

IARU Region 1 HF bandplan – why?

Ulrich Mueller, DK4VW, Chairman IARU Region 1 HF Committee C4

After amateur radio was recognized as a service at the first World Radio Conference in Washington (DC) 1927 and had some HF bands allocated, the amateur radio societies agreed to suggest recommendations on how to use them.

In the beginning the bands were divided only in sections for telegraphy and telephony; in the 1960s Radio Teletype (RTTY) and later other digital modes (Packet, Amtor) were added. In addition to the segment for RTTY, a specific segment for Packet Radio was introduced into the bandplan; however packet turned out to be rather unsuitable for HF and is rarely used. All the different digital modes that were developed and used for some time for experiments caused the HF managers of IARU Region 1 to think about a method to react more flexibly to mode changes.

Should each IARU Region 1 conference, which takes place every 3 years, modify the bandplan in favour of a new digital mode and delete the out dated ones? The solution found was to divide the HF bands into segments with a different maximum of occupied bandwidth for the specific modes: segments with max. 200 Hz, 500 Hz, 2700 Hz, and in the 10m band additionally with max. 6000 Hz bandwidth.

Up to the maximum bandwidth all modes should get access to the specified segments with equal rights. A bandplan following this philosophy was introduced for the first time by the Davos conference 2005.

The bandplan shows these columns: Frequency, Max. Bandwidth, Preferred Mode and Usage.

Segments with 200 Hz maximum bandwidth:

Only CW is named in these segments. This means that **only CW** mode should be used. In fact this is in contradiction to the bandwidth philosophy, but there are historical reasons for this singular exception: It is intended to separate CW operation from the digimodes which are generated and decoded by computers and therefore might not recognize weak CW signals. With that reasoning even PSK31 operation (with its very low bandwidth) is not included in the max. 200 Hz segments.

Segments with 500 Hz maximum bandwidth:

These segments are intended for **all narrow band modes** not exceeding 500 Hz bandwidth. In practice these modes are all digimodes (RTTY, AMTOR, JT65, PSK31 etc.).

Segments with 2700 Hz maximum bandwidth:

All modes with up to 2700 Hz bandwidth may be used; such a maximum bandwidth is needed for SSB or digital modes transmitting text, image or voice. The bandwidth of a normal SSB filter has set this upper limit of 2700 Hz. Such a limitation should allow usage of the band by as many stations as possible with an equal fraction of a band, independent of mode.

In the past we had no limitation of bandwidth indicated in the bandplan, but the introduction of such limitation is justified by the increasing number of radio amateurs during the past decades.

A digital voice or image mode could occupy up to 10 kHz running to full efficiency; in the former 40m band only 100 kHz wide, a few of such QSOs would block the entire band Europe-wide, which is not acceptable.

Segments with 6000 Hz maximum bandwidth:

Modes with up to 6000 Hz may be used on frequencies above 29200 kHz, since the 10m band is wide. In practice such a bandwidth is used mainly for FM transmissions with a very low modulation index.

Explanation of “Preferred Mode and Usage”:

Centre of Activity

These are frequencies on which certain activities, like QRS or QRP, should concentrate. They are mostly derived from practice and should advise where somebody with the same interest can find a QSO partner more easily. Indirectly such a note is a recommendation to those with no interest in the special interest to avoid this frequency for calling CQ. In the sense of good self regulation of the amateur radio service everyone should keep this in mind.

Nobody may claim to use a specific frequency or one around it, a centre of activity may not be interpreted as a frequency reserved for an interest group. If such a frequency is already occupied, one has to move some kHz to the next free frequency, which is the standard procedure for the entire band.

Digimode

Some parts of a segment with a max. bandwidth of 500 or 2700 Hz indicate digimodes as the preferred mode. This is another recommendation to find a QSO partner with the same interest more easily. There are also small sub segments for automatically controlled data stations (unattended) to separate those from the operation by individual amateurs. Automatically controlled stations need well known frequencies to be able to make automatic data transfer between themselves or to be called by interested amateurs. To avoid the risk of QRM by these automatically operated stations individual amateurs interested in contacts with other individuals are encouraged to stay away from these small sub segments. Digimodes are not limited to segments with the indication “preferred usage digimode”, the words “all narrow band modes ” and “all modes” in the second column may be understood literally, which is helpful during contests (e.g. RTTY) with high activity.

Contest Preferred Segments

With its bandplan the IARU Region 1 gives recommendations to participants and organizers of contests to use only specific parts of the band, so called “contest preferred segments” for contest activities. This allows those amateurs not interested in contests, to use parts of the bands without contest activity. The last IARU Region 1 conference in Cavtat 2008 underlined this with additional recommendations. Some societies (e.g. DARC, UBA, USKA, VERON etc.), but also IOTA and the Scandinavian Contest regulate the allowed contest frequencies by rule or make the IARU Region 1 bandplan mandatory for participants.

