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| Summary:  |
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| Proposal:  |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.1

1.1 to consider an allocation of the frequency band 50-54 MHz to the amateur service in Region 1, in accordance with Resolution 658 (WRC-15)

# ISSUE

CEPT has identified the following elements, relevant for this agenda item:

* to study spectrum needs for the amateur service in the band 50-54 MHz;
* to study sharing between the amateur service, and the mobile, fixed, radiolocation and broadcastingservices, in order to ensure protection of these services

# Preliminary CEPT position

CEPT would support an allocation in the frequency range 50-54 MHz to the amateur service in Region 1 only if the spectrum needs for the amateur services are justified and studies show that incumbent services, including their future deployment and services in adjacent spectrum are protected.

# Background

The band 50-54 MHz is allocated to the Amateur Service by ITU in Regions 2 and 3.

While the Region 1 African countries listed in No 5.169 have an allocation to the amateur service in the frequency band 50-54 MHz on a primary basis, a number of other Region 1 countries have authorised the use of all or parts of the band 50-52 MHz by the amateur service on a mainly secondary (but sometimes national primary) basis in accordance with RR 4.4.

No 5.162A provides for an additional allocation to the radiolocation service on a secondary basis in a number of countries, limited to the operation of wind profiler radars in accordance with Resolution 217 (WRC-97);

The frequency band 47-68 MHz is allocated to the broadcasting service on a primary basis in Region 1.

The frequency band 47-68 MHz or part of it, is also allocated to the land mobile service on a primary basis in a number of countries in Region 1.

The frequency band 50-54 MHz is allocated to the land mobile service on a primary basis as shown in the European Table of Frequency Allocations.

No 5.167 and other relevant footnotes in this frequency band provide for alternative and additional allocations to the fixed, mobile and broadcasting services on a primary basis,

The opportunity provided by Agenda item 1.1 to achieve global harmonisation would provide the means to introduce new and innovative systems, as well as regularising existing amateur service usage in the range 50-54 MHz, including a reduction in the number of footnotes in Article 5.

The following provides the reasoning for the creation of a global allocation to the amateur service in the band 50-54 MHz, in response to AI 1.1 of WRC-19.

The frequency range 30-80 MHz marks the transition area between ionospheric and non-ionospheric propagation modes, which makes it particularly interesting for experimentation and study within the amateur service. An allocation in this frequency range in Article 5 has not been generally available to the amateur service in Region 1 for over half a century. Alignment with Region 2 and 3 would therefore facilitate the general understanding and prediction of propagation events as data accumulates and more Region 1 administrations grant their amateur licensees access to spectrum in the band 50-54 MHz.

A number of propagation modes are used by amateurs in the range 50-54 MHz:

Free-space (line of sight)

Sporadic-E ‘clouds’,

E and F2 multi-hop and chordal-hop,

Trans-equatorial spread-F,

E-layer FAI (field-aligned ionisation irregularities),

Aurora backscatter,

Meteor scatter,

Earth-Moon-Earth (using the moon's surface as a passive reflector),

Tropospheric super-refraction and ducting,

Tropospheric scatter,

Scatter from aircraft and objects in near Earth orbits (e.g. International Space Station)

In recent years broadcasting has significantly declined in the band 47-68 MHz and national allocations for the amateur service have already been established in parts of Region 1. For example the European Common Allocation table (ECA) of CEPT has included an allocation to the amateur service in the band 50-52 MHz for a number of years.

By 2020 analogue television broadcasting within this frequency range in other parts of Region 1 is expected to decline further. Sharing between the broadcasting service and amateur service in the band 50-54 MHz in Region 1 should then be minimal.

A Region 1 allocation would facilitate further worldwide harmonisation.

Longer term propagation studies would continue and thrive.

The amateur service sees a need to bridge the very wide gap between the existing allocations to the amateur service at 28 MHz and 144 MHz in Region 1 thus avoiding the use of RR 4.4 by those administrations in Region 1, not party to No 5.169, which have provided an allocation to the amateur service within the band 50-54 MHz.

The technical and operational characteristics of systems used in the amateur service for the purpose of performing sharing studies can be found in ITU-R Recommendation M.1732.

