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| Summary: | | |
| This ECO Bulletin provides a summary update on aspects of progress in spectrum management outside the CEPT. The items in this bulletin include:   1. Update from APT (new APT Recommendations, Reports, questionnaires and further on-going work, work on strategic plan); 2. Preliminary position of the RCC Administrations on Agenda Items for the WRC-19; 3. 450-470 MHz : Developments in China and 3GPP; 4. Broadband DA2G - USA; 5. New 57 – 64 GHz Outdoor Use Rules (Argentina, Mexico); 6. Canada - Technical Requirements for Fixed Line of-Sight Radio Systems Operating in the Bands 71-76 GHz and 81-86 GHz; 7. Canada – outdoor use in 5150-5250 MHz permitted; 8. FCC moves to combat scam robocalls & malicious Caller ID spoofing; 9. FCC – Update to 800 MHz Band; 10. FCC – Guidance on Antennas (Part 15 ‘SRD’ equipment); 11. FCC: Change of Part 95 rules (wireless devices that are used by the general public but not included in Part 15); 12. FCC: Cut-off established for additional NGSO satellite applications in the 12.75-13.25 GHz, 13.85-14.0 GHz, 18.6-18.8 GHz, 19.3-20.2 GHz, and 29.1-29.5 GHz bands; 13. FCC: Proposed rulemaking to facilitate the use of earth stations in motion (ESIM) communicating with GSO satellites in bands allocated to the FSS; 14. Information about 3GPP V2X standardisation and related (China CCSA, 5GAA, USA, Canada). | | |
| Proposal: | | |
| ECC is invited to note this bulletin. More detailed input on some of the subjects covered is being input to the groups dealing with the respective subjects.  Several of the issues covered in this bulletin should be noted or discussed in detail at the respective WG/ PT level.  This includes information related to satellite issues (items 12 and 13), fixed service (item 6), for CPG (item 2), for items in relation to SRD or SRD/MG activities (items 5, 10, 11 and 14), PPDR (items 1 and 3), some activities in 3GPP (items 3 and 14), of general interest for WG FM on DA2G (item 4), 5150-5250 MHz WAS/RLAN outdoor use (item 7), or for PT1 (items 1,2, 3, 9, 14). Some elements may be of interest for WG SE and SE19 or SE24 (items 1, 5, and 6). Item 8 is for information of WG NaN.  Especially items 7 (5150-52350 MHz WAS/RLAN outdoor), item 8 (this information is relevant to ECC WG NaN’s ongoing work on the role of E.164 numbers in facilitating international fraud), item 12 (handling of several NGSO system filings) and item 14 (C-V2X vs IEEE 802.11/11p/ ETSI G5) are recommended for detailed discussions in the respective working groups and project teams. | | |
| Background: | | |
| The Office brings to each ECC meeting a bulletin on activities in radio communications in other world regions, where a regulatory dimension is raised (e.g. by innovative services or technology).  The primary objective is to identify whether the ECC needs to investigate further or consider possible new actions. A secondary but more frequently addressed objective is to enable comparison to be made with the regulatory approach in other regions to subjects already treated by the ECC (including, where relevant, to the work of the CPG). | | |

# News from APT

The 21st Meeting of the APT Wireless Group (AWG-21) was held from 3 to 7 April 2017 in Bangkok, Thailand.

AWG-21 developed two Draft New APT Recommendations which have now been submitted for the approval process in APT:

* [Draft APT Recommendation on Frequency Arrangements in the Range 694-894 MHz for Broadband Public Protection and Disaster Relief (PPDR)](http://www.apt.int/sites/default/files/Upload-files/AWG/AWG-21-REC1_PPDR.docx); recommending to APT administrations that spectrum within parts of the 3GPP Band 5 (824-849/869-894 MHz), 3GPP Band 26 (814-849/859-894 MHz), 3GPP Band 27 (807 824/852-869 MHz), and 3GPP Band 28 (703-748/758-803 MHz) is made available on a national basis for BB-PPDR.
* [Draft APT Recommendation on Licensed Shared Access (LSA)](http://www.apt.int/sites/default/files/Upload-files/AWG/AWG-21-REC2_LSA.docx); referring to APT Report 68 and hence over APT Report 68 includes many references to ECC as well as FCC deliverables.

Table 1: New APT Reports (approved and published)

| Reference | Topic |
| --- | --- |
| [APT/AWG/REP-69](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-69_APT_Report_ARNS.docx) | APT Report on Survey Study on Frequency Usage of the Bands 108 – 117.975 MHz, 328.6 – 335.4 MHz and 960 – 1 164 MHz for Aeronautical Radionavigation Service in APT Region |
| [APT/AWG/REP-70](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-70_APT_Report_17GHz_and_27GHz.docx) | APT Report on Survey Study on the Usage and Future Plans of the Bands 17.7-20.2 GHz and 27.5-30 GHz in the Asia-Pacific Region |
| [APT/AWG/REP-71](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-71_APT_Report_Service_and_Application_WPT.docx) | APT Report on Services and Applications of Wireless Power Transmission Technology |
| [APT/AWG/REP-72](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-72_APT_Report_Grid_Monitoring_TDOA.docx) | APT Report on Grid Monitoring Network Using TDOA Technology |
| [APT/AWG/REP-73](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-73_APT_Report_PPDR_Spectrum_Harmonization.docx) | APT Report on Harmonization of Frequency Ranges Use by Wireless PPDR Applications in Asia-Pacific Region |
| [APT/AWG/REP-57(Rev.1)](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-57Rev.1_APT_Report_Integrated_MSS_Hybrid_Satellite-Terrestrial_System.docx) | Note: APT Report 73 includes also opportunities for BB-PPDR at 1 447-1 467 MHz and 4 940–4 990 MHz |
| [APT/AWG/REP-46(Rev.1)](http://www.apt.int/sites/default/files/Upload-files/AWG/APT-AWG-REP-46Rev.1_APT_Report_2100_MHz_Survey.docx) | APT Report on "Studies within the Architecture and Performance of Integrated MSS System and Hybrid Satellite/ Terrestrial Systems below the 3GHz Band" |

AWG-21 agreed to distribute several questionnaires:

* [on current spectrum usage and future plan of unmanned aircraft system](http://www.apt.int/sites/default/files/Upload-files/AWG/AWG-21-Q1_Unmanned_Aircraft_System.docx);
* [on usage and future plan of the band 3300-3400 MHz in AsiaPacific region](http://www.apt.int/sites/default/files/Upload-files/AWG/AWG-21-Q2_3300-3400_MHz.docx);
* [on usage and future plan of the band 4800-4990 MHz in AsiaPacific region](http://www.apt.int/sites/default/files/Upload-files/AWG/AWG-21-Q3_4800-4990_MHz.docx); and
* [on potential implementation of IMT in the frequency band 1427-1518 MHz in Asia-Pacific region](http://www.apt.int/sites/default/files/Upload-files/AWG/AWG-21-Q4_1427-1518_MHz_IMT.docx).

