



## Wake Up Call! The Future of RFID is Dawning.

By Max Sutherland

Dr. Max Sutherland's column is published monthly and posted on the web at [www.sutherlandsurvey.com](http://www.sutherlandsurvey.com). Receive an advance copy by email - [free subscription](#). Max Sutherland is author of the book '[Advertising & the Mind of the Consumer](#)' (published in 8 languages) and is a registered psychologist. He works as an independent marketing consultant in Australia and USA and is also adjunct Professor at Bond University. Contact [msutherland@adandmind.com](mailto:msutherland@adandmind.com).

**Radio Frequency Identification Devices (known as RFID's) are set to usher in a new world of consumer convenience. But beware the 'silent stalker' that accompanies this technology. You may need an electronic jammer to shield your privacy.**

In 2002, I pointed to early applications of RFID that were developing rapidly.<sup>1</sup> A couple of years later, this still fledgling technology has gained an [unstoppable](#) momentum. Because of the cost-saving efficiencies for supply-chain management and positive effects on consumption lifestyles, the future is dawning fast.

Imagine in the supermarket, you've forgotten what you need from the cold section. Don't worry, simply phone your [RFID enabled refrigerator](#) and 'poll' its contents. At the checkout, no more waiting in line with an overloaded shopping cart. Just sail through the exit and without stopping, every item will be scanned, itemized and charged to your account in an instant. These are just a couple of the consumer lifestyle benefits brought to you by RFID!

But wait! See that character loitering in the shopping center carpark? Is he a mugger? Or a market researcher? These 'promiscuous' RFID signals respond to anybody's scanner. So, maybe he knows what you bought. (And if RFID microchips get [embedded in bank notes](#), he could also know how much cash you are carrying.)

Step into this 'science-fact' scenario and take a look around at what a laissez faire world of RFID looks like. A world that almost everyone agrees *will* need controls. The question is what and when - and can we afford to wait?

To unmask the 'silent stalker', you have to understand how RFID works (see inset).

### The Incredible Shrinking RFID.

Technology eliminated the need for these devices to carry their own battery power-source. RFIDs became antenna-bearing microchips, the size of a single grain of sand and drawing their power from the

#### What is RFID?

When you attach an electronic transponder to your windscreen to automatically pay road or bridge tolls, you are using an RFID. Various called a Speedpass or E-tag, these are radio frequency identity devices (RFID) that identify you and your account so it can be automatically billed.



In parts of the USA the same Speedpass will buy a fast-fill at Mobil stations or a Big Mac and fries in a McDonald's drive-through.

An RFID functions by responding to a signal from a receiver that causes it to transmit its own unique ID. Most commonly, the return signal identifies a person (or their credit card account).

But it can just as easily identify a product. The [Prada](#) store in New York is a good example. When shoppers take a garment in to the change room, the attached RFID triggers the video in the change room to show models wearing *that* exact garment.

electronic 'interrogation signal' sent out from the scanner. 'Passive' RFIDs, as these are known, are much more restricted in transmission range. Initially it was only about a meter (3 feet) but it continues to expand progressively.

Such microchips can be embedded in bank notes, your driver's license, your passport – or even your cat. They can also be embedded in packages and price stickers, hence their potential to displace the ubiquitous barcode.

When, with mass production, their price eventually reduces to perhaps a cent, all products are likely to have an RFID instead of a barcode and retailers will be able to electronically "poll the shelf" to keep track of everything from cans of Coke to packets of Pringles.

You too will be able to "poll" your pantry and indeed your entire house. You will know exactly what you own, where everything is, and be reminded if anything is getting low. Imagine being able to locate your car-keys, spectacles, remote control - and never again losing another sock in the wash!



RFID chips no bigger than grains of sand

Imagine a world where your cat-flap opens only when it senses the identity chip implanted in *your* cat. And your car refuses to start for would-be thieves unless it detects [your driver's license](#). Where your pantry reminds you that you have forgotten to take your [medication](#) and your [refrigerator](#) tells you it is running low on milk and the butter is past the use-by date. Imagine you are about to leave home and your [handbag](#) announces "you forgot your keys" and that you have very little [cash](#).

