

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Channel Alignment and EB/EBR Exchange (in CSM) Operation for 802.15.4g PHYs]

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Re: [TG4g Channel Alignment]

Abstract: [Illustration of Channel Alignment for PHYs in TG4g]

Purpose: [This document provides a list of the editing staff that will be working on 802.15.4g.]

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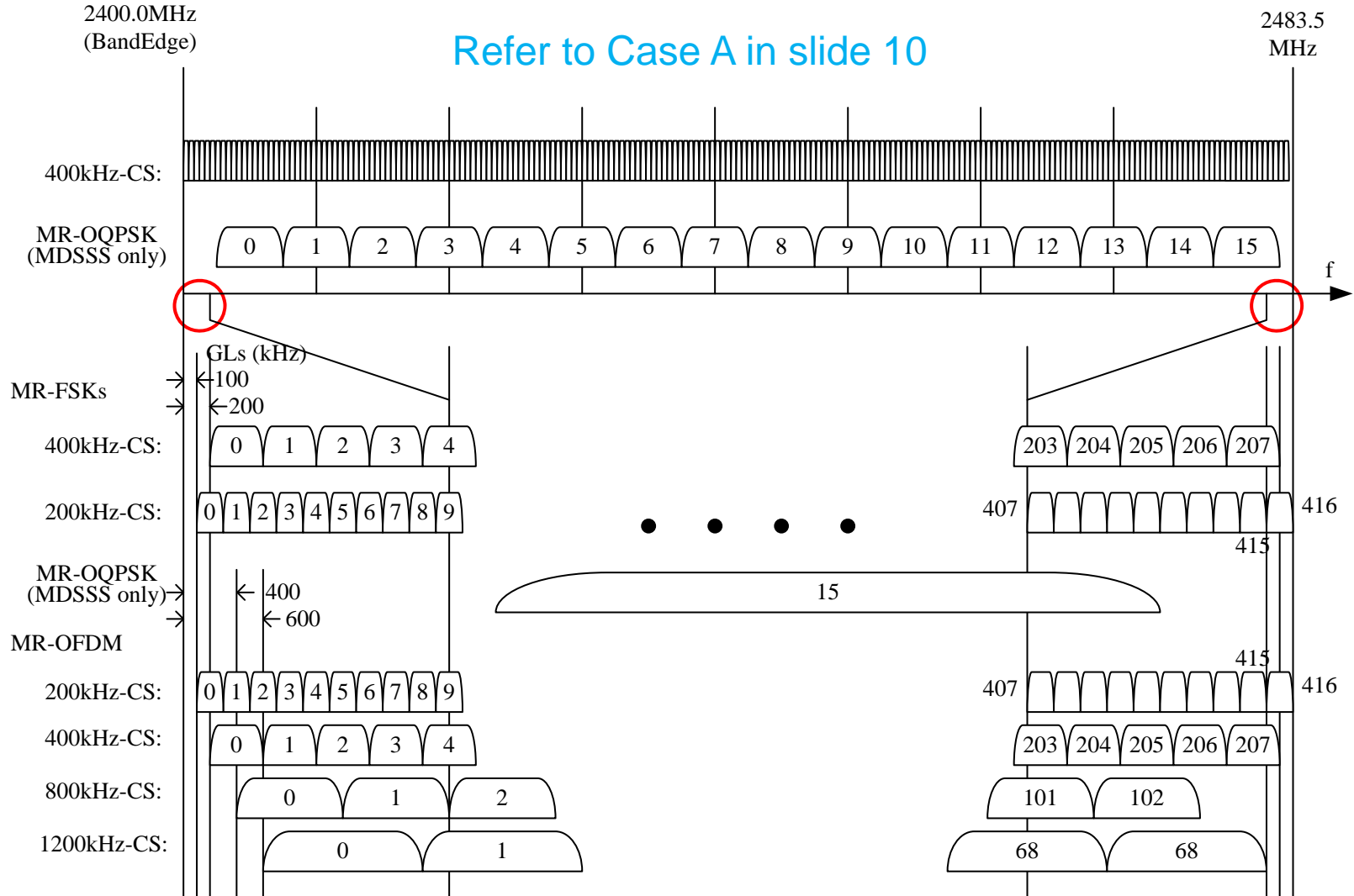
Summary

- This document illustrates the alignment of channels for different PHYs and different Channel Spacing (CS) in respective frequency bands
- This document gives an example of possible operation for EB/EBR exchange (in CSM) in the Japanese band
- Modified text as compared to 10/952r1 is colored in blue

