

CLAIMS

What is claimed is:

1. A method for wireless communication at a user equipment (UE), comprising:
 - identifying a random-access preamble for transmission to a base station in a random-access channel occasion as part of a two-step random-access procedure;
 - identifying data or control information for transmission to the base station as part of the two-step random-access procedure; and
 - transmitting both the random-access preamble and the data or control information within the random-access channel occasion, wherein the data or the control information includes at least one of a radio resource control (RRC) setup request, an RRC reestablishment request, an RRC resume request, an RRC system information request, and a cell radio network temporary identifier (C-RNTI).
2. The method of claim 1, wherein transmitting both the random-access preamble and the data or control information within the random-access channel occasion comprises:
 - transmitting the data or control information in the random-access channel occasion with the random-access preamble based at least in part on a number of bytes of the data or control information being below a threshold.
3. The method of claim 2, wherein the threshold is configurable and is based at least in part on the random-access channel occasion.
4. The method of claim 1, wherein identifying the random-access preamble for transmission to the base station in the random-access channel occasion comprises:
 - receiving a control message indicating a plurality of random-access channel occasion configurations; and
 - selecting the random-access channel occasion from the plurality of random-access channel occasion configurations based at least in part on a content or quantity of the data or control information to be transmitted as part of the two-step random-access procedure.
5. The method of claim 4, wherein each random-access channel occasion configuration indicates time and frequency resources for a random-access preamble transmission in a corresponding random-access channel occasion, a correspondence of the corresponding

random-access channel occasion to a synchronization signal block, and a resource size for a data or control information transmission in the corresponding random-access channel occasion.

6. The method of claim 5, wherein the resource size for the data or control information transmission in each random-access channel occasion is based at least in part on data or control information to be transmitted in the random-access channel occasion.

7. The method of claim 5, wherein the resource size for the data or control information transmission in each random-access channel occasion is fixed.

8. The method of claim 1, wherein transmitting both the random-access preamble and the data or control information within the random-access channel occasion comprises:

transmitting the random-access preamble and the data or control information in the random-access channel occasion in a first random-access message of the two-step random-access procedure.

9. The method of claim 8, further comprising:

transmitting additional data or control information in a data channel in the first random-access message but outside of the random-access channel occasion.

10. The method of claim 8, further comprising:

transmitting an indication in the random-access channel occasion of whether additional data or control information is transmitted in a data channel in the first random-access message.

11. The method of claim 8, further comprising:

transmitting an indication in the random-access channel occasion of resources to be used for transmitting additional data or control information in a data channel in the first random-access message.

12. The method of claim 8, further comprising:

receiving a second random-access message from the base station as part of the two-step random-access procedure, the second random-access message being received based at least in part on transmission of the first random-access message.

13. The method of claim 12, wherein the second random-access message comprises a timing advance indication, power control parameters, an uplink grant, a downlink grant, a cell radio network temporary identifier, information for contention resolution, or a combination thereof.

14. The method of claim 1, wherein the data or control information is transmitted on a first set of resources adjacent to a second set of resources on which the random-access preamble is transmitted in the random-access channel occasion.

15. ~~A method for wireless communication at a base station, comprising:~~

~~identifying a configuration for a random-access channel occasion to be allocated to one or more user equipment (UE), wherein the configuration indicates a first set of resources in the random-access channel occasion allocated for a random-access preamble transmission and a second set of resources in the random-access channel occasion allocated for a data or control information transmission;~~

~~transmitting a control message indicating the configuration of the random-access channel occasion; and~~

~~receiving, from a user equipment (UE), a random-access preamble on the first set of resources in the random-access channel occasion and data or control information on the second set of resources in the random-access channel occasion as part of a two-step random-access procedure.~~

16. ~~The method of claim 15, wherein receiving the random-access preamble and the data or control information in the random-access channel occasion comprises:~~

~~receiving the data or control information in the random-access channel occasion with the random-access preamble based at least in part on a number of bytes of the data or control information being below a threshold.~~

17. ~~The method of claim 16, wherein the threshold is configurable and is based at least in part on the random-access channel occasion.~~

18.— The method of claim 15, wherein the configuration of the random access channel occasion further indicates a correspondence of the random access channel occasion to a synchronization signal block.

19.— The method of claim 15, wherein a size of the second set of resources allocated for the data or control information transmission is based at least in part on the data or control information to be transmitted in the random access channel occasion.

20.— The method of claim 15, wherein a size of the second set of resources allocated for the data or control information transmission is fixed.

21.— The method of claim 15, wherein receiving the random access preamble and the data or control information in the random access channel occasion comprises:

receiving the random access preamble and the data or control information in the random access channel occasion in a first random access message of the two-step random access procedure.

22.— The method of claim 21, further comprising:

receiving additional data or control information in a data channel in the first random access message but outside of the random access channel occasion.

23.— The method of claim 21, further comprising:

receiving an indication in the random access channel occasion of whether additional data or control information is transmitted in a data channel in the first random access message.

