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Land, sea and airwaves

Safeguarding terrestrial services at the World Radiocommunication Conference

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Terrestrial services for a safe digital future

Doreen Bogdan-Martin, ITU Secretary-General

Terrestrial communications and digital transformation go hand in hand. Whether on land, at sea, or up to 50 kilometres above our heads, terrestrial radio services have helped connect countless communities across the globe, empowering them with opportunities to thrive now and into the future.

As we strive together to connect the remaining 2.7 billion amid a shifting technological landscape, terrestrial radio remains a key part of the equation.

From mobile broadband access through high-altitude platforms to the lifesaving disaster alerts at the heart of the Early Warnings for All Initiative, terrestrial radio can help us reach the remotest corners of our planet, build digital resilience worldwide, and ensure that technology's transformative potential is shared sustainably and equitably.

All of this and more will be discussed at the World Radiocommunication Conference (WRC-23) in November and December in Dubai, UAE. The conference's crucial updates to the Radio Regulations will help ensure current services can continue, while enabling the seamless integration of ground-breaking new technologies and applications.

This is an exciting time to be in terrestrial services.

Let's use this moment to build a safe and sustainable digital future for all.

> *"This is an exciting time to be in terrestrial services."*
>
> Doreen Bogdan-Martin


WORLD RADIOCOMMUNICATION CONFERENCE
ITUWRC
DUBAI2023
20 November – 15 December 2023
Dubai, United Arab Emirates
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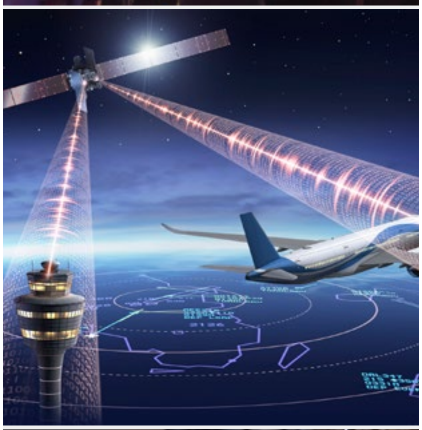
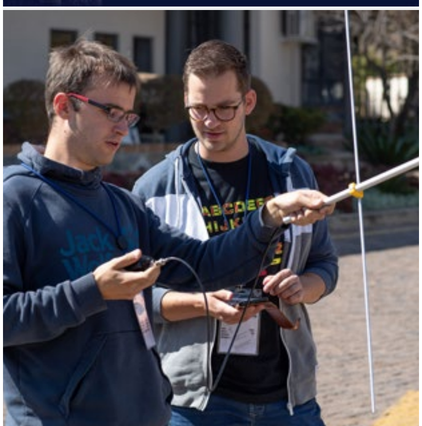
What is terrestrial?

In the international regulatory context, a terrestrial radio station consists of a set of equipment situated on Earth – whether on land, at sea, or at altitudes up to 50 kilometres – and used for providing a radiocommunication service.

Terrestrial services are subject to several international regulatory instruments, including the Radio Regulations treaty governing radiocommunication services and the utilization of radio frequencies worldwide, along with certain regional agreements on specific services. Together, such agreements ensure interference-free radio operation, provide stability and predictability for governments and investors, and facilitate the harmonization of spectrum use.

The Radio Regulations and all associated regional agreements are maintained by the International Telecommunication Union (ITU), the United Nations specialized agency for information and communication technologies, originally established for telegraph services in 1865.





Terrestrial services keep us connected and help sustain our lives

Mario Maniewicz, Director,
ITU Radiocommunication Bureau

> *Terrestrial radio services encompass many of the world's most vital communication systems.*
>
> Mario Maniewicz

The United Nations 2030 Agenda for Sustainable Development provides a framework for each one of us to find and implement practical solutions to attain a viable future for all. It addresses challenges on a global scale, such as how to tackle climate change, how to ensure access to quality education and health for all, and how to address societal challenges such as attaining gender equality.

At the International Telecommunication Union (ITU), our principal focus in today's world is on how to address the digital challenge. How do we ensure the digital economy will benefit people everywhere regardless of their socio-economic status? How do we bridge the digital divides that exist between women and men, among countries, and within countries?

Terrestrial radiocommunication services encompass many of the world's most vital communication systems. They keep us connected and ensure the safety of life-sustaining global transport systems.

Wireless communication

Today, terrestrial radio technologies support a myriad of wireless communication services and devices. Every time you make a call, catch a flight, browse the Internet on your smartphone, listen to the radio in your car, or check the weather forecast, you benefit from advances in the corresponding terrestrial services.

But those services are not yet available to everyone. Expanding the reach and the affordability of broadband mobile systems is crucial to overcome the global digital challenge, establish connectivity for all, and ultimately achieve sustainable development.

Terrestrial radio technologies have evolved considerably to meet consumer demand, with new applications emerging continually over the past few decades. Examples include advanced mobile broadband, intelligent transport systems, and Internet of Things (IoT) devices.

Radio frequencies and regulations for these technologies are on the agenda of the World Radiocommunication Conference (WRC-23) to be held in Dubai, United Arab Emirates, between 20 November and 15 December.

Building on the vision of International Mobile Telecommunications (IMT) systems, industry and government stakeholders have worked to build successive generations of mobile broadband connectivity. To date, three IMT generations – IMT-2000, IMT-Advanced, and IMT-2020, more commonly referred to as 3G, 4G and 5G – were standardized through ITU.

Mobile Internet has provided the basis for many app-based businesses supporting mobile learning, health, and money services. They have become a powerful and reliable platform for broadband connectivity – especially in developing countries – to bridge the digital divide.

We are now focusing on "IMT-2030 and Beyond". This next iteration is expected to give technology users immersive communication, including near-real-life interactions with machine-driven interfaces. Data and algorithms enabled by artificial intelligence (AI) are expected to become increasingly abundant.

"Terrestrial radio technologies have evolved considerably to meet consumer demand, with new applications emerging continually over the past few decades."

Maritime and aviation services

ITU's maritime and aviation experts continue leveraging their regulatory and scientific expertise to lay the foundation for greater maritime and aviation connectivity, improve the safety of transport by sea and air, and ensure a sustainable future for the entire maritime and aeronautical industries.

ITU works to support and improve the services provided by these industries through the allocation and protection of frequency spectrum for maritime and aviation communications, as well as by developing standards for maritime and aeronautical radio systems. In addition, ITU publishes and regularly updates maritime service publications containing information on coast and ship stations worldwide and on the rules for establishing communications at sea.

When ITU Member States update the Radio Regulations treaty at WRC-23, they are expected to consider the modernization of the Global Maritime Distress and Safety System (GMDSS), the introduction of e-navigation systems, and other maritime communication issues. These changes should enable the industry to respond to emerging trends in maritime communications, including the transition to digital technologies and wireless applications.

WRC-23 will also consider new spectrum to enhance aeronautical mobile radiocommunications, including command-and-control links for non-safety communications with unmanned aircraft, relaying very-high-frequency (VHF) terrestrial communications with pilots via satellites, and a regulatory framework for introducing new digital technologies in high-frequency (HF) aeronautical bands.

Along with improved safety and efficiency at sea and in the air, decisions to be taken at the conference will shape future digital infrastructure to ensure better environmental protection.

“We are now focusing on 'IMT-2030 and Beyond'.”

Broadcasting

Ensuring the smooth operation of broadcasting systems across a growing array of platforms relies on consensus-based technical standardization, and the resulting standards must be continually updated with input from industry and policymakers worldwide.

Frequency bands – ranging from low-frequency (LF) to ultra-high frequency (UHF) – are assigned and used worldwide for radio, television, and multimedia terrestrial broadcasting. Although broadcasting has received no new spectrum allocation for years, the demand for more and better services continues to grow.

Yet for parts of the bands currently allocated, future access for broadcasting has come under threat from competing uses. Several agenda items for the upcoming WRC-23 are highly relevant to future terrestrial broadcasting services in the UHF and HF bands.

The conference will also consider the future of the UHF broadcasting band, with implications for television broadcasts and programming, and also for public protection and disaster relief.

Countdown to WRC-23

ITU's Member States in April approved the Report of the Conference Preparatory Meeting to WRC-23, which summarizes and analyses the results of extensive technical studies conducted by the ITU Radiocommunication Sector (ITU–R) and possible solutions to satisfy WRC-23 agenda items. The report is now available in all six ITU official languages.

The third and final Inter-regional Workshop on WRC-23 Preparations, taking place 27–29 September, will give participants another opportunity to consider proposed solutions to the issues identified.

The latest *ITU News Magazine* captures industry perspectives, as well as the views of specialized international and regional organizations, on key issues related to terrestrial radiocommunication services ahead of WRC-23.

Report of the CPM

Technical, operational and regulatory/procedural matters that will be considered by the World Radiocommunication Conference 2023

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These include:

- **The continued development of International Mobile Telecommunications (IMT) systems** (agenda items 1.2 and 1.5). The article focuses on reaching digital equality, harmonization, and expansion of mobile broadband services via potential new spectrum allocations and identifications for IMT in the UHF and mid-bands from 3.3 gigahertz (GHz) to 10.5 GHz.

- **Unlicensed usage of mid-bands** (linked to agenda item 1.2), which considers the 6 GHz Wi-Fi applications, their importance for worldwide connectivity, spectrum needs and co-existence with other services.

- **Balancing UHF broadcasting and mobile spectrum needs** (agenda item 1.5). The article explores the frequency requirements of different radiocommunication services in the lower part of the UHF band and possible solutions to satisfy those requirements.

