Progression CdA 0.3500 to 0.1750

I started back into competitive cycling when a friend of mine at the gym suggested we enter the “Rowers Revenge” triathlon, that was 2003. They substitute a 4km row on a Concept 2 static rowing machine for the swim (which suits me as I don’t swim), threw in a 25km sporting time trial course and followed that with a 7.5km run. I did a couple of these on a Trek 1000 with Ironman aftermarket tri-bars. Not exactly the most aero set up, but then I didn’t know much about aero at the time, just about enough to add the tri-bars. I’d taken them off when the photograph was taken as I was selling the bike.

I did a few more of these events including a series in 2005. Meanwhile I’d looked up my old club, High Wycombe CC, and entered a couple of evening time trials. I was very disappointed with my times at age 55. I couldn’t get near the times that I had done as a 15-year old. I invested in a better bike (2007), but it wasn’t much better in aero terms, even with the tri-bars I was still not doing the times that I wanted.
Three years later, after a bit of time off, getting married again and becoming a father, I got back into training with the objective of getting under the hour for a 25 TT and under 24 minutes for a 10 before I reached 65.

I did a bit of experimentation with a dedicated set of aero bars that I bought off eBay, fitted to the Madone. I bought my first aero helmet, which was a Kask K-31, which was basically a road helmet with a fairing on top. It had a hinged visor. It was reminiscent of riding with a balloon on my head. Fortunately, I don’t have any pictures from that era.

I bought an old low-end Pinarello road bike to use as a winter training bike towards the end of 2010. I didn’t want to use the Madone in bad weather. It was quite a small frame so I configured it as a time trial bike in the spring of 2011. I also bought a pair of SRAM S60 “aero” wheels (new), and a second hand disk off eBay. I used the Pinarello “TT bike” in two early season Open events in 2011, 27:14 for H10/22 (the Marlow by-pass course) and 1:12:10 for H25/2 (the Ski slope 25 course). In 2012 I did 26:51 and 1:08:02 on the same set-up.

At this stage I was really getting into the CdA aspects of performance after a friend at the club had suggested that I look at Aerolab in Golden Cheetah. The CdA on the Pinarello with a basic club skin suit, Kask-K-31, S60 front and FFWD disk came out at about 0.2400. Room for improvement.

The picture below is from when I used the Pinarello a few years later in the 2014 North Road Hard Riders event. The wheels in the picture are no-brand imports.
Towards the end of 2012 I bought what I thought was a TT bike, a Felt B12, but it was actually more of a triathlon bike. In 2013 I did 25:16 on H10/22 and 1:01:39 on H25/2.

Those with a keen eye will also spot an SRM power meter. This was bought as part of a project I was working on to do with ramp testing and interval training software running on a PC using ANT+. That was back around 2009. I still haven’t needed to change the battery.

These two pictures are from the Richmond Park events in 2013. The CdA on the Felt was coming in at about 0.2150, that’s with the S60 and Zipp Super 9 disk. I think I got one of the first in the country. I remember picking up the delivery box at Athlete Service in Henley and thinking that the box was empty.
The wheel is really light. It gets twice as heavy when you put a cassette, tyre and tube on it.

Around the spring of 2014 I saw an advert for a small P3 for sale as a complete bike. I bought it. It had FSA K-Force Light SRMs on it and the no-brand deep section wheels. What I didn’t know was that the SRMs had been damaged by pressure washing. It cost me over a thousand pounds to get them repaired, which was actually a complete replacement of everything but the crank arms, a very generous deal from SRM, so chapeau to them and TrainSmart who organized the repair / exchange.

I changed the bars for Vision ones, as I had concluded that these were very “aero”, and that notion was supported by a few contacts I had made on the timetrialingformum. I’d also “invested” in a Zipp 808 front wheel. The club skin suit had been upgraded to one in a better material, I’d also ditched the K-31 in favour of a Bambino.

This picture is from the Lesley Cole Good Friday 10TT.
I used this configuration in the two early-season Open events in 2014, 23:55 for H10/22 (the Marlow bypass course) and 59:47 for H25/2 (the Ski slope 25 course). Targets set in 2010 achieved, about 40 Watts gained through training and the equivalent gained by reducing CdA to around 0.1950.

This picture is from the HWCC Open 25 TT a few weeks later.

What else could I change on the P3 to lower CdA even more? Three significant changes have been:

I changed the bars to Ventus II Limited. These are used with Aura clamps and risers, credit to Xavier Disley for suggesting that one. I’m also riding with a higher position now, using risers, with little or no detrimental effect on my CdA.

Going Di2 to eliminate the cables required for mechanical front and rear mechs.

Going “single ring” with a 55 tooth ring from Fibrelyte in combination with removing the front mech..
The final change, recently, was to have some risers custom made with a grove milled into them to hide the single Di2 cable that comes down from the extensions. The small junction box is hidden inside of the left extension, and I only use one shifter with two buttons.

I’ve also upgraded the front wheel from a pre-Firecrest 808 to a 2016 808 NSW. In hindsight I should have kept the original 808 and bought an ENVE 7.8. I’ve borrowed one of those to test and it handles better than the 808 NSW in the wind and produces exactly the same CdA number.

In my 2016 aero tests and events I’m achieving a CdA of around 0.1750, quite a reduction from the 0.2400 of the Pinarello set-up in 2012, the 0.2150 of the Felt B12 in 2013, and even the 0.1950 that I was achieving with the P3 in 2014.
The front view shows the risers in place. The only cable visible is to the front brake, which is a TriRig Omega X, and even that cable is within the envelope of what’s behind it, so it’s not adding to the frontal area. The cable hanger / bearing cover is custom made to enable the Ventus II base bar to be positioned as low as possible, so that the base bar grips line up with the top tube when viewed from a 45 degree angle. This is very similar to the drooping bar configuration of the current Pinarello TT machines. The Di2 cable comes out of a hole drilled in the extension and into the recess. It is taped over to keep it in place.

The rear view shows the Di2 cable running over the surface of the Venus II base bar, and along side the rear brake cable to the top tube. The top tube has been drilled to allow the Di2 cable to enter the top tube and drop down within the down tube to a junction box mounted under the bottom bracket.

The Steerer has been cut down so that the top cover fits flush to the top of the stem which is an integral part of the Ventus II base bar. There is only one clamping screw on the Ventus “stem” so having a slightly shorter steerer than you would normally have for a two bolt stem is not an issue.

The elbow pads are from Zipp Vuka clip-ons. They are mounted onto the part of the extensions that extends behind the Aura clamps. This enables them to be positioned for comfort and for them to be rotated to an angle that supports a bit of outward pressure from the elbows. I find that this makes the position very stable and improves handling with the upper body acting as a single unit.

Ends