

CLAIMS

~~WHAT IS CLAIMED IS:~~

1. A method of wireless communication at a base station, comprising:
~~—— configuring an initial Control Resource Set (CORESET) having a reduced bandwidth corresponding to a bandwidth capability of a first User Equipment (UE) type, the reduced bandwidth having a narrower frequency range than a bandwidth capability of a second UE type; and~~
~~—— transmitting a control channel in the initial CORESET.~~
2. ~~The method of claim 1, wherein the initial CORESET having the reduced bandwidth is configured using a first set of bandwidth options in a Master Information Block (MIB) that are lower than a second set of bandwidth options in the MIB.~~
3. ~~The method of claim 1, wherein the first UE type has a first bandwidth capability and the base station serves at least one UE of the second UE type having a second bandwidth capability that is wider than the first bandwidth capability, and wherein the base station configures the initial CORESET based on the first bandwidth capability of the first UE type.~~
4. ~~A method of wireless communication at a base station, comprising:~~
configuring a first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a first bandwidth capability; ~~and~~
configuring a second initial CORESET for at least a second UE type having a second bandwidth capability that is lower than the first bandwidth capability; ~~and~~
transmitting a control channel in at least one of the first initial CORESET or the second initial CORESET;
5. ~~The method of claim 4, wherein the second initial CORESET is configured based on the first initial CORESET having a larger bandwidth than the second bandwidth capability of the second UE type.~~
6. ~~The method of claim 4, wherein the first initial CORESET comprises a first~~

frequency range, and wherein the second initial CORESET comprises a second frequency range that is within the first frequency range.

72. The method of claim 61, wherein the first initial CORESET and the second initial CORESET have a same center frequency.

8. ~~The~~3. A method of ~~claim 4, wherein the~~wireless communication at a base station, comprising:

configuring a first initial Control Resource Set (CORESET ~~comprises~~) for a first set of symbols in time, and wherein the User Equipment (UE) type having a first bandwidth capability;

configuring a second initial CORESET ~~comprises~~ for at least a second set of symbols UE type having a second bandwidth capability that are not fully overlapping with this lower than the first bandwidth capability; and

transmitting a control channel in at least one of the first initial CORESET or the first set of symbols. second initial CORESET,

9. ~~The method of claim 4, wherein the first initial CORESET comprises a first set of symbols in time, and wherein the second initial CORESET comprises a second set of symbols that are within with the first set of symbols.~~

10. ~~The~~4. A method of ~~claim 4, wherein the~~wireless communication at a base station, comprising:

configuring a first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a first bandwidth capability;

configuring a second initial CORESET is configured based on a configuration offor at least a second UE type having a second bandwidth capability that is lower than the first bandwidth capability; and

transmitting a control channel in at least one of the first initial CORESET or a Synchronization Signal (SS) set associated with the first second initial CORESET.

11. ~~The method of claim 4, further comprising:~~

~~indicating at least a portion of a configuration of the second initial CORESET to the second UE type.~~

~~12. The method of claim 11, wherein the at least the portion of the configuration of the second initial CORESET is indicated to the second UE type independent from configuration information for the first initial CORESET.~~

~~13. The method of claim 4, wherein the second initial CORESET is nested within at least one of frequency resources or time resources of the first initial CORESET, and wherein the control channel is transmitted to UEs of the first UE type and the second UE type in the second initial CORESET.~~

~~145.~~ The method of claim ~~134~~, further comprising:

_____selecting a first set of control channel candidates from a plurality of control channel candidates based on the second bandwidth capability of the second UE type;

mapping the first set of control channel candidates to time and frequency resources within a center bandwidth shared by the first initial CORESET and the second initial CORESET;

_____selecting a second set of control channel candidates from remaining control channel candidates of the plurality of control channel candidates; and

_____mapping the second set of control channel candidates to time and frequency resources of the second initial CORESET that do not overlap the first initial CORESET.

