

Privacy and Societal Implications of RFID

Katherine Albrecht

Consumers Against Supermarket
Privacy Invasion and Numbering
(CASPIAN)

“One-ness”

Retail Systems®2003
Conference & Exposition

VICS COLLABORATIVE
COMMERCCE
VOLUNTARY INTERINDUSTRY
COMMERCE STANDARDS

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SHOW DAILY

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Creating One-ness Among Systems, Supply Chain and Business

By Tom Friedman, Show Founder
Retail Systems® 2003/VICS Collaborative Commerce Conference & Exhibition

I am pleased to welcome you to the most important combined retail IT and supply chain conference and exposition of the year.

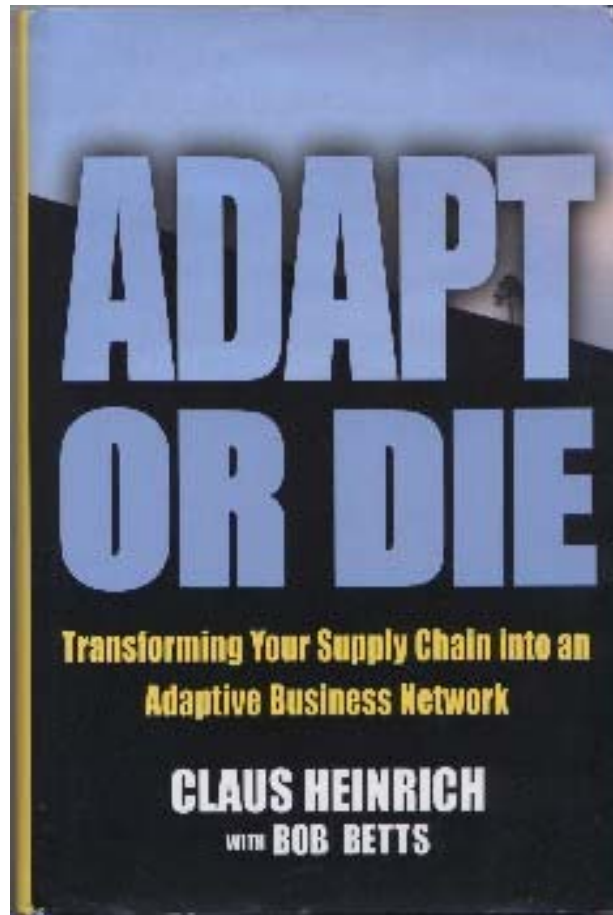
stones of the 2003 edition of Retail Systems/VICS Collaborative Commerce Conference & Exposition:

Expanding upon the theme of “Building A View of What Is Soon to Come

MEET ME!



The pressure is on businesses to comply



**We've had enough experiences
with technology gone awry.**

**The time to discuss the
implications of RFID is now.**

Used improperly, RFID has the potential to jeopardize consumer privacy, reduce or eliminate purchasing anonymity, and threaten civil liberties.

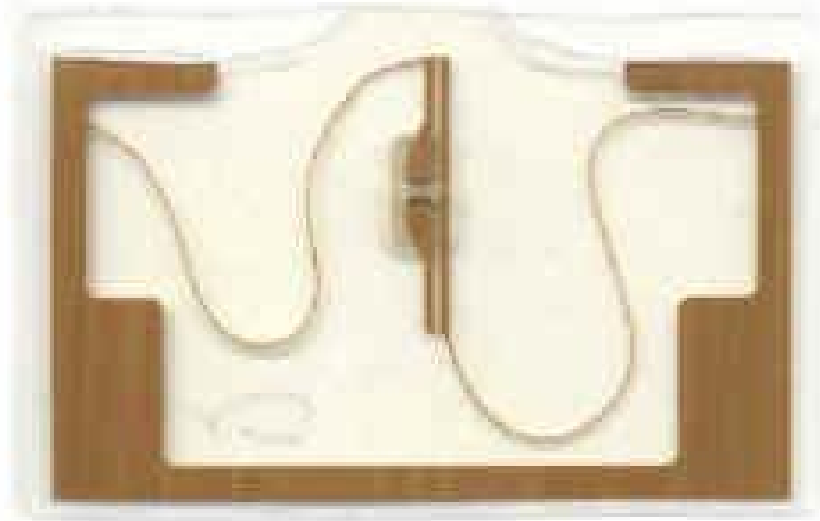
Threats to Privacy and Civil Liberties

1. Hidden placement of tags.
2. Unique identifiers for all objects worldwide.
3. Massive data aggregation.
4. Hidden readers.
5. Individual tracking and profiling.