- **Future sub-orbital flights** (agenda item 1.6). The article explains the concept of sub-orbital vehicles and highlights the regulatory challenges these future flying vehicles are facing.

- **Satellite links to support communications with pilots** (agenda item 1.7). The article speaks about the expansion of voice and data communications with aircraft to oceanic and remote areas by relaying these terrestrial communications via satellites.

- **Modernization of the Global Maritime Distress and Safety System** (agenda item 1.11). The article explains how the maritime communication and navigation applications are governed by ITU documents and how the latest GMDSS improvements could be introduced in the Radio Regulations at WRC-23.

- **The amateur use of the 1.2 GHz spectrum** (agenda item 9.1 (b)) explores potential ways of preserving the 1.2 GHz band for amateur usage while ensuring additional protection for the radionavigation-satellite service.

The outcomes of WRC-23 will be pivotal in shaping the future framework for radiocommunication services in all countries. I thank all experts who contributed to this edition for bringing their perspectives to the table.

I am confident that these articles offer a well-informed overview and look forward to welcoming our delegates from around the world to WRC-23.

"I am confident that these articles offer a well-informed overview and look forward to welcoming our delegates from around the world to WRC-23."

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About the World Radiocommunication Conference

World Radiocommunication Conferences are held every 3–4 years to review, and, if necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits.

ITUWRC
DUBAI2023

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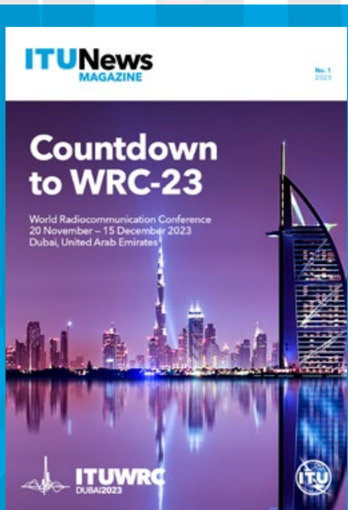
Explore WRC-23 topics in the *ITU News Magazine*

- Countdown to WRC-23
- The future of Coordinated Universal Time



Conference website: WRC-23.

Key topics for the terrestrial radio future

Martin Fenton, Chairman, ITU Radiocommunication Sector (ITU–R) Study Group 5

The World Radiocommunications Conference (WRC-23) being convened by the International Telecommunication Union (ITU) later this year in Dubai, UAE, will consider several vital questions related to future terrestrial services.

The ITU Radiocommunication Sector (ITU–R) oversees the preparatory work on terrestrial services for the conference through a dedicated group of experts – ITU–R Study Group 5.

For the upcoming WRC, Study Group 5 and its working parties are looking at mid-band spectrum use, frequencies for unlicensed mobile applications, and other terrestrial services and applications, including modernizing and enhancing maritime emergency communications.

“ITU-R oversees the preparatory work on terrestrial services for the conference through a dedicated group of experts, ITU-R Study Group 5.”

Martin Fenton

Mid-band spectrum use

WRC-23 is set to consider several agenda items related to the use of mid-band spectrum – encompassing various bands between 3300 megahertz (MHz) and 7125 MHz – for mobile and wireless broadband connectivity. These include potential new or upgraded mobile allocations and additional identifications for International Mobile Telecommunications (IMT).

IMT is the global standard created and maintained by the International Telecommunication Union (ITU) that specifies the requirements for mobile communication networks, including current 4G and fast-emerging 5G systems. A framework for future 6G systems (technically known as IMT-2030) should be ready for ITU–R adoption at the upcoming Study Group 5 meeting in September.

Upper 6 GHz – IMT vs. Wi-Fi

Demand is also on the rise for mid-band frequencies for unlicensed mobile uses, such as radio local area networks (RLAN), including Wi-Fi applications.

The upper 6 GHz band – spanning radio frequencies between 6425 MHz and 7125 MHz – is of particular interest to both the RLAN/Wi-Fi and IMT communities. WRC-23 is set to consider this band – which is already available for unlicensed use in various countries – potentially identifying it for IMT use between 6425 MHz and 7025 MHz exclusively in Region 1 (comprising Europe, Africa, the Commonwealth of Independent States, Mongolia, and the Middle East west of the Persian Gulf, including Iraq) and between 7025 MHz and 7125 MHz globally.

With both the IMT and RLAN/Wi-Fi communities wanting access to the upper 6 GHz, the outcome of WRC-23 could be crucial for both IMT and RLAN/Wi-Fi.

“WRC-23 is set to consider several agenda items related to the use of mid-band spectrum.”

Other terrestrial services and applications

Other agenda items for the crucial quadrennial conference include:

- Proposed measures to protect aeronautical and maritime mobile services in the frequency band 4800–4990 MHz for stations located in international airspace and waters.
- Use of high-altitude platform stations as IMT base stations (HIBS) in bands below 2700 MHz that are already identified for IMT.
- Regulatory provisions to enable sub-orbital vehicles to safely communicate with air traffic management systems and ground control facilities.
- Possibilities for allowing very-high frequency (VHF) aeronautical communications via non-geostationary satellites to standard VHF radios already installed onboard aircraft, particularly over oceans or other large remote areas not easily reachable with terrestrial systems.
- Provisions to allow unmanned aircraft (UA) to use fixed satellite service (FSS) networks and frequency allocations for control and non-payload communications (CNPC).
- Changes to the Radio Regulations (Appendix 27) that would allow digital technologies to use existing high-frequency (HF) bands (such as 2.85 MHz and 22 MHz) for safety-of-life applications on commercial aircraft.
- Potential new spectrum allocations (15.4 to 15.7 and 22 to 22.21 GHz) to the aeronautical mobile service for "non-safety" wideband line-of-sight data links.

> *"The conference will discuss the GMDSS, the international system for automated emergency communication for ships at sea."*

Maritime emergency communications

Finally, the conference will discuss the Global Maritime Distress and Safety System (GMDSS), the international system for automated emergency communication for ships at sea.

Today's GMDSS – developed by the International Maritime Organization (IMO) under the International Convention for the Safety of Life at Sea (SOLAS) – integrates both satellite and terrestrial radio systems and is supported by specific provisions in the Radio Regulations maintained by ITU.

WRC-23 will consider proposals for the system's modernization, along with e-navigation and the introduction of additional satellite systems for maritime safety.

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Critical factors for mobile rest on WRC-23

Luciana Camargos, Head of Spectrum, GSMA

> *As WRC-23 approaches, I see enough support for priority IMT radio-frequency bands to alleviate concern.*
>
> Luciana Camargos

Mobile can continue to grow. With 50 per cent 5G adoption and 92 per cent smartphone adoption globally, mobile can impact GDP by almost USD 1 trillion in 2030. That is the good news.

The bad news is that 40 per cent of that will be lost if we fail to allocate spectrum for mobile.

Fortunately, spectrum is unlikely to be constrained to today's levels after the World Radiocommunication Conference (WRC-23). There is always positive momentum behind meeting International Mobile Telecommunications (IMT) spectrum needs, whether long-term or urgent. As WRC-23 approaches, I see enough support for priority IMT radio-frequency bands to alleviate concern. There is, however, still much work to be done on the technical and regulatory side.

GSMA – representing the worldwide mobile communications industry – believes that WRC-23 can serve several core purposes: strengthening digital equality, increasing harmonization, and producing spectrum capacity for IMT expansion to the end of the decade. There is also a chance to enhance spectral efficiency by maximizing the use of existing bands and equally the chance to start looking further into the future at 6G bands.

Digital equality

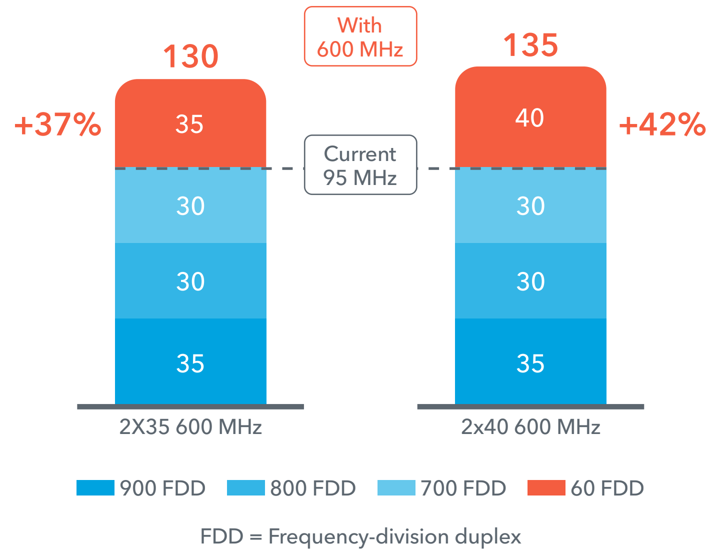
Agenda item 1.5, which looks at the 470–694 megahertz (MHz) band in Region 1, is crucial for closing the digital divide, whether between urban and rural, high- and low-income countries, the rich and poor, or between genders. The propagation characteristics make this low-band radio spectrum attractive for mobile and broadcasting, while simultaneously creating a challenging co-existence environment. However, finding enough capacity in low bands is an ongoing challenge and this frequency has been on the agenda of many WRCs.

Governments need to consider whether a mobile allocation may be useful to the future connectivity needs of their country. This may be now, or years into the future, but WRC-23 is the opportunity to give yourselves that future option in Region 1. It is an option that has been held by Regions 2 and 3 for many years and that clear regulatory backdrop has allowed Region 3 a flexibility that Region 1 does not have. With the mobile allocation in place comes the second question of an IMT identification in all or part of the band.