24.— The method of claim 21, further comprising:

receiving an indication in the random access channel occasion of resources to monitor for additional data or control information in a data channel in the first random access message.

25.— The method of claim 21, further comprising:

~~transmitting a second random access message to the UE as part of the two-step random access procedure, the second random access message being transmitted based at least in part on reception of the first random access message.~~

~~26.—The method of claim 25, wherein the second random access message comprises a timing advance indication, power control parameters, an uplink grant, a downlink grant, a cell radio network temporary identifier, information for contention resolution, or a combination thereof.~~

~~27.—The method of claim 15, wherein the first set of resources allocated for the random access preamble transmission is adjacent to the second set of resources allocated for the data or control information transmission.~~

~~28~~15. An apparatus for wireless communication at a user equipment (UE), comprising:

a processor,
memory coupled with the processor; and
instructions stored in the memory and executable by the processor to cause the apparatus to:

identify a random-access preamble for transmission to a base station in a random-access channel occasion as part of a two-step random-access procedure;

identify data or control information for transmission to the base station as part of the two-step random-access procedure; and

transmit both the random-access preamble and the data or control information within the random-access channel occasion, wherein the data or the control information includes at least one of a radio resource control (RRC) setup request, an RRC reestablishment request, an RRC resume request, an RRC system information request, and a cell radio network temporary identifier (C-RNTI).

~~29~~16. The apparatus of claim ~~28~~15, wherein the instructions to transmit both the random-access preamble and the data or control information within the random-access channel occasion are executable by the processor to cause the apparatus to:

transmit the data or control information in the random-access channel occasion with the random-access preamble based at least in part on a number of bytes of the data or control information being below a threshold.

~~30~~17. The apparatus of claim ~~29~~16, wherein the threshold is configurable and is based at least in part on the random-access channel occasion.

~~31~~18. The apparatus of claim ~~28~~15, wherein the instructions to identify the random-access preamble for transmission to the base station in the random-access channel occasion are executable by the processor to cause the apparatus to:

receive a control message indicating a plurality of random-access channel occasion configurations; and

select the random-access channel occasion from the plurality of random-access channel occasion configurations based at least in part on a content or quantity of the data or control information to be transmitted as part of the two-step random-access procedure.

~~32~~19. The apparatus of claim ~~31~~18, wherein each random-access channel occasion configuration indicates time and frequency resources for a random-access preamble transmission in a corresponding random-access channel occasion, a correspondence of the corresponding random-access channel occasion to a synchronization signal block, and a resource size for a data or control information transmission in the corresponding random-access channel occasion.

~~33~~20. The apparatus of claim ~~32~~19, wherein the resource size for the data or control information transmission in each random-access channel occasion is based at least in part on data or control information to be transmitted in the random-access channel occasion.

~~34~~21. The apparatus of claim ~~32~~19, wherein the resource size for the data or control information transmission in each random-access channel occasion is fixed.

~~35~~22. The apparatus of claim ~~28~~15, wherein the instructions to transmit both the random-access preamble and the data or control information within the random-access channel occasion are executable by the processor to cause the apparatus to:

transmit the random-access preamble and the data or control information in the random-access channel occasion in a first random-access message of the two-step random-access procedure.

~~36~~23. The apparatus of claim ~~35~~22, wherein the instructions are further executable by the processor to cause the apparatus to:
transmit additional data or control information in a data channel in the first random-access message but outside of the random-access channel occasion.

~~37~~24. The apparatus of claim ~~35~~22, wherein the instructions are further executable by the processor to cause the apparatus to:
transmit an indication in the random-access channel occasion of whether additional data or control information is transmitted in a data channel in the first random-access message.

~~38~~25. The apparatus of claim ~~35~~22, wherein the instructions are further executable by the processor to cause the apparatus to:
transmit an indication in the random-access channel occasion of resources to be used for transmitting additional data or control information in a data channel in the first random-access message.

~~39~~26. The apparatus of claim ~~35~~22, wherein the instructions are further executable by the processor to cause the apparatus to:
receive a second random-access message from the base station as part of the two-step random-access procedure, the second random-access message being received based at least in part on transmission of the first random-access message.

~~40~~27. The apparatus of claim ~~39~~26, wherein the second random-access message comprises a timing advance indication, power control parameters, an uplink grant, a downlink grant, a cell radio network temporary identifier, information for contention resolution, or a combination thereof.

~~41~~28. The apparatus of claim ~~28~~15, wherein the data or control information is transmitted on a first set of resources adjacent to a second set of resources on which the random-access preamble is transmitted in the random-access channel occasion.

~~42. An apparatus for wireless communication at a base station, comprising:~~
~~a processor;~~
~~memory coupled with the processor; and~~

instructions stored in the memory and executable by the processor to cause the apparatus to:

identify a configuration for a random access channel occasion to be allocated to one or more user equipment (UE), wherein the configuration indicates a first set of resources in the random access channel occasion allocated for a random access preamble transmission and a second set of resources in the random access channel occasion allocated for a data or control information transmission;

transmit a control message indicating the configuration of the random access channel occasion; and

receive, from a user equipment (UE), a random access preamble on the first set of resources in the random access channel occasion and data or control information on the second set of resources in the random access channel occasion as part of a two-step random access procedure.

