# Spectrum Management

# in Europe

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# Objectives of the lecture

- *General introduction in spectrum management*
  - definitions, purpose & objectives
  - main activities

- *Main players in spectrum management*
  - world-wide
  - in Europe

- *CEPT and ECC*
  - structure
  - activities

- *Role of ERO*

# What is spectrum management ?

*'Spectrum management is management of the radio-frequency (RF) spectrum.'*

# What is the radio-frequency spectrum ?

- electromagnetic medium capable of transferring electromagnetic waves that may contain information

- natural resource
  *'Nobody owns the spectrum!'*

- equally available in every country

- scarce resource (limited in terms of its suitability for utilisation in radiocommunications)

- not consumable resource, but can be wasted
  *'Spectrum not in use or used in a suboptimal way is wasted!'*

# Main objectives of spectrum management

- to ensure that the radio frequency spectrum is used in an optimal way in order to maximise the benefits of the users
- to meet requirements put forward by different users
- to avoid harmful interference
- to prevent unauthorised operation

# Main areas of activities

- Frequency planning on short and long term basis
- Licensing of services and stations
- Authorisation of equipment in order to ensure that they meet minimum standards
- Monitoring, interference investigations and enforcement
- International cooperation

# What is the optimal use of the spectrum?

- No ultimate answer to this question

- Optimal use may have to be determined in each case

## *Spectrum Utilisation Factor*

$$U = B \cdot S \cdot T$$

**B:** frequency bandwidth
**S:** geometric space (usually area)
**T:** time

Source: Rec. ITU-R SM.1046-1

# Different aspects of spectrum management

- technical
- regulatory
- administrative
- economic

- national
- international

## No universal rules. However, the following is true for spectrum management:

- Multidisciplinary
- Responsibility of national administrations
- Essential for successful implementation of radio services
- Long-term process

# Basis for efficient spectrum management

## *National level*

- National organisation(s) for frequency management
- Telecommunication law
- Regulations
- National technical standards
- Administrative procedures

## *International level*

- International organisations
- International legislation
- International agreements
- Coordination procedures
- International technical standards

# Basis for efficient spectrum management (2)

## *Frequency plans*

- Allocations
  - National frequency allocation tables
  - European common allocation table
  - Radio Regulations Article S5
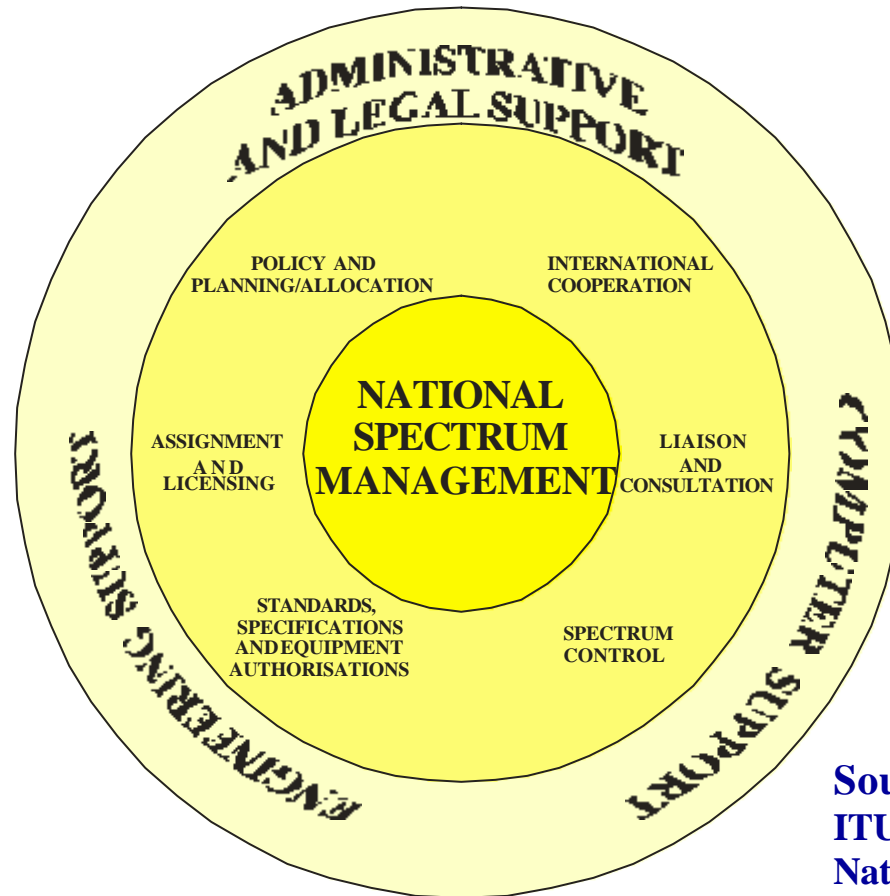- Assignment / allotments

