

LANGE AVIATION ANTARES 23

The ANTARES 23 in the World Gliding Championships, Uvalde, TX, 2012
Peter Harvey, member British Gliding Team, © Lange Aviation 2012



really must thank his enormous generosity in letting a stranger from England, take his beautiful new machine across the world to race in a hot, dusty airfield - a real leap of faith. Thank you so much Hartmut. I hope you continue to have as much fun as I did in those first 3 weeks.

The 23m Antares is a development of the 20m electric Antares 20E, with the wing extended to 23m, but maintaining the super ellipse plan form and thin profile. The max weight is increased to 850kg, providing a loading range from 32kg/m² to 58kg/m². This is new territory for the open class and we would have to learn the techniques to optimise handling, speed and performance at all weights. Whilst new to the open class, Lange Aviation has been developing fuel cell powered machines for the DLR project where 65kg/m² is considered a relatively low wing loading.

We went to the 2012 World Gliding Championships in Uvalde, Texas with the new 23-metre Antares (wing span 23m, new Open Class). It was a truly amazing adventure and I hope the following provides a useful insight into the process of taking a design concept and proving it under the most testing regime of world championship international gliding competition - the best pilots, the best gliders, the most competitive environment.

The Antares 23E & Antares 23T

Before describing the amazing flying, let me introduce you to my partner in this adventure, the new Antares 23metre. Da daaa!

A couple of years ago, Axel Lange had described some of his dreams for the future. Like many glider pilots talking over a coffee, we discussed characteristics the ideal competition glider might have.

Responsive handling, fantastic loading range, comfortable cockpit ergonomics, simple operation, reliable, strong, easy on the ground, world beating performance and above all, fun.

Easy really !

It was beyond my hopes that 2012 would begin with a phone call from Axel saying he thought the machine would be ready and would I be interested in flying it in Texas?

YEEEEEEEESSSSSSSSSS, AXEL!!! Actually, I'm a cool competition pilot so tried to hide my excitement and stupidity, while asking almost intelligent questions about the design, performance projections, timescales, logistics, arrangements, blah, blah. I don't remember too much of the phone call, but it was clear that this was a project involving a lot of people - a real team effort - and that there was a lot of responsibility on everyone to work hard and deliver.

Texas and the new Antares 23. What a project!

This machine, the second production model, would belong to Hartmut Lodes, one of the original leaders of the ETA project, so no stranger to leading edge glider technology. I

New again was the Solo 2 stroke turbo engine, a beautiful new 'light weight, low-vibration set-up with large propeller and step down gearing for significantly increased output, but incredibly simple operation. Unfortunately, with shipping to Texas, we ran out of time and took the decision to fly as a glider. Very retro!

Completing the Lange team was Ludwig Starke's Antares 23E to be flown by fellow Austrian pilot Josef Kammerhofer. The new 23m wing on the proven 20m electric powered fuselage.

Of course, we weren't the only manufacturer with a new glider. In fact, there was an unusual air of expectancy over the 2012 World Gliding Championships, with so many new supermodels. Schempp-Hirth had seven Quintus. The Quintus uses the Antares 23m wing, but re-angled at the outer section and different winglets. We expected performances of the Quintus and Antares to be largely similar. Jonkers had four JS1C. These machines took the 18m JS1, with extended outer tips to



21m span. The increased weight meant they should be able to reach 58kg/m², too. Binder had two EB29, flying at 25m span as per last year.

Dick Butler had just completed his fabulous 30m span Concordia. Pure Hollywood. Dick is a real gentleman and has spent many years following a dream to make his own glider and fly it for his country, in his own county. It worked too, such a beautiful, slim silhouette and fantastic performance.

What a line-up of new machines, with difference performance strategies and spans

It's been at least 40 years since so many manufacturers produced new gliders at the same moment, the same site, the same championship. That the competition should be in Texas, one of the most consistently fast airmasses in the world and with tasks that would be long, meant that the setting was established to test man and machine to the limit.

A word about Texas

Texas is an unrelenting hard place to fly, hard in the physical sense. The air is also surprising stable, needing the huge quantities of heat to get thermals moving. And there is plenty of heat. Many days saw 40 degrees, with night time temperatures rarely dropping into the

20s. With an average 5 hours in the air and sometimes much longer, glider performance, ergonomics and ease of use would be crucial.

The Uvalde task area is generally flat, with the coast some 200km south. The terrain is covered in one huge oilfield with thousands of nodding donkeys and new wells being dug. In fact, Texas is undergoing a new oil and gas boom with many thousands of wells planned. Just 30km north, a geologic fault line allowed limestone to gently rise from the plain to form rolling hillsides, eventually lifting some 500m, enough to generally provide a higher airmass, but few landing opportunities in the wild trees and brush. Indeed, this is the fabled 'wild lands' of Texas cowboy movies.

Uvalde is small, formed at the cross section of freeways 90 and 83, but with a small river, springing from the fault line just north, flowing through the town centre. These days the high street is full of fast food outlets, but that's not surprising given that these two freeways are now the longest in the USA, spanning east to west coast, gulf coast to Canada.

