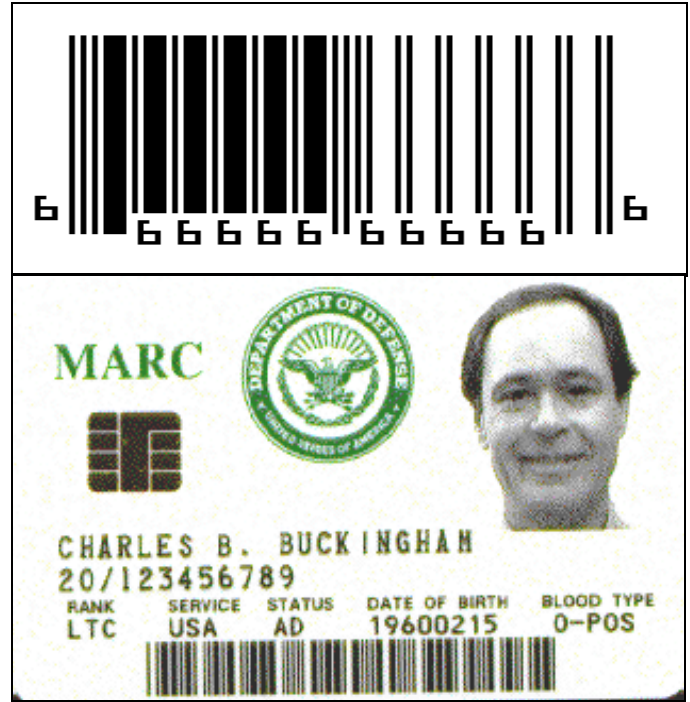


## E-Commerce Images



The inventor of the **UPC barcode** is **George J. Laurer**. In 1971, while Mr. Laurer was an employee at IBM, he was assigned the task 'to design the best code & symbol suitable for the grocery industry'. The UPC barcode was introduced. In 1973.



'**MARC**' stands for '**Multi-technology Automated Reader Card**' – Introduced by **Sen. Charles S. Robb**, July 7, 1997. The MARC is a portable, credit card-sized '**smart card**' capable of storing & updating personnel data on a particular service member or DOD employee. Utilizes a magnetic stripe, a two-kilobyte (2KB) integrated circuit (IC) chip, & a bar code to update & store data. It holds printed information, a digital photograph, embossed name & SSN. The MARC can interface with a various of technologies & systems, from imprinting machines to computer systems that use IC chips as data carriers.