## *Spectrum management tools and techniques*

- Data handling tools
- Engineering analysis techniques
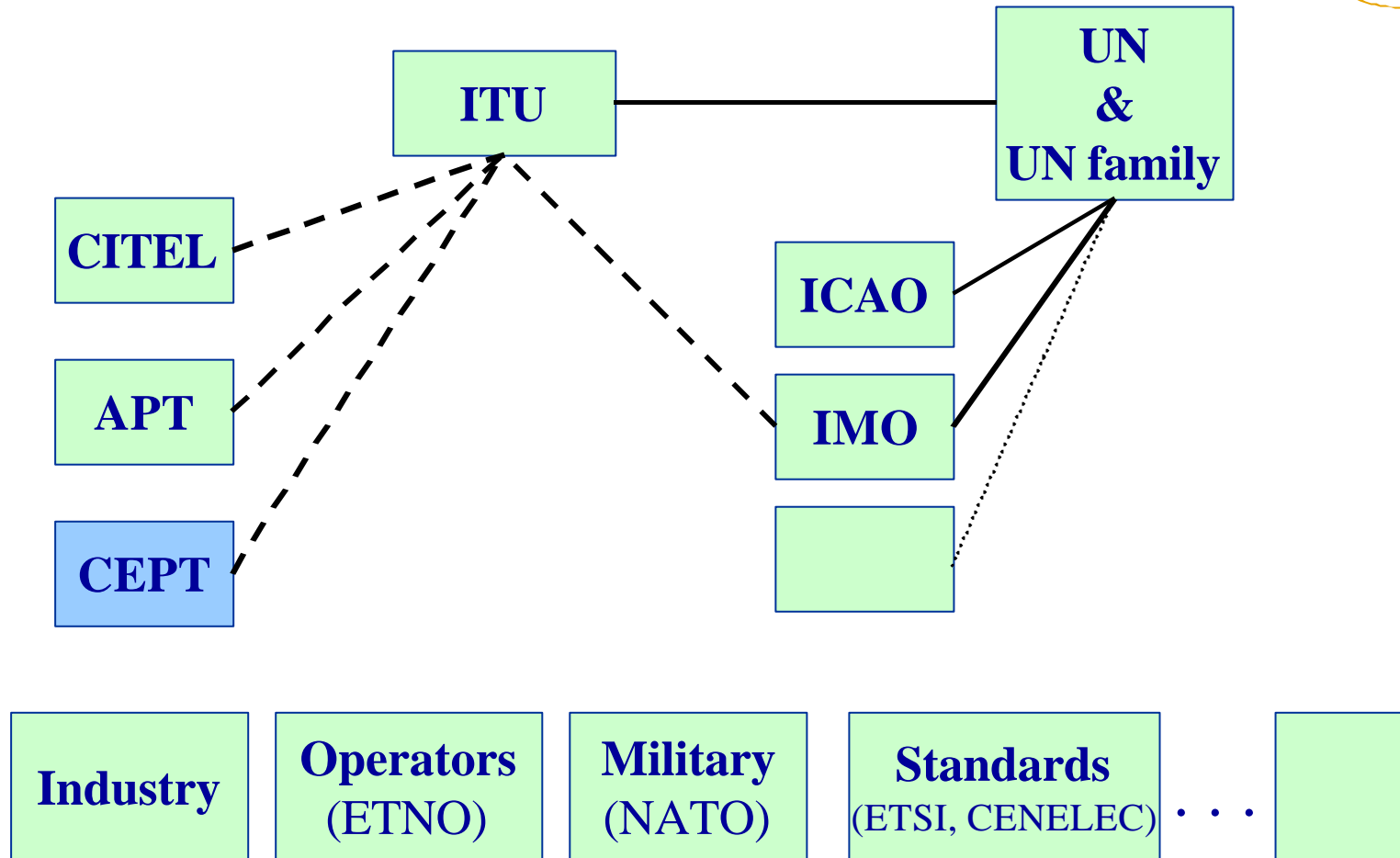
## *Key element:*