~~156.~~ The method of claim ~~145~~, wherein a first Control Channel Element (CCE) allocation for a first control channel transmission is based on a first number of first set of control channel candidates and a second CCE allocation for a second control channel transmission is based on a second number of the second set of control channel candidates.

~~167.~~ The method of claim ~~145~~, wherein Control Channel Element to Resource Element Group (CCE-to-REG) interleaving is performed separately for the center bandwidth shared by the first initial CORESET and the second initial CORESET and for a non-overlapping bandwidth of the second initial CORESET that does not overlap the first initial CORESET.

~~17. An apparatus for wireless communication at a base station, comprising:~~

_____means for configuring an initial Control Resource Set (CORESET) having a reduced bandwidth corresponding to a bandwidth capability of a first User Equipment (UE) type, the

reduced bandwidth having a narrower frequency range than a bandwidth capability of a second UE type; and

— means for transmitting a control channel in the initial CORESET.

18. — The apparatus of claim 17, wherein the initial CORESET having the reduced bandwidth is configured using a first set of bandwidth options in a Master Information Block (MIB) that are lower than a second set of bandwidth options in the MIB.

19. — The apparatus of claim 17, wherein the first UE type has a first bandwidth capability and the base station serves at least one UE of the second UE type having a second bandwidth capability that is wider than the first bandwidth capability, and wherein the base station configures the initial CORESET based on the first bandwidth capability of the first UE type.

20. An apparatus for wireless communication at a base station, comprising:

means for configuring a first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a first bandwidth capability; and

means for configuring a second initial CORESET for at least a second UE type having a second bandwidth capability that is lower than the first bandwidth capability; and

means for transmitting a control channel in at least one of the first initial CORESET or the second initial CORESET;

21. — The apparatus of claim 20, wherein the second initial CORESET is configured based on the first initial CORESET having a larger bandwidth than the second bandwidth capability of the second UE type.

22. — The apparatus of claim 20, wherein the first initial CORESET comprises a first frequency range, and wherein the second initial CORESET comprises a second frequency range that is within the first frequency range.

23. The apparatus of claim 22, wherein the first initial CORESET and the second initial CORESET have a same center frequency.

24. — The apparatus of claim 20, wherein the apparatus is for wireless communication at a base

station, comprising:

means for configuring a first initial Control Resource Set (CORESET) for a first set of symbols in time, and wherein the User Equipment (UE) type having a first bandwidth capability;

means for configuring a second initial CORESET comprises for at least a second set of symbols UE type having a second bandwidth capability that are not fully overlapping with is lower than the first bandwidth capability; and

means for transmitting a control channel in at least one of the first initial CORESET or the first set of symbols; second initial CORESET,

25. — ~~The apparatus of claim 20, wherein the first initial CORESET comprises a first set of symbols in time, and wherein the second initial CORESET comprises a second set of symbols that are within with the first set of symbols.~~

26. — ~~The~~^{11.} ~~An apparatus of claim 20, wherein the~~ for wireless communication at a base station, comprising:

means for configuring a first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a first bandwidth capability;

means for configuring a second initial CORESET is configured based on a configuration or for at least a second UE type having a second bandwidth capability that is lower than the first bandwidth capability; and

means for transmitting a control channel in at least one of the first initial CORESET or a Synchronization Signal (SS) set associated with the first initial CORESET.

27. — ~~The apparatus of claim 20, further comprising:~~

~~means for indicating at least a portion of a configuration of the second initial CORESET to the second UE type.~~

28. — ~~The apparatus of claim 27, wherein the at least the portion of the configuration of the second initial CORESET is indicated to the second UE type independent from configuration information for the first initial CORESET.~~

29. — ~~The apparatus of claim 20, wherein the second initial CORESET is nested within~~

at least one of frequency resources or time resources of the first initial CORESET, and wherein the control channel is transmitted to UEs of the first UE type and the second UE type in the second initial CORESET.

