



# What is IARU? What is IARU doing?

**Mats Espling, SM6EAN**

**Secretary IARU Region 1**

*International Amateur Radio Union - Working for the future of amateur radio*



# What is IARU?

The International Amateur Radio Union (IARU)  
The worldwide federation of National Amateur Radio Societies  
from more than 160 countries.

IARU represents amateur radio in the  
International Telecommunication Union,  
Regional Telecommunication Organizations (RTOs),  
standardisation bodies and supra-national political entities.

*International Amateur Radio Union - Working for the future of amateur radio*



# Foundation & History of IARU

- In March 1924, in Paris, representatives from UK, France, Belgium, Italy, Luxembourg, Spain, Switzerland and U.S.A. gathered to organize the founding congress of IARU.
- 1925 IARU founded in Paris
- 1927 Washington Radiotelegraph Conference sets out frequency bands for amateur radio
- 1932 ITU admits IARU to participation in CCIR (later the Radiocommunication Sector)
- 1938 ITU creates the three Region structure for frequency allocations
- 1950 IARU Region 1 formed
- 1962 4U1ITU station created as “showcase” for amateur radio in ITU
- 1964 IARU Region 2 formed
- 1968 IARU Region 3 formed
- 1980 IARU Administrative Council formed with new Constitution (1984)

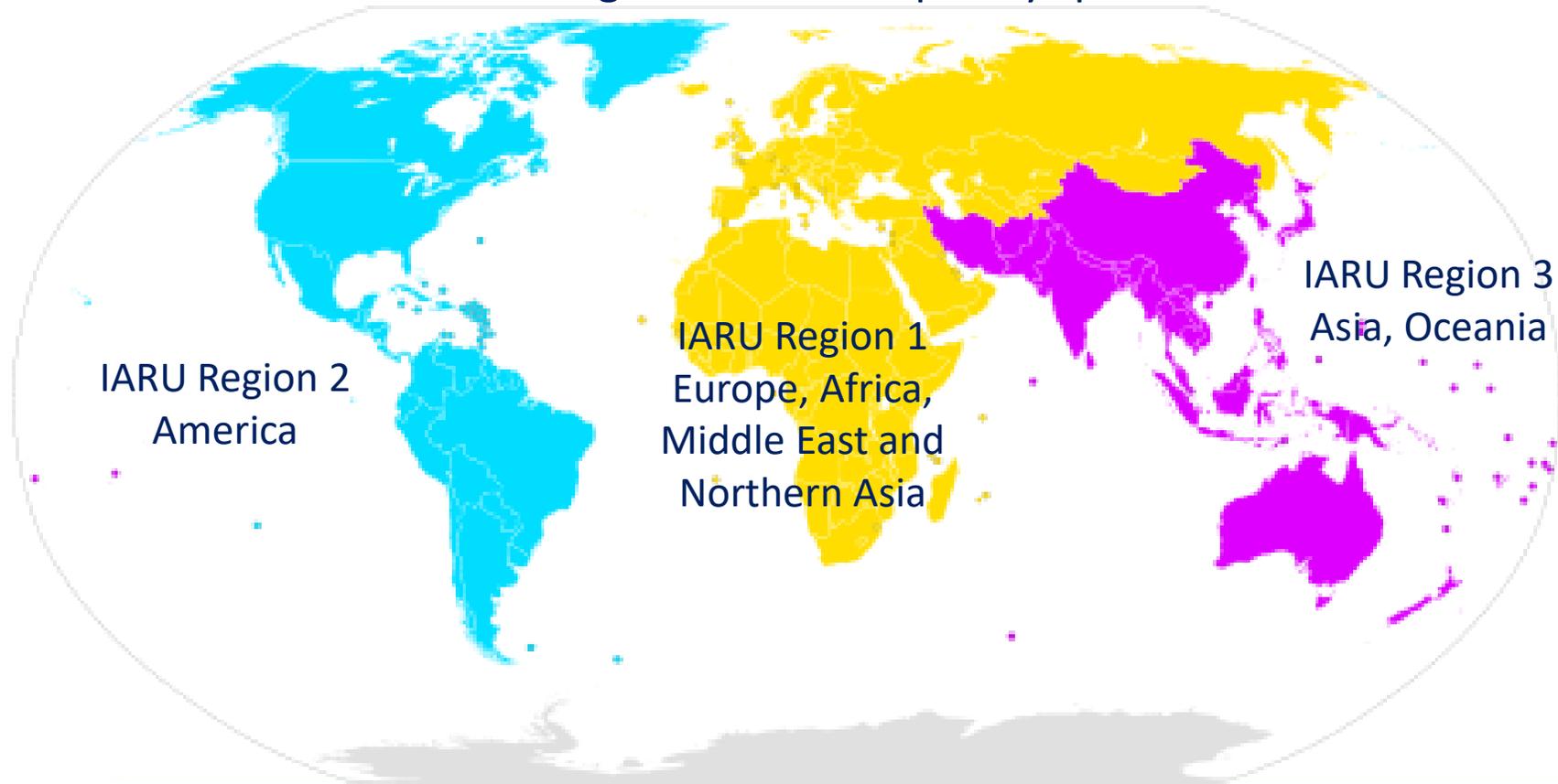


***International Amateur Radio Union - Working for the future of amateur radio***



# IARU Structure

IARU structure comprises three regions, identical to those in which ITU organizes the world in the Radio Regulations, to manage the radio frequency spectrum.



