Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Correction of inconsistencies in 802.16-2004 OFDMA mode repetitions and data mapping to burst**
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Re:	802.16REVd/D5-2004
Abstract	Errata to 802.16-2004
Purpose	Correction of inconsistencies in 802.16-2004
Notice	
Release	
Patent Policy and Procedures	

Correction of inconsistencies in 802.16-2004 OFDMA mode repetitions and data mapping to burst

1 Statement of the problem

In section 8.4.9.2 the word sub-channel is used instead of slot, which would imply that FEC block concatenation is done in the frequency dimension. The same applies to repetition coding that is defined in section 8.4.9. This direction of mapping is inconsistent with the direction of mapping defined in section 8.4.3.4

2 Proposed solution

Solve inconsistency by defining the direction of concatenation, repetition and mapping to be in units of slots and in a frequency first manner.

3 Specific text changes

[Modify the text on page 590, line 32-47 as shown below]

8.4.9 Channel coding

Channel coding procedures include randomization (see 8.4.9.1), FEC encoding (see 8.4.9.2), bit interleaving, (see 8.4.9.3), repetition (see 8.4.9.5), and modulation (see 8.4.9.4). ~~When repetition code is used, allocation for the transmission shall always include an even number of adjacent Subchannels. The basic block shall pass the regular coding chain where the first Subchannel shall set the randomization seed used in 8.4.9.1, and the data shall follow the coding chain up to the Mapping. The data outputted from the modulation (8.4.9.4) shall be mapped onto the block of subchannels allocated for the basic block and then it will be also mapped on the following consecutive allocated Subchannels (for repetition coding of 2 another block of subchannels of the same size is used, for repetition coding of 4 another 3 blocks of subchannels of the same size are used and for repetion of 6 another 5 blocks of subchannels of the same size are used), the process of regular encoding and repetition encoding is shown in Figure 252~~.

[Replace figure 252 with the following]

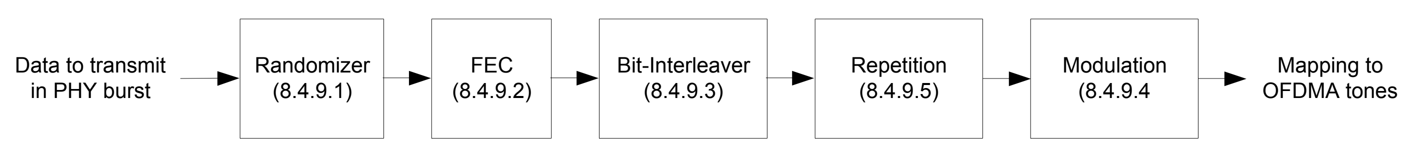


Figure 252—Channel coding process for regular and repetition coding transmission

[Starting from page 592 line 25 to page 593 line 23: replace the word 'sub-channel' with word 'slot' (14 replacements)]

[Starting from page 598 line 49 to page 599 line 52: replace the word 'sub-channel' with word 'slot' (16 replacements)]

[Add a new section, 8.4.9.5 on page 623, line 8 as shown below]

8.4.9.5 Repetition

Repetition of R = 2, 4, or 6 shall be applied to bit-interleaved data before modulation. The number of allocated slots (Ns) shall be a whole multiple of the repetition factor R. The FEC and bit-interleaving shall be applied to Ns/R slots. Then, each group of bits designated to fit in a slot will be repeated R times to form R contiguous slots. This repetition scheme applies in all coding schemes except H-ARQ with CTC defined in 8.4.9.2.3.5.

[Modify the text on page 499, line 33-65 as shown below]

8.4.3.4 OFDMA data mapping

MAC data shall be processed as described in 8.4.9 and shall be mapped to an OFDMA Data Region (see 8.4.3.1) for downlink and uplink using the algorithms defined below.

Downlink:

1) Segment the data into blocks sized to fit into one OFDMA slot.

2) Each slot shall span one or more subchannels in the subchannel axis and ~~two~~ one or more OFDMA symbols in the time axis (see Figure 216), as per the specific slot used. Map the slots such that the lowest numbered slot occupies the lowest numbered subchannel in the lowest numbered OFDMA symbol.

3) Continue the mapping such that the OFDMA ~~symbol~~ subchannel index is increased. When the edge of the Data Region is reached, continue the mapping from the lowest numbered OFDMA ~~symbol~~ subchannel in the next ~~subchannel~~ available symbol.