IMT identification and use will support networks that help lower the digital divide, giving more capacity (a 35–45 per cent boost to rural speeds through just the 600 MHz band for example) to those outside cities that rely on low band. Those in low- and middle-income countries, that typically have larger rural populations, may benefit the most.

Governments need to consider whether a mobile allocation may be useful to the future connectivity needs of their country.

Increase in download speeds through use of 600 MHz spectrum in Region 1



Source: GSMA

Harmonization

Harmonization is the golden opportunity of WRCs and one of the most important roles of the International Telecommunication Union (ITU).

The 3.3–3.8 gigahertz (GHz) band has become the global 5G launch band, providing around 80 per cent of 5G launches since the first commercial networks in 2019. This has led to the rich 3.5 GHz ecosystem of devices which support the whole of this band – devices which have hit huge scale and variety, allowing us, once again, to minimize the digital divide through spectrum harmonization.

However, 3.5 GHz is an example of where the Radio Regulations have not kept up with regional or national decisions. In Region 1, both Europe and the Arab world made regional moves to assign 3.3/3.4–3.8 GHz for IMT use well ahead of even the adoption of an agenda item. This has been the case individually with countries all over the world. The 3.3–3.4 and 3.6–3.8 GHz bands can be concluded at WRC-23, giving countries what they require for the first phase of 5G.

“At GSMA, we believe that WRC decisions can benefit billions by delivering affordable and sustainable mobile growth.”

Mobile expansion

Building on 3.5 GHz, agenda item 1.2 allows us to look into the future expansion of mobile with the 6 GHz band, which is – much needed for 5G expansion. This new band has already been the subject of intensive equipment R&D that, those who joined the GSMA at Mobile World Congress this year will have seen, is starting to reach its conclusion.

6 GHz will enable consistent 5G speeds, with lower network density, while reducing capex and carbon emissions. This band is for the future, and market dynamics will dictate how soon that arrives. How its use will be defined in the Radio Regulations, and with what options chosen to ensure coexistence, will be an important issue at WRC-23.

Whether you walk the halls at Mobile World Congress, or count the supporters at ITU meetings, 6 GHz mobile is a reality, and countries will be using it to support their mobile networks.

The right consensus at WRC-23 can help develop IMT while ensuring co-existence with current services. If we make the right decisions for mobile development, we can avoid the bad news scenario. At GSMA, we believe that WRC decisions can benefit billions by delivering affordable and sustainable mobile growth. But it will be up to the Conference to decide.

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Connecting to the future with 6 GHz Wi-Fi

Alex Roytblat, Vice President, Worldwide Regulatory Affairs, Wi-Fi Alliance

Every day, billions of users worldwide rely on Wi-Fi for connectivity. Predominating over other wireless technologies in affordability, sustainability, interoperability, and security, it has become essential to global connectivity.

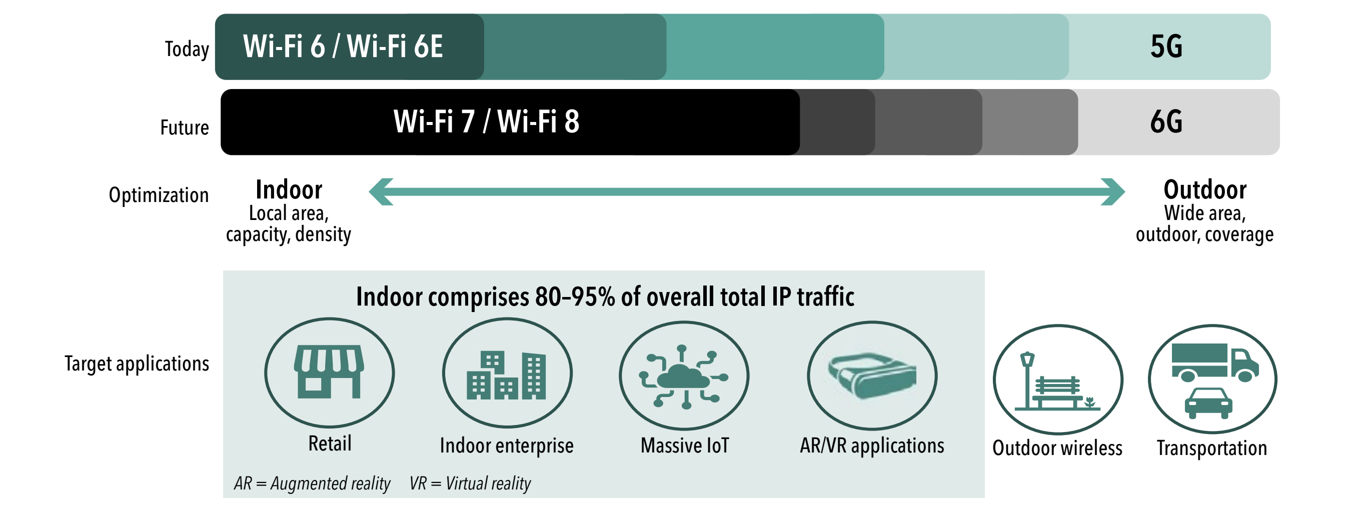
The significance of Wi-Fi will only increase with the next generation of wireless connectivity, as future use cases will require computational resources and connectivity that are hundreds, if not thousands, times faster than current International Mobile Telecommunications (IMT) applications.

Next-generation connectivity will command immersive experiences such as virtual, augmented, and extended-reality (VR/AR/XR), wearable tech, artificial intelligence (AI), telehealth, industrial automation, the Internet of Things (IoT), and 3D-video.

Instead of today's wide-area microcell networks, next-generation use cases will rely on local-area, short-range networks (see figure). These would include Wi-Fi designed for more data traffic, more devices, more applications, and much lower latency.

> *"The significance of Wi-Fi will only increase with the next generation of wireless connectivity."*
>
> Alex Roytblat

Connectivity demands – predominately indoors and short-range



Source: Wi-Fi Alliance

Relying on access to radio frequency spectrum

As with any wireless technology, Wi-Fi depends on access to radio frequency spectrum. But a lack of spectrum threatens future Wi-Fi performance and functionality.

Policymakers, recognizing this, are expanding Wi-Fi spectrum access with a focus on the 5925–7125 megahertz (MHz), or 6 gigahertz (GHz), frequency band. Opening this band to Wi-Fi will enable a wide range of new use cases.

These – combined with expanded broadband access via fibre or satellite – promise to deliver versatile and extremely affordable connectivity. This makes Wi-Fi an ideal force multiplier for connectivity.

The latest Wi-Fi, Wi-Fi 6E, with access to the 5925–7125 MHz band, is designed to deliver optimized performance for next-generation use cases.

Following regulatory approvals, Wi-Fi 6E devices are quickly becoming available in several countries. Correspondingly, the list of Wi-Fi 6E certified products is growing.

Over 473 million Wi-Fi 6E devices are expected to enter the market this year, creating economies of scale and benefits for businesses, consumers, and national economies.

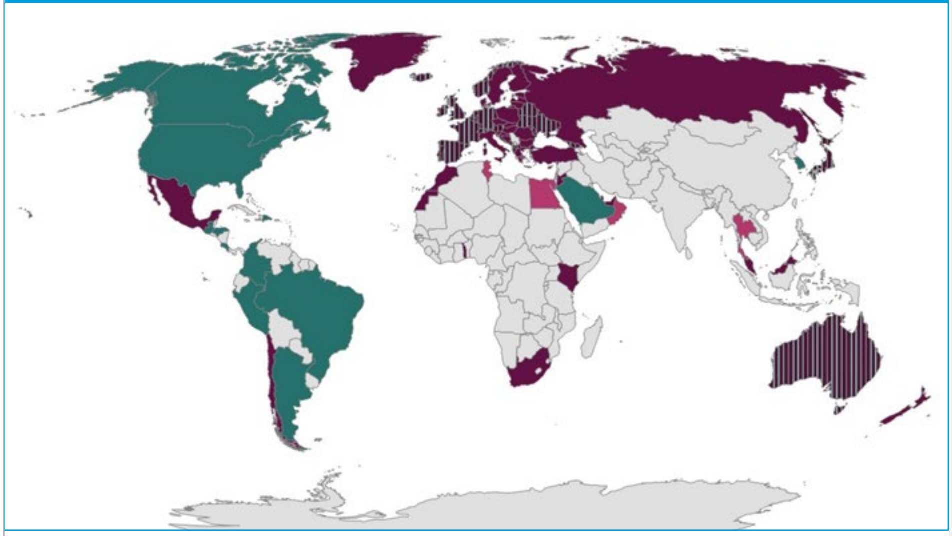
> *"Instead of today's wide-area microcell networks, next-generation use cases will rely on local-area, short-range networks."*

Wi-Fi's coexistence with other spectrum users

Importantly, Wi-Fi has demonstrated its ability to coexist with and protect other spectrum users. Moreover, such coexistence is essential to efficient Wi-Fi operation.

Common regulations already adopted in multiple countries ensure Wi-Fi's coexistence with ongoing, incumbent operations in the 5925–7125 MHz band, as well as facilitating international harmonization.

Countries enabling Wi-Fi in 6 GHz (Wi-Fi 6E)



Source: Wi-Fi Alliance

But Wi-Fi cannot operate co-channels with international mobile services. Regulators and investors await the outcome of the World Radiocommunication Conference (WRC-23) to provide key clarifications.

In the meantime, regulatory uncertainty impedes the development and introduction of advanced Wi-Fi technology in several countries.