*International Amateur Radio Union - Working for the future of amateur radio*



# Management of IARU

- IARU is led by an Administrative Council (AC) composed of the President, Vice-President, Secretary and two representatives of each of the three Regions
- One of its National Societies serves as International Secretariat (IS).
- Each IARU Region is led by an Executive Committee (EC), within the framework established by a triennial conference.





# Members of IARU

- IARU comprises more than 160 National Societies
- Each National Society has the responsibility for representing amateur radio within its own country or territory
- Each National Society represents its members in IARU
- Only one National Society may represent each country





# IARU's Mission

- Protection, promotion and advancement of Amateur & Amateur Satellite Services within ITU regulations, in partnership with National Societies.
- **Protection:** Maintaining our frequencies, developing them and keeping them usable
- **Promotion:** In regulatory forums primarily, but this needs to develop further
- **Advancement:** Encouraging Member Societies to remain relevant in a rapidly changing world

IARU-R1 2021 workshop  
➔ “Shaping the Future”



# Objectives and strategies

- **Represent interests of amateurs in regulatory forums**
- **Encourage agreements between National Societies on matters of common interest.**
- **Enhancement of amateur radio as technical self-training for all people.**
- **Promotion of radio communications technical and scientific research**
- Intensive involvement in ITU, CEPT, ATU, RCC, ASMG, APT, CITELE and CISPR. Some 1200 days per year of formal meetings and preparation (about 600 in Region 1)
- Through the triennial General Conferences and in between
- Progressive licence strategy and maximum availability of spectrum
- ARSPEX, IARUMS, Spectrum Committees, inputs to ITU Working Parties



# Objectives and means

- **Promotion of amateur radio to provide relief during natural disasters.**
  - **Encourage international goodwill and friendship.**
  - **Support National Societies in developing amateur radio as a national resource, particularly in developing countries.**
  - **Develop amateur radio in countries not represented by Member Societies and in “fledging” economies.**
- Via Emergency Communications Coordinator
  - Through membership and participation at General Conferences
  - STARS
  - STARS



# IARU Structure

Periodically, each IARU Region holds a conference, where National Societies attend to address matters of interest for amateur radio.





# Region 1 General Conference

- Generally about R1 50 Member Societies present
- Policy issues on amateur radio and IARU itself
- Sets the Agenda for the next three years
- Sets the budget
- Appoints all key positions
- Next conference in 2026





# Promotion of amateur radio

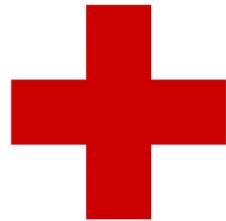
The IARU, through the National Societies, seeks to promote in each country:

- Adoption of national regulations that promote and strengthen amateur radio.
- Adoption of common minimum standards that facilitate access to the Amateur Radio Service.
- In 2021, we had a conference devoted entirely to future and growth, engaging with Member Societies to develop shared agendas. Resulted in the program **Shaping the Future**



# Emergencies and disasters

IARU cooperates through LoU/MoU with the international organizations involved, coordinating the preparation and assistance of communications provided by amateur radio operators.