Threat 1: Hidden placement of tags

- Integrated into cardboard boxes
- Hidden in inaccessible location on product
- Slipped between layers of paper
- Sewn into clothing
- Embedded in plastic
- Printed onto product packaging
- Seamlessly integrated into paper

A 6” tag is hard to hide.



← 6.0 inches →

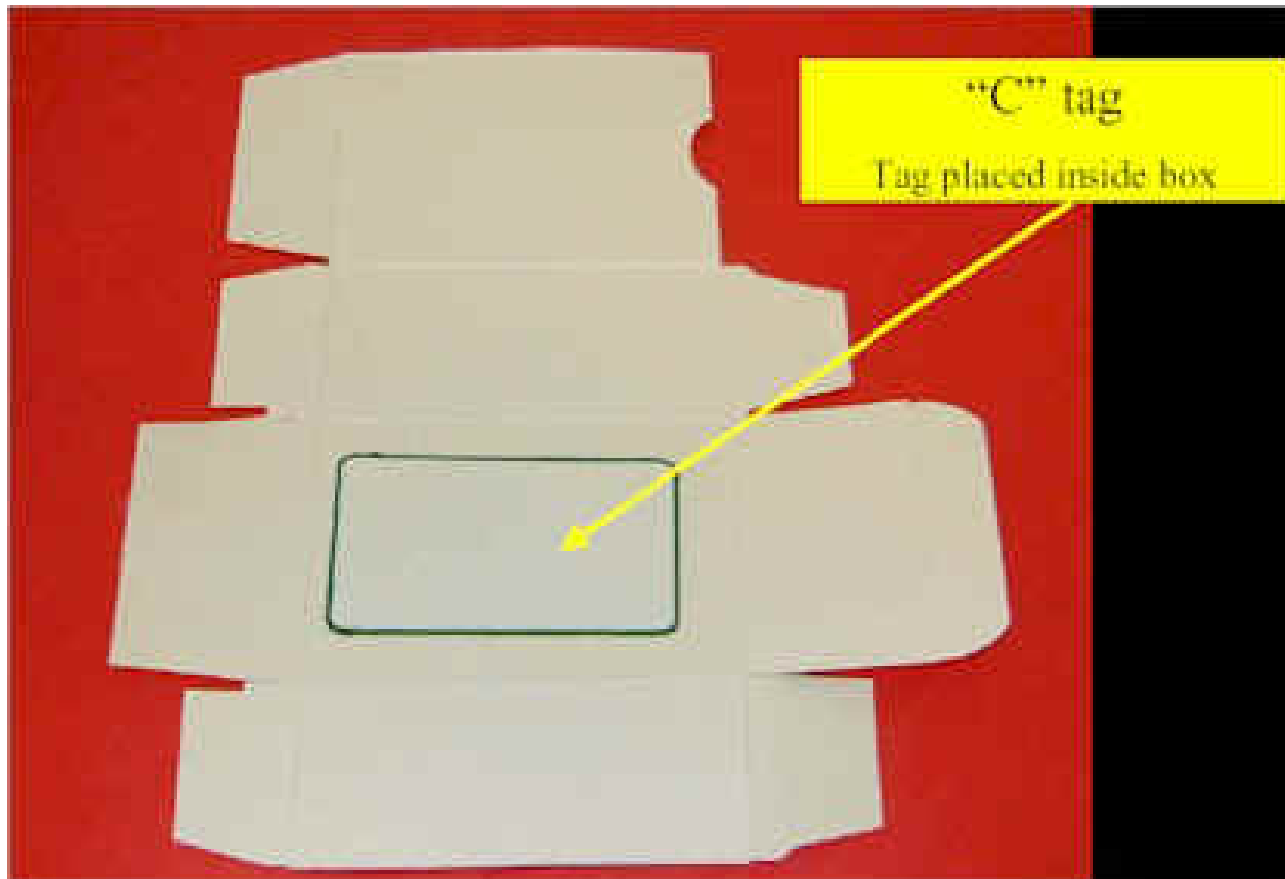
Alien/RAFSEC “C” tag

Used on:

Bar Soap, Paper Products

Or is it?

Hidden: Sandwiched in cardboard



6" Alien/RAFSEC "C" tag inside a box

**This tag (with a 17ft. read range)
is easy to spot, right?**



Alien/RAFSEC ‘I’ Tag

Used on:

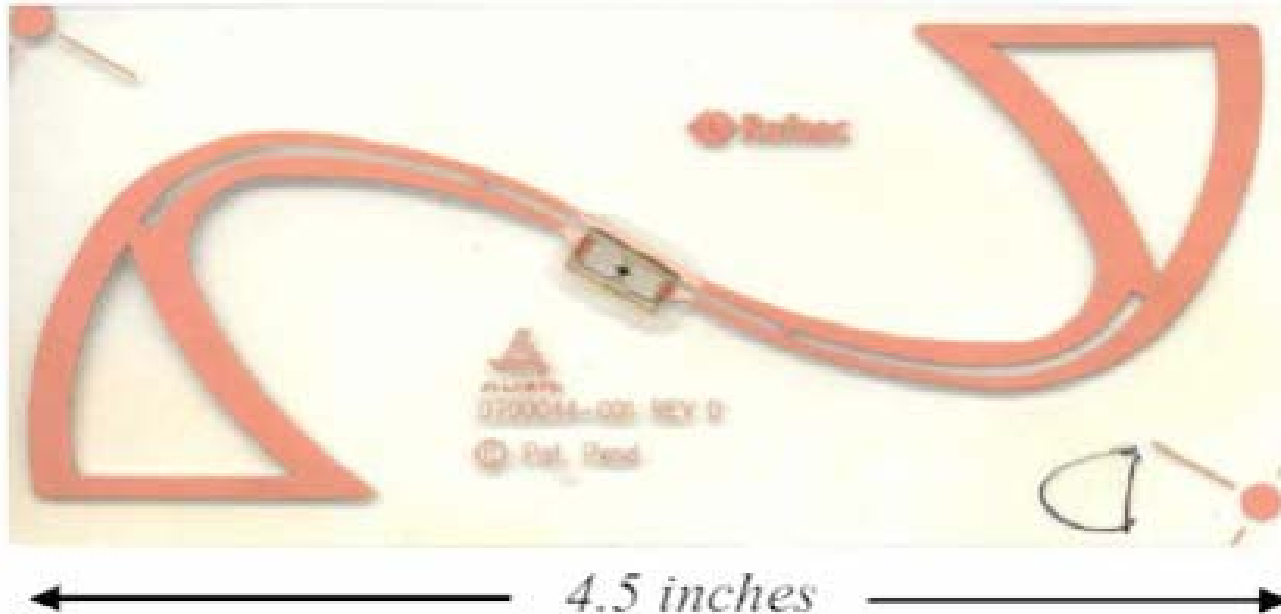
Cases, Shampoo Bottle, Aerosol Cans

Not when “placed inside cap” – an inaccessible location on this flip-top product



Alien/RAFSEC “I” tag in lid of Pantene shampoo bottle

Another big tag (4.5")



Used on:
Cases, Dog Food, Coffee Cans

Alien/RAFSEC "S" Tag

“placed between layers of paper”



Alien/RAFSEC “S” Tag in Bag

Tags can be sewn into clothing



Embedded in plastic



footstar
www.footstar.com

ATTENTION: Our products
have theft detection devices
embedded which will be
deactivated at the
register or the
service
desk

Printed onto product packaging

"The vision is to move from the etched, solid metal antennas to the printed antennas."