What to consider when preparing for WRC-23

In preparing for the conference, administrations must take several factors into account.

Notably, plans outlined by IMT proponents for deployments in the 6425–7125 MHz band are incompatible even with ongoing, incumbent operations. Moreover, to maintain service quality, wide-area networks for IMT with high-power rooftop deployments require priority spectrum access.

Hence, licensed IMT networks cannot avoid interfering with – or tolerate interference from – incumbent operations in the 6 GHz band.

The IMT proponents have not offered a viable method for coexistence with 6 GHz incumbents, and mmWave bands previously designated for hotspot services remain significantly underutilized.

Given technical and economic realities, administrations should also recognize the uncertainty about developing a viable 6 GHz IMT ecosystem in the next five years, even under favourable assumptions on spectrum availability.

"The case for allowing Wi-Fi services in the 5925-7125 MHz band is clear and compelling, with 6 GHz Wi-Fi already delivering real socio-economic benefits in many countries."

The case for Wi-Fi

The case for allowing Wi-Fi services in the 5925–7125 MHz band is clear and compelling, with 6 GHz Wi-Fi already delivering real socio-economic benefits in many countries.

The diverse and growing product ecosystem for 6 GHz Wi-Fi fits perfectly with broadband objectives in developed and developing countries – and without disrupting incumbent operations.

Granting Wi-Fi access to the 5925–7125 MHz band would be the best way to maximize the socio-economic value of this spectrum. Conversely, 6 GHz IMT "vaporware" looks far from achieving commercial feasibility, particularly given a total absence of equipment at this stage.

Inflated claims of 6 GHz spectrum need

Designating the 6425–7125 MHz band for IMT would stall other moves to derive value and benefits from that spectrum. Such a decision at WRC-23 could foster a regulatory divide between regions prioritizing IMT allocations and those where Wi-Fi operates in the full 6 GHz band.

Claims about urgently needed 6 GHz spectrum access for IMT appear exaggerated. But even if such needs exist, they are addressable with other frequency bands.

Such access need not impede the introduction of advanced Wi-Fi technologies, either now, or in the future.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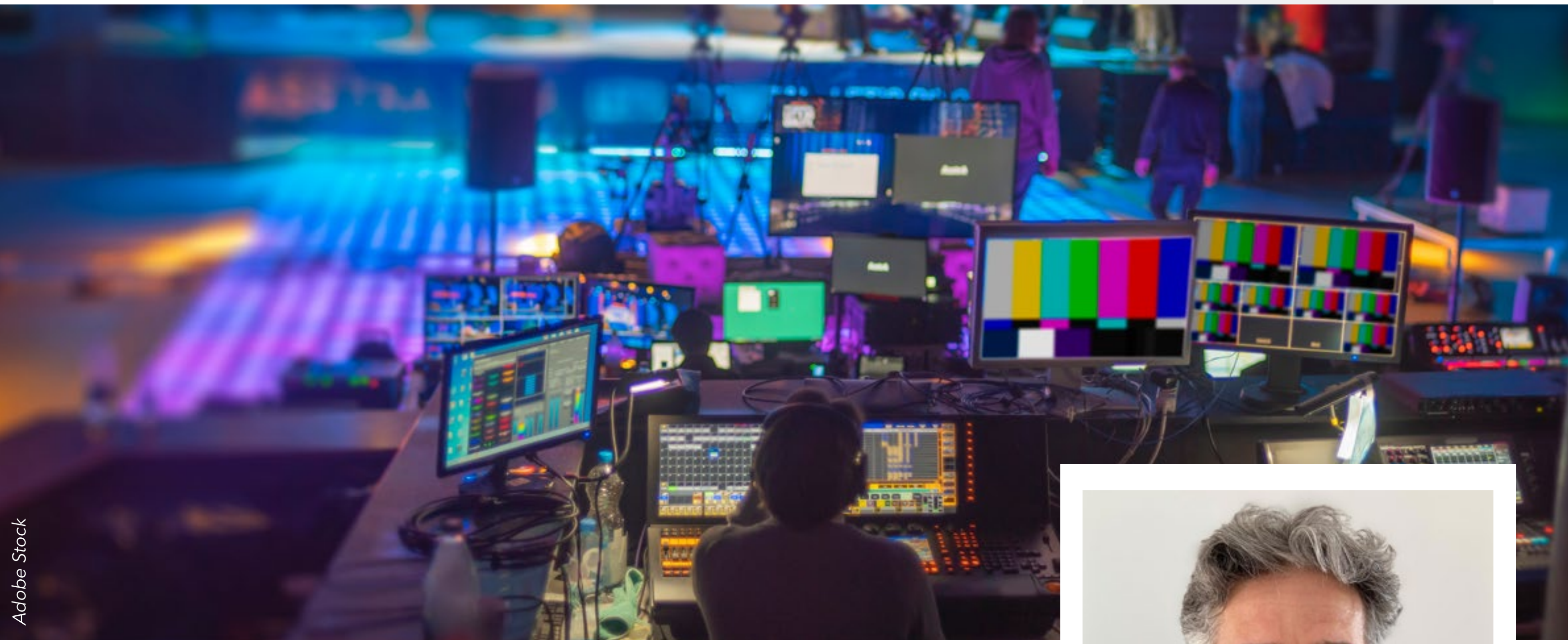

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Balancing UHF broadcasting and mobile spectrum needs

Darko Ratkaj, Senior Project Manager,
European Broadcasting Union (EBU)

Agenda item 1.5 of the upcoming World Radiocommunication Conference, WRC-23, follows WRC-07 and WRC-12 decisions to add a primary mobile allocation in the 800 megahertz (MHz) and 700 MHz frequency bands, respectively. As a result, those bands have, in most countries, now been re-purposed from broadcasting to International Mobile Telecommunications (IMT).

Perhaps this is why WRC-23 agenda item 1.5 is sometimes seen as the next "either-or" choice between terrestrial broadcasting and IMT.

Studies carried out in preparation for WRC-23, however, reveal a much more diverse picture.

> *"The 800 MHz and 700 MHz frequency bands have, in most countries, now been re-purposed from broadcasting to IMT."*
>
> Darko Ratkaj

Services in the frequency band 470–960 MHz

The Radio Regulations include seven different radiocommunications services in the 470–960 MHz band:

- broadcasting – used for terrestrial television;
- mobile – used in different applications such as IMT, public protection and disaster relief (PPDR), the applications ancillary to broadcasting and programme-making (SAB/SAP), short-range devices, and railway and defence systems;
- radio astronomy;
- radiolocation – used for wind-profiling radars;
- fixed-satellite service;
- mobile-satellite service; and
- aeronautical radio navigation.

Furthermore, in Region 1 (comprising Europe, Africa, the Commonwealth of Independent States, Mongolia, and the Middle East west of the Persian Gulf, including Iraq), as well as in Iran, this frequency band is governed by both the Radio Regulations and the Geneva 2006 Regional Agreement.

While the existing services and applications in the ultra-high-frequency (UHF) band may vary regarding their economic or public value, they are all important. Many are essential for a well-functioning society and governmental policies.

Some applications are used extensively with a mature ecosystem that would be difficult to replicate in other bands. Some depend on the specific physical properties of UHF, making it the only spectrum where they can operate.

Moreover, administrations clearly want to retain all existing allocations in the UHF band.

The studies by the ITU Radiocommunication Sector (ITU-R – one of three Sectors of the International Telecommunication Union) also revealed considerable differences in how spectrum is used in practice across Region 1, reflecting varying circumstances and priorities in different countries. This is true for all services in the UHF band and will likely remain so for the foreseeable future.

Some administrations are proposing to add a primary mobile allocation in the 470–694 MHz band, or part of it, to allow the introduction of IMT, public protection disaster relief (PPDR), or trunked ad-hoc mobile systems. But how would this proposal be implemented?

Agenda item 1.5

"to review the spectrum use and spectrum needs of existing services in the frequency band 470–960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470–694 MHz in Region 1 on the basis of the review in accordance with Resolution 235 (WRC-15)".

The need for coexistence

A significant majority of Region 1 administrations have said they require the full 470–694 MHz band for broadcasting in the future, allowing current sharing arrangements with radio astronomy and with services ancillary to broadcasting (SAB) and systems applications products (SAP) to continue. Therefore, additional mobile applications in this band would need to coexist with incumbent services.

However, coexistence requires a large geographical separation – up to hundreds of kilometres – between broadcasting and mobile stations. This is rather restrictive and inefficient.

Separation distances could be reduced only if the protection of one or both services were to be substantially lowered, which might be possible in some situations but is not generally applicable. This issue, identified in ITU radiocommunication studies, was confirmed by real interference cases reported when the 700 MHz and 800 MHz bands have been re-purposed from broadcasting to IMT.

Notwithstanding the ITU–R studies, administrations hold different views regarding future use of the UHF band. Some foresee a decreasing need for terrestrial broadcasting and wish to give more spectrum to the mobile service, while others consider existing mobile allocations in the UHF band to be sufficient.

Numerous administrations support investments in digital terrestrial television and SAB/SAP applications. In many European countries, current regulations below 694 MHz give priority to broadcasting and SAB/SAP until at least 2030. Therefore, any change would only be possible after that date.

The challenge of finding a balance

The challenge for WRC-23 is to find a balance between these sometimes-contradictory objectives. The conference may decide to leave allocations in the 470–694 MHz band unchanged, or to add a primary mobile allocation.

Another proposal is to add a secondary mobile allocation at WRC-23 and consider a possible upgrade eight years later, at WRC-31.

