

CLAIMS

1. A method for wireless communication, comprising: receiving a set of resource indicator bits in one or more control channel elements (CCEs); determining that possible bit combinations for the set of resource indicator bits is less than available uplink control channel resources; identifying a first CCE of the one or more CCEs based at least in part on the determining; selecting an uplink control channel resource for uplink control information (UCI) transmission based at least in part on the set of resource indicator bits and the first CCE of the one or more CCEs; and transmitting the UCI using the selected uplink control channel resource.
2. The method of claim 1, wherein selecting the uplink control channel resource comprises: determining an uplink control channel resource set based at least in part on the set of resource indicator bits; and determining a relative uplink control channel resource index based at least in part on the first CCE, wherein the selected uplink control channel resource corresponds to the relative uplink control channel resource index within the uplink control channel resource set.
3. The method of claim 1, wherein selecting the uplink control channel resource comprises: determining an uplink control channel resource set based at least in part on the first CCE; and determining a relative uplink control channel resource index based at least in part on the set of resource indicator bits, wherein the selected uplink control channel resource corresponds to the relative uplink control channel resource index within the uplink control channel resource set.
4. The method of claim 1, wherein selecting the uplink control channel resource comprises: determining an offset value based at least in part on the set of resource indicator bits; and selecting the uplink control channel resource based at least in part on a combination of the first CCE and the determined offset value.
5. The method of claim 1, wherein selecting the uplink control channel resource is further based at least in part on an aggregation level.
6. The method of claim 1, further comprising: comparing uplink control channel resource indices

within an uplink control channel resource set to a threshold of resources; and determining to select the uplink control channel resource based at least in part on an aggregation level if the uplink control channel resource indices within the uplink control channel resource set is less than the threshold of resources.

7. The method of claim 1, wherein the UCI comprises acknowledgement (ACK) bits according to an ACK payload size.

8. The method of claim 7, wherein the ACK payload size comprises a radio resource control (RRC) configured ACK payload size.

9. The method of claim 8, further comprising: receiving a number of downlink shared channels that is less than the ACK bits according to the RRC configured ACK payload size; inserting ACK bits of a bit value corresponding to decoded results of the downlink shared channels into an ACK payload; and inserting ACK bits of a default bit value corresponding to non-received downlink shared channels into the ACK payload to obtain the RRC configured ACK payload size.

10. The method of claim 8, further comprising: receiving an assignment index bit in downlink control information (DCI); and determining whether to use the RRC configured ACK payload size based at least in part on the assignment index bit.

11. The method of claim 7, further comprising: receiving a set of assignment index bits in downlink control information (DCI); and determining the ACK payload size based at least in part on the set of assignment index bits.

12. The method of claim 11, wherein the DCI comprises a number of assignment index bits based at least in part on a format of the DCI.

13. The method of claim 11, wherein a full DCI format corresponds to a first number of assignment index bits and a fallback DCI format corresponds to a second number of assignment

index bits that is less than the first number of assignment index bits.

14. The method of claim 7, further comprising: receiving a first downlink control channel transmission in a first transmission time interval (TTI), a second downlink control channel transmission in a second TTI, or both; and determining the ACK payload size, ACK bit resources, or both based at least in part on receiving the first downlink control channel transmission, the second downlink control channel transmission, or both.

15. The method of claim 1, wherein the UCI is transmitted in either a short uplink control channel transmission or a long uplink control channel transmission according to a radio resource control (RRC) configuration.

16. The method of claim 1, further comprising: determining to transmit the UCI in either a short uplink control channel transmission or a long uplink control channel transmission based at least in part on the set of resource indicator bits.

17. The method of claim 1, further comprising: receiving a second set of resource indicator bits in a second set of CCEs; determining that updated possible bit combinations for the second set of resource indicator bits is equal to or greater than updated available uplink control channel resources; and selecting a second uplink control channel resource for a second UCI transmission based at least in part on the second set of resource indicator bits, wherein selecting the second uplink control channel resource is not based at least in part on a first CCE of the second set of CCEs according to determining that the updated possible bit combinations for the second set of resource indicator bits is equal to or greater than the updated available uplink control channel resources.