AWG-21 also approved the re-circulation of a questionnaire on usage and future plan of frequency bands in relation to studies on WRC-19 Agenda Item 1.13 in Asia-Pacific region.

Other items discussed in AWG-21 which could be of interest to the ECC and its subordinate groups:

* an information ‘white paper’ document from Qualcomm Hongkong and the 5G Automotive Association (5GAA) lobbying for V2X as currently standardisied in 3GPP. The paper includes statements such as:

*It is important to recognize that in the device-to-device mode (V2V, V2I, V2P) operation, C-V2X does not necessarily require any network infrastructure. In short, C-V2X could and should be used for the public good. 5GAA therefore firmly believes that the device-to-device modes must be enabled and not prohibited by regulatory frameworks because such modes could also be operated in the 5.9 GHz ITS band without any required subscription or payment;*

*Co-existence of different technologies in the same 5.9 GHz ITS band, using such schemes as different channel assignments, are under study in 3GPP Release 14 and in other standards fora. These studies have merit, because regardless of the outcome, it is good policy to provide sufficient harmonized spectrum for the best low latency vehicle-to-vehicle communication technology in order to save lives and to usher in a future of connected and automated driving.*

* A proposal from Apple to develop an APT Recommendation on frequency ranges for non-beam WPT technologies for mobile devices. Apple recommends to identify 205 – 500 kHz as needing further study for worldwide harmonisation of WPT frequencies. In addition, Apple proposes APT to submit the new frequency range to ITU-R WP1A and WP1B for WPT as a recommendation;
* Australia (Telstra) recommending a new APT Recommendation on harmonised arrangements for BB-DA2G links with passenger aircraft and referring to developments in 3GPP (ref: work on-going in 3GPP for TR 38.913, LTE-based for ‘in the air’ macro-cells up to 100 km radius and below 4 GHz);
* APT is working on a new APT Report on sharing and compatibility studies above 24 GHz for IMT-2020. The bands included at this stage are: 24.25-27.5GHz, 31.8-33.4 GHz, 37-43.5 GHz, 45.5-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz.

From the APT Standardization Program (ASTAP), the following questionnaires and a new Report was noted:

* [Questionnaire on Requirement of Future Transport Network Technologies](http://www.apt.int/sites/default/files/Upload-files/ASTAP/ASTAP-28-OUT-20-Questionnaire-Transport_Networks.docx) / [Circular Letter](http://www.apt.int/sites/default/files/Upload-files/ASTAP/ASTAP-28-Circular-Questionnaire-FTNT.pdf)
* [Questionnaire on Smart City Applications for the future case study report](http://www.apt.int/sites/default/files/Upload-files/ASTAP/ASTAP-28-OUT-11-Questionnaire-Smart-City-Application.docx) / [Circular Letter](http://www.apt.int/sites/default/files/Upload-files/ASTAP/ASTAP-28-Circular-Questionnaire-SCA.pdf)
* [APT/ASTAP/REPT-25](http://www.apt.int/sites/default/files/Upload-files/ASTAP/APT-ASTAP-REPT-25-MMW_RoF_Fronthaul_Backhaul.docx): APT Report on Fronthaul/ Backhaul using Millimeter-wave Radio over Fiber Technologies (*Note: this includes also some information about 60 GHz)*

As indicated in the last ECO Bulletin, APT is also developing a Strategic Plan of APT for 2018-2020. Priority areas (strategic pillars) have been defined in the embedded document here:



The first and initial draft has been circulated to APT members in May to get feedback from members and the 2nd Meeting of CGSP which will be held on 27 July 2017 will further discuss a more detailed Strategic Plan.

The recent APT e-Newsletters are available under: <http://www.apt.int/Publications> (last edition from May 2017).

**(of interest for ECC PT1, WG FM (incl. PTs and SRD/MG) , and WG SE)**

# Preliminary position of the RCC Administrations on Agenda Items for the WRC-19

The Regional Commonwealth in the field of Communications (RCC) published a preliminary position paper on 14 April, 2017:



**(of interest for CPG and PT1 mainly)**

# 450-470 MHz: Developments in China and 3GPP

The Chinese Government has adopted 10MHz within 450MHz to 470MHz for LTE trials in 8 cities of China, which aims to clear 10 MHz for mobile broadband services. The related agreement that IMT systems would be allocated within a 2x5MHz FDD band from 450MHz to 470MHz have been approved recently in the CCSA (China Communications Standards Association) TC5 WG8 #79 meeting, and the final licensing e of 450MHz is expected in the near future in China.

Meanwhile, during February 2017 meeting of ITU Working Party 5D , many countries are working on IMT frequency planning entitled “ Recommendation ITU-R M. 1036”, in which the frequency arrangements on 450MHz should be determined. Input document (R15-WP 5D/515-E) from China (People’s Republic of), provides a proposal on the frequency arrangement in the frequency band 450-470MHz.

The arrangement is shown as following:

* Bandwidth: 5 MHz
* Uplink: 450-455 MHz
* Downlink: 460-465 MHz
* Centre gap: 5 MHz
* Duplex separation: 10 MHz

To facilitate 450 MHz eco-system development in Region 3 including China in a timely manner, it is proposed by China to standardisze a new E-UTRA operating band based on this band plan. Besides, due to the propagation behaviour, 450MHz is taken into into account as good candidate band for NB-IoT or eMTC.

**3GPP:**



Technical Report 3GPP TR 36.748 (Release 15) for 450MHz E-UTRA FDD Band for LTE PPDR and PMR/PAMR in Europe is currently under preparation and includes the existing 3GPP band 31 and a new 3GPP band 72 of uplink = 451 - 456 MHz and downlink = 461 – 466 MHz, see figure above.

3GPP is of the view that 2x5 MHz band plans are feasible but 2x5.5 MHz band plans are not suitable for full duplex operation. Note that ECC/DEC/(16)02 defines

a) 450.5 - 456.0 MHz (Uplink) / 460.5 - 466.0 MHz (Downlink);

b) 452.0 - 457.5 MHz (Uplink) / 462.0 - 467.5 MHz (Downlink).

The possibilities include channel bandwidths of 1.4MHz, 3MHz and 5MHz. The new band(s) will be supported by eMTC and NB-IoT. This new FDD E-UTRA opportunities are expected to be available from Release 15 onwards.

The above shows that there are currently 3 options (3GPP bands 31 and 72 as well as the ‘Chinese’ option) in the standardisation process.

**(Relevant for WG FM and FM54, of interest for PT1)**

# Broadband DA2G - USA

In addition to the Australian initiative in APT reported under item 1, the following information was noted from press releases with regard to the situation in the USA:

**Gogo:**

The existing DA2G service provider Gogo announced plans for a next-generation ground-based network in September 2016 and confirmed more precise information on 1 March 2017. It was said that the new network would use unlicensed spectrum (2.4 GHz) and LTE technology, a proprietary modem and a new beam-forming antenna. The existing Gogo ATG network features 250 cellular towers, but with limited bandwidth, the service has struggled to provide adequate service, even for low intensity cabin-based in-flight communication applications such as email.

