STILL GEEKY
AFTER ALL THESE YEARS

Those with long memories (and the inclination to read geeky posts on the net) may recall my first UniBlog, "Not Rocket Science?", which was posted way back in October 2007. The last line of that blog was "So, if you thought that playing darts isn't rocket science, just watch this space!".

This is now, amazingly, my 110th UniBlog and in many of the 108 between this and that first I've indeed tried to show how knowing something about rocket science (or, to be geekily pedantic, "aeroballistics") can help dart players get better results.

Although my most recent blogs are archived on this spiffy new Unicorn website under "Quick Links", the old ones have, at least temporarily, fallen down the back of the cyber-sofa and are no longer readily available to the discerning (OK, geeky again) reader. But even if they were, trying to find explanations for any specific aspect of dart flight in them would involve a dauntingly tedious trawl through 11 verbose years' worth of pearls of scientific wisdom (no derisive snorts please!).

I have thus decided to commence forthwith a refresher course showing how rocket science still relates to darts. Apologies to those who remember all the stuff from the first time around, but welcome to those for whom it will all be new!

For those newbies, I'd better start with tutor credentials. Back in 2007 when "The UniBoffin" was introduced as "Unicorn's very own tame egg-head", some suspicious souls thought I might be less a genuine boffin than a figment of Unicorn PR department's imagination. So let me assure you that, firstly, their imagination is not that perverse (although, looking at the accompanying avatar they came up with, that's arguable!) and, secondly, being a rocket scientist and writing papers and textbooks on the subject really did pay my mortgage for nearly 40 years (yes, I'm that old!).

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So, credentials established, on to Lesson One. For which I'm rather contrarily going to steal something from my 100th blog and establish an ABC of three aspects which, for all practical purposes, make up a dart's trajectory:

A) A parabolic curve described by the dart's centre of gravity (cg) which is solely determined by its velocity (ie speed and direction of travel) on release, unaffected by the dart's weight, angle, or design.

B) Perturbations from that parabola due to aerodynamic forces. These are usually of only a few millimetres, maybe a centimetre, with variability mostly down to lift from the flights (lift in this sense can act in any direction perpendicular to the trajectory, even downwards). There is also a more consistent drag effect which, like that from lift, is inversely proportional to dart weight.

C) In-flight angular motion of the dart about its cg, the characteristics of which are mainly dependent on that lift force from the flights (and hence their shape and size), their distance from the cg, and the "moment of inertia" of the whole dart – – a combination of the weight of all its various components multiplied by the square of their distance from the cg..

So, as I said in my 100th blog, if your darts hit the board at reasonable angles but tend to miss by more than a few millimetres (maybe a centimetre) you're simply throwing the cgs along the wrong parabolas and no amount of clever aerodynamics short of a guidance system can help. Try a different barrel shape or grip - or maybe just practice some more (I made a note of that to myself last time and it's started to work!).

However, for those who do throw their darts' cgs along the right parabola, there are still two variable aspects that can go wrong and make them miss the target; the aerodynamic perturbations from that parabola and the offset of the point from the cg's trajectory at impact.

And that is where applying rocket science and good aerodynamic design can help, either by minimising these two aspects or, better still, by making them tend to cancel each other out. Which hopefully justifies me geekily proceeding next time to Lesson Two!