IEEE P802.22
Wireless RANs

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| Proposed Text for the IEEE802.22b |
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|  |  |  |  |  |

Abstract

This document contains the proposed text for P802.22b.

# I. Introduction

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This contribution provides the proposed text for the IEEE 802.22b draft on PHY.

# II. Text Proposals

*[Start of Proposed Text]*

1. PHY

[ Modify Table 198 as follows]

1. System parameters for WRAN

|  |  |  |
| --- | --- | --- |
| **Parameters** | **Specification** | **Remark** |
| Frequency range | 54~862 MHz\* |  |
| Channel bandwidth | 6, 7, or 8 MHz | According to regulatory domain (see Annex A). |
| Data rate | 4.54 to 31.78 Mbit/s | See Table 202 |
| Spectral Efficiency | 0.76 to 5.30 bit/(s·Hz) | See Table 202 |
| Payload modulation | QPSK, 16-QAM, 64-QAM256-QAM, MD-TCM-QAM | BPSK used for preambles, pilots and CDMA codes. |
| Transmit EIRP | 4W maximum for CPEs. 4W maximum for BS’s in the USA regulatory domain. | Maximum EIRP for BS’s may vary in other regulatory domains. |
| Multiple Access | OFDMA |  |
| FFT Size (NFFT) | 2048 |  |
| Cyclic Prefix Modes | 1/4, 1/8, 1/16, 1/32 |  |
| Duplex | TDD |  |

\* Frequency range allocated to the Television Broadcasting Service in various parts of the world. See Annex A for further details.

*[End of Proposed Text]*

*[Start of Proposed Text]*

### 9.2 PHY mode

[ Add additional PHY mode into Table 202]

**Table 202** — **PHY Modes and their related modulations, coding rates and data rates for TCP = TFFT/16**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PHY Mode** | **Modulation** | **Coding Rate** | **Data rate (Mb/s)** | **Spectral** **Efficiency (for 6 MHz　bandwidth)** |
| (No change for PHY modes 1-16) |  |  |  |  |
| 17 | 256-QAM | 1/2 | 18.16 | 3.03 |
| 18 | 256-QAM | 2/3 | 24.2 | 4.03 |
| 19 | 256-QAM | 3/4 | 27.24 | 4.54 |
| 20 | 256-QAM | 5/6 | 30.24 | 5.04 |
| 21 | 256-QAM | 7/8 | 31.78 | 5.30 |
| 22 | 4D-48TCM | 10/11 for 2 \*2D symbol | 22.69 | 3.78 |
| 23 | 4D-192TCM | 14/15 for 2 \*2D symbol | 31.78 | 5.30 |

*[End of Proposed Text]*

*[Start of Proposed Text]*

**9.8 Constellation mapping and modulation**

**9.8.1 Data modulation**

[Modify text above Fig. 150]

The output of the bit interleaver is entered serially to the constellation mapper. The input data to the mapper

is first divided into groups of number of coded bits per carrier, i.e., NCBPC (see Table 226) bits and then

converted into complex numbers representing QPSK, 16-QAM, 64-QAM or 256-QAM constellation points. The mapping for QPSK, 16-QAM and 64-QAM is performed according to Gray-coding constellation mapping,

as shown in Figure 150, Figure 151, Figure 152, and Fig. 152a respectively where b0 represents the most significant modulation bit for all constellations.

[ Add New Fig. 152a below Fig. 152]



**Fig. 152a Gray Mapping for 256QAM**

*[End of Proposed Text]*

*[Start of Proposed Text]*

[Modify Table 226 and Table 227 as follows]

**Table 226** — **Number of coded bit per carrier and normalization factor for different modulation constellations**

|  |  |  |
| --- | --- | --- |
| **Modulation Type** | **NCBPC** | **KMOD** |
| QPSK | 2 | 1/√2 |
| 16-QAM | 4 | 1/√10 |
| 64-QAM | 6 | 1/√42 |
| 256-QAM | 8 | TBD |

**Table 227** — **Number of coded bits per OFDM slot (NCBPS) and corresponding number of data bits for different modulation constellation and coding rate combinations**

|  |  |  |  |
| --- | --- | --- | --- |
| **Constellation type** | **Coding rate** | **NCBPS** | **Corresponding number of data bits** |
| QPSK | 1/2 | 48 | 24 |
| QPSK | 2/3 | 48 | 32 |
| QPSK | 3/4 | 48 | 36 |
| QPSK | 5/6 | 48 | 40 |
| 16-QAM | 1/2 | 96 | 48 |
| 16-QAM | 2/3 | 96 | 64 |
| 16-QAM | 3/4 | 96 | 72 |
| 16-QAM | 5/6 | 96 | 80 |
| 64-QAM | 1⁄2 | 144 | 72 |
| 64-QAM | 2/3 | 144 | 96 |
| 64-QAM | 3/4 | 144 | 108 |
| 64-QAM | 5/6 | 144 | 120 |
| 256-QAM | 1/2 | 192 | 96 |
| 256-QAM | 2/3 | 192 | 128 |
| 256-QAM | 3/4 | 192 | 144 |
| 256-QAM | 5/6 | 192 | 160 |
| 256-QAM | 7/8 | 192 | 168 |

*[End of Proposed Text]*

# References:

[1] IEEE Std. 802.22TM-2011, July 2011.