

TECH

Top games & hardware

It might not look like much — but that's the point. The mechanical insect you see on this page is the world's smallest camera-carrying ultra-miniaturised aircraft, or nano air vehicle (NAV), measuring less than 4in across and weighing in at an ant-like 0.1oz.

It is also one of the most sophisticated, able to buzz though the air at 10mph while the transmitter beams TV-quality images back to a base station a few hundred feet away.

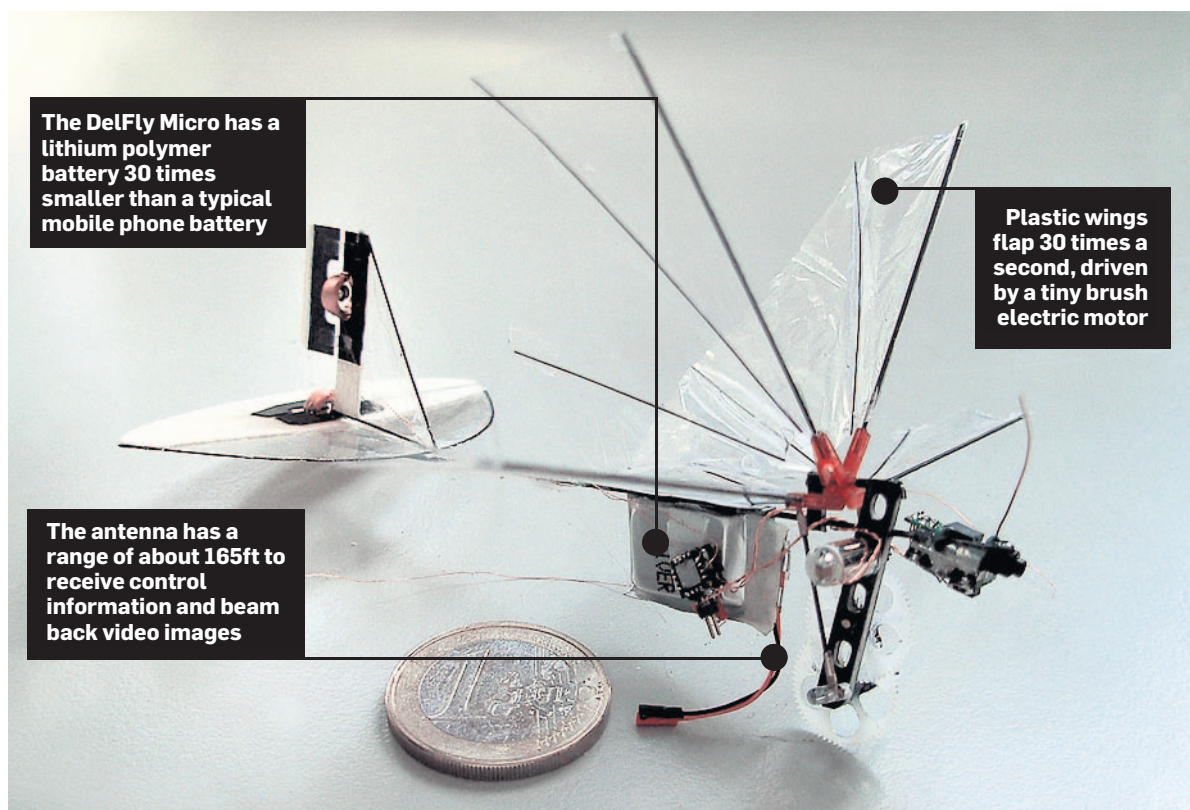
Called the DelFly Micro, the machine has been likened to a robotic dragonfly and is built from ultra-light thermoplastic polymers, carbon fibre and micro-circuitry. A small lithium polymer battery gives it a flight time of three minutes.

It was unveiled last week by Delft University of Technology, in Holland, but it is only the latest in a series of nano air vehicles to take to the skies: the growing flock of NAVs worldwide includes pocket-sized helicopters, tiny rocket-powered wings and machines that mimic the flight of hummingbirds.

Full-size flying robots have been around for years. High-tech drones scout out terrorists and launch guided missiles in Afghanistan and Iraq while their "pilots" sit thousands of miles away in America. Less sophisticated drones are already being used by police forces in Britain to plan raids and monitor music festivals.

But the focus is now shifting towards designing intelligent, autonomous, miniaturised aircraft that can sneak unseen into even the most well-protected airspace.

