CLAIMS

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

1. A method for wireless communication~~,~~ performed by a user equipment, UE (615), comprising:
identifying (1505) a first carrier and a second carrier that are scheduled for a transmission in a transmission time interval ~~(~~, TTI~~),~~, the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;
performing (1510) a listen before talk ~~(~~, LBT~~),~~ procedure to determine availability of the second carrier for transmissions during the TTI; ~~and~~
prioritizing the first carrier and second carrier for power allocation based at least in part on a payload of the control information; and
allocating (1515) a total transmission power for the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof.

~~2. The method of claim 1, further comprising:~~

~~prioritizing the first carrier and second carrier for power allocation based at least in part on a payload of the control information.~~

~~3~~2. The method of claim 1, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and wherein the allocating further comprises:
prioritizing the second carrier to provide a first portion of the total transmission power to the second carrier irrespective of the scheduled transmission on the first carrier; and
allocating a difference between the total transmission power and the first portion of the total transmission power to the first carrier.

~~4~~3. The method of claim 1, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in each of the plurality of subframes, and the

first carrier is scheduled for transmission in a second subframe that is after a first subframe, and wherein the allocating further comprises:
determining a first portion of the total transmission power to be allocated to the second carrier irrespective of the scheduled transmission of the first carrier;
reducing the first portion of the total transmission power based at least in part on a parameter associated with a transmission using the second carrier;
allocating the reduced first portion of the total transmission power to the second carrier for each of the plurality of subframes; and
allocating a difference between the total transmission power and the reduced first portion of the total transmission power to the first carrier.

~~5. The method of claim 4, wherein the parameter associated with the transmission using the second carrier comprises a modulation and coding scheme (MCS), a redundancy version identification (RV ID), a power loss (PL) measurement, or any combination thereof.~~

~~6~~4. The method of claim 1, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and wherein the allocating further comprises:
determining whether the second carrier is scheduled for transmission in a third subframe of the plurality of subframes after the second subframe;
dropping the first carrier in the second subframe; and
allocating the total transmission power to the second carrier.

~~7~~5. The method of claim 1, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in each of the plurality of subframes, and the first carrier is scheduled for transmission in a second subframe that is after a first subframe, and wherein the allocating further comprises:
determining that control information and shared channel information is scheduled to be transmitted on the first carrier during the second subframe;
diverting a portion of the total transmission power to the first carrier;
transmitting the control information using the first carrier; and
dropping the shared channel information scheduled to be transmitted on the first carrier.

~~8~~6. The method of claim 1, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in each of the plurality of subframes, and the first carrier is scheduled for transmission in a second subframe that is after a first subframe, and wherein the allocating further comprises:

determining that control information and shared channel information is scheduled to be transmitted on the first carrier during the second subframe and that only shared channel information is scheduled to be transmitted on the second carrier during the second subframe;

diverting a first portion of the total transmission power to the first carrier;

allocating a difference between the total transmission power and the first portion of the total transmission power to the second carrier;

transmitting the control information and shared channel information using the first carrier; and

transmitting shared channel information scheduled to be transmitted on the second carrier.

~~9~~7. The method of claim ~~8~~6, wherein a ratio of the total transmission power to divert is based at least in part on whether channel state information ~~(~~, CSI~~)~~, is to be transmitted using the second carrier.

~~10~~8. The method of claim 1, wherein the TTI comprises a plurality of subframes and each of the first carrier and the second carrier are scheduled for transmissions in a first subframe immediately following completion of the LBT procedure, and wherein the allocating further comprises:

pre-allocating, prior to performing the LBT procedure, a first portion of the total transmission power to the first carrier and a difference between the total transmission power and the first portion of the total transmission power to the second carrier.

~~11~~9. The method of claim ~~10~~8, wherein a ratio between the first portion and the total transmission power is determined based at least in part on whether control channel information scheduled on one or more of the first carrier or second carrier, or whether channel state information ~~(~~, CSI~~)~~, is to be transmitted using a physical uplink shared channel ~~(~~, PUSCH~~)~~.

~~12~~10. The method of claim ~~10~~8, further comprising:

transmitting a first portion of a first subframe following the LBT procedure using the pre-allocated transmission powers;
reallocating the total transmission power for the TTI across the first carrier and the second carrier based at least in part on the outcome of the LBT procedure; and
transmitting a remaining portion of the first subframe using the reallocated transmission powers.