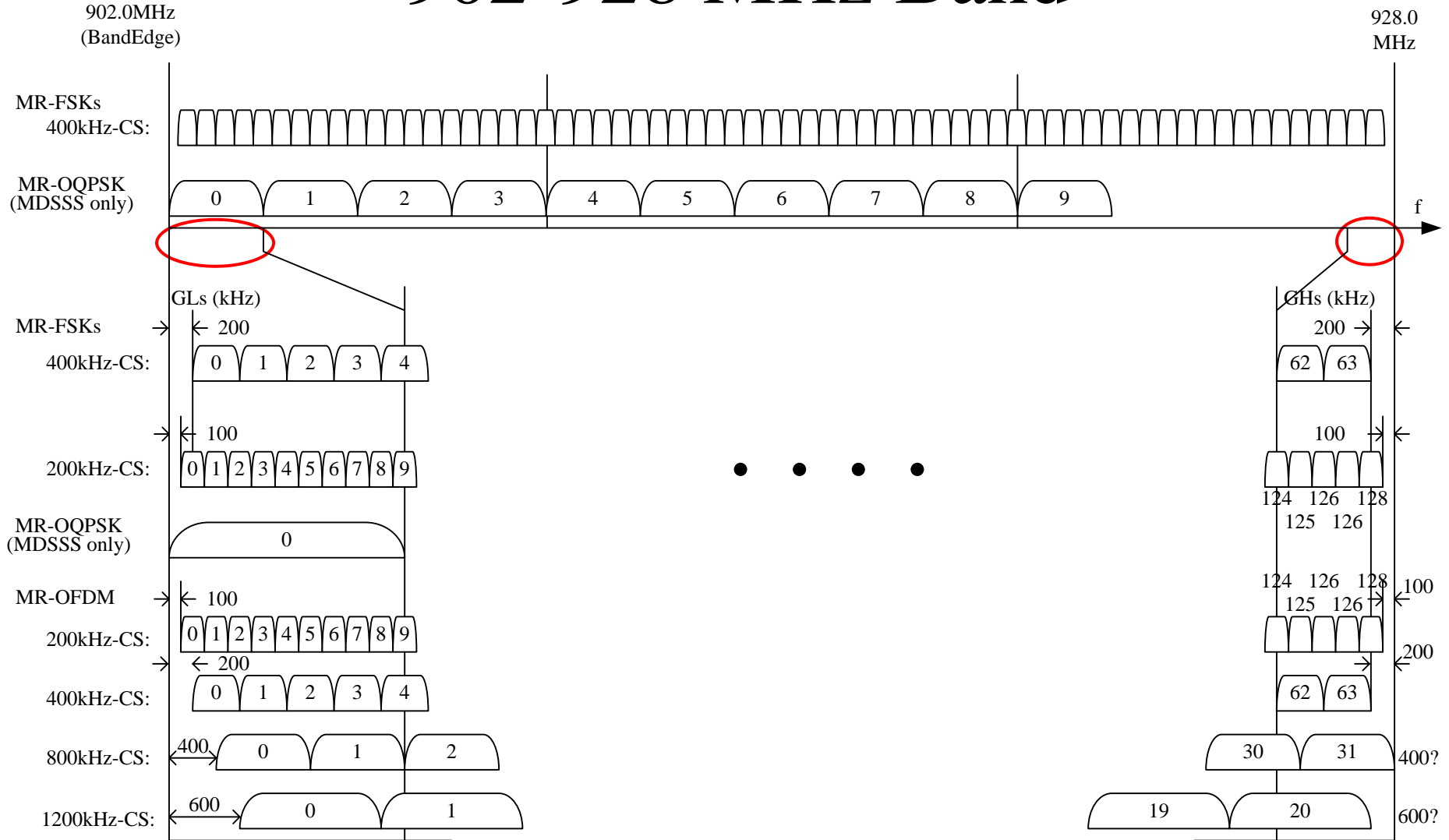
Channel Alignment for different Frequency Bands

