|  |  |  |
| --- | --- | --- |
| **Plenary** | | **Doc. ECC(18)110** |
| **49th Meeting** | | |
| **Bordeaux, 23-26 October 2018** | | |
|  | | |
| **Date issued:** | **17 October 2018** | |
| **Source:** | **ECO** | |
| **Subject:** | **ECO Bulletin on on-going/new issues in other regions or organisations** | |
| Group membership required to read? (Y/N)  N | | |
|  | | |
| **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 AWG (new and revised APT Reports, questionnaire on ITS via satellite and further on-going work, work on strategic plan); 2. USA: DoT and NHTSA (National Highway Traffic Safety Administration) apply technology-neutral policy on Road ITS technologies and in favour of designating additional spectrum; 3. USA: FCC’s 5G FAST Plan – overview and reactions; 4. USA: FCC’s tentative new proposed rulemaking consultation on 6 GHz WAS/RLAN; 5. USA: FCC new report and order on earth stations in-motion (ESIM); 6. USA: C Band developments - CBRS (3550-3700 MHz); 7. USA: C Band developments – 3700-4200 MHz – satellite operators’ alliance; 8. INMARSAT & DEUTSCHE TELEKOM’s (2 GHz MSS) European Aviation Network (EAN) – PANASONIC joins Inmarsat as a strategic partner; 9. Australia and Canada: Spectrum Outlook 2018-2022; 10. 5G showcase events and developments at the FIFA World Cup and the Asian Games, Qatar, USA, Japan, South Korea, and China; 11. 5G UE device announcements; 12. USA, Puerto Rico, New Zealand: Google Project Loon balloon proposals and trials in 700 MHz and 800 MHz; 13. M2M over satellite: ORBCOMM launches satellite services in China (relates to S-PCS below 1 GHz); 14. Globalstar provides evidence about noise rise in 5150-5250 MHz and requests FCC investigations (and Chile changing regulations for 5 GHz WAS/RLAN) 15. 77-81 GHZ SRR (Short Range Radar) – worldwide overview (USA, Canada, Japan, China) | | |
| **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.  This includes information related to satellite issues for FM44 and SE40 (item 1, 7, 9, 13, and 14), some for CPG, for items in relation to SRD (items 1, 2, and 15), for ECC PT1 (items 1, 3, 6, 7, 9, and 10). Item 1 may be for information in FM22 and FM56, Items 4 and 14 for FM57. Several items may be of interest in WG FM, some elements may be of interest for WG SE. | | |
| **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). | | |

1. **News from APT**

The Asia-Pacific Telecommunity (APT) organised the 24th Meeting of the APT Wireless Group (AWG-24) held from 17 to 21 September 2018 in Bangkok, Thailand.

AWG consists of the Plenary and three Working Groups (WGs). Sub-Working Groups (Sub-WG) and Task Groups (TGs) are formed under the WGs.

|  |  |  |
| --- | --- | --- |
| **Working Group on Spectrum Aspects**  **(WG SPEC)** | **Working Group on Technology Aspects**  **(WG TECH)** | **Working Group on Services and Applications**  **(WG S&A)** |
| Sub Working Group on Spectrum Arrangement and Harmonization  (Sub-WG SA&H**)** | Sub Working Group on IMT  (Sub-WG IMT) | Task Group on Modern Satellite Applications  (TG MSA) |
| Task Group High Altitude Platform Systems (TG HAPS) | Task Group on Aeronautical and Maritime (TG A&M) |
| Sub Working Group on Sharing Studies  (Sub-WG SS) | Task Group on Fixed Wireless Systems (TG FWS) | Task Group on PPDR  (TG PPDR) |
| Task Group on Internet of Things (TG IoT) | Task Group on Railway Radiocommunications  (TG RR) |
| Sub Working Group on Spectrum Monitoring  (Sub-WG SM) | Task Group on Intelligent Transportation Systems  (TG ITS) |  |
| Task Group on Wireless Power Transmission  (TG WPT) |

**New or revised APT Reports (approved and published in 04/2018)**

| **Reference** | **Topic** |
| --- | --- |
| [APT/AWF/OP-02(Rev.3)](https://www.apt.int/sites/default/files/APT-AWG-OP-2Rev.3_Technical_conditions_for_mobile_onboard.docx) | Revision of APT Guideline on "Technical Conditions for the Use of Mobile Phones Onboard Aircraft" |
| [APT/AWG/REP-07(Rev.6)](https://www.apt.int/sites/default/files/APT-AWG-REP-07Rev.6__SRD_Report.docx) | Revision of APT Report on Survey on Operation of Short-Range Devices (SRD) (similar to Rec. 70-03) |
| [APT/AWG/REP-15(Rev.5)](https://www.apt.int/sites/default/files/APT-AWG-REP-15Rev.5_Mobile_Frequency_Tech_License.docx) | Revision of APT Report on "Information of Mobile Operator's Frequencies, Technologies and License Durations in Asia Pacific Countries" (similar to ECO Report 03) |
| [APT/AWG/REP-84](https://www.apt.int/sites/default/files/APT-AWG-REP-84_Report_IMT_implementation.docx) | New APT Report on Survey on Regulatory Information for Implementation of IMT Network in the Asia Pacific region |
| [APT/AWG/REP-85](https://www.apt.int/sites/default/files/APT-AWG-REP-85_Report_FWS_remote_connectivity.docx) | New APT Report on Technologies of Fixed Wireless System to Provide Remote Connectivity |
| [APT/AWG/REP-86](https://www.apt.int/sites/default/files/APT-AWG-REP-86_IoTimplementation_and_deployment.docx) | New APT Report on "Survey on Current status and future plan of implementation and deployment of Internet of Things in Asia Pacific region Countries" |
| [APT/AWG/REP-87](https://www.apt.int/sites/default/files/APT-AWG-REP-87_100_to_300kHz_band_for_Non-Beam__WPT.docx) | New APT Survey Report for 100 to 300 kHz band Non-beam WPT |
| [APT/AWG/REP-88](https://www.apt.int/sites/default/files/APT-AWG-REP-88_PPDR_Narrowband_Report.docx) | New APT Report on Narrowband PPDR Applications and Systems in bans below 1 GHZ |
| [APT/AWG/REP-89](https://www.apt.int/sites/default/files/APT-AWG-REP-89_Satellite_Next_Generation_Access_Network.docx) | New APT Report on Integration of Satellite Technologies into the next generation access technologies ecosystem |

