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Re:	80216j-07_007r2: "Call for Technical Comments and Contributions regarding IEEE Project 802.16j"	
Abstract	This document specifies the RS relay amble amplitude.	
Purpose	Text proposal for 802.16j Baseline Document	
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RS Amble Amplitude.

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1. Introduction

In order to provide proper time and frequency synchronization, and Cell ID information for the sub-ordinated Relay Stations attempting to enter the network getting connected to through a parent RS, a relay amble structure has to be defined. One of the parameters of this relay structure is its related amplitude.

2. Details

In order to avoid confusing the MSs attempting to execute a network entry using a frame structure employing two different amble structures, a new PN sequence is required in order to support the high mobility RS requirements.

Considering the new PN sequence which has a PAPR behavior almost identical with the old preamble, the pilot subcarriers present in the amble structure, used for 512, 1 k and 2 k FFT shall be modulated according with the [1] eEquation 1 [136]:

$$\begin{aligned} \text{Re}\{AmblePilotsModulated\} &= 4\sqrt{2}\left(\frac{1}{2} w_k\right) \\ \text{Im}\{AmblePilotsModulated\} &= 0 \end{aligned} \quad \text{Equation 1}$$

For FFT128, the pilot subcarriers present in the RS amble structure shall be modulated as present in Equation 2

$$\begin{aligned} \text{Re}\{AmblePilotsModulated\} &= 3.55\sqrt{2}\left(\frac{1}{2} w_k\right) \\ \text{Im}\{AmblePilotsModulated\} &= 0 \end{aligned} \quad \text{Equation 2}$$

The reason for the reduced amplitude for 128 point FFT is that the PAPR of the new PN sequences, as defined by [3] will be higher, due to the fact that the sequence set size from which new sequences for the RS amble can be extracted is limited.

3. Conclusion

The amplitude of the pilot subcarriers present in the new RS amble is the same like for the access preamble, for 512, 1k and 2k FFT. A -13 dB correction is required for FFT128 in order to compensate match for the increased related PAPR of the new PN sequences for RS amble in the 128 FFT mode, as defined in [3] performance.

4. Specific text changes

~~Insert new Add sub-clause #8.4.9.4.3.1.1]~~

8.4.9.4.3.1.1.1 Relay amble pilot modulation

The pilots in the ~~downlink-relay amble preamble~~ for 512FFT, 1k FFT and 2k FFT shall follow the instructions in 8.4.6.1.1.3 and shall be modulated according to Equation [136-1]

$$\begin{aligned} \text{Re}\{AmblePilotsModulated\} &= 4\sqrt{2}\left(\frac{1}{2} - w_k\right) && \text{Equation xxx} \\ \text{Im}\{AmblePilotsModulated\} &= 0 \end{aligned}$$

$$\begin{aligned} \text{Re}\{PreamblePilotsModulated\} &= 4\sqrt{2}\left(\frac{1}{2} - w_k\right) && \text{Equation 136-1} \\ \text{Im}\{PreamblePilotsModulated\} &= 0 \end{aligned}$$

The pilots in the ~~downlink-preamble~~relay Amble for 128 FFT shall follow the instructions in 8.4.6.1.1.3 and shall be modulated according to Equation [136-2]xxx

$$\begin{aligned} \text{Re}\{AmblePilotsModulated\} &= 3.55\sqrt{2}\left(\frac{1}{2} - w_k\right) && \text{Equation 136-2xxx+1} \\ \text{Im}\{AmblePilotsModulated\} &= 0 \end{aligned}$$

References

1. IEEE 802.16-2004 “IEEE Standard for Local and Metropolitan Area Networks – Part 16”
2. IEEE 802.16e-2005
3. [IEEE C802.16j-07/223r1 “Relay Amble Modulation Series”. C. Huo et al](#)