2400-2483.5 MHz Band

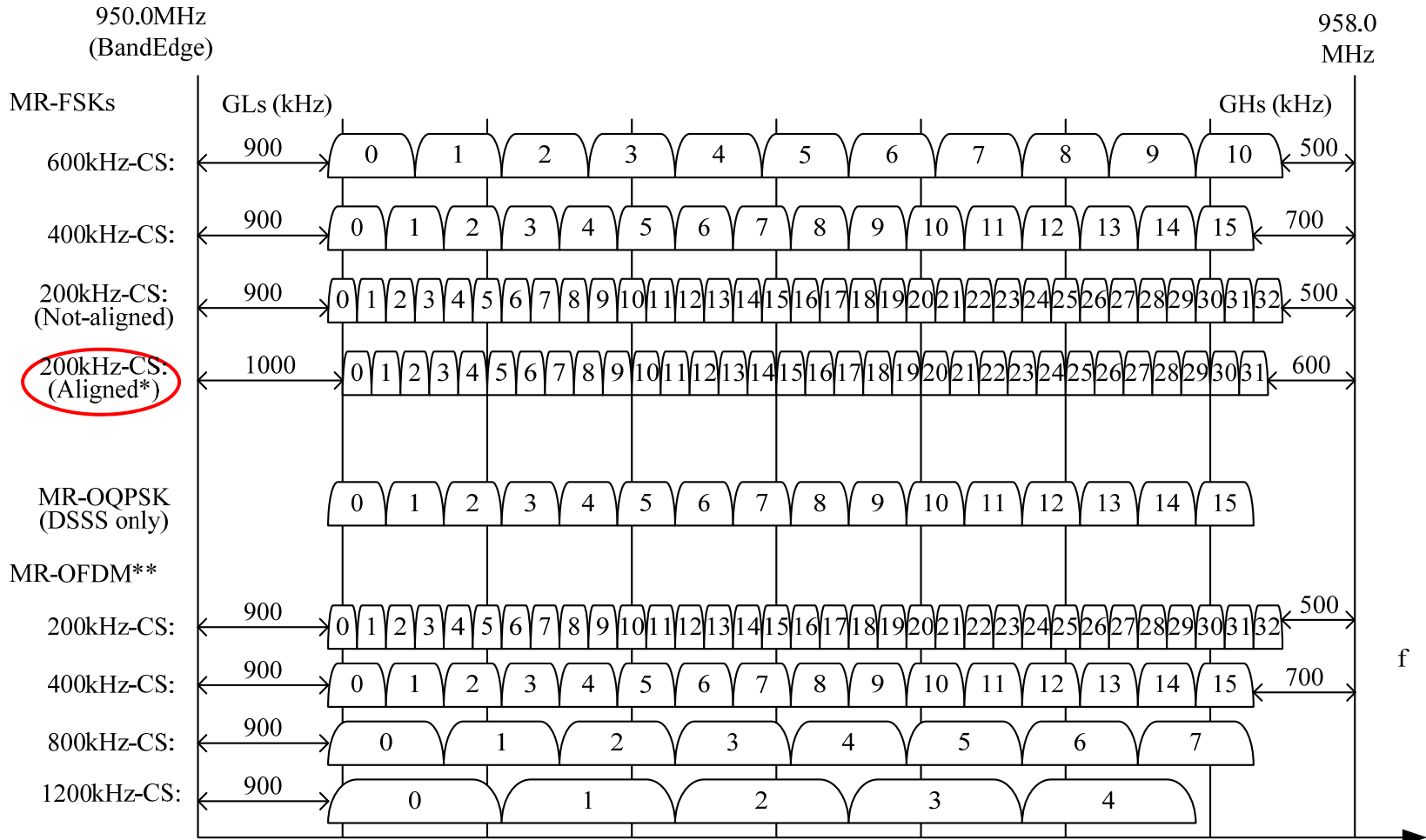
Refer to Case A in slide 10



902-928 MHz Band



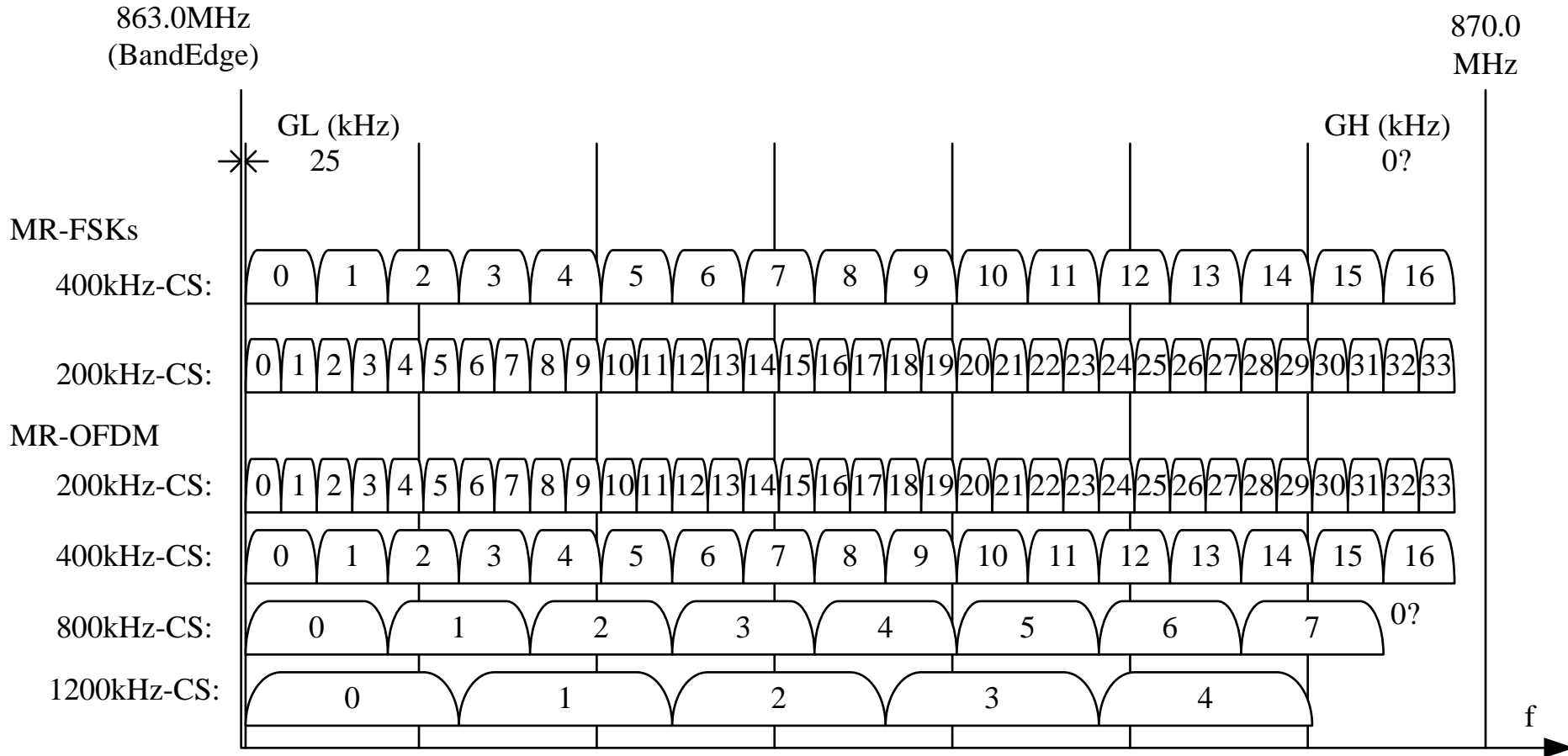