Given the importance of the UHF band, administrations in Region 1 will undoubtedly continue to search for viable future arrangements. WRC-23 may succeed in reconciling the diverging proposals, but it could just as likely leave a long-term solution to be found at a future conference.

“A significant majority of Region 1 administrations have said they require the full 470-694 MHz band for broadcasting in the future...”

“Notwithstanding the ITU-R studies, administrations hold different views regarding future use of the UHF band.”

Boeing/NASA

Readying sub-orbital flights to bring passengers to space

Joseph Cramer, Director, Federal Legislative Affairs, Global Spectrum Management, Boeing

The upcoming WRC-23 will consider a topic that could impact passenger travel for generations.

Joseph Cramer

The upcoming World Radiocommunication Conference, WRC-23, will consider a topic that could impact passenger travel for generations – how to regulate the communications, navigation and surveillance systems of platforms flying for a short time in space.

Agenda item 1.6 considers what regulatory provisions, if any, are needed to facilitate radiocommunications for sub-orbital vehicles.

What are sub-orbital vehicles?

A sub-orbital vehicle can reach space but does not reach a sufficient speed to complete an orbit of the Earth. After being taken to a very high altitude by a rocket, another aircraft or its own propulsion, the vehicle uses its wings and additional energy to gain lift into space.

Because of the speed limitation, the flight path does not consist of a full orbit. Hence, we call such an aircraft a "sub-orbital" vehicle.

Towards space travel

Several companies are working to provide commercially viable travel for passengers to experience, at least for a few moments, the sensation of weightlessness and being in space. As the vehicle free-falls back to Earth, those onboard will experience the feeling of zero gravity.

Flying in a sub-orbital vehicle will allow passengers a view of both space and the curvature of the Earth. They will also very likely experience the rise and fall of the sun more than once in less than a day.

The challenge

WRC-23 agenda item 1.6 has presented a challenge, because there is no agreed definition of exactly when terrestrial services end and space services begin. There is also no clear understanding of, nor agreement on, whether a terrestrial station becomes a space station when it operates on a platform "above the major portion of the Earth's atmosphere".

Providing scheduled commercial transportation to space, even for short-duration space flights, still entails technical and operational challenges. These include communication, as well as regulatory challenges related to telecommunications.

Fortunately, the International Telecommunication Union (ITU), which organizes the World Radiocommunication Conference, is well placed to develop the regulatory structure to help industry and governments find the most efficient and safe way to take people into space.

An exciting opportunity for space travel

Like other technically complex aviation and aerospace technologies, the world will need time to establish the standards and regulations to ensure public and aviation safety for sub-orbital vehicles.

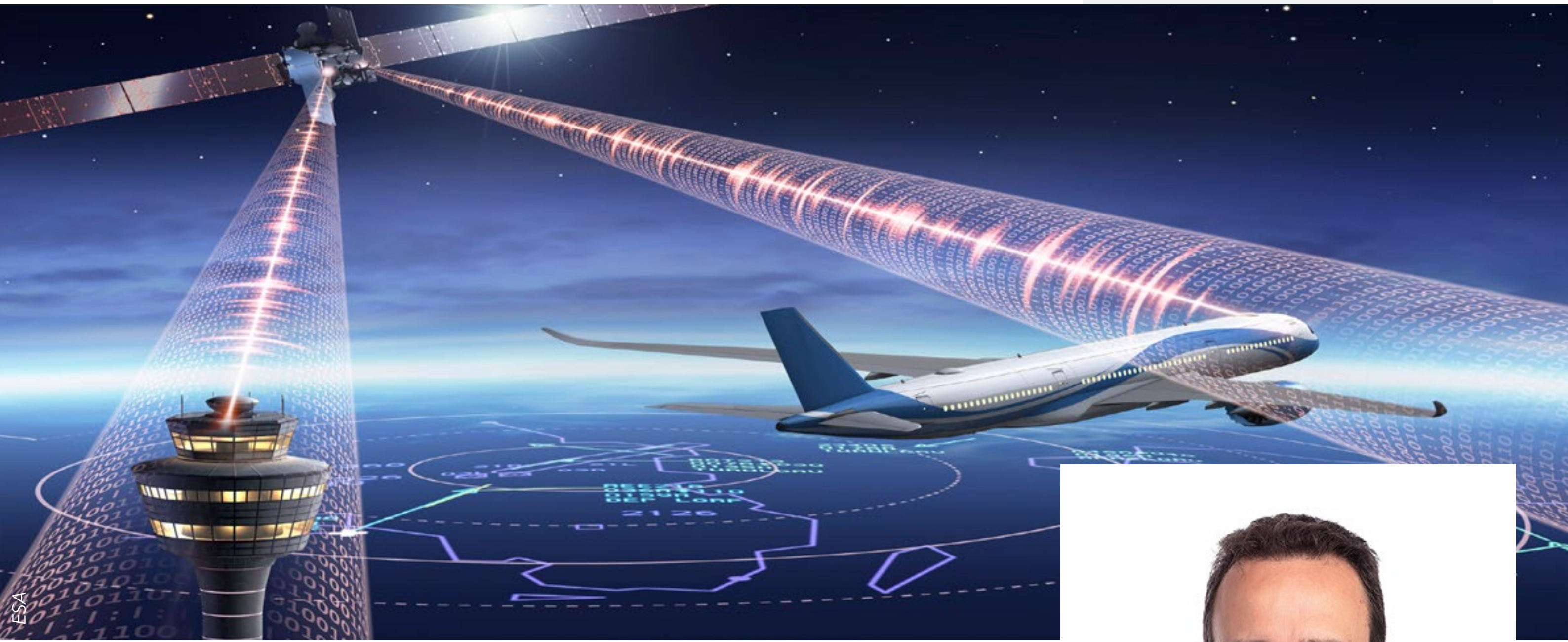
As we continue our preparatory work for WRC-23, administrations will have the opportunity to help shape the telecommunication regulatory environment, enabling this new and exciting opportunity to develop.

Portions of the Earth's atmosphere

The Earth's atmosphere has five major and several secondary layers. From lowest to highest, the major layers are the troposphere, stratosphere, mesosphere, thermosphere and exosphere.

Source: NASA

> *"Like other technically complex aviation and aerospace technologies, the world will need time to establish the standards and regulations to ensure public and aviation safety for sub-orbital vehicles."*


ESA

VHF communications with aircraft via aeronautical mobile satellite

Manuel García Martín, Chief, Spanish Air Navigation (ENAIRE) Communications Division

"The satellite-based technology will overcome constraints in oceanic and remote areas."

Manuel García Martín

Space-based very high frequency (VHF) communications would enable aircraft to communicate with air traffic control (ATC) via satellite radio links operated in the aeronautical mobile-satellite (route) service (AMS(R)S).

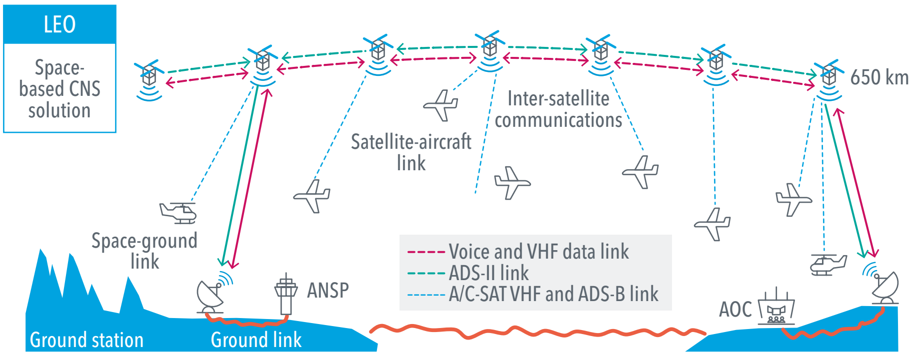
The concept is expected to support flight operations in many areas of the world, particularly in oceanic and remote zones. It will complement current aviation navigation and surveillance technologies, like automatic dependent surveillance (ADS).

Enhancing communications in oceanic and remote areas

Current technologies for long-range communications, such as high frequency (HF) and conventional satellite links, may not provide the level of performance needed to safely support close aircraft-to-aircraft separation in a similar way as terrestrial VHF communications. The satellite-based technology will overcome these constraints in oceanic and remote areas, where deploying VHF terrestrial infrastructure is unpractical.

The figure below illustrates the space-based VHF communication concept. The space segment is able to receive and transmit to standard VHF radios already installed on aircraft and is designed to behave like a VHF-tower located in the sky, with a larger footprint than terrestrial towers. Satellite-based VHF communications also require feeder links operating in a different fixed-satellite frequency band.

Satellite-based VHF potential



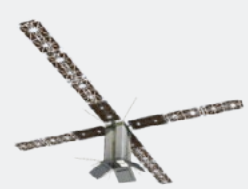
ATS data comms	VHF voice	ADS-B	AOC	No retrofitting
CPDLC & ADS-C services	*Controller-pilot voice communications*	*Secure triangulated ADS-B signals*	*Provision of AOC data*	*Does not require any modifications to existing aircraft systems*

ATM	Air traffic management	ANSP	Air navigation service provider
ADS-B	Automatic dependent surveillance–broadcast	AOC	Airline operational communications
TBO	Trajectory-based operations	CPDLC	Controller pilot data link communication
LEO	Low Earth orbit	ADS-C	Automatic dependent surveillance contract
CNS	Communication navigation surveillance		

Source: ENAIRE

Satellite-based solutions offer the potential to provide fully integrated and global VHF communications and automatic dependent surveillance broadcast (ADS-B) services to air traffic, enabling trajectory-based operations

Satellite prototype



New space

Designed for ATM

Nano satellites (<50 kg)

LEO constellation of ±240 satellites

ITU studies

The need for such satellite-based VHF communications was discussed in the previous study cycle of the ITU Radiocommunication Sector (ITU–R – one of three Sectors of the International Telecommunication Union), resulting in a new agenda item 1.7 for the upcoming World Radiocommunication Conference, WRC-23.

