

CLAIMS

1. A method for wireless communications at a user equipment (UE), comprising:
 - transmitting, to a network entity, a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;
 - identifying a set of time resources for the network entity for transmission of one or more other SSBs from the network entity;
 - identifying a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;
 - identifying a search space for receiving a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;
 - identifying a start of the search space based at least in part on transmitting the first RACH message;
 - identifying an end of the search space based at least in part on a response timer;
 - identifying monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space; and
 - monitoring for the PDCCH message in the identified search space based on the identified monitoring occasions over two consecutive slots of the Type0-PDCCH common search space.
2. The method of claim 1, wherein the PDCCH message comprises a PDCCH grant for a RACH message 2 (Msg2) transmission, a PDCCH grant for a RACH message 3 (Msg3) transmission, a PDCCH grant for a RACH message 4 (Msg4) transmission, or a combination thereof.
3. The method of claim 1, wherein the one or more other SSBs are received by the UE on receive beams that are different from the first receive beam.

4. The method of claim 1, wherein identifying the search space further comprises:

identifying a remaining minimum system information (RMSI) search space with time resources non-overlapping with the identified set of time resources, wherein the identified search space comprises the identified RMSI search space.

5. The method of claim 1, further comprising:

receiving, from the network entity, an indication of a set of time resources for the search space; and

removing time resources of the identified set of time resources from the indicated set of time resources for the search space, wherein the identified search space comprises remaining time resources of the indicated set of time resources for the search space.

6. The method of claim 5, wherein:

the indication of the set of time resources for the search space comprises a time window for the search space; and

a subset of slots of the time window comprises the identified search space.

7. The method of claim 6, wherein the subset of slots comprises each slot of the time window.

8. The method of claim 1, wherein the response timer comprises a random access response (RAR) window, a contention resolution timer, or a combination thereof.

9. The method of claim 1, further comprising:

receiving the SSB from the network entity, wherein the first RACH message is transmitted in a RACH occasion corresponding to the SSB.

10. The method of claim 1, further comprising:

selecting the first receive beam, wherein the identified search space is monitored using the selected first receive beam during the time resources that are different from the identified set of time resources;

selecting a second receive beam different from the selected first receive beam;

and

monitoring for at least one SSB of the one or more other SSBs using the selected second receive beam during the identified set of time resources.

11. The method of claim 10, further comprising:

receiving the at least one SSB of the one or more other SSBs from the network entity based at least in part on the time resources for the identified search space not overlapping with the identified set of time resources.

12. The method of claim 1, further comprising:

receiving the PDCCH message in control channel elements (CCEs) of the identified search space based at least in part on the monitoring.

13. The method of claim 1, wherein the one or more other SSBs comprise one

or more SSBs actually transmitted by the network entity.

14. The method of claim 13, further comprising:

receiving, from the network entity, an indication of the one or more SSBs actually transmitted by the network entity in remaining minimum system information (RMSI), other system information (OSI), a radio resource control (RRC) message, a medium access control (MAC) control element (CE), a handover message, or a combination thereof.

15. The method of claim 1, wherein locations of the one or more other SSBs

are fixed.

16. The method of claim 1, wherein identifying the search space further

comprises:

determining to implement a default search space based at least in part on a remaining minimum system information (RMSI) transmission from the network entity.

17. The method of claim 1, wherein identifying the search space further

comprises:

removing time resources from the identified Type0-PDCCH common search space that overlap with the identified set of time resources.

18. The method of claim 17, wherein removing the time resources from the identified Type0-PDCCH common search space comprises:

altering a slot-level periodicity of the identified Type0-PDCCH common search space, wherein the identified search space comprises same symbol index locations as the identified Type0-PDCCH common search space but with the altered slot-level periodicity of the identified Type0-PDCCH common search space.