APT AWG also adopted an updated [Workplan of AWG](https://www.apt.int/sites/default/files/WorkplanSeptember2018.docx):

This workplan includes, amongst others:

| **No.** | **Work Item** | **Responsible Group** | **Expected Deliverable** | **Completion Target** |
| --- | --- | --- | --- | --- |
| 1 | Studies on frequency arrangements in the band 1427-1518 MHz | Sub-WG SA&H | Report | AWG-25 |
| 2 | Harmonized frequency arrangement in the band 3 300 – 3 400 MHz | Sub-WG SA&H | Report/  Recommendation | AWG-25 |
| 3 | Frequency arrangement in the band 4 800 – 4 990 MHz | Sub-WG SA&H | Report/  Recommendation | AWG-25 |
| 4 | Frequency ranges for non-beam WPT for mobile devices | Sub-WG SA&H | Recommendation | AWG-25 |
| 5 | Sharing and compatibility studies for selected frequency bands below 6GHz | Sub-WG Sharing | Report, Liaison Statements | AWG-25 |
| 6 | Sharing and compatibility studies for IMT above 24GHz | Sub-WG Sharing | Report, Liaison Statements | AWG-25 |
| 7 | Studies related to techniques and technical conditions for Licensed-Assisted Access (LAA) and 5G New Radio - Shared Spectrum (5G NR-SS) as national solutions for accessing shared spectrum | Sub-WG Sharing Studies | Report | AWG-26 |
| 8 | Spectrum monitoring techniques and methods under multi-path environment | Sub-WG SM | Report | AWG-26 |
| 9 | Report on mitigation measures to improve coexistence of 4G-LTE and 5G-NR operating in the 3400 - 3600 MHz band and other systems operating in adjacent spectrum | Sub-WG Sharing Studies | Report | AWG-28 |
| 10 | Study on Technical and Operational Measures for Coexistence between Terrestrial and Satellite IMT Systems Deployed in 1 980-2 010 MHz/2 170-2 200 MHz in the Asia-Pacific Region | Sub-WG Sharing Studies | Report | AWG-27 |
| 11 | Survey of usage and future plan of frequency bands in relation to studies on WRC-19 agenda item 1.13 in Asia-Pacific region | Sub-WG IMT | Report | AWG-25 |
| 12 | Implementation Public Safety LTE (PS-LTE) Networks | Sub-WG IMT (jointly with TG PPDR) | Report | AWG-25 |
| 13 | Necessary technical conditions to support technology neutrality and spectrum efficiency for implementation of IMT networks in bands identified for IMT | Sub-WG IMT | Report | AWG-25 |
| 14 | Current status and future plan of implementation and deployment of IMT-2020 (5G) in Asia-Pacific region | Sub-WG IMT | Report | AWG-25 |
| 15 | Studies on implementation aspects of IMT-2020 in the frequency bands below 6 GHz in Asia-Pacific region | Sub-WG IMT | Report | AWG-26 |
| 16 | Studies on 5G implementation in frequency bands above 24.25 GHz | Sub-WG IMT | Recommendation/Report | AWG-26 |
| 17 | Models for FWS link performance degradation due to wind | TG FWS | Report | AWG-27 |
| 18 | Cellular based V2X for ITS applications in APT countries | TG ITS | Report | AWG-28 |
| 19 | Millimetre wave ITS applications in APT countries | TG ITS | Report | AWG-28 |
| 20 | Vehicle Mounted Earth Stations (VMES) in Ku-Band GSO FSS Networks | TG ITS | Report | AWG-26 |
| 21 | LPWAN for IoT based on non-cellular technologies | TG IoT | Report | AWG-26 |
| 22 | Technology and spectrum management technics for IoT networks | TG IoT | Report | AWG-26 |
| 23 | Radio Frequency Beam WPT | TG WPT | Report | AWG-26 |
| 24 | Impact study for Non-Beam WPT for Mobile Devices | TG WPT | Report | AWG-25 |
| 25 | Current and future usage of unmanned aircraft | TG A&M | Report | AWG-25 |
| 26 | Broadband Wireless Air-to-Ground Communications Links with Passenger Aircraft | TG A&M | Report | AWG-25 |
| 27 | Implementation of the bands 108 – 117.975 MHz, 328.6-335.4 MHz and 960-1164 MHz for the aeronautical radionavigation systems in APT region | TG A&M | Report | AWG-26 |
| 28 | Study of usage of the bands 457.5125-457.5875 MHz and 467.5125-467.5875 MHz by the maritime mobile service in Asia Pacific region | TG A&M | Report | AWG-27 |
| 29 | Implementation of Public Safety LTE (PS-LTE) networks | Sub-WG IMT (jointly with TG PPDR) | Report | AWG-25 |
| 30 | System deployment and relevant testing studies of Railway Radiocommunication System between Train and Trackside (RSTT) in APT countries | TG RR | Report | AWG-25 |
| 31 | Railway radiocommunication system for passengers’ access to information and Internet services | TG RR | Report | AWG-25 |

The following questionnaire was distributed following AWG-24:

[Questionnaire on Vehicle-Mounted Earth Stations (VMES) operating with GSO FSS networks in the Ku-band in APT countries](https://www.apt.int/sites/default/files/Questionnaire_VMES.docx)

One example of the use of this application may be the instantaneous and ubiquitous wide-area delivery of software updates to automobiles worldwide, thus averting expensive and time-wasting recalls of vehicles. This proposed work item is intended to study individual Vehicle-Mounted Earth Stations (VMES; VMES within the family of ITS applications: ‘ITS via satellite’) operating with GSO networks within the fixed satellite service (FSS) allocations 10.7-12.75 GHz (space-to-Earth) and 14.0-14.50 GHz (Earth-to-space), depending on national allocations. The proposal is to develop an APT Report addressing the use of VMES operating with GSO networks in the FSS allocations within the frequency bands 10.7-12.75 GHz (space-to-Earth) and 14.0-14.50 GHz (Earth-to-space). This could be of interest for FM44.

