

Additional Preamble Definitions for 802.16d OFDM-256

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Purpose:

To describe the need for multiple preamble definitions for network reuse planning purposes.

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Problem Statement

- Consider a TDD network with a low reuse frequency plan:
 - Network will need to be frame synchronized to avoid undue interference problems (between uplink/downlink)
 - In downlink, SS will detect signals from multiple base stations
 - Current long preamble marking the start of the downlink frame has only a single definition
 - Interference between multiple BS transmissions of the same preamble will result in degraded frame synchronization and channel estimation by the SS
- Similar issues can occur in uplink

Suggested Remedy

- Design a set of preambles to replace each of the current preambles, supporting a reuse pattern:
 - Unique preambles with good cross-, auto-correlation
 - Frequency-spread subchannel preambles
 - Cyclic time shifted versions of the above
- The preambles for which to consider designing replacement sets include:
 - 4x64, 2x128
 - AAS network entry preamble
 - STC preamble
 - Subchannel preambles
- Support for new preambles would be mandatory for all SS

Design Issues

- How many distinct preambles in each set that replaces current preamble definitions?
 - Are distinct frame start preambles required?
 - Impact on SS performance requirements
- Low PAR required
- Good auto-correlation and cross-correlation properties required

Proposal

- Subgroup of interested 802.16 members to discuss detailed preamble design for May interim meeting:
 - Naftali Chayat, Alvarion
 - Dale Branlund, BeamReach
 - Hassan Yaghoobi, Minnie Ho, Intel Corp
 - Bogdan Franovici, Redline Communications
 - Roger Bertschmann, SiWorks
 - Martin Lysejko, David Castelow, Ofer Kelman, Airspan
- To be added, please email adam@arraycomm.com