**International  
Red Cross**



**OCHA**

**UN Office for the Coordination  
of Humanitarian Affairs**

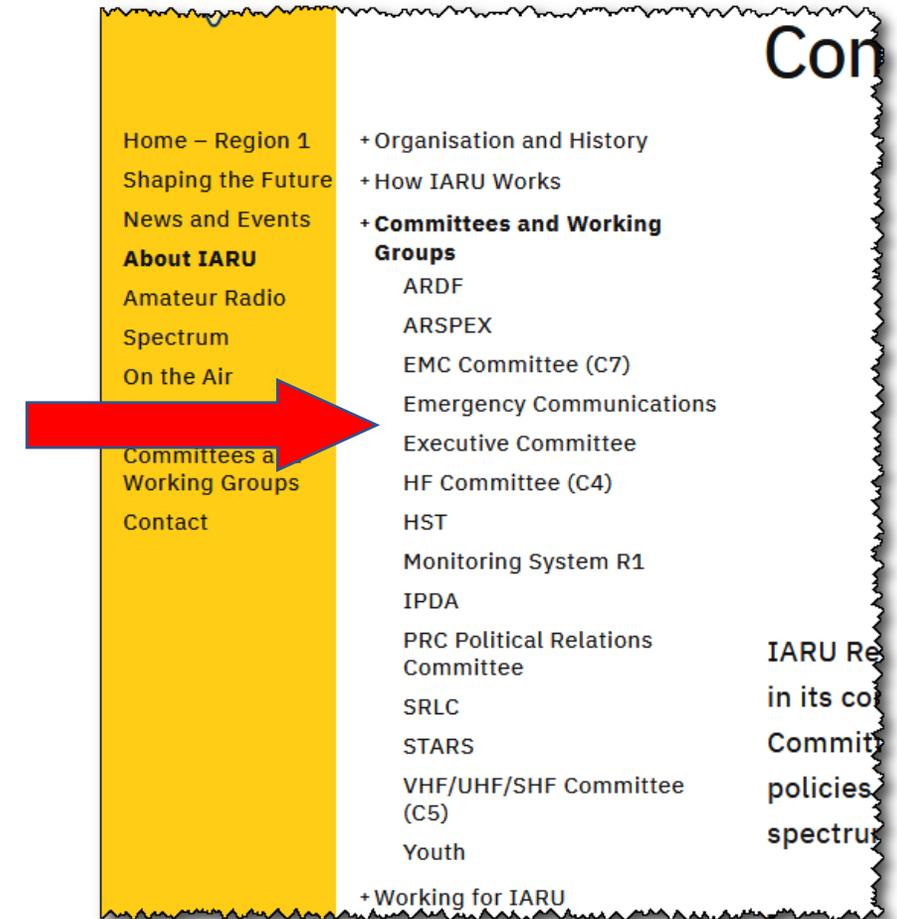


**International  
Red Crescent**



# How IARU interacts with its member societies (MS)

- Each MS must appoint “IARU liaison officer”, all correspondence goes via that person
- New suite of websites operational early 2020
- Direct contact with the functional committees and working groups
- Use of Social Media – *we need to get better here*
- General Conference (GC), every three years in sync with ITU WRC
- Interim meeting, one year before the GC
- MS write proposals to IARU





# Websites

International Amateur Radio Union  
Working for the Future of Amateur Radio

Global R1 R2 R3

The International Amateur Radio Union has been the worldwide voice of radio amateurs, securing and safeguarding the amateur radio spectrum since 1925.

Read more about us →

News

**Region 1 General Conference to be in two parts**  
Jun 27, 2020 · Spectrum · Don, G3BJ

In the light of the COVID-19 problems, the IARU Region 1 Executive Committee has consulted with those Member Societies planning to attend the 2020 General Conference. As a result the clear majority support an EC proposal to split the Conference into two ...

Events

**Ham Radio Friedrichshafen**  
June 25, 2021 – June 27, 2021

Connect With Our Community

Home – Region 1  
News and Events  
About IARU  
Amateur Radio  
Spectrum  
On the Air  
Reference  
Committees and Working Groups  
Contact

International Amateur Radio Union  
Working for the Future of Amateur Radio

Home (R1) → About IARU → Committees and Working Groups →

Global R1 R2 R3

EMC Committee (C7)

What is EMC and why this matters for all radio amateurs. [Read more here](#)

The IARU Region 1 EMC Committee is a permanent committee of IARU Region 1 which:

- makes input to the development of EMC related legislation and standards for the proper protection of amateur radio spectrum
- exchanges information related to all aspects of electromagnetic compatibility,
- provides guidance on EMC to IARU Member Societies,
- monitors developments in technology so as to identify possible EMC issues

Home – Region 1  
News and Events  
About IARU  
Amateur Radio  
Spectrum  
On the Air  
Reference  
Committees and Working Groups  
Contact

- Organisation and History
- How IARU Works
- Committees and Working Groups
  - ARDF
  - ARSPEX
  - EMC Committee (C7)
  - Emergency Communications
  - Executive Committee
  - HF Committee (C4)
  - HST
  - Monitoring System R1
  - IPHA
  - PRC Political Relations Committee
  - SRLC
  - STARS
  - VHF/UHF/SHF Committee (C5)
  - Youth
- Working for IARU

**IARU Region 1**  
[www.iaru-r1.org](http://www.iaru-r1.org)



# ***Spectrum***

***“Allocation and protection of amateur radio spectrum”***



# IARU and ITU

At world level, IARU is a Sector Member of ITU and participates fully in its work.





# WRC-23 – IARU preparation

- WRC preparation is a global task coordinated by Ole, LA2RR
- Every agenda item (AI) has a responsible person and if required a supporting team (e.g. AI 9.1b about 23cm band)
- IARU participate in the work in ITU and RTO work groups
- There is an IARU responsible person for every RTO

IARU Matrix for WRC-23 and WRC-27													
	WRC-23 Agenda Items						WRC-27 Agenda Items			Non-WRC issues			
	1,2	1,12	1,14	1,18	9.1a	9.1b	10	2,1	2,6	2,13	WPT & EMC	Noise	Small Sats Handbook
	IMT 3300-3400 MHz, 10.0-10.5 GHz	45 MHz EESS	231.5-252 GHz	NB sats 3300-3315, 3385-3400 MHz	Space weather sensors	1240-1300 MHz RNSS/amateur	WRC-27 Agenda	231.5-275 GHz	Space WX	NB sats			
WP1A												G3BJ	
WP3L												G3BJ/W5ZN	
WP4A													PB2T
WP4C				G4SJH		G4SJH							
WP5A						LA2RR/G4SJH							
WP5D	WB3ERA												
WP7C		NQ6Z	K1ZZ		NQ6Z								
CPM-2							VE6SH/LA2RR						
CEPT/CPG	G4SJH/EI3IO	G4SJH/EI3IO	G4SJH/EI3IO	G4SJH/EI3IO	G4SJH/EI3IO	G4SJH/EI3IO	G4SJH/EI3IO						
PT1 (IMT)	G4SJH												
PTA Science		EI3IO/G6JYB	EI3IO/G6JYB		EI3IO/G6JYB								
PTB Space													
PTC Aero & Maritim						G4SJH/DF2ZC							
PTD UHF													
ASMG	Vacant	Vacant	Vacant	Vacant	Vacant	Vacant		Vacant	Vacant	Vacant	As needed		
ATU	6W1KI	6W1KI	6W1KI	6W1KI	6W1KI	6W1KI		6W1KI	6W1KI	6W1KI	AS needed		
RCC	LZ1US	LZ1US	LZ1US	LZ1US	LZ1US	LZ1US		LZ1US	LZ1US	LZ1US	As needed		
CITEL	PY2ZX/WB3ERA	PY2ZX	PY2ZX	PY2ZX	PY2ZX	PY2ZX/WB3ERA		PY2ZX	PY2ZX	PY2ZX	PY2ZX		
APT	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU		JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU	JA1CJP/VK3MV/JE1MU		



# IARU and RTOs

IARU participates in Regional Organizations (RTOs).



