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Science fiction? Not any more

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Communications: Taking its cue from "Star Trek", an American company has devised a clever new form of voice-driven wireless communicator

SCIENCE fiction has often been the source of inspiration for new technologies. The exo-skeletons and head-mounted displays featured in the film "Aliens", for example, spawned a number of military-funded projects to try to create similar technologies. Automatic sliding doors might never have become popular had they not appeared on the television series "Star Trek". And the popularity of flip-top or "clamshell" mobile phones may stem from the desire to look like Captain Kirk flipping open his communicator on the same programme.

Now it seems that "Star Trek" has done it again. This month, American soldiers in Iraq will begin trials of a device inspired by the "comm badge" featured in "Star Trek: The Next Generation". Like crew members of the starship *Enterprise,* soldiers will be able to talk to other members of their unit just by tapping and then speaking into a small badge worn on the chest. What sets the comm badge apart from a mere walkie-talkie, and appeals to "Star Trek" fans, is the system's apparent intelligence. It works out who you are calling from spoken commands, and connects you instantly.

The system, developed by Vocera Communications of Cupertino, California, uses a combination of Wi-Fi wireless networking and voice-over-internet protocol (VoIP) technologies to link up the badges via a central server, akin to a switchboard. The badges are already being used in 80 large institutions, most of them hospitals, to replace overhead paging systems, says Brent Lang, Vocera's vice-president.

Like its science-fiction counterpart, the badge is designed so that all functions can be carried out by pressing a single button. On pressing it, the caller gives a command and specifies the name of a person or group of people, such as "call Dr Smith" or "locate the nearest anaesthesiologist". Voice-recognition

software interprets the commands and locates the appropriate person or group, based on whichever Wi-Fi base-station they are closest to. The person receiving the call then hears an audible alert stating the name of the caller and, if he or she wishes to take the call, responds by tapping the badge and starting to speak.

That highlights a key difference between the “Star Trek” comm badge and the real-life version: Vocera's implementation allows people to reject incoming calls, rather than having the voice of the caller patched through automatically. But even the most purist fans can forgive Vocera for deviating from the script in this way, says David Batchelor, an astrophysicist and “Star Trek” enthusiast at NASA's Goddard Space Flight Centre in Greenbelt, Maryland. For there are, he notes, some curious aspects to the behaviour of the comm badges in “Star Trek”. In particular, the fictional badge seems to be able to predict the future. When the captain of the *Enterprise* says “Picard to sick-bay: Medical emergency on the bridge,” for example, his badge somehow connects him to the sick-bay before he has stated the destination of the call.

Allowing badge users to reject incoming calls if they are busy, rather than being connected instantly, was a feature added at the request of customers, says Mr Lang. But in almost all other respects the badges work just like their fictional counterparts. This is not very surprising, says Lawrence Krauss, an astrophysicist at Case Western Reserve University in Cleveland, Ohio, and the author of “The Physics of Star Trek”. In science fiction, and particularly in “Star Trek”, most problems have technological fixes. Sometimes, it seems, those fixes can be applied to real-world problems too.

Vocera's system is particularly well suited to hospitals, says Christine Tarver, a clinical manager at El Camino Hospital in Mountain View, California. It allows clinical staff to reach each other far more quickly than with beepers and overhead pagers. A recent study carried out at St Agnes Healthcare in Baltimore, Maryland, assessed the amount of time spent by clinical staff trying to get hold of each other, both before and after the installation of the Vocera system. It concluded that the badges would save the staff a total of 3,400 hours each year.

Nursing staff often end up playing phone tag with doctors, which wastes valuable time, says Ms Tarver. And although people using the badges sometimes look as though they are talking to themselves, she says, many doctors prefer it because it enables them to deal with queries more efficiently. The system can also forward calls to mobile phones; it can be individually trained to ensure that it understands users with strong accents; and it can even be configured with personalised ringtones.

In Iraq, soldiers will use the Vocera badges in conjunction with base-stations mounted on Humvee armoured vehicles. Beyond medical and military uses, Vocera hopes to sell the technology to retailers and hotels. And the firm's engineers are now extending the system to enable the badges to retrieve stored information, such as patient records or information about a particular drug, in response to spoken commands. Their inspiration? Yet another “Star Trek” technology: the talking ship's computer.