However with the use of unlicensed spectrum, and the upgraded aircraft modem and antenna, Gogo is promising speeds of 100 Mbit/s, which would then be broken down in terms of connection speeds based on passenger use, device type and other individual user factors. If this becomes a reality, the new ATG network would deliver speeds about 10 times as fast as Gogo’s existing ATG system. The network is planned for a 2018 launch. Aircraft equipped with older versions of Gogo’s air-to-ground technologies will need new modems and blade antennas to use the new service.

**SmartSky Networks:**

SmartSky Networks’ announced again that their patented SmartSky 4G radio system completed the major milestone of receiving FCC certification, clearing the way for deployment of the ultra-fast SmartSky 4G air-to-ground network later this year, with nationwide service launching in mid-2017. Haynes Griffin, SmartSky Chairman and CEO, stated, “After investing tens of millions of dollars and over five years of research and development effort, SmartSky’s now certified technology has unlocked enough spectrum to be able to offer, for the first time, the reliable use of a sophisticated, custom-designed 4G system that can deliver an office-like internet experience in the air for both business aviation and commercial aviation customers.”

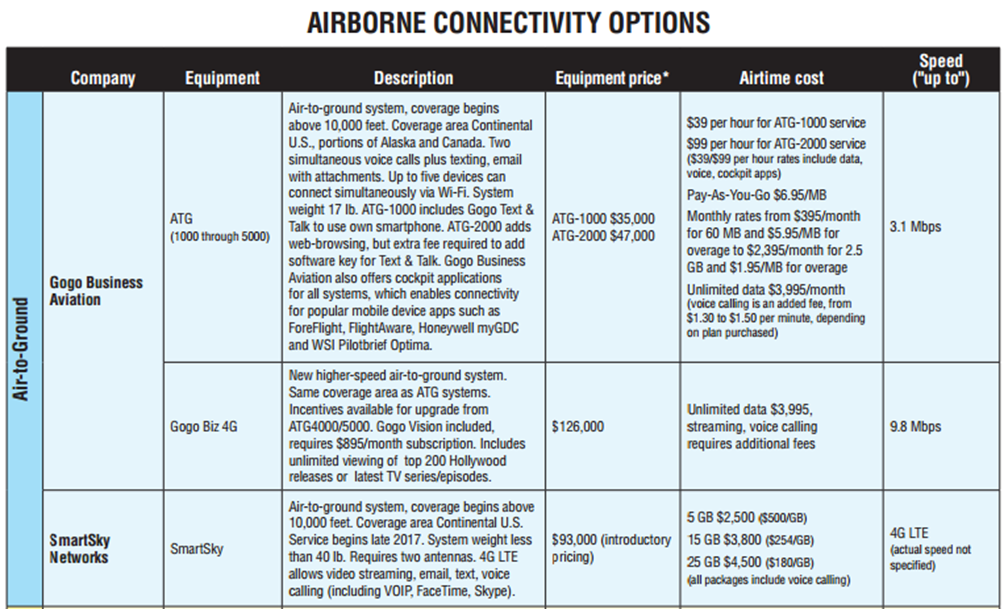
FCC certification is the culmination of work to develop and patent protect the multiple bodies of technology that uniquely enable SmartSky to make use of the unlicensed 2.4 GHz spectrum band, all without causing harmful interference to or receiving interference from the operation of the same band on the ground. Despite the widespread assertion that aviation-related spectrum reuse in the unlicensed band would not be feasible, SmartSky has successfully solved the challenge by implementing new technical methods that are broadly covered by its robust and growing portfolio of 20 granted patents. Additional patents are pending.

Reed Hundt, SmartSky’s Vice Chairman of the Board and former Chairman of the FCC, remarked, “Long ago, the FCC authorized the allocation of large blocks of unlicensed spectrum to foster innovation and encourage competition. Today, we see the amazing results of that prescient regulation, which has resulted in ubiquitous Wi-Fi on the ground. By application of novel technologies using 2.4 GHz unlicensed spectrum, SmartSky’s breakthrough will finally give the aviation industry the superior connectivity now taken for granted terrestrially.”

Roberson and Associates, a highly regarded independent wireless industry consulting firm, investigated the ability of SmartSky’s radio technology to seamlessly coexist with terrestrial Wi-Fi. CEO Dennis Roberson, who is also Chairman of the FCC’s Technical Advisory Council, commented, “SmartSky’s technology solution is transparent to Wi-Fi users on the ground, enabling the air-to-ground sharing of the 2.4 GHz unlicensed band.”

SmartSky’s technology and patent portfolio is not limited to the unlicensed band. Most of the patents apply to any frequency and any waveform in any high speed air-to-ground network. Because these are broad patents, SmartSky enables underlying technical advances to be incorporated into its conceptual solution. “Over time, this will allow SmartSky to keep pace with the latest advances in computing, antennas, radios and networking while still being protected by our foundational patents,” said Griffin

The above information provided to the public from Gogo (seeking a solution for service continuation for DA2G) and SmartSky actually suggests that these networks (or one network) is already under construction. In addition, an indicative pricing list (see below) was also published in some aviation magazines. SmartSky Network (as the ‘newcomer’) seems also to have secured more than 170 million USD in financing in March 2017, completing the equity funding for the deployment of its nationwide network. In addition, SmartSky works together with the equipment manufacturer Harris and also with the aircraft manufacturer Bombardier. Harris got an equipment type approval from the FCC (<http://www.satcom.guru/2016/10/fcc-grants-harris-authorization-for.html>) under which Ground Station equipment with roughly 150 mW output power and with an antenna gain of 20 to 30 dBi (phased array antenna, steerable beams) can operate with 42 to 53 dBm in the 2.4 GHz range (smart antenna systems following FCC §15.247) and under the current regulations.



FCC:

No confirmation or statements from the FCC have been given or received with regard to these DA2G network plans. In other words, neither the FCC nor Canada do seem to have dedicated plans for a specific new regulation for DA2G. It is therefore assumed that the approach from Gogo and SmartSky is based on using the current 2.4 GHz regulations which do not necessarily exclude an ATG utilisation. In addition, also the 14 GHz process (Qualcomm initiative) is ‘still pending’.