**ATU**

African  
Telecommunications Union



**APT**

Asia Pacific  
Telecommunity



**CEPT**

European Conference of Post  
and Telecommunications  
Administrations



**CTU**

Caribbean  
Telecommunications Union



**RCC**

Regional Commonwealth in the  
Field of Communications



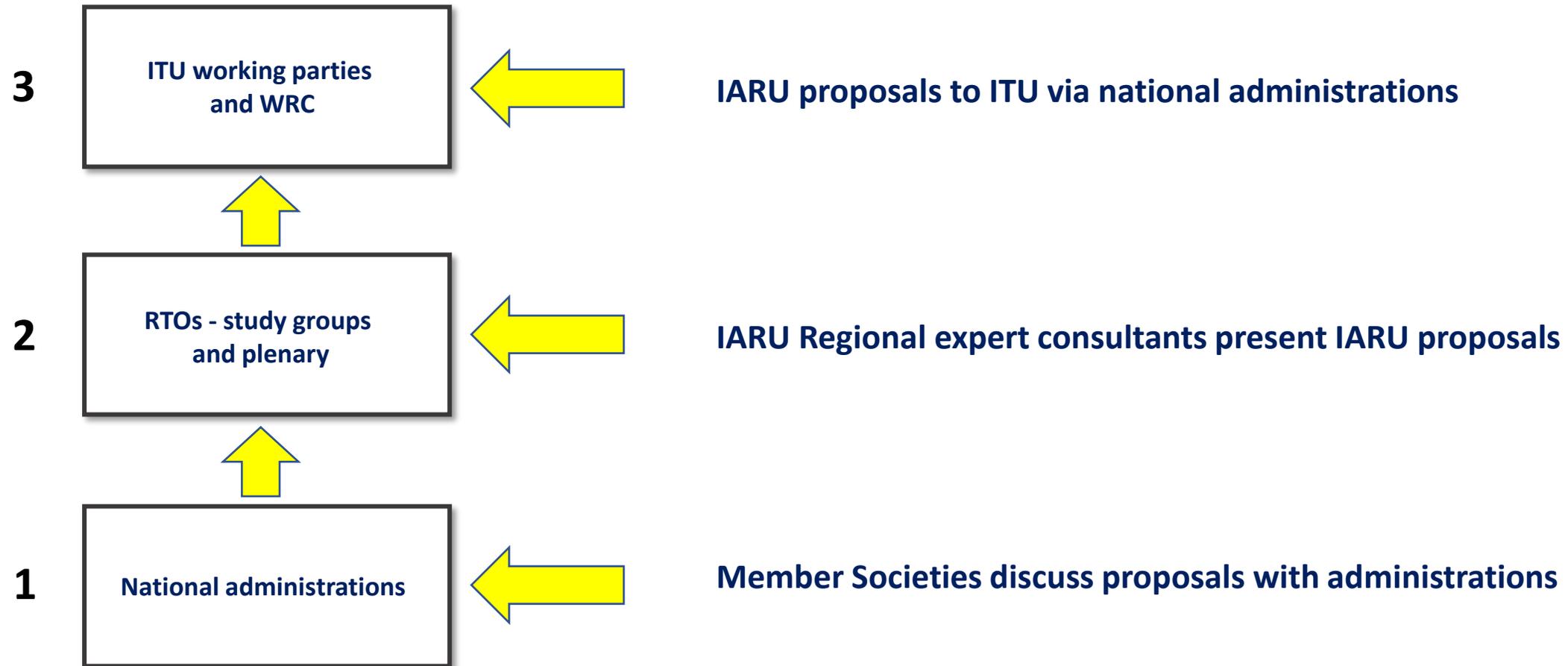
**ASMG**

Arab Spectrum  
Management Group

*International Amateur Radio Union - Working for the future of amateur radio*



# Achieving agreement in the ITU domain





# IARU experts

IARU experts advocate for amateur radio  
in a number of areas:

- ITU-D Development
- ITU-R Radiocommunications
- General Technical
- Electromagnetic Compatibility
- Unwanted emissions
- Noise
- Legal
- Regulatory
- Space sciences
- Amateur Satellites
- VHF and Microwaves
- Spectrum management

**All experts come from Member Societies – IARU has no “Staff”**



# Some IARU Achievements

- 21 MHz band globally (WARC 1947)
- Amateur Satellite Service created (WRC-Space 1971)
- 10, 18, 24 MHz bands globally (WARC 1979)
- More amateur-satellite bands (WARC 1979)
- Improved 1.8 MHz band (WARC 1979)
- 7 MHz extension (WRC 2003)
- 136 kHz band globally (WRC 2007)
- 472 kHz band globally (WRC 2012)
- Small global 5MHz band (WRC 2015)
- Improvements in international roaming for radio amateurs (CEPT & CITEL)
- Global 50 MHz band sought at WRC 2019 – mainly affects Region 1
- WRC 2023 agreement on 23cm band co-existence with navigational services (RNSS)



# WRC-23 – 23cm band

- Agenda item 9.1b: Protection of satellite navigation services, RNSS
- RNSS is a Primary user, while Amateur Services are secondary
- IARU preparations started 2019

**ITU Publications** International Telecommunication Union  
Recommendations Radiocommunication Sector

**Recommendation ITU-R M.2164-0**  
(11/2023)

M Series: Mobile, radiodetermination, amateur and related satellite services

**Guidance on technical and operational measures for the use of the frequency band 1 240-1 300 MHz by the amateur and amateur-satellite service in order to protect the radionavigation-satellite service (space-to-Earth)**

- 17dBW = 50W
- 22dBW = 158W
- 27dBW = 500W

in order to protect RNSS, recognizing that other measures to protect RNSS may be implemented by administrations based on their national circumstances.