~~13~~11. The method of claim 1, wherein the TTI comprises a plurality of subframes and each of the first carrier and the second carrier are scheduled for transmissions in a first subframe and the LBT procedure is completed during the first subframe, and wherein the allocating further comprises:
pre-allocating, prior to performing the LBT procedure, a first portion of the total transmission power to the first carrier and a difference between the total transmission power and the first portion of the total transmission power to the second carrier; and
transmitting on the first carrier during an entirety of the first subframe using the first portion of the total transmission power regardless of the outcome of the LBT procedure.

~~14~~12. The method of claim 1, wherein allocating the total transmission power for the TTI across the first carrier and the second carrier is further based on whether the first carrier is associated with a primary cell or a primary secondary cell.

~~15~~13. A ~~method~~user equipment, UE (615), for wireless communication, comprising:
means for identifying a ~~user equipment (UE) capable of transmitting using both a~~ first carrier and a second carrier that are scheduled for a transmission in a transmission time interval, TTI, the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;
~~allocating wireless resources of the first carrier and the second carrier to the UE for uplink transmissions during a transmission time interval (TTI);~~

~~configuring the UE to allocate a total transmission power for uplink transmissions during the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof; and~~

~~receiving the uplink transmissions from the UE on at least one of first carrier and the second carrier.~~

~~16. An apparatus for wireless communication, comprising:~~

~~means for identifying a first carrier and a second carrier that are scheduled for a transmission in a transmission time interval (TTI), the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;~~

means for performing a listen before talk ~~(~~, LBT~~)~~, procedure to determine availability of the second carrier for transmissions during the TTI; ~~and~~

means for prioritizing the first carrier and second carrier for power allocation based at least in part on a payload of the control information; and

means for allocating a total transmission power for the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof.

~~17. The apparatus of claim 16, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in each of the plurality of subframes, and the first carrier is scheduled for transmission in a second subframe that is after a first subframe, and~~

~~wherein the means for allocating a total transmission power for the TTI across the first carrier and the second carrier comprises:~~

~~means for prioritizing the second carrier to provide a first portion of the total transmission power to the second carrier irrespective of the scheduled transmission on the first carrier, when; and~~

~~means for allocating a difference between the total transmission power and the first portion of the total transmission power to the first carrier.~~

~~18. The apparatus of claim 16, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmissions in each of the plurality of~~

subframes, and the first carrier is scheduled for transmission in a second subframe that is after a first subframe, and

wherein the means for allocating a total transmission power for the TTI across the first carrier and the second carrier comprises:

means for determining whether the second carrier is scheduled for tranmission in a third subframe of the plurality of subframes after the second subframe;

means for dropping the first carrier in the second subframe; and

means for allocating the total transmission power to the second carrier.

19. The apparatus of claim 16, wherein the TTI comprises a plurality of subframes and each of the first carrier and the second carrier are scheduled for transmissions in a first subframe immediately following completion of the LBT procedure, and

wherein the means for allocating a total transmission power for the TTI across the first carrier and the second carrier comprises means for pre-allocating, prior to performing the LBT procedure, a first portion of the total transmission power to the first carrier and a difference between the total transmission power and the first portion of the total transmission power to the second carrier.

20. The apparatus of claim 16, wherein allocating the total transmission power for the TTI across the first carrier and the second carrier is further based on whether the first carrier is associated with a primary cell or a primary secondary cell.

21. An apparatus for wireless communication, comprising:

means for identifying a user equipment (UE) capable of transmitting using both a first carrier and a second carrier, the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;

means for allocating wireless resources of the first carrier and the second carrier to the UE for uplink transmissions during a transmission time interval (TTI);

means for configuring the UE to allocate a total transmission power for uplink transmissions during the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an

outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof; and

means for receiving the uplink transmissions from the UE on at least one of first carrier and the second carrier.

22. An apparatus for wireless communication, in a system comprising:

a processor;

memory in electronic communication with the processor; and

instructions stored in the memory and operable, when executed by the processor, to cause the apparatus to:

identify a first carrier and a second carrier that are scheduled for a transmission in a transmission time interval (TTI), the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;

perform a listen before talk (LBT) procedure to determine availability of the second carrier for transmissions during the TTI; and

allocate a total transmission power for the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof.