### USES:

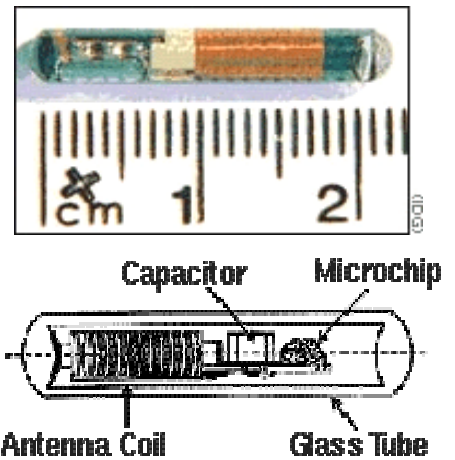
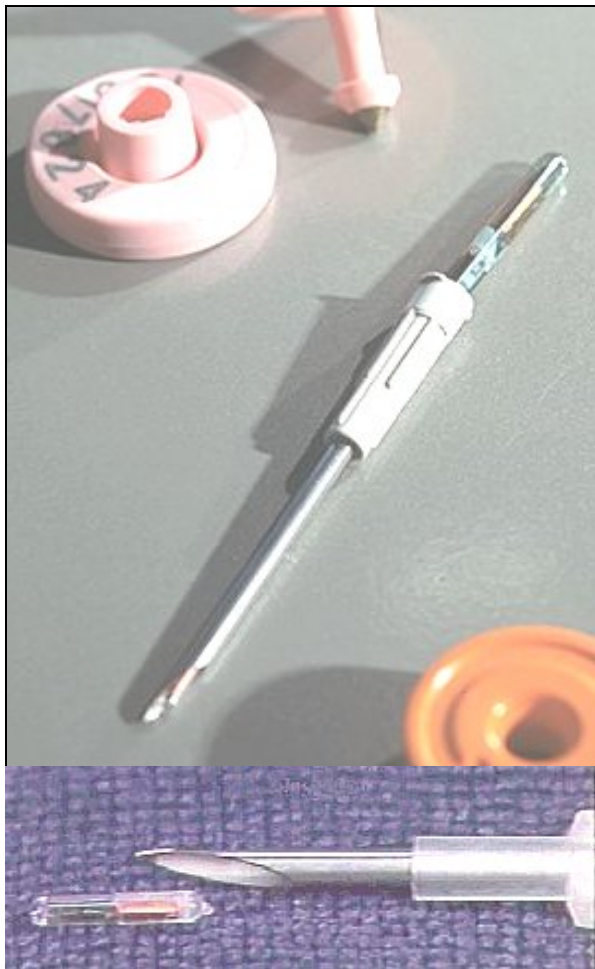
- **Field Medical Documentation.** The field medical evaluation will assess the ability of the MARC IC chip to record, revise, and transfer medical treatment data across echelons of care in the field for both mass casualty and field outpatient treatment.
- **Mobility/Readiness Processing.** The evaluation will assess the use of MARC IC chip to store the up-to-date readiness information such as personal, legal, medical and other data that the soldier must have current prior to deployment.
- **Manifesting.** This evaluation will use the MARC IC chip and bar code to create real-time manifest records of military personnel as they board and disembark from aircraft or ships.
- **Accountability.** This evaluation will use the MARC IC chip and bar code to create real-time accountability reports for military personnel in the field or garrison, allowing commanders to track personnel location and status.
- **Food Service Head Count.** This evaluation uses the MARC magnetic stripe to replace the current paper meal card. Automated collection and reporting of meal headcount data and the ability for the diner to pay by payroll deduction are supported.
- **CHCS Patient Reception.** The evaluation will assess the ability of the MARC bar code to automate and improve the accuracy of patient admission processes within Military Treatment Facilities (MTF).

**RFID Chips.** There is a fundamental difference between a barcode technology and RFID. Barcodes used **Universal Product Codes** to identify the product—say, Coke in cans. RFID replaces the UPC with an **Electronic Product Code (EPC)** that identifies **the single item**—a particular can of Coke.

### RFID Explosion is Real – No Hype

- Last year, Gillette placed an order for 500 million RFID tags from Alien Technology
- SmartCode making 0.25mm chips – target cost 5-10 cents for a billion – 15-20 feet range
- Manufacturing capacity up to 10 billion a year

# RFID = Radio Frequency Identification



**RFID chips:** One proposal is to use RFID chips to identify individuals for secure financial transactions.

VeriPay

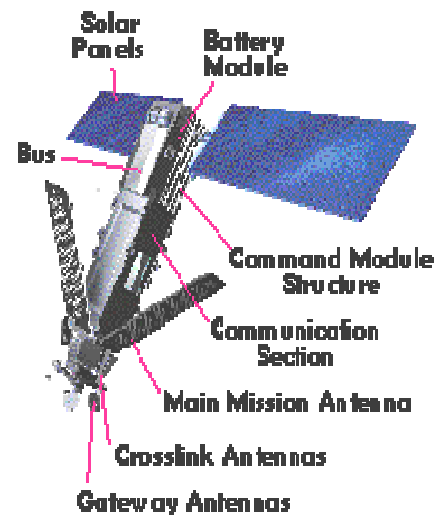
The Iridium satellite system is a array of 66 transponders in low earth orbit that is currently provides satellite phones, pagers, etc. to DOD in a \$219 million contract. This system is able to track implantable RFID chips anywhere on earth.

## Iridium Satellite Schematic

Hitachi Unveils Smallest RFID Chip – 0.3 mm<sup>2</sup>



Timex offers Watch w/ RFID chip with Mobil 'SpeedPass' capability (1997)



How big could RFIDs become?

- More than 30 billion smart labels / radio tags / yr – needed to hit 5 cents cost
  - If just 5 retailers insist on tagging of cases we will see >10 billion tags a year
  - Wal-Mart and Tesco already committed
- |             |           |          |           |
|-------------|-----------|----------|-----------|
| – Carrefour | 2 billion | – Target | 1 billion |
| – Metro     | 1 billion | – Tesco  | 1 billion |
- Expect use at *point of sale* to drive second wave
  - Could see >100 billion radio barcodes a year

– Wal-Mart 10 billion