- 1) For narrowband (bandwidth  $\leq 150$  kHz) applications operating in the amateur service:
  - a) 1 240-1 255.76 MHz:  
Maximum values of e.i.r.p.<sup>2</sup>:
 

-39.0 dBW in (150 kHz)	for $-90^\circ \leq \theta < 0^\circ$
-39.0 dBW in (150 kHz)	for $0^\circ \leq \theta < 5^\circ$
-39.0 -1.05 ( $\theta - 5$ ) dBW in (150 kHz)	for $5^\circ \leq \theta < 25^\circ$
-60 dBW in (150 kHz)	for $25^\circ \leq \theta < 90^\circ$ ,

 where  $\theta$  = elevation angle of amateur station antenna,
  - b) 1 255.76-1 256.52 MHz: Maximum value of e.i.r.p.<sup>2</sup> = 24 dBW,
    - Out-of-band emissions below 1 255.76 MHz, should be as defined in point 1a) above.
  - c) 1 256.52-1 258 MHz: Maximum value of e.i.r.p.<sup>2</sup> = 21 dBW
  - d) 1 258-1 296 MHz: Maximum value of e.i.r.p.<sup>2</sup> = -17 dBW
  - e) 1 296-1 298 MHz: Maximum transmitter power<sup>3</sup> = 17 dBW
  - f) 1 298-1 300 MHz: Maximum transmitter power<sup>3</sup> = 22 dBW
    - for narrowband Earth-Moon-Earth applications in the amateur service using a symmetric high-performance antenna (e.g. boresight gain at least 30 dBi) pointing at least 15 degrees above the horizontal:
      - a) 1 298-1 300 MHz: Maximum transmitter power<sup>3</sup> = 27 dBW

<sup>2</sup> Where e.i.r.p. refers to the radiated power of the amateur station.

<sup>3</sup> Where maximum power means either peak envelope power or carrier power (as appropriate) delivered by the transmitter to the amateur station antenna.



# Spectrum defence

- Radio frequency spectrum is the life-blood of amateur radio. No spectrum = no amateur radio
- Today, our spectrum is under **serious threat** in many segments – unlikely to retain all
- Commercial demands for more spectrum and limited amateur occupancy make a toxic mix (E.g. 433 MHz: SRD; 1,3 GHz: RNSS sharing; 2,3 & 3,4 GHz: 5G; 2,4 GHz: WLAN, etc.)
- Shared Licence Access (SLA) and dynamic spectrum sharing are coming
- At HF and LF, WPT and WPT-EV represent a big threat of further harmful interference
- Up to VHF, some type of solar power systems generate interference
- Proactive defence and limited achievement of new allocations are priority strategic objectives in IARU's policy
- The battles are waged nationally, and in three international forums: RTOs, CISPR and ITU



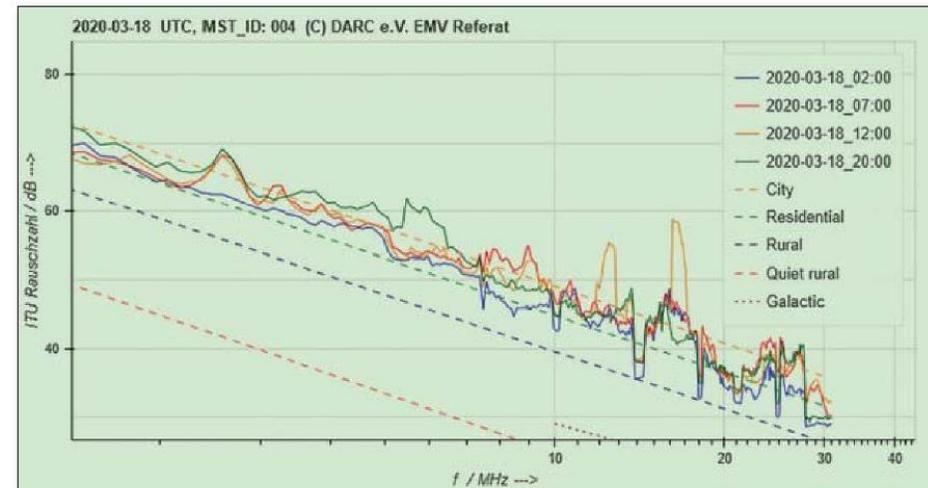
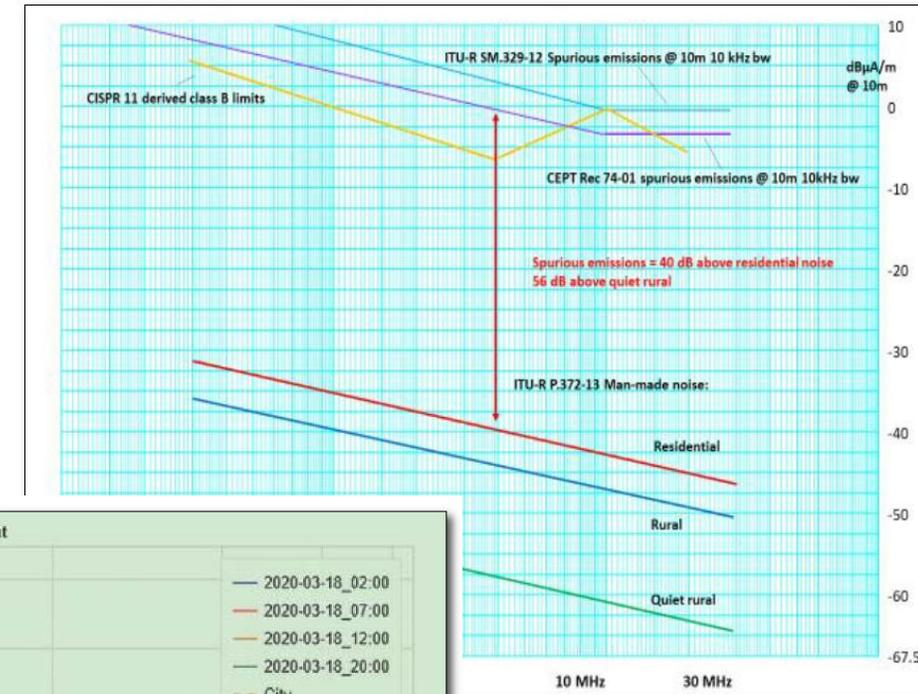
# Usable spectrum