Contest operation outside the specified segments is a violation of contest rules and the adjudicator can take appropriate measures. Though IARU Region 1 cannot force the individual amateur to follow

the bandplan everybody is encouraged to understand the principle of self regulation and to follow the recommendations.

Amplitude Modulation

This mode with a bandwidth exceeding 2700 Hz is occasionally used for historical reasons. A footnote to the bandplan is trying to cope with such requirement: Amplitude modulation (AM) may be used in the telephony sub-bands provided consideration is given to adjacent channel users. It was agreed by the conference that a special segment for AM is not useful; it would encourage AM which is not intended.

Telegraphy

All segments with a max. bandwidth of 200 Hz are to be used only with CW, but CW operation is not limited to these segments. CW is allowed all over the bands, since in the segments for “all narrow band modes” (up to 500 Hz) or “all modes” (up to 2700 Hz) a CW signal also fits with these definitions. This makes mixed operation possible, e.g. a SSB station may be called by a CW station.

Beacon Bands

Around the beacon frequencies of the International Beacon Project (IBP, operated by NCDXF) the bandplan shows small segments of +/- 1 kHz in which to enable propagation studies. Unfortunately some stations don't always comply with this requirement, especially during contests, and cause interference to beacon reception.

It seems that not everybody understands that digimode usage (e.g. RTTY in a contest) may also take place above 14101 kHz, since the recommendation for digimode continues and the bandwidth of a RTTY signal does not exceed the max. allowed bandwidth of 2700 Hz. Some may have forgotten that an AFSK generated RTTY signal using frequencies up to 2 kHz in USB, and the resulting signal is transmitted about 2 kHz higher in frequency than the VFO display shows (e.g. 14098 kHz) – which means it is transmitting on top of the beacons!

Please avoid operating between 14099 and 14101 kHz.

What does note (1) mean?

Depending on the sideband selected a transmitted signal appears below or above the displayed frequency. On the bands 40m to 160m lower sideband is used for SSB. Note (1) should remind you that the VFO display must not be set lower than the noted frequencies. On 40m the lowest VFO display setting for LSB in the segment for all modes with up to 2700 Hz would be 7053 kHz. (If no digimode activity takes place the segment of 7050-7060 kHz may be used for SSB).

On the 20m and higher bands the frequency display must be kept 3 kHz below the upper band limit, otherwise parts of the signal will be transmitted outside of the amateur band. Some countries have a limited allocation on the 160m band, e.g. only 1810–1850 kHz. Therefore IARU tolerates phone operation there, although this is a violation of the 160m bandplan, which assumes a band up to 2000 kHz. In such cases the lowest possible setting of the frequency for LSB is 1813 kHz – a lower setting will result in an out of band operation which is strictly forbidden by ITU and national administration.

Extension of the 40m band

For ITU Region 1 the World Radio Conference 2003 reclaimed the segment 7100-7200 kHz from the historical 40m band (7-7.3 MHz). In advance of the conference considerable efforts were needed worldwide in administrations, international bodies and amateur radio societies, including IARU. Distributed over several years some hundreds of meetings were needed for the positive outcome.

It has been said that the total costs of all meetings, including the WRC itself, were estimated in the order of 1 billion \$. If this cost is averaged by the amount of the frequencies discussed, the extension of our 40m band cost about 33 million \$.

PSK31 in the new digimode segment above 7040 kHz

Knowing the incurred costs of the band extension it is difficult to understand why the resulting possibilities are only partially accepted by amateurs. Since 29 March 2009 the doubled 40m band space gave IARU Region 1 the possibility to promote the digimodes by giving much more room than before, but this was associated with a shift of the segments. It is a pity that most PSK31 activity still takes place near 7037 kHz, which is now in the ***exclusive CW band section of 7000-7040 kHz***.

Please operate in digimodes only above 7040 kHz, e.g. PSK31 on 7041-7042 kHz.

It is envisaged that identical splitting up of the bands is made equal in all IARU Regions. Region 2 (America) hasn't yet adjusted its bandplan to the Region 1 bandplan. In Region 2 PSK31 at 7042 kHz would be in the "all modes" segment with max. 2700 Hz, while in Region 1 it is in the "all narrow band modes" segment; such usage conforms to both bandplans.

Is the IARU Region 1 bandplan only a recommendation or an obligation?

Some societies have the answer in a statement in their by-laws, requesting to respect the IARU Region 1 bandplan as mandatory. But also non-members should follow the recommendations when selecting a frequency. Adopted at an IARU Region 1 conference by delegates of member societies, the bandplan is based on a self-regulation process as a compromise of the various interests of ***all*** amateurs.

Bandplans for downloading:

<http://www.iaru-r1.org> [Spectrum & Band Plans](#)

<http://www.iaru.org/bandplans.html>

In a slightly different form:

<http://www.darc.de/funkpraxis/iaru-bandplaene-kurzwelle-hf-bands/iaru-band-plans-hf/> (English)

<http://www.darc.de/funkpraxis/iaru-bandplaene-kurzwelle-hf-bands/> (German)

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