Project	IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>		
Title	Clarifications for AAS Zone		
Date Submitted	2005-3-15		
Source(s)	Dave Pechner, Doug Dahlby, Todd Chauvin	ArrayComm Inc.	dpechner@arraycomm.com, dahlby@arraycomm.com, chauvin@arraycomm.com,
Re:	IEEE P802_Cor1_D1		
Abstract	This contribution introduces clarifications for an AAS zone in the OFDMA PHY		
Purpose	Adopt into P802.16d/D5 corrigenda		
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.		
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.		
Patent Policy and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.		

Clarifications for AAS Zone

Dave Pechner, Todd Chauvin, Doug Dahlby

1 Problems with the current AAS Zone

Clarifications for how UL AAS allocations are made were accepted in Session 35. However, these clarifications allowed for an UIUC 12,13 region within an AAS zone to be an arbitrary number of symbols in duration. This flexibility is not required and creates ambiguity in the UL Map slot offset field.

The AAS preamble modulation equation was incorrectly modified.

2 Outline of proposed solution

Require that UIUC 12,13 allocations in an UL AAS zone be an integer number of slots.

Correct the AAS preamble modulation equation.

3 Proposed Text Changes

[modify Section 8.4.4.6.4 as follows:]

AAS Preambles are used to provide training information in both UL and DL AAS zones. All data allocations (UIUC 1-10, DIUC 0-12) and the optional AAS DLFP in an AAS zone are preceded by an AAS preamble.

UL and DL allocations are made exclusive of the AAS preamble. In the DL, a 2D allocation burst is preceded by the appropriate DL AAS preamble. In the UL, a 1D allocation is preceded by the appropriate AAS preamble. The absolute slot offset for the UL AAS allocation indicates the first data slot, which is preceded by the appropriate AAS preamble. If an UL allocation wraps at the end of the AAS zone, the data allocation does not include the symbols required for the initial AAS zone preambles.

The optional AAS -DLFP is preceded by an AAS downlink preamble of one symbol duration. All other DL bursts with DIUC 0-12 within an AAS DL zone have a preamble whose duration is specified by the "Downlink_preamble_config" fields of the AAS_DL_IE. This field shall be consistent with the same field of the AAS_DLFP if present. In the case the AAS DL Zone is using the PUSC permutation, the "Downlink_preamble_config" shall always be set to an integer number of slot durations (i.e. 0 or 2 symbols).

An UL preamble is inserted at the start of an UL data allocation with UIUC 1-10 and whenever such an UL allocation wraps from the end of an AAS zone to the beginning. The first Uplink_preamble_config symbols of the UL AAS zone are reserved for UL AAS preambles. On a given subchannel, an UL AAS preamble will be inserted into these symbols by the SS devices who is allocated the slot following the preamble (or following a UIUC 12,13 region if it directly follows the preamble). Any UL preamble inserted in an AAS zone in an allocation other than the first Uplink_preamble_config symbols shall be 3 symbols in duration.

