

# A long and interesting journey

**M**y journey leading to the building and flying of my DynAero MCR-4S ZK-PSA had its origins back in 2000. At that time I visited the Auckland Big Boys' Toys show where then SAA member Tony Krzyzewski was displaying his Europa. Tony and I had worked together for the same company in 1983 in Auckland.

I did not realise that one could build as a kit a composite plane with such a modern appearance. At the time it was an idea only, as I had neither the time nor the money to contemplate such a project. However, it did not stop me from dreaming my thoughts, surfing the web, gaining lots of ideas and coming to some conclusions, among which was that if I ever had the opportunity to build a plane I wanted it to be a four-seater, it had to be economical with good performance and endurance and it had to look good — buggie flight characteristics. Lastly, it had to be advanced avionically to suit my computer background.

As part of this process I came upon the company DynAero based in Darois, 10 km out of Dijon in France. They had an aeroplane called an MCR-4S which appeared to have the attributes I required. What did I know about building planes or the theory associated with flying, let alone a pilot's licence? Zilch, diddly squat or whatever you want to call it.

I did find out that (MC)R stands for Michel Colomban, a famous French aeroplane designer who also designed the CriCri, and M(CR) stands for Christophe Robin, son of Pierre Robin, designer of the Robin range of aircraft well known throughout Europe.

As we know, time moves along and my circumstances changed regarding time and finances. I began to get a little busier on the web and found a site called [www.contraails.free.fr](http://www.contraails.free.fr)

The owner of this site was Gilles Thesee who was building an MCR-4S in Vienne, near Lyon, south of Dijon. This site reinforced my choice of aeroplane if I ever was going to own one, so I called him (several times) which ultimately led me to meeting him as an extension of a business trip to the US and the UK.

So in July 2006 I arrived in Lyon on the TGV from Paris and met Gilles. Now bearing in mind at this time I had probably 20 hours of flying time in my logbook, you can see I was a worldly experienced pilot, but blind faith is pretty powerful. I spent three days with Gilles, flying in the area in the MCR-4S and learning that the mistral wind that travels up the Rhône Valley can be pretty vigorous and that the 4S copes with 20 knot crosswinds as claimed in the handbook.

Over the next couple of days Gilles then flew me to the DynAero factory at Darois where I met Christophe Robin and his staff. As a result of this visit to the factory I decided that if I was going to purchase I was going to build it at the factory for the initial stages.

I received my quotation and, mindful of past experiences with New Zealand folk paying for Europas from New Zealand and not receiving them, was

Peter Armstrong and the only twin-engine Renault 8 in France. The box holds a much-travelled Rotax 914.



able to use Gilles as my minder and mentor, given my non-provess in French. I paid my deposit in December 2006 with the balance planned for April in 2007.

My company had won a prize to the Americas Cup racing in Valencia scheduled for May 2007, so I thought I would claim this, and in mid-May 2007 I arrived in Dijon with my Italian di Blasi folding bicycle which I had transported all the way from New Zealand.

The theory was that I would cycle the 9 km from my apartment in Dijon to Darois every day and back. That was the theory — what I did not allow for was the 1800 foot difference in elevation between the two locations, uphill to work and downhill at night. You might say downhill at night is all very well, but alas I did not allow for the French summer and its myriad bugs in my eyes, my mouth and other places. The bike got very quickly discarded and I managed to inveigle my way into a little red Renault 8 that belonged to DynAero. This worked a treat.

The kit I ordered was an advanced one with all major fabrications done — wings, tailplane, stabilator etc. I knew that because of the plane's all-carbon fibre nature I did not have the composite experience or the factory jigs to do any carbon fibre lay-ups in New Zealand. I also did not know how long it would take. Everyone's advice had been to ignore what any factory tells you about build time, so my initial sojourn was for six weeks as I had to meet an important date in July in Canada — my son's wedding.

Gilles, when building his 4S, decided that the DynAero cooling system was not good enough. He is a physics tutor from Grenoble and was able to use the skills of his students to design a Skunk works version of a new cooling system

for the 4S. Because Gilles was a close friend of Christophe Robin of DynAero, and DynAero did not like folk

playing around with their designs, it needed to be done as a Skunk works project.