Several working documents (drafts) exist within APT AWG, amongst others (in brackets the group inside ECC which could be interested):

* Working Document towards a Preliminary Draft New Report on “Cellular Based V2X for ITS Applications in APT Countries” (SRD/MG, SE24);
* Working Document towards a Preliminary Draft New Report on “Milimeter Wave ITS Applications in APT countries” (SRD/MG);
* Working Document towards a Draft New APT Report on “System deployment and relevant testing studies of Railway Radiocommunication System between Train and Trackside (RSTT) in APT countries” (FM56);
* Working Document towards a Preliminary Draft New APT Report on “Railway Radiocommunication System for Passengers' access to information and internet access services” (FM56);
* Working Document towards a Preliminary Draft New APT Report on “Spectrum monitoring techniques and methods under multipath environment” (FM22);
* Working Document towards a preliminary Draft New APT Report on “Current status and future plan of implementation and deployment of IMT-2020 (5G) in Asia-Pacific region” (ECC PT1);
* Working Document towards a Preliminary Draft New Report on “Mitigation measures to improve coexistence of 4G-LTE and 5G-NR systems in the 3400 - 3600 GHZ MHz band with other systems operating in adjacent spectrum” (ECC PT1);
* Working Document towards Preliminary Draft New Report on “Broadband wireless air-to-ground communications links with passenger aircraft” (WG FM). This working document includes information from Europe and about a Project using frequencies close to 40 GHz in Japan but no further information about any BB-DA2G projects in Asia under development (e.g. developments in China as reported in the last Bulletin).

The recent APT e-Newsletters are available under: <https://www.apt.int/Publications> (last edition from September 2018).

**(for information in ECC PT1, WG FM (incl. PTs and SRD/MG), WG SE, and CPG)**

1. **USA – on 5.9 GHz ITS**

In the USA, the Department of Transportation (DoT) and the NHTSA (National Highway Traffic Safety Administration) have not made any final decision (i.e. decision postponed) on the proposed rulemaking concerning a V2V mandate which was in consultation in 2017. V2V is however kept in the DOT’s significant rulemaking report.

More recently, NHSTA has indicated its support for a technology neutral policy approach whereby the market decides whether ITS-G5 or LTE-V2X (or both) will be the preferred solution for V2X communications; see the statement from Ms Heidi King, Deputy Administrator NHSTA, “Spectrum and Connectivity in supporting Transportation Safety”; keynote remarks at the International Symposium on Advanced Radio Technologies 2018 Conference, 25 July 2018. <https://www.nhtsa.gov/speeches-presentations/prepared-keynote-remarks-international-symposium-advanced-radio-technologies>

Key statements in the speed have been:

*“Further, as many of you know, device-to-device communications technologies themselves are improving and changing at a fast pace — including continued advancements in DSRC (i.e. ITS-G5) as well as emerging C-V2X and even all new 5G protocols to support high-performance, direct communications between devices. The market will eventually sort out which of these may be the preferred solution for V2X communications, or even if they might exist side-by-side while supporting varying transportation applications. The Department of Transportation sees great advantages in having spectrum available to allow these technologies to mature — and, avoiding policies that would force a premature, or less-considered, decision on technologies.”…*

*“Finally, if it is not clear already from my earlier comments about the wisdom of the marketplace, the US DoT remains technology-neutral relative to communications protocols that support V2X technology. Our historical research focused on DSRC (i.e. ITS G5) because that was the only technology available … but we are also working with industry partners to explore the new, emerging cellular V2V (CV2X) capabilities…..We are also working with NTIA to better understand leading-edge 5G communications — and to stay involved in related requirements and standards-development activities.”*

**(for information in WG FM and SRD/MG)**

1. **USA: FCC 5G FAST Plan**

The FCC 5G FAST Plan (overview document under: <https://docs.fcc.gov/public/attachments/DOC-354326A1.docx>; 1 October 2018).

The FCC is taking action to make additional spectrum available for 5G services:

* High-band: The FCC has made auctioning high-band, millimetre-wave spectrum a priority. The FCC will hold its first 5G spectrum auctions this year in the 27.5-28.35 GHz as well as 24.25-24.45 MHz and 24.75-25.25 GHz bands. The 28 GHz and 24 GHz band licences will be offered in two auctions with separate application and bidding processes, and concurrent application windows. The bidding for 28 GHz will commence on 14 November 2018, and the bidding for 24 GHz will commence after the 28 GHz bidding concludes. The auctions will use different bidding formats to account for differences in the licences:
  + 28 GHz: standard simultaneous multiple round auction format. Licences will be offered in two 425 MHz blocks by county;
  + 24 GHz: clock auction format, beginning with a clock phase that will allow bidding on generic blocks in each partial economic area in successive bidding rounds, followed by an assignment phase for frequency-specific licence assignments. Licences will be offered in seven 100 MHz blocks.
  + In the second half of 2019, the FCC will auction the 37.6-38.6 GHz, 38.6-40 GHz and 47.2-48.2 GHz bands. For the Upper 37 GHz, 39 GHz and 47 GHz bands the FCC is proposing to offer a total of 3.4 GHz (including 2.4 GHz contiguous spectrum) in 100 MHz blocks (modification from the existing 200 MHz block size) in a single incentive auction. This will provide more spectrum than all the other flexible use bands combined;
  + The FCC is working to free up another 2.75 GHz of 5G spectrum in the 26 and 42 GHz bands.
  + Mid-band: Mid-band spectrum has become a target for 5G buildout given its balanced coverage and capacity characteristics with work on the 2.5 GHz, 3.5 GHz, and 3.7-4.2 GHz bands, the FCC could make up to 844 MHz available for 5G deployments.
  + Low-band: The FCC is acting to improve use of low-band spectrum (useful for wider coverage) for 5G services, with targeted changes to the 600 MHz, 800 MHz, and 900 MHz bands.
  + ‘Unlicensed’: Recognising that unlicensed spectrum will be important for 5G, the FCC is creating new opportunities for the next generation of Wi-Fi in the 6 GHz and above 95 GHz band.

