

~~AMENDED SET OF CLAIMS~~

~~Clean Copy~~

1. An apparatus for wireless communications, comprising:
a processing system configured to generate a frame comprising:
a first portion for transmission on separate channels;_i and
a second portion for transmission using channel bonding, wherein:
the second portion ~~having~~ includes:
a training field including first complementary sequences;_i
a first channel estimation field (CEF) including second complementary sequences;_i and
a ~~second~~ shifted CEF, different from the first CEF, including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF, wherein the shifted CEF is at least partially included within the training field; and
an interface for outputting the frame for transmission.
2. The apparatus of claim 1, wherein a last of the first complementary sequences of the training field is a same as a last of the second complementary sequences of the first CEF, both forming a cyclic pattern.
3. The apparatus of claim 2, wherein a second to the last of the first complementary sequences of the training field is a same as a last of the subset of the second complementary sequences of the ~~second~~ shifted CEF, both forming a cyclic pattern.
4. The apparatus of claim 1, wherein the second portion of the frame is output for transmission as a single carrier (SC) transmission using the channel bonding.
5. The apparatus of claim 1, wherein the second portion of the frame is output for transmission as an orthogonal frequency division multiplexing (OFDM) transmission with the channel bonding.

6. The apparatus of claim 1, wherein the first complementary sequences of the training field and the second complementary sequences of the first CEF comprise Golay code sequences.
7. The apparatus of claim 1, wherein:
 - the one of the first complementary sequences included in the ~~second~~shifted CEF comprises a last complementary sequence of the training field; and
 - the last complementary sequence of the training field comprises a Ga Golay code sequence.
8. The apparatus of claim 1, wherein the processing system is configured to determine lengths of at least one of the first or second complementary sequences based on a width of the channel bonding.
9. The apparatus of claim 1, wherein the ~~second channel estimation field is a shifted version of~~CEF at least partially overlaps the first channel estimation training field in time.
10. A ~~method for wireless communications~~station, comprising:
 - ~~generating~~ at least one antenna;
 - a processing system configured to generate a frame comprising:
 - a first portion for transmission on separate channels;₁ and
 - a second portion for transmission using channel bonding, wherein:
 - the second portion ~~having~~includes:
 - a training field including first complementary sequences;₁
 - a first channel estimation field (CEF) including second complementary sequences;₂ and
 - a ~~second~~shifted CEF, different from the first CEF, including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF, wherein the shifted CEF is at least partially included within the training field; and
 - ~~outputting a transmitter configured to transmit the frame for transmission.~~

11. — ~~The method of claim 10, wherein a last of~~via ~~the first complementary sequences of the training field is a same as a last of the second complementary sequences of the first CEF, both forming a cyclic pattern.~~

12. — ~~The method of claim 11, wherein a second to the last of the first complementary sequences of the training field is a same as a last of the subset of the second complementary sequences of the second CEF, both forming a cyclic pattern.~~

13. — ~~The method of claim 10, wherein the second portion of the frame is output for transmission as a single carrier (SC) transmission using the channel bonding.~~

14. — ~~The method of claim 10, wherein the second portion of the frame is output for transmission as an orthogonal frequency division multiplexing (OFDM) transmission with the channel bonding.~~

15. — ~~The method of claim 10, wherein the first complementary sequences of the training field and the second complementary sequences of the first CEF comprise Golay code sequences.~~

16. — ~~The method of claim 10, wherein:~~

— ~~the one of the first complementary sequences included in the second CEF comprises a last complementary sequence of the training field; and~~

— ~~the last complementary sequence of the training field comprises a Ga Golay code sequence.~~

17. — ~~The method of claim 10, further comprising determining lengths of at least one of the first or second complementary sequences based on a width of the channel bonding~~antenna.

18. — ~~The method of claim 10, wherein the second channel estimation field is a shifted version of the first channel estimation field.~~

1911. An apparatus for wireless communications, comprising:

~~means for generating an interface configured to obtain a frame comprising, wherein:~~
a first portion ~~for transmission of the frame is obtained~~ on separate channels, ~~and a~~
second portion of the frame is obtained using channel bonding and
~~a second portion for transmission using channel bonding, the second portion having~~
includes:

a training field including first complementary sequences;_i

a first channel estimation field (CEF) including second complementary sequences;_i and

a ~~second~~ shifted CEF, different from the first CEF, including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF, wherein the shifted CEF is at least partially included within the training field; and

~~means for outputting the frame for transmission.~~

20. ~~The apparatus of claim 19, wherein a last of the first complementary sequences of the training field is a same as a last of the second complementary sequences of the first CEF, both forming a cyclic pattern.~~

21. ~~The apparatus of claim 20, wherein a second to the last of the first complementary sequences of the training field is a same as a last of the subset of the second complementary sequences of the second CEF, both forming a cyclic pattern.~~

22. ~~The apparatus of claim 19, wherein the second portion of the frame is output for transmission as a single carrier (SC) transmission using the channel bonding.~~

23. ~~The apparatus of claim 19, wherein the second portion of the frame is output for transmission as an orthogonal frequency division multiplexing (OFDM) transmission with the channel bonding.~~

24. ~~The apparatus of claim 19, wherein the first complementary sequences of the training field and the second complementary sequences of the first CEF comprise Golay code sequences.~~

