
Radio Frequency Identification

Radio Regulatory Environment

John Falck & Chris Turner

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Frequencies for RFID

- ◆ LF – 120 to 135 kHz range
- ◆ HF – 13.56 MHz : available almost globally
- ◆ UHF – 433 MHz : low power
- ◆ UHF – 860 to 870 MHz, 902 to 928 MHz and 950 to 956 MHz depending on country
- ◆ μ Wave – nominally 2.45 GHz

Most suitable for passive RFID

- ◆ HF – 13.56 MHz : suitable for short range <1 - 2 metre systems in the presence of organic material and close stacking of items. This is a standard ISM frequency available almost globally.
- ◆ UHF – 860 - 960 MHz band : most suitable for longer range > 2 metre systems in the retail supply chain. The actual band and regulatory requirements differ between ITU regions and individual countries.

ITU Region 1 (EU and Africa)

◆ CEPT countries

- 869.4 - 869.65 MHz : 500mW erp
- 865.6 - 867.6 MHz : 2W erp (proposed)

◆ South Africa

- 869.4 - 869.65 MHz : 500mW erp (proposed)
- 915.2 - 915.4 MHz : 8 W eirp

Note: all the above are channelised in <250kHz wide channels

ITU Region 2 (Americas)

- ◆ USA, Canada and Mexico
 - 902 - 928 MHz : 4W eirp FHSS, 500kHz wide channels permitted – relaxed emission requirements within the whole band.
- ◆ Central & South America
 - Generally similar to North America but varies from country to country.

ITU Region 3 (Asia)