950-958 MHz Band



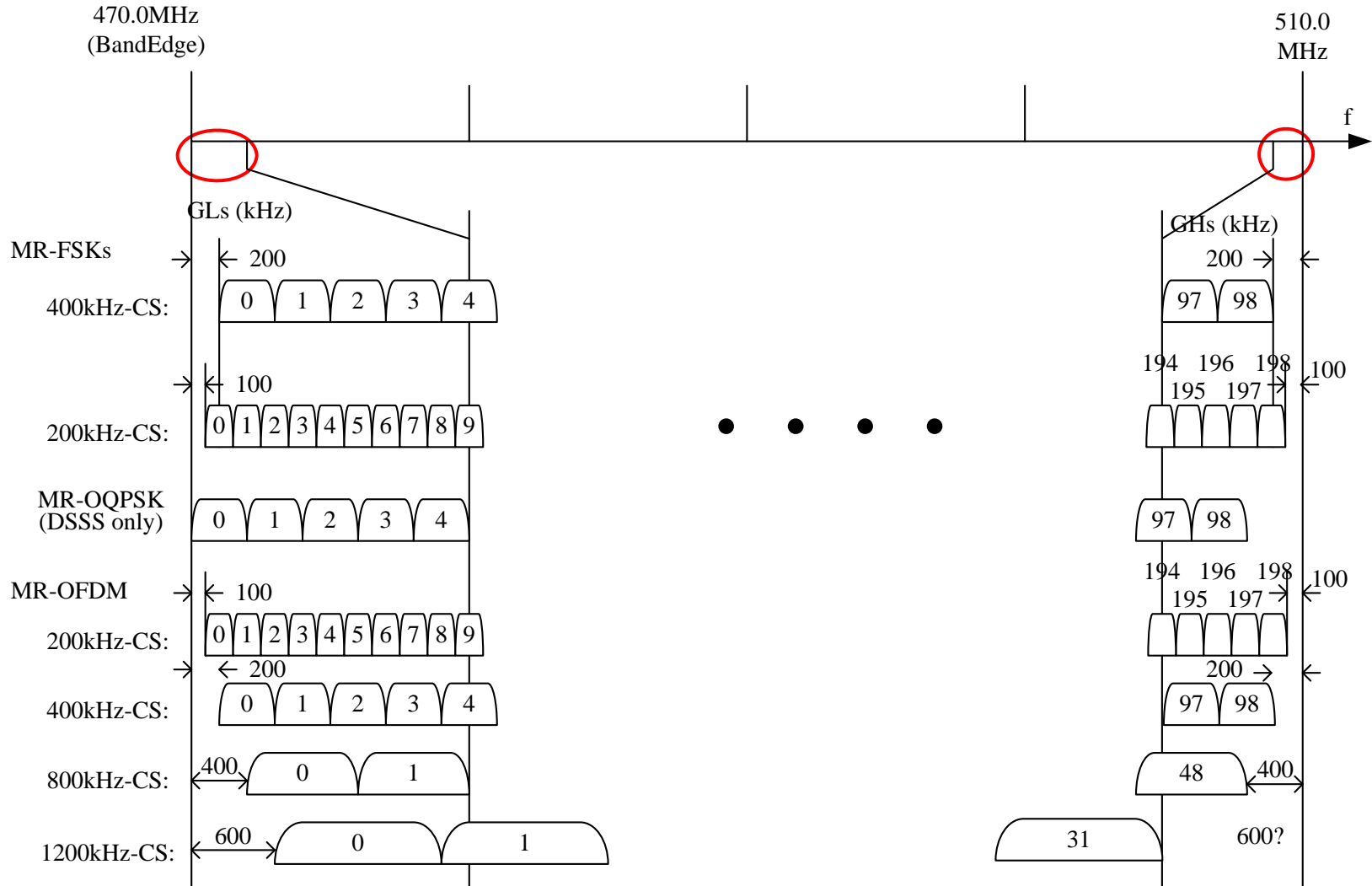
*; Not included in D2 though possible under the current regulatory

