

2021 - A crucial year

Although the next World Radiocommunication Conference will not take place until 2023, a national German position is already being pushed now, in 2021: The issue is the future use of the frequency range between 470 and 694 MHz, which has so far been used for wireless means of production such as radio microphones, terrestrial TV transmission and astronomy. Now mobile communications and some public authorities are registering their interest in the spectrum. The distribution battle has begun.

by Jochen Zenthöfer

It was a timely drumbeat - "Keep the frequencies for culture and broadcasting!" - demanded six members of Germany's parliament from the parties SPD (Social Democrats), FDP (Liberal), Left Party and Greens in a statement around the turn of the year 2020/21. The appeal, which was published on the website "netzpolitik.org," did not fail to make an impact. Now the future of broadcasting frequencies, also called cultural frequencies (in German: "*Kulturfrequenzen*"), is being negotiated at the highest political level.

A lot is happening: FDP member of the Bundestag Thomas Hacker submitted a question to the Federal Ministry of the Interior. Margit Stumpp, a member of the Green Party, organized a social media theme week in February 2021. She provided information on Instagram and Facebook about the importance of the frequencies in the range between 470 and 694 MHz. She demanded a guarantee that the frequencies may be used at least until 2030. SPD politician Gustav Herzog put the future of the UHF band on the agenda of the advisory board of the Regulatory Agency "Federal Network Agency" (*Bundesnetzagentur*).

FDP member of parliament Christian Jung assured the stages and trade fair organizers in his constituency of the city of Karlsruhe that he would work to save the necessary frequencies. And left-wing politician Anke Domscheit-Berg tapped her fingers to the bone on Twitter to point out the importance of culture, especially in the pandemic. The party CDU from chancellor Angela Merkel also intervened. Its cultural policy spokeswoman in the Bundestag, Elisabeth Motschmann, met with the Association APWPT e. V. and the "SOS - Save Our Spectrum" initiative to get an update.

The great political interest is no coincidence. The future of the UHF band will not be decided until the World Radiocommunication Conference in 2023 as agenda item 1.5. But national positions are already developing before then. In this context, the year 2021 is of crucial importance. The Federal Network Agency has commissioned a study that will record what demand there is for the frequency band for stages, the event industry and others. The APWPT and SOS interest groups will also be surveyed for this analysis. But potential users are also expressing interest and calling for a reallocation of the band.

On the one hand, mobile communications companies want to secure additional areas, even though they already have more than 1300 MHz of spectrum. Allegedly, this is to plug radio gaps. But mobile communications does not lack frequencies, but rather modern antenna technology and "national roaming". Both are technically and legally possible and would preserve the cultural frequencies.

The "Public protection and disaster relief" (PPDR) also have an increasing need for frequencies. In the future, the police, fire department, customs and others want to operate not only voice communication, but also data communication. Initially, they had their sights set on the 450 MHz range. However, the energy industry needs this range.

Now, the PPDR want to push into the 470 MHz range, and the question of distribution arises: Who will fly out of the frequency spectrum? What will happen to the European harmonization of this band for radio microphones, which has made touring possible up to now? The danger of not only a shortage of frequencies but also a European patchwork is real. Terrestrial television transmission would also suffer. This is often used by people who cannot afford cable or satellite connections.

In addition, the home antenna (terrestrial) allows anonymous use of television. This is not possible with the other reception paths, except via satellite, which requires a highly visible dish on the roof of the house. The end of terrestrial transmission would mean the end of anonymized use. Moreover, terrestrial transmission is the most environmentally friendly form of television use. Radio microphones have been using the gaps between TV stations in good coexistence for decades. This works well and should be continued.

Authorities such as the police, fire department, customs use a nationwide digital voice and data radio system. It is based on the international TETRA standard (Terrestrial Trunked Radio; digital trunked radio) and mainly uses frequency ranges between 380 and 410 MHz. For PPDR, the cultural frequency range (470 to 694 MHz) or part of it would be unsuitable: there are no terminals. Existing cell phones and base stations cannot use 470 to 520 MHz because of the long wavelength. In addition, the transmission technology of BOS with often omnidirectional antennas is not suitable. BOS needs above all the uplink (videos from the accident site, fire scene or the demo to the operation center, scanning of documents, etc.). This does not work. Relays could help, but are only used for major incidents. In addition, the antenna network is far too small. For BOS, it is therefore much more advantageous to use existing infrastructures.

Thanks to the network slicing technology available for 4G and 5G, all the transmission capacity requirements of PPDR (upload and download) can be mapped in existing mobile radio infrastructures. The requirements for broadband transmission capacity can thus be met extremely quickly (the infrastructure and terminal equipment are available on the market at known and favorable prices), extremely securely (cf. encrypted "Chancellor's cell phone" in the Deutsche Telekom network) and extremely cost-effectively (no new infrastructure needs to be built).

Load balancing between the existing infrastructures makes it possible to optimally handle local and temporal peak demands for upload and download capacities. A self-contained broadband PPDR radio network can therefore be set up quickly on the basis of the existing mobile radio infrastructures. Additional spectrum is not required, and the efficient use of frequencies already allocated today would be increased. In this way, the cultural frequencies would be secured in the long term.

It should be borne in mind that the number of cultural events and thus the number of wireless production resources required for them increased continuously up to the start of the pandemic. This is also evident from reports by the German government. A further increase is expected from 2022. The UHF range is the only range that penetrates obstacles such as decorations, which often consist of steel or aluminum structures. This is the only way to ensure that the audience can understand the artists and musicians without interference.

"As the bearers of broadcasting and cultural sovereignty, the 16 German states (*Bundesländer*) have a say in what happens to cultural frequencies," SOS founder Helmut G. Bauer (Germany) recently explained in a public contribution: "The current statements of many heads of state and senate

chancelleries show that the topic does not (yet) seem to be on their agenda in 2021." Consequently, the members of the *Bundestag* declared in their appeal: "Frequencies are vital for the cultural industry. Despite all the technological progress, it is not yet foreseeable whether further digitalization and the use of 5G will be available to the cultural industry and the event sector as an efficient alternative.

Therefore, the German Bundestag should reaffirm its commitment to support culture during this legislative period and renew the pledge to secure frequencies until December 2030. At the same time, the cultural and creative industries deserve a perspective for the decade that follows." A clear signal from the politicians for the continued existence of cultural frequencies! But whether the government will act sensibly in 2021 also depends on the commitment of the SOS and APWPT initiatives and of each individual artist: for example, by writing a message to their members of parliament and drawing attention to the problem.

Dr. Jochen Zenthöfer has been co-chair of the Association of Professional Wireless Production Technologies e. V. (APWPT). The association has its headquarters in Berlin, operates internationally and coordinates closely with the "SOS - Save Our Spectrum" initiative, which is based in Luxembourg.

Status: March 12, 2021

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