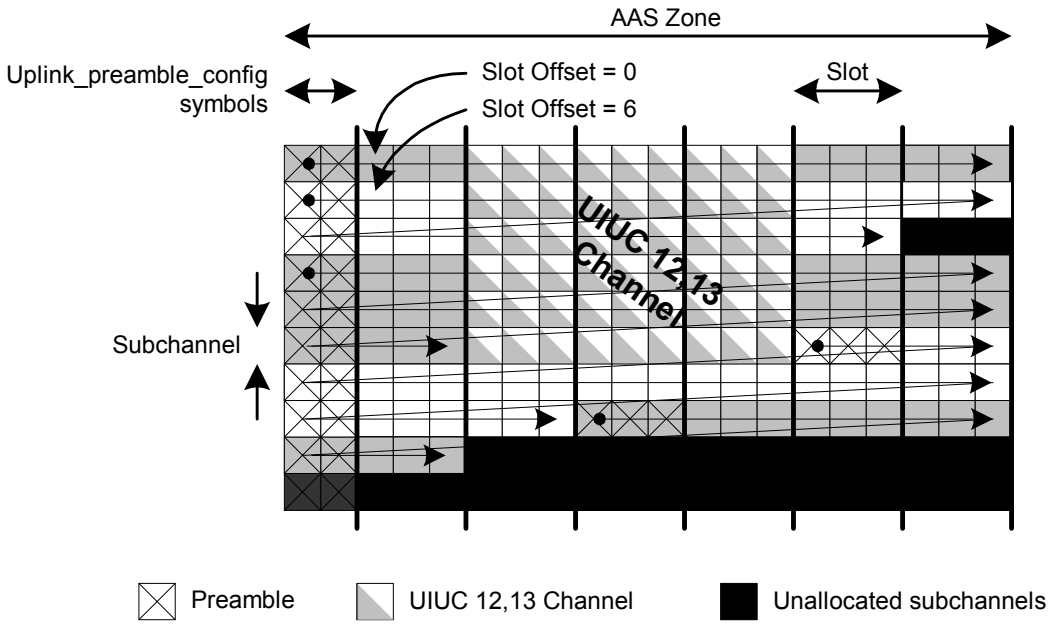
The absolute slot offset field in the UL map IE corresponds to the first data slot of an allocation, which is preceded by the appropriate number of symbols for the UL AAS preamble. The absolute slot offset will count from the first subchannel slot, counting all slots in an AAS zone including any UIUC 12,13 regions. The slot offset will not include the first "Uplink_preamble_config" preamble symbols at the start of the AAS zone.

The duration of an UL AAS zone minus the reserved uplink preamble symbols and any UIUC 12,13 allocations shall be an integer number of slots. To insure that UL tile structures are not broken due to an allocation wrapping, the following restrictions hold:

- When used in an AAS zone, a UIUC 12,13 region shall ~~either span all subchannels and consist of an arbitrary number of symbols, or be constrained to~~ be a multiple of 3 symbols in duration.
- ~~In the absence of a UIUC 12,13 region that spans all subchannels,~~ an UL AAS Zone shall consist of an integer number of slots plus the number of UL AAS preamble symbols as defined in by the "Uplink_preamble_config" field of the UL_AAS_IE and AAS_DLFP.
    - UL AAS Zone Duration = *N**3 + Uplink_preamble_config symbols.
- ~~In the presence of one or more UIUC 12,13 regions that span all subchannels, an UL AAS Zone shall consist of an integer number of slots plus the number of UL AAS preamble symbols as defined in by the "Uplink_preamble_config" field of the UL_AAS_IE and AAS_DLFP plus the number of UIUC 12,13 symbols.~~
    - ~~UL AAS Zone Duration = *N**3 + Uplink_preamble_config symbols + UIUC 12,13 symbols~~
- Fast feedback channels shall be allocated an integer number of slots. If a fast feedback channel wraps at the end of an AAS zone, the first Uplink_preamble_config symbols of the UL AAS zone are skipped to maintain slot alignment.

Figure 224a shows a legal UL AAS zone with an UIUC 12,13 allocation that is an integer number of slots in duration.

[replace Figure 224a with the following:]



~~Figure 224b shows a legal UL AAS zone with an UIUC 12,13 allocation that spans all subchannels and is not an integer number of slots in duration.~~

[remove Figure 224b]

[modify section 8.4.9.4.3.1 as follows:]

~~Equation (135) shall not be applied to symbols corresponding to either the UL (8.4.4.6.3.2) or DL (8.4.4.6.3.1) AAS preambles.~~

Subcarriers for UL and DL AAS preambles shall follow the instructions in 8.4.4.6.4.1 and 8.4.4.6.4.2, and shall be modulated according to the following formula:

$$\mathrm{Re}\{c_k\} = 2*(1/2 - w_k)$$

$$\mathrm{Im}\{c_k\} = 0$$

These AAS preamble subcarriers may further be modified by the UL and DL PHY modifiers as defined in 8.4.5.3.11 and 8.4.5.4.14.