

## From telegraphy to auto-identification: radio is still with us

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With the proliferation of new technologies in our modern world, it is easy to forget that so many of them need 19th century radio technology to work.

My granny used to call a radio a wireless, after its original name, 'wireless telegraphy'.

My favourite mad scientist, Nikola Tesla, holds the US patent for the invention of wireless transmission of data, although the patent was originally awarded to Guglielmo Marconi, thanks to the influence of Marconi's financial backers, which included Thomas Edison and Andrew Carnegie. Tesla's patent was only reinstated in 1943, shortly after his death.

Tesla was a big thinker who visualised then what the world is only beginning to realise now. When he built his tower at Wardencliff around the turn of the century, rather than capitalising on manufacturing millions of ugly little radios like Marconi (which he couldn't have done anyway because Marconi had his patent), he imagined a world of secure multichannel transceiving of information, universal navigation, time synchronization, and a global location system.

Another inventor, a Russian called Leon Theremin, who would have been quite happy to be left to inventing musical instruments (he invented one of the first electronic musical instruments, the theremin in 1919) had he not been spirited away to a sharashka (a secret research and development laboratory) by the KGB in 1938 and put to work on a number of covert projects.

It was in the esteemed company of fellow prisoners Tupolev and Korolev, that he invented "The Thing", a bug which used inducted energy from radio waves of one frequency to transmit an audio signal on another. Because the device only radiated a signal when it was activated, it was difficult to detect, and found its way into the office of the American ambassador in Moscow, embedded in a wooden plaque presented to him by Russian schoolchildren.

This 'bug' is said to be the forerunner of yet another radio application, Radio Frequency Identification, which is widely used to remotely identify products, animals and people to prevent theft and breaches of security.

In an article on the Wired magazine website ([www.wired.com](http://www.wired.com)), journalist Annalee Newitz exposes this attempt at securing property as extremely vulnerable. Accompanied by a skinny, long-haired 23-year-old hacker, a laptop and a cheap homemade USB device, she witnessed the theft of the digital code embedded in the office access card of a wealthy software entrepreneur.

The device used by the hacker was able to clone the signals emitted by the RFID chip in the card when they were activated by a reader. The hacker then downloaded the data onto his laptop and was able to gain access to the office of said wealthy software entrepreneur. If the hacker had not been a benevolent one hired by the wealthy software entrepreneur to test his security system, he might have made off with thousands of dollars worth of computer equipment. The problem with RFID technology, which may be extended to implants in humans and has been touted by some as the embodiment of the apocalyptic "Mark of the Beast", is that no one thought to build security into its application. Most of the tags cost about 25 US cents, while encrypted tags cost \$5, not a cost-effective option for the average office block. With the right equipment it is possible to steal anything that depends on it — petrol, cars, library books, medicine, information and identity. Ultimately, this vulnerability could also be manipulated to include espionage, where movements and habits of individuals can be traced by governments, private investigators and stalkers by tracing the RFID's that they use.

Question is, with the revenue that these chips are capable of generating, will they ever stop making them?

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