**(of interest for WG FM)**

# 57 – 64 GHz Outdoor Use Rules

Two countries were noted to have introduced outdoor use rules in the frequency range 57-64 GHz:

* 1. Argentina

On March 10, 2017, Argentina’s Regulator, Ente Nacional de Comunicaciones (ENACOM0) published Resolution 1336-E/2017 advising that the 57 – 64 GHz frequency range is now allocated for the use of multi-gigabit wireless systems (MGW) in Argentina. The technical requirements for equipment and systems operating within the 57 - 64 GHz band are:

1. Average Equivalent Isotropically Radiated Power (EIRP) shall not exceed 40 dBm.
2. Peak Equivalent Isotropically Radiated Power (EIRP) shall not exceed the value of 43 dBm.
3. Average Equivalent Isotropically Radiated Power (EIRP) Spectrum spectral density shall not exceed 13 dBm/MHz.
4. The Peak Conducted Power shall not exceed 500 mW.
5. Antenna gain and output power shall be adjusted in such a way that the limits established in items (1), (2), (3) and (4) are not exceeded.
   1. Mexico

On May 9, 2017, Mexico’s Regulator Instituto Federal de Telecomunicaciones (IFT) classified the 57-64 GHz band as free use, including outdoor use, whereby devices operating in the 57-64 GHz band should not be used onboard aircraft or satellites. Point-to-point transmitters located outdoors shall amongst other technical restrictions (spectrum power density, operate with an average e.i.r.p. not exceeding 82 dBm and a maximum EIRP not exceeding 85 dBm. In cases where the antenna gain is less than 51 dBi, 2 dB should be subtracted from the average EIRP and the maximum EIRP, for each dB the gain is less than 51 dBi.

**(WG FM, WG SE, SRD/MG and SE19)**

# Canada - Technical Requirements for Fixed Line of-Sight Radio Systems Operating in the Bands 71-76 GHz and 81-86 GHz

During May 2017, Industry Canada released SRSP-371.0, Issue 1, Technical Requirements for Fixed Line of-Sight Radio Systems Operating in the Bands 71-76 GHz and 81-86 GHz. This SRSP outlines the minimum technical requirements for the efficient use of the frequency bands 71-76 GHz and 81-86 GHz by point-to-point digital line-of-sight radio systems in the fixed service. The SRSP (Standard Radio System Plan) is intended to be employed in the design and specification of radio systems and equipment. It specifies equipment characteristics relating to efficient spectrum usage only, and is not to be regarded as a comprehensive specification for equipment design and/or selection. For details, see this [link](http://rheintech.us4.list-manage.com/track/click?u=ea8729ded10d990820bca7414&id=707a43ff34&e=56b0e30a9b).

**(for information WG SE, SE19)**

# Canada - outdoor use in 5150-5250 MHz permitted

Canada has changed the rules for the 5150 – 5250 MHz band. Similar to the USA, also Canada now allows higher power and outdoor usage in this band.

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11294.html#sA>

The rulings in the USA and now also in Canada are equivalent. Cable operators in North America are interested in such outdoor WAS/RLAN. Professional operators can switch off or reduce power in order to avoid interferences. Interestingly, Canada considers the use inside of cars as indoor use.

In relation, on February 23, 2017, Industry Canada released RSS-247, Issue 2 Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices, replacing RSS-247, Issue 1, dated May 2015. RSS-247*,*[Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10971.html)

There seems to be an agreement with Globalstar. As such, this possibility may also exist for Europe.

Background: Aggregated Interference into MSS satellite front end, see earlier contribution from Globalstar to the process when the FCC was abolishing the indoor restriction (<https://ecfsapi.fcc.gov/file/7520959857.pdf>).

Nevertheless, the FCC changed the rules in 2014 and abolished the indoor restriction:

*U-NII Low (U-NII-1): 5.150-5.250 GHz. Originally limited to indoor use only. Regulations required use of an integrated antenna, with power limited to 50 mW. Rules changed in 2014 to permit outdoor operation, maximum fixed power 1 watt, maximum fixed EIRP 4 watts (+36 dBm) point-to-multipoint, 200 watts (+53 dBm) point-to-point. However, strict out-of-band emission rules limit practical point-to-point power to lower levels. For the protection of Globalstar, the limitation are strict vertical emission limits, i.e. limitation to fixed infrastructure, no electrical or mechanical steerable beam antenna.*

(See FCC: <https://transition.fcc.gov/bureaus/oet/ea/presentations/files/oct14/51-New-Rules-for-UNII-Bands,-Oct-2014-TN.pdf> )

There is also AI 1.16 of WRC-19 referring to the whole frequency range 5150 MHz to 5925 MHz. - i.e. all current utilisation conditions including the indoor restriction could potentially be reconsidered. It would make sense to know details of a possible agreement between Globalstar on one hand and the regulators and proponents on the other hand.

(**For consideration in CPG and WG FM)**

# FCC Moves to combat scam robocalls & malicious Caller ID spoofing

On Thursday 23 March 2017, the FCC voted to pass a rule proposal that could eventually let carriers block more unwanted calls. The FCC’s current rules prevent the proactive blocking of calls. The proposed new rules would permit carriers to block any robocaller that uses a number that has not been assigned to any customer or that has a non-existent area code. The proposal was established in collaboration with a “strike force” that included AT&T, Apple, Google, and Comcast.

“Robocalls are the number one consumer complaint to the FCC from members of the American public,” FCC chairman Ajit Pai said. “We aim to take an important first step in ending the scourge of illegal robocalls.”

Robocalling when used in conjunction with Caller ID spoofing (**Caller ID, also known as Calling Line Identification – CLI – in Europe**) is a serious threat to consumer protection. Caller ID spoofing helps robocallers get around the Do Not Call registry, which allows people to block unwanted calls from telemarketers. Scammers also use spoofing to trick people into thinking a call is coming from the IRS, according to the FCC. This can lead to “vishing” where an unsuspecting caller may give out personal information or credit card details to the calling party. This is also a problem currently being experienced in many European countries.

Once the proposal’s rules go into effect, carriers will have permission to block all calls from numbers that can’t possibly be valid, such as those that aren’t assigned to anyone or phone numbers that simply don’t exist (like “000-000-0000”). Mr. Pai added that “there is no reason why any legitimate caller should be spoofing an unassigned or invalid phone number. It’s just a way for scammers to evade the law.”

If a robocaller decides to spoof another phone number — making it appear that they’re calling from a different line to hide their identity — phone providers would be able to block them if they use a number that clearly can’t exist because it hasn’t been assigned or that an existing subscriber has asked not to be spoofed.

The measure will now head into a public comment period, where phone companies and consumers can comment on the changes. In particular, the FCC is asking what it can do to better combat spoofed calls that begin in other countries and what it can do to minimise legitimate, legal calls from getting blocked by accident. There will then be a final vote, likely later this year, on an amended version of the rules.

This information is relevant to ECC WG NaN’S ongoing work on the role of E.164 numbers in facilitating international fraud.

More information is available at: <https://www.fcc.gov/document/fcc-moves-confront-scam-robocalls-malicious-spoofing> .