Fantasy? No! Each of these is just *part* of the world of RFID and many of these have gone beyond the drawing board and are already in testing and production. (Follow the links for details.)

### Meet Mr. Hyde

That's Dr Jeckyl's story. Now let's meet Mr. Hyde. A laissez faire world of RFID would be pretty frightening. New technologies frequently need social controls. Telephones for example can only be tapped by police with a court order.

How would you feel if you could be tracked by authorities, wherever you go, via the [RFID in your driver's license](#)? And the [passport](#) in your pocket reveals your nationality and perhaps even your identity to any discerning terrorist looking for prime kidnap targets among passing tourists? And why would police need search warrants when they can effortlessly scan the contents of your pockets or your car or your house?

However, all this scary Big Brother stuff won't happen of course - because controls will be put in place.

When? And what controls?

There is a strong argument being put right now that says '[don't regulate RFID--yet](#)', before the technology has a chance to be implemented, because it will prevent industries from unlocking the benefits. Indeed, hasty *over*-reaction poses a real risk for RFID. At the same time, many people are very uncomfortable about opening Pandora's box in an *unrestrained* environment. Especially when, in this onward march, each new application seems to give rise to others that trigger ever-greater magnitudes of concern.

When your cat gets lost, you welcome it being quickly identified by the [microdot embedded](#) under its skin. How do you feel if your aged mother with Alzheimer's, prone to wandering off and getting lost can be returned to you at the right address by the same technology? Or how do you feel about [electronically tagging your kids](#) for their own protection? If the [US Federal Drug Administration gave approval](#) for an RFID implant [chip to be used in humans](#), would it flag something of a Big Brother, danger signal? Well the FDA *has* given approval! Follow the links.

What you discover is that a number of these things are already happening.... albeit on a small scale and for well-intended purposes. Each small step moves us progressively forward but the fear is that they may retrospectively add up to one giant leap for Big Brother! [New Scientist](#) reported in 2004 that clubbers in Spain are choosing to receive an RFID implant instead of carrying a membership card. As many as [2,000 people in the world already have RFID chips implanted](#) in their arm. And Wal-mart, the world's biggest retailer mandated that its top 100 suppliers put RFID in their products by this month (January 2005). So, these [suppliers will be tagging about 65 percent of all their products](#) that will be sold through more than a 100 Wal-Mart stores by the end of this month.

What safeguards are needed to accompany RFID is a debate that we urgently need to have.

Hasty, knee-jerk solutions like legislating that all RFIDs be removed or electronically deactivated at store exits, would rob us of the benefits of RFID in the home. Some of us *want* to be alerted if any food or pharmaceutical product is subject to recall or getting close to the use-by date – not to mention the boon of always being able to find the remote control and those missing socks.

But with RFID transmission ranges now climbing to around 20 feet ([6 meters](#)) and claims of 100 feet ([30 meters](#)), how long will it be before we will have to buy [a personal jammer](#)? Will we need electronic shields around ourselves, our cars and our homes in order to prevent leakage of this information?

In this laissez faire world, market research vehicles could roam neighborhoods, conducting sweeps of homes for information on your possessions and their date-of-purchase with links to postal addresses. Privacy guidelines in Europe and Australia might prevent them recording and linking this information to your *personal identity* (uncovered by the signal emitted from your credit cards or driver's license) but how about in the USA? And what will stop them pestering your postal address with direct mail offers to get you to replace that aging couch, computer or credenza?

Sophisticated thieves wouldn't have to waste time stealing from the poor. They could drive by and scan the value of the items in your house or your car, *before* breaking in. Muggers would know not only how much [cash](#) you are carrying but also whether that's a real Rolex you're wearing - *before* intercepting you.

Clearly, 'rules of engagement' *are* needed for the RFID revolution that is now dawning. Some [legislators](#) and [Privacy Commissioners](#) have their eyes open but Joe and Josephine Citizen are asleep, oblivious to the huge implications this new day will bring. It is time for us all to wake up and become more aware of this new technology.

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<sup>1</sup> Adnews Sept 2002. *More of Science's Gee-whiz Toys*