Under this agenda item, ITU has the task to define the relevant technical characteristics, study the compatibility between proposed AMS(R)S systems within the 117.975–137 megahertz (MHz) band and existing primary services in adjacent bands, and allocate necessary spectrum for the new technology.

Importantly, the space-based VHF concept is based on the use of existing airborne equipment. The system will be able to interact with standard on-board ADS-B (Automatic Dependent Surveillance–Broadcast) and VHF systems, both for VHF digital data links and voice communications.

> *"The space-based VHF concept for air traffic management promises major operational benefits."*

The benefits

The space-based VHF concept for air traffic management promises major operational benefits.

These include:

- the use of the same operational procedures for air traffic controllers in continental and oceanic areas;
- important gains in safety for aircraft operation in oceanic and remote continental areas;
- a significant increase in communication capacity in oceanic and remote areas;
- no additional training for air traffic controllers, as operation is the same as in aeronautical terrestrial VHF communications;
- no additional avionics required in aircraft;
- a significant reduction in fuel combustion and therefore fewer carbon dioxide (CO_2) emissions owing to optimized and efficient routes;
- increased situational awareness for air traffic controllers, who would have more accurate information about aircraft positions.

Importantly, the voice and digital data communications between air traffic controllers and pilots would continue to function as they do now. While the use of new platforms would be transparent, air traffic controllers and pilots would not need to distinguish between communications supported by terrestrial or space-based technology.

Testing feasibility and compatibility

Administrations and the aeronautical industry – including avionics system providers, aircraft manufacturers, satellite industries and operators – have been examining the feasibility of the new concept, as well as its compatibility with existing systems operating in the same and adjacent bands.

Several conclusions have emerged:

- Satellite-based voice and datalink services could be integrated into the existing ground infrastructure using current operational procedures, without any modification in current avionics.
- Satellite-based voice and data services could coexist with current terrestrial aeronautical services.
- Satellite-based voice and digital data services can also coexist with adjacent band services and without adverse impact to those services.

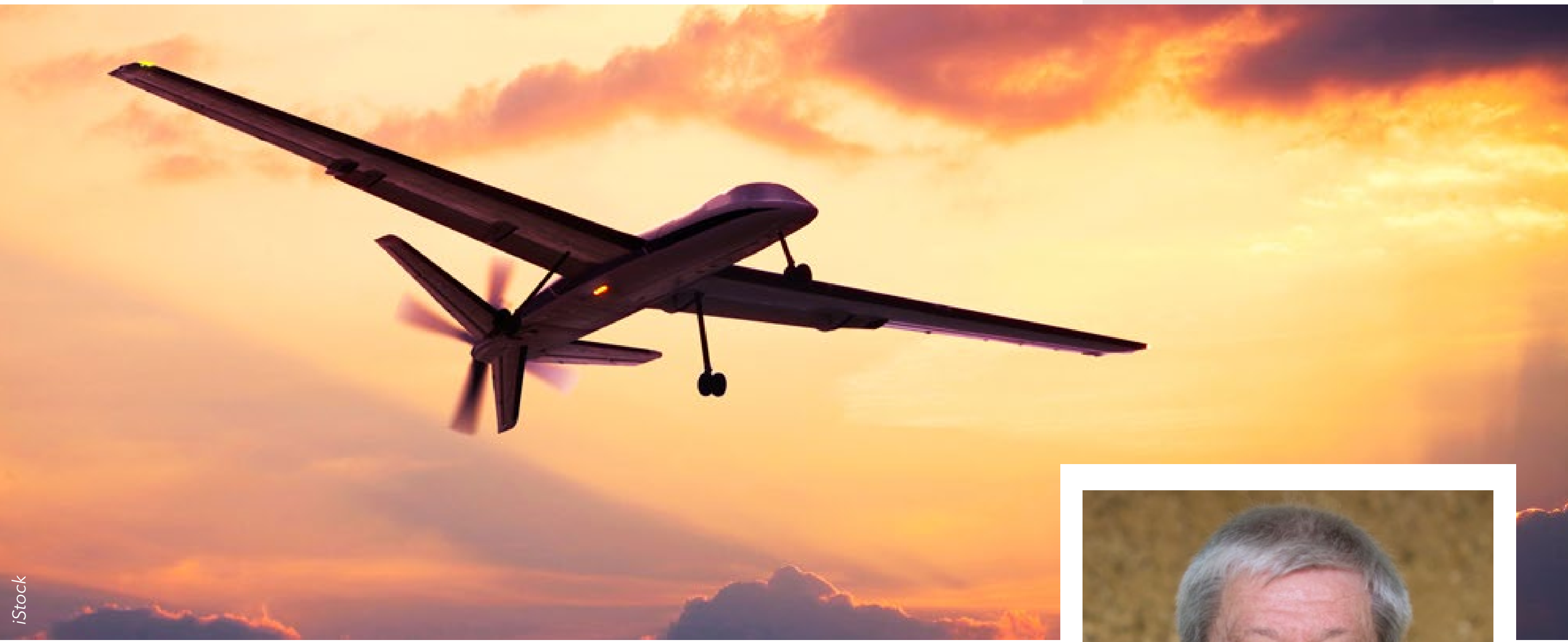
The satellite-based VHF concept will be a bridge to the future. The associated infrastructure would offer the potential to keep up with evolving technology and support the International Civil Aviation Organization (ICAO) "No Country Left Behind" initiative.

What's expected at WRC-23

Future satellite-based VHF communications will require the allocation of the entire band 117.975–137 MHz to AMS(R)S, including the upper end. This is because aeronautical terrestrial digital data links operate in the upper part of the band, and the frequency 136.975 MHz is used for the data link signalling and control channel.

WRC-23 therefore needs to ensure that the future AMS(R)S can operate in the whole frequency band, allowing for future provision of both voice and data services.

"WRC-23 needs to ensure that the future AMS(R)S can operate in the whole frequency band, allowing for future provision of both voice and data services."



iStock

Controlling unmanned aircraft through links on regular communication satellites – a good or bad idea?

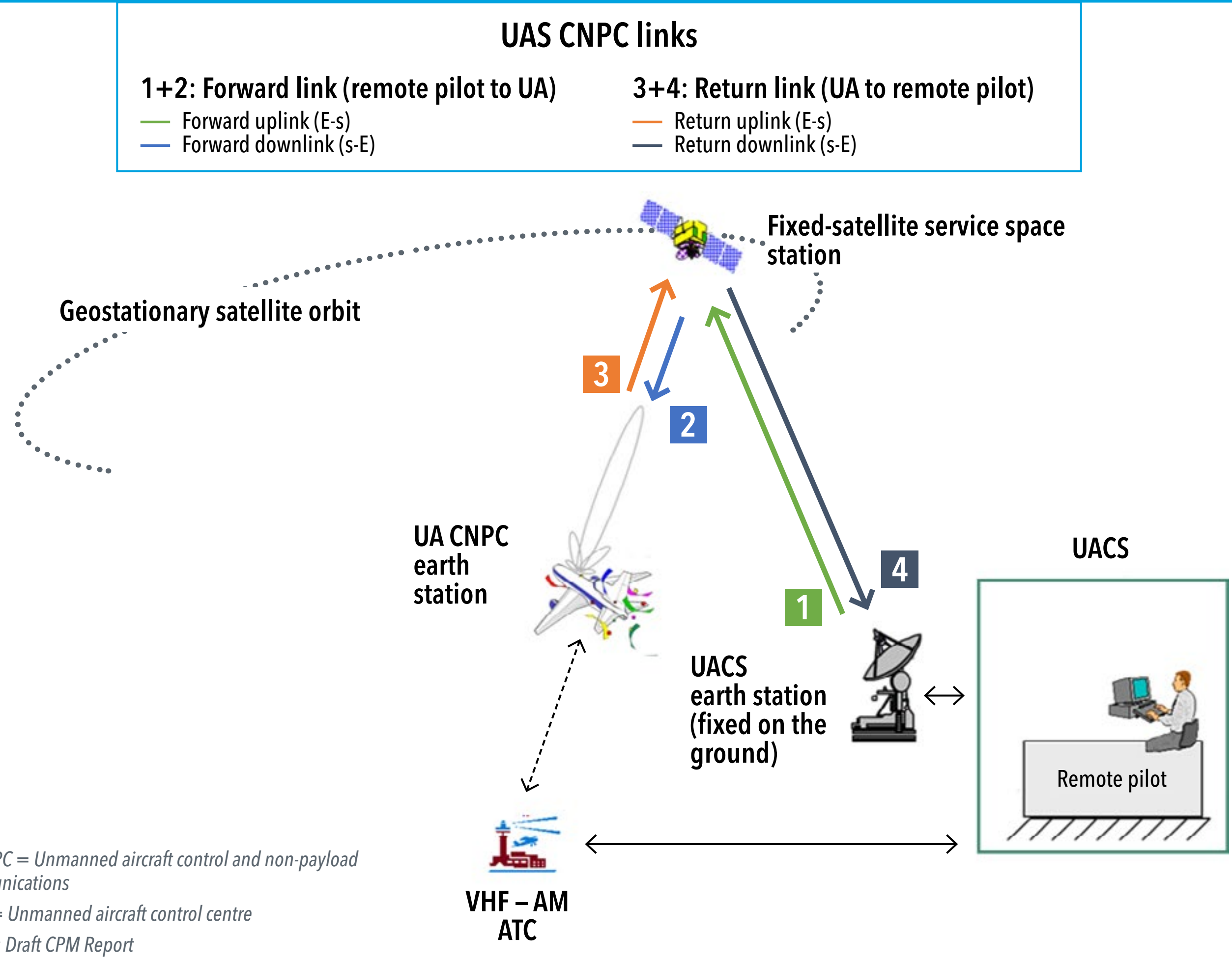
Per Hovstad, Principal Spectrum Engineer, AsiaSat

With interest in unmanned aircraft increasing, foreseen innovations include cargo planes, crop dusters, surveillance planes, and other uses. Like any other airplane, the flight of such planes needs to be controlled in a safe and reliable manner.