- What defines a usable spectrum?
- Who defends a usable spectrum below 30 MHz?



# Noise Measuring Campaign (NMC)

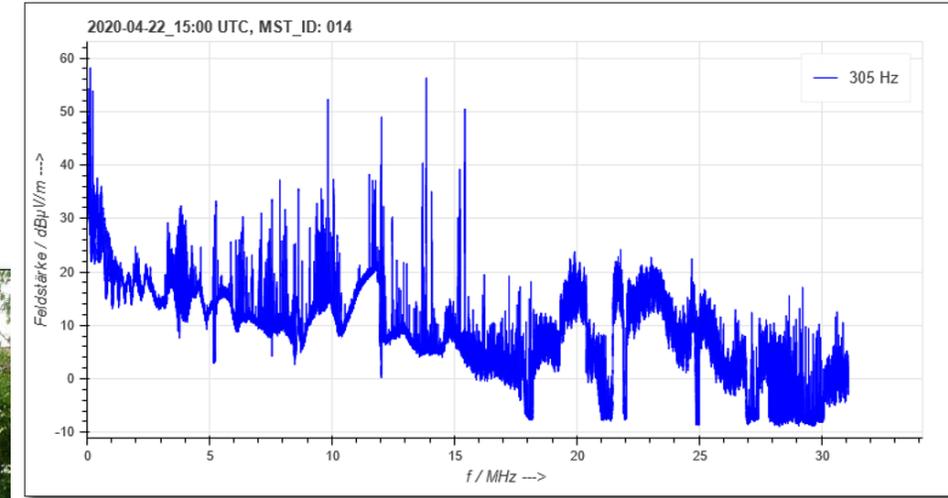
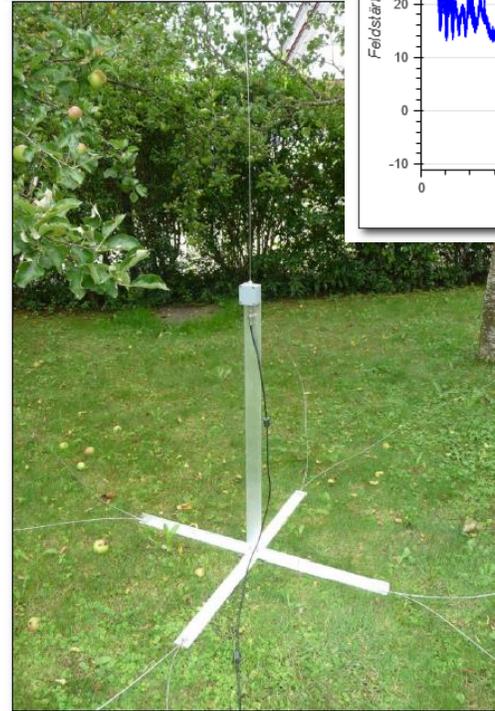
- IARU region 1 project to study LF & HF band background noise by collecting “big data”
  - Measure the noise continuously and receivers connected to server over Internet
  - Challenging building receiver and data management systems
  - Protect the LF & HF bands!
- 
- The basic IARU questions:
    - Are the ITU noise levels correct?
    - Is the background noise increasing?
  - Make sure standards are not changed to our disadvantage (CISPR, CEPT)
  - Become a trusted member of the standardisation world