Uplink:

The UL mapping consists of two steps. In the first the OFDMA slots allocated to each burst are selected. In the second steps the allocated slots are mapped.

A. Step 1 – allocate OFDMA slots to bursts

1) Segment the data into blocks sized to fit into one OFDMA slot.

2) Each slot shall span one or more subchannels in the subchannel axis and three OFDMA symbol in the time axis (see Figure 217). Map the slots such that the lowest numbered slot occupies the lowest numbered subchannel in the lowest numbered OFDMA symbol.

3) Continue the mapping such that the OFDMA symbol index is increased (skipping allocations made with UIUC=12,13, see 8.4.54). When the edge of the UL zone (which is marked with Zone_switch_IE) is reached, continue the mapping from the lowest numbered OFDMA symbol in the next available subchannel

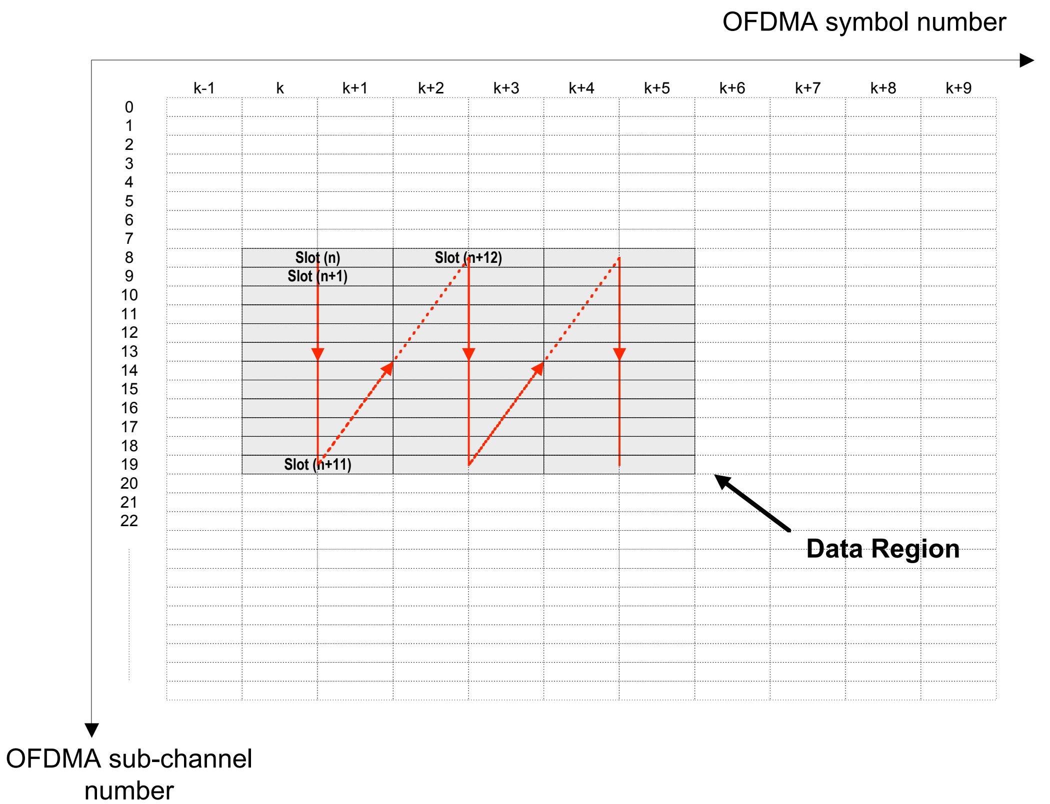
4) An UL allocation is created by selecting an integer number of contiguous slots, according to the ordering of steps 1-3. This results in the general Burst structure shown by the gray area in figure 217.

B. Step 2 – Map OFDMA slots within the UL allocation.

1) Map the slots such that the lowest numbered slot occupies the lowest numbered subchannel in the lowest numbered OFDMA symbol.

2) Continue the mapping such that the Subchannel index is increased. When the last subchannel is reached, continue the mapping from the lowest numbered subchannel in the next OFDMA symbol that belongs to the UL allocation. The resulting order is shown by the arrows in figure 217.

[Replace figure 216 on page 500 with the figure shown below]



OFDMA symbol number
t
k-1
k
k+1
k+2
k+3
k+4
k+5
k+6
k+7
k+8
k+9
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
Slot (n)
Slot (n+1)
Slot (n+11)
Slot (n+12)
Data Region
OFDMA sub-channel number

[Replace figure 217 on page 501 with the figure shown below]