- ◆ Australia

- 918 - 926 MHz : 1W eirp, FCC emission regs

- ◆ New Zealand

- 864 - 868 MHz : 4W eirp

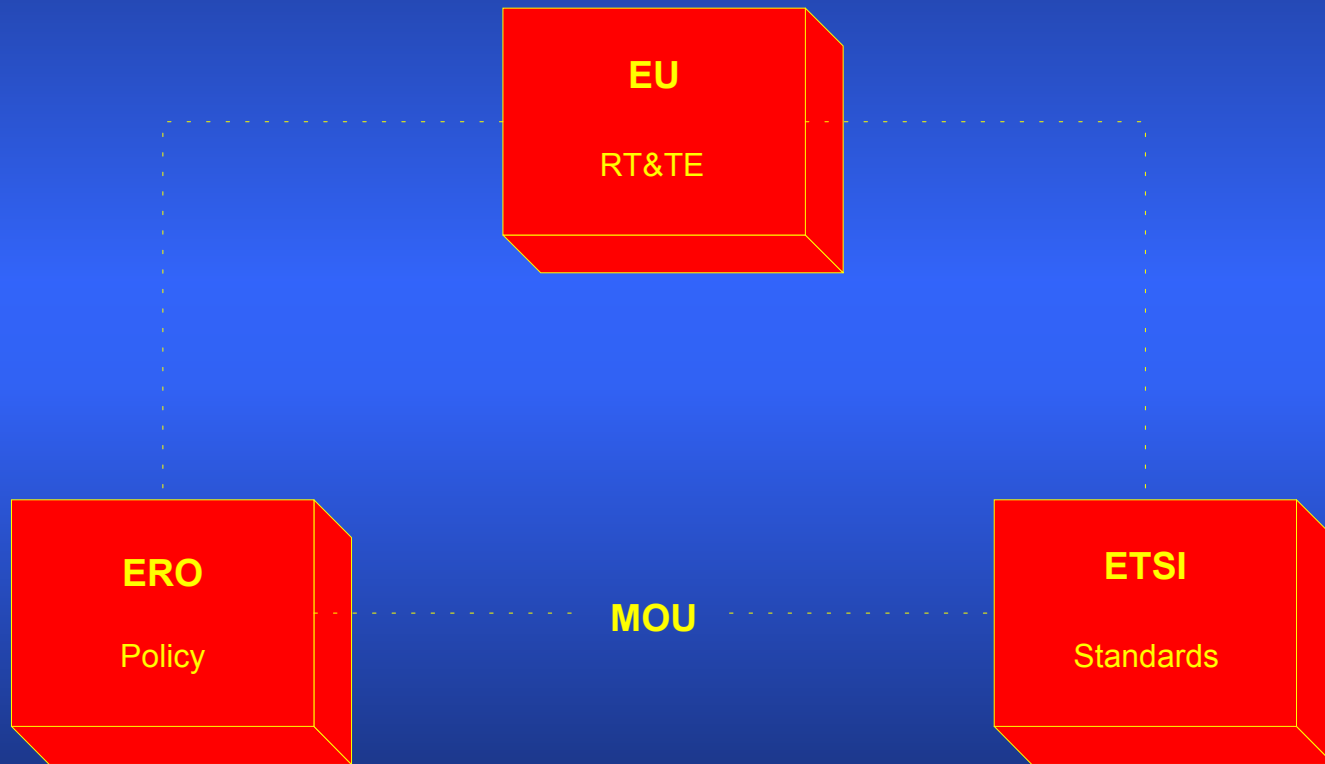
- ◆ Elsewhere in Asia

- Generally follow CEPT except Taiwan which generally follows FCC

- ◆ Japan

- 950 - 956 MHz : Provisional test allocation

European Environment



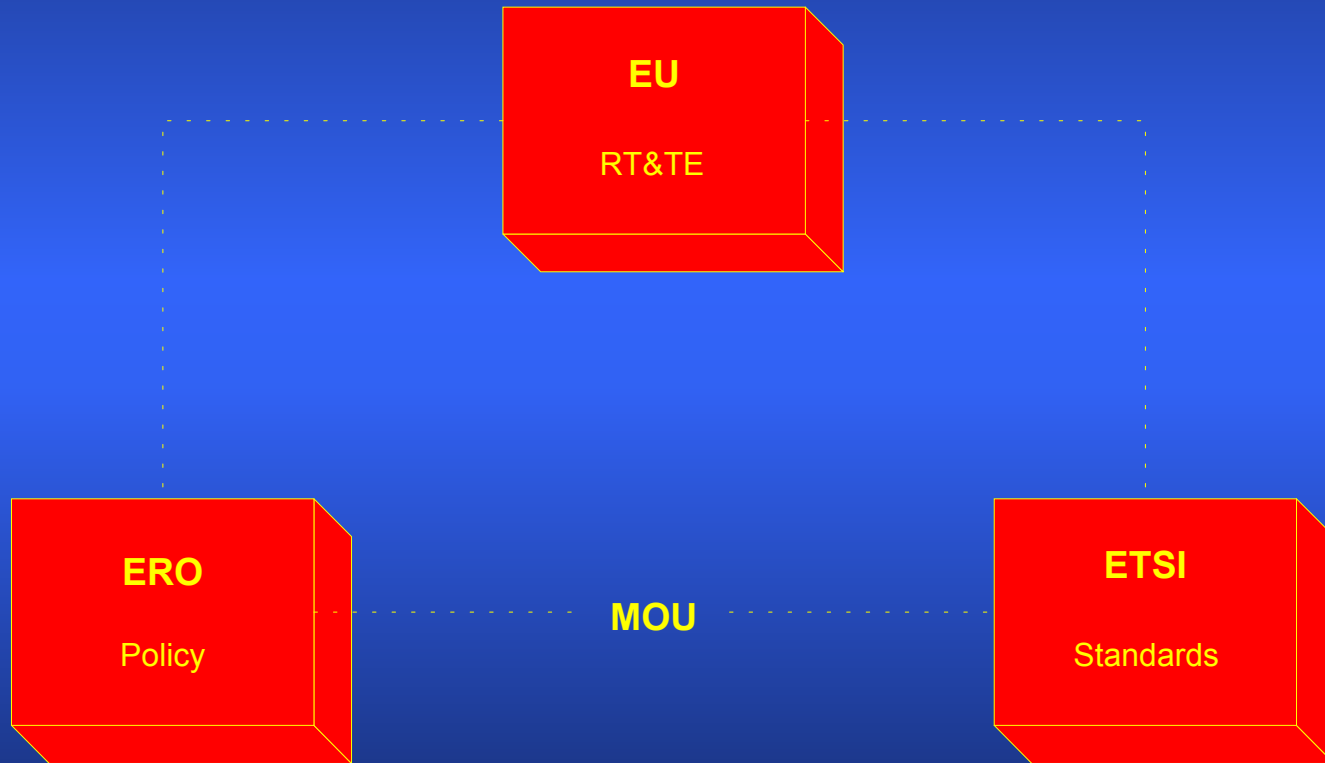
R&TTE directive

- ◆ Essential requirements for all equipment (article 3.2)
 - Electrical Safety : directive 73/23/EEC
 - EMC : directive 89/336/EEC
 - Conformance to the relevant ETSI standard (for RFID at UHF currently EN 300 220 and proposed EN 302 208)
 - Evaluation of human exposure to electromagnetic fields : EN 50357

R&TTE directive contd...

- ◆ Approval and use of equipment is under the R&TTE directive 1999/5/EEC
 - Manufacturers self-certify and notify Administrations
 - Manufacturers are required to maintain a data pack on all CE marked equipment offered for sale.
 - Administrations seek out non-compliant equipment being offered for sale or being used.
 - Government Authorities police the importation and sale of non-compliant equipment.

