CLAIMS

~~**What is claimed is:**~~

1. A method of receiving resources at a user equipment (UE), the method comprising:

receiving information comprising a medium occupation and a resource block group (RBG) size from a gNB, wherein the ~~resource block group size is based on medium occupancy.~~ RBG size is based on medium occupancy; and reducing resource allocation (RA) overhead by: receiving a starting physical resource block (PRB), RBG, or interlace; spanning a number of PRBs, RBGs, or interlaces across multiple channels including unoccupied channels and guard bands; and automatically skipping PRBs, RBGs, or interlaces in the guard bands and in the unoccupied channels.

2. The method according to claim 1, further comprising receiving an additional guard band around each side of the occupied medium.

3. The method according to claim 1, wherein the information comprising the medium occupation and the ~~resource block group (~~RBG~~)~~ size is from a radio resource control (RRC) layer or is predefined.

4. The method according to claim 1, wherein the information comprising the medium occupation is ~~received by the UE using information~~ carried by a common signal on an L1 channel, and wherein there is an implicit mapping between the RBG size and the medium occupancy.

5. The method according to claim 1, wherein the information comprising the medium occupation is ~~received by the UE using information~~ indicated by a bitmap and received by the UE on a UE specific channel, ~~and~~ wherein at least one bit in the bitmap represents one or more RBGs; and wherein there is an implicit mapping between the RBG size and ~~the~~a configured bandwidth part (BWP).

6.~~—~~ The method according to claim 1, further comprising:

further reducing ~~resource allocation (~~RA~~) overhead by~~

~~receiving a starting PRB, RBG, or interlace;~~

~~spanning a number of said RBs, RBGs, or interlaces across multiple channels including unoccupied channels and guard bands; and~~

~~automatically skipping PRBs, RBGs, or interlaces in the guard band and in unoccupied channels.~~

~~7. The method according to claim 1, further comprising:~~

~~reducing resource allocation (RA)~~ overhead by joint coding a ~~resource allocation (RA)~~RA indication and a medium occupation index~~ comprising:~~, wherein reducing RA overhead comprises: receiving ~~a~~the starting PRB in a first allocated channel and an end PRB in a last allocated channel; and

receiving the medium occupancy indicating the first and the last allocated channel.

~~8.~~7. The method according to claim 1, further comprising:

receiving access to at least one interlace of equally spaced PRBs across one channel of the UE.

~~9.~~8. The method according to claim 1, further comprising:

receiving access to at least one interlace or one partial interlace of equally spaced PRBs across a plurality of channels within a system bandwidth.

~~10.~~9. The method according to claim 2, wherein the guard band is assigned around ~~said~~the occupied medium to avoid adjacent channel leakage-power if the occupied medium is not fully occupied.

~~11.~~10. The method according to claim 4, wherein the ~~message~~information carried on the L1 channel is transmitted in the first slot of a transmit opportunity (TXOP) and repeated in subsequent slots of the TXOP.

11. The method of claim 1, wherein the medium occupation is based on a listen before talk (LBT) procedure performed by the gNB.

12. The method of claim 1, wherein the medium occupancy corresponds to one or more channels that are currently accessible to the gNB and the UE.

13. The method of claim 1, wherein a larger medium occupancy corresponds to a coarser RBG size.

14. The method of claim 1, wherein a smaller medium occupancy corresponds to a finer RBG size.

~~12.~~15. An apparatus for receiving resources at a user equipment (UE), the apparatus comprising:

means for receiving information comprising a medium occupation and a resource block group (RBG) size from a gNB, wherein the ~~resource block group~~RBG size is based on a medium occupancy~~.~~; and means for reducing resource allocation (RA) overhead, comprising: means for receiving a starting physical resource block (PRB), RBG, or interlace; means for spanning a number of PRBs, RBGs, or interlaces across multiple channels including unoccupied channels and guard bands; and means for automatically skipping PRBs, RBGs, or interlaces in the guard bands and in the unoccupied channels.

~~13.~~ 16. The apparatus according to claim ~~12~~15, further comprising means for receiving an additional guard band around the occupied medium.

~~14.~~17. The apparatus according to claim ~~12~~15, wherein the information comprising the medium occupation and the ~~resource block group (~~RBG~~)~~ size is from a radio resource control (RRC) layer or is predefined.

~~15.~~ 18. The apparatus according to claim ~~12~~15, wherein the information comprising the medium occupation is ~~received by the UE using information~~ carried by a common signal on an L1 channel, and wherein there is an implicit mapping between the RBG size and the medium occupancy.

~~16.~~19. The apparatus according to claim ~~12~~15, wherein the information comprising the medium occupation is ~~received by the UE using information~~ indicated by a bitmap and received by the UE on a UE specific channel, wherein at least one bit in the bitmap represents one or more RBGs, and wherein there is an implicit mapping between the RBG size and ~~the~~a configured bandwidth part (BWP).