43.— The apparatus of claim 42, wherein the instructions to receive the random access preamble and the data or control information in the random access channel occasion are executable by the processor to cause the apparatus to:

receive the data or control information in the random access channel occasion with the random access preamble based at least in part on a number of bytes of the data or control information being below a threshold.

44.— The apparatus of claim 43, wherein the threshold is configurable and is based at least in part on the random access channel occasion.

45.— The apparatus of claim 42, wherein the configuration of the random access channel occasion further indicates a correspondence of the random access channel occasion to a synchronization signal block.

46.— The apparatus of claim 42, wherein a size of the second set of resources allocated for the data or control information transmission is based at least in part on the data or control information to be transmitted in the random access channel occasion.

47.— The apparatus of claim 42, wherein a size of the second set of resources allocated for the data or control information transmission is fixed.

48.— The apparatus of claim 42, wherein the instructions to receive the random-access preamble and the data or control information in the random-access channel occasion are executable by the processor to cause the apparatus to:

receive the random-access preamble and the data or control information in the random-access channel occasion in a first random-access message of the two-step random-access procedure.

49.— The apparatus of claim 48, wherein the instructions are further executable by the processor to cause the apparatus to:

receive additional data or control information in a data channel in the first random-access message but outside of the random-access channel occasion.

50.— The apparatus of claim 48, wherein the instructions are further executable by the processor to cause the apparatus to:

receive an indication in the random-access channel occasion of whether additional data or control information is transmitted in a data channel in the first random-access message.

51.— The apparatus of claim 48, wherein the instructions are further executable by the processor to cause the apparatus to:

receive an indication in the random-access channel occasion of resources to monitor for additional data or control information in a data channel in the first random-access message.

52.— The apparatus of claim 48, wherein the instructions are further executable by the processor to cause the apparatus to:

transmit a second random-access message to the UE as part of the two-step random-access procedure, the second random-access message being transmitted based at least in part on reception of the first random-access message.

53.— The apparatus of claim 52, wherein the second random-access message comprises a timing advance indication, power control parameters, an uplink grant, a downlink grant, a cell radio network temporary identifier, information for contention resolution, or a combination thereof.

~~54.—The apparatus of claim 42, wherein the first set of resources allocated for the random-access preamble transmission is adjacent to the second set of resources allocated for the data or control information transmission.~~

5529. An apparatus for wireless communication at a user equipment (UE), comprising:

means for identifying a random-access preamble for transmission to a base station in a random-access channel occasion as part of a two-step random-access procedure;

means for identifying data or control information for transmission to the base station as part of the two-step random-access procedure; and

means for transmitting both the random-access preamble and the data or control information within the random-access channel occasion, wherein the data or the control information includes at least one of a radio resource control (RRC) setup request, an RRC reestablishment request, an RRC resume request, an RRC system information request, and a cell radio network temporary identifier (C-RNTI).

~~56.—An apparatus for wireless communication at a base station, comprising:~~

~~means for identifying a configuration for a random-access channel occasion to be allocated to one or more user equipment (UE), wherein the configuration indicates a first set of resources in the random-access channel occasion allocated for a random-access preamble transmission and a second set of resources in the random-access channel occasion allocated for a data or control information transmission;~~

~~means for transmitting a control message indicating the configuration of the random-access channel occasion; and~~

~~means for receiving, from a user equipment (UE), a random-access preamble on the first set of resources in the random-access channel occasion and data or control information on the second set of resources in the random-access channel occasion as part of a two-step random-access procedure.~~

5730. A non-transitory computer-readable medium storing code for wireless communication at a user equipment (UE), the code comprising instructions executable by a processor to:

identify a random-access preamble for transmission to a base station in a random-access channel occasion as part of a two-step random-access procedure;

identify data or control information for transmission to the base station as part of the two-step random-access procedure; and

transmit both the random-access preamble and the data or control information within the random-access channel occasion, wherein the data or the control information includes at least one of a radio resource control (RRC) setup request, an RRC reestablishment request, an RRC resume request, an RRC system information request, and a cell radio network temporary identifier (C-RNTI).

58.— ~~A non-transitory computer-readable medium storing code for wireless communication at a base station, the code comprising instructions executable by a processor to:~~

~~identify a configuration for a random-access channel occasion to be allocated to one or more user equipment (UE), wherein the configuration indicates a first set of resources in the random-access channel occasion allocated for a random-access preamble transmission and a second set of resources in the random-access channel occasion allocated for a data or control information transmission;~~

~~transmit a control message indicating the configuration of the random-access channel occasion; and~~

~~receive, from a user equipment (UE), a random-access preamble on the first set of resources in the random-access channel occasion and data or control information on the second set of resources in the random-access channel occasion as part of a two-step random-access procedure.~~