The plan faces major criticism from cities and communities in the USA. They find their hands tied at governing how these networks and all the equipment they require will fit into their communities.

The FCC restricted cities’ ability to regulate 5G infrastructure. Under the new rules, local governments face tight deadlines to approve or reject the installation of new cellular equipment. The rules also put limits on how much money cities can charge wireless firms for the privilege of putting hardware in public rights of way.

The dispute comes down to the “small cell” equipment required for much of 5G and who gets to say where it goes. While a 4G cell site might cover a dozen city blocks, 5G’s fastest, millimeter-wave frequencies might need one site for each block. One study in March 2018 estimated that there could be nearly 1 million small-cell deployments in the U.S. until 2026.

Recent announcements about planned commercial launch in the USA were noted from: 28 &39 GHz, T-Mobile in the 600 MHz band, and AT&T in the 39 GHz. Side notice: Japan (August 2020 Olympic Games): NTT DoCoMo: 28 GHz and 4.5GHz, KDDI: 4.5GHz).

**(for information in ECC PT1 and WG FM)**

1. **USA: FCC tentative 6 GHz new proposed rulemaking**

The tentative 6 GHz NPRM (to be voted on 23 October 2018) is available under <https://www.fcc.gov/document/promoting-unlicensed-use-6-ghz-band>.

It would allow WAS/RLAN with up to 36 dBm e.i.r.p. in the 5.925-7.125 GHz band.

The ‘Notice of Proposed Rule Making’ is not the final step in the FCC’s regulatory process. The NPRM is the FCC’s proposal for rules in 6 GHz for which the Commission will seek public comment. Subsequently, based on input received, FCC will issue a Report and Order.

Key parts of the proposal are:

* Licence-exemption to operate under the FCC’s Part 15 rules only in locations and frequencies where they would not cause harmful interference to the licensed services in the band;
* rules for two types of licence-exempt devices tailored to protect incumbent services that operate in distinct parts of the 6 GHz band:
  + in the 5.925-6.425 GHz and 6.525-6.875 GHz sub-bands, unlicensed devices would only be allowed to transmit under the control of an automated frequency control (AFC) system. These frequencies are heavily used by point-to-point FS and the FSS. The AFC system would identify frequencies on which unlicensed devices could operate without causing harmful interference to FS p-t-p receivers.

o in the 6.425-6.525 GHz and 6.875-7.125 GHz sub-bands, unlicensed devices would be restricted to indoor use and would operate at lower power, without an AFC system. These frequencies are used for mobile services, such as the Broadcast Auxiliary Service and Cable Television Relay Service, as well as FS and FSS. The itinerant nature of the mobile services makes the use of an AFC system impractical. The combination of lower power and indoor operations would protect licensed services operating on these frequencies from harmful interference.

|  |  |  |  |
| --- | --- | --- | --- |
| **Band (GHz)** | **Primary Allocations** | **Reference used**  **in the NPRM** | **Devices** |
| 5.925-6.425 | Fixed Service  FSS | U-NII-5 | Standard-Power Access Point (up to 36 dBm e.i.r.p.) |
| 6.425-6.525 | Mobile Service  FSS | U-NII-6 | Low-Power Access Point (up to 30 dBm e.i.r.p.), client devices up to 24 dBm |
| 6.525-6.875 | Fixed Service  FSS | U-NII-7 | Standard-Power Access Point (up to 36 dBm e.i.r.p.) |
| 6.875-7.125 | Fixed Service  Mobile Service  FSS64 | U-NII-8 | Low-Power Access Point (up to 30 dBm e.i.r.p.), client devices up to 24 dBm |

To determine whether an individual unlicensed device can transmit at a particular location on a given frequency, the FCC proposes that standard-power access points be required to obtain a list of permissible frequencies from an AFC system prior to transmitting or a list of prohibited frequencies. I.e. devices are required to access a database system that determines the available frequencies at a device’s location prior to operation. A device may transmit only on frequencies that the database system indicates are available for use. The FCC envisions the AFC system to be a simple database that is easy to implement.

In IEEE, the channel plan for IEEE P802.11ax Draft 3.0 has been agreed in July 2018 and shows no WAS/RLAN channels below 5935 MHz:



**(for information in WG FM, FM57, WG SE, SE45)**

1. **USA: FCC new Report and Order on ESIM**

This includes an amendment to the Allocation Table, 1 October, 2018 edition, on ESIM – Report and Order and FNPRM, [FCC 18-138](https://www.fcc.gov/document/fcc-facilitates-use-satellite-earth-stations-motion-0) - Amendment of Parts 2 and 25 of the FCC's rules to facilitate the use of earth stations in motion communicating with GSO FSS networks.

On 26 September 2018—The FCC streamlined, consolidated, and harmonised the rules governing earth stations used to provide satellite-based services on ships, airplanes and vehicles (Earth Stations on Vessels (ESV), Vehicle-Mounted Earth Stations (VMES), and Earth Stations Aboard Aircraft (ESAA)). These actions simplify the regulatory approval process for this rapidly growing segment of the satellite communications market.

Currently, the regulation of these earth stations that communicate with geostationary satellite orbit (GSO) satellites operating in the fixed-satellite service (FSS), and are collectively known as “ESIM”, vary depending on the type of vehicle they are attached to and are covered in various rule provisions. This Report and Order integrates the three types of earth stations in motion into a single regulatory category, reducing the burden on applicants leading to a more efficient licensing process. The decision also gives increased flexibility to ESIM to operate in the “conventional Ka- frequency band”, facilitating the delivery of satellite-based high-speed services. The Further Notice of Proposed Rulemaking (FNPRM) seeks comment on expanding the frequencies available to ESIM communicating with GSO FSS satellite networks to allow additional flexibility to satellite operators.