~~30~~12. The apparatus of claim ~~29~~11, further comprising:

means for selecting a first set of control channel candidates from a plurality of control channel candidates based on the second bandwidth capability of the second UE type;

means for mapping the first set of control channel candidates to time and frequency resources within a center bandwidth shared by the first initial CORESET and the second initial CORESET;

means for selecting a second set of control channel candidates from remaining control channel candidates of the plurality of control channel candidates; and

means for mapping the second set of control channel candidates to time and frequency resources of the second initial CORESET that do not overlap the first initial CORESET.

~~31~~13. The apparatus of claim ~~30~~12, wherein a first Control Channel Element (CCE) allocation for a first control channel transmission is based on a first number of first set of control channel candidates and a second CCE allocation for a second control channel transmission is based on a second number of the second set of control channel candidates.

~~32~~14. The apparatus of claim ~~30~~12, wherein Control Channel Element to Resource Element Group (CCE-to-REG) interleaving is performed separately for the center bandwidth shared by the first initial CORESET and the second initial CORESET and for a non-overlapping bandwidth of the second initial CORESET that does not overlap the first initial CORESET.

~~33~~15. An apparatus for wireless communication at a base station, comprising:

a memory; and

at least one processor coupled to the memory and configured to:

configure ~~an~~ a first initial Control Resource Set (CORESET) ~~having a reduced bandwidth corresponding to a bandwidth capability of~~ for a first User Equipment (UE) type, ~~the reduced bandwidth having a narrower frequency range than a~~ first bandwidth capability of;

_____ configure a second UE type; and

~~transmit a control channel in the initial CORESET;~~

~~34. The apparatus of claim 33, wherein for at least the initial CORESET second UE type having the reduced a second bandwidth is configured using a first set of bandwidth options in a Master Information Block (MIB) capability that are is lower than a second set of bandwidth options in the MIB.~~

~~35. The apparatus of claim 33, wherein the first UE type has a the first bandwidth capability and the base station serves at least one UE of the second UE type having a second bandwidth capability that is wider than the first bandwidth capability, and wherein the base station configures the initial CORESET based on the first bandwidth capability of the first UE type; and~~

~~transmit a control channel in at least one of the first initial CORESET or the second initial CORESET,~~

~~wherein the first initial CORESET comprises a first frequency range, and wherein the second initial CORESET comprises a second frequency range that is within the first frequency range.~~

~~16. The apparatus of claim 15, wherein the first initial CORESET and the second initial CORESET have a same center frequency.~~

~~36~~17. An apparatus for wireless communication at a base station, comprising:

a memory; and

at least one processor coupled to the memory and configured to:

configure a first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a first bandwidth capability; and

configure a second initial CORESET for at least the second UE type having a second bandwidth capability that is lower than the first bandwidth capability

; and transmit a control channel in at least one of the first initial CORESET or the second initial CORESET.

37. — ~~The apparatus of claim 36, wherein the second initial CORESET is configured based on the first initial CORESET having a larger bandwidth than the second bandwidth capability of the second UE type.~~

38. — ~~The apparatus of claim 36, wherein the first initial CORESET comprises a first frequency range, and wherein the second initial CORESET comprises a second frequency range that is within the first frequency range.~~

39. — ~~The apparatus of claim 38, wherein the first initial CORESET and the second initial CORESET have a same center frequency.~~

40. — ~~The apparatus of claim 36, wherein the first initial CORESET comprises a first set of symbols in time, and wherein the second initial CORESET comprises a second set of symbols that are not fully overlapping within with the first set of symbols.~~

41. — ~~The~~18. An apparatus of claim 36, ~~wherein~~for wireless communication at a base station,
comprising:

_____ a memory; and

_____ at least one processor coupled to the memory and configured to:

_____ configure a first initial Control Resource Set (CORESET ~~comprises~~) for a first set of symbols in time, and wherein theUser Equipment (UE) type having a first bandwidth capability;

_____ configure a second initial CORESET ~~comprises~~ for at least the second UE type having a second set of symbolsbandwidth capability that are within with a lower than the first set of symbols.bandwidth capability; and

42. — ~~The apparatus of claim 36, wherein the second initial CORESET is configured based on a configuration of~~transmit a control channel in at least one of the first initial CORESET or a ~~Synchronization Signal (SS) set associated with the first~~second initial CORESET.