# Electrical Noise Area Measurement System

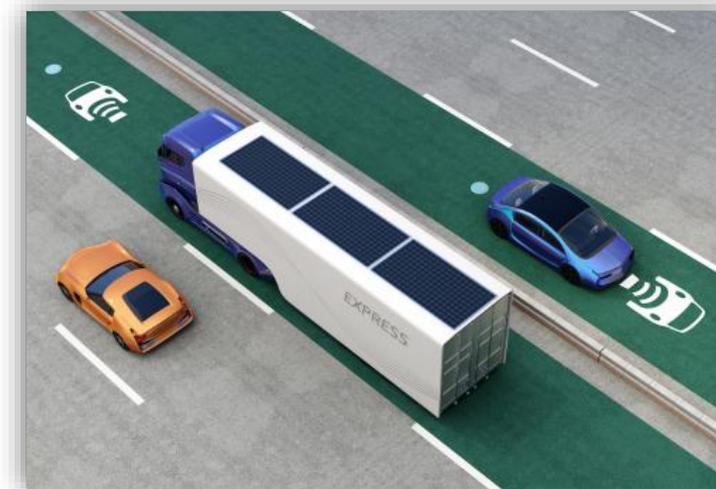
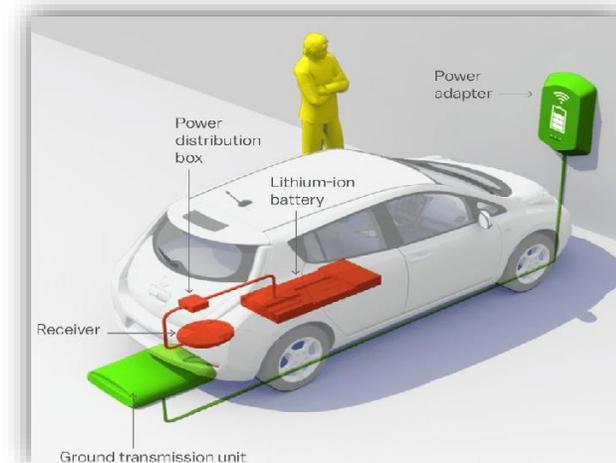
- ENAMS - Electrical Noise Area Measurement System – an automatic receiving system for recording the interference level in the frequency range from 50 kHz to 31 MHz.
- Current system comprises 55 receivers that scan the entire frequency range from long wave (50 kHz) to upper short wave (31 MHz).
- Red Pitaya SDRs receivers and an active E-field antenna for the entire frequency range.
- Calculations on central server
- Key driving MS: DARC and SARL
- Main purpose is to validate background noise against ITU standard.





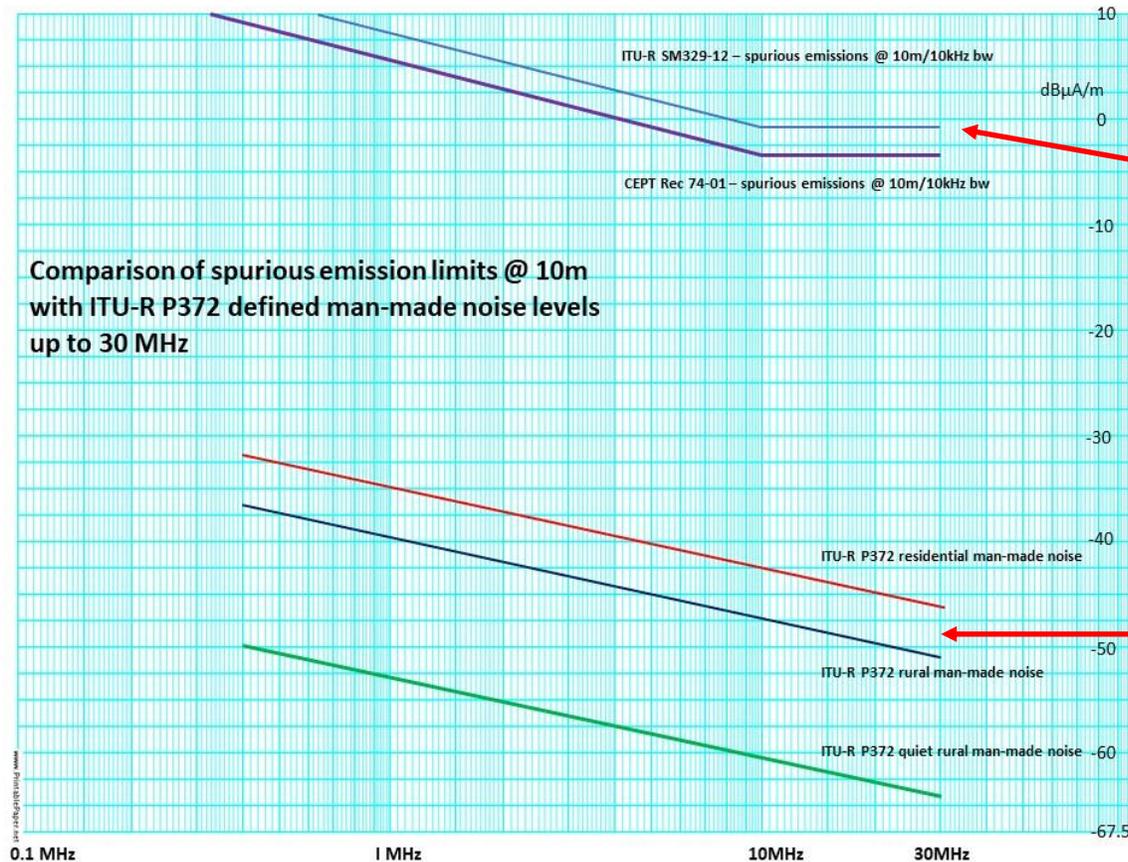
# WPT – wireless power transmission

- In various forms – low power, medium power and high power including electric vehicles (up to 200kW)
- Generally uses low frequency for power transfer (< 150 kHz)
- Low power generally not a problem to the amateur service
- Electric vehicle WPT could cause interference unwanted emissions
- IARU has been very active in ITU, CEPT, CISPR in arguing for the right emission limits
- Next threat: Dynamic roads – continuous WPT-EV embedded into the road surface – already under test in several countries including Sweden