educated and skilled spectrum managers

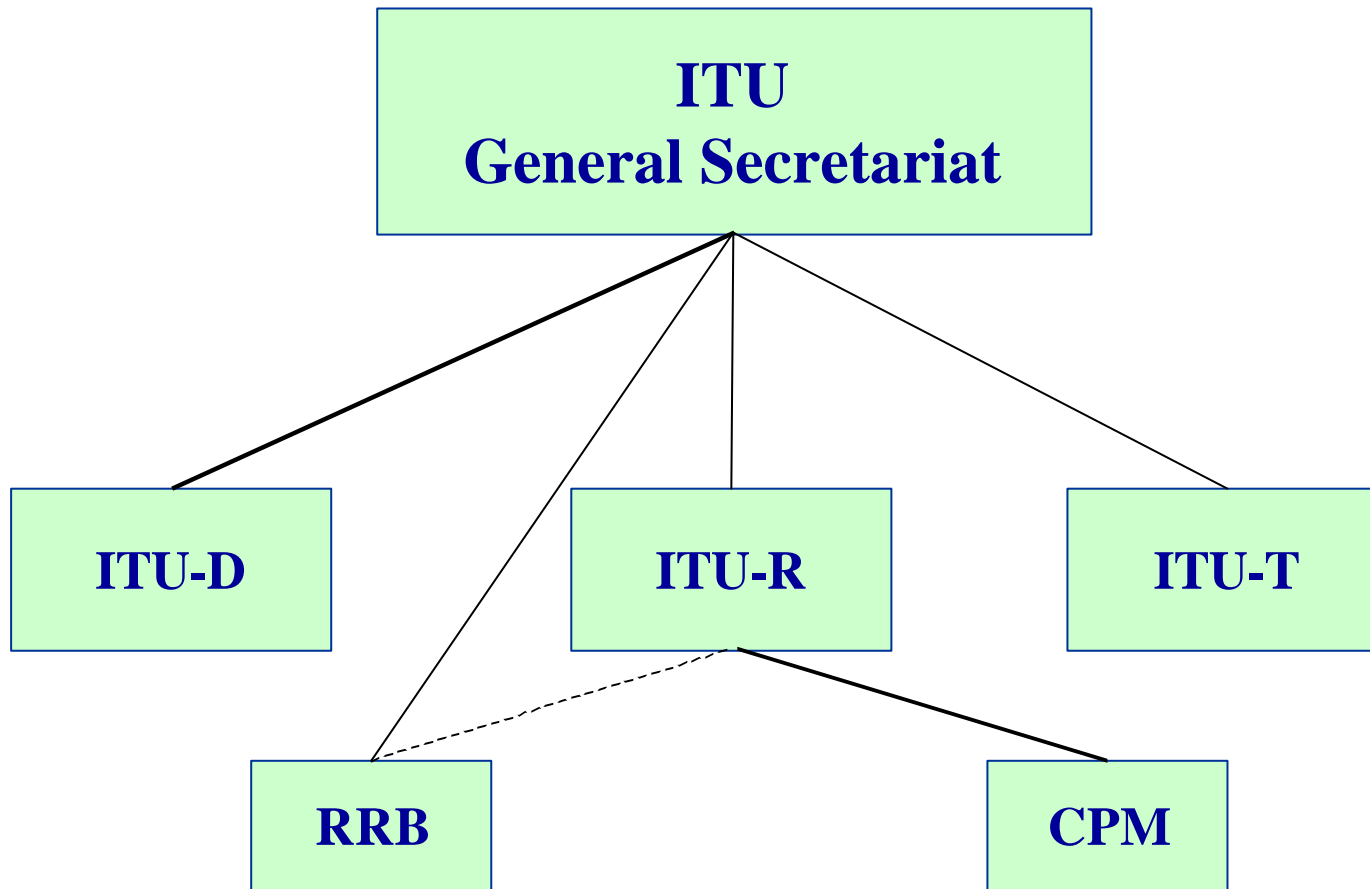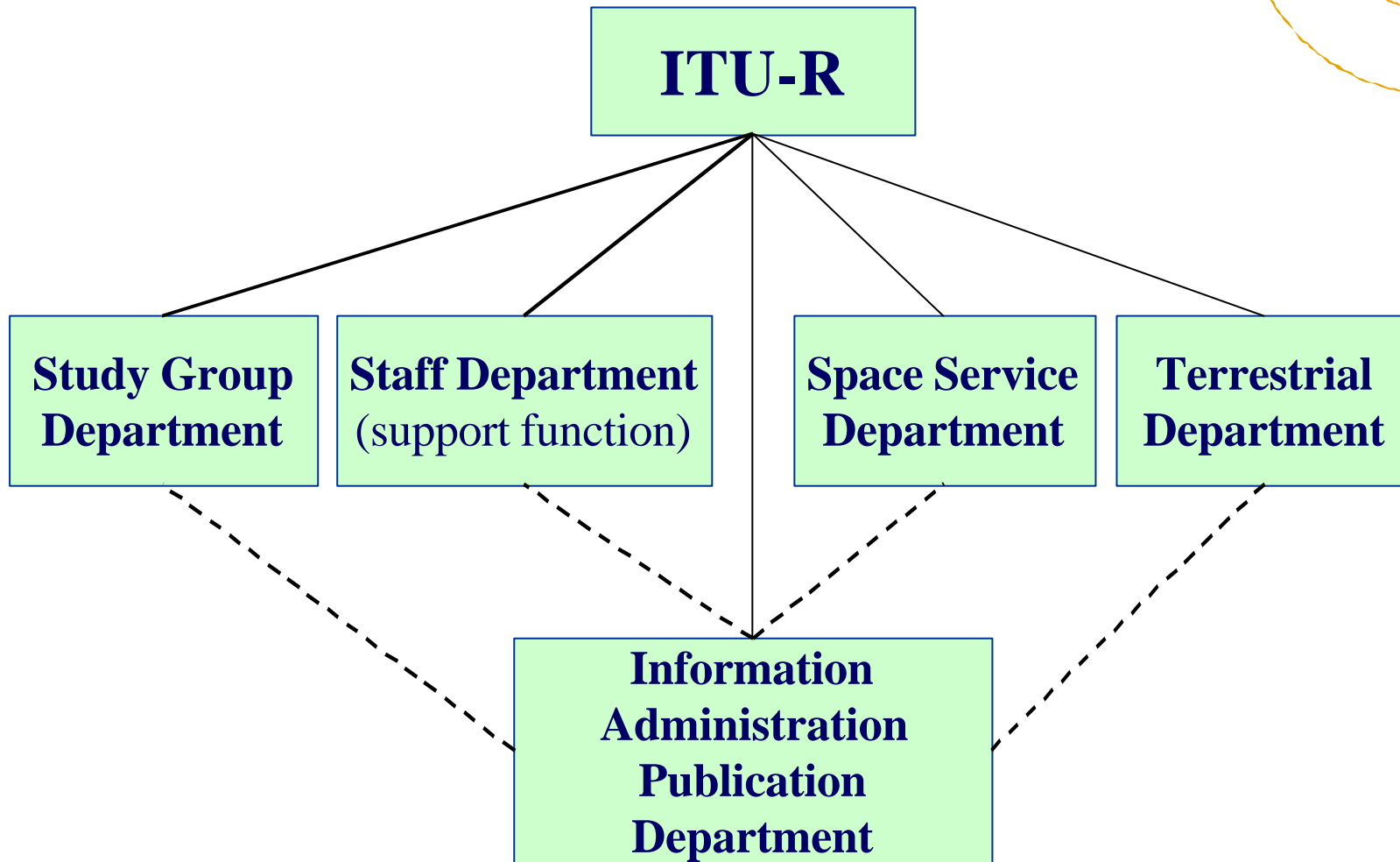# *Spectrum management organisation based on functional responsibilities*



**Source:**
**ITU Handbook**
**National Spectrum Management**
**Geneva, 1995**

# *Main organizations worldwide*

ITU — UN & UN family

CITEL

APT

CEPT

ICAO

IMO

Industry | Operators (ETNO) | Military (NATO) | Standards (ETSI, CENELEC) . . .