**; Not confirmed and subjected to change

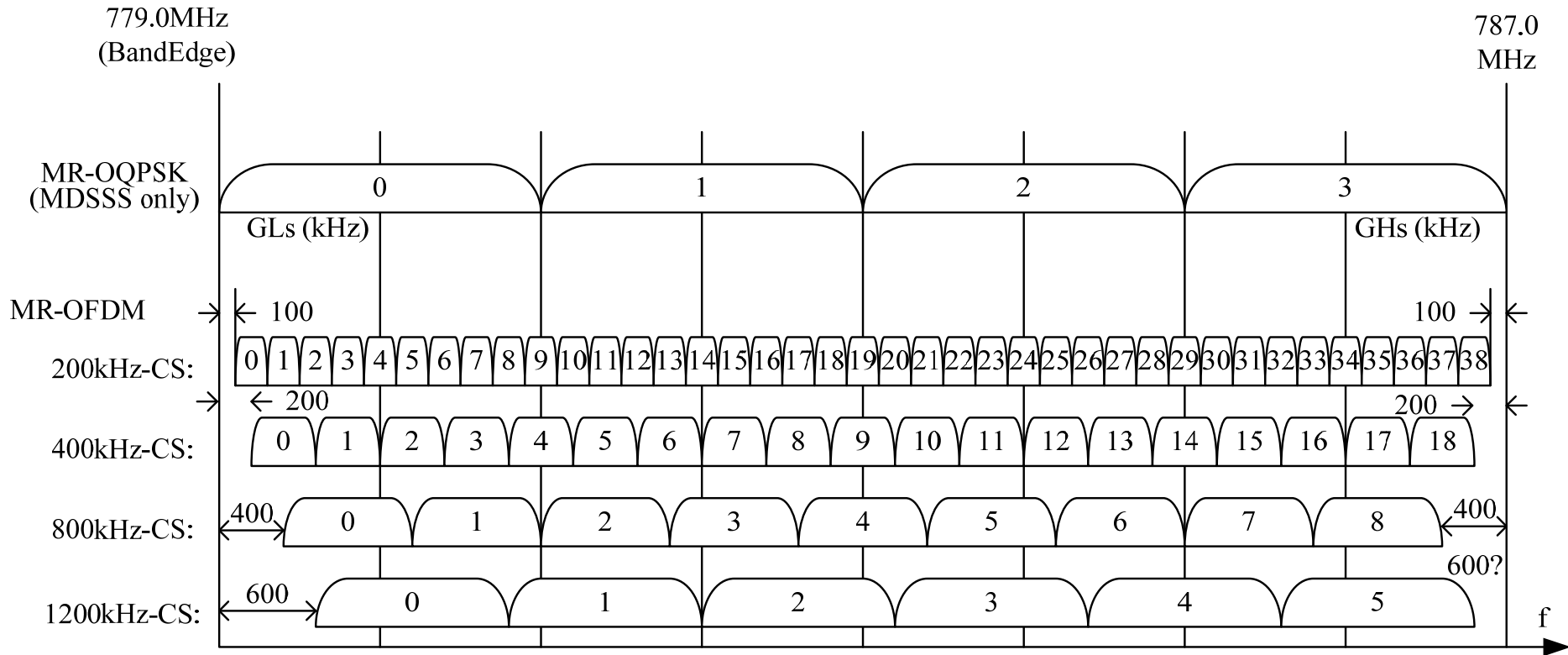
863-870 MHz Band



470-510 MHz Band



779-787 MHz Band



2400 - 2483.5 MHz Band

~*GL* and *GH* calculation~

- Case A: If *GL* is set to $\text{ChanSpacing}/2$, and assuming the most number of channels possible, then:
 - For 200kHz CS – total number of channel is 417, and *GH* is 0
 - For 400kHz CS – total number of channel is 208, and *GH* is 0.1MHz
- Case B: If *GL* is set to $\text{ChanSpacing}/2$, and setting *GH* around 5MHz as in current D2, then
 - For 200kHz CS – total number of channel is 392, and *GH* is 5MHz
 - For 400kHz CS – total number of channel is 195, and *GH* is 5.3MHz

2400-2483.5 MHz Band

~Modification on Draft Text~

- For Case A:
- Proposal: Replace the sentence in pg. 16 line 20
 - “For the 2.4GHz band, GH is 5MHz.”with
 - “For the 2.4GHz band, GL is $ChanSpacing/2$, GH is 0 for 200kHz CS and 0.1MHz for 400kHz CS.” OR simply “For the 2.4GHz band, GL is $ChanSpacing/2$.”
- For Case B:
- Proposal: Replace the sentence in pg. 16 line 20
 - “For the 2.4GHz band, GH is 5MHz.”with
 - “For the 2.4GHz band, GL is $ChanSpacing/2$, GH is 5MHz for 200kHz CS and 5.3MHz for 400kHz CS.” OR simply “For the 2.4GHz band, GL is $ChanSpacing/2$.”