19. A method for wireless communications at a network entity, comprising:
receiving, from a user equipment (UE), a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

identifying a set of time resources used for transmission of one or more other SSBs by the network entity;

identifying a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

identifying a search space for the UE to receive a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

identifying a start of the search space based at least in part on transmitting the first RACH message;

identifying an end of the search space based at least in part on a response timer;

identifying monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space, wherein the monitoring occasions for monitoring for the PDCCH message are over two consecutive slots of the Type0-PDCCH common search space;

mapping the PDCCH message to control channel elements (CCEs) within the identified search space; and

transmitting, to the UE, the PDCCH message according to the mapping and the identified monitoring occasions.

20. The method of claim 19, wherein the PDCCH message comprises a PDCCH grant for a RACH message 2 (Msg2) transmission, a PDCCH grant for a RACH

message 3 (Msg3) transmission, a PDCCH grant for a RACH message 4 (Msg4) transmission, or a combination thereof.

21. The method of claim 19, wherein the one or more other SSBs are received by the UE on receive beams that are different from the first receive beam.

22. The method of claim 19, wherein identifying the search space further comprises:

identifying a remaining minimum system information (RMSI) search space with time resources non-overlapping with the identified set of time resources, wherein the identified search space comprises the identified Type0-PDCCH common search space.

23. The method of claim 19, further comprising:
transmitting, to the UE, an indication of a set of time resources for the search space; and

removing time resources of the identified set of time resources from the indicated set of time resources for the search space, wherein the identified search space comprises remaining time resources of the indicated set of time resources for the search space.

24. The method of claim 23, wherein:
the indication of the set of time resources for the search space comprises a time window for the search space; and
a subset of slots of the time window comprises the identified search space.

25. The method of claim 24, wherein the subset of slots comprises each slot of the time window.

26. The method of claim 19, further comprising:
transmitting, to the UE, the SSB, wherein the first RACH message is received in a RACH occasion corresponding to the SSB.

27. The method of claim 19, wherein identifying the search space further comprises:

removing time resources from the identified Type0-PDCCH common search space that overlap with the identified set of time resources.

28. The method of claim 27, wherein removing the time resources from the identified Type0-PDCCH common search space comprises:

altering a slot-level periodicity of the identified Type0-PDCCH common search space, wherein the identified search space comprises same symbol index locations as the identified Type0-PDCCH common search space but with the altered slot-level periodicity of the identified Type0-PDCCH common search space.

29. The method of claim 19, wherein transmitting the PDCCH message further comprises:

transmitting the PDCCH message over two consecutive slots of the Type0-PDCCH common search space.

30. An apparatus for wireless communications at a user equipment (UE), comprising:

means for transmitting, to a network entity, a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

means for identifying a set of time resources for the network entity for transmission of one or more other SSBs from the network entity;

means for identifying a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

means for identifying a search space for receiving a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

means for identifying a start of the search space based at least in part on transmitting the first RACH message;

means for identifying an end of the search space based at least in part on a response timer;

means for identifying monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space; and

means for monitoring for the PDCCH message in the identified search space based on the identified monitoring occasions over two consecutive slots of the Type0-PDCCH common search space.

31. An apparatus for wireless communications at a network entity, comprising:

means for receiving, from a user equipment (UE), a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

means for identifying a set of time resources used for transmission of one or more other SSBs by the network entity;

means for identifying a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

means for identifying a search space for the UE to receive a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

means for identifying a start of the search space based at least in part on transmitting the first RACH message;

means for identifying an end of the search space based at least in part on a response timer;

means for identifying monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space, wherein the monitoring occasions for monitoring for the PDCCH message are over two consecutive slots of the Type0-PDCCH common search space;

means for mapping the PDCCH message to control channel elements (CCEs) within the identified search space; and

means for transmitting, to the UE, the PDCCH message according to the mapping and the identified monitoring occasions.

32. An apparatus for wireless communications at a user equipment (UE), comprising:

one or more memories; and

one or more processors coupled to the one or more memories and configured to:

transmit, to a network entity, a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

identify a set of time resources for the network entity for transmission of one or more other SSBs from the network entity;

identify a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

identify a search space for receiving a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

identify a start of the search space based at least in part on transmitting the first RACH message;

identify an end of the search space based at least in part on a response timer;

identify monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space; and

monitor for the PDCCH message in the identified search space based on the identified monitoring occasions over two consecutive slots of the Type0-PDCCH common search space.