European Environment



The Regulatory Process

- ◆ ERO – Copenhagen
 - undertakes compatibility studies
 - recommends parameters of operation
e.g. frequency, power levels etc
- ◆ ETSI – Sophia Antipolis
 - prepares technical reports
 - generates product standards via its Task Groups

Present Position in Europe

- ◆ RFID at UHF permitted in band 869.40 - 869.65 MHz
- ◆ Must comply with EN 300 220
- ◆ Transmitted power < 500 mW e.r.p.
- ◆ Duty cycle < 10%

Status of RFID within ERO

- ◆ Compatibility report on 2 W RFID at UHF approved by WGSE
- ◆ SRD-MG consider their recommendations on RFID in December 03
- ◆ WGFM will decide policy on 2 W RFID in January 04
- ◆ ERO will publish policy in Rec 70-03 in approx Mar/Apr 04

Format of Standard

Standard typically written in two parts

- ◆ Part 1 - Voluntary
- ◆ Part 2 - Mandatory and embodied in the O.J. of the European Commission

Status of EN 302 208

Predicted Milestones

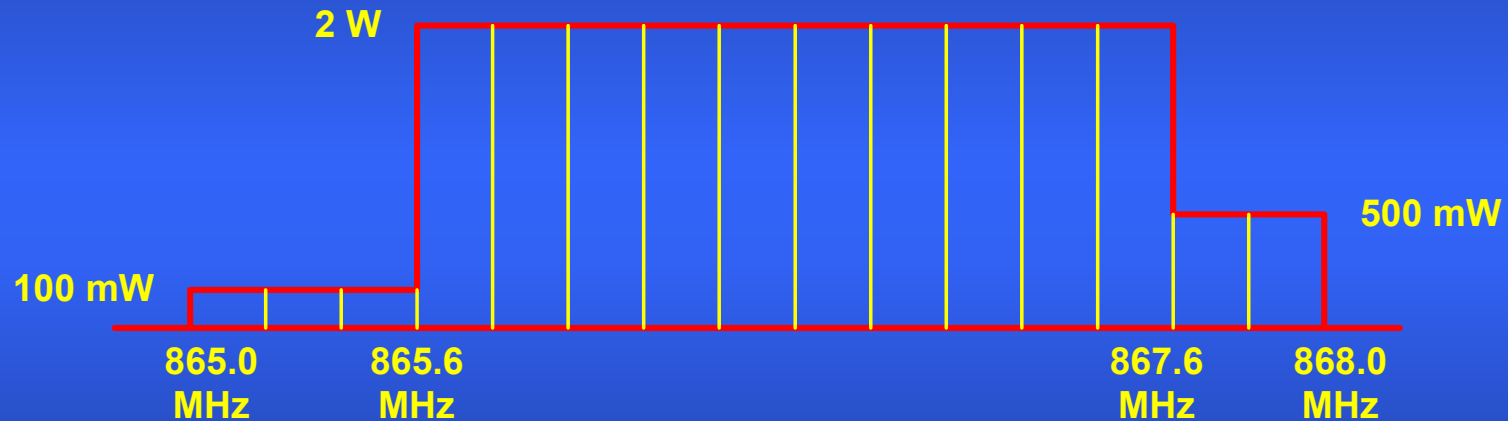
- ◆ Final draft approved for public enquiry
- ◆ Resolution meeting in March 04
- ◆ Approved for National Vote in June 04
- ◆ Published in September 04

Principle requirements

Draft standard proposes the following:

- ◆ Mandatory “listen before talk”
- ◆ Operation in sub-bands of 200 kHz
- ◆ Assigned band 865.0 – 868.0 MHz at transmit powers up to 2 W e.r.p.

Power Limits



Transmission Times

- ◆ Mandatory listen time of 1 msec before each transmission
- ◆ Maximum period of continuous transmission of 4 sec
- ◆ Pause of 100 msec between repeated transmissions on same sub-band

Or

Can move immediately to another vacant sub-band

Scope of EN 302 208

- ◆ The technical requirements of EN 302 208 are based on inputs provided by RFID manufacturers at an early stage in the standardisation process.
- ◆ The standard will permit operation in Europe of product built in compliance with ISO 18000-6
- ◆ The standard may not permit operation of some new systems that are currently under development

Regulatory Issues

RFID classified as SRD which means:

- ◆ Type approval only
- ◆ Operate within shared bands
- ◆ No protection

Contact Details

◆ John Falck

John Falck Associates
36 New Barns Road
Ely
Cambs CB7 4PN

Tel: 01353 665309
jfalck@jfassociates.biz

◆ Chris Turner

RFIP Solutions Ltd
10 Fleet Place
Limeburner Lane
London
EC4M 7SB

Tel: 07812 17 4133
chris.turner@rfipsolutions.com