ITU
General Secretariat

ITU-D

ITU-R

ITU-T

RRB

CPM

ITU-R

| Study Group Department | Staff Department (support function) | Space Service Department | Terrestrial Department |

Information Administration Publication Department

# *The European Environment*

**CEPT**
**ECC**

**44**

**National**
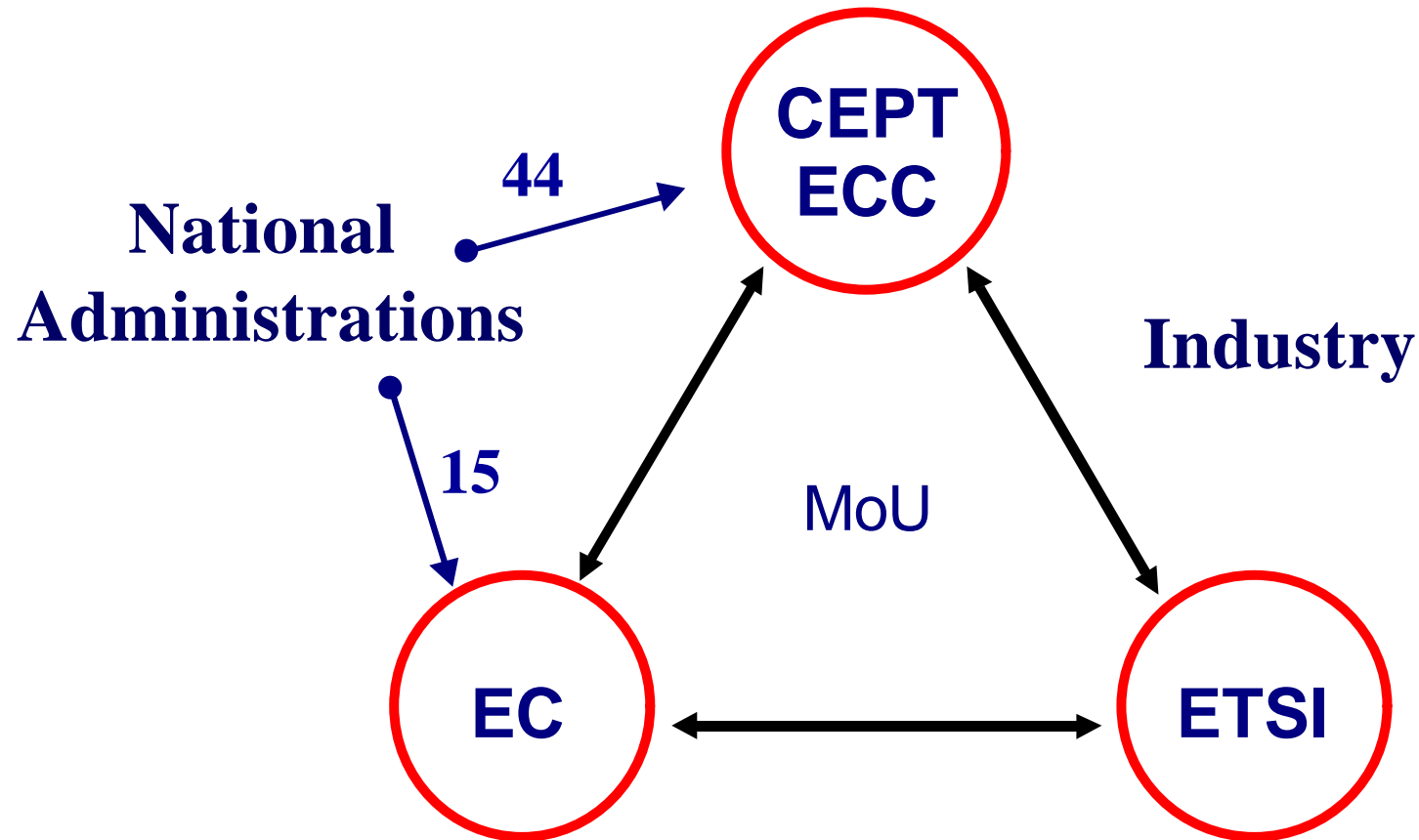**Administrations**

**15**

**Industry**

MoU

**EC**

**ETSI**

# European Conference
# of Postal and Telecommunications
# Administrations (CEPT)

## 44 members

# *New organisation of CEPT*
## *approved in September 2001*

| Presidency | CEPT Assembly |
| --- | --- |

| ERO Council |
| --- |

| ERO | ECC | CERP |
| --- | --- | --- |

| FM | RR | SE | CPG | WG ITU | GMR | IMT2000 PT 1 | TRIS PT 2 | PTN PT 3 | APRII PT 4 | SAT COM PT 5 | EFIS PT 6 | MRC |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

# Structure of the ECC

**Electronic Communications Committee ECC)**

**Steering Group**

**ERO Council**

**European Radiocommunications Office (ERO)**

| WG FM *Frequency Management* | WG RR *Radio Regulatory* | WG SE *Spectrum Engineering* | CPG *Conference Preparatory Group* | *Working Group ITU* | WG GMR *General Milestone Review for Satellite Systems* |

**Working Group Project Teams**

**ECC Project teams**

# Structure of the ECC (2)

## *Working groups:*

- Frequency Management (WG FM)
- Radio Regulatory (WG RR)
- Spectrum Engineering (WG SE)
- Conference Preparatory Group (WG CPG)
- ITU (WG ITU)
- General Milestone Review for Satellite systems (WG GMR)

## *Project teams:*

- IMT 2000 (PT1)
- Technical Regulations and Standards Requirements for Interconnection (PT2)
- Numbering (PT3)
- Accounting Principles and Regulatory Interconnection Issues  (PT4)
- Satellite Communications  (PT5)
- ERO Frequency Information System (PT6)

## *Special entity:*  Milestone Review Committee

# ECC mission

- To consider and develop common electronic communications regulatory policies in a European context, taking account of European and international legislation and regulations

