

SPY BOTS

Watch out – there are cops and spies about, but they're not human! Police and law-enforcers have long used machines or dogs to help in their investigations. Now they are turning to robots in their quest to patrol, tackle crime, spy on suspects and gain vital intelligence on terrorists and enemy nations' forces.

ON ALERT

Compared to human security guards and spies, robotic sentries are tireless, can operate 24 hours a day, aren't easily distracted and can sound the alarm instantly even if under attack. A number of robots are currently used to patrol military facilities, high-tech laboratories and homes.

In the 1990s, the pioneering Robart III cruised through empty offices and warehouses, automatically opening electronic doors and looking for intruders. Its dart gun used air pressure to fire six tranquiliser darts in 1.5 seconds.

Like a Dalek, Robart III could not move up and down stairs. But this didn't prevent it being ranked number 16 in Wired magazine's survey of the 50 best robots ever!

SECURITY ROBOTS

Some security robots are used to take sound and vision into high-risk situations, such as a gangland hideout. They can also be used to supply, for example, a hostage-taker with a phone to contact the police. In combat zones and in terrorism situations, robots like *PackBots*® and *Talon* rovers in Iraq have been sent in ahead of human soldiers. These robotic rovers check for potentially lethal surprises around a corner, from booby traps and mines to enemy soldiers.

Other guard robots are helping with security at home. Fujitsu's *Maron-1* can follow a pre-programmed patrol path around a home. It can operate remote-controlled devices such as TVs and garage doors, and sound an alarm if it detects smoke or unexpected movement. A four-legged robot, the Sanyo-Tmsuk *Banyru* performs similar tasks and is equipped with temperature, movement and sound sensors to detect fires or intruders.

Maron-1's swivelling eyeballs contain two cameras which can take and send images of part of a house or an intruder to the owner's mobile phone.

MIT's Huggable looks like a typical cuddly teddy bear, but it contains two cameras, together with microphones and motors in the neck so that its head can turn. The robot can transmit what it sees and hears over the Internet. This means that, in future, a child off sick from school could potentially be spied on by his or her parents!

DID YOU KNOW?

At least three *Global Hawk* spy planes have been lost in combat zones in the Middle East. Plans are afoot to power a modified *Global Hawk* with a small nuclear power reactor. This would give it virtually unlimited flying time.

SPIES IN THE SKY

Unmanned aerial vehicles (UAVs) are on the prowl, working for police and security forces in different ways. Police blimps (small airships) travel slowly and scan the ground below in detail with powerful zoom cameras; at night the blimps use thermal imagers to detect objects.

Military UAVs, like *Global Hawk* and *Predator* can cruise for hours at a time, taking hundreds of images of enemy bases or troop movements. *Sentry Owl* is a smaller scale UAV, weighing 11 lb (5kg); it can be carried in a soldier's backpack and assembled in minutes. Then it can fly off by itself to spy and scout. Future flying spies will be far smaller than *Sentry Owl*. Micro aerial vehicles (MAVs) that sit easily in a person's hand will be able to fly and hover around unnoticed, homing in on targets and relaying back crucial images or listening in on conversations.

THE FLYING, SPYING DOUGHNUT

It's no surprise that reports of flying saucers started to flood in when people first spotted the Sikorsky *Cypher*. With its helicopter rotor blades whirring round inside the hole in its 1.95m-diameter body, the *Cypher* was shaped like a doughnut. It could hover at the height of a tall building and drop a radio or other surveillance equipment on to the roof. The *Cypher* made over 550 flights. Its successor, the *Cypher II* or *Mariner*, can be fitted with wings for longer distance missions.

The Cypher could spy in through a skyscraper window.

Scientists have at last discovered how insects fly – a fact that is likely to fast-forward the development of flying robots. The tiny Dragonfly robot is being developed to follow suspected criminals and guide missiles to their targets. It will also search inside collapsed buildings to find survivors in disaster or war situations.