18. The method of claim 1, further comprising: receiving additional downlink control information in a second set of CCEs; determining that the additional downlink control information comprises fewer resource indicator bits than a threshold of bits; selecting a second uplink control channel resource for a second UCI transmission based at least in part on a CCE of the second set of CCEs, wherein selecting the second uplink control channel resource is based at

least in part on determining that the additional downlink control information comprises fewer resource indicator bits than the threshold of bits; and transmitting the second UCI using the selected second uplink control channel resource.

19. The method of claim 18, wherein: the additional downlink control information comprises zero resource indicator bits; and the second UCI is transmitted in either a short uplink control channel transmission or a long uplink control channel transmission according to a radio resource control (RRC) configuration.

20. The method of claim 18, wherein: the additional downlink control information comprises at least one resource indicator bit; and the second UCI is transmitted in either a short uplink control channel transmission or a long uplink control channel transmission based at least in part on the at least one resource indicator bit.

21. The method of claim 1, wherein: the set of resource indicator bits is received in a downlink grant or an uplink grant; and the first CCE of the one or more CCEs comprises an initial CCE for the downlink grant or the uplink grant.

22. The method of claim 1, wherein the uplink control channel resource comprises a physical uplink control channel (PUCCH) resource.

23. The method of claim 1, wherein the set of resource indicator bits comprises a set of acknowledgement resource indicator (ARI) bits.

24. A method for wireless communication, comprising: identifying an uplink control channel resource for allocation; determining a set of resource indicator bits based at least in part on the identified uplink control channel resource; selecting one or more control channel elements (CCEs) for transmission, wherein a first CCE of the one or more CCEs and the set of resource indicator bits indicate the uplink control channel resource; and transmitting the set of resource indicator bits in the one or more CCEs.

25. The method of claim 24, wherein the set of resource indicator bits indicates an uplink control channel resource set, and the first CCE indicates a relative uplink control channel resource index within the uplink control channel resource set.

26. The method of claim 24, wherein the first CCE indicates an uplink control channel resource set, and the set of resource indicator bits indicates a relative uplink control channel resource index within the uplink control channel resource set.

27. The method of claim 24, wherein the set of resource indicator bits indicates an offset value, and a combination of the first CCE and the offset value indicates the uplink control channel resource.

28. The method of claim 24, further comprising: selecting an aggregation level, wherein the aggregation level, the first CCE of the one or more CCEs, and the set of resource indicator bits indicate the uplink control channel resource; and transmitting the set of resource indicator bits in the one or more CCEs based at least in part on the selected aggregation level.

29. The method of claim 24, further comprising: receiving uplink control information (UCI) over the uplink control channel resource, wherein the UCI comprises an acknowledgement (ACK) payload.

30. The method of claim 29, further comprising: performing a blind detection process on one or more uplink control channel resources, wherein the UCI is received based at least in part on the blind detection process.

31. The method of claim 24, further comprising: transmitting a set of assignment index bits in downlink control information (DCI), wherein the set of assignment index bits indicates an acknowledgement (ACK) payload size.

32. The method of claim 31, wherein a format of the DCI indicates a number of assignment index bits to include in the set of assignment index bits.

33. The method of claim 31, wherein a full DCI format indicates a first number of assignment index bits to include in the set of assignment index bits and a fallback DCI format indicates a second number of assignment index bits to include in the set of assignment index bits, wherein the second number of assignment index bits is less than the first number of assignment index bits.

34. The method of claim 24, further comprising: selecting either a short uplink control channel transmission or a long uplink control channel transmission for the allocation; and determining the set of resource indicator bits further based at least in part on the selected short uplink control channel transmission or long uplink control channel transmission.

35. The method of claim 24, further comprising: identifying a second uplink control channel resource for allocation.

36. The method of claim 35, further comprising: determining a second set of resource indicator bits based at least in part on the identified second uplink control channel resource, wherein the second set of resource indicator bits indicates the second uplink control channel resource.

37. The method of claim 35, further comprising: selecting a second set of CCEs for transmission, wherein a CCE of the second set of CCEs indicates the second uplink control channel resource.

38. The method of claim 35, further comprising: determining at least one resource indicator bit, wherein the at least one resource indicator bit indicates either a short uplink control channel transmission or a long uplink control channel transmission for the second uplink control channel resource.

