



International Amateur Radio Union Region 1

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Subject: HF band plan (30 m)
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Summary:

- 1) The 30 m band allows almost daily communication between all parts of the world. However, differences in the band plans among the three IARU regions make it difficult to fully profit from this capability.
- 2) Harmonisation of band plans among IARU regions is a generally accepted aim. On October 14, 2016, IARU R2 accepted various changes to its band plans in view of better harmonisation with R1 and R3. It is desirable that IARU R1 further this harmonisation by adapting its 30 m band plan. Allowing wideband **digimode (< 2700 Hz) and CW (but no voice) in the segment from 10,140 to 10,150 kHz** will lead to total agreement in this band between R1 and R2.
- 3) The 30 m band is the only HF band in which digimode operation is not allowed up to a bandwidth of 2700 Hz. It is difficult to understand the reason for this. In other bands with small total bandwidths there is considerable room for 2700 Hz operation. For instance, on 17 m and 12 m -- with 100 kHz just double the size of 30 m -- 57% and 59%, respectively, are allocated for 2700 Hz.
- 4) This proposal would reduce the present 500 Hz bandwidth partition on 30 m by 10 kHz. The band's current 20 kHz segment for narrowband (< 500 Hz) digimode is proportionally more than what is available in other bands. Today the 30 m band reserves 20 kHz out of 50 kHz (or 40%) for 500 Hz digimode. This would be changed to 20% - still much more than in the other bands.

| Band | 80 | 40 | 30 | 20 | 17 | 15 | 12 | 10 |
|--------------|-----|-----|----|-----|-----|-----|-----|------|
| Total [kHz] | 300 | 200 | 50 | 350 | 100 | 450 | 100 | 1700 |
| 500 Hz [kHz] | 20 | 10 | 20 | 29 | 14 | 40 | 14 | 120 |
| 500 Hz [%] | 6.7 | 5 | 40 | 8.3 | 14 | 8.9 | 14 | 7.1 |

- 5) Emergency communication is a recognized purpose of amateur radio. It needs efficient message transmission and must rely on wideband digital modes with high data throughput. Transmission speed is usually proportional to signal bandwidth for a specific modulation. Thus, a digimode with a BW of 2500 Hz would be roughly 5 times faster than with a BW of 500 Hz. With progress in digital signal processing, the most efficient modems for message exchange require a bandwidth of at least 2400 Hz. It is necessary to allow such signals on all HF bands in order to be prepared for emergency communications.

Below is a comparison of the maximum throughput of popular messaging

modes for 500 Hz and 2700 Hz bandwidth limits in bits/s:

| Bandwidth | Mode | PDR | NDR |
|-----------|------------------|-------|---------|
| < 2700 | VARA | 10920 | 5802 |
| | PACTOR 4 | 9000 | 5512 |
| | PACTOR 3 | 3600 | 2722 |
| | WINMOR 1600 | 2250 | 1800 |
| < 500 | PACTOR 2 | 800 | 700 |
| | WINMOR 500 | 562.5 | 307.5 |
| | ROBUST PACKET | 800 | 600 |
| | PACKET RADIO 300 | 300 | ca. 250 |

PDR: Physical data rate; NDR: Net data rate

- 6) Using wideband modes for message transmission does NOT increase total spectrum use (meant as the product of bandwidth and transmission time) because transmission time is usually inversely proportional to the bandwidth used. While transmission of a specific message in a wideband mode would need 3 min, transmitting the same message in a narrowband mode would need 15 min or more.

Live tests on 80 m have proven that a message of 55 kBytes could be transmitted as follows:

| Bandwidth | Mode | Time [min:s] | Bytes/min | Speed [%] |
|-----------|------|--------------|-----------|-----------|
| < 2700 | VARA | 2:17 | 24'130 | 585 |
| | P4 | 2:50 | 19'370 | 470 |
| < 500 | P2 | 13:21 | 4'130 | 100 |

Proposal: The Region 1 Band Plan for 30 m shall allow digimodes with a bandwidth of < 2700 Hz and CW from 10,140 – 10,150 kHz, but no voice operation. The change would become effective after final consent by the IARU R1 General Conference 2020.

Financial Implications: Minor. Publication of the new Band Plan in the Internet.