The driving force behind that focus is the military — specifically the US government's Defence Advanced Research Projects Agency (Darpa). "We are interested in a system that has 20 minutes of



The DelFly Micro has a lithium polymer battery 30 times smaller than a typical mobile phone battery

Plastic wings flap 30 times a second, driven by a tiny brush electric motor

The antenna has a range of about 165ft to receive control information and beam back video images

The dragonfly built to spy

Tiny flying robots have the military abuzz, says Mark Harris

flight time, can withstand 5mph wind gusts, can operate inside buildings and has a range of over 1,000 yards," explains Todd Hylton, a Darpa programme manager. For several years, Darpa has been spending millions of dollars developing insect-sized aircraft that mimic nature, to gain a surveillance edge in future wars. These aircraft include a sycamore seed-like vehicle that uses a chemical rocket to spin almost silently through the air, controlled by a simple autopilot.

Darpa has just announced its top choice for the next generation of NAV development: the hummingbird-like Nano Scout from AeroVironment, a defence company. The Nano Scout (standing for Sensor Covert Observer in

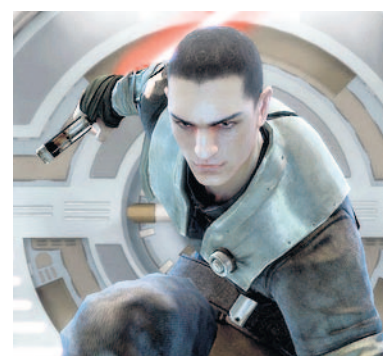
Urban Terrain) has rapidly flapping wings and a tail-less design that enables it to hover, dash at up to 20mph and take off or land vertically. In return for its \$2.3m (£1.1m) investment, Darpa expects to see a flying prototype next month.

When fully operational, these miniature aircraft will need the ability to navigate and seek out targets for themselves. "One of our test aircraft beams images to the ground station, where a computer performs calculations and sends control signals back to the engine," says Bart Remes of Delft University. The development means that in future remote-control pilots will become redundant, and with the heavy, power-hungry electronic brains kept

safely back at base, aircraft can be made lighter, faster and cheaper.

So just how small could these surveillance robots become? As scientists understand more about the physics of flight at very small scales, there's little to hold them back. "We are now on our third generation of DelFly, and they keep getting smaller and smaller," says Remes. "The next generation will be under two inches long. In the long term, we're dreaming of an aircraft the size of a fruit fly."

SUNDAY TIMES ONLINE
To see a video of the DelFly in action go to www.timesonline.co.uk/tech



Soul Calibur IV
Xbox 360, PS3; £50.
Age 12 ★★★★★

The Soul Calibur series is among the classiest of beat-'em-up games. Your character must fight all-comers in one-on-one battles to win a legendary sword. This instalment brings the biggest mixture of combatants yet, featuring samurai swordsmen, warrior women and even Star Wars characters. The graphics are superb, with settings ranging from pirate ships to the hangar of an Imperial Star Destroyer, and the action is non-stop. What a belter. **Stuart Andrews**



SBK-08 Superbike World Championship
PS2, PC, Xbox 360; £20-£40.
Age 3+ ★★★★★

No two-wheeled racing game so far has stood up to the challenge of the top car-based titles such as Gran Turismo. And SBK-08 does little to change that. Based on the superbike world championship, fans get the official racetracks, riders and team sponsors. The handling of the bikes is also replicated with accuracy. But if you hanker to race crotch rockets, last year's MotoGP 07 game has the edge. **Stuart Andrews**

HOT LINKS

This week's best new clicks

MODEL SPORTSMEN

The opening ceremony of the Beijing Olympics gets under way this Friday, kicking off more than two weeks of sporting action and giving every vaguely physical activity from dancing in water (aka synchronised swimming) to fast walking (or power walking, if you prefer) a shot at the back pages. Let's face it, by week two you're going to struggle to feign excitement, even if the men's coxless fours pull off the usual gold medal-winning shtick.

To relieve those Olympics frustrations go to www.crashtestdummyolympics.co.uk, where you can play a mindless game that involves using your space bar to propel a crash test dummy over a jump and towards a target.

It's seriously old school

(sub-Daley Thompson's Decathlon on your old Commodore 64). For a more in-depth look at the Games visit <http://beijingolympicsblog.wordpress.com/>, a useful and unofficial blog dedicated to all things Olympic.

TELLY ADDICT

The BBC, Channel 4 and ITV all now put programmes online to stream to your computer or download for later viewing. Rather than having to keep checking each broadcaster's website, Blink brings together all their offerings onto a single, searchable website at <http://tv.blinkx.com>.

The result is more than 1,000 British television shows available to view — and just part of the 26m hours of online video already indexed by the company.

THE RACE IS ON

Despite his protestations that he was simply starting a debate, it's widely considered that foreign secretary David Miliband threw the first punch in a Labour leadership contest last week. Keep up with the potential challenger's thoughts via his personal blog at <http://blogs.fco.gov.uk/roller/miliband> — you can be certain Gordon Brown will be logging on.