Requirement/Justification:

The amateur service, with more than three million operators worldwide, continues to grow. In CEPT, the number of amateur licences is around 400.000. Since 2010, the number of amateur licences has grown by approximately 7,5%. 41 CEPT countries have an amateur allocation in part of the band 50-54 MHz.

Radio amateurs utilise allocations to the amateur service to engage in scientific and technical investigation and experimentation, provide communication in the wake of natural disasters, provide non-commercial public service communications, and conduct other activities to advance technical education, develop radio operating technique, and enhance international goodwill.

As mentioned previously a number of Region 1 countries not party to No 5.169 have made all or parts of the band 50-52 MHz available to the amateur service by means of RR 4.4. The lower part of this frequency range is utilised for weak signal communications which would derive great benefit from harmonisation with Regions 2 and 3. The essential requirement here is for 500 kHz of narrowband applications including propagation beacons.

The frequency range 50.5-52 MHz is currently utilised for voice communications using frequency or phase modulation (FM), Data, Gateways and FM Repeaters. Concerning two frequency repeaters, which are working in a half-duplex mode, sufficient separation must be available between input and output frequencies in order to be able to easily engineer the cavity diplexers required for such installations. Digital Voice (DV) and data is already being used for 50 MHz VHF mobile networks in the amateur service incorporating text and simple voice messaging. Such systems have shown to be of considerable value in emergency communications. See RR 25.3.

Additional spectrum above 52 MHz is required in order to give amateur radio room to develop new innovative applications, systems and modes in keeping with 21st century developments and to assist young people in developing new communications skills. Based on current experimentation, in general these will be digital, combining voice video and data like services encompassing a wide range of appropriate bandwidths. These applications, systems and modes may be used in conjunction with HAMNET, a mainly IP based broadband point-to-point network in the amateur service utilising spectrum mainly in allocations to the amateur service at 2.3 GHz and 5.7 GHz.

In addition, access to the entire band 50-54 MHz in Region 1would mitigate problems experienced by the amateur service in several ways. The widespread rise in the overall noise floor in MF and HF spectrum increasingly renders lower frequencies allocated to the amateur service subject to disturbance and harmful interference, particularly in urban environments. Furthermore additional VHF spectrum would help to compensate for spectrum identified for IMT in the 2.3 GHz band and the 3.4 GHz bands at recent WRCs. This would apply especially for wideband modes such as data and multimedia which are increasingly being displaced from these bands.

Amateur innovation in 52-54 MHz could also pioneer the way for commercial applications in other parts of the low VHF band where many administrations are investigating how such spectrum might be used in an efficient and effective manner. HoT (HAMNET of Things), Machine to Machine and Station to Remote Station are anticipated applications.

Unlike Region 2 and in some cases Region-3, the amateur service in Region 1 does not have allocations elsewhere in the VHF range at 146-148 MHz and 220-225 MHz; harmonising with Regions 2 and 3 in 50-54 MHz would therefore seem appropriate, especially if global networks with roaming capabilities are eventually realised.

Current trials show that RB-DATV (reduced bandwidth digital amateur television) could also be implemented above 52 MHz. With leading-edge amateur innovation, currently the lowest data rate achievable for DATV (MPEG-4/DVB-S QPSK) is 333kb/s requiring a necessary bandwidth of 500 kHz. When the hardware to support such applications matures, it is expected that there will be greater demands for VHF amateur spectrum to additionally provide some form of one-to-one amateur video communications as well as other data services.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

* Recommendation ITU-R M.1732-1 Characteristics of systems operating in the amateur and amateur-satellite services for use in sharing studies;
* Amateur and amateur-satellite services Handbook
* Work plan for WRC-19 Agenda item 1.1
* Resolution 658 (WRC-15)
* Working Document Toward Preliminary Draft New report ITU-R M.[AMATEUR\_50\_MHz]
* Report ITU-R BT. 2387-0 (07/2015) contains information on responses from administrations on use of various frequency bands, including 50-54 MHz for broadcasting.
* Recommendation ITU-R BT.1368 Planning criteria, including protection ratios, for digital terrestrial television services in the VHF/UHF bands.
* Recommendation ITU-R BT.2033 Planning criteria, including protection ratios, for second generation of digital terrestrial television broadcasting systems in the VHF/UHF bands.
* Recommendation ITU-R SM.851 Sharing between the broadcasting service and the fixed and/or mobile services in the VHF and UHF bands.
* Final Acts of the European Broadcasting Conference (Stockholm, 1961 as revised in Geneva, 2006) (“ST61”) in the European Broadcasting Area
* Final Acts of the African Broadcasting Conference (Geneva, 1989 as revised in Geneva, 2006) (“GE89”) in the African Broadcasting Area and neighbouring countries.

