

Timothy Compston finds out why aerostats are making their presence felt in the on-going battle to secure borders and fight back against drug smugglers

LIGHTER THAN AIR SURVEILLANCE



Although drones remain very much in the news, aerostats are one family of aerial systems that have much to commend them and are taking off like never before, thanks to a wide range of model options and more compact WAMI (Wide Area Monitoring Imagery) sensor platforms. The ability to deliver a persistent overview of areas – for days or even weeks at a time – from hundreds or thousands of feet above the surrounding landscape makes such lighter-than-air systems stand out from the crowd.

Perhaps signalling the shape of things to come for aerostats, the Olympics in Rio saw the high profile deployment of four tactical systems. These aerostats were tasked with floating continuously over key Olympic venues under, an approximately, US \$8 million contract. The solution in question, chosen by the authorities, was the OMNI aerostat from ALTAVE – the Brazilian lighter-than-air aerospace company – which, the vendor claims, represents the first wide area, persistent surveillance, aerostat developed specifically for civilian use.

“It can stay on station for hours or even days at a time – depending on the weather

Speaking to Bruno de Azevedo, director and co-founder of ALTAVE for an inside track on the OMNI project, he was keen to underline the security challenges the event faced: “The Olympics is a complex event for security. The authorities realised that filling the city with cameras wouldn’t solve the problem – the information would be scattered”. For Bruno Avena de Azevedo the beauty of the ALTAVE OMNI as an aerostat is the way it offers a big picture or – more technically speaking – enhanced situational awareness.

Drilling down into some of the performance characteristics of the OMNI, Bruno Avena de Azevedo says that the area watched during the Olympics – when put into the context of the four aerostats – corresponded to an impressive 13 percent of the full Rio city area: “In fact this comprised almost 100 percent of the four clusters that held the games. Each ALTAVE OMNI captured the equivalent of 60 full HD [High Definition] cameras – a huge amount of data – with the strong advantage that this was in a continuous image, making it easy to understand the context,” explains Bruno Avena de Azevedo.

Beyond the Olympics, Bruno Avena de Azevedo was keen to flag up the potential for aerostats – like its ALTAVE HORIZONTE model – to operate in the border protection arena: “Border security is a hot topic at the moment. We have had multiple discussions on this matter with different countries, especially where the landscape requires a higher observation spot or an ‘over the hill’ monitoring capability”. He adds that scanning the horizon from above with thermal imagery, and zooming in to do recognition, is a valuable border security resource.

Still on border security, Bruno Avena de Azevedo reckons that a tactic that can pay dividends is to operate aerostats in an ‘itinerant way’ with them staying for days or weeks in the same location before being re-deployed to another spot: “This generates an ‘availability heuristic’, where people who previously saw the aerostat will believe it may suddenly take off again in that place, even if it has moved far away,” he concludes.

Returning to the subject of aerostats and the Olympics, Doug Rombough, vice-president for business development at US-based LOGOS Technologies, confirms that the company supplied its Simeras – a wide-area sensor featuring 13 cameras – as part of the ALTAVE OMNI solution. Rombough believes that this move marked the first time that a non-US Government entity had operated a wide-area motion imagery (WAMI) sensor at an international sporting event. “We built Simeras

to be a day-only sensor because we wanted to make it easy to push through the US Government’s export licensing requirements. Coming in at 40lbs [18kg] also meant it could go on a very small aerostat. That made it something that the Brazilians [ALTAVE] were particularly interested in,” says Rombough.

When we talk, Rombough rewinds the clock to the early days of WAMI sensors. He explains, for instance, that WAMI was initially developed by Dr John Marion – now the President of Logos Technologies – at Lawrence Livermore National Laboratory, which led to a system as part of the Constant Hawk initiative. According to Rombough, this weighed in at a massive 1,500lbs [680kg], meaning it basically took up an entire aircraft. “Ever since that sensor, we have been pushing forward with the size, weight and power reduction of wide-area motion imagery systems. In fact, we were asked to build the very first system to go on an aerostat”.

Fast forward to today and Rombough points out that it is possible to offer something at 40lbs [18kg] like Simeras. Offering a glimpse of the future, he tells me that another, even more capable, sensor called KS200 is also in the works. This, according to Rombough, is essentially a younger – and more compact – brother to one of the company’s proven solutions, the Kestrel which racked up over 60,000 hours with US forces in Afghanistan. “We are in the process of building our new day/night sensor [the KS200] that weighs in at only 80lbs [36kg]. It is going to be just as capable as the original Kestrel that has been very successful in combat”.