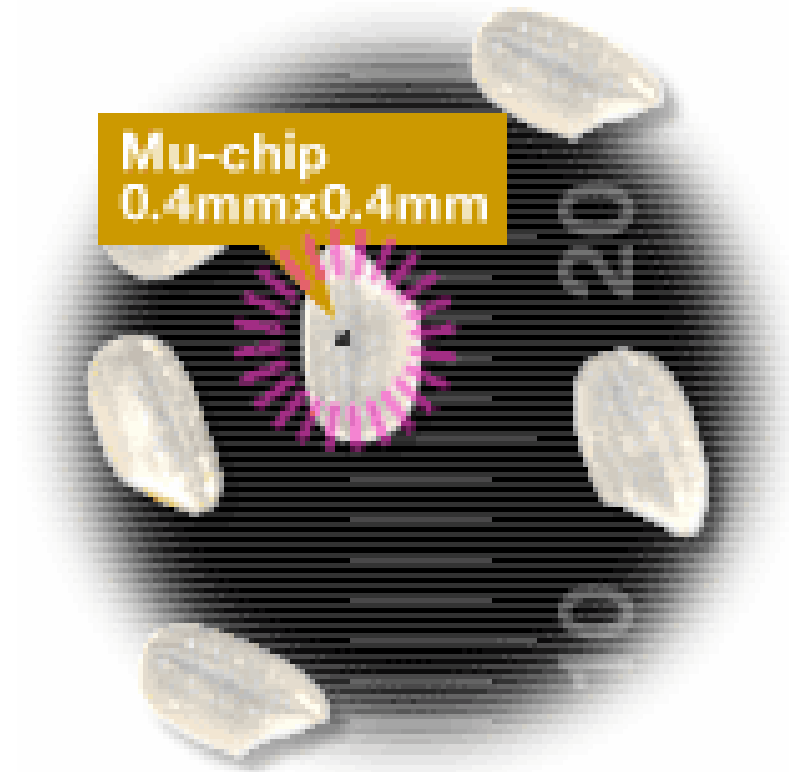
"Since radio waves travel through most packaging materials, packagers...could print the antenna...inside of the box. They could laminate it inside the package, or print it on the outside and print over it."

– Dan Lawrence, Flint Ink

Tiny chips could be very hard to spot

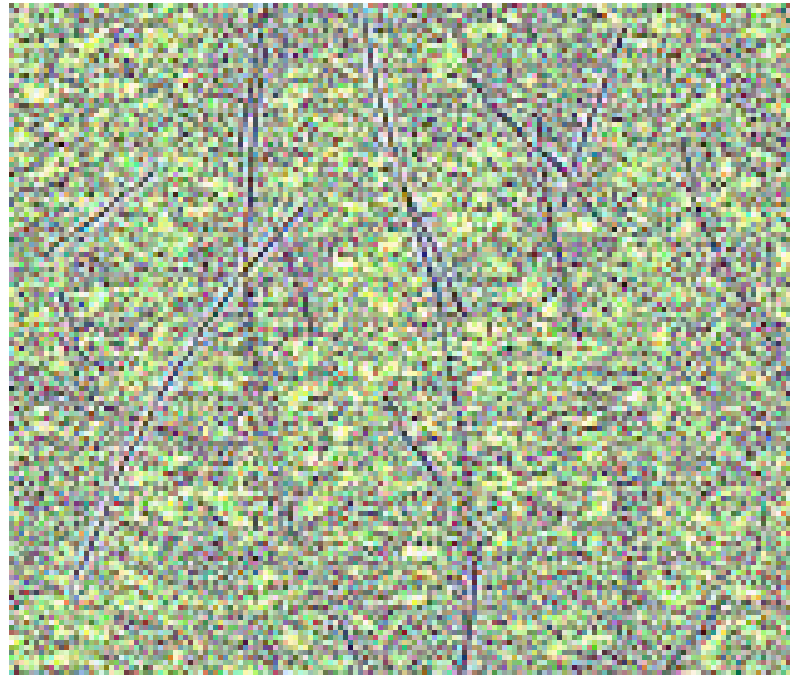


And they're getting smaller.



