

IEEE 802.22 Wireless Regional Area Network

IEEE 802.22, is a standard for wireless regional area network (WRAN) using white spaces in the TV frequency spectrum with following specificities

- Coverage: Up to 100 km [1]
- Max Delay Spread (μ s) : 11 to 25, 25 to 60 [1]
- Total Bandwidth: 6 MHz, 7 MHz, 8 MHz [1]
- Maximum Data Rate: 22 Mbps, 69 Mbps [1]
- Modulation: OFDM [1]
- Payload Modulation: QPSK, 16-QAM, 64-QAM [1]
- Error Correcting Code: Convolutional code, CTC, LDPC, SBTC[1]
- Range for Best MAC Efficiency: 17 km to 33 km radius [1]
- Downlink: 1.5 Mbps [2]
- Uplink: 384 kbps [2]
- Channel Capacity: 18 Mbps [2]
- Frequency Range: 54 MHz to 862 MHz [3]
- Multiple Access: OFDMA [3]
- Cyclic Prefix Modes: 1/4, 1/8, 1/16, 1/32 [3]
- Maximum Power Limit: 4 W [4]

❖ Values for Wireless Microphones

- Channel Availability Check Time: 30 sec [5]
- Non-Occupancy Period: 10 minutes [5]
- Channel Detection Time: 500 msec to 2 secs [5]
- Channel Setup Time: 2 sec [5]
- Channel Opening Transmission Time: 100 msec [5]
- Channel Move Time: 2 secs [5]
- Channel Closing Transmission Time: 100 msec [5]
- Inference Detection Threshold: -107dBm [5]
- Power Limit: 250 mW [13]
- Frequency Bands: 54 to 72 MHz, 76 to 88 MHz, 174 to 216 MHz, 470 to 698 MHz, 902 to 928 MHz, 2400 to 2483.5 MHz, 5725 to 5850 MHz [13]

❖ Values for TV Broadcasting

- Channel Detection Time: less than 2 secs [6]
- Channel Move Time: 2 secs [6]
- Channel Closing Transmission Time: 100 msec [6]
- Inference Detection Threshold: -116dBm [6]
- EIRP: 3, 9 dBm [8]

- Channel Bandwidth: 8, 24 MHz [8]
- Power Limit: [10]
 - Fixed Devices: 30 dBm
 - Personal/ Portable Devices (adj. channel): 16 dBm
 - Sensing Only: 17 dBm
 - All other Personal/ Portable Devices: 20 dBm
- Channel Bandwidth: 5, 10, and 20 MHz [11]
- 5 MHz Channel: [11]
 - Radio Data Rate: 1.5, 6, 12 Mbps
 - Data Throughput: 1.3, 4.3, 7 Mbps
 - Modulation: BPSK, 16 QAM, 64 QAM
 - Max Tx Power: 30, 30, 24 dBm
 - Rx Sensitivity: -96, -86, -76 dBm
- 10 MHz Channel: [11]
 - Radio Data Rate: 3,12, 24 Mbps
 - Data Throughput: 2.5, 8, 14 Mbps
 - Modulation: BPSK, 16 QAM, 64 QAM
 - Max Tx Power: 30, 30, 24 dBm
 - Rx Sensitivity: -95, -82, -73 dBm
- 20 MHz Channel: No Information Found
- Allowed TV Channels for: [7]
 - Fixed Devices: Ch 2 to Ch 51 (except Ch 3,4, and 37)
 - Personal/Portable Devices: Ch 21 to Ch 51 (except Ch 37)
- Radio Frequency for: [9]
 - Fixed Devices: 54 to 60 MHz, 76 to 88 MHz, 174 to 216 MHz, 470 to 512 MHz
 - Personal/ Portable Devices: 512 to 608 MHz, 614 to 698 MHz
- Frequency Bands for Channels* (Center Frequencies are written in brackets): [12]
 - Ch 2: 54 to 60 MHz (57 MHz)
 - Ch 5: 76 to 82 MHz (79 MHz)
 - Ch 6: 82 to 88 MHz (85 MHz)
 - Ch 7: 174 to 180 MHz (177 MHz)
 - Ch 8: 180 to 186 MHz (183 MHz)
 - Ch 9: 186 to 192 MHz (189 MHz)
 - Ch 10: 192 to 198 MHz (195 MHz)
 - Ch 11: 198 to 204 MHz (201 MHz)
 - Ch 12: 204 to 210 MHz (207 MHz)
 - Ch 13: 210 to 216 MHz (213 MHz)
 - Ch 14: 470 to 476 MHz (473 MHz)
 - Ch 15: 476 to 482 MHz (479 MHz)
 - Ch 16: 482 to 488 MHz (485 MHz)

- Ch 17: 488 to 494 MHz (491 MHz)
- Ch 18: 494 to 500 MHz (497 MHz)
- Ch 19: 500 to 506 MHz (503 MHz)
- Ch 20: 506 to 512 MHz (509 MHz)
- Ch 21: 512 to 518 MHz (515 MHz)
- Ch 22: 518 to 524 MHz (521 MHz)
- Ch 23: 524 to 530 MHz (527 MHz)
- Ch 24: 530 to 536 MHz (533 MHz)
- Ch 25: 536 to 542 MHz (539 MHz)
- Ch 26: 542 to 548 MHz (545 MHz)
- Ch 27: 548 to 554 MHz (551 MHz)
- Ch 28: 554 to 560 MHz (557 MHz)
- Ch 29: 560 to 566 MHz (563 MHz)
- Ch 30: 566 to 572 MHz (569 MHz)
- Ch 31: 572 to 578 MHz (575 MHz)
- Ch 32: 578 to 584 MHz (581 MHz)
- Ch 33: 584 to 590 MHz (587 MHz)
- Ch 34: 590 to 596 MHz (593 MHz)
- Ch 35: 596 to 602 MHz (599 MHz)
- Ch 36: 602 to 608 MHz (605 MHz)
- Ch 38: 614 to 620 MHz (617 MHz)
- Ch 39: 620 to 626 MHz (623 MHz)
- Ch 40: 626 to 632 MHz (629 MHz)
- Ch 41: 632 to 638 MHz (635 MHz)
- Ch 42: 638 to 644 MHz (641 MHz)
- Ch 43: 644 to 650 MHz (647 MHz)
- Ch 44: 650 to 656 MHz (653 MHz)
- Ch 45: 656 to 662 MHz (659 MHz)
- Ch 46: 662 to 668 MHz (665 MHz)
- Ch 47: 668 to 674 MHz (671 MHz)
- Ch 48: 674 to 680 MHz (677 MHz)
- Ch 49: 680 to 686 MHz (683 MHz)
- Ch 50: 686 to 692 MHz (689 MHz)
- Ch 51: 692 to 698 MHz (695 MHz)

*Note: Channels 3,4, and 37 are skipped above because they are not allowed.

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