Except for a few platform-specific exceptions, the three rule sections that govern the operation and licensing of ESV, VMES, and ESAA are very similar. In addition, the current rules provisions are limited to communications with GSO satellites in the conventional C- and Ku-bands, as well as portions of the extended Ku-band. The Commission further proposed rules for ESIM operations in the conventional Ka-band. Specifically, these rules apply to ESIMs communicating with geostationary-orbit (GSO) FSS space stations operating in 18.3-18.8 GHz and 19.7-20.2 GHz, and 28.35-28.6 GHz and 29.25-30.0 GHz frequency bands.

**(for information in WG FM, FM44, WG SE, SE40)**

1. **USA: C Band Developments – CBRS (3550-3700 MHz)**

The FCC issued a [public notice](https://docs.fcc.gov/public/attachments/DA-18-783A1.pdf) in July seeking proposals for short-term initial commercial deployments (ICDs) from the six conditionally approved Spectrum Access System (SAS) Administrators in the Citizens Broadband Radio Service (CBRS) band (3550-3700 MHz).

The public notice invited potential SAS administrators to describe in detail how they propose to meet the previously defined requirements and core functions by a 10 September deadline.

The ICDs, which may support real commercial services, can only begin once the SAS´ have satisfactorily passed lab testing. The SASs need to take into account the presence of ‘tier-one’ federal users and ‘tier-two’ Priority Access Licences (PALs) which will be auctioned for other uses including mobile.

The CBRS Alliance reacted positively to the announcement.

The FCC has delayed further the plan for auctioning the tier-two PALs to consider requests from the mobile industry for longer licence terms and wider geographic coverage. A Notice of Proposed Rulemaking is expected on the subject shortly.

**(for information in ECC PT1)**

1. **USA: C Band Developments – 3700-4200 MHz**

On 1 October four major satellite operators – Intelsat, SES, Eutelsat, Telesat - announced the creation of a consortium called the [C-Band Alliance](https://c-bandalliance.com/) (CBA). The CBA is designed to act as a facilitator for clearing the 3700-4200 MHz to make 100 MHz of the band available for 5G services, in response to the notice of proposed rulemaking issued in July, as reported in the previous ECO Bulletin.

The CBA notes in its mission statement that it aims to speed U.S. leadership in 5G deployment and innovation while ensuring protection to the existing range of satellite services in the band.

**(for information in ECC PT1, WGFM, FM 44)**

1. **Inmarsat & Deutsche Telekom’s (2 GHz MSS) European Aviation Network (EAN) – Panasonic joined Inmarsat as a new strategic partner**

Another move on partnerships was observed on 20 September 2018 when Inmarsat and Panasonic Avionics Corporation (Panasonic) announced they have agreed a strategic collaboration, for an initial ten-year period, that enables them to combine their highly complementary market leading services to offer broadband in-flight connectivity (“IFC”) paired with high-value solutions and services to customers in the commercial aviation industry worldwide.

Recall: at the end of June, at the time when the Inmarsat S-EAN (European Aviation Network) satellite launched by an Arianespace rocket, there were controversies and Eutelsat, ViaSat and in-flight communications company Panasonic Aviation had lodged objections to the European Court of Justice and asked for an injunction to be issued to stop Inmarsat’s satellite opening for business.

Rupert Pearce, Inmarsat’s CEO, speaking to The Daily Telegraph newspaper at the end of June, dismissed the challenge saying his three rivals were just making mischief. “We are very confident about our licence and have issued a cease and desist order on them,” Pearce said. “We take very seriously the damage to our reputation this could cause.” He continued saying that the legal challenge was designed to slow Inmarsat down.

The move is remarkable, also seeing that Panasonic is one (if not the biggest) of the market leaders of today’s Ku-band AES (aircraft earth stations) solutions (ref. ECC/DEC/(05)11). Although it is not outspoken that there is a relation to the EAN, it seems however obvious.

Another obstacle for the EAN seems to have also disolved: An initial licence, issued by the Belgian BIPT, was annulled in March this year on procedural grounds, with the Belgium Market Court requiring additional reasoning to support the Belgian regulator’s decision to award the licence. In August 2018 the licence was re-issued by BIPT.

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

1. **Australia and Canada: spectrum Outlook 2018-2022**

On 13 September 2018, the Australian regulator ACMA published the final 2018-22 spectrum outlook after a consultation earlier this year. High priority is given to band planning and the allocation of spectrum, including the forthcoming 3.6 GHz auction, consideration of 5G, IoT and space communications as key drivers of spectrum demand and their associated pressures. See [Five-year-spectrum-outlook-2018-22](https://www.acma.gov.au/-/media/Spectrum-Review-Implementation-Taskforce/Issue-for-comment/IFC-12-2018/Five-year-spectrum-outlook-2018-22-docx.docx?la=en).

The Canadian government department Innovation, Science, and Economic Development Canada (ISED), has published its "[Spectrum Outlook](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Outlook-2018-EN.pdf/$file/Outlook-2018-EN.pdf)", which outline plans and priority bands for spectrum release between 2018 and 2022. It lists bands according to priority 1-3 (where 1 indicates near term release plans).

The priority 1 bands are 600 MHz (614–698 MHz), 1500 MHz (1525–1559 MHz + 1626.5–1660.5 MHz), 1600 MHz (1610–1626.5 MHz + 2483.5–2500 MHz), 3500 MHz (3450–3650 MHz), upper 26 GHz (26.5–27.5 GHz), 28 GHz (27.5–28.35 GHz), 32 GHz (31.8-33.4 GHz, for backhaul) 37–40 GHz, 64–71 GHz, 71-76 GHz (for backhaul) and 81-86 GHz (for backhaul).

ISED plans to release the lower bands (3500 MHz and below) from 2019, starting with the 600 MHz band. The 3500 MHz band is planned for release in 2020.

The lower 26 GHz band from 24.25–26.5 GHz (referred to as 24 GHz) is classified as priority 2, meaning that work is expected to start during 2018-2022 and is subject to WRC-19 outcomes.

The remaining C Band spectrum from 3650-4200 MHz is also classified as priority 2.