**(for information for WG NaN)**

# FCC – Update to 800 MHz Band

On March 23, 2017, the FCC took steps to reform certain outdated rules applicable to the 800 MHz cellular service band to facilitate the use of cellular spectrum for mobile broadband services such as long term evolution (LTE). Specific reforms adopted in this revision include:

* • Power Reform: FCC will facilitate broadband technologies by changing its technical rules to permit cellular licensees to transmit the same amount of power across the spectrum band, whether they are deploying a legacy (narrow bandwidth) technology or modern (wider bandwidth) technology like LTE;
* • Co-existence with Public Safety: FCC will continue to ensure co-existence of cellular and neighboring public safety systems by retaining cellular-specific interference resolution rules and procedures, and by engaging stakeholders via a public forum;
* • Consistent Treatment with Similar Spectrum Bands: FCC will treat cellular spectrum consistently with other similar commercial wireless spectrum bands by conforming rules related to power measurement, out of band emissions, field strength, and discontinuance of operations;
* • Unnecessary rules/burdens: FCC will eliminate unnecessary rules and burdens related to application filings, domestic and international coordination, and comparative renewal.

**(for information for ECC PT1)**

# FCC – Guidance on Antennas (Part 15 ‘SRD’ equipment)

On April 4, 2017, the FCC issued [353028 D01 Antennas Part 15 Transmitters v01](http://rheintech.us4.list-manage.com/track/click?u=ea8729ded10d990820bca7414&id=99711f7368&e=56b0e30a9b) summarising the equipment authorisation policies and rules for antennas used with Part 15 intentional radiator (transmitter) devices.

**(for information: SRD/MG and SE24)**

# FCC – Change of Part 95 rules (wireless devices that are used by the general public but not included in Part 15)

May 19, 2017 - Report and Order

This Report and Order is a major re-write of the Part 95 Rules. According to the FCC, the rules are being overhauled "to modernise them, remove outdated requirements, and reorganise them to make it easier to find information. In re-writing the rules, the commission hopes to make them "consistent, clear and concise".

Here is a summary of key changes to those services:

Family Radio Service (FRS)

FRS would now have more, i.e. 22 channels. All 22 channels that today's combination FRS/GMRS radios use will become part of FRS. All FRS channels are also allotted to the GMRS channels on a shared basis.

FRS would now have higher power. Previously, FRS was limited to 500 mW to 1 W. The new rules allow FRS radios to transmit at up to 2 W. According to the FCC's new rules, "Each FRS transmitter type must be designed such that the effective radiated power (ERP) on channels 8 through 14 does not exceed 0.5 Watts and the ERP on channels 1 through 7 and 15 through 22 does not exceed 2 Watts."

FRS radios may transmit digital data. Previously, FRS transmissions were limited to voice conversations. Now, these units may also transmit and receive digital data as well. This includes location information or brief text messages to and from other FRS or GMRS stations. The FCC states "Digital data transmissions must be initiated by a manual action of the operator, except that a FRS unit receiving an interrogation request may automatically respond with its location."

FRS will be allowed to be combined with Part 15 devices. This would permit combination with technologies such as Wi-Fi and Bluetooth.

Both individuals and businesses now seem to be explicitly authorized for use (license-exempt use) on the FRS.

General Mobile Radio Service (GMRS)

GMRS would have 30 channels. The GMRS is allotted 30 total channels consisting of 16 main channels and 14 interstitial channels. The GMRS operators may use their GMRS station for two-way plain language voice communications with other GMRS stations and with FRS units for personal or business activities.

GMRS can still be used with repeaters. The rules allow for use of GMRS with repeaters on specified channels. GMRS repeater, base and fixed stations may be operated by remote control.

GMRS radios may transmit digital data. As with FRS, digital location information, requests for location information, and brief text messages to another specific unit is now allowed to be transmitted over GMRS. Previously this was allowed to Garmin through a special waiver.

GMRS still requires a licence but for a longer term. Previously, a GMRS licence was valid for 5 years. Licences are now valid for 10 years. As for current FRS/GMRS radios, If it transmits above 2 watts, it's a GMRS radio and needs a licence. Current repeater capable FRS/GMRS radios will be classified as GMRS and require a licence. A licence is still issued for use by individuals and their immediate families. Immediate family members are the licensee's spouse, children, grandchildren, stepchildren, parents, grandparents, stepparents, brothers, sisters, aunts, uncles, nieces, nephews and in-laws. Non-individuals are grandfathered in.

Citizen's Band Radio Service (CBRS)

"Citizens Band Radio Service" would be officially named "CB Radio Service". Cordless microphones are allowed on CB. The restriction of long-range communications for CB has been eliminated, however the power limit was not increased. The CB serial number is no longer required to be engraved into the transmitter chassis. Manufacturers are no longer required to include the FCC rules with CB radios.

Other notable changes affecting all of these services:

* •Voice obscuring features would be prohibited across the entire PRS;
* •Continued use of existing radios that include scrambling features are not prohibited;
* •18 months after adoption, no person shall be permitted to manufacture, import, sell, or offer for sale any equipment that incorporates voice scrambling or obscuring for any of the PRS regardless of previous certification;
* •Radios combining multiple services will no longer be approved. This includes FRS and GMRS (although GMRS is compatible with FRS);

Note: This is now in the rulemaking process, the new rulemaking is not finalised.

Part 95 also includes other applications such as MBANS or PLB, but no obvious change seems to be proposed.

**(for information: SRD/MG and FM54)**

# FCC – Cut-off established for additional NGSO satellite applications in the 12.75-13.25 GHz, 13.85-14.0 GHz, 18.6-18.8 GHz, 19.3-20.2 GHz, and 29.1-29.5 GHz bands

Applications for NGSO satellites are reviewed in groups for a given frequency band. The review process starts when someone files an application to use spectrum. At this point, the FCC issued a public notice inviting comment and establishing a cut-off date for additional applications to be considered together with the lead application. Once the cut-off date passes and all applications are reviewed, the FCC dismisses unacceptable applications such as when the application does not demonstrate that the applicant is qualified to operate a satellite system. After the short list of successful applications is complete, the spectrum is divided equally among those applicants. On 26 May 2017, the FCC published a further list of systems accepted for filing.

In detail:

For the Ku- and Ka-bands:

On April 28, 2016, OneWeb submitted a request for U.S. market access for a constellation of 720 satellites, using the following frequency bands: 10.7-12.7 GHz (↓); 14-14.5 GHz (↑); 17.8-18.6 GHz (↓); 18.8-19.3 GHz (↓); 27.5-29.1 GHz (↑); 29.5-30 GHz (↑).

The OneWeb application was placed on Public Notice (PN) on July 15, 2016, and a processing round (“Ku-/Ka-band processing round”) was announced. Competing NGSO-like applications were due November 15, 2016.

Eleven other applications were received by this closing date. Ten of these applications have gone on Public Notice on May 26, 2017. These applications included frequencies that were not in the OneWeb applications. A new processing round was initiated: 12.75-13.25 GHz (↑); 13.85-14.0 GHz (↑); 18.6-18.8 GHz (↓); 19.3-20.2 GHz (↓); 29.1-29.5 GHz (↑) (July 26, 2017 cut-off date).