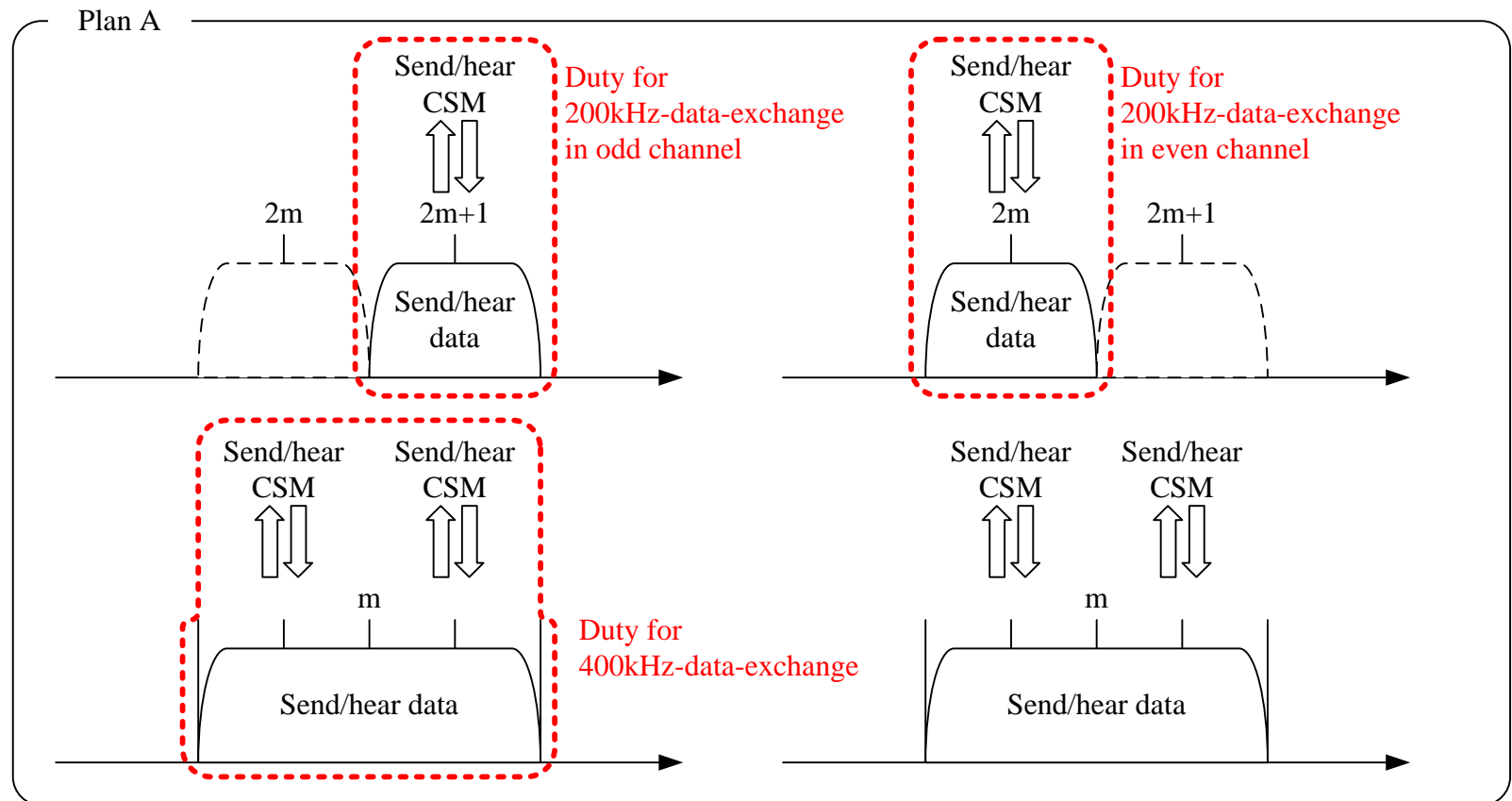
EB/EBR Exchange (in CSM) Operation Example: Japanese Band

CSM Operation in Japanese band

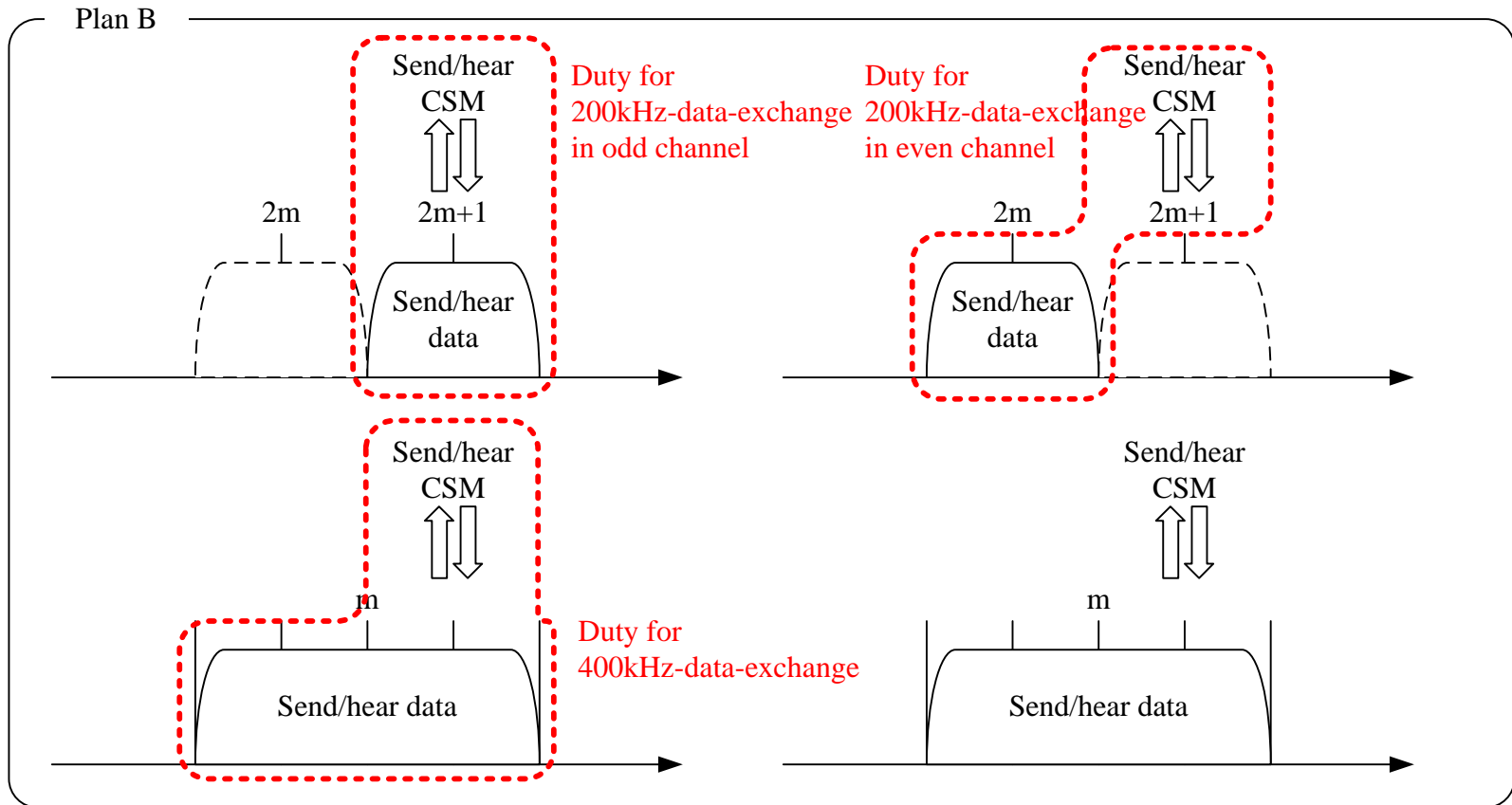
- In the Japanese band, no frequency hopping is specified
- Hence, EB/EBR and CSM shall be utilized mainly for interference avoidance in non-hopping systems
- The following slides show how the EB/EBR (through CSM) is exchanged across systems with different Channel Spacing (CS)
- Plan A requires the ‘wide CS’ system to perform heavier workload by exchanging EB/EBR (CSM) in every ‘narrow CS’ it overlaps with
 - Wide CS has heavier workload for EB/EBR (CSM) exchanging
 - Narrow CS needs not switch channel for EB/EBR (CSM) exchanging
- Plan B requires the ‘narrow CS’ system to perform heavier workload by exchanging CSM in every possible channel overlapping with a ‘wide CS’ system
 - Wide CS has lighter workload for EB/EBR (CSM) exchanging
 - Narrow CS may need to switch channel for EB/EBR (CSM) exchanging
- While the current Japanese band is illustrated by the ‘not-aligned channelization’ slides, the ‘aligned channelization’ slides are also shown for reference

