Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Proposed AWD Text on the Ranging Configurations for Non-synchronized AMSs**
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Re:	IEEE 80216m-09/0020, "Call for Contributions on Project 802.16m Amendment Working Document (AWD) Content" ″Comments on AWD 15.3.9 UL-CTRL"
Abstract	This contribution proposes the text of ranging channel section to be included in the IEEE 802.16m AWD.
Purpose	To be discussed and adopted by TGm for the IEEE 802.16m AWD
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Proposed AWD Text on the Ranging Configurations for Non-synchronized AMSs

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1. Introduction

This contribution proposes the text of ranging channel section to be included in IEEE 802.16m amendment [1]. The proposed text is developed in order to be readily combined with IEEE P802.16 Rev2/D9 [2]. It is also compliant to the 802.16m SRD [3] and the 802.16m SDD [4].

2. Ranging Channel Configurations

From the analysis in [5], one ranging channel per 5ms can be considered for 10 MHz as a normal scenario. It can be interpreted that one ranging channel per 10ms can support for 5 MHz as well as low loaded scenario for other bandwidth. Therefore, we propose 1-bit signaling whether all frames are used to allocate the ranging channel or only odd frames are used to allocate the ranging channels.

Only one ranging channel in frequency domain is allocated at a time. Then, different subframe period can be used for the ranging channel allocation depending on the ranging loads (e.g. higher system bandwidths). This provides the simple signaling with smaller ranging waiting time.

In the TDD mode, since it is desirable to allocate the ranging channels contiguously in the time domain due to lack of UL subframe, the number of ranging channel can be indicated for the ranging channel allocation depending on the ranging loads.

3. References

[1] IEEE 802.16m-08/0010r1a, "IEEE 802.16m Amendment Working Document," March 2009.

[2] IEEE P802.16Rev2/D9a, "DRAFT Standard for Local and metropolitan area networks / Part 16: Air Interface for Broadband Wireless Access Systems," March 2009.

[3] IEEE 802.16m-07/002r8, "IEEE 802.16m System Requirements," January 2009.

[4] IEEE 802.16m-08/003r8, "IEEE 802.16m System Description Document," April 2009.

[5] IEEE 802.16m-09/1093, "Proposed AWD Text on the Ranging Codes for Non-synchronized AMSs," April 2009.

Text proposal for inclusion in the 802.16m amendment

Black text: current text in the subclause *15.3.9.2.4.1 Ranging channel for non-synchronized AMSs* of [1]

~~Red Strike through Text~~: Deleted

Blue text: new text

[Bracketed Italic text]: Informative

-- *Text Start* --

[Insert the following text in the section 15.3.9.2.4.1 Ranging channel for non-synchronized AMSs.]

~~Ranging channel configurations~~

15.3.9.2.4.1.2. Ranging channel configurations

The information for ranging time/frequency resource allocation is indicated by the S-SFH. The the ranging configuration information in the SFH consists of the frame-period (P_F) and subframe-period (P_{SF}) for ranging time resource allocation, and the starting subband position (k_0) in the frequency domain as units of subband for ranging frequency allocation. Within a superframe, the ranging channels are allocated from the $P_F{}^{th}$ frame in every frame (P_F=0) or every odd frame (P_F=1). Within the allocated frame, the ranging channels are allocated from the first UL subframe with period of P_{SF} in the FDD mode. In the TDD mode, the ranging channels are allocated in the consecutive P_{SF} subframes from the first UL subframe.