33. The apparatus of claim 32, wherein the PDCCH message comprises a PDCCH grant for a RACH message 2 (Msg2) transmission, a PDCCH grant for a RACH message 3 (Msg3) transmission, a PDCCH grant for a RACH message 4 (Msg4) transmission, or a combination thereof.

34. The apparatus of claim 32, wherein the one or more other SSBs are received by the UE on receive beams that are different from the first receive beam.

35. The apparatus of claim 32, wherein the one or more processors is further configured to:

identify a remaining minimum system information (RMSI) search space with time resources non-overlapping with the identified set of time resources, wherein the identified search space comprises the identified RMSI search space.

36. The apparatus of claim 32, wherein the one or more processors is further configured to:

receive, from the network entity, an indication of a set of time resources for the search space; and

remove time resources of the identified set of time resources from the indicated set of time resources for the search space, wherein the identified search space comprises remaining time resources of the indicated set of time resources for the search space.

37. The apparatus of claim 36, wherein:

the indication of the set of time resources for the search space comprises a time window for the search space; and

a subset of slots of the time window comprises the identified search space.

38. The apparatus of claim 37, wherein the subset of slots comprises each slot of the time window.

39. The apparatus of claim 32, wherein the response timer comprises a random access response (RAR) window, a contention resolution timer, or a combination thereof.

40. The apparatus of claim 32, wherein the one or more processors is further configured to:

receive the SSB from the network entity, wherein the first RACH message is transmitted in a RACH occasion corresponding to the SSB.

41. The apparatus of claim 32, wherein the one or more processors is further configured to:

select the first receive beam, wherein the identified search space is monitored using the selected first receive beam during the time resources that are different from the identified set of time resources;

select a second receive beam different from the selected first receive beam; and monitor for at least one SSB of the one or more other SSBs using the selected second receive beam during the identified set of time resources.

42. The apparatus of claim 41, wherein the one or more processors is further configured to:

receive the at least one SSB of the one or more other SSBs from the network entity based at least in part on the time resources for the identified search space not overlapping with the identified set of time resources.

43. The apparatus of claim 32, wherein the one or more processors is further configured to:

receive the PDCCH message in control channel elements (CCEs) of the identified search space based at least in part on the monitoring.

44. The apparatus of claim 32, wherein the one or more other SSBs comprise one or more SSBs actually transmitted by the network entity.

45. The apparatus of claim 44, wherein the one or more processors is further configured to:

receive, from the network entity, an indication of the one or more SSBs actually transmitted by the network entity in remaining minimum system information (RMSI), other system information (OSI), a radio resource control (RRC) message, a medium access control (MAC) control element (CE), a handover message, or a combination thereof.

46. The apparatus of claim 32, wherein locations of the one or more other SSBs are fixed.

47. The apparatus of claim 32, wherein the one or more processors is further configured to:

determine to implement a default search space based at least in part on a remaining minimum system information (RMSI) transmission from the network entity.

48. The apparatus of claim 32, wherein the one or more processors is further configured to:

remove time resources from the identified Type0-PDCCH common search space that overlap with the identified set of time resources.

49. The apparatus of claim 48, wherein the one or more processors is further configured to:

alter a slot-level periodicity of the identified Type0-PDCCH common search space, wherein the identified search space comprises same symbol index locations as the identified Type0-PDCCH common search space but with the altered slot-level periodicity of the identified Type0-PDCCH common search space.

50. An apparatus for wireless communications at a network entity, comprising:

one or more memories; and

one or more processors coupled to the one or more memories and configured to:

receive, from a user equipment (UE), a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

identify a set of time resources used for transmission of one or more other SSBs by the network entity;

identify a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

identify a search space for the UE to receive a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

identify a start of the search space based at least in part on transmitting the first RACH message;

identify an end of the search space based at least in part on a response timer;

identify monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space, wherein the monitoring occasions for monitoring for the PDCCH message are over two consecutive slots of the Type0-PDCCH common search space;

map the PDCCH message to control channel elements (CCEs) within the identified search space; and

transmit, to the UE, the PDCCH message according to the mapping and the identified set of monitoring occasions.