Or, for a frankly more entertaining time, follow the odds on the Labour leadership race at



Gordon Ramsay's F Word is among the shows available for download

<http://politicalbetting.com/> then place a bet at www.willhill.com. The latest price for Brown to remain in office longer than Blair: 1-100.

SEX AND THE SURFER

The clever little tool at tinyurl.com/6xmego will read your browser's history list and, based on the websites you've visited recently, make a guess at your gender. It's spookily accurate — and a little sinister, as it's been developed to help target online advertisements more accurately.

DON'T PANIC

NIGEL POWELL ANSWERS YOUR TECH-RELATED QUERIES

Q I have an old hard disk that was originally formatted with Microsoft's DriveSpace3 compression system. How can I get my new PC to "see" this hard disk in order to recover some data from it?

John Benney, Harringworth, Northamptonshire

A First, you'll need to be running Windows 98, Microsoft's old operating system. Visit www.bootdisk.com and download free software to create a Win98 "boot disk", then attach the old hard drive to your new computer using an external USB-based disk cradle (£30 at tinyurl.com/6q44ls). Start up your new PC with the bootable Win98 CD in the disk drive and it will load the correct operating software; you should then be able to read or copy the data stored on the drive.

If this sounds too technical, the easier solution here is to contact a data-recovery firm such as MJM (www.mjmdatarecovery.co.uk) and ask it to quote for a recovery. It's unlikely to be cheap, but if the data are important it could be well worth the money.

Q Over the years, I have not had much success creating DVDs for others to watch. How can I ensure that friends and family will not be frustrated with discs that don't work?

Shay Hayes, Dublin

A There are several technological variables that can cause problems such as this. These range from using the wrong type of DVD blank (stay away from the DVD-RW and DVD+RW formats, for example), not choosing the correct video-output format in your DVD-creation software and your friends may be using outdated DVD players, which tend to have problems playing back homemade discs.

To make a homemade DVD it's best to use the latest version of one of the major video-editing programs such as Pinnacle Studio 12 (£40 from www.pinnaclesys.com) with simple DVD-authoring tools. As a decent freeware alternative try the Video DVD Maker software at <http://protectedsoft.com>. Hopefully this will put an end to the gripes about your discs refusing to play.

dontpanic@sunday-times.co.uk

ONLY £3 JOINING FEE

YOU HAVE THE PICK OF THE PREMIERSHIP AND SPL

DREAM ON FABIO

Play the classic Fantasy Football game for just £3 for your chance to win a share of £100,000.

Sign up today and get three teams for the price of two. Visit timesonline.co.uk/fantasy

THE SUNDAY TIMES
FANTASY FOOTBALL

Over 18s only. For full terms and conditions visit www.timesonline.co.uk/fantasy

Suzuki SX4
from £10,515
0% APR (typical)
Minimum deposit required*
3 years free road tax*

THE SUPERMINI WITH MORE SPACE

Win a space themed family holiday to Florida. Plus get two free cinema tickets to see WALL-E when you take a test drive.

Give yourself the extra space at www.suzuki4.co.uk/walle or call 0845 850 8800

SX4 range official fuel consumption figures in mpg (l/100km): urban from 28.8 (9.8) to 44.1 (6.4), extra urban from 44.1 (6.4) to 61.4 (4.6), combined from 37.1 (7.6) to 53.3 (5.3), CO₂ emissions from 139g/km to 182g/km.

*Model shown is the SX4 1.6 GLX petrol available at £10,999 on the road (metallic paint available at £360). 0% APR (typical) finance over 2 years is subject to availability for vehicles privately registered between 1 July 2008 and 30 September 2008 from participating Authorised Suzuki Dealers only. **With a deposit of 50% required. Credit is available to persons aged 18 years or over, subject to status. Indemnities may be required. Terms may vary. For full details contact your local Suzuki dealer. Suzuki Finance reserve the right to withdraw or amend this offer without notice or prior warning. The offer is available to customers within the UK (excludes Channel Islands and Isle of Man). Suzuki Finance Services Limited, part of Black Horse Ltd, Head and Registered office: St. William House, Trellehan Terrace, Cardiff, CF10 5BH. This offer cannot be used in conjunction with any other offer. Vehicles shown may not be to UK specification. All prices and specifications are correct at time of going to press. †Cost of 3 year road tax (between £345 and £700 according to VED band) will be deducted from the on the road price of the vehicle at time of purchase. Data as stated on www.hm-treasury.gov.uk as at 30.06.08. To enter the free prize draw simply go to www.suzuki.co.uk/walle or visit your local Suzuki dealer and complete an entry form. Entrants must be aged 18 years or over. All entries must be received on or before 30th September 2008. The promoter of this free prize draw is Suzuki GB PLC, Steinbeck Crescent, Snekhall West, Milton Keynes, Buckinghamshire, MK4 4AE. Cinema tickets subject to availability. For full terms and conditions please visit www.suzuki4.co.uk/walle