

# WRC-23 Results with possible Impact on Video Frequencies

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## Introduction

WRC-23 has just been finalised. Many deliverables, based on proposals from participating radio administrations from many countries, have been finalised. With regard to wireless production tools, we focus on audio and video tools that use many frequency ranges worldwide. In the following text we focus on video tools in several frequency bands.

The main focus of Video PMSE is on these radio frequency bands:

2010-2110 MHz, 2200-2500 MHz, 2700-2900 MHz, 3400-3600 MHz, 4400-5000 MHz, 6700-8500 MHz, 10.0-10.68 GHz, 21.2-23.6 GHz, 24.0-24.5 GHz and 47.2-50.2 GHz

The challenge of video transmission is the ever-increasing demand for display resolution on end devices. Whereas in the past it was 720p (1280 x 720 pixels), 1080p (1920 x 1080 pixels), 2K (2048 x 1080 pixels), 1440p (2560 x 1440 pixels), the current trend is moving from 4K (4096 x 2160 pixels) to 8K (7.680 x 4.320 pixels). This image outlines from the video camera's point of view that a higher resolution can capture more of the environmental content;



The "explosion" in the display resolution provided to the end customer results in a significantly higher bandwidth requirement for the transmission of the video content. With digital television broadcasters (e. g. DVB-T2), the video signal is compressed in order to reduce the bandwidth required for content provision. Something similar can of course also be used with video cameras. Unfortunately, there is considerably less room for manoeuvre here than with content provision. The problem: multiple signal compression generates disturbing artefacts in the video content. This can significantly reduce the value of the final product. This is not accepted by the market.

Summary: a significant increase in screen resolution inevitably leads to a considerable increase in the frequency bandwidth required for the video cameras used at the beginning of the entire production chain.

## Initial summary

Taking into account the WRC-23 action items, we outline below the expected impact on the video frequency ranges used so far.

In co-operation with video experts, to which we are currently inviting, we expect to be able to supplement this data.

These frequency bands, which are fully or partially utilised by video PMSE, are currently being considered for new wireless services or applications;

- 2 010-2 025 MHz, Harmonised within EU member states, Decision (EU) 2016/33
- 2 483.5-2 690 MHz
- Frequencies in the range around 2.7 GHz
- 3 400-3 700 MHz
- 4 400-5 000 MHz
- 7 125-8 500 MHz
- 9 200-10 400 MHz
- 22.55-23.15 GHz
- 37.5-52.4 GHz
- 47.2-50.2 GHz

## Upcoming activities in ITU-R

Immediately after WRC-23, preparations began for the next WRC as part of CPM27-1, where upcoming tasks were assigned to the responsible ITU-R working groups. Our challenge is to identify the necessary tasks in which we must participate and provide the necessary resources.

## Examples of frequency allocations or recommendations for studies

### Agenda Item 1.2

#### MOD

**5.429A** *Additional allocation:* in Angola, Botswana, Burkina Faso, Burundi, Cabo Verde, Central African Republic, Comoros, Djibouti, Eritrea, Eswatini, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mauritania, Mozambique, Namibia, Niger, Nigeria, Palestine\*, the Dem. Rep. of the Congo, Rwanda, Sao Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Sudan, South Africa, Tanzania, Chad, Togo, Zambia and Zimbabwe, the frequency band 3 300-3 400 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis. Stations in the mobile service operating in the frequency band 3 300-3 400 MHz shall not cause harmful interference to, or claim protection from, stations operating in the radiolocation service. (WRC-23)

#### Summary:

It was subsequently decided to utilise the 3300-3400 MHz frequency range. This has no co-channel impact on video radio frequencies.

Agenda Item 7(C)

**MOD**

**18.4-22 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>20.2-21.2</b>	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) Standard frequency and time signal-satellite (space-to-Earth) 5.524 ADD 5.B7(C)3	

Summary:

It was subsequently decided to utilise the 18.4-22 GHz frequency range. This may have co-channel interference on video radio frequencies in use.

Agenda Item 1.10

**MOD**

**22-24.75 GHz**

Allocation to services		
Region 1	Region 2	Region 3
<b>22-22.2</b> FIXED MOBILE except aeronautical mobile (R) ADD 5.B110 ADD 5.C110 ADD 5.D110 ADD 5.E110 ADD 5.F110 5.149	<b>22-22.2</b> FIXED MOBILE except aeronautical mobile 5.149	<b>22-22.2</b> FIXED MOBILE except aeronautical mobile ADD 5.G110 5.149
<b>22.2-22.21</b>	FIXED MOBILE except aeronautical mobile 5.149	

Summary:

It was subsequently decided to utilise the 22-24.75 GHz frequency range. This may have co-channel interference on video radio frequencies in use.

Agenda Item 1.18

**RESOLUTION 248 (WRC-19)**

**Studies relating to spectrum needs and potential new allocations to the mobile-satellite service in the frequency bands 1 695-1 710 MHz, 2 010-2 025 MHz, 3 300-3 315 MHz and 3 385-3 400 MHz for future development of narrowband mobile-satellite systems**

Summary:

In Europe, 2010-2025 MHz is harmonised for video PMSE applications. RESOLUTION 248 addresses this frequency range for future use. Participation by video PMSE experts in upcoming studies is recommended.

Agenda Item 9.1

**MOD**

TABLE 21-2 (Rev.WRC-23)

Frequency band	Service	Limit as specified in Nos.
...	...	...
17.7-18.4 GHz 18.6-18.8 GHz 19.3-19.7 GHz 22.55-23.55 GHz 24.45-29.5 GHz	Fixed-satellite Earth exploration-satellite Space research Inter-satellite	21.2, 21.3, 21.5 and 21.5A

NOTE: Additional frequency bands above 29.5 GHz may be considered for inclusion in Table 21-2 by a future competent conference.

Summary:

It was subsequently decided to utilise the 22.55-23.55 GHz frequency range. This may have co-channel interference on video radio frequencies in use.

Agenda Item 10

**MOD**

RESOLUTION 249 (REV.WRC-23)

**Study of technical and operational issues and regulatory provisions for space-to-space transmissions in the frequency bands 1 518-1 544 MHz, 1 545-1 559 MHz, 1 610-1 645.5 MHz, 1 646.5-1 660 MHz, 1 670-1 675 MHz and 2 483.5-2 500 MHz**

**MOD**

RESOLUTION 176 (REV.WRC-23)

**Studies on the use of the frequency bands 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space), or parts thereof, by aeronautical and maritime earth stations in motion in the fixed-satellite service**

Summary:

It was subsequently decided to utilise the 2483.5-2500 MHz and 47.2-50.2 GHz frequency range. This may have co-channel interference on video radio frequencies in use. RESOLUTION 176 and RESOLUTION 249 addresses this frequency range for future use. Participation by video PMSE experts in upcoming studies is recommended.