51. The apparatus of claim 50, wherein the PDCCH message comprises a PDCCH grant for a RACH message 2 (Msg2) transmission, a PDCCH grant for a RACH message 3 (Msg3) transmission, a PDCCH grant for a RACH message 4 (Msg4) transmission, or a combination thereof.

52. The apparatus of claim 50, wherein the one or more other SSBs are received by the UE on receive beams that are different from the first receive beam.

53. The apparatus of claim 50, wherein the one or more processors is further configured to:

identify a remaining minimum system information (RMSI) search space with time resources non-overlapping with the identified set of time resources, wherein the identified search space comprises the identified RMSI search space.

54. The apparatus of claim 50, wherein the one or more processors is further configured to:

transmit, to the UE, an indication of a set of time resources for the search space; and

remove time resources of the identified set of time resources from the indicated set of time resources for the search space, wherein the identified search space comprises remaining time resources of the indicated set of time resources for the search space.

55. The apparatus of claim 54, wherein:
the indication of the set of time resources for the search space comprises a time window for the search space; and
a subset of slots of the time window comprises the identified search space.

56. The apparatus of claim 55, wherein the subset of slots comprises each slot of the time window.

57. The apparatus of claim 50, wherein the one or more processors is further configured to:
transmit, to the UE, the SSB, wherein the first RACH message is received in a RACH occasion corresponding to the SSB.

58. The apparatus of claim 50, wherein the one or more processors is further configured to:
remove time resources from the identified Type0-PDCCH common search space that overlap with the identified set of time resources.

59. The apparatus of claim 58, wherein the one or more processors is further configured to:
alter a slot-level periodicity of the identified Type0-PDCCH common search space, wherein the identified search space comprises same symbol index locations as the identified Type0-PDCCH common search space but with the altered slot-level periodicity of the identified Type0-PDCCH common search space.

60. The apparatus of claim 50, wherein the one or more processors to transmit the PDCCH message is further configured to:
transmit the PDCCH message over two consecutive slots of the Type0-PDCCH common search space.

61. A non-transitory computer-readable medium storing code for wireless communications at a user equipment (UE), the code comprising instructions executable by one or more processors to:

transmit, to a network entity, a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

identify a set of time resources for the network entity for transmission of one or more other SSBs from the network entity;

identify a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

identify a search space for receiving a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

identify a start of the search space based at least in part on transmitting the first RACH message;

identify an end of the search space based at least in part on a response timer;

identify monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space; and

monitor for the PDCCH message in the identified search space based on the identified monitoring occasions over two consecutive slots of the Type0-PDCCH common search space.

62. A non-transitory computer-readable medium storing code for wireless communications at a network entity, the code comprising instructions executable by one or more processors to:

receive, from a user equipment (UE), a first random access (RACH) message based at least in part on a synchronization signal block (SSB) received by the UE on a first receive beam;

identify a set of time resources used for transmission of one or more other SSBs by the network entity;

identify a Type0 physical downlink control channel (Type0-PDCCH) common search space corresponding to the SSB and configured via a physical broadcast channel (PBCH) configuration;

identify a search space for the UE to receive a physical downlink control channel (PDCCH) message based at least in part on the first RACH message;

identify a start of the search space based at least in part on transmitting the first RACH message;

identify an end of the search space based at least in part on a response timer;

identify monitoring occasions for monitoring for the PDCCH message based at least in part on monitoring occasions of the Type0-PDCCH common search space, wherein the monitoring occasions for monitoring for the PDCCH message are over two consecutive slots of the Type0-PDCCH common search space;

map the PDCCH message to control channel elements (CCEs) within the identified search space; and

transmit, to the UE, the PDCCH message according to the mapping and the identified monitoring occasions.