Hitachi's mu-chip contrasted with grains of rice

They can be integrated into paper



**Inkode's "chipless tag":
Closeup of Inkode metal fibers embedded in paper**

More on chipless tags:

“The Inkode system involves embedding very tiny metal fibers...[that] reflect radio waves back to the reader, forming what Inkode calls a ‘resonant signature.’ These can be converted into a unique serial number.”

“The tags can be read from less than an inch to 10 feet away.”

- RFID Journal 3/31/03 #

Threat 2: Unique identifiers for all objects worldwide.

“...the EPC network [is] a new global standard for immediate, automatic identification of any item in the supply chain of any company, in any industry, in the world.”

- EPCGlobal

**The Auto-ID Center and EPCGlobal
have developed a system they hope
will tag every manufactured item on
Earth with a unique ID**



The Internet of Things

how intelligent tagging is about to change the world

Soon these chips could appear on every Coke can...



“In answer to a question...about *whether Coca-Cola is REALLY interested in uniquely identifying a single can of Coke among billions*, Michael [Okoroafor, in charge of technical solutions for Coca-Cola] replied with a resounding ‘YES!’”

- IDTechEx Magazine 2003

...and on every pack of gum



“Alien envisions [conductive] ink being mixed with regular packaging ink to create antennas on boxes of cereal and other disposable packaging...”

“With these things you could literally tag a pack of chewing gum.” - Jacobsen, Alien Technology

Threat 3: Massive data aggregation.

- DARPA, Homeland Security, and other Federal and state law enforcement agencies hope to consolidate consumer purchase data in centralized databases

Threat 4: Hidden readers.

Reader devices can be invisibly embedded in:

- Walls
- Doorways
- Floor tiles
- Carpeting
- Floor mats
- Vehicles
- Roads
- Sidewalks
- Counters
- Shelving
- Furniture
- Consumer products
 - Printers
 - Copiers
 - Vacuum cleaner
- Handheld, i.e., in a backpack

Shelving: the photo-snapping Gillette “smart shelf”



Gillette product packaging



The loyalty card is the retailers' secret weapon in keeping track of customers. But what of the future? Already, some packets of razorbodies have built-in tags that trigger a camera to take a photograph of anyone who picks them up...

**Currently, RFID enables
“silent commerce.”**

Consumers don't know where it is.

###

Threat 5: Individual tracking and profiling.



Retailers want to identify and target shoppers.

- Surprisingly, many (if not most) retail POS systems currently link bar code information with consumer identity
- Much customer data captured at POS is sold and shared -- both legally and illegally

Loyalty cards are a huge potential RFID market

"...the ability to read and record a cardholder's movement as they move through a retail or hospitality environment can be appealing to retailers or marketers desiring to know the habits or preferences of their customers."

- Intellitag promotional copy, 2003



**The card in your wallet could
transmit data about you**



What did you do today?

**Privacy invasion and people
tracking with RFID.**

**Michelin is placing “spy chips”
in its tires.**





**ARE YOU WEARING
TRACK SHOES?**

Are our bodies next?

Why are Humans listed on this slide?

BITS	UNIQUE NUMBER	OBJECTS
23	6.0×10^6 per annum	Automobiles
29	5.6×10^8 in use	Computers
33	6.0×10^9 total	Humans
34	2.0×10^{10} per annum	Razor blades
54	1.3×10^{16} per annum	Grains of rice

The “Verichip” implant (short read range)





AP PHOTO • APPLIED DIGITAL SOLUTIONS

The new Verichip, about the size of a grain of rice, is the first-ever computer ID chip that could be embedded beneath a person's skin.

Human computer ID chip proposed

■ Privacy advocates warn of loss of liberty.

By CHRISTOPHER NEWTON
THE ASSOCIATED PRESS

WASHINGTON - A Florida technology company is poised to ask the government for permission to market a first-ever computer ID chip that could be embedded beneath a person's skin.