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

# Actions to be taken

Identify windprofiler radar stations operating in the band 50-54 MHz and in adjacent bands;

Identify broadcasting stations operating in the band 50-54 MHz, including their switch off / transition plan and to suppress unused broadcasting assignments in the band 50-54 MHz in the MIFR and the 1961 Stockholm Plan (revised 2006);

Specify technical and operational characteristics for amateur communication systems in the proposed band;

Specify technical and operational characteristics and protection criteria for the broadcasting service systems operating in the band 50-54 MHz;

Specify technical and operational characteristics and protection criteria for land mobile communication systems operating in the band 50-54 MHz;

Specify technical characteristics and protection criteria for systems of other existing services in the proposed band;

Conduct compatibility studies based on characteristics, protection criteria and interference scenario’s;

# Relevant information from outside CEPT

## European Union (date of proposal)

## Regional telecommunication organisations

APT (date of proposal)

ATU (date of proposal)

Arab Group (date of proposal)

CITEL (date of proposal)

RCC (16 September 2016)

The RCC Administrations consider that during studies on possible allocation of the frequency band 50-54 MHz to the amateur service in Region 1, spectrum requirements for the amateur service should be identified.

The RCC Administrations consider that, when identifying technical and regulatory conditions for such allocation, protection shall be ensured to the broadcasting service to which this frequency band is allocated on a primary basis, including stations of the broadcasting service in the frequency band 50-54 MHz, regulated by Stockholm-61 and Geneva-89.

## International organisations

IARU (25 November 2016)

The IARU supports modification of the Table of Frequency Allocations to allocate the band 50-54 MHz to the Amateur Service on a primary basis in Region 1.

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

SFCG (date of proposal)

WMO and EUMETNET (8 February 2017)

WMO does not oppose an allocation to amateur service in the 50-54 MHz provided that:

* appropriate protection of radiolocation service allocated by RR No 5.162A is ensured and
* the status of the new allocation to amateur service provides the radiolocation service equality or precedence relative to the amateur service.

WMO opposes any new allocation to amateur-satellite service in this frequency band

## Regional organisations

ESA (date of proposal)

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (9 March 2017)

The EBU notes that the Stockholm 1961 Regional Agreement (Rev. Geneva 2006) still applies in the 50-54 MHz band.

This Agreement regulates the use of VHF bands for the broadcasting service by the countries of the European Broadcasting Area which covers almost all CEPT member states.

Many administrations in this area still have broadcasting assignments registered in the ST61 Plan or in the BR IFIC, and the provisions of the Agreement regarding protection of those assignments need to be respected, unless agreed otherwise by the administrations concerned.

As recorded by footnote ECA3 in the ECA Table: CEPT administrations are urged to take all practical steps to clear the band 47-68 MHz of assignments to the broadcasting service. The broadcasting assignments according to Stockholm Agreement 1961 shall be protected.

EBU also notes footnote ECA36 in the ECA Table: A frequency band, which has been harmonised by NATO and NATO member nations for military use as defined in the NATO Joint Civil/Military Frequency Agreement (NJFA) 2014. Note: A public version of the NJFA 2014 is expected to be provided by NATO to ECO by the end of 2016.

GSMA (date of proposal)

CRAF (8 March 2017)

LOFAR is currently the only radio telescope operational in the band 50-54 MHz and is located in region 1. Thanks to the geographical and frequency coverage LOFAR is also a unique instrument for passive space weather research. Resolution 657 (WRC-15) invites ITU-R to document for WRC-19 the technical and operational characteristics of space weather sensors, to determine for WRC-19 the appropriate radio service designations for space weather sensors, to conduct for WRC-23 the necessary sharing studies for incumbent systems operating in frequency bands used by space weather sensors, with the objective of determining regulatory protection that can be provided while not placing additional constraints on incumbent services. CRAF requests great care in allocating bands to active services, which may block the further development of space weather research.