The total list of NGSO systems at the FCC of system accepted for filing (including earlier requests) includes:

|  |  |
| --- | --- |
| Applicant | Constellation structure |
| Audacy Corporation | * 3 satellites * 3 planes (1 satellite per plane) in a 25° circular orbit at 13,890 km |
| Karousel LLC | * 12 satellites * 3 groups (4 satellites per group, with nominal nodal crossings at 85W, 135E, and 25 E) in a 63.4° elliptical orbit (31,569.5 km x 40,002.3 km) |
| Kepler Communications Inc. | * 140 satellites * 7 planes (20 satellites per plane, including spares) in 98.6° circular orbit at 500 to 650 km |
| LeoSat MA, Inc. | * 78 satellites (+6 spares) * 6 planes (13 satellites + 1 spare per plane) in a 90° circular orbit at 1,400 km |
| O3b Limited | * 60 satellites * 3 proposed additions to the current 12 operational satellites:   + 8 additional satellites in circular equatorial orbit at 8,062 km   + 24 satellites in circular equatorial orbit at 8,062 km   + 16 satellites: 2 planes (8 satellites per plane) in a 70° circular orbit at 8,062km |
| Space Exploration Holdings, LLC | * Initial Deployment:   + 800-1600 satellites: 32 planes (25-50 satellites per plane) in a 53° circular orbit at 1,150 km * Final Deployment (2825 satellites):   + 1,600 satellites: 32 planes (50 satellites per plane) in a 53.8° circular orbit at 1,110 k   + 400 satellite: 8 planes (50 satellites per plane) in a 74° circular orbit at 1,130 km   + 375 satellites: 5 planes (75 satellites per plane) in a 81° circular orbit at 1,275 km   + 450 satellites: 6 planes (75 satellites per plane) in a 70° circular orbit at 1,325 km |
| Space Norway AS | 2 satellites in 63.4° HEO (8,089 x 43,509 km) |
| Telesat Canada | * 117 satellites * 6 planes with 12 satellites per plane in a 99.5° circular orbit at 1,000 km * 5 planes with 9 satellites per plane in a 37.4 ° circular orbit at 1,248 km |
| The Boeing Company | * 60 satellites * 3 groups (20 satellites per group) in a 63.4 ° elliptical orbit (27,355 km x 44,221) |
| Theia Holdings A, Inc. | * 112 satellites (+8 spares) * 8 planes (14 satellites per plane) in a 98.6° circular orbit at 800 km |
| ViaSat, Inc. | * 24 satellites (+3 spares) * 3 planes (8 satellites plus 1 spare per plane) in a 87° circular orbit at 8,200 km |
| WorldVu Satellites Limited (Oneweb) | * 720 satellites (plus spares) * 18 planes (40 satellites per plane) in a 87.9° circular orbit at 1,200 km |

For the V-bands:

On June 22, 2016, Boeing submitted a licence application for a constellation of 2956 satellites, using the following frequency bands:

37.5-42.5 GHz (↓); 47.2-50.2 GHz (↑); 50.4-52.4 GHz (↑)

The Boeing application was placed on Public notice on November 1, 2016, and a processing round (“V-band processing round”) was announced. Competing NGSO-like applications were due November 15, 2017 .

The processing round did not include the frequencies 42-42.5 GHz and 51.4-52.4 GHz, and we deferred action on these frequencies.

Six other applications were received by the cut-off date.

Audacy and ViaSat Ku-Ka applications contained V-band frequencies and were included in the processing round, bringing the total number of V-band applications to nine.

Boeing filed an amendment to its initial application to reduce the orbit height.

The amended Boeing application was placed on Public notice on May 19, 2017.

The other applications are expected to be placed on Public Notice soon.

|  |  |
| --- | --- |
| Applicant | Constellation structure |
| Boeing | * Initial Deployment   + 1396 satellites: 35 planes (32 satellites per plane) in a 45° circular orbit at 1,030 km; 6 planes (46 satellites per plane) in a 55° circular orbit at 1,082 km * Final Deployment:   + 1560 additional satellites: 12 more planes (46 satellites per plane) in a 55° circular orbit at 1,082 km; 21 planes (48 satellites per plane) in a 88° circular orbit at 970 km |
| Theia | * 112 satellites (previously filed) |
| Audacy | * 3 satellites (previously filed) |
| SpaceX | * Some of the 4425 satellites (previously filed) + 7518 LEO satellites (altitudes between 335 and 336 km) |
| Boeing 2 | * 147 satellites (132 LEO – 1,056 km altitude; and 15 highly inclined NGSO at altitudes between 27,355 and 44,221 km) |
| Telesat | * 117 (follow-on to the 117 Ku/Ka satellites) |
| OneWeb | * 720 (previously filed) + 1280 MEO satellites at 8,500 km nominal altitude |
| O3b | * 24 (previously filed) |
| ViaSat | * 24 (previously filed) |

NGSO satellites communicate primarily with omnidirectional ground antennas, therefore, it is not possible to reuse frequency bands as is the case with GSO satellites where directional ground antennas can point to a single satellite. For this reason, dividing spectrum equally among the qualified NGSO applicants seems to be the most equitable solution. Keep in mind that it is possible for the parties to negotiate their bandwidth assignments before the final licences are granted, and even to purchase spectrum rights from one another after the licences are granted.

The first-come, first-serve approach as well as the group review approach assume three things: (1) that there is an international frequency allocation by the International Telecommunications Union (ITU); (2) that there is a domestic frequency allocation by the FCC; and (3) that there exist FCC service rules for the frequency allocation.

If an application if filed before there is an ITU allocation, the FCC will dismiss the application as premature. In turn, if an application is filed after there is an ITU allocation but before an FCC allocation, the applicant must file a waiver of the domestic Table of Frequency Allocations.

Finally, if an application is filed after allocations are in place, but before FCC service rules, the FCC will allow the operation of the satellite under default rules until rules are enacted.

To help deter speculative applications and to ensure that applicants make a financial commitment to construct and launch their satellites, the FCC requires the posting of a multi-million dollar bond. In addition to the bond, applicants are required to meet certain milestones which include contract execution, a design review, commencement of satellite construction and launch. The bond requirement is reduced proportionally after each milestone is met.