39. The method of claim 24, wherein: the set of resource indicator bits is transmitted in a downlink grant or an uplink grant; and the first CCE of the one or more CCEs comprises an initial CCE for the downlink grant or the uplink grant.

40. The method of claim 24, wherein the uplink control channel resource comprises a physical uplink control channel (PUCCH) resource.

41. The method of claim 24, wherein the set of resource indicator bits comprises a set of acknowledgement resource indicator (ARI) bits.

42. An apparatus for wireless communication, comprising: means for receiving a set of resource indicator bits in one or more control channel elements (CCEs); means for determining that possible bit combinations for the set of resource indicator bits is less than available uplink control channel resources; means for identifying a first CCE of the one or more CCEs based at least in part on the determining; means for selecting an uplink control channel resource for uplink control information (UCI) transmission based at least in part on the set of resource indicator bits and the first CCE of the one or more CCEs; and means for transmitting the UCI using the selected uplink control channel resource.

43. An apparatus for wireless communication, comprising: means for identifying an uplink control channel resource for allocation; means for determining a set of resource indicator bits based at least in part on the identified uplink control channel resource; means for selecting one or more control channel elements (CCEs) for transmission, wherein a first CCE of the one or more CCEs and the set of resource indicator bits indicate the uplink control channel resource; and means for transmitting the set of resource indicator bits in the one or more CCEs.

44. An apparatus for wireless communication, comprising: a processor; memory in electronic communication with the processor; and instructions stored in the memory and executable by the processor to cause the apparatus to: receive a set of resource indicator bits in one or more control channel elements (CCEs); determine that possible bit combinations for the set of resource indicator bits is less than available uplink control channel resources; identify a first CCE of the one or more CCEs based at least in part on the determining; select an uplink control channel resource for uplink control information (UCI) transmission based at least in part on the set of resource indicator bits and the first CCE of the one or more CCEs; and transmit the UCI using the selected uplink control channel resource.

45. The apparatus of claim 44, wherein the instructions to select the uplink control channel resource are executable by the processor to cause the apparatus to: determine an uplink control channel resource set based at least in part on the set of resource indicator bits; and determine a relative uplink control channel resource index based at least in part on the first CCE, wherein the selected uplink control channel resource corresponds to the relative uplink control channel resource index within the uplink control channel resource set.

46. The apparatus of claim 44, wherein the instructions to select the uplink control channel resource are executable by the processor to cause the apparatus to: determine an uplink control channel resource set based at least in part on the first CCE; and determine a relative uplink control channel resource index based at least in part on the set of resource indicator bits, wherein the selected uplink control channel resource corresponds to the relative uplink control channel resource index within the uplink control channel resource set.

47. The apparatus of claim 44, wherein the instructions to select the uplink control channel resource are executable by the processor to cause the apparatus to: determine an offset value based at least in part on the set of resource indicator bits; and select the uplink control channel resource based at least in part on a combination of the first CCE and the determined offset value.

48. The apparatus of claim 44, wherein selecting the uplink control channel resource is further based at least in part on an aggregation level.

49. The apparatus of claim 44, wherein the instructions are further executable by the processor to cause the apparatus to: compare uplink control channel resource indices within an uplink control channel resource set to a threshold of resources; and determine to select the uplink control channel resource based at least in part on an aggregation level if the uplink control channel resource indices within the uplink control channel resource set is less than the threshold of resources.

50. The apparatus of claim 44, wherein the UCI comprises acknowledgement (ACK) bits

according to an ACK payload size.

51. The apparatus of claim 50, wherein the ACK payload size comprises a radio resource control (RRC) configured ACK payload size.

52. The apparatus of claim 51, wherein the instructions are further executable by the processor to cause the apparatus to: receive a number of downlink shared channels that is less than the ACK bits according to the RRC configured ACK payload size; insert ACK bits of a bit value corresponding to decoded results of the downlink shared channels into an ACK payload; and insert ACK bits of a default bit value corresponding to non-received downlink shared channels into the ACK payload to obtain the RRC configured ACK payload size.

