### History of Radio-frequency identification

In 1945, ***Léon Theremin*** created the "Thing," a covert listening device for the Soviet Union that retransmitted incident radio waves with added audio information. This passive device was activated by external radio waves, making it an early precursor to RFID.

During World War II, technology like the Identification friend or foe (IFF) transponder was used by the Allies and Germany to identify aircraft as friendly or hostile. Transponders, which are still used in aviation today, were an early form of RFID.

In 1948, ***Harry Stockman***'s influential paper predicted the need for research and development in reflected-power communication and the exploration of useful applications, setting the stage for RFID's development.

***Mario Cardullo***'s 1973 patent marked a significant milestone in RFID technology. His passive radio transponder with memory laid the foundation for modern RFID. The device had various potential applications, including transportation, banking, security, and medical use.

In 1973, *researchers at the Los Alamos National Laboratory* demonstrated early passive and semi-passive RFID tags that used reflected power (modulated backscatter) at 915 MHz, a technique that remains prevalent in contemporary UHFID and microwave RFID tags.

The term "RFID" was first associated with a patent in 1983, granted to ***Charles Walton***.

In 1996, a significant milestone was reached with the grant of a patent for a batteryless RFID passive tag with limited interference, paving the way for more efficient and interference-resistant RFID technology.

### Important names in the field, research team

1. Sanjay Sarma

Sarma was one of the founders of the Auto-ID Center at MIT, which, along with a number of partner companies and its "spin-off," EPCglobal, developed the technical concepts and standards of modern RFID. He also chaired the Auto-ID Research Council consisting of six labs worldwide, which he helped to establish. Today, the suite of standards developed by the Auto-ID Center, commonly referred to as the EPC, are utilized by over a thousand companies on five continents. Between 2004 and 2006, Sarma took a leave of absence from MIT to found the software company OATSystems, which was acquired by Checkpoint Systems in 2008. He is a consultant and board member at several companies, including EPC Global, and also serves as a permanent guest of the board of GS1 and a member of the board of governors of GS1US. Sarma also serves on the City of Boston's Complete Streets Advisory Group.

1. Kevin Ashton

Kevin Ashton is a British technology pioneer who cofounded the Auto-ID Center at the Massachusetts Institute of Technology (MIT), which created a global standard system for RFID and other sensors.

1. Ari Juels

Ari Juels is a renowned computer scientist and cryptography expert who has made significant contributions to RFID security. He is known for coining the term "RFID security" and has published numerous papers on the topic.

1. Kevin Fu

Kevin Fu is a computer scientist and expert in embedded and computer security. He has conducted extensive research on RFID security, focusing on vulnerabilities, privacy issues, and countermeasures.

1. Adam Stubblefield

Adam Stubblefield is a researcher and professor with expertise in RFID security and cryptography. His work has helped identify security weaknesses in RFID systems and propose countermeasures.

1. Avi Rubin

Avi Rubin is a well-known security researcher and author who has contributed to the discussion on RFID security and privacy issues. He has also worked on various aspects of computer and network security.

### Online Resources:

1. Auto-ID Labs

The Auto-ID Labs network is a research group in the field of networked radio-frequency identification (RFID) and emerging sensing technologies. The labs consist of seven research universities located on four different continents. These institutions were chosen by the former Auto-ID Center to design the architecture for the Internet of Things together with EPCglobal.[1][2] The federation was established in 1999; the network they have developed is at the heart of a proposal sponsored by EPCglobal and supported by GS1, GS1 US, Wal-Mart, Hewlett-Packard, and others to use RFID and the Electronic Product Code (EPC) in the identification of items in the supply chain for companies. The areas of expertise range from hardware to software to business research related to RFID.

1. EPCglobal:

EPCglobal® is a GS1 initative to innovate and develop industry-driven standards for the Electronic Product Code™ (EPC) to support the use of Radio Frequency Identification (RFID) and allow global visibility of items (EPCIS) in today's fast-moving, information rich, trading networks.

1. RFID Journal

The World’s Leading Source of RFID News and Information

RFID Journal was launched on Mar. 1, 2002, as the world’s first independent media company devoted solely to radio frequency identification and its many business applications. Today, RFID Journal is, by far, the world’s leading source of RFID news and insights. Our mission is to help companies use RFID and other Internet of Things (IoT) technologies to improve the way they do business.

### Online Research Journals and Magazines

1. Journal of RFID and Wireless IoT:

This journal focuses on RFID and wireless IoT technologies and their applications.

1. RFID & Wireless IoT Global

A source for news, articles, and publications related to RFID and IoT.

### Relevant links

* RFID Handbook: Fundamentals and Applications in Contactless Smart Cards and Identification: <https://books.google.ro/books?hl=en&lr=&id=jAszZEQYa9wC&oi=fnd&pg=PT6&dq=RFID+Handbook:+Fundamentals+and+Applications+in+Contactless+Smart+Cards+and+Identification&ots=2KrEkmTWQn&sig=ZznpVo2Bi_EBqXe_HVVcvxLOtNg&redir_esc=y#v=onepage&q=RFID%20Handbook%3A%20Fundamentals%20and%20Applications%20in%20Contactless%20Smart%20Cards%20and%20Identification&f=false>
* RFID Applied: <https://books.google.at/books?hl=en&lr=&id=7TTHouZ5ExwC&oi=fnd&pg=PR9&dq=RFID+Applied&ots=Li7jSSjj12&sig=HwjJXJFE4_1Rp3Whot0VcKOLUOA#v=onepage&q=RFID%20Applied&f=false>
* RFID for Dummies: <https://books.google.at/books?hl=en&lr=&id=Gb6w54X7Kw0C&oi=fnd&pg=PR5&dq=RFID+for+Dummies&ots=GadIkIWoCy&sig=MB4o6qRSDyJGh_FZ4OnBvvhdj0I#v=onepage&q=RFID%20for%20Dummies&f=false>
* RFID systems and security and privacy implications: <https://scholar.google.com/citations?view_op=view_citation&hl=en&user=r9UmpGUAAAAJ&citation_for_view=r9UmpGUAAAAJ:u-x6o8ySG0sC>
* RFID: technology and applications: <https://scholar.google.com/citations?view_op=view_citation&hl=en&user=r9UmpGUAAAAJ&citation_for_view=r9UmpGUAAAAJ:roLk4NBRz8UC>
* RFID Technology and Applications: <https://www.academia.edu/78944612/RFID_Technology_and_Applications>
* Defining Strong Privacy for RFID: <https://www.arijuels.com/wp-content/uploads/2013/09/JW09.pdf>

## Bibliography

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* <https://en.wikipedia.org/wiki/Radio-frequency_identification>
* <https://en.wikipedia.org/wiki/Auto-ID_Labs>
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* <https://en.wikipedia.org/wiki/Kevin_Ashton>
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