**(for information in WG FM and ECC PT1)**

1. **5G showcase events and developments: Examples at the FIFA world cup, the asian games, Qatar, USA, Japan, South Korea, china**

At the FIFA World Cup in June and July in Russia, Ericsson partnered with Russian telecommunications company MTS to deploy 5G-ready Massive Multiple-Input Multiple-Output (MIMO) technology on the MTS network in 7 of the 11 tournament cities. This included coverage at select stadiums, fan zones, transportation hot spots, and landmarks including Red Square and Tverskaya Street in Moscow.

The trial allowed tens of thousands of users in one place to experience high-speed connectivity.

During the Asian Games held in Indonesia in August 2018, Korea Telecom (KT) in cooperation with local operator provided a showcase of 5G technology in the 28 GHz band.

This follows KT’s similar successful showcase at the Winter Olympics in February. KT is aiming to provide to the world’s first nationwide 5G network in South Korea by March 2019.

A 5G Zone was set up at the stadium in Jakarta to provide interactive experiences to sports fans, allowing users to select from real-time shots and view them from different angles in stereoscopic vision. Events covered included badminton, basketball and golf.

Other notable 5G developments in different countries are listed below.

**Qatar**: Ooredoo claimed in May 2018 to be the first world player to launch 5G nationally with 50 sites providing 5G wTTH(wireless To The Home) services on 3.5 GHz spectrum with very few compatible devices available. Ooredoo is waiting for manufacturers to produce 5G capable devices (June 2019).

**USA: Verizon** started marketing its 5G Home service on 13 September 2018 with online orders. The service went live on 1 October 2018 in Houston, Indianapolis, Los Angeles and Sacramento. Conditions are 50 USD/month for Verizon customers and at 70 USD/month for new customers. The first 5G home subscribers will have three months free, YouTube TV for free for the first three months, a free Apple 4K HDR TV or a Google Chromecast Ultra. Quoted speeds are 300 Mbps to 1 Gbps depending on location without any data caps.

Other US operators are expected to follow soon. Since early 2017, AT&T has been performing fixed wireless & mobile 5G trials. AT&T plans to launch 5G services to 15 cities or population centres by the end of 2018, including Dallas TX, Atlanta GA, Waco, TX, and Charlotte, NC, Raleigh, NC and Oklahoma City. AT&T remains reserved about 5G FWA. A&T is expected to launch 5G with a mobile “puck” as first device. After launch of the AT&T 5G service in early 2019, the roll-out will be extended to additional cities including Las Vegas, NV, Los Angeles, Nashville, TN, Orlando FL, San Diego, CA and San Jose, CA. Sprint targets the first half 2019 for the launch of its 5G service to several cities including New York City, Phoenix, Kansas City, Atlanta, Chicago, Houston, Dallas, Los Angeles, and Washington DC. T-Mobile USA recently signed two $2.5bn contracts with Ericsson and Nokia for the provision of 5G infrastructures.

**The three South Korean MNOs** agreed on a jointly 5G launch in March 2019. The MNOs agreed to share 5G deployment and network earlier in April 2018. The intention aims at avoiding a very costly launch campaign when 4G came to reality back in 2011 and generating heavy cost savings of nearly 1 trillion KRW over the next ten years. This announcement also follows 5G spectrum auctions of 3.5 and 28 GHz spectrum in June 2018.

**Japan:** NTT DoCoMo has carried out a number of 5G trials with the Chinese vendor Huawei. More recently, in May 2018, NTT DOCOMO achieved a 5G field trial at 28GHz, involving a 5G base station and a car travelling at around 293km/h. SoftBank has been performing a lot of 5G trials with Huawei or Ericsson since 2017, notably using 4.5 GHz frequencies.

**China**: 5G deployment in China is strongly backed by the government. 5G ranks among the strategic priorities for the whole country (13th 5-year plan 2015-2020 and Made In China 2025 Initiative launched in 2013). **In January 2017, the MIIT published a report on “Development Planning for Information and Communication Industry (2016-2020) in which it sets the objective of becoming one of the Global leaders of 5G**. The Made In China 2025 initiative aims for a commercial 5G launch by 2020. The timescale has accelerated significantly in 2018 and China Mobile brought forward its scheduled 5G launch by one year, finally planning to offer 5G services by year-end 2019 (with pre-commercial launch during 2019). China Mobile appears to be the fastest player in China towards 5G. However, competitors do not seem so far from each other in terms of 5G deployment and expected launch: pre-commercial service should be there in 2019 with true commercial service in 2020

These are just examples from outside of Europe, while in Europe, more than 110 pre-commercial 5G trials and pilots have been launched in a recent count. See <http://5gobservatory.eu>.

**(for information in ECC PT1)**

1. **5G device announcements**

Several 5G basebands have been already announced with various levels of development and readiness. Qualcomm, Samsung and Huawei seem to have commercial products supporting both <6GHz and 28GHz.

Samsung announced ’the industry’s first 5G modem that is fully compatible with 3GPP Release 15’ in August. The Exynos 5100 modem chipset functions as a Cat-19 LTE device (1.6 Gbps download speed, 8 channel carrier aggregation, 256QAM modulation on DL and UL, and 4x4 MIMO) as well as supporting 5G New Radio (NR) in sub-6 GHz and mmWave spectrum for DL speeds of up to 6 Gbit/s. It also supports GSM and various 3G modes.

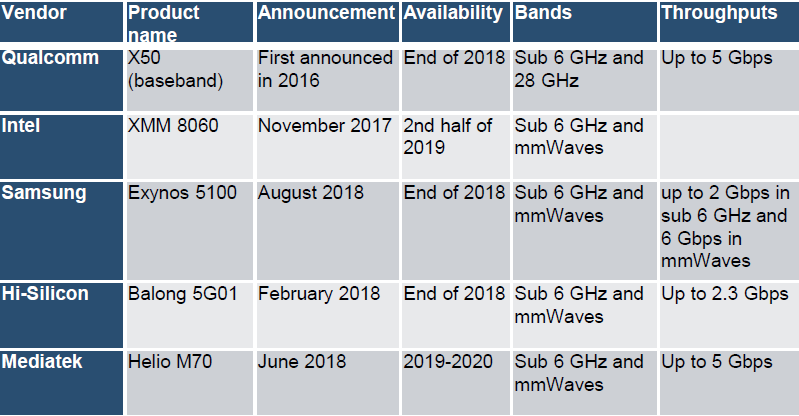
This joins previous early 5G chipset announcements from other manufacturers including Qualcomm’s Snapdragon X50 and Intel’s XMM 8060, and more recent announcements including MediaTek’s Helio M70 and Hi-Silicon’s Balong 5G01. A limited number of early 5G devices from Huawei and Samsung using some of these chipsets are available but details are limited. MediaTek has announced that devices using its Helio M70 modem will be commercially available in 2019.