# Current CEPT / ITU “limits” and the noise level



Note suggested limits are some 40-60dB above man-made noise level at 10m distance.  
CISPR 11 is similar (not shown)

Recent measurements in UK on noise levels and other reports submitted to ITU suggest that, with the exception of a few “hot spots”, the ITU-R P372 levels are still a reasonable assessment of the median levels in the real world



# Solar power - PV

- Some type of solar power systems including optimizers, generate very bad interference to radio, up to VHF.
- Other type of PV systems, using well designed inverters, show no problem.
- In Sweden, PV system installations are stopped close to sensitive areas (e.g. airports, military installations)
- Danish study shows there is no benefit in using optimizers.



University of Southern Denmark

The Impact of Optimizers for PV-Modules

A comparative study

Franke, Toke

This study shows that PV systems have typically a higher yield if no module optimizers are applied. To demonstrate that, extreme scenarios have been chosen where optimizers are expected to bring the highest benefits. But only for some small niches where complete PV modules have significantly different irradiation at any given time, do the optimizers help produce more energy than they actually consume.



# ***Future of amateur radio***

***Is amateur radio set up for meeting the future  
and attracting new radio amateurs?***



# Challenges for IARU

- Educating a new breed of regulators
- Speed of response – modelled too much on ITU
- Generational change – we all need to “get” the new world of amateur radio and interworking
- Resourcing the IARU with new generation amateurs
- Member Societies have declining membership or even going out of existence

**So, how do we meet “the Future”??**



# 2021 virtual conference and workshop



**2** During the pandemic 2021, virtual conference and workshop for the future was carried out

For 6 days, 47 MS and about 100 persons participated in the workshop

**1** IARU-R1 decided to work with member societies and set goals for the future

The member societies prepared by a SWOT

**3** 8 strategic objectives were identified and serve as goals for the IARU work

Strengths	
1	<b>Strong community</b> National organisation, international representation, clubs, international fraternity
2	<b>Relationships with the regulator (some)</b> Good relationships in some societies
3	<b>Diverse technical hobby / know how</b> Technical expertise, diverse activities, STEM linkage
4	<b>Public service</b> Good examples of public service
Opportunities	
1	<b>Growing our recruitment pool.</b> New scientific and technical communities offer new recruitment opportunities
2	<b>Technology</b> Wide range of technologies are available to increase attractiveness of amateur radio
3	<b>Emergency communications</b> Fragility of our modern communications infrastructure in the face of crisis situations
4	<b>Image</b> Social networks and web allow a wide dissemination of a new image of amateur radio
5	<b>STEM</b> Rising popularity of STEM = opportunity to attract younger people to Amateur Radio
Weaknesses	
1	<b>Motivation and capability within the amateur radio community</b> Coherence of purpose, internal issues, availability of resources
2	<b>Amateur radio and how we portray it</b> Relevance, promotion, relationship with regulator
3	<b>Recruitment and retention</b> Recruitment focus and barriers
4	<b>Ageing amateur radio population &amp; recruitment of new radio amateurs</b> Age profile
Threats	
1	<b>Increasing noise levels in spectrum</b> EMC issues in the spectrum
2	<b>Loss of amateur spectrum</b> Commercial interests / pressures & local restrictions on spectrum
3	<b>Amateur radio loses in competition with other areas</b> Ease of access issues, costs and general perception
4	<b>Relationship with authorities</b> Regulator attitudes, security concerns, antenna restrictions in some societies

## “Shaping the Future”

- Strategic objectives**
- 1 — Amateur radio is continually redefined and refocused to be relevant and appealing to a wide range of science and technology interest groups
  - 2 — Amateur radio is seen as a welcoming and accessible activity for people of all ages, backgrounds, genders, and ethnicities, providing fun, social community and personal development
  - 3 — Amateur radio is seen to be providing social, economic, educational, and other benefits to society
  - 4 — Experimentation, innovation, and creativity are central to amateur radio, which is publicly recognised as the leading non-commercial community on wireless communication
  - 5 — Amateur radio provides a supportive environment for self-development and excellence within communications and technology, supporting the development of STEM (science, technology, engineering, and mathematics) skills
  - 6 — Governments, non-governmental organisations (NGOs), professional bodies and academia acknowledge the relevance and technical capability of the amateur service and its benefit to society
  - 7 — Amateur radio has an extensive media presence from its accessibility to new entrants to its high value technical and scientific contribution
  - 8 — IARU has an active program and supporting tools to strengthen member societies, their mutual cooperation and their development and growth.



# Will we succeed?

- This is difficult – but we know what we want to do
- The alternative not to do anything cannot be accepted – we must try!
- The biggest challenge is to find volunteers to join the work

*International Amateur Radio Union - Working for the future of amateur radio*

*International Amateur Radio Union - Working for the future of amateur radio*



***Thank you!***

Mats Espling, SM6EAN  
Secretary IARU Region 1  
[secretary@iaru-r1.org](mailto:secretary@iaru-r1.org)

*International Amateur Radio Union - Working for the future of amateur radio*