Proposed Working Assumption for DL Broadcast Channel

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Venue:

IEEE 802.16m-08/005, “Call for Contributions on Project 802.16m System Description Document (SDD)”, on topic of ‘Downlink Control Structures’

Base Contribution:

None

Purpose:

To be discussed and adopted by TGm for the 802.16m SDD

Proposed Working Assumptions for DL Broadcast Channel

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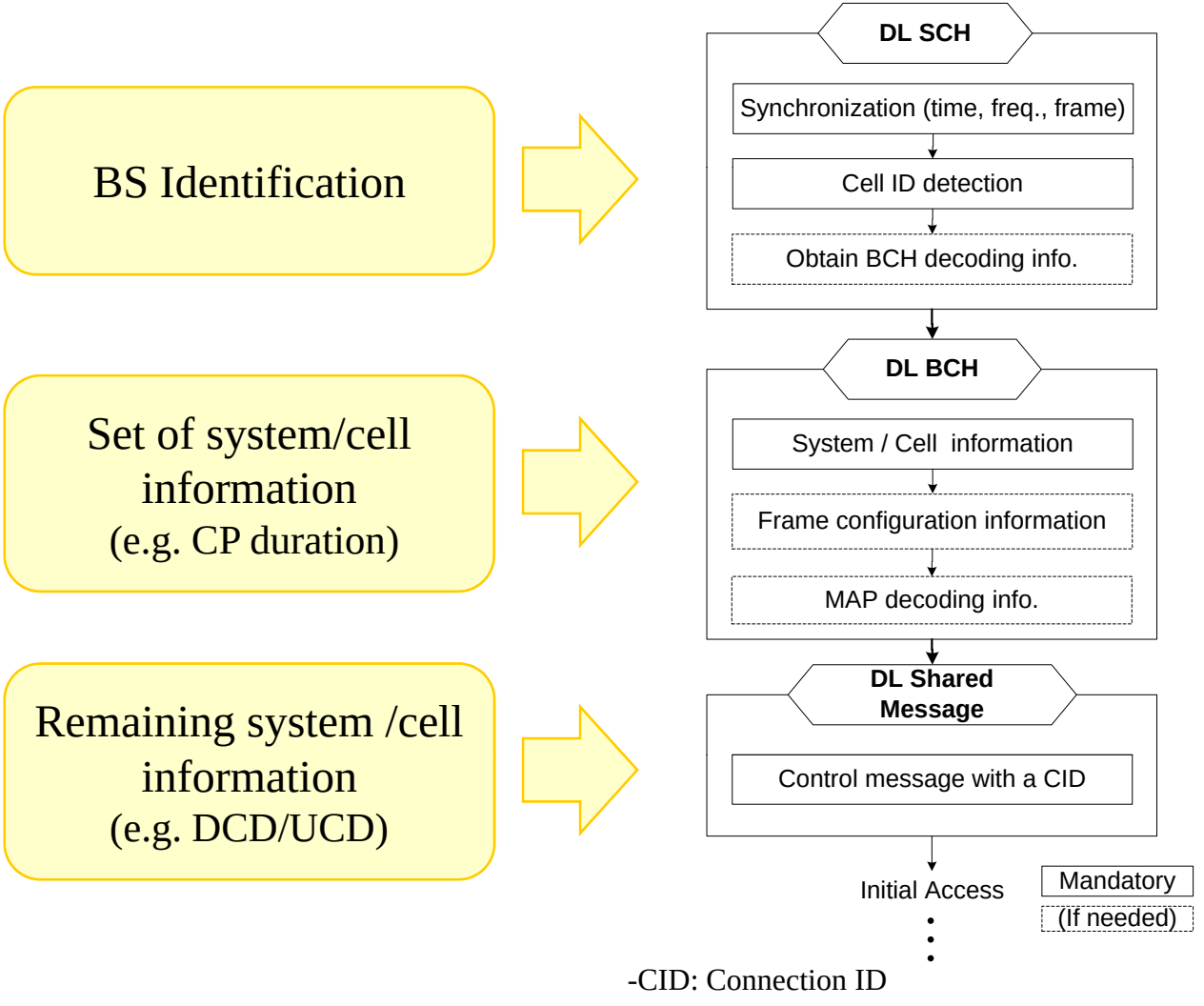
About this contribution

- Scope
  - Categorization of common control information
  - Proposes BCH PHY structure