One further development has been the announcement by Qualcomm of a mmWave antenna module (QTM052, designed to complement the X50 modem chipset) and a sub-6 GHz RF front-end module (QPM56xx) developed specifically for 5G NR.

5G mobile processors/platforms are at an earlier stage of commercialisation than modem chipsets.

Separately, Sprint and LG announced a 5G phone is planned to be available in the first half of next year to be launched in conjunction with the Sprint 5G network in the US. Sprint believes this will be the first available 5G smartphone in the US.

The device is planned to support Sprint’s 2.5 GHz spectrum for 5G. The operator is currently in the process of deploying 2.5 GHz 5G equipment, mainly using massive MIMO antennas, to all of its towers across the country, with two-thirds of its macro sites upgraded so far.



Source of the table: iDate

**(for information in ECC PT1)**

1. **USA, Puerto Rico, New Zealand: Google Project Loon balloon proposals in 700 MHz and 800 MHz**

Loon, the Google balloon project, has requested the FCC to allow tests in the 700 and 800 MHz bands (LTE bands 20 and 28) in the area surrounding its launch facility in Winnemucca, Nevada.

Loon balloons with directional antennas will be positioned over the proposed test area and used to relay communications between handsets on the ground. Standard LTE handsets will be used to communicate with the balloons which use Wi-Fi or E-band frequencies to interconnect with ground terminals.

Loon has the ability to terminate transmissions if the balloons exit the test area. In addition, connections to the ground infrastructure can be used to manually disable transmissions, and the airborne radios will automatically be disabled if the connection to the ground infrastructure is lost for a certain period of time.

Tests are planned until March 2019. Loon had previously been granted authority to use the 800 MHz for a limited period.

Loon started as a “moonshot” project within Google “X” in 2011, but now has independent status within the Alphabet parent company.

Initial pilots were conducted in New Zealand in 2013. The technology has since been developed so that it works with operators’ terrestrial networks. Loon transmits an operator’s signal from connection points on the ground, beams it across balloons in the stratosphere, and then sends that signal back to a user’s LTE device.

Last year, Loon worked with U.S. mobile operators to provide internet service to thousands of people in Puerto Rico following Hurricane Maria.

Other projects and products also exist which use balloons for airborne base stations, e.g. for emergency (disaster relief), defence, temporary events, surveillance, or local capacity provision in rural areas. Such platforms provide normally HD cameras (video link downlinked in real-time) and miniaturised 4G/LTE modems, and the payload is within a range between 3 to 10 kg. Because of changing frequency utilisation conditions from country-to-country, the payloads often have software defined radio capabilities and can be customised to the requirements for spectrum use at a dedicated location.

**(for information in ECC PT1, WGFM)**

1. **M2M via Satellite: Orbcomm Launches satellite services in China**

As announced on 3 October 2018, one of the biggest M2M via satellite operators, LEO constellation operator Orbcomm, launched satellite services and solutions targeted at the heavy equipment, transportations and logistics, and maritime industries in China. A Chinese telecommunications operator recently received the authorisation to use Orbcomm’s satellite constellation. Asia Pacific Navigation Telecommunications Satellite (APNTS), ORBCOMM’s local partner in China, will participate in providing service, support and distribution. The companies plan to build a China gateway earth station (GES) to serve as a network link between the Orbcomm satellite system and its worldwide infrastructure. That will enable Orbcomm to more effectively deliver the advanced services provided by its satellite constellation, making communications more efficient, reliable and globally available for industrial internet of things (IoT) customers. Additional Orbcomm GES facilities in China are in the planning stages. The regulatory approval combined with the addition of an Orbcomm GES in China will significantly improve service levels and coverage in the region, as well as provide access to a new high-growth market for deployment of Orbcomm’s industrial IoT/M2M solutions. Orbcomm targets especially the transportation and logistics and maritime industries with solutions to improve the efficiency and performance of such businesses‘ operations, e.g. also by remotely track, monitor, and control fixed and mobile assets. Seeing the amount of trade, in particular in, from and to, Europe and China/Asia, this development seems to be important.

Note that in Europe, ECTRA Decision (99)02, ECC/DEC(99)05 and ECC/DEC/(99)06 are in place. These Decisions have not been amended since 1999. The overall implementation situation has still not achieved full European harmonisation for S-PCS below 1 GHz (those systems are typically based on LEO satellite orbits). As an example, for 399.9-400.05 MHz/400.15-401 MHz, there are currently 27 satellite network filings at the ITU registered. A review in FM44 might be required (noting also the work on a new draft ECC Report on M2M via satellite).

**(for information in WGFM, FM44)**

1. **Globalstar provides evidence about noise rise in 5150-5250 MHz and requests FCC investigations; and Chile changing regulations in 5150-5250 MHz**

Mobile satellite services (MSS) provider Globalstar said harmful interference is seriously degrading Globalstar’s MSS offerings including public-safety community services if the FCC does not promptly investigate and explore remedies to the 5.1 GHz noise rise.

In a new FCC filing, Globalstar said its products and services are used daily by public-safety personnel and other customers around the world for emergency communications, in many instances resulting in life-saving rescues. Harmful aggregate interference to Globalstar’s MSS feeder uplink spectrum at 5.1 GHz will have a substantial, detrimental impact on Globalstar’s two-way satellite services, the carrier said.

Earlier this year, Globalstar requested the FCC issue a notice of inquiry (NOI) into the cause of Globalstar experiencing a 2 dB rise in the noise floor of its licensed 5 GHz spectrum in North America. The FCC allowed unlicensed use on a shared basis in the 5 GHz band, and Globalstar requested a notice of inquiry to gather additional information and help determine the cause. The National Public Safety Telecommunications Council (NPSTC) [submitted comments supporting the request](https://www.rrmediagroup.com/News/NewsDetails/NewsID/17080/).