43. — ~~The apparatus of claim 36, the at least one processor further configured to:~~

~~indicate at least a portion of a configuration of the second initial CORESET to a second UE type.~~

~~44. The apparatus of claim 43, wherein the at least the portion of the configuration of the second initial CORESET is indicated to the second UE type independent from configuration information for the first initial CORESET.~~

~~45. The apparatus of claim 36, wherein the second initial CORESET is nested within at least one of frequency resources or time resources of the first initial CORESET, and wherein the control channel is transmitted to UEs of the first UE type and a second UE type in the second initial CORESET.~~

~~46~~19. The apparatus of claim ~~45~~18, the at least one processor further configured to:

select a first set of control channel candidates from a plurality of control channel candidates based on the second bandwidth capability of the second UE type;

map the first set of control channel candidates to time and frequency resources within a center bandwidth shared by the first initial CORESET and the second initial CORESET;

select a second set of control channel candidates from remaining control channel candidates of the plurality of control channel candidates; and

map the second set of control channel candidates to time and frequency resources of the second initial CORESET that do not overlap the first initial CORESET.

~~47~~20. The apparatus of claim ~~46~~19, wherein a first Control Channel Element (CCE) allocation for a first control channel transmission is based on a first number of first set of control channel candidates and a second CCE allocation for a second control channel transmission is based on a second number of the second set of control channel candidates.

~~48~~21. The apparatus of claim ~~46~~19, wherein Control Channel Element to Resource Element Group (CCE-to-REG) interleaving is performed separately for the center bandwidth shared by the first initial CORESET and the second initial CORESET and for a non-overlapping bandwidth of the second initial CORESET that does not overlap the first initial CORESET.

~~49~~22. A non-transitory computer-readable medium storing computer executable code for

wireless communication at a base station, the code when executed by a processor cause the processor to:

~~configure a first initial Control Resource Set (CORESET) having a reduced bandwidth corresponding to a bandwidth capability of~~ for a first User Equipment (UE) type, having a first bandwidth capability;

~~configure a second initial CORESET for at least a second UE type having a second bandwidth capability that is lower than the reduced first bandwidth having a narrower frequency range than a bandwidth capability of a second User Equipment (UE) type~~ capability; and

~~transmit a control channel in at least one of the first initial CORESET, or the second initial CORESET,~~

wherein the first initial CORESET comprises a first frequency range, and wherein the second initial CORESET comprises a second frequency range that is within the first frequency range.

5023. A non-transitory computer-readable medium storing computer executable code for wireless communication at a base station, the code when executed by a processor cause the processor to:

configure a first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a first bandwidth capability; ~~and~~

configure a second initial CORESET for at least a second UE type having a second bandwidth capability that is lower than the first bandwidth capability; and

transmit a control channel in at least one of the first initial CORESET or the second initial CORESET;

51. ~~A method of wireless communication at a User Equipment (UE) of a~~ wherein the first UE type, comprising:

~~determining a configuration of an initial Control Resource Set (CORESET) having a reduced bandwidth corresponding to a bandwidth capability of the~~ comprises a first UE type, the reduced bandwidth having a narrower frequency range than a bandwidth capability of a set of symbols in time, and wherein the second UE type; and

~~monitoring for a control channel from a base station in the initial CORESET;~~

52. ~~The method of claim 51, further comprising:~~

~~—receiving another configuration of another initial CORESET from the base station, wherein the other initial CORESET is based on a higher bandwidth capability than the bandwidth capability of comprises a second set of symbols that are within with the first UE type, wherein the UE determines the configuration of the initial CORESET having the reduced bandwidth based at least partially on the other configuration of the other initial CORESETset of symbols.~~

