

# HAI HeliExpo Hits Houston

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**T**his year's HAI HeliExpo was held in Houston, Texas in a hall so large the 17,373 visitors seemed almost lost in the space, and the 523 exhibitors (which included 63 helicopters) had plenty of room to publicise their wares in an attractive manner. There were a few innovations in

the market and several revampings of past ideas. The first and most exciting innovation was the Sikorsky X-2, with its 'suite of technologies' and its resemblance (although this turned out to be incorrect) to a large and well designed gyrocopter.

Eurocopter brought out its latest

model the 175, a larger version of the 145, designed specifically for the off-shore market and Schweizer (now part of Sikorsky) brought out the 434, a 333 with one more blade (reminding one of the transition from the 330 to the 333) a utility helicopter designed for lifting and carrying jobs.

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# GEORGE R. BROWN CONVENTION CENTER



## **Robinson**

Robinson does not yet have a certified R66, although there were the usual questions at the press conference, but he did expound on his thoughts about roof top helipads and the problem of noise avoidance. He pointed out that the reason for having helicopters is their verti-

cal capability, which is being wasted by forcing helicopters to fly to airports. By using roof-top helipads the delays and additional noise of airport traffic could be avoided. However, he said, he is already somewhat disillusioned by the response (or lack of it) that he has had to his roof top pads.

Having worked some years ago on the Hughes 500P quiet helicopter programme, Robinson is very aware of noise conditions. "The R44," he said, "is currently the quietest helicopter around." He believes the way noise classification is done, relating weight to noise, is faulty, and suggests that, to the people on the





Sikorsky X2 unveiled  
Inset: aero propeller

ground, noise is noise and the weight or size of the over-flying helicopter is irrelevant. A re-classification of noise would, he believes, help both the industry and future relations between the general public and helicopter flyers.

Once again Robinson has had a very successful year in sales, selling 823 helicopters, a new record both for Robinson and for the helicopter industry. Interestingly, seventy percent of these helicopters were exported outside the USA, something he attributes to the low dollar.

Robinson said the R66-Turbine has been flying for several months, but is not yet ready for certification. It flies like a R44, but, of course, with a different starting procedure, there is less vibration than in a R44, and the speed and rate of climb are higher, with good power margins. He may give the R66 a glass cockpit, but has mixed feelings about it. There will not be an autopilot but he is interested in a good SAS system to improve the stability, making it up to the level of an aeroplane! Although they have been testing the Rolls Royce RR300 engine, they have also been using the standard 250-C20 in the machine.

### Sikorsky

Since 2005, Sikorsky has been working on a new technology for helicopter flight, which it refers to

as a 'suite of technologies.' The prototype for this, the X-2, was launched in Houston.

At first sight the X-2 looks like a form of large gyrocopter as it has an 'aero propeller' at the back and a coaxial main rotor with a rigid head, but this is a misleading concept, it actually is a helicopter. For flying controls it will use fly-by-wire (electronic) technology as opposed to mechanical or hydraulic.

Sikorsky has two main aims in building the X-2. Firstly, it wants to produce a helicopter able to fly faster than the traditional 170 (or so) knots, they are looking in the region of 250 knots; a considerable increase. Secondly, having the propeller on the back as well as the coaxial rotors negates the need for a tail rotor, and thus allows more ener-

gy to be put through the main rotor and less to be drawn away by the tail rotor.

In traditionally built helicopters with a main rotor and a tail rotor these two aims, of speed and extra energy, are limited both by a condition known as retreating blade stall, and by the energy needs of the tail rotor, which reduces the amount of energy from the engine available to the main rotor. Replacing the tail rotor with a propeller not only reduces the energy needs but increases the amount of power actually generated.

Coaxial contra-rotating rotors eliminate the retreating blade stall by allowing each side of the rotor disk to have a retreating and an advancing blade. This then prevents the instability of more lift on one side than on the other. In the case of the X-2 the pusher-propeller provides the extra thrust that allows the helicopter to reach the higher speeds while the coaxial rotors keep the machine stable. Moreover, the main rotor head is double ended in an attempt to reduce the negative effects of reverse flow and turn this into lift, Sikorsky engineers says 80% of the flow will now be giving extra lift.

There have been other coaxial helicopters, particularly from Russian manufacturers, but they have previously always had a rudder rather than a propeller at the back, and have traditionally been slower than conventional helicopters.

In the past, other technologies have been designed to try and reduce this



Schweizer are now bringing out the S434



problem with retreating blade stall. One is the 'tilt-rotor' a hybrid, half plane half helicopter, which allows the rotors to be in a 'helicopter' position for lift-off, while rotating down into a turbo-prop engine for flight, which allows much greater cruise speed. However, there are some drawbacks with this technology as the tilt-rotor cannot autorotate, and it does not have desirable helicopter abilities such as hovering and low speed stability. There have also been experiments with 'Mu' technology, as used in the partially NASA funded Carter Copter. Mu is the ratio of speed of the overall helicopter compared to the speed of the tips of the blades. If the blade tip and the aircraft are flying at the same speed, Mu is 1. Slow the rotor tip speed to half that of the aircraft and Mu is 2. Carter Copter reduced rotor tip speed by using weights in the tips. This is currently in an experimental stage, but there have been some problems with the prototype.