23. The apparatus of claim 22, wherein the instructions further comprise instructions executable by the processor to cause the apparatus to prioritize the first carrier and the second carrier for power allocation based at least in part on a payload of the control information.

24. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and

~~wherein the instructions executable by the processor to allocate a total transmission power for the TTI across the first carrier and the second carrier comprise instructions executable by the processor to:~~

~~prioritize the second carrier to provide a first portion of the total transmission power to the second carrier irrespective of the scheduled transmission on the first carrier; and~~

~~allocate a difference between the total transmission power and the first portion of the total transmission power to the first carrier.~~

~~25. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and~~

~~wherein the instructions executable by the processor to allocate a total transmission power for the TTI across the first carrier and the second carrier comprise instructions executable by the processor to:~~

~~determine a first portion of the total transmission power to be allocated to the second carrier irrespective of the scheduled transmission of the first carrier;~~

~~reduce the first portion of the total transmission power based at least in part on a parameter associated with a transmission using the second carrier;~~

~~allocate the reduced first portion of the total transmission power to the second carrier for each of the plurality of subframes; and~~

~~allocate a difference between the total transmission power and the reduced first portion of the total transmission power to the first carrier.~~

~~26. The apparatus of claim 22, wherein the parameter associated with the transmission using the second carrier comprises a modulation and coding scheme (MCS), a redundancy version identification (RV ID), a power loss (PL) measurement, or any combination thereof.~~

~~27. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and~~

~~wherein the instructions executable by the processor to allocate a total transmission power for the TTI across the first carrier and the second carrier comprise instructions executable by the processor to:~~

~~determine whether the second carrier is scheduled for transmission in a third subframe of the plurality of subframes after the second subframe;~~

~~drop the first carrier in the second subframe; and~~

~~allocate the total transmission power to the second carrier.~~

~~28. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and~~

~~wherein the instructions executable by the processor to allocate a total transmission power for the TTI across the first carrier and the second carrier comprise instructions executable by the processor to:~~

~~determine that control information and shared channel information is scheduled to be transmitted on the first carrier during the second subframe;~~

~~divert a portion of the total transmission power to the first carrier;~~

~~transmit the control information using the first carrier; and~~

~~drop the shared channel information scheduled to be transmitted on the first carrier.~~

~~29. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and~~

wherein the instructions executable by the processor to allocate a total transmission power for the TTI across the first carrier and the second carrier comprise instructions executable by the processor to:

determine that control information and shared channel information is scheduled to be transmitted on the first carrier during the second subframe and that only shared channel information is scheduled to be transmitted on the second carrier during the second subframe;

divert a first portion of the total transmission power to the first carrier;

allocate a difference between the total transmission power and the first portion of the total transmission power to the second carrier;

transmit the control information and shared channel information using the first carrier; and

transmit shared channel information scheduled to be transmitted on the second carrier.

30. The apparatus of claim 29, wherein a ratio of the total transmission power to divert is based at least in part on whether channel state information (CSI) is to be transmitted using the second carrier.

31. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes and each of the first carrier and the second carrier are scheduled for transmission in a first subframe immediately following completion of the LBT procedure, and

wherein the instructions further comprise instructions executable by the processor to pre-allocate, prior to performing the LBT procedure, a first portion of the total transmission power to the first carrier and a difference between the total transmission power and the first portion of the total transmission power to the second carrier.

32. The apparatus of claim 31, wherein a ratio between the first portion and the total transmission power is determined based at least in part on whether control channel information is scheduled for transmission on one or more of the first carrier or second carrier, or whether channel state information (CSI) is to be transmitted using a physical uplink shared channel (PUSCH).

33. The apparatus of claim 31, wherein the instructions comprise instructions executable by the processor to to:

transmit a first portion of a first subframe following the LBT procedure using the pre-allocated transmission powers;

reallocate the total transmission power for the TTI across the first carrier and the second carrier based at least in part on the outcome of the LBT procedure; and

transmit a remaining portion of the first subframe using the reallocated transmission powers.