This project was done in a separate hangar at Darois and was subsequently "discovered" by DynAero. With agreement between the parties, the moulds and designs were handed over to DynAero. This became part of my purchase requirement and my 4S is the first factory example to have this variety of cooling system fitted to a Rotax 914.

My next seven-week sojourn occurred during Rugby World Cup time in September–October 2007, and my most notable experience was being at the local rugby club's *stade* in Dijon for All Blacks versus France. The New Zealand anthem was played and this solitary Kiwi stood up and sang the national anthem. I sat down and then 30,000 French folk stood up and sang the "Marseilles".

I was pretty chirpy at half time when we were winning, but five minutes into the second half I just



by Peter A  
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knew we were going to lose. We did, and at the end of the game I had 30,000 French people slapping me on the back with their commiserations. Mind you, I got so many free beers out of it that evening that I was a very sorry chappie the next morning.

During this time I also received my Rotax 914, designed and built in Austria, shipped to Australia and air freighted all the way back to France — and still €2000 cheaper than had I purchased it in France. Now work that out — the most travelled Rotax 914 that you have seen without it ever flying. Again, because my plane had the new cooling system, the factory helped me install the engine and used the photos of our build process to provide the training and documentation for future EcoLight builds, as it came to be known.

I left the factory late November and returned in January, their winter, usually with lots of snow but in this instance very little but cold. They keep the factory heated at all times because of the gluing process, with carbon fibre requiring a consistent heat to maintain the appropriate bond strength. It was not cold inside, but the lack of insulation on the hangar must have made it an expensive process for DynAero.

The aeroplane was shipped to New Zealand with another 4S destined for Australia (I had assisted in its sale). At Auckland my 4S was slid out (we needed a 40 foot container because of the wing length, so we shipped a helluva lot of French air back to New Zealand) and the other 4S was also slid out, straight into another 40 foot container destined for Sydney.

The costs for the shipping component were shared between the two of us — including the French air!

It arrived in July 2008 because of French strikes. I was fortunate that because of the lateness of its arrival I was able to secure the hangar of Tony K, who had decided that due to health reasons he was not going to be able to complete his

Europa, and on 1 April 2008 I took over the lease of his hangar. The delay enabled my son to fit out my hangar and I now have my version of My Shed.

Between then and late 2009, slow progress was made because of business commitments. However, during this time I met David Rose who was assisting Jon Farmer in the construction of his Cheetah. David offered to assist me once the Cheetah project was finished and, as I was learning that all aeroplane building projects take longer than anticipated, we started working together in early 2010, three days a week, with my view that I would

be flying by Christmas 2010. That was not David's view, and he was right, I was wrong.

His previous plane building experience was invaluable, along with my having the opportunity to bounce ideas off someone. I had a fear that, being a composite structure with my lack of composite experience and being far from the factory, if I cocked it up it would take a long time to resolve. It also removed the temptation to procrastinate, by forcing the responsibility on to yourself that you are accountable to someone else, and that if you want their assistance you have to be responsible.

So what do I have, or rather what is fitted? The BRS chute is a story in itself. Paid for it but did not turn up with the plane because of the financial struggles of BRS with Cirrus, since resolved, but being the French led to a high degree of suspicion between DynAero and BRS. The end result was I went back to DynAero in 2010 and recovered my money which I then sent to BRS — and received my parachute seven weeks later.

I loaded the rocket in New Zealand (very carefully) and installed the system in my 4S. As BRS says results are not guaranteed, I just hope that if I ever have to use it, it works. The BRS system is heavy at 20 kg and my model is designed to be ejected with a payload of up to 850 kg (my MAUW is 750 kg) at up to 180 knots.

I have a GT Propellers two-blade constant speed hydraulic propeller because DynAero says that electric props are not as fast reacting. I paid for a three-blade prop (because it looks better), but DynAero thought better and sent me a two-blade unit. Just too hard to change and they had good reasons for what they thought was best suited to the plane — that's the French.