- To forward plan and harmonise within Europe the efficient use of the radio spectrum, satellite orbits and numbering resources so as to satisfy requirements of users and industry

- To promote the interest of Europe on a world-wide basis in preparations for ITU fora

- To encourage deregulation and liberalisation

- To foster the process of free circulation and use of radiocommunication equipment to support the development of an open and competitive   market

# ECC Terms of Reference

- consider and develop policies on electronic communications activities in a European context, taking account of European and international legislation and regulations; electronic communications means transmission, and, where applicable, switching or routing, which permits the conveyance of signals by wire, radio, optical or other electromagnetic means, irrespective of the type of information conveyed.

- develop European common positions and proposals, as appropriate, for use in the framework of international and regional bodies;

- forward plan and harmonise within Europe the efficient use of the radio spectrum, satellite orbits and numbering resources, so as to satisfy the requirements of users and industry;

# ECC Terms of Reference (2)

- take decisions on the management of the work of the ECC;
- approve Decisions and other deliverables;
- implement the strategic decisions of the Assembly;
- seek guidance from the Assembly, as and when necessary, and propose issues for consideration by the Assembly;
- where relevant, establish contacts with equivalent organisations outside of Europe;
- report to the CEPT Assembly on the progress of its work.

In carrying out these activities, the ECC shall establish close cooperation and consultation with relevant European bodies, in particular the European Commission and the European Free Trade Association.