~~17.~~ 20. The apparatus according to claim ~~12~~15, further comprising:

~~means for reducing resource allocation (RA) overhead, comprising:~~

means for receiving ~~a starting PRB, RBG, or interlace;~~

~~means for spanning a number of said RBs, RBGs, or interlaces across multiple channels including unoccupied channels and guard bands; and~~

~~means for automatically skipping PRBs, RBGs, or interlaces in the guard band and in unoccupied channels.~~

~~18. The apparatus according to claim 12, further comprising:~~

~~reducing resource allocation (RA) overhead by joint coding a resource allocation (RA) indication and a medium occupation index comprising:~~

~~receiving a starting PRB in a first allocated channel and an end PRB in a last allocated channel; and~~

~~receiving medium occupancy indicating the first and the last allocated channel.~~

~~19. The apparatus according to claim 12, further comprising:~~

~~receiving~~ access to at least one interlace of equally spaced PRBs across one channel of the UE.

~~20.~~21. The apparatus according to claim ~~12~~15, further comprising:

means for receiving access to an interlace or one partial interlace of equally spaced PRBs across a plurality of channels within a system bandwidth.

~~21.~~22. The apparatus according to claim ~~13~~16, wherein the guard band is assigned around ~~said~~the occupied medium to avoid adjacent channel leakage-power if the occupied medium is not fully occupied.

~~22.~~23. The apparatus according to claim ~~15~~18, wherein the information carried on the L1 channel is transmitted in the first slot of a transmit opportunity (TXOP) and repeated in subsequent slots of the TXOP.

~~23.~~ 24. An apparatus to receive resources at a user equipment (UE), the apparatus comprising:

a memory; and

a processor coupled to the memory, the processor configured to:

receive information comprising a medium occupation and a resource block group (RBG) size from a gNB, wherein the ~~resource block group~~RBG size is based on a medium occupancy~~.~~; and reduce resource allocation (RA) overhead by joint coding a RA indication and a medium occupation index, wherein reducing RA overhead comprises: receive a starting physical resource block (PRB) in a first allocated channel and an end PRB in a last allocated channel and receive the medium occupancy indicating the first and the last allocated channel.

~~24.~~ 25. The apparatus according to claim ~~23~~24, wherein the processor is further configured to receive an additional guard band around each side of the occupied medium.

~~25.~~26. The apparatus according to claim ~~23~~24, wherein the information comprising the medium occupation and the resource block group (RBG) RBG size is from a radio resource control (RRC) layer or is predefined.

~~26~~27. The apparatus according to claim ~~23~~24, wherein the information comprising the medium occupation is ~~received by the UE using information~~ carried by a common signal on an L1 channel, and wherein there is an implicit mapping between the RBG size and the medium occupancy.

~~27.~~28. The apparatus according to claim ~~23~~24, wherein the information comprising the medium occupation is ~~received by the UE using information~~ indicated by a bitmap and received by the UE on a UE specific channel, wherein at least one bit in the bitmap represents one or more RBGs, and wherein there is an implicit mapping between the RBG size and ~~the~~a configured bandwidth part (BWP).

~~28.~~ 29. The apparatus according to claim ~~23~~24, wherein the processor is further configured to:

further reduce ~~resource allocation (~~RA~~)~~ overhead by

: receive ~~a~~the starting PRB, RBG, or interlace;

span a number of ~~said RBs~~PRBs, RBGs, or interlaces across multiple channels including unoccupied channels and guard bands; and

automatically skip PRBs, RBGs, or interlaces in the guard ~~band~~bands and in the unoccupied channels.

~~29. The apparatus according to claim 23, wherein the processor is further configured to:~~

~~reducing resource allocation (RA) overhead by joint coding a resource allocation (RA) indication and a medium occupation index comprising:~~

~~receiving a starting PRB in a first allocated channel and an end PRB in a last allocated channel; and~~

~~receiving medium occupancy indicating the first and the last allocated channel.~~

30.—— A non-transitory processor-readable storage medium having stored thereon processor-executable instructions configured to cause a processor of an apparatus to receive resources at a user equipment (UE~~),~~) by performing operations, the operations comprising:

~~receive~~receiving information comprising a medium occupation and a resource block group (RBG) size from a gNB, wherein the ~~resource block group size is based on a medium occupancy.~~RBG size is based on a medium occupancy; and reducing resource allocation (RA) overhead by joint coding a RA indication and a medium occupation index, wherein reducing RA overhead comprises: receiving a starting physical resource block (PRB) in a first allocated channel and an end PRB in a last allocated channel; and receiving a medium occupancy indicating the first and the last allocated channel.