53. The method of claim 51, further comprising:

~~—receiving configuration information for the initial CORESET from the base station, wherein the UE determines at least a portion of the configuration of the initial CORESET based on the configuration information received from the base station.~~

54. The method of claim 53, further comprising:

~~receiving another configuration of another initial CORESET from the base station, wherein the other initial CORESET is based on a higher bandwidth capability than the bandwidth capability of the first UE type, wherein the configuration information for the initial CORESET that is received from the base station is separate from the other configuration of the other initial CORESET.~~

55. An apparatus for wireless communication at a User Equipment (UE), comprising:

~~—means for determining a configuration of an initial Control Resource Set (CORESET) having a reduced bandwidth corresponding to a bandwidth capability of a first UE type, the reduced bandwidth having a narrower frequency range than a bandwidth capability of a second UE type; and~~

~~—means for monitoring for a control channel from a base station in the initial CORESET.~~

56. The apparatus of claim 55, further comprising:

~~—means for receiving another configuration of another initial CORESET from the base station, wherein the other initial CORESET is based on a higher bandwidth capability than the bandwidth capability of the first UE type, wherein the UE determines the configuration of the initial CORESET having the reduced bandwidth based at least partially on the other configuration of the other initial CORESET.~~

57. — The apparatus of claim 55, further comprising:

— means for receiving configuration information for the initial CORESET from the base station, wherein the UE determines at least a portion of the configuration of the initial CORESET based on the configuration information received from the base station.

58. — The apparatus of claim 57, further comprising:

— means for receiving another configuration of another initial CORESET from the base station, wherein the other initial CORESET is based on a higher bandwidth capability than the bandwidth capability of the first UE type, wherein the configuration information for the initial CORESET that is received from the base station is separate from the other configuration of the other initial CORESET.

59. — An apparatus for wireless communication at a User Equipment (UE), comprising:

— a memory; and

— at least one processor coupled to the memory and configured to:

— determine a configuration of an initial Control Resource Set (CORESET) having a reduced bandwidth corresponding to a bandwidth capability of a first UE type, the reduced bandwidth having a narrower frequency range than a bandwidth capability of a second UE type; and

— monitor for a control channel from a base station in the initial CORESET.

60. — The apparatus of claim 59, the at least one processor further configured to:

— receive another configuration of another initial CORESET from the base station, wherein the other initial CORESET is based on a higher bandwidth capability than the bandwidth capability of the first UE type, wherein the UE determines the configuration of the initial CORESET having the reduced bandwidth based at least partially on the other configuration of the other initial CORESET.

61. — The apparatus of claim 59, the at least one processor further configured to:

— receive configuration information for the initial CORESET from the base station, wherein the UE determines at least a portion of the configuration of the initial CORESET based on the configuration information received from the base station.

62. — The apparatus of claim 61, the at least one processor further configured to:

~~receive another configuration of another initial CORESET from the base station, wherein the other initial CORESET is based on a higher bandwidth capability than the bandwidth capability of the first UE type, wherein the configuration information for the initial CORESET that is received from the base station is separate from the other configuration of the other initial CORESET.~~

6324. A non-transitory computer-readable medium storing computer executable code ~~for~~or wireless communication at a User Equipment (UE), base station, the code when executed by a processor cause the processor to:

~~determine~~configure a ~~configuration of an~~first initial Control Resource Set (CORESET) for a first User Equipment (UE) type having a reduced bandwidth corresponding to a first bandwidth capability of a first UE type;

configure a second initial CORESET for at least a second UE type having a second bandwidth capability that is lower than the reduced first bandwidth having a narrower capability;
and

transmit a control channel in at least one of the first initial CORESET or the second initial CORESET,

wherein the second initial CORESET is nested within at least one of frequency range than a bandwidth capability of a second User Equipment (UE) type; and resources or time resources of the first initial CORESET, and wherein the control channel is transmitted to UEs of the first UE type and a second UE type in the second initial CORESET.

~~— monitor for a control channel from a base station in the initial CORESET.~~