Thrust project
What goes into designing the fastest boat in the world?

Lorne Campbell and Butch Dalrymple-Smith:

LORNE CAMPBELL: My name is Lorne Campbell. I'm a naval architect, basically a boat designer but specialising in high speed boats. And my role was designing this shape, if you like.

LORNE CAMPBELL: You look back on history and see what's gone before, you use your own experience. You use what you've got to use. You know, we have an engine, we've got to use that engine. Therefore we have to design a boat that will carry that engine and withstand the forces of that engine.

But if the boat's too large, we don't get the speed we want. If the boat's too small, the engine overpowers the boat. So you have to use to a certain extent, you start with experience. The more experienced you are, the closer you can get from the beginning. And so obviously the boat has to float, so you've got to get your volume right, Archimedes principle a bit of mathematics involved in that.

And then once you start driving it through the water, you've got to start with parting of the water like a ship. But then as you go faster, in order to get anywhere, you've got to skid over the water because pushing water, which is 800 times denser than air, apart gets to be very hard work and you rapidly run out of power. You're bulldozing the water if you like.

So you've got to get up on top. And then then when you're on top, you have to control it.

And we have ended up with hydrofoils as being not the most efficient way of achieving the record, but the way that is safest and with most control because we could make the boat more efficient by having a hydroplane shape where we just plane on these surfaces here.

BUTCH DALRYMPLE SMITH: My real name is Terek Dalrymple Smith and that's quite impossible. So everyone calls me Butch and have done since I was a baby, so it's perfectly normal.

My role in the project is that I designed the hydrofoils and because there were one or two other things that cropped up that needed to be done, I filled in a little bit. I designed the air intake for the model C3.2B. Also, because the aft hydrofoils steer the boat, that means that I designed the steering and also of course the the hydrofoil control system, which is just the mechanical side of it. I don't understand the electronics at all, but the mechanical system I did.

BUTCH DALRYMPLE SMITH: At university I studied medicine and subsequently I discovered firstly that I love sailing. I've sailed all my life and I've done a lot of competitive sailing, so around the world, done all that sort of stuff. And I should really have studied aeronautical engineering, that was my big mistake.

My sister studied aeronautical engineering, but I didn't. And because of my interest in sailing, I started designing boats and I have a sort of engineering bent, so it wasn't totally outrageous. I've designed hydraulic road building machines when I worked for the AMI group, I put the the ventilation flat fans into the Sydney Opera House, which is quite a claim for fame.

But anyway, obviously to design yachts, I had to learn all about naval architecture and I actually ended up teaching naval architecture at Turin University. And so it meant that although I'm technically not allowed to call myself a naval architect, my students that I was teaching went on to become naval architects.

So I think that kind of qualifies me as being a naval architect.