For long-haul flights over areas with low traffic density and over oceans, building a terrestrial radiocommunication network would be unrealistic, making the use of satellite links a logical choice. The figure below illustrates the architecture of an Unmanned Aircraft System for Control and Non-Payload Communications (UAS CNPC).

> *"With interest in unmanned aircraft increasing, foreseen innovations include cargo planes, crop dusters, surveillance planes…"*
>
> Per Hovstad

UAS CNPC architecture



UA CNPC = Unmanned aircraft control and non-payload communications

UACS = Unmanned aircraft control centre

Source: Draft CPM Report

Spectrum requirements for such use has been debated for decades and the 2012 World Radiocommunication Conference (WRC-12), in response to the issue raised by WRC-07, allocated spectrum in the 5000–5150-megahertz (MHz) band for the AMS(R)S – an aeronautical mobile-satellite service reserved for communications relating to the safety and regularity of flights, primarily along national or international civil air routes.

However, the 5000–5150 MHz band, being identified as a safety band, is not included in payloads –carried by regular communication satellites. Dedicated payloads for this purpose thus would need to be built, resulting in expensive solutions that would only be offered through a limited number of satellites.

A cheaper and simpler solution would be to use the regular, readily available transponders of commercial fixed satellite service (FSS) satellites.

Concerns about flight safety

In response to this issue raised by WRC-12, WRC-15 decided that UAS CNPC links operating in non-segregated airspace could be offered on the transponders of commercial FSS geostationary (GSO) satellites in the "unplanned" portions of Ku-band, as well as "non-shared" (or allocated almost exclusively to FSS) Ka-band.

However, WRC-15 was unable to determine how flight safety could be ensured in a band shared with a multitude of commercial and governmental terrestrial and satellite uses, or how this could be done without having an undue impact on those uses.

Consequently, the upcoming WRC-23 was tasked to review possible detailed regulatory and technical conditions for UAS CNPC operation.

And that's where we are.

Being able to make use of transponders on regular GSO FSS satellites would, without doubt, be cheaper than building dedicated payloads for satellite links to control unmanned aircraft. It would also mean that many satellites could potentially support this application. Moreover, large and growing numbers of available satellites would provide better opportunities to build redundancy schemes to enhance flight safety.

In the work of the International Telecommunication Union (ITU) leading up to WRC-23, there has been agreement that any recognition of the UAS CNPC application should not adversely impact other users sharing the same frequency bands. Nor should links for this application obtain a higher status than the regular non-safety FSS under which they operate.

Thus, UAS CNPC operation shall neither adversely affect future FSS networks during regular satellite coordination processes nor impose any additional coordination requirements.

Safety of life or other special requirements shall not be used as an argument to request more protection than what is normally considered during the regular bilateral coordination process between FSS networks. Furthermore, UAS CNPC operators must adequately protect terrestrial services and need to accept any interference caused by terrestrial services operating in conformity with the Radio Regulations.

"The upcoming WRC-23 was tasked to review possible detailed regulatory and technical conditions for UAS CNPC operation."

Segregated vs. non-segregated airspace

Segregated airspace is reserved for specific users. Non-segregated airspace is everywhere else.

Unplanned

"Unplanned" refers to frequency bands not subject to the space plans contained in Appendix 30, 30A or 30B of the Radio Regulations.

Questions arising

When considering regulatory provisions and international recognition for widespread UAS CNPC use in regular FSS frequency bands, some important questions arise:

- Interference, normally accidental and unintended, is a regular occurrence between GSO networks in heavily used and severely congested commercial FSS bands. Furthermore, given the current increasing number of non-GSO FSS satellites being launched, operating in the same frequency bands and which do not coordinate with GSO satellites, are those frequency bands suitable to safely control the flight of unmanned aircraft? Are there ways to counter or mitigate interference in a satisfactory manner, such as redundant links or pre-programmed flight paths?

- Can UAS CNPC unconditionally accept interference from terrestrial services in the same frequency bands while ensuring the operational quality of service to safely control unmanned aircraft flight? If so, how?

- How can flight safety be assured without giving a higher status to UAS CNPC links than regular FSS links, and without having an adverse impact on those links? If higher levels of protection were required than those normally considered in bilateral discussions for regular FSS coordination, could this not constitute an obstacle for the coordination and introduction of future FSS networks?

- While spectrum use for UAS CNPC links lies within ITU's remit, the responsibility for flight safety lies with the International Civil Aviation Organization (ICAO) which, independently of ITU, would need to develop its own regulations for UAS CNPC operation. Can we be sure that ICAO rules and regulations will not negate or contradict ITU rules and regulations, or go against principles agreed within ITU?

These are among the many and complex questions that administrations will need to consider under WRC-23 agenda item 1.8 on the issue of the use of regular FSS transponders for UAS CNPC links. Ultimately, the delegates must determine whether the use by UAS CNPC links regular GSO FSS satellite transponders was really a good or a bad idea.

"When considering regulatory provisions and international recognition for widespread UAS CNPC use in regular FSS frequency bands, some important questions arise."

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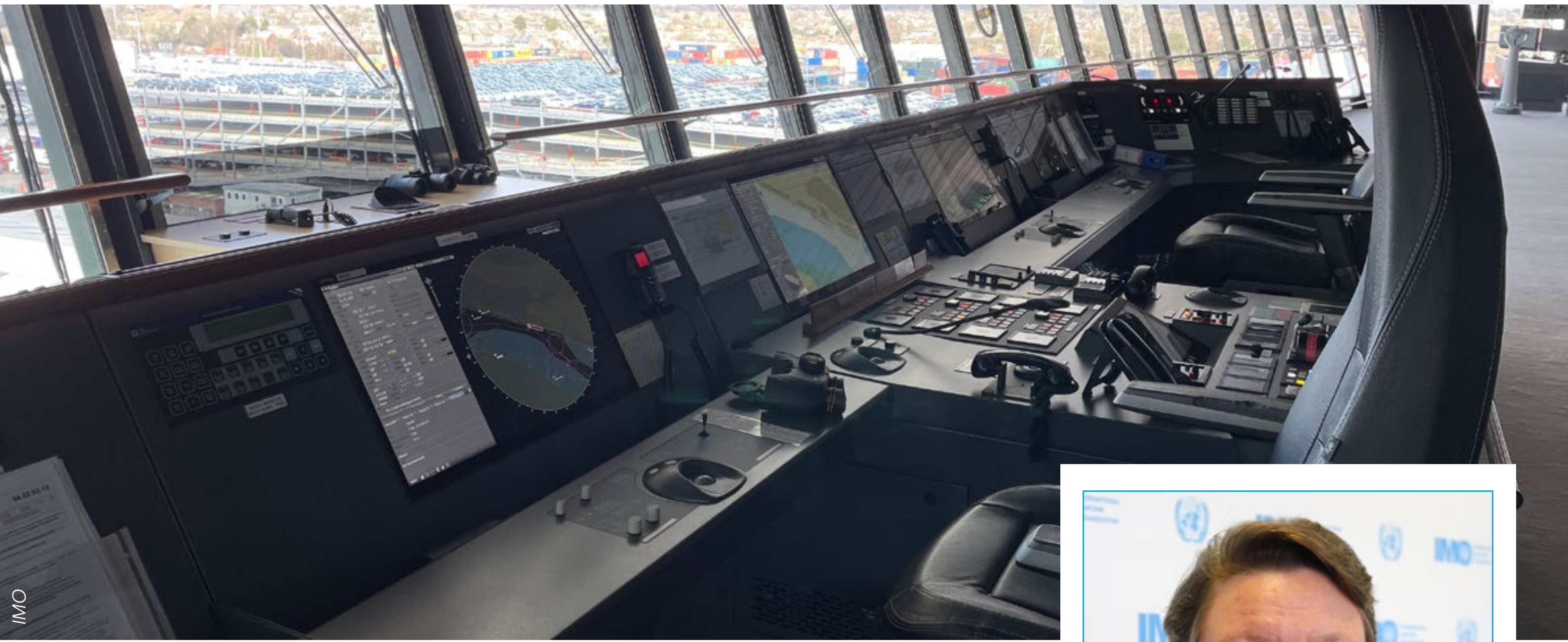
IMO

Supporting world trade through efficient maritime communications

Heike Deggim, Director; Javier Yasnikouski, Head, Operational Safety; and Cafer Ozkan Istanbullu, Technical Officer – Maritime Safety Division, International Maritime Organization (IMO)


Heike Deggim


Javier Yasnikouski


Cafer Ozkan Istanbullu

Maritime transport is a vital component of international trade, handling over 80 per cent of world trade by volume, amounting to approximately 11 billion tonnes per year.