For airports, nuclear power plants and other high security facilities, the immediate benefits could be a closer-to-foolproof security system. But privacy advocates warn the chip could lead to encroachments on

civil liberties.

The implant technology is another case of science fiction evolving into fact. Those who have long advanced the idea of implant chips say it could someday mean no more easy-to-counterfeit ID cards nor dozing security guards.

Just a computer chip - about the size of a grain of rice - that would be difficult to remove and tough to mimic.

Other uses of the technology on the horizon, from an added device that would allow satellite tracking of an individual's every movement

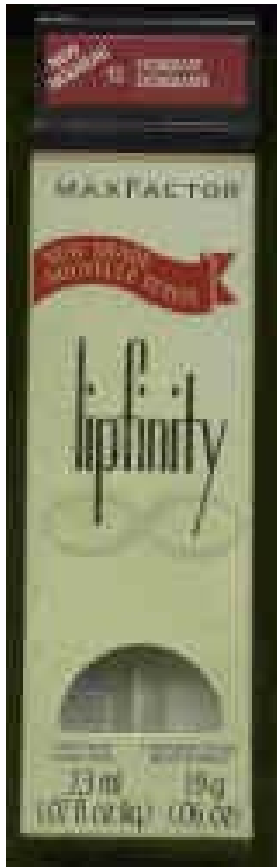
See CHIP, Back Page

Consumers wonder: Who's guarding the henhouse?

Scandals in 2003:

- Broken Arrow. Wal-Mart and P&G conducted secret trials involving live consumers, then tried to cover it up
- Gillette "Spy Shelf." Gillette caught taking mugshots of unsuspecting customers with shelf cameras, then shifted responsibility to partner Tesco
- Brockton Wal-Mart Trial. Gillette and Wal-Mart both denied existence of smart shelf until CASPIAN provided photos to the press.
- Auto-ID Center Confidential Documents. PR strategy involved conveying the "inevitability" of RFID, "pacifying" consumers, and relying on consumer "apathy"
- Non-Response to Information Requests. CASPIAN's "three questions" letter – sent twice -- has gone unanswered to this date.
- Benetton/Philips. Benetton misled consumers about its clothing tracking chip, telling them the chips could be "killed" at checkout

Wal-Mart / P&G Lipfinity Trial



Broken Arrow, Oklahoma

Wal-Mart and P&G conducted a 4-month secret RFID experiment using live consumers. Distant P&G executives used a video camera trained on the shelf to observe shoppers.

Both Wal-Mart and P&G repeatedly denied the trials until evidence was produced.

Public Policy Committee Members not Notified of Trials

Every single product-level RFID trial to date has had a station where tags could be killed.

That's because there have been NO product-level RFID trials to date. But the trials that were planned at Walmart, before they were canceled, were going to have a kill station.

Posted by: [Simson Garfinkel](#) at October 4, 2003 07:58 AM

Gillette / Tesco “Smart Shelf” Trial

Great Britain

Gillette was caught taking mugshots of unsuspecting customers using RFID-triggered shelf cameras. Gillette initially denied the trials, then shifted responsibility to partner Tesco. The Auto-ID Center never acknowledged its involvement.



The Brockton Trial: never admitted

Brockton, MA

Wal-Mart and Gillette both denied existence of a smart shelf in the Brockton Wal-Mart until CASPIAN provided photos to the press. Both companies then claimed the test never went “live.”



The Gillette smart shelf tested by an Auto-ID Center researcher

Auto-ID Center's Confidential Documents Revealed

CASPIAN obtained confidential documents from the Auto-ID Center's unsecured website. The Center's confidential PR strategy was found to include “pacifying” consumers, conveying the “inevitability” of RFID technology, and relying on consumer “apathy.”



The Internet of Things
how intelligent tagging is about to change the world

Non-Response to Information Requests

The “three questions,” CASPIAN asked the Auto-ID Center Board of Overseers on July 9, 2003 were never answered

1. What consumer products are currently being individually tagged with RFID devices? What products have been tagged in the past?
2. What retail stores are selling or have sold RFID-tagged items to consumers? Please provide specific store location information.
3. Where can consumers get details about information collected when they interact with RFID-tagged items at these locations? For example, are consumers being tracked, videotaped, or photographed?