The resurgence in aerostat systems, at a tactical and strategic level, in recent years can partially be attributed to the way that they were rolled out by the US military in both Iraq and Afghanistan. Now, post draw-down, many of these battle-proven units are being trialled and deployed by other government agencies for non-military applications. A case in point is US Customs and Border Protection (CBP), which has been operating tactical aerostats for the last few years in areas like the Rio Grande valley in Southern Texas, adjacent to the US – Mexico border. “Everything from the tactical aerostats programme is all DoD [Department of Defence] re-use equipment. That is how we acquired it and how we put it into use,” explains Nanette Peterson, programme manager for tactical aerostats and re-locatable towers at CBP. Peterson’s colleague, John Milne who is the acting deputy programme manager, confirms that there are, in fact, three different sizes of aerostats which CBP can call now on: “We have a 17m aerostat with its capabilities, a 22m and we also have 35m balloons”.

TCOM’s manufacturing, production and testing facilities

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An operator looks at pictures that have been sent back from the ALTAVE OMNI

For his part, Johnny Meadors, assistant chief patrol agent with US Border Patrol in the Rio Grande sector is a strong advocate of tactical aerostats and their positive impact on the ground: "From a border patrol perspective, since the aerostats have been in place we have definitely seen the adversary – our smugglers and the folks that are bringing bad people and bad things across the border – change their tactics". He goes on to stress that in his view there is no better deterrence and no better detection capabilities, than the aerostats, especially in the Rio Grande Valley area. "The simple reason is that nothing in our inventory right now flies at the height of our aerostats and gives us that detection of illicit activity or illegal crossings".

Asked what an aerostat brings to the fight that can't be replicated by a drone, helicopter or tower, Meadors replies that when an aerostat flies there is persistent surveillance: "It can stay on station for hours or even days at a time – depending on the weather – whereas a drone or helicopter obviously can't stay on station for nearly as long a period of time. It also flies at an altitude – 1,000 to 5,000ft – that a tower cannot reach. It is hard to measure deterrence, but from interviews we have done the bad guys know when it flies, it is overt," he adds.

Meadors goes on to cite a case where aerostats were instrumental in the success of an operation: "Out in the Rio Grande City area – our furthest West station – the aerostat operators detected narcotics smugglers that came across the river in rafts. The smugglers loaded up the narcotics in a vehicle and drove away. However the aerostat operators were able to track the vehicle to what we call a 'stash house' and to vector in both Border Patrol and our, Texas, state local partners to seize their narcotics and more drugs in the vicinity."

Above and beyond aerostats at the tactical level, US

Customs and Border Protection is also now responsible for the long-serving tethered aerostat radar system – TARS – which were transferred from the Department of Defence to the Department of Homeland Security, under whose umbrella CBP falls. First deployed a quarter of a century ago, TARS units stretch over the Southern US border at 10,000 feet from Yuma, Arizona, to Lajas, Puerto Rico, and are able to use a powerful 200-mile range radar to pick up light aircraft, which are frequently used in drug smuggling and other nefarious activities.

Someone with their pulse firmly on what TARS offers is Richard Booth, director of domain awareness for the Office of Air Marine Operations: "TARS flies higher than any of the tactical aerostats and it has a wider area surveillance radar, which accesses air and surface. At altitude it provides a much larger look than any aircraft that we have and it overcomes the curvature of the earth, and any obstructions with terrain masking and things like that".

Considering the future for aerostats, Matthew McNeill, vice president of business development at TCOM, is very bullish about the way ahead for the technology: "The global environment continues to create threats and challenges to not only conventional military missions, but also asymmetrical scenarios like terrorism that require effective, low cost and long-range persistent surveillance." Moreover, McNeill says that TCOM is anticipating expansion of the aerostat envelope in the areas of emergency preparedness, disaster relief and recovery, first responders and homeland security.

Given all of this, it will certainly be interesting to see where the flight path of aerostats – both tactical and strategic – takes the technology in the year ahead. The Rio experience certainly demonstrates that there is scope for aerostats to be employed in a wider range of scenarios than ever before.

Timothy Compston is a journalist and PR professional who specialises in security issues. He studied International Relations and Strategic Studies at Lancaster University, is PR Director of Compston PR, and a previous chairman of both the National PR Committee and CCTV PR Committee of the British Security Industry Association (BSIA).