To assist the performance attributes of the aeroplane, an intercooler is fitted and I have the optional additional fuel capacity with a total capacity of 200 litres. At 20 lt/hr and 125 knot cruise that gives me a range of 1250 nm, wind effects excluded — more than my bladder can last.

As mentioned earlier, I wanted an advanced avionics plane, so in 2008 and 2009 I took myself off to Oshkosh with a list of vendors I wanted to see and meet. One of the advantages (and disadvantages) of taking longer than anticipated is that new things come to market.

That's the good news. The bad news is that if you have purchased and take longer, these new things come to market while you have the old things uninstalled. However, it did allow me to make a thorough analysis of what was available and is now integrated into my 4S.

I chose MGL predominantly after reviewing Dynon, GRT, AFS and Blue Mountain (now defunct) because they have offered, for my needs, the best value, feature/function and flexibility and are supported by an enthusiast in New Zealand, Stuart Parker of Sparxfly. I am not sorry I chose MGL.

I spent six months designing the avionics and am now the proud possessor of 32 pages of electrical schematics. It is all-electric — no round gauges anywhere and, being a Rotax 914 with no mechanical fuel pump, it

Rugby World Cups tend to generate a certain amount of rivalry.



Armstrong P2178



cooling system.





Structure and systems start to go together in the forward part of the cabin. The nose leg is aft of the firewall.



This Rotax 914 is equipped with intercooler for its turbocharger.



The builder has not neglected the underside for his striking scheme.



Left: Peter Armstrong (front) and David rose fit the BRS — very carefully.

Above: One partially completed MCR-4S is delivered at Ardmore. Only three more years to go!

Above right: David Rose checks the fit.



More on the avionics in a future *Sport Flying*.

the second battery (conventionally fused) supports the second fuel pump and the cigarette lighter socket. Both batteries have Tyco contactors protecting them, but more on the avionics in an upcoming article.

Because as PIC I do not have a large amount of experience, I reviewed this with my inspector, Tony Schischka of the CAA (and SAA). We agreed that I simply did not have enough experience

to be the test pilot, and SAA member Kevin Paulsen kindly assisted.

ZK-PSA took the air four years and two months after build commencement.

So what does it fly like? It is very neutral in its flight handling characteristics, with little trim adjustment required.

To meet the CAA approved SAA test requirements, we installed six plastic boxes, each containing two bags of sealed sand, for a total of 175 kg in the rear to meet the 750 kg MAUW at the aft C of G for testing purposes.

The plane stalls on the numbers: 61 knots clean and 45 knots at 30 degrees of flap, the new EcoLight cooling system works a treat and the temperatures and pressures remain in the green for all tests. The climb test from 500 feet to 7000 feet at  $V_y$  92 knots, the first 1000 feet at maximum power and then max

continuous, gave a consistent climb performance of just under 500 ft/min without dropping the rate of climb.

$V_{NE}$  is 165 knots, but we sneaked up to 174 with the controls being heavier and stiffer, as expected, with no other adverse results.

Speed at 33 in and 5300 rpm sees an IAS of about 125 knots. I don't know the true fuel flow yet as my K factor for fuel flow has yet to be properly calibrated. It's very easy to see 139 knots in a slight descent. Because of my inexperience I have yet to know whether this is good or not, but I know that, compared to the trusty Cessna 172 I learned to fly in, It's a helluva lot quicker than the 105–110 knots I used to see level flight at 35 lt/hr of 100LL. Still learning.

After our flight tests were complete and Kevin was confident of my ability to pilot the plane, this information was passed to the CAA where I was permitted to complete the endurance testing portion as PIC. Currently we are now up to 28 hours of the 40-hour fly-off. Like any test period there have been little things you discover, but I am very happy with its performance and capability.

As usual in any building there is a large round of thanks to be made to folk, and without David Rose's help this aircraft would be still looking for a completion Christmas. Other mentions include Rocket Signs for the artwork and graphics, Stu Warmen of Stu's Trim and Sound for the upholstery, Norm Bartlett for the initial flights and my family.

Those people I have forgotten — the barbecue and beers are yet to come this summer.