25. ~~The apparatus of claim 19, wherein:~~

~~the one of the first complementary sequences included in the second CEF comprises a last complementary sequence of the training field; and~~

~~the last complementary sequence of the training field comprises a Ga Golay code sequence.~~

26. ~~The apparatus of claim 19, further comprising means for determining lengths of at least one of the first or second complementary sequences based on a width of the channel bonding.~~

27. ~~The apparatus of claim 19, wherein the second channel estimation field is a shifted version of the first channel estimation field.~~

28. ~~A wireless station, comprising:~~

~~a processing system configured to generate a frame comprising:~~

~~a first portion for transmission on separate channels, and~~

~~a second portion for transmission using channel bonding, the second portion having a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and~~

~~a transmitter configured to transmit the frame.~~

29. ~~A computer readable medium having instructions stored thereon for:~~

~~generating a frame comprising:~~

~~a first portion for transmission on separate channels, and~~

a second portion for transmission using channel bonding, the second portion having a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and

outputting the frame for transmission.

30. ~~_____~~ An apparatus for wireless communications, comprising:

~~_____~~ an interface configured to obtain a frame, wherein

~~_____~~ a first portion of the frame is obtained on separate channels, a second portion of the frame is obtained using channel bonding, and

~~_____~~ the second portion has a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and

a processing system configured to perform channel estimation based on at least one of the first CEF or the second CEF.

31. ~~_____~~ 12. The apparatus of claim ~~30~~11, wherein the processing system is further configured to determine whether to base the channel estimation on the ~~second~~secondshifted CEF or the first CEF, based on one or more conditions.

32. ~~_____~~ 13. The apparatus of claim ~~31~~12, wherein the one or more conditions relate to at least one of available processing resources of the apparatus or latency requirements.

~~33~~14. The apparatus of claim ~~32~~13, wherein:

the latency requirements call for the apparatus to generate a response to the frame within a time period after obtaining the frame; and

the processing system is configured to

determine the channel estimation is to be based on the ~~second~~secondshifted CEF if the ~~first~~ time period is less than or equal to a threshold value; or

determine the channel estimation is to be based on the first CEF if the first-time period is greater than the threshold value.

~~3415.~~ The apparatus of claim 30, ~~wherein the second channel estimation field is a shifted version of the first channel estimation field.~~

~~35.~~ A method for wireless communications, comprising:

~~obtaining a frame, wherein~~

~~a first portion of the frame is obtained on separate channels, a second portion of the frame is obtained using channel bonding, and~~

~~the second portion has a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and~~

~~performing channel estimation based on at least one of the first CEF or the second CEF.~~

~~36.~~ The method of claim ~~35~~11, further comprising ~~determining whether to base~~at least one antenna via which the channel estimation on the second CEF or the first CEF, based on one or more conditions.

~~37.~~ The method of claim ~~36~~frame is received, wherein the ~~one or more conditions relate to at least one of available processing resources of the apparatus or latency requirements.~~

~~38.~~ The method of claim 37, wherein:

~~the latency requirements call for the apparatus to generate a response to the frame within a time period after obtaining the frame; and~~

~~the determining comprises~~

~~determining the channel estimation is to be based on the second CEF if the first time period is less than or equal to a threshold value; or~~

—determining the channel estimation is to be based on the first CEF if the first time period is greater than the threshold value.

39. The method of claim 35, wherein the second channel estimation field is a shifted version of the first channel estimation field.

40. An apparatus for wireless communications, comprising:

—means for obtaining a frame, wherein

—a first portion of the frame is obtained on separate channels, a second portion of the frame is obtained using channel bonding, and

—the second portion has a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and

—means for performing channel estimation based on at least one of the first CEF or the second CEF.

41. The apparatus of claim 40, further comprising means for determining whether to base the channel estimation on the second CEF or the first CEF, based on one or more conditions.

42. The apparatus of claim 41, wherein the one or more conditions relate to at least one of available processing resources of the apparatus or latency requirements.

43. The apparatus of claim 42, wherein:

—the latency requirements call for the apparatus to generate a response to the frame within a time period after obtaining the frame; and

—the means for determining comprises

—means for determining the channel estimation is to be based on the second CEF if the first time period is less than or equal to a threshold value; or

_____ means for determining the channel estimation is to be based on the first CEF if the first time period is greater than the threshold value.

44. _____ The apparatus of claim 40, wherein the second channel estimation field is a shifted version of the first channel estimation field.

45. _____ A is configured as a wireless station, comprising:

_____ a receiver configured to receive a frame, wherein

_____ a first portion of the frame is received on separate channels, a second portion of the frame is obtained using channel bonding, and

_____ the second portion has a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and

_____ a processing system configured to perform channel estimation based on at least one of the first CEF or the second CEF.

46. _____ A computer readable medium, having instructions stored thereon for:

_____ obtaining a frame, wherein

_____ a first portion of the frame is obtained on separate channels, a second portion of the frame is obtained using channel bonding, and

_____ the second portion has a training field including first complementary sequences, a first channel estimation field (CEF) including second complementary sequences, and a second CEF including one of the first complementary sequences of the training field and a subset of the second complementary sequences of the first CEF; and

_____ performing channel estimation based on at least one of the first CEF or the second CEF.