

Flight



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Building a GRAND CHAMPION CLASSIC AIRCRAFT

RESTORATING AND FLYING MY 1946 TAYLORCRAFT BC12D
BY SCOTT MCFADDEN

Canadian owners, pilots and restorers are always well represented at EAA AirVenture, arguably the world's most significant annual aviation event.

The year 2019 in particular was a banner year with Canadians winning awards in several categories. Congratulations to Buck Koral of High River Alta., Dan Garyfalakis of Mono, Ont., Ron Bekkers of Oakville, Ont., and Paul Wild of Sault St. Marie, Ont., for their hard earned achievements.

I was surprised — deer-in-the-headlights stunned, actually — to receive a Gold Lindy Grand Champion Classic Aircraft for my 1946 Taylorcraft BC12D. My restoration philosophy for the airplane was “in the spirit of original,” but I had no plans to show CF-CLR until after its first visit to Oshkosh in 2018. It is impossible to adequately summarize this odyssey of restoration project that started in 1989, so with the benefit of 14 months of frequently asked questions, I thought I'd tell a story that weaves in the answers.

I purchased CF-CLR (then CF-DEP) over the phone sight unseen in 1985. The aircraft was not airworthy and the wings had been removed for storage in the seller's basement. I trailered it home (then St. Lazare, Quebec) and although purchased as a project, realized it was actually in reasonable shape. I replaced the windshield, checked conformance on ADs, etc., did a few fabric repairs, put on



new tires and flew it on wheels and skis until 1989 (about 150 hours). I had too much fun (without parting with a lot of money), but, knowing what I know now, I'm glad I stopped flying it in 1989! I started the restoration that year, but career changes, a sailing adventure, kids and moves back and forth across the country, meant the airplane remained in boxes. In 1997, the bare fuselage frame was sitting in our garage so my young family walked past it every day.

One day, my four-year-old daughter Niki asked me what it was. I said, “It's an airplane” and dug out some old photos (of which we have very few) to prove it.

▲ McFadden started restoring CF-CLR (then CF-DEP) in 1989, but would restart in 1997 and again in 2013.

Next thing I knew she was in the garage, rag in hand, cleaning the dust off the frame with words to the effect “Daddy, we need to make it fly again.” I like to think that was the official start of the restoration, possibly because it created an obligation I couldn't ignore, but it was another 17 years before I continued the restoration in earnest.

Fall 2013 with daughters Niki away at university and Jessie about to follow, I started working on CF-CLR on a daily

PHOTOS: JESSE MCFADDEN

basis. I worked on the project every day, some days longer than others. My original goal was July 2016 (ha!), but eventually concluded it would be finished when there was nothing left to do — and not a day later!

On July 19, 2018, I picked up the C of A from Transport Canada, flew it for the first time since 1989 on Friday (a day later), did a few circuits, adjustments, and a very short cross-country over the weekend, and Monday morning loaded up the sleeping bag and headed for Oshkosh. CF-CLR was well received and I was inspired to spend another (less intensive) year making refinements before returning to AirVenture 2019.

From 2014, I kept a blog of my progress and one day received a call from Glen Mast in the U.S. He had purchased the airplane, then N96586, in Denver Co in 1966 for \$350. His brother John Mast imported it to Red Lake, Ont., as CF-DEP in 1973. It was fun to learn more about the history of the aircraft and so my wife, Claire, and I did some more sleuthing. We were able to create a chronology of ownership (including a copy of the original Bill of Sale), and events from its first flight June 26, 1946, in the hands of test pilot Bill Ward. After leaving the factory in Ohio; Texas, Oklahoma, Kansas, Colorado, Red Lake, Amos, Quebec, Green Bank, Markham, Montreal and now Thunder Bay have all been home bases.

The most challenging parts of the restoration were: a) motivation (often you work your butt off for weeks, months even, and cannot see progress), b) lack of parts availability, and c) the sparsely populated technical manuals and drawings (if available). Parts on the used market are just that, used, so the only alternative is fabrication, usually involving making tooling first.