The occupied resource for a ranging channel is defined as Nr_1 subframes by Nr_2 subbands. For Format 0, 1, and 2, $Nr_1 = 1$. For Format 3, $N_1 = 3$. The unit of Nr_2 is [1 or 2] subband(s) for all Formats. Figure xxx shows an example of ranging channel allocation.
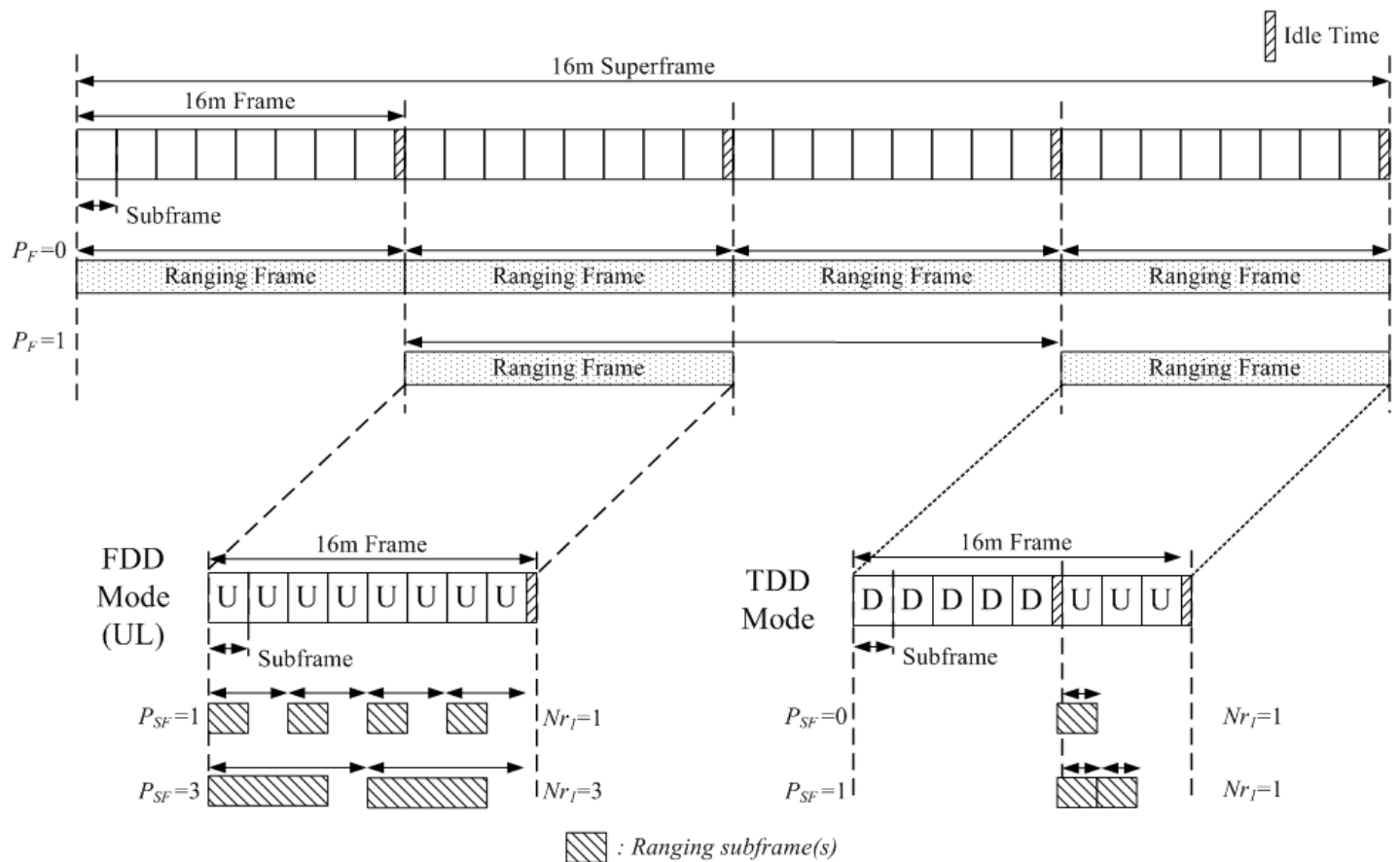

Figure xxx. The example of ranging channel allocation in time domain for FDD and TDD duplex mode, respectively.

There are different types of ranging opportunities in ranging channel formats. First, each AMS randomly selects a ranging subframe assigned in the superframe, which is indicated by S-SFH. When ranging channel Format 1 is used, each AMS randomly selects one of time opportunities within a selected ranging subframe. Finally, each AMS randomly selects a code-opportunity from the available ranging code set in a sector defined in *Subclause 15.3.9.2.4.1.1 Ranging preamble codes.*

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