Benetton/Philips clothing tagging controversy

Tags could not be “killed” as promised

In March 2003, Philips announced that Benetton would incorporate its RFID tags into the labels of the “Sisley” line of clothing, a line consisting primarily of women’s undergarments.

After an international outcry, Benetton told consumers the tags could be “killed” at checkout. Philips documentation revealed the tags could only be made “dormant.”

Don't think it could get worse?

Because...

- **Read-range distances are not sufficient to allow for consumer surveillance.**
- **Reader devices not prevalent enough to enable seamless human tracking.**
- **Limited information contained on tags.**
- **Passive tags cannot be tracked by satellite.**
- **High cost of tags make them prohibitive for wide-scale deployment.**

MYTH

- **Read-range distances are not sufficient to allow for consumer surveillance.**

Read Range 915 MHz Tags

Mfgr	Type	Frequency	Read Range	Comments
Transponder Technologies Intellitag 500	Passive	915 MHz	11 feet	“Read range up to 3.5m (11.48 ft) using unlicensed 915 MHz reader with one antenna; read range up to 7m (22.96 ft) with two antennas”
Telenexus	Passive	915 MHz	15 feet	“Telenexus has developed a reader and antenna for the 915 MHz long-range RFID system...with a read range of over 15 feet. The tag is a low-cost passive transponder.”
Alien	Passive	915 MHz	17 feet	“The maximum freespace read range of these emulator tags is 5 meters, consistent with the performance of other known UHF passive tags.”
iPico	Passive	915 MHz	66 feet USA licensed 20-26 feet USA unlicensed 3 – 7 feet EU	Read range “depends on reader configuration and tag enclosure. 30 W EIRP (USA site licensed): > 20m 4 W EIRP (USA unlicensed): 6-8m 500 mW ERP (Europe): 1-2m”
Matrics/Savi	Passive	unspecified	33 feet	“The first product to come from the collaboration will be a handheld device that reads Matrics' passive EPC tags...The unit will be able to read passive tags from up to 33 feet (10 meters) away”

MYTH

- **Reader devices not prevalent enough to enable seamless human tracking**

MYTH

- **Limited information contained on tags.**

MYTH

- **Passive tags cannot be tracked by satellite.**

MYTH

- **High cost of tags make them prohibitive for wide-scale deployment.**

#

Some Proposed Industry Solutions

- **Killing tags at point of sale**
- **Blocker tags**
- **Closed system**

Principles of Fair Information Practice

- **Openness, or transparency**
- **Purpose specification**
- **Collection limitation**
- **Accountability**
- **Security Safeguards**

RFID Practices that Should be Flatly Prohibited:

- Merchants must be prohibited from forcing or coercing customers into accepting live or dormant RFID tags in the products they buy.
- There should be no prohibition on individuals to detect RFID tags and readers and disable tags on items in their possession.

RFID Practices that Should be Flatly Prohibited (continued) :

- RFID must not be used to track individuals absent informed and written consent of the data subject. Human tracking is inappropriate, either directly or indirectly, through clothing, consumer goods, or other items

RFID Practices that Should be Flatly Prohibited:

- RFID should never be employed in a fashion to eliminate or reduce anonymity.

For instance, RFID should never be incorporated into currency.

Conclusions

We request manufacturers and retailers to agree to a *voluntary moratorium on the item-level RFID tagging of consumer items* until a formal technology assessment process involving all stakeholders, including consumers, can take place.

Conclusions

Further, the *development of this technology must be guided by a strong set of Principles of Fair Information Practice*, ensuring that meaningful consumer control is built into the implementation of RFID.

**Position Statement
on the Use of RFID on Consumer Products**

November 14, 2003

Available at www.spychips.com and www.privacyrights.org

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Issued by:

Consumers Against Supermarket Privacy Invasion and Numbering (CASPIAN)
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