In the 1980s in Montreal, I had the good fortune to work with a gentleman by the name of Angelo Perin, an extraordinarily talented individual. I paid attention and learned a whole lot about sheet metal work — and life. Angelo once told me, "It's okay to dump a rivet... it's not okay to leave it [dumped]." People comment on my skills and my answer is always the

same: I just keep doing things over and over again until I get an acceptable result! (It took seven attempts to make the bungee covers, for example.)

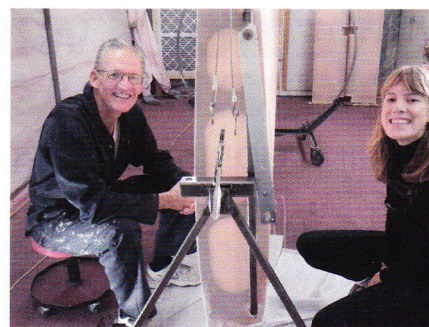
This strategy means it took an awful long time, but I fabricated from scratch: wing spars, aileron spars, cabin and fuselage stringers, the upper and lower cowlings, carb air intake, exhaust heat shroud, all engine baffles, belly panel and bungee covers, lower boot cowl, gear and wing root fairings, window sliders, right door skin, hat shelf, windshield door post trims, outboard aileron coves, half a dozen wing forward ribs, radio/transponder box, and map box doors. In addition, extensive repairs to the nose bowl, wheel pants (no bondo), carb air box and more. Oh — and the headliner, installed, pinned, trimmed, stitched, removed, repeat four times to get it right.

Making the forms for the components was sometimes most of the work. Trimming and fitting took a lot of time and is a high consequence activity. One slip and a week or month of work can be toast. In 2014, I made an apple press. It makes good cider, but mostly it was used to make Taylorcraft parts.

My daughter Jessie helped to rib stitch the wings and Nigel Jackson of Avtech in Thunder Bay did a fantastic job on the wool/leather seats and door cards. Great help from Hualdo Mendosa on the phone from Polyfiber and thanks to Matt Bunn for doing the dual inspection on the controls. The rest of the work, I did myself, with moral support and patience from friends and family. My friend and former airport colleague Bill Britt was a frequent project visitor. I once met him at a retirement celebration and he quipped "Good to see you out of the hangar!" The dangers of becoming a hangar hermit were real.

I should note that even with my sweat equity accounting for most of the labour, over 40 local businesses, another half dozen Canadian and about 20 U.S. entities derived direct economic benefit from CF-CLR's restoration — GA economics in action!

The airplane itself is just a lot of fun to fly. One unseen upgrade was to replace



▲ Scott and Jessie McFadden rib stitching wings of the eventual Gold Lindy-winning Taylorcraft.

the original control cable pulleys with ball bearing versions. A peculiarity of the BC12D is that, because of the design of the control system, elevator and aileron cable tensions change depending on the position of the controls. So cable tensions are set at about 5lbs at the "slack spots". Anyway, the new cables, pulleys and rigging resulted in controls that are light and smooth. Like many aircraft of the era, you need to be on your toes, you can fly hands off but not feet off.

The 65HP Continental of course has no electrical system so starting involves the armstrong method. By the book, cruise power is set by adjusting RPM to 2,150. On a typical summer day, this results in true airspeed of 90MPH and 4.2GPH (I resurrected the Stromberg carb mixture control), a little over 4 hours endurance.

Taylor used a NACA 23012 airfoil, a semi-symmetrical airfoil. This, plus tight cowlings and cabin means the Taylorcraft is a little faster compared with others in its class. A relatively low stall speed was maintained by a relatively large wing area. Stall is under 40MPH and I find the biggest challenge is getting the aircraft to stop flying! No flaps, so side slipping is a must especially when you've tried to "keep the speed up" in our Class D airspace at CYQT. Over the fence with the power off under 55 and round out to three points. Then I often need to speed up again to exit. The only way to do this is lift the tail otherwise you're airborne again. When conditions are less than ideal, wheel landings are preferable. In any case much more fun on grass! 🌱