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Up in the air!

The world wept when the Hindenburg turned into a fireball in 1937, killing around a third of the 97 passengers and crew on board. But Hokan Colting is not put off. He is in love with all things dirigible, and he believes that the new generation of airships will revolutionise everything from communications to safaris. Alison Motluk found Colting surprisingly down to earth when she spoke to him at his headquarters in Newmarket, Ontario



Photo: Russell Monk

What makes you think airships have a future - given previous nightmares?

People always go back to the Hindenburg. The truth is the safety record of today's airships is excellent.

What has changed?

The Hindenburg used hydrogen as a lifting gas, which is explosive. We use helium. It doesn't ignite, explode or burn. We also have much better fabrics: they had ones you could tear by hand, ours are ten times stronger than steel at the same weight. And our engines are better - theirs needed 24-hour supervision, ours are reliable.

So what interested you about them?

When I first flew in an airship, it was fantastic. I thought: "There must be a market here." But when they landed, there were over 20 people on the ground helping the pilot land. You don't need a calculator to figure out that it is far too costly to have 20 staff when you take off or land. So I thought, if I can just come up with an airship that doesn't need so many people... I accumulated books and tried to figure out why they needed so much help.

And why did they?

It goes back to the shape. A cigar-shaped airship has fins at the back, and for them to be effective there has to be airflow over them. But when the airship slows down to land, you are losing that steerage. I started to experiment with models to devise another way to steer. If you don't have airflow, you have to create it. You do that with engines and propellers. You need differential power either side of the airship, and deflected thrust to push you up and down.

What kinds of engines do you use?

At first we used engines from ultra-light airplanes. Now we use converted turbo-diesel engines, the sort used for heavier trucks and transports. Initially I was going to use those for a cigar-shaped airship, but then it dawned on me that you could use this on any shape. Then I thought back to ballooning again. Initially, hot air balloons were all a standard balloon shape. But I built some of the first specially shaped balloons - you know, cans, bottles.

But why a sphere?

It has so many advantages. For example, a cigar-shaped airship is tied

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down by the nose and has to be able to swivel 360 degrees as the wind changes, so if the airship is 60 metres long, you need a 120-metre diameter circle to park it.

What did airship aficionados think?

I went to some so-called airship experts and presented my idea to them. And pretty much, though they didn't laugh in my face, there was snickering. I was told that this couldn't be made: "You won't be able to control it", and "It's not steerable". I told them I had made some radio-controlled models and they worked very well. "Well, it won't work if you scale it," they told me. I kept arguing. Then came the killer: "If it is as good as you say, somebody else would have done it already." So I built the first prototype in 1991, and it flew very well.

You taught yourself how to fly hot-air balloons. Did you teach yourself how to design too?

Yes, I'm not an engineer. But I'm a firm believer that you can do anything that you really want to do.

But aren't you afraid you've left out some vital bolt or something that engineers were taught in school was essential?

I now use consulting engineers to help with things that I can't do, like stress analysis. And I usually over-build - make things too strong and a little too heavy. But I have engineers looking at it all.

You've had at least one emergency landing...

People call every landing in the world an emergency landing when they see it. They say: "Oh, he crashed!" So, yeah, we have had emergency landings. OK, we have had a couple of times when the engines have failed.

And?

It's not what people think of as an emergency landing. With an airship or a balloon, you fly on until you come to a suitable field. You aren't forced down. In a heavier-than-air craft like a helicopter or an airplane, if you get engine failure, you go down. In an airship, if I get engine failure in the morning, I can fly on until the evening if I want. On board, we have the means for dumping helium to descend, and we also have emergency ballast of water or sand, so we can dump to ascend.

Ever had any incidents where you've feared for your life?

No.

What's the highest you've flown in it?

We took it up to 6234 metres (20,450 feet), which is the world record for airships. Traditional airships can only go up to about 1540 metres. After that, we descended, and sat in the cabin with the door open and had lunch.

How do you eat up there?