- Common control information includes system or cell-specific information

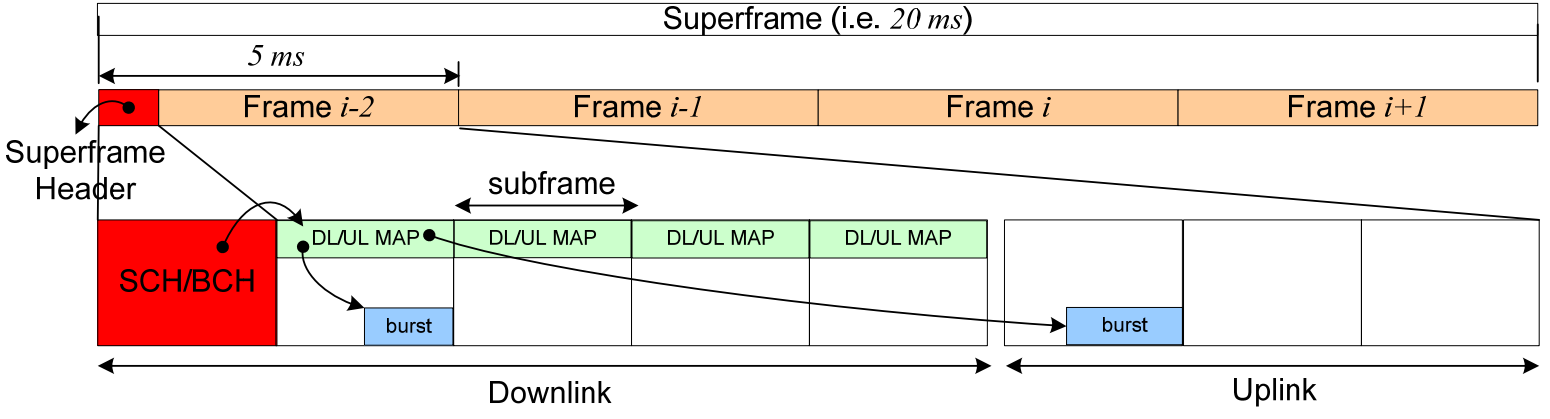
Categorization of Common Control Information

- Cell ID
- CP duration
- Transmission bandwidth
- Resource block configuration
- DCD/UCD (DL/UL channel description)
- Transmit antenna configuration
- Information of the common reference signal
- ...



Superframe Structure

- High level view of basic DL control structure [1]



- DL control channel
  - SCH (synchronization channel) : Reference signal for system acquisition
  - BCH (broadcasting channel) : System or cell-specific information
  - DL/UL MAP: Burst Assignment or other DL Control

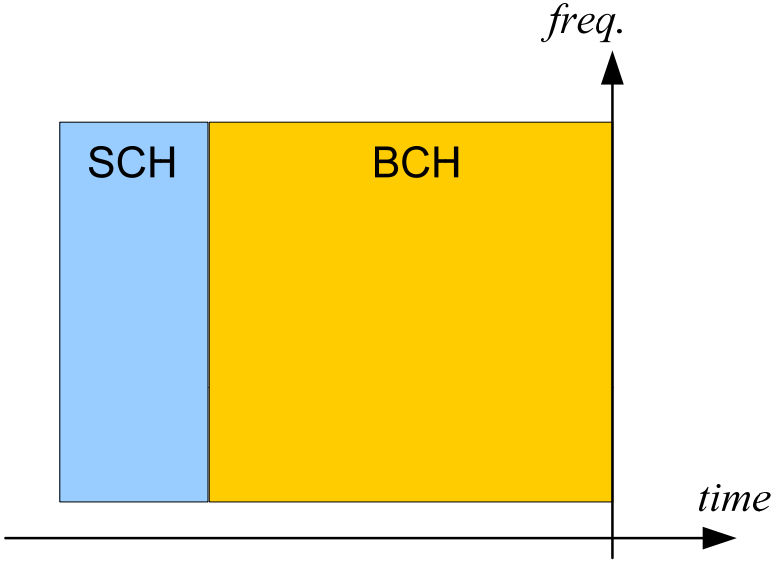
    (Shared or Dedicated may be distinguished by CID)

BCH Design Requirements

- Reliability
  - BCH must be decodable by all MSs within a target cell
- Maximizes BCH capacity
  - Maximizes BCH information transmission rate

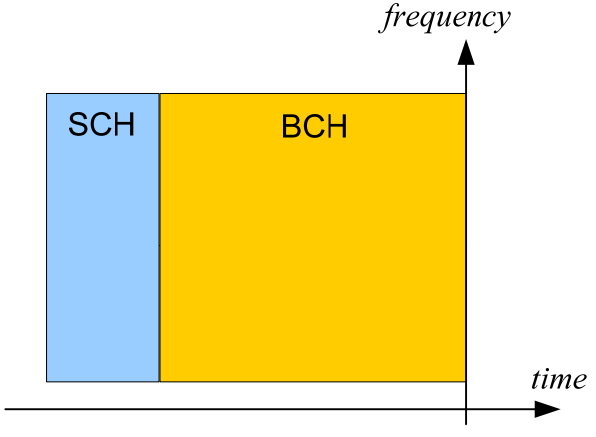
BCH Design (16m-Only Scenario)

- 16m-Only Scenario
  - Propose to transmit BCH adjacent to SCH
    - BCH use the SCH as a reference signal