The COVID-19 pandemic was a powerful reminder of how vital maritime transport is to keep supply chains running across the world, especially during crisis times. At its height, the estimated 1.9 million seafarers on approximately 99,800 ships of 100 gross tons and above, ensured that critical goods continue to be shipped despite the serious disruptions.

Crucial radiocommunications at sea

Since the Titanic sank in 1912, the international maritime community has been committed to faster, more reliable and more efficient radiocommunication systems and services, both between ships and with shore stations.

The International Maritime Organization (IMO) sets global standards for radiocommunications in shipping through the International Convention for the Safety of Life at Sea (SOLAS), adopted in 1974. In particular, the Global Maritime Distress and Safety System (GMDSS), established under SOLAS, outlines the requirements for shipborne radio equipment and systems and ensures that a ship in distress at sea will always be heard and responded to, regardless of its location.

In addition to the distress and safety aspects, radiocommunications have also become an integral part of commercial shipping operations. Today, there is an intensified demand from the maritime industry for greater connectivity and higher data capacity to support all maritime operations.

Preparations for WRC-23

IMO and the International Telecommunication Union (ITU), in preparation for ITU's upcoming World Radiocommunication Conference (WRC-23), have conducted studies to determine spectrum needs and regulatory options for maritime services. In particular, WRC-23 agenda item 1.11 looks at the requirements for GMDSS modernization; implementing e-navigation; and introducing additional GMDSS satellite systems.

IMO's own recently completed GMDSS modernization project produced amendments to the 1974 SOLAS Convention and other related instruments, which will enter into force on 1 January 2024, to allow the use of new shipboard communication technologies and removal of outdated requirements.

"Maritime transport is a vital component of international trade, handling over 80 per cent of world trade by volume, amounting to approximately 11 billion tonnes per year."

Heike Deggim, Javier Yasnikouski and Cafer Ozkan Istanbullu

Agenda item 1.11

Possible regulatory actions to support the modernization of the Global Maritime Distress and Safety System and the implementation of e-navigation.

Reutilizing old technology for distress communications and introducing new systems

WRC-23 will consider regulatory actions to address discontinuing narrow-band direct-printing (NBDP) telegraphy for distress communications – a proposal emanating from GMDSS modernization. This would reduce the burden on ships, as well as on governments, to maintain an approach that has already fallen into disuse. However, the use of NDBP will be retained for the reception of maritime safety information (MSI) broadcasts, as well as for general communications.

"In addition to the distress and safety aspects, radiocommunications have also become an integral part of commercial shipping operations."

These to-be discontinued NBDP distress frequencies are meant to be reused for a future automatic connection system (ACS) to provide simple and reliable connectivity for mariners. The ACS would automatically determine the most appropriate frequency to establish radiocommunication links in the medium- and high-frequency bands.

Another proposed update to the ITU Radio Regulations involves the inclusion of an automatic identification system search and rescue transmitter (AIS SART) for survival craft, along with the withdrawal from service of the 1.6 gigahertz (GHz) emergency radio-beacon.

IMO is in the process of introducing a digital navigational data system (NAVDAT) in the GMDSS to enhance broadcasting of maritime safety information and search and rescue-related information to ships. This is in parallel to ongoing considerations at ITU for accommodating NAVDAT frequencies in Appendix 15 of the Radio Regulations alongside other GMDSS frequencies for distress and safety communications.

Amendments to SOLAS are currently being considered to introduce the VHF (very high frequency) data exchange system (VDES), which would expand the capabilities of the current automatic identification system (AIS). VDES would include additional channels and satellite communications, addressing the increasing demand for data exchange at sea, both between ships and with shore.

In collaboration with other international organizations, IMO is further developing the e-navigation concept to reduce administrative burden and increase efficiency in shipping by harmonizing the format and structure of different maritime services, including information exchange between ships and supporting shore services.

Various existing satellite networks already support the concept, and VDES and NAVDAT are expected to follow. From a spectrum regulatory point of view, the requirements for e-navigation are covered, at least for the time being.

BeiDou's message service system for use in GMDSS

Finally, IMO recently recognized the BeiDou Message Service System (BDMSS) for use in the GMDSS, although a number of outstanding issues need to be addressed before service begins. WRC-23 is expected to consider regulatory provisions, while safeguarding the availability and protection of spectrum used by other satellite services.

Once again, the World Radiocommunication Conference in November and December will stage important decisions and exciting developments for maritime services and the maritime industry.

"Once again, the World Radiocommunication Conference in November and December will stage important decisions and exciting developments for maritime services and the maritime industry."

At an IARU "Youth on the Air" camp, individuals are using 1.2 GHz and other VHF frequencies to communicate with an amateur satellite.

IARU

Use of the 1.2 GHz band for amateur radio

Timothy Ellam KC, President,
International Amateur Radio Union

Since its founding in 1925, the International Amateur Radio Union (IARU) has worked tirelessly to defend and expand the frequency allocations for amateur radio.

A proud and active member of the International Telecommunication Union (ITU) – IARU was admitted in 1932 to the CCIR (International Technical Consultative Committee for Radioelectric Communications), the forerunner to today's ITU Radiocommunication Sector (ITU-R), and has been contributing to the work of ITU ever since.

Thanks to the support of enlightened administrations in every part of the world, radio amateurs are today able to experiment and communicate in frequency bands strategically located throughout the radio spectrum.

From 23 countries at its inception, IARU has grown to include over 160 member-societies and has been recognized by ITU as representing the interests of amateur radio worldwide. Today, amateur radio is more popular than ever, with over three million licensed operators around the globe.

"Thanks to the support of enlightened administrations in every part of the world, radio amateurs are today able to experiment and communicate in frequency bands strategically located throughout the radio spectrum."

Timothy Ellam KC

The first to develop bands above 30 MHz

Amateur radio experimenters were among the first to develop frequency bands above 30 megahertz (MHz) and have been active for many years in using very high frequency (VHF), ultra high frequency (UHF) and super high frequency (SHF) amateur allocations.

We are pleased to have this opportunity, ahead of the World Radiocommunication Conference (WRC-23), to highlight amateur radio's use of VHF+ allocations – both primary and secondary – as important tools for radio experimentation, satellite communication, emergency communication and education.

This is very evident in the amateur allocation at the 1.2 gigahertz (GHz) band, where favourable conditions of use encourage a great deal of experimentation and self-training in microwave technology techniques and radio propagation.

The 1.2 GHz frequency band

When the 1.2 GHz band was made available for amateur use at the 1947 International Radio Conference in Atlantic City in the United States, it gave the amateur community the possibility to experiment with a microwave band and offered an excellent introduction for subsequent self-training and hands-on experience.

Amateur radio operators remain at the forefront of radio experimentation.

Along with technical self-training, the 1.2 GHz amateur band opened up possibilities for different modes of communication, including not just voice and data, but also technically challenging inter-continental Earth-Moon-Earth (EME) communications. A wide bandwidth allocation has also helped promote the development of wideband digital amateur television techniques.

IARU has developed a robust band plan for the use of this spectrum, both to avoid interference between the various amateur modes and to minimize interference with other services.

Today, the secondary allocation for amateur radio lies between 1240 MHz and 1300 MHz, while the amateur-satellite (Earth-to-space) allocation uses the 1260–1270 MHz segment.

"Amateur radio operators remain at the forefront of radio experimentation."

"We are pleased that ITU recognizes the value of amateur services in times of crisis, and we are equally proud to assist ITU with the goal of improving emergency communications."

Improving emergency communications

Radio amateurs have a long and proud history of providing communications to alleviate suffering in the wake of natural disasters. They use their VHF, UHF and SHF allocations for many applications, including local networks that operate independently of commercial telecommunication infrastructure.

Crucially, these continue to function when regular communication links are disrupted or overloaded. In one example, amateurs in northern Norway have used the 1.2 GHz allocation for emergency contacts to transmit real-time images from a remote command centre back to the main search and rescue headquarters.

We are pleased that ITU recognizes the value of amateur services in times of crisis, and we are equally proud to assist ITU with the goal of improving emergency communications.

Protecting the radionavigation satellite service primary allocation

ITU-R Working Party 5A is now developing a recommendation to guide administrations if they need to facilitate the protection of the primary allocation for radionavigation satellite service (RNSS), and especially the high-accuracy Galileo E6 service, from transmissions in the secondary amateur and amateur satellite services.

This guidance recommendation – proposed for consideration at WRC-23 under agenda item 9.1, topic (b) – would move certain amateur station operations in the band 1240–1300 MHz away from RNSS operating centre frequencies. Together with reasonable power-level constraints, this should allow amateur and amateur-satellite services to continue using the 1.2 GHz band for their operations, self training, and emergency communication.

Seeking consensus

IARU has cooperated with others in the Working Party 5A framework in an attempt to reach consensus on a proportionate recommendation, which would protect the RNSS and at the same time retain spectrum and power levels that allow the important work of radio amateurs at 1.2 GHz to continue.

Agenda item 9.1 topic (b)

9 Consider and approve the Report of the Director of the Radiocommunication Bureau

9.1 on the activities of the ITU Radiocommunication Sector since WRC-19:

(b) Review the amateur service and the amateur-satellite service allocations in the frequency band 1240–1300 MHz to determine if additional measures are required to ensure protection of the radionavigation-satellite service (space-to-Earth) operating in the same band.

What is Galileo HAS?

The Galileo High Accuracy Service (HAS) provides free-of-charge access, through the Galileo signal (e6-B) and by terrestrial means (Internet), to accurate positioning information, allowing estimates based on a precise point positioning algorithm in real-time.

Source: EUSPA

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