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The spying game: The latest gadgets for spooks

From night vision to tiny cameras, many everyday gadgets were originally developed for spies. Guy Adams plays with the latest spookware to see what's heading our way

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¹ Try to walk casually out of the Science Museum's latest exhibition and several red lights will flicker, triggering a loud alarm. But crawl on all fours, or do a hopscotch, and you'll escape without so much as by-your-leave. The dark corridor from the Science of Spying show has been fitted with an artificially intelligent security system capable of "gait recognition". That means it can distinguish between a human and, say, a guard dog.

² It works by throwing a person's shadow on to the wall, allowing a computer to map the movement of individual limbs. If human walking or running is detected, the system "locks on". If the computer can't detect a normal "gait", it merely keeps a beady eye on things.

³ To a working spy, this sort of technology could be the difference between life and death; to a career criminal, it could mean life imprisonment. Either way, as James Bond's gadget man "Q" demonstrated, any self-respecting man of mystery must be prepared to

look for hi-tech solutions to day-to-day problems.

⁴ With this in mind, the Science Museum will on Saturday open an exhibition dedicated to the technology of espionage. In a sneak preview, I was invited to play with several exhibits which – the curator Anna Faherty says – show how spy gadgets can shape our daily life.

⁵ "This is all about how science can affect you," she says. "For instance, we used to think that secret cameras were very James Bond; cool and hi-tech. Well, now we've all got them in our mobile telephones. What used to be unthinkable technology now seems everyday."

⁶ In the same way that the kit on Formula One cars eventually finds its way into your family estate, cutting-edge spy technology of years gone by is mainstream today. Night-vision goggles were first used by the military; now, the optical technology that powers them is found in high-street video cameras of the sort used (most notoriously) by Paris Hilton.

⁷ Even specialist spy gadgets can be bought off the shelf for domestic use. Suspicious wives might be tempted to purchase a Deleted SMS Reader in order to see if their husbands have been receiving any fruity text-messages. Even if he has erased them in the past 24 hours, the messages will show up.

"What used to be unthinkable technology now seems everyday"

⁸ Another exhibit, a Raven Spyplane, fits in a briefcase. You clip it together, launch by hand, and control with a joystick. It was developed by the US military. These days, they cost \$30,000 (£15,200) at most, and are used by mountain rescue teams and coastguards.

⁹ The meat and drink of spook work has always been bugging, though. Transmitters the size of a Smartie ➔

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➡ can now be secreted about the person or installed in innocuous-looking household objects such as a three-pin plug.

¹⁰ As a result, most careful spies carry a bug detector. Visitors to the exhibition can have a go with one: an in-built strength meter allows rogue bugs to be pinpointed with relative ease. If you've got to keep a low profile, it has a "vibrate" mode.

¹¹ But technology can also hinder the spy. Harry Ferguson, a former MI6 officer who's been employed by the museum to act as a consultant to the exhibition, says that customised gadgetry of the 007 kind is often a real spook's last resort. "As a spy, I actually don't want to use gadgets unless I absolutely have to," he says. "For example, if I get sent somewhere and get found with a special camera, I'm screwed; if I'm carrying an ordinary camera, I'm just a tourist. So we try initially to get away with ordinary stuff.

¹² "At times, you do need something special, though. Our first port of call is to get something off the shelf from a spy store, but if that really won't do, the men in the lab step in to make custom stuff."

¹³ The biggest growth area in hi-tech spying involves what the professionals call "data mining", usually carried out by technically minded agents at places like GCHQ in Cheltenham. "A lot of the stuff you want to know is

already out there, and it's a case of knowing how to get to it," Ferguson says. "Surveillance satellites are a tremendous resource. The real problem isn't getting the information, but sorting out the great splurge of it that comes your way."

¹⁴ Ferguson believes that the future of spy gadgets lies in confusing the most advanced security systems. As a result, the Science Museum will display several examples of prototype kit that will help the Bonds of tomorrow, such as face masks that will fool face-recognition software, and fake fingers to deceive fingerprint detectors.

"we are all spies now"

¹⁵ The centrepiece, though, is a prototype artificial leg (see below) that is intended to replace an agent's real one. The thinking behind this is that, rather like the way normal people already use plastic surgery to change their appearance, secret agents might want to do the same to help their performance.

¹⁶ It's all a far cry from the good old, bad old days, when being an international man of mystery involved nothing more than making a few secret drops and perhaps carrying a poison-tipped umbrella. But, as they say at the Science Museum, we are all spies now.

Pay attention 007... what's new in the spooks' world – Implantable Radio Frequency Identification Tags

These devices are commonly known as RFID tags, and are most widely used in standard supermarket and library security systems. Ken Livingstone's faintly Orwellian Oyster cards, for paying Tube fares, are also individual RFID tags. The example pictured is particularly small – the size of a grain of rice – and could therefore be implanted under the skin of a human, in the same way that many household pets now carry ID chips. Once there, it can be used for identification, tracking or to store vital medical details such as blood group and allergies, or even used instead of a credit card.

Entomopter

A micro air vehicle (MAV) inspired by the movement of an insect, rather than a traditional aircraft. It can fly, crawl and swim, accessing areas that remote-controlled helicopters, for instance, cannot reach. Could be used in both emergency and espionage situations to enter a building (say through an open window). This example is about six inches long. The only thing preventing smaller versions being developed is the relatively large size of batteries. This machine uses a "reciprocating chemical muscle" that flaps the MAV's wings, and the waste gases from its fuel cell are recycled to power the flight controls and its on-board sonar sensor.

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Keystroke Logger

This discrete device can be plugged into the back of any PC, and will then capture every keystroke typed in by the user. In the past, criminals and spies have used keystroke loggers to discover passwords and even invade online bank accounts. They are simple, effective and widely used, and can now be bought from any spy shop for around £50. Because they are hardware, rather than invasive items of software, normal anti-virus devices won't pick them up: the only way to tell they're there is to look at the back of your computer. Knowing these exist may make you think twice about using internet cafés...

Mobile phone security

The advent of mobile phones has been a gift to spies, who can pack a handset with hidden technology, from bug detectors

to voice changers that disguise their identity. To be sure that the gadget does not fall into the wrong hands, they can also be fitted with iris scanners. Although expensive now, this could be the answer to gadget theft in the future. After all, colour screens were once expensive, too.

Spyrobot camera

The "tough-grip" wheels allow this mobile device to crawl into danger zones, run down stairs, and climb 40-degree slopes. It is self-righting, and can survive a 2m drop before being used to shoot either video or stills. This model is made by a firm called Macroswiss and can be bought over the counter for a few thousand pounds. It can be thrown through a glass window and used to film the inside of an unfamiliar building, and has all kinds of implications for fire brigades and rescue teams.

Super-powered Spy Leg

Finally, this is one possible example of technology that spies might use in 20 years, given current trends, a vision of the future from product designers at the Royal College of Art. It's a prototype of an artificial leg that would be stuck on in place of the agent's real limb to augment his (or her) physical skills. Four separate attachments can be used: a "cheetah" leg for fast running and high jumping, a tentacle appendage to help you climb like an octopus, a grapple hook for hanging (like Tom Cruise in *Mission: Impossible*) and a swanky brogue for undercover work. It's all a bit Inspector Gadget. ■