The processing of applications will be conducted by the FCC with the following intentions:

* All NGSO FSS requests that comply with applicable FCC rules will be granted;
* In particular, constellations have to meet requirements governing sharing with other operations in each particular band;
* In all Ku-band frequencies, and in Ka-band frequencies outside the ranges 18.8-19.3 GHz (↓) and 28.6-29.1 GHz (↑), NGSO FSS operations must protect GSO FSS and GSO BSS operations by meeting the applicable EPFD (equivalent power flux-density) limits;
* Also, in most frequencies used for space-to-Earth transmissions, NGSO FSS constellations must protect terrestrial services by meeting PFD (power flux-density) limits;
* With respect to sharing between NGSO FSS systems, there will be periods of time when there is potential for interference, e.g., when an earth station of one system is aligned, or close to alignment, with a satellite in its system and a satellite of another system (an “in-line event”);
* During an in-line event, the two systems have to coordinate or, in the absence of an agreement, spectrum licensed to both systems will be split between the two (or among all the systems involved in the in-line event);
* Currently, an “in-line event” is defined as any configuration within 10°of perfect alignment;
* Sharing between earth stations and terrestrial stations does not have to be addressed when licensing space stations or granting access to the U.S. market;
* Earth station authorisations will be considered, according to the rules applicable in each frequency band, when earth station applications are filed.

**(for information and consideration of WG FM and FM44)**

# FCC – Proposed rulemaking to facilitate the use of earth stations in motion (ESIM) communicating with GSO satellites in bands allocated to the FSS

The FCC has rules for satellite earth stations on ships and almost identical rules for satellite earth stations on land vehicles and for satellite earth stations on aircraft. Having three sets of duplicative rules is now seen by the FCC as unnecessary and inefficient. Therefore, a new proposed rulemaking by the FCC is to combine these three rule sections into one—collectively called earth stations in motion, or ESIMs.



Simplifying the rules will help the FCC process applications for new deployments more efficiently and will make it easier for satellite companies to offer customers additional service options. And authorising ESIMs to operate in ‘new bands’ such as the Ka-band) means more opportunities for deployment. In sum, this proposal is intended to meet two core goals of the FCC: reducing unnecessary red tape and enabling the private sector, in this case, a fast-growing segment of the satellite industry, to innovate and invest in new technologies.

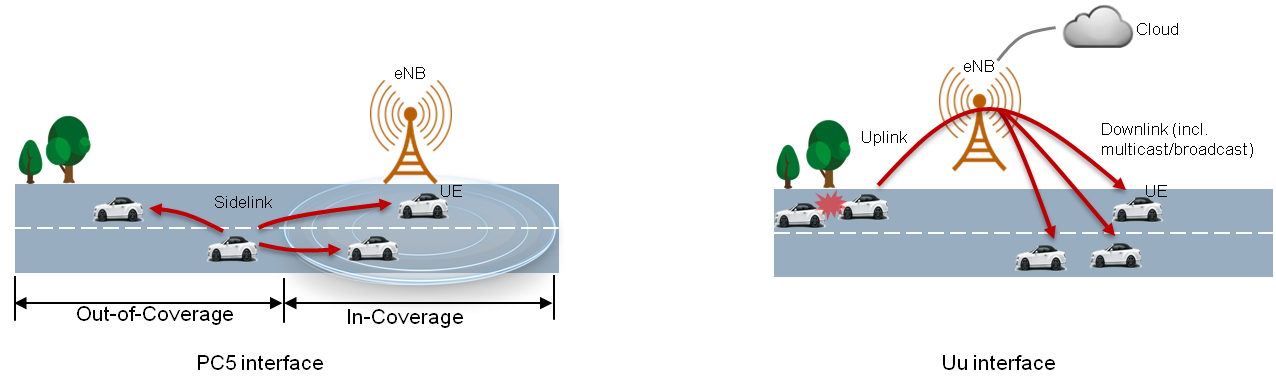
**(for information in WG FM, FM44)**

# Information about 3GPP V2X standardisation and related (China CCSA, 5GAA, USA, Canada)

V2X (LTE based V2X) as one enabling technology of advanced ITS, is based on LTE technology, and is intended to support both telematics and road safety related applications.

3GPP is working on development of V2X (LTE based V2X) technical specifications, and CCSA (China Communications Standards Association) is also working on standardisation studies of V2X (LTE based V2X) technology with enhancements according to Chinese traffic circumstances.

The general architecture of LTE based V2X consists of the Uu interface via cellular network, and the PC5 interface via direct links for communication between vehicle to vehicles (V2V), vehicle to pedestrian (V2P), vehicle to infrastructures (V2I), and vehicle to network (V2N). LTE based V2X could be operated under the coverage of cellular network, which is called an “in coverage” scenario (IC), as the services are controlled by the network. Meanwhile, the “out of coverage” scenario (OoC) is also supported by LTE based V2X, considering the V2X road safety related applications, which should be supported regardless of network deployment.



Typical telematics applications can be supported via the Uu interface. For road safety related applications, both PC5 and Uu interfaces are able to support the LTE-V2X in order to meet the associated service requirements.

The PC5 interface is designed based on the existing LTE Device-to-Device (D2D) communication technology with more enhancements in resource allocation, physical layer structure, and synchronisation, in order to meet the V2X transmission requirements. SC-FDMA and multiple (re)transmissions are inherited from LTE D2D. Multiple (re)transmissions can ensure the reception performance and reliability. Furthermore, both of the centralised and distributed resource allocation mechanisms are supported for V2X communication. The centralised resource assignment is valid within network coverage; eNB (evolved Node-B) could provide dynamic scheduling or semi-persistent scheduling based on traffic circumstances. For the distributed resource mechanisms, it could be supported regardless of the network control, and a detailed sensing with semi-persistent transmission mechanism is specified in order to decrease the potential transmission collision and maintain high reliability. From the synchronisation perspective, LTE-V2X relies on a precise external synchronisation signal. Three kinds of synchronisation references are supported using an external GNSS module, eNB or another vehicle. For the out-of-coverage scenario, GNSS case has a higher synchronisation priority in order to obtain a good system performance.

For the Uu interface, the road safety related V2X messages can be transmitted to the cellular network via the Uu uplink and be forwarded to the vehicles, which individually operate components via the Uu downlink. To accommodate the broadcast nature of V2X messages, the SC PTM (Single Cell Point To Multipoint) and MBSFN (Multicast-Broadcast Single-Frequency Network) technologies are both investigated and supported in LTE-V2X with necessary enhancements.

The following was discussed at the 3GPP TSG RAN Plenary #76 Meeting in Palm Beach, USA, 5-8 June 2017:

Two V2X\_new band combinations have been proposed to be added for V2X I as below:

Please note that 3GPP band 5 is in 824–849/869–894 MHz and relevant for the USA, Australia, India, Korea and some other countries, band 34 is in 2010–2025 MHz, band 47 is in 5855-5925 MHz.

|  |  |  |  |
| --- | --- | --- | --- |
| **V2X inter-band concurrent combination** | **V2X Band** | **Channel bandwidths [MHz]** | **Interface** |
| V2X\_34\_47 | 34 | 5, 10, 15 | Uu |
| 47 | 10, 20 | PC5 |
| V2X\_5\_47 | 5 | 5,10 | Uu |
| 47 | 10,20 | PC5 |

3GPP RAN4 is tasked to study the coexistence impact to the V2X RX frequency ranges for these new V2X band combinations.

