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Title	**Proposed Modifications to Data Subcarrier Mapping (16.3.7.2.3 and 16.3.10.2.3)**
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Source(s)	Fred Vook, Mark Cudak, Bill Hillery, Eugene Visotsky, Anup Talukdar fred.vook@motorola.com **Motorola Inc.**
Re:	Category: P802.16m/D3 comments for LB30b Area: Sections 16.3.7 (DL MIMO) and 16.3.10 (UL MIMO)
Abstract	We propose modifications to the data subcarrier mapping methodology to simplify receiver processing requirements
Purpose	Discuss and adopt
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Modifications to Subcarrier Mapping (Sections 16.3.7.2.3 and 16.3.10.2.3)

Bill Hillery, Fred Vook, Mark Cudak, Eugene Visotsky, Anup Talukdar

Motorola, Inc.

1. Introduction

The current subcarrier mapping rule in D3 is frequency first, LRU second, symbol third, meaning that the outputs of the MIMO encoder are allocated frequency first across all the LRUs of an allocation before continuing to the next OFDM symbol. Contributions 1706 [1] and 2446 [2] describe motivations for a mapping order which is frequency first, symbol second, LRU third, meaning that the output of the MIMO encoder is allocated across all subcarriers and OFDM symbols within an LRU before continuing to the next LRU of the allocation. The contribution proposes that the subcarrier mapping be changed to the frequency first, symbol second, LRU third allocation strategy. Justification for this type of mapping can be found in [1] and [2].

2. Proposed Text Changes

[Remedy 1 – Downlink subcarrier mapping – Modify Section 16.3.7.2.3 as follows:]

~~Consecutive symbols for each antenna at the output of the MIMO precoder are mapped in a frequency domain first order across LRUs of the allocation, starting from the data subcarrier with the smallest OFDM symbol index and smallest subcarrier index, and continuing to subcarrier index with increasing subcarrier index. When the edge of the allocation is reached, the mapping is continued on the next OFDM symbol.~~

Consecutive symbols for each antenna at the output of the MIMO precoder are mapped in a frequency domain first order within an LRU before continuing to the next LRU of the allocation. Within an LRU, the mapping of symbols shall start from the data subcarrier with the smallest OFDM symbol index and smallest subcarrier index and shall continue on subcarriers with increasing subcarrier indices within the LRU. When the last subcarrier of the LRU is reached, the mapping is continued on the subcarrier with smallest subcarrier index of the next OFDM symbol of LRU. When the entire LRU is filled the mapping continues to the next LRU of allocation, where the LRUs are indexed in a frequency first order.

[Remedy 2 – Uplink subcarrier mapping – Modify Section 16.3.7.2.3 as follows:]

~~Consecutive symbols for each antenna at the output of the MIMO precoder are mapped in a frequency domain first order across LRUs of the allocation, starting from the data subcarrier with the smallest OFDM symbol index and smallest subcarrier index, and continuing to subcarrier index with increasing subcarrier index. When the edge of the allocation is reached, the mapping is continued on the next OFDM symbol.~~

Consecutive symbols for each antenna at the output of the MIMO precoder are mapped in a frequency domain first order within an LRU before continuing to the next LRU of the allocation. Within an LRU, the mapping of symbols shall start from the data subcarrier with the smallest OFDM symbol index and smallest subcarrier index and shall continue on subcarriers with increasing subcarrier indices within the LRU. When the last subcarrier of the LRU is reached, the mapping is continued on the subcarrier with smallest subcarrier index of the next OFDM symbol of LRU. When the entire LRU is filled the mapping continues to the next LRU of allocation, where the LRUs are indexed in a frequency first order.

3. References

[1] IEEE C80216m-09/1706, “Proposed Changes to DL subcarrier mapping (15.3.7.2.4) for the IEEE 802.16m/D1”.

[2] IEEE C80216m-09/2446, “Proposed text for DL/UL subcarrier mapping (15.3.7.2.3, 15.3.10.2.3)