

Additional Preamble Definitions for 802.16d OFDM-256

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Adam Kerr, Paul Petrus
ArrayComm, 2480 North First St.
San Jose, CA 95131-1014

Voice: 408-428-9080
Fax: 408-428-9083
E-mail: adam@, petrus@arraycomm.com

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Purpose:

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

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Adam Kerr and Paul Petrus
ArrayComm, Inc.
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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

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