Globalstar said its real-world data and technical analysis demonstrate that **this noise rise is the result of outdoor, higher-power operation of U-NII-1 (5150-5250 MHz) Wi-Fi access points and other devices, permitted by the commission in April 2014.**

The FCC has a statutory obligation to protect licensed services, and it committed in its 2014 order to take ‘corrective action’ in response to any harmful interference to the MSS. Globalstar now urges the FCC should open a proceeding on these interference issues rather than look the other way and do nothing. The full Globalstar filing is [here](https://ecfsapi.fcc.gov/file/10927022955695/Globalstar%20Ex%20Parte%20Notice_27%20September%202018-Final.pdf).

In another note, recently, Chile’s regulatory authority, Subsecretaría de Telecomunicaciones (SUBTEL), modified its regulations for 5 GHz WAS/RLAN to allow up to 1 W maximum power output, a significant increase from the prior 150 mW allowance. The changes are as follows:

* the band 5725-5850 MHz now has the same value for outdoor and indoor devices at 1W; previously, the outdoor operation had to be 50 mW;
* the band 5150-5250 MHz is still restricted to indoor only, but now the limit is 200 mW instead of 150 mW.

I.e. not all countries in Latin America follow the USA’s example to withdraw the outdoor restriction in 5150-5250 MHz.

**(for information in WGFM, FM44, FM57)**

1. **77-81 GHz SRR (Short Range Radars) – worldwide overview**

As earlier reported in the ECO Bulletin 02/2018, the USA and Japan have implemented 77-81 GHz SRR regulations:

* The FCC recently consolidated the rules for 76-81 GHz vehicular radar operations into [47CFR§95 Subpart M](https://rheintech.us4.list-manage.com/track/click?u=ea8729ded10d990820bca7414&id=90c70a633c&e=56b0e30a9b) (replacing 47CFR§15.253, and revising other Part 15 sections). Per 47CFR§95.3331, radar systems operating in the 76-81 GHz band may operate as vehicular radars, or as fixed or mobile radars in airport air operations areas, including but not limited to FOD (foreign object detection) radars and aircraft-mounted radars for ground use only. Per 47CFR§95.3333, notwithstanding the provisions of 47CFR§95.3331, 76-81 GHz Band Radar Service is prohibited aboard aircraft in flight. Aircraft-mounted radars shall be equipped with a mechanism that will prevent operations once the aircraft becomes airborne.
* Noting the exception as stated, the FCC will allow vehicular radar sensors to be mounted and deployed on “terrestrial transportation vehicles” including but not limited to railroad train locomotives and train cars; monorails and trams; construction vehicles; farming vehicles such as tractors and harvesters; motorcycles, scooters and motorbikes; mobile scissor-lifts and mobile work platforms; and boats and ships operated within territorial waters of the United States, provided the overall installation complies with the conditions of the grant and the relevant technical standards for operation.
* Japan also implemented the 77-81 GHz SRR application in 2017 (ARIB standard STD-T111 - 79 GHz Band High-Resolution Radar).
* China is still in process of implementing but with strong indications that this process is going to be finalised in 2018 or early 2019.

Note that within the ECC, ECC/DEC/(04)03 is under review in WGFM/SRD/MG. and ETSI is in process of preparing an ETSI SRDoc. A common regulation 76-81 GHz, in support of the trend towards single chip solutions 76-81 GHz, and setting out of the regulation in a way to enable more use cases (such as in the USA) could potentially be considered. There is also Decision 2004/545/EC in relation to ECC/DEC/(04)03.

* In July 2018, Canada’s Innovation, Science and Economic Development (ISED) published [Radio Standard Specification RSS-251, Issue 2, Vehicular Radar and Airport Fixed or Mobile Radar in the 76-81 GHz Frequency Band](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/RSS-251-issue1.pdf/$FILE/RSS-251-issue1.pdf), replacing RSS-251, Issue 1, Field Disturbance Sensors in the Bands 46.7-46.9 GHz (Vehicular Radar) and 76-77 GHz (Vehicular and Airport Fixed Radar).

The main changes are as follows:

* A six-month transition period has been included to accommodate the compliance of 76-77 GHz vehicular radar devices and airport fixed radar to RSS-251, Issue 2 requirements.
* The frequency band for vehicular radar and airport fixed (now also for airport mobile radar) has been expanded from 76-77 GHz to 76-81 GHz, to harmonize with the global usage of the frequency band.
* The scope of the term “vehicle” has been included in the purpose and application of the current standard to identify vehicle types that fall within the scope of this standard. This includes aircraft-mounted radars for ground operations while within airport air operations areas.
* The scope of airport radar systems has been expanded to allow fixed or mobile radar systems for airport air operations purposes, in addition to those previously listed (foreign object debris detection and monitoring of aircrafts and service vehicles in service areas where there is no public access).
* A requirement to implement a radar deactivation mechanism when an aircraft becomes airborne, has been implemented as aircrafts’ use of the 76-81 GHz radars is intended exclusively for their operation while on the ground, in airport air operations areas.
* New sections to address certification and licensing requirements information (license-exempt) have been included in the general section (Section 3).
* The sections referencing RSS-102 (for radio frequency exposure) and RSP-100 (for certification of radio apparatus) have been removed. These are referenced by RSS-Gen, which is referenced by this current standard.
* The allowance to transmit information in addition to the primary radar functions, which was applicable to radar devices in the bands 46.7-46.9 GHz and 76-77 GHz, was removed. Radar (i.e. vehicular and airport fixed or mobile radar) is the only permitted use by devices under the scope of this current standard.
* The method of measurements and limits for average e.i.r.p. and peak e.i.r.p. spectral density for 76-81 GHz radars have been reviewed and prescribed accordingly.
* The unwanted emission requirements for 76-81 GHz radars have been reviewed and prescribed accordingly.

**(for information in WG FM and SRD/MG)**