There is nothing about this event that is average

Just getting to the event was an epic. Gliders and trailers needed transporting from all over the world. Cars and trucks, metric tow balls (or imperial trailer hooks) truck electric converters, 110volt mains, crew, accommodation, licences, paperwork. Just getting an airworthy glider to the start line and ready to race was a huge achievement. Indeed, I must take this opportunity to thank Andy Sandhoefner from the Austrian team and Antares 18m pilot whogave up many hours, days even, of his time arranging transport, by air, of our Antares to Texas. Andy, you're a legend!

Getting any work done outside was murderous in the humidity and heat. Luckily no flies or bugs to worry, just snakes and some very interesting spiders...

A typical flying day

My trusty crew, Baldrick, gets up early (or goes to bed late) and fills the Antares in the dark. He says the air is cooler. Whist he waits for the 380 litres to fill the wings and tail, he

cleans the wings from the fine dust, loads the batteries and checks the systems. The focus is usually on pilots, but the reality is we are nothing without our support crew - our team. Baldrick and I have done many competitions together, so I know he was particularly interested in the Antares systems and how easy they are in use - sophisticated design making the complex simple. There's the electrically operated main wheel, the fuselage air extract system to increase ventilation (but reduce cockpit air leakage), the calibrated total energy system, the twin tail tanks, the electrical switched wing water system. The water system has 6 dump valves per wing. A benefit is the speed of water dumping and ability to optimise handling with span wise loading.

Back to the crew

With Baldrick sweating away as the sun rises (I'm in bed, of course), another 129 gliders are also being prepared. Often the crews work together making an international team of sweat, suntan oil and swearing. Indeed, to the side of us were the two French Open class of Laurent Aboulin and Sylvain Gerbaud and behind was German ace Tassilo Bode - all three with Quintus. We spent a lot of time in the first week comparing notes, working on techniques, improving water filling and stealing beer.

By 9.00am, the glider was usually ready, driven over the weighing scales and parked next to the grid position (assuming no rattle snakes were found). Then breakfast as the temperature reached well into the 30s. Briefing at 10, first launch could be 11.30am. Take off, wait to start (could be 2 hours), fly the task, land at 6-7.30pm, sort the glider, clean up, eat, wash, sleep. Repeat. Repeat. Repeat. The pilots were drained. The crews were drained. The gliders were drained. Anything loose fell off. Anything weak broke. I think it reasonable to

say that if a glider component is good enough for a world championship, it should be fine for normal club use. Nothing major failed for us. We fixed a couple of minor items and made some notes for minor improvements. We were very happy.



What about the flying?

Surprisingly easy. The handling with 23m is really straightforward and not at all tiring. Our machine still had the original 18m fuselage, so rudder a little small, but no more effort than my trusty Nimbus 4. The production Antares 23 will have a new, larger fin, so that will make co-ordination better still. The large cockpit and great ventilation meant the long flights were less tiring too. The view is exceptional from the large perspex canopy. One's legs fit either side of the instrument binnacle allowing easy movement and stretching of the legs. It also meant that the feet can stay warm in the sun when high. Comfort levels are a vital factor for long flights and maintaining performance.

One of the most surprising factors was the Lange total energy system. In Texas, the thermals were fast bubbles of strong lift - fast, but very small. With our high cruise speeds, it was absolutely essential to pull immediately and positively into the thermal and for this, the total energy was essential. I have to say that the Antares has the best TE I have ever flown in, with negligible 'stick thermal' even when converting from 220kph to 100kph in a zoom climb. I don't want to go back to normal systems ever again!

Axel and Ludwig worked on theoretical speeds and centre of gravity calculations and

we experimented with best set-up and technique to optimise Hartmut's glider. Andor in the factory gave me technical tips and between us all, we developed a performance strategy. A real team effort.

Typical flying speeds were established as follows

Full of water, thermal between 110 and 120kph, best glide 148kph (!), cruise with flap minus 2 until 200kph, then flap minus 3. If in doubt, fly faster. This is a seriously fast machine! Even with these high speeds, it was easy to hear the air over the wing and the breakaway at stall. I found the best technique for thermalling was 110-120kph (Axel said to fly fast), with slight inside slip, listening to just avoid the sound of the breakaway.

The climb remained excellent and with the smaller span, I found I could thermal inside many others, even with the high speed. That was very helpful with the small, powerful Texas bubbles.

A negative feature of the bubbles, was flying without a team buddy. Team flying is a normal part of top competition flying and when done well, a joy to share. My normal team mate, Steve Jones, was unable to make it this year, so I found myself flying alongside others, but without their radio help. It was all too easy to

fly past a small bubble, but without a team mate to call me back.

As a strategy I found it useful to leave later and use the Antares' performance advantage to play catch up. I am convinced the Antares held an advantage above 200kph over everything. Indeed, with three day wins, a 2nd and a 3rd place, during 7508km of flown tasks (in addition to practice) and the fastest speed ever in Uvalde of 161kph (!), it's clear the Antares 23m has world beating performance.

