Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Data Randomization**
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Re:	Call for contribution IEEE 802.16d-03/02

Abstract	This contribution identifies two problems in the section on data randomization and proposes solutions therefore.

Purpose	For inclusion in the 802.16d amendment document

Data Randomization

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1. References

[1] IEEE 802.16a

2. Problem statement and Discussion

Two problems were encountered in the current data randomization description:

1. Section 8.4.3.1 of [1] states that data randomization is performed on each burst of data independently. This implies that the scrambler has to be reset at the start of each burst. Currently for the DL there is only an initialization vector defined at the start of each frame. To be complete, we therefore need to define an intialization vector for each data burst. To simplify the implementation (critical feedback loops) for the SSs, the scrambler should not need to be reset after the FCH. . For the bursts #2...*N* an initialization vector similar to the one for the UL can be used.

2. For the initialization of the scrambler on the UL, it has to be defined precisely what the OFDM symbol number is. We propose to reference the symbol number to the start of the UL-subframe. The first symbol can be counted as symbol #0.

3. Proposal

Change the last two sentences of 8.4.3.1 of [1] and add a figure:

On the DL, the scrambler shall be initialised at the start of the FCH with the vector: 1 0 0 1 0 1 0 1 0 0 0 0 0 0 0. The scrambler shall not be reset at the start of burst #1. At the start of subsequent bursts the scrambler shall be initialised with the vector shown in Figure 128ada. The OFDM symbol number (i.e. the number of the first OFDM symbol of the data burst) shall be counted from the start of the DL-subframe, the first symbol being counted as symbol #0.

Figure 128ada: OFDM scrambler DL initialisation vector for bursts #2..*N*

On the UL, the scrambler shall be initialised with the vector shown in Figure 128adb. The OFDM symbol number (i.e. the number of the first OFDM symbol of the data burst) shall be counted from the start of the UL-subframe, the first symbol being counted as symbol #0.
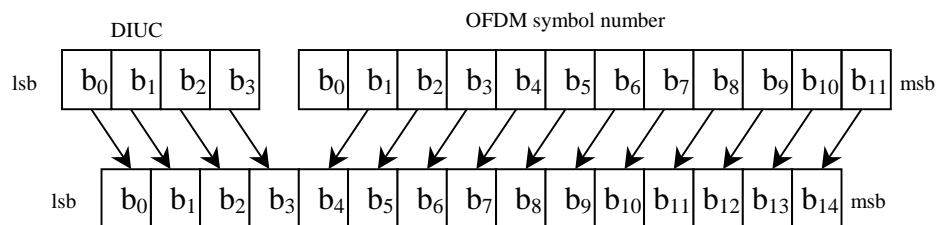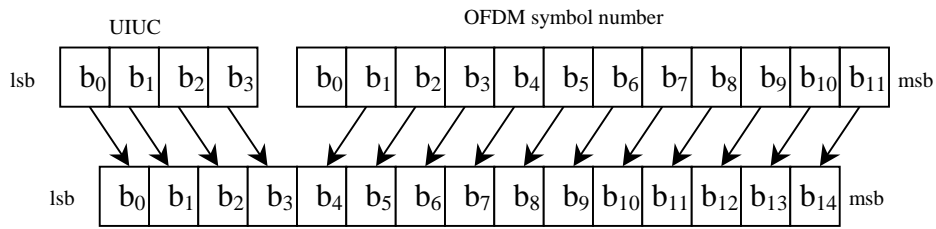
Figure 128adb: OFDM scrambler UL initialisation vector