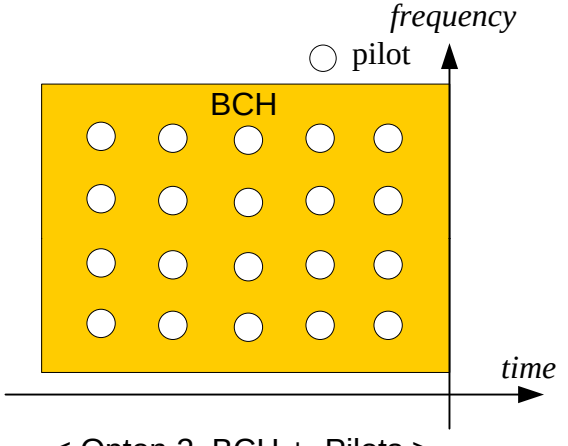


BCH Design (16m/16e Mixed Scenario) (1/3)

- 16m/Legacy mixed scenario
  - If SCH is transmitted with BCH
    - BCH uses SCH as a reference signal
  - If SCH is not required, there are two options



< Option 1. SCH + BCH >

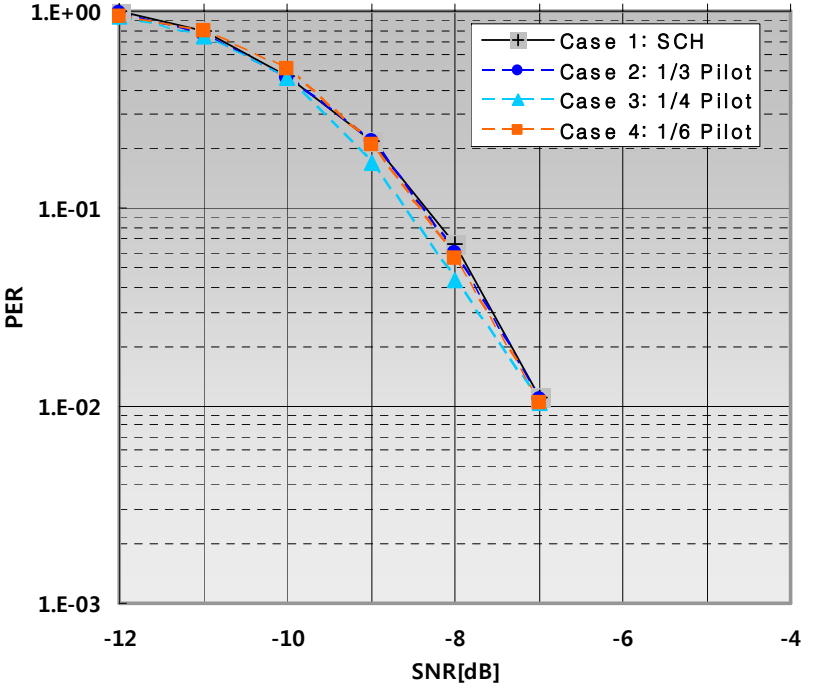


< Opton 2. BCH + Pilots >

BCH Design (16m/16e Mixed Scenario) (2/3)

- Simulation Results

Environment	Value
Superframe header	6 OFDM symbols
Channel	Ped. B with 3km/hr
# of tones	864
Code rate	CTC 1/2
Tx diversity	FSTD



	Case 1	Case 2	Case 3	Case 4
Overhead	**SCH**	**1/3 Pilot**	**¼ Pilot**	**1/6 Pilot**
Repetition	**To meet 1% PER @ -7dB**			
Question	**Max number of information bits / 6 symbols = ?**			

BCH Design (16m/16e Mixed Scenario) (3/3)

- Author's proposal: SCH + BCH

  ⇐ close to the max capacity and a common BCH structure

	Case 1	Case 2	Case 3	Case 4
Overhead	**SCH**	**1/3 Pilot**	**¼ Pilot**	**1/6 Pilot**
Repetition	**10**	**10**	**11**	**13**
Maximum information bits	**345**	**345**	**353**	**332**
Remarks	**• Common BCH structure btw 16m only and 16m/16e mixed** **•Can detect location of BCH**	**-**	**-**	**-**

Text Proposal for Chapter 11 – PHY Layer

Insert the following text into Physical Layer Clause (i.e. Chapter 11 in [3]):

---------- Text Start ----------

11. Physical Layer

11.x DL control channel

11.x.x SCH

The SCH (Synchronization Channel) is a DL physical channel to provide a reference signal for time, frequency and frame synchronization and BS identification for system acquisition. The SCH is transmitted within the superframe header.

11.x.x BCH

The BCH (Broadcast Control Channel) is a DL physical channel to provide the system or cell-specific information to MSs. The BCH is transmitted within superframe header, where SCH also should be transmitted.

---------- Text End ----------

References

- [1]IEEE C802.16m-08/062r1, “Proposed 802.16m Frame Structure”
- [2] IEEE 802.16m-07/002r4, “IEEE 802.16m System Requirements”
- [3] IEEE 802.16m-08/003, “Draft IEEE 802.16m System Description Document”
- [4] IEEE 802.16m-07/037r2, “(Draft) IEEE 802.16m Evaluation Methodology Document ”