We just had cold food: sandwiches and water and fruit.

Do you have a bathroom on board?

No, we had a pail with a lid.

What is flying in an airship like compared with other air vehicles? It looks very slow...

So far the spherical airships fly at about 30 knots, or about 55 kilometres per hour. It is slow, absolutely, but it's very peaceful. That time, after the record, was the most fantastic flight experience. When we shut off the engines, we were just sitting on top of the clouds. It was almost religious. I don't know any better word to explain the feeling of it. It was very moving.

Why is the sphere so good for high altitudes?

When you're climbing up through the atmosphere, helium expands. By 3000 feet, it has expanded 10 per cent over sea level. By 20,000 feet, the volume you had at sea level has doubled. When you're coming up to 60,000 to 70,000 feet, you have 16 to 17 times the volume you had. Going the other way around, it means you can only inflate an airship to 6 per cent at ground level for it to fully expand at 60,000 to 70,000 feet.

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The sphere is the most volume-efficient shape: the helium will naturally occupy the space in the top centre and will act as an upward vertical force along the central vertical axis. That will stabilise the airship in all flight conditions. In a cigar shape, the helium may slosh from side to side, creating severe instability. Traditional low-altitude airships don't have this problem because they don't have to allow for 1700 per cent gas expansion.

You're hoping to be the first to go around the world in a non-stop flight?

Yes, that's part of the high-altitude development.

Do you know when?

No - sometime next year. There is one more stepping stone before we can send an airship up into the stratosphere. They're going to be unmanned, of course, and will have an autonomous flight control system. You program it but it can be overridden from the ground. We will have to do an extended flight from 30,000 to 40,000 feet to test the autonomous flight control system among other things.

Who's going to want these airships?

High-altitude airships will be used for wireless telecommunications. For a signal to go from the ground to a geostationary satellite and down again, it's a round trip of 70,000 kilometres. Even at the speed of light, that still creates a delay. Or else you put up all these telephone towers everywhere.

What's wrong with towers?

You lose contact or your conversation is broken because you're out of range. Towers usually depend on line-of-sight contact. Airships are the equivalent of having a tower 20 kilometres high. And you won't get dead zones.

Will we see your airships up there?

Very likely. But there won't be that many. There won't be clusters of them.

But aren't you going to need quite a few to replace all those satellites and towers?

They won't replace all of them. And air ships are going to have an awfully big coverage area. For example, one airship could cover greater London all the way to the English Channel - or greater Atlanta and surrounding areas.

Who else is thinking of buying them?

The US government wants to have 11 or 12 airships around its borders to detect everything from incoming missiles to illegal immigrants. They'll want more for communications, broadcast, surveillance and so on. Currently they use satellites and robot planes but the planes can't stay in station. They want something that just sits there.

How long will your airships stay in place?

Initially, about 30 days. Eventually, several years.

What else can they do?

We have some artists' drawings of a sightseeing airship. It'll have a glass bottom, and there'll be lots of space. It's not like a sightseeing helicopter where you're strapped into your seat. You can walk up to the bar and get a drink, look at the sights at a leisurely pace. You would leave from, say, Niagara Falls and fly up over the falls for an hour. We have had companies in Africa contacting us.

For safaris?

Yes. We sold some balloons for balloon safaris in Kenya. They inflate the balloon at sunrise, then they fly with the wind. But they have to land after an hour. With an airship, you can go over the animals and then come back and land where you started. You can also fly at night and have infrared vision to see the animals hunting. And I have heard that there is an environmental impact from the chase vehicles. Following the hot-air balloon on the ground. The desert is fragile. But if you have an airship, you do your tour, come back and land. You don't have that impact.

Can you earn a living making prototypes?

It has been really tough. We have had to pay for everything ourselves. There have been times when we wondered if we would be able to continue. Luckily the financial hardships are behind us.

Did your parents have this inventive streak?

No, not really. They were farmers.

And your four kids? Are they inventors?

Not yet!

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