CSM usage in “not-aligned” channelization

Plan A: Work more in 400kHz CS

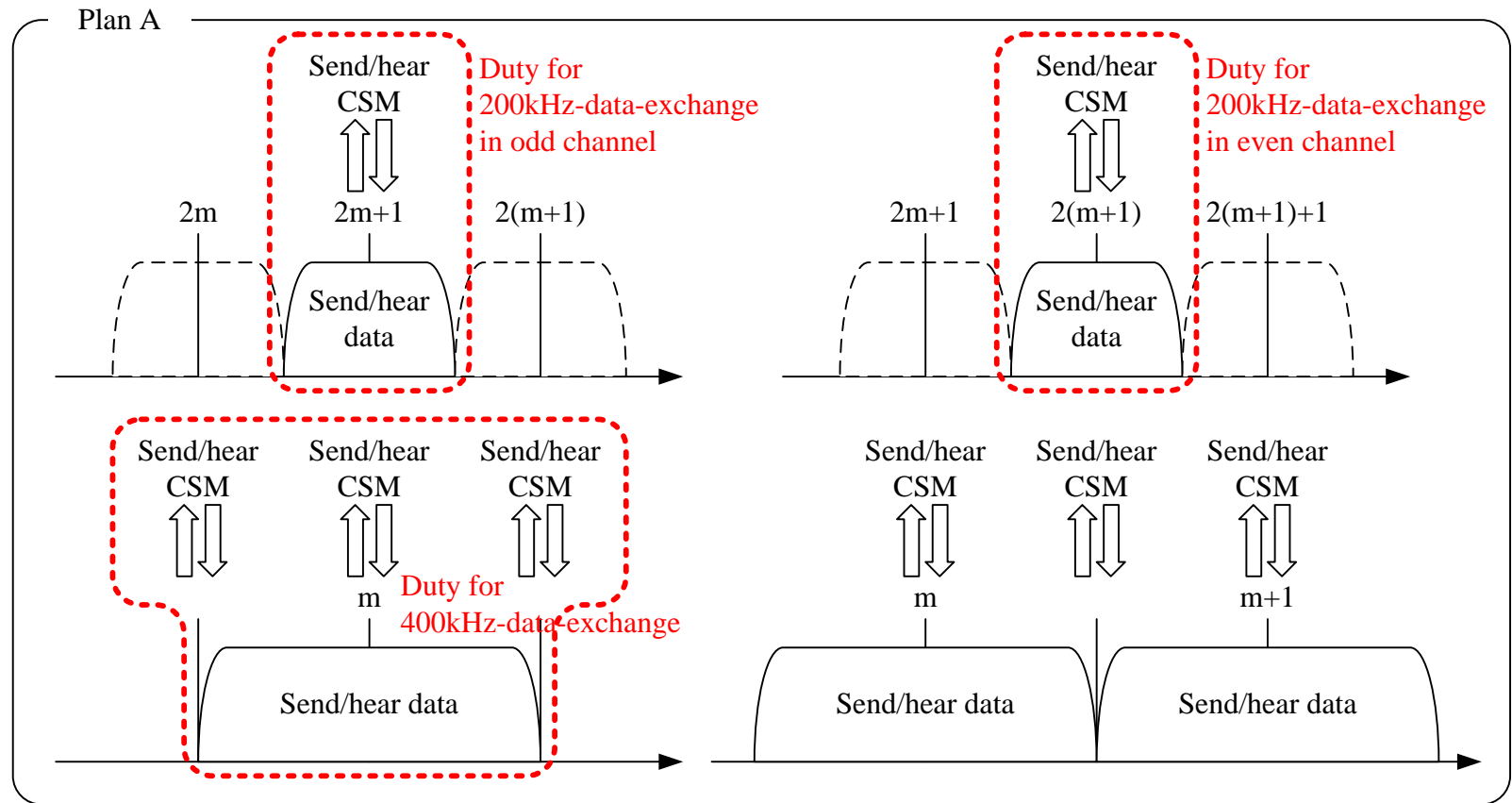


CSM usage in “not-aligned” channelization Plan B: Work more in 200kHz CS



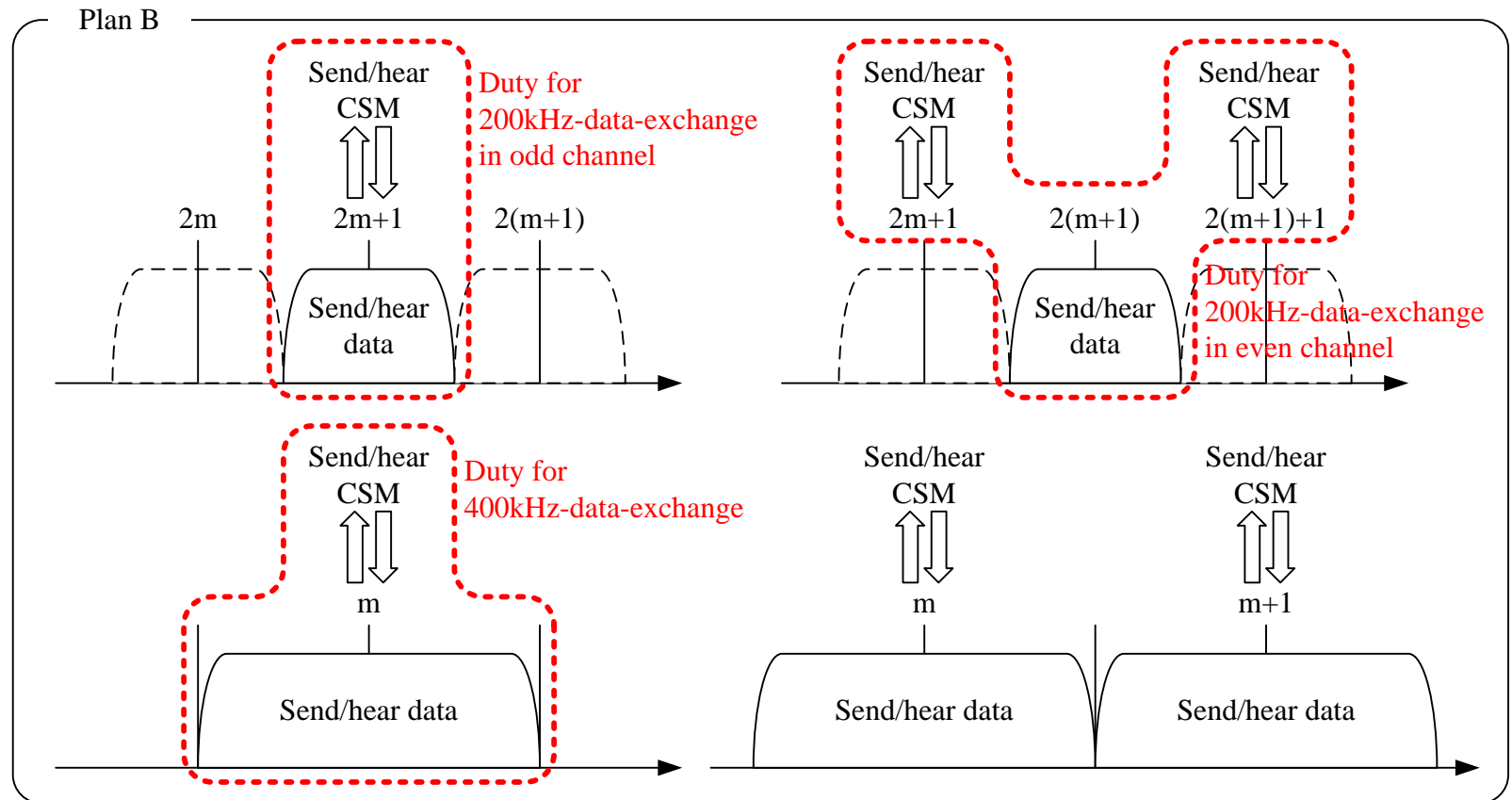
CSM usage in “aligned” channelization

Plan A: Work more in 400kHz CS



CSM usage in “aligned” channelization

Plan B: Work more in 200kHz CS



Conclusion

- For a frequency hopping system, channel alignment (center frequency alignment for 200kHz CS and 400kHz CS) between systems with different channel spacing is important to facilitate EB/EBR exchange
 - [Some suggestions are provided to improve the text in the 2.4GHz band channel numbering](#)
- For a non-frequency hopping system, EB/EBR may be exchanged between systems with different channel spacing in both the ‘channel-aligned’ and ‘channel-non-aligned’ cases
 - The actual channel used for exchanging the EB/EBR can be determined by a parameter in the primitive (refer 10/872r3) prior to operation
- The primitive in 10/872r3 may also be applicable to facilitate the advanced EB/EBR exchange (as proposed in 10/771r6) employing a reduced set of channels