* Concurrent operation of additional LTE Uu frequency bands and PC5 operation on Band 47

Highest priority, and target for RAN#76 completion, is given to the following combination:

|  |  |  |  |
| --- | --- | --- | --- |
| **V2X MCC Band** | **V2X Band** | **Channel bandwidths [MHz]** | **Interface** |
| V2X\_20\_47 | 20 | 5, 10, 15, 20 | Uu |
| 47 | 10, [20] | PC5 |

Other LTE Uu frequency bands are not precluded. For the target completion date, RAN4 should guaranteed the minimum two RAN4 WG meeting from the starting for new band combinations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **V2X inter-band concurrent combination** | **V2X Band** | **Channel bandwidths [MHz]** | **Interface** | **Started from** | **Target Completion date** |
| V2X\_34\_47 | 34 | 5, 10, 15 | Uu | RAN #76 | RAN #78 |
| 47 | 10, 20 | PC5 |
| V2X\_5\_47 | 5 | 5,10 | Uu | RAN #76 | RAN #78 |
| 47 | 10,20 | PC5 |

* Concurrent operation of LTE Uu Carrier Aggregation and PC5 operation on Band 47. Proposed combinations to be proposed during the work item in line with the CA basket WID approach.

Based on agreed work plan (R4-1703287), the total number of carriers of LTE Uu CA and PC5 operation is restricted up to 3CCs in this WI.

E.g. CA\_XA-YA (Uu) + 47A (PC5) or XA (Uu) + 47B (PC5)

Newly proposed combinations may be included to this work item at every RAN plenary, but shall have been proposed at the RAN4 meeting prior to the corresponding RAN plenary where they are agreed.

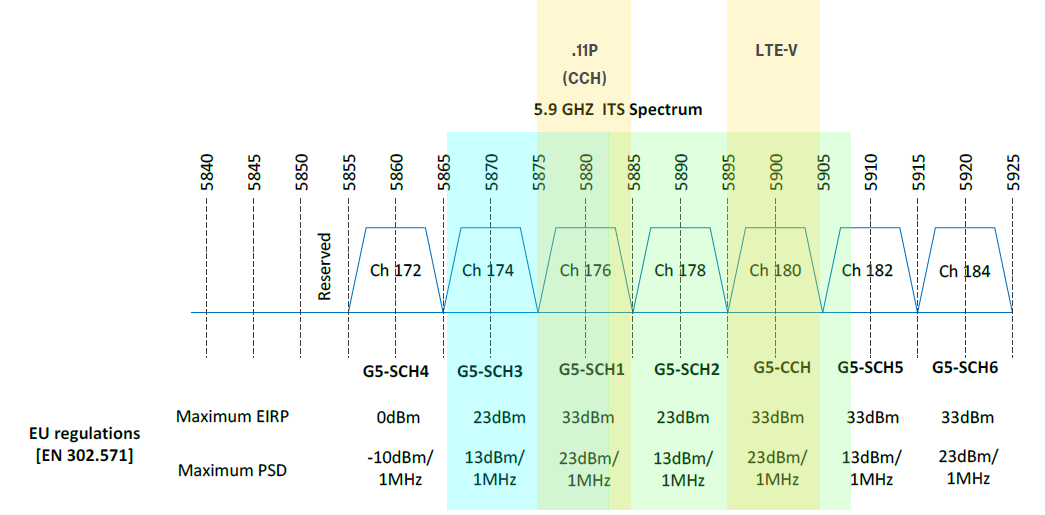
Once a band combination is completed, it shall be included in the 3GPP specifications immediately, and Release independence of that combination shall be supported from release 14 (the same approach as for LTE frequency bands and CA combinations today).

**As can be seen from the above, only vehicle-to-vehicle communication is currently foreseen in 5855-5925 MHz in this standardisation approach. No Uu interface in band 47 is indicated.**

The band combination approach could also be interpreted as an approach to overcome the conflict with IEEE 802.11/11p/ETSI G5 about the use of the 5855-5925 MHz. Both systems cannot co-exist on the same channel, as they are currently standardised.

Below is a detailed overview of the 3GPP work items in relation to V2X as provided in April by 5GAA at a conference hosted by Vodafone in Duesseldorf, Germany. Some early proposals from 3GPP V2X proponents foresee the use of one channel for V2X (PC5, vehicle-to-vehicle), though this may not be acceptable for proponents of IEEE 802.11/11p/ETSI G5 because this proposal foresees exactly to use the range 5895-5905 MHz, which is used by ETSI G5 as the control channel. It illustrates the sort of conflict which is pending a resolution in the standardisation and regulatory environment at this stage. Note also that the EC and ECC Decision for ITS are technology neutral and the spectrum is seen a ‘shared spectrum’ environment.

C-V2X and 802.11p use different physical layers and medium access control protocols. As such, the operation of the two technologies in the 5.9 GHz band on the same channel and in the same geographic area without an agreed coexistence solution would result in mutually harmful co-channel interference.



5GAA published another position paper on the 12 June 2017 about the coexistence of C-V2X and 802.11p at 5.9 GHz which includes new modified proposals:



The paper recognised that the technology neutral nature of spectrum regulations in Europe means that both LTE-V2X1 and 802.11p have equal rights to operate in the 5.9 GHz band, subject to compliance with the relevant regulatory technical conditions.

To this end, 5GAA proposes a solution – to be agreed among the stakeholders – to be implemented in up to three steps. In all steps, each of C-V2X and 802.11p can operate safety-related ITS services free from co-channel interference from the other technology. In the short-term, 5GAA proposes to allocate distinct 10 MHz channels at 5875-5905 MHz to each of the two technologies, while the final configuration will apply full sharing of all available channels across the two technologies. The latter will require further studies on appropriate sharing mechanisms and thus cannot be provided from the beginning. This follows the working assumption that the spectrum is available on a shared use basis.

Specifically, the proposed steps would involve the following:

1) Safe harbour channels for C-V2X and 802.11p (with each of the 5875-5885 and 5895-5905 MHz channels paired with one of either C-V2X or 802.11p);

2) Shared use of the middle channel (5885-5895 MHz);

3) Shared use of all channels in the end.

In this context, the considerations in WG FM and SRD/MG, and ETSI, about Urban Rail Systems are also important.



The 5GAA suggestion is that suitable sharing mechanisms could be specified in ETSI EN 302 571 on the basis of the results of studies to be undertaken at ETSI, and as captured in a relevant ETSI technical report (TR).

Detailed 3GPP work item overview:



As a side note: there was no reporting from the USA or Canada during the recent annual USA-CAN-ECC meeting, neither with regard to 5.9 GHz nor 63-64 GHz activities by the US regulator or Canada. This also includes the Urban Rail Systems subject. See also item 1 (APT), information about the ‘white paper’ document from Qualcomm Hongkong.

**(for information and consideration in WG FM, SRD/MG, for information in CPG and PT1)**