34. The apparatus of claim 22, wherein the TTI comprises a plurality of subframes and each of the first carrier and the second carrier are scheduled for transmissions in a first subframe and the LBT procedure is completed during the first subframe, and

wherein the instructions are operable, when executed by the processor, to cause the apparatus to:

pre-allocate, prior to performing the LBT procedure, a first portion of the total transmission power to the first carrier and a difference between the total transmission power and the first portion of the total transmission power to the second carrier; and

transmitting on the first carrier during an entirety of the first subframe using the first portion of the total transmission power regardless of the outcome of the LBT procedure.

35. The apparatus of claim 22, wherein allocating the total transmission power for the TTI across the first carrier and the second carrier is further based on whether the first carrier is associated with a primary cell or a primary secondary cell.

36. An apparatus for wireless communication, in a system comprising:

a processor;

memory in electronic communication with the processor; and

instructions stored in the memory and operable, when executed by the processor, to cause the apparatus to:

~~identify a user equipment (UE) capable of transmitting using both a first carrier and a second carrier, the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;~~

~~allocate wireless resources of the first carrier and the second carrier to the UE for uplink transmissions during a transmission time interval (TTI);~~

~~configure the UE to allocate a total transmission power for uplink transmissions during the TTI across the first carrier and the second carrier based at least in part on a timing for transmission of the control information, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof; and~~

~~receive the uplink transmissions from the UE on at least one of first carrier and the second carrier.~~

~~37~~14. A ~~non-transitory~~ computer readable medium storing code for wireless communication, the code comprising instructions ~~executable by a processor to:~~, which when executed by a user equipment (615), cause the UE (615) to perform a method according to any of claims 1 to 12.

~~identify a first carrier and a second carrier that are scheduled for a transmission in a transmission time interval (TTI), the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;~~

~~perform a listen before talk (LBT) procedure to determine availability of the second carrier for transmissions during the TTI; and~~

~~allocate a total transmission power for the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof.~~

~~38. The non-transitory computer readable medium of claim 37, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a~~

first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and

wherein the code further comprises instructions executable by a processor to:

prioritize the second carrier to provide a first portion of the total transmission power to the second carrier irrespective of the scheduled transmission on the first carrier; and

allocate a difference between the total transmission power and the first portion of the total transmission power to the first carrier.

39. The non-transitory computer readable medium of claim 37, wherein the TTI comprises a plurality of subframes, the second carrier is scheduled for transmission in a first subframe and a second subframe that is after the first subframe, and the first carrier is scheduled for transmission in the second subframe, and

wherein the code further comprises instructions executable by a processor to:

determine whether the second carrier is scheduled for transmission in a third subframe of the plurality of subframes after the second subframe;

drop the first carrier in the second subframe; and

allocate the total transmission power to the second carrier.

40. The non-transitory computer readable medium of claim 37, wherein the TTI comprises a plurality of subframes and each of the first carrier and the second carrier are scheduled for transmissions in a first subframe immediately following completion of the LBT procedure, and

wherein the code further comprises instructions executable by a processor to pre-allocate, prior to performing the LBT procedure, a first portion of the total transmission power to the first carrier and a difference between the total transmission power and the first portion of the total transmission power to the second carrier.

41. The non-transitory computer readable medium of claim 37, wherein allocating the total transmission power for the TTI across the first carrier and the second

carrier is further based on whether the first carrier is associated with a primary cell or a primary secondary cell.

42. A non-transitory computer readable medium storing code for wireless communication, the code comprising instructions executable by a processor to:

identify a user equipment (UE) capable of transmitting using both a first carrier and a second carrier, the first carrier using a dedicated radio frequency spectrum band and the second carrier using a shared radio frequency spectrum band;

allocate wireless resources of the first carrier and the second carrier to the UE for uplink transmissions during a transmission time interval (TTI);

configure the UE to allocate a total transmission power for uplink transmissions during the TTI across the first carrier and the second carrier based at least in part on a type of control channel for transmission of control information during the TTI, an outcome of the LBT procedure, a timing of the LBT procedure relative to the TTI, one or more other transmissions to be transmitted during the TTI, or any combination thereof; and

receive the uplink transmissions from the UE on at least one of first carrier and the second carrier.