Unlike the tilt-rotor or the Carter Copter (which really is a gyrocopter with wings) the X-2 will still retain desirable helicopter qualities including excellent low speed handling, efficient hovering ability and it will be able to autorotate. So, it does appear to be a totally different concept, but as yet Sikorsky have revealed few real details and even



**Eurocopter EC175 unveiled at the show**

though some twenty hours of ground runs have been done, there is no date set for its test flight, which Jeff Pino, Sikorsky CEO says, "will be done when the time is right."

Jeff Pino also said at the press conference that Sikorsky had had the most amazing couple of years, and that last year it produced 70% more helicopters than in the previous year, reaching a turnover of 11.4 billion US dollars.

### **Eurocopter**

The EC175 medium twin was also launched at Houston, on a virtual oil rig with lots of men acting (presumably) as oilies, as this was a helicopter designed for a specific mission and almost a specific customer:

Bristows being the 'launch customer'. The EC175 follows the EC145 in having a tail rotor instead of the fenestrom of the majority of the Eurocopter range. It was a joint program with China and the airframe will be produced by the Harbin Aviation Industry Group.

The EC175 will be powered by two Pratt & Whitney PT6C-67E engines. It will have a range of more than 200 miles and be able to carry 16 passengers.

### **Schweizer**

Schweizer have designed a 434 for the utilitarian mode, and already have a customer in Saudi Arabia. They are expecting the first delivery in June.

The 434 will be much like a combination of the 333 and the Fire Scout UAV, it will have four blades for quietness, as well as more power and load capacity and a larger 84 gallon fuel tank. Improvements include a Rolls Royce 250-C20W engine with a 320 shp maximum take-off power, a useful load of 1,855 lbs and a gross weight of 3,200 lbs, including external load. It retains 333 stability and handling characteristics and 'unparalleled' energy absorption systems, low control forces and low cabin noise levels. The base price will be US\$933,000 with an hourly cost of US\$240.



**Lynn Tilton, inset, says her faith in her customers has been justified**



**Eurocopter AS365 skims the highway**



**AW139 on approach to the Houston HAI pad**



### **MD Helicopters**

Lynn Tilton, the MD of MD Helicopters, said she is now supported by a management team who understand her vision and this has allowed her to turn around the company, get rid of the problems of the past and finally, after three years, bring her company back to profit. She hopes to deliver 62 helicopters this year.

MD, like some other helicopter companies, are moving towards what they called vertical integration. This means using fewer external suppliers and depending only on those who are part of the larger company, and consequently can be trusted to come up with the goods on time; supplier difficulties is something she has suffered from in the past. MD started out with 700 suppliers and they hope to be down to 50 this year. Having so many

suppliers made business too complicated in the past, and her mission is to simplify. She quoted: "Complexity; fools ignore it, pragmatist suffer it and geniuses simplify." A quote from Alan Perlis, an American computer scientist, known for his work in programming languages.

Ms Tilton will be going into several partnerships in the future, in particular with CalStar, and will be working closely with Sagem, Honeywell and Rolls Royce, all of whom were very supportive of her during the 'bad years' when the press were forecasting her demise.

On the subject of the press, Ms Tilton pointed out that while she had learnt a lot from her customers, she had learnt very little from the press. However, she now hoped that they would learn a little from her, and in

particularly from that tenacity which allowed her to rise to the top, in spite of their demoralising mockery.

Patriach Holdings, MD's parent company, are looking at buying a VLJ company, it is speculated that this will be Adam's Aviation, which has had a few cash-flow problems in the past.

MD helicopters are looking into green issues and will be testing the NOTAR in the Gulf region this year. They will also be looking more deeply into safety issues, and may replace their standard blades and engines.