53. The apparatus of claim 51, wherein the instructions are further executable by the processor to cause the apparatus to: receive an assignment index bit in downlink control information (DCI); and determine whether to use the RRC configured ACK payload size based at least in part on the assignment index bit.

54. The apparatus of claim 53, wherein a full DCI format corresponds to a first number of assignment index bits and a fallback DCI format corresponds to a second number of assignment index bits that is less than the first number of assignment index bits.

55. The apparatus of claim 50, wherein the instructions are further executable by the processor to cause the apparatus to: receive a set of assignment index bits in downlink control information (DCI); and determine the ACK payload size based at least in part on the set of assignment index bits.

56. The apparatus of claim 55, wherein the DCI comprises a number of assignment index bits based at least in part on a format of the DCI.

57. The apparatus of claim 50, wherein the instructions are further executable by the processor to cause the apparatus to: receive a first downlink control channel transmission in a first

transmission time interval (TTI), a second downlink control channel transmission in a second TTI, or both; and determine the ACK payload size, ACK bit resources, or both based at least in part on receiving the first downlink control channel transmission, the second downlink control channel transmission, or both.

58. The apparatus of claim 44, wherein the UCI is transmitted in either a short uplink control channel transmission or a long uplink control channel transmission according to a radio resource control (RRC) configuration.

59. The apparatus of claim 44, wherein the instructions are further executable by the processor to cause the apparatus to: determine to transmit the UCI in either a short uplink control channel transmission or a long uplink control channel transmission based at least in part on the set of resource indicator bits.

60. The apparatus of claim 44, wherein the instructions are further executable by the processor to cause the apparatus to: receive a second set of resource indicator bits in a second set of CCEs; determine that updated possible bit combinations for the second set of resource indicator bits is equal to or greater than updated available uplink control channel resources; and select a second uplink control channel resource for a second UCI transmission based at least in part on the second set of resource indicator bits, wherein selecting the second uplink control channel resource is not based at least in part on a first CCE of the second set of CCEs according to determining that the updated possible bit combinations for the second set of resource indicator bits is equal to or greater than the updated available uplink control channel resources.

61. The apparatus of claim 44, wherein the instructions are further executable by the processor to cause the apparatus to: receive additional downlink control information in a second set of CCEs; determine that the additional downlink control information comprises fewer resource indicator bits than a threshold of bits; select a second uplink control channel resource for a second UCI transmission based at least in part on a CCE of the second set of CCEs, wherein selecting the second uplink control channel resource is based at least in part on determining that the additional downlink control information comprises fewer resource indicator bits than the threshold of bits;

and transmit the second UCI using the selected second uplink control channel resource.

62. The apparatus of claim 61, wherein: the additional downlink control information comprises zero resource indicator bits; and the second UCI is transmitted in either a short uplink control channel transmission or a long uplink control channel transmission according to a radio resource control (RRC) configuration.

63. The apparatus of claim 61, wherein: the additional downlink control information comprises at least one resource indicator bit; and the second UCI is transmitted in either a short uplink control channel transmission or a long uplink control channel transmission based at least in part on the at least one resource indicator bit.

64. The apparatus of claim 44, wherein: the set of resource indicator bits is received in a downlink grant or an uplink grant; and the first CCE of the one or more CCEs comprises an initial CCE for the downlink grant or the uplink grant.

65. The apparatus of claim 44, wherein the uplink control channel resource comprises a physical uplink control channel (PUCCH) resource.

66. The apparatus of claim 44, wherein the set of resource indicator bits comprises a set of acknowledgement resource indicator (ARI) bits.

67. An apparatus for wireless communication, comprising: a processor; memory in electronic communication with the processor; and instructions stored in the memory and executable by the processor to cause the apparatus to: identify an uplink control channel resource for allocation; determine a set of resource indicator bits based at least in part on the identified uplink control channel resource; select one or more control channel elements (CCEs) for transmission, wherein a first CCE of the one or more CCEs and the set of resource indicator bits indicate the uplink control channel resource; and transmit the set of resource indicator bits in the one or more CCEs.

68. The apparatus of claim 67, wherein the set of resource indicator bits indicates an uplink

control channel resource set, and the first CCE indicates a relative uplink control channel resource index within the uplink control channel resource set.