# *Deliverables developed by ECC*

- *CEPT ECC Decisions*

  - measures on significant harmonisation matters

- *European Common Proposals*

  - submissions to ITU conferences, Assemblies and meetings, signed by ECC members

- *CEPT ECC Recommendations*

  - measures which Administrations are encouraged to apply, principally intended as harmonisation measures for those matters where not yet relevant, or guidance to national administrations

- *CEPT ECC Reports*

  - results of studies by the ECC family in support of a harmonisation measure

# Consensus - the main working principle in ECC

*'To seek consensus is the responsibility for all Members and demands a deep commitment to achieve pragmatic European results with acceptable costs for Administrations and users.'* (Working Methods of the ECC)

# Long term objective :

## *Harmonised use of the radio-frequency spectrum in all CEPT countries*

# European Radiocommunications Office

## *Functions*

- to provide a centre of expertise which shall act as a focal point, identifying problem areas and new possibilities in the radiocommunications field and to advise the ERC accordingly;

- to draft long-term plans for future use of the radio frequency spectrum on a European level;

- to support and work together with the national frequency management authorities;

- to conduct consultations on specific topics or parts of the frequency spectrum;

# ERO Functions (2)

- to publish the ERC Decisions and Recommendations and keep a record of the implementation;

- to perform studies for the Commission of the European Communities;

- to work on the harmonisation of national numbering schemes and number assignment procedures

- to implement a system for facilitating the pan-European licensing of a first group of liberalised services (data services, value added services and services not offered to the public)

- to operate a One-Stop-Shopping procedure (OSS) on the licensing of these services.

# ERO Functions (3)

- Distribution point for all ECC documentation.

- ERO Frequency information system (EFIS) - www.efis.dk

- T-DAB Plan management

- software development

- Internet services (web site, FTP server, e-mail server, forum)

  *www.ero.dk*   - working tool for ECC family

  - main source of information about the latest developments within the ECC

  - publication of the ECC documents

- CEPT conference

# CEPT Conferences

- every 18 months

- each conference has its own theme

- oriented mainly towards non-CEPT participants

- main objectives
  - transparency - what are we doing in CEPT
  - presentation and discussion of hot issues
  - contact with and feedback from others
    (users, industry, EC, other regions of the world)

- open, informal an friendly atmosphere

# Themes of the previous CEPT Conferences

1st   Nov 1991      A new framework for spectrum management in Europe

2nd  Nov 1992      Mobile systems * Regulations: Do they ease
                   telecommunications? * DSI II

3rd  Nov 1993      ERC * Frequency management * Industry *
                   Regional/global issues

4th  Nov 1994      ERC * Mobility * Key spectrum and regulatory issues

5th  Dec 1995      Regulatory update * The digital revolution *
                   Spectrum roundup

6th  Nov 1996      Regulation and legislation in a liberalised market

7th  May 1998      Competition and convergence

8th  Mar 1999      Globalisation of radiocommunications

9th  Oct  2000     Global standardisation * Mobile convergence *
                   Satellite vs terrestrial * Regulation update *
                   Results of WRC-2000

# 10th CEPT radiocommunications conference
### Vienna, 17-19 April 2002

## *Main topics*

- Moving to digital broadcasting

- Moving across the borders

- Regulators on the move

- Implementation of new radio policy

- Mobile communications
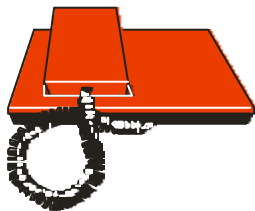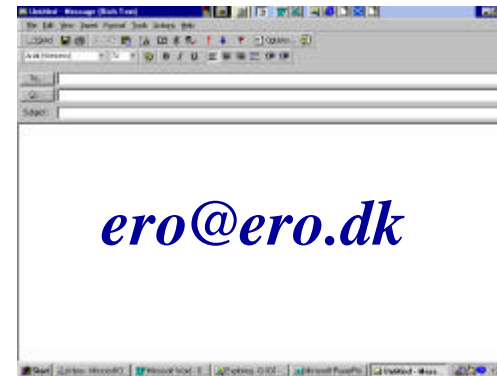
+

*. . . poster sessions, exhibitions & demonstrations*
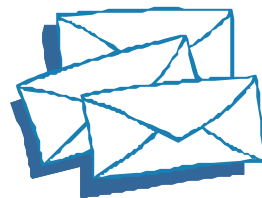
*… and much, much more:*

**www.cept.org
www.ero.dk**

**ero@ero.dk**
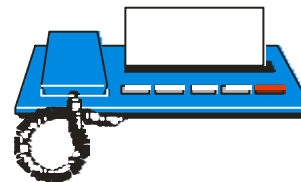
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# Thank you !