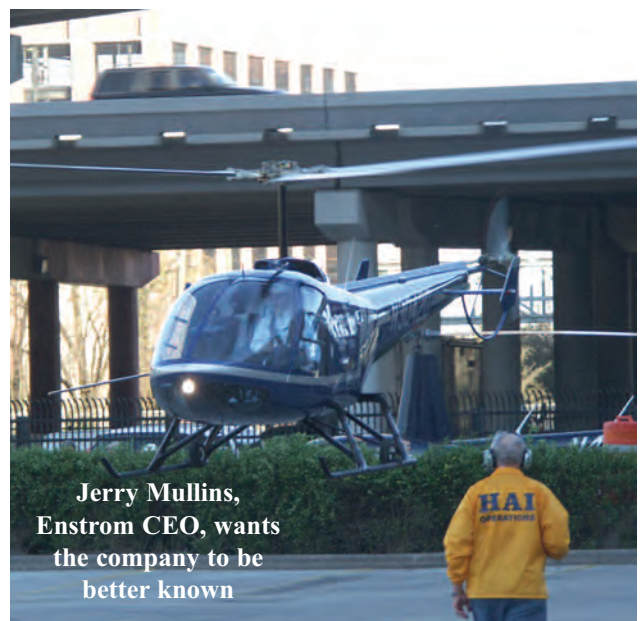
### **Bell Helicopters**

Bell's Executive VP of Customer Solutions, Mike Blake, explained the helicopter company's decision to phase out production of four models, the Bell 206B3 JetRanger, the 210, 427 and 430, by 2010, as streamlining. This will leave the 206L4

**Bell 212 belonging to the Delaware State Police**



**Jerry Mullins, Enstrom CEO, wants the company to be better known**



PHOTOGRAPHS BY ALAN NORRIS AND GEORGINA HUNTER-JONES





Axsys Cineflex camera attached to EC130



Schweizer 300 landing amongst the Houston high rises

LongRanger, the 407, 412 and the soon to be certified 429, as Bell's produce for the next decade.

Mr Blake said that more customers were buying the L4 than the B3, but also admitted there was a lot of competition from the soon to be certified Robinson R66-Turbine, which had influenced their decision.

#### Enstrom

At the 'Meet the CEOs' conference, Jerry Mullins, Enstrom CEO, talked about Enstrom's greatest challenge: to make such a small company known to the world. He said many people in the aviation world were not even aware that Enstrom existed.

In 2007, Enstrom sold twenty seven helicopters to countries as diverse as Turkey, The Phillipines, Latin America and the UK.

Mr Mullins also believes in vertical integration and, consequently, Enstrom built a lot of their own parts in-house, including the main trans-

mission. He is looking towards controlled growth as, he said, fast growth can cause a lot of pain. He is expecting sales in the Enstrom 480B to increase now that the JetRanger is no longer going to be produced.

#### Axsys

In 2007, Axsys the defence company bought Cineflex which, Aled Miles, Vice President, said, "was a synergistic acquisition with no losses and benefits on all sides. It has increased Axsys's military capabilities, thanks to using the superbly detailed Ciniflex cameras. Before Axsys bought Ciniflex, however, the cameras were daylight only. Now, thanks to Axsys's infrared capabilities, they have enhanced their performance to night useage."

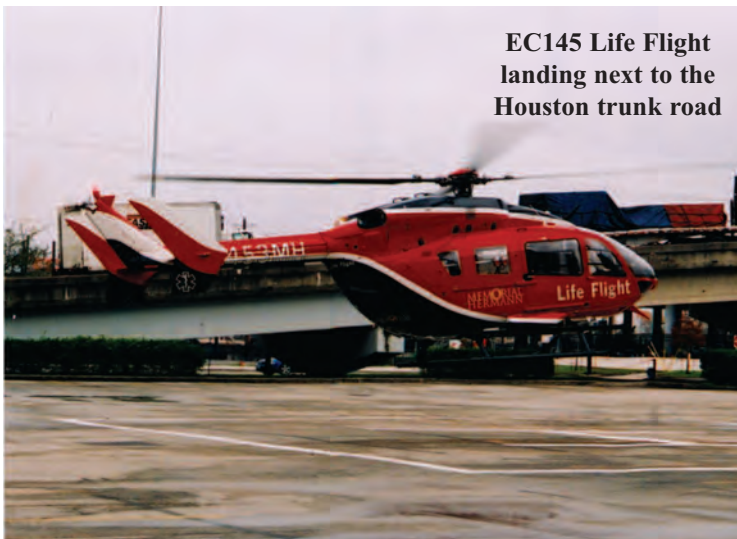
The company is also involved in many civilian ventures including film work for Planet Earth. They are based in Grass Valley, in northern California, with other outlets elsewhere in the USA. Military ventures include

CROWS (crew remote optical weapons station) using a machine gun and a camera from inside a HUMV, which allows the weapons to be fired without exposing the crew to the enemy.

The 2008 HeliExpo was an excellent show with many participants. General feeling appears to be that the healthy state of the helicopter market will continue in spite of nervous markets and the downturn in the US economy and its effect on the rest of the world. Certainly the major companies are continuing to innovate, and buyers continue to emerge from the crowd. There is much talk about the age of current helicopter fleets and the importance of the replacement market, and greener issues as both Agusta Westland and Sikorsky look into using bio-fuels.

FIDAE, in April and Farnborough, in July this year will give further indications of the future, but for now the market remains upbeat.

PHOTOGRAPHS BY IAN TURNER, GEORGINA HUNTER-JONES, ALAN NORRIS AND AXSYS



EC145 Life Flight landing next to the Houston trunk road



Breaking down after the show