69. The apparatus of claim 67, wherein the first CCE indicates an uplink control channel resource set, and the set of resource indicator bits indicates a relative uplink control channel resource index within the uplink control channel resource set.

70. The apparatus of claim 67, wherein the set of resource indicator bits indicates an offset value, and a combination of the first CCE and the offset value indicates the uplink control channel resource.

71. The apparatus of claim 67, wherein the instructions are further executable by the processor to cause the apparatus to: select an aggregation level, wherein the aggregation level, the first CCE of the one or more CCEs, and the set of resource indicator bits indicate the uplink control channel resource; and transmit the set of resource indicator bits in the one or more CCEs based at least in part on the selected aggregation level.

72. The apparatus of claim 67, wherein the instructions are further executable by the processor to cause the apparatus to: receive uplink control information (UCI) over the uplink control channel resource, wherein the UCI comprises an acknowledgement (ACK) payload.

73. The apparatus of claim 72, wherein the instructions are further executable by the processor to cause the apparatus to: perform a blind detection process on one or more uplink control channel resources, wherein the UCI is received based at least in part on the blind detection process.

74. The apparatus of claim 73, wherein a full DCI format indicates a first number of assignment index bits to include in the set of assignment index bits and a fallback DCI format indicates a second number of assignment index bits to include in the set of assignment index bits, wherein the second number of assignment index bits is less than the first number of assignment index bits.

75. The apparatus of claim 67, wherein the instructions are further executable by the processor to cause the apparatus to: transmit a set of assignment index bits in downlink control information (DCI), wherein the set of assignment index bits indicates an acknowledgement (ACK) payload size.

76. The apparatus of claim 75, wherein a format of the DCI indicates a number of assignment index bits to include in the set of assignment index bits.

77. The apparatus of claim 67, wherein the instructions are further executable by the processor to cause the apparatus to: select either a short uplink control channel transmission or a long uplink control channel transmission for the allocation; and determine the set of resource indicator bits further based at least in part on the selected short uplink control channel transmission or long uplink control channel transmission.

78. The apparatus of claim 67, wherein the instructions are further executable by the processor to cause the apparatus to: identify a second uplink control channel resource for allocation.

79. The apparatus of claim 78, wherein the instructions are further executable by the processor to cause the apparatus to: determine a second set of resource indicator bits based at least in part on the identified second uplink control channel resource, wherein the second set of resource indicator bits indicates the second uplink control channel resource.

80. The apparatus of claim 78, wherein the instructions are further executable by the processor to cause the apparatus to: select a second set of CCEs for transmission, wherein a CCE of the second set of CCEs indicates the second uplink control channel resource.

81. The apparatus of claim 78, wherein the instructions are further executable by the processor to cause the apparatus to: determine at least one resource indicator bit, wherein the at least one resource indicator bit indicates either a short uplink control channel transmission or a long uplink control channel transmission for the second uplink control channel resource.

82. The apparatus of claim 67, wherein: the set of resource indicator bits is transmitted in a downlink grant or an uplink grant; and the first CCE of the one or more CCEs comprises an initial CCE for the downlink grant or the uplink grant.

83. The apparatus of claim 67, wherein the uplink control channel resource comprises a physical uplink control channel (PUCCH) resource.

84. The apparatus of claim 67, wherein the set of resource indicator bits comprises a set of acknowledgement resource indicator (ARI) bits.

85. A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by a processor to: receive a set of resource indicator bits in one or more control channel elements (CCEs); determine that possible bit combinations for the set of resource indicator bits is less than available uplink control channel resources; identify a first CCE of the one or more CCEs based at least in part on the determining; select an uplink control channel resource for uplink control information (UCI) transmission based at least in part on the set of resource indicator bits and the first CCE of the one or more CCEs; and transmit the UCI using the selected uplink control channel resource.

86. A non-transitory computer-readable medium storing code for wireless communication, the code comprising instructions executable by a processor to: identify an uplink control channel resource for allocation; determine a set of resource indicator bits based at least in part on the identified uplink control channel resource; select one or more control channel elements (CCEs) for transmission, wherein a first CCE of the one or more CCEs and the set of resource indicator bits indicate the uplink control channel resource; and transmit the set of resource indicator bits in the one or more CCEs.