The complete set is ~~\$3000~~, the K7 fuselage \$700. Photos are on
www.hoverplanes.org under the "sailplane parts" link. Contact **John Austen-Brown** at
john.austenbrown@sympatico.ca

Update: Price now reduced to \$1500 or best offer. The equipped 35ft trailer is worth about this, so the sailplane is free!

For Sale: **Jack Geall** is selling his [Zenith CH-200](#) project along with many aviation tools and
 completed E-Z-E Lift 1650 Floats. For the complete list of items, please refer to the classifieds
 section of the [January 2008 Newsletter](#). Call 819-274-2275 or 450-689-0359 or email
jackgeall@sympatico.ca

For Sale: Lycoming O-290G, comes with aircraft oil pan, mags and carburetor. Never operated
 on an aircraft (was on a propeller driven ski sled) but unknown hours. Call **Pierre Leduc**: 514-
 817-8421 pierreleduc0@videotron.ca. Also, have C-75, C-85, C-145, O-200, O-300 Continental
 cylinders, a nice Hartzell prop for a C-180 (O-470), a few tail wheels assemblies, C-140 struts,
 a C-140 right wing, C-180 landing gears, a few 6" wheels as well as transponders and other
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