But what's it really like to fly in Texas?

Day 6 was probably the most interesting, with everything thrown at us over the 710km task.

Forecast was for possible strong development in the hill country, but a long day and little likelihood of the sea breeze penetrating too far inland. We had been achieving 140kph regularly over the last few tasks, so planned on about 5 hours. That meant waiting almost 1.5 hours before starting the 710km! I left with the Germans Tassilo Bode and Michael Sommer, but within 20km chose a differing route. Once again, I paid the price for flying alone and missed bubbles I just knew were close by. The frustration increased as I glided lower into the hill country. With few landing options and the lift broken, I was forced to take a poor climb from bottom of a stack of 20 gliders. Interestingly, the circling gliders were spread - not packed tight into a thermal core, but over a large area. Indeed, there seemed no strong core, just broken general lift, in spite of good clouds above. The pattern continued as I remained low, unable to find an elusive core to climb into the better, upper air mass. Approaching the north-west turn, Michael and Tassilo were exiting high and fast, already far ahead, while I was entering low and slow. Some days are like this.

Pushing across the hill country, the poor lift and frustration continued, albeit in good company with another eight open class for company. Two more small bubbles and I once again missed the cores, falling back still further. The final straw was three good clouds in succession failing to give a climb and every-



one else disappearing into the distance. Nothing was working. AAAHHHHHHHHH!

Well some days are like that too

I gave up. Sat back, had a drink, admired the view and wondered what it was all about.

So the clouds aren't working. Solution? Aim for the blue of course. Silly, but if all else fails, do something different. A minute later and I hit 4.5m climb. That's better. Ten minutes later another 4m climb, then a fantastic run of 120km towards the easterly turn along a developing street to the south everyone else missed as they flew towards the nearer clouds and the increasing overdevelopment. We're back in business.

With the next turn shrouded in heavy rain under a gigantic Texas cumulonimbus and with another heavy rain shower fast approaching, there seemed just a small gap to squeeze into the TP. Under a flat, wide, ominously dark storm cloud, the race was now to find some lift, get the turn and get out before it got too horrible. Often the best lift is next to, or in the rain of a storm, so I pushed carefully towards the wall of rain. As I approached, the two rain showers were closing together, blocking the turn completely. With time running out, I pushed to the turn and the final 2km in heavy rain and sink.

And what rain! It was like flying in a bath. It poured in the cockpit from everywhere. The

vents were closed, but still it came. The noise was deafening. The darkness like night, the turbulence extreme. Nothing on the radio over the deafening noise and then I realised it was 50% hail. Just the thin canopy protecting me from an ice pounding. I slowed. That's not so bad, because heavy rain means heavy sink, but hail often means lift.

However, this was going down fast, so with a quick log in the TP zone it was time to escape back towards the light to visibility, to safety, to possible landings, to life.

Why do we do these stupid, stupid, STUPID things? Thank goodness this glider is so strong. Just into the clear air with a huge, black rolling ceiling of cloud above, a wall of rain behind, my heart rate going off the scale and lightning bolts cracking past the wingtip.

Then lift, wonderful lift. 2m, 3m, 5, 7m up, up, up! Yes, yes, yes! 7m yeeeeehaaaa! I put the Antares on a wingtip, give thanks to the maker (not you Axel - the big cheese) and screamed skywards watching the altimeter spinning and trying to clean up the cockpit, where everything had been thrown in a mess. Still racing upwards and with 500m to base, I pushed for the south and the edge - freedom. At 200kph, I skipped clear of the monster, skimming the wisps and thankful of the great escape - high and fast.

Some days are like that ;-)

One more towering cumulonimbus to dance around to the south, then push gently to the blue and a completely stable airmass. It seems strange a day can change so quickly, but with 700km to task, perhaps not so surprising. Eventually I met up with Oscar Goudriaan and Laurent Aboulin, then Michael and Tassilo scratch in beneath us as we tip toed homewards in the smooth, blue evening bubbles. We knew the day winner would be within our gaggle (Oscar by a few seconds), but the art was to work together and get home. Finally, the gaggle climbed up onto glide and with a wave we shared the long glide home and a cold beer. Magic.

I wish more days were like that

We flew everyday, except the mandatory rest day. Over 7500km of tasks, at high speed in thermal, sheer wave, storm and blue. The big Texan smile spread to us all and we did 'have a nice day!' The Texans made us very welcome, the organisers were superb and once again, we shared one of life's great experiences with our friends from around the world. A true privilege shared.

The Antares is a dream to fly and with the longer 23m span and higher loading, its beautiful wing forms a most graceful and recognisable curve. The turbo option is beautifully engineered, powerful and yet simple, so will offer many years of reliable, lower cost performance - a real alternative. As a team effort, we showed what can be done with these modern machines.

So Axel, you have produced a world class glider, 15m handling with proven top class performance.

Above all, it was fun

Peter Harvey
Britisches Gliding Team
Uvalde 2012