CLAIMS

What is claimed is:

1. A non-transitory machine-readable medium having executable instructions to cause one or more processing units to perform a method to determine a physical downlink shared channel scheduling resource for a user equipment device and a base station, the method comprising:

grouping a plurality of component carriers from a pool of available component carriers associated with a wireless link established between the user equipment device and the base station

into a plurality of groups of component carriers, wherein at least one of the plurality of component carriers is included in two of the plurality of groups of component carriers;

selecting a group of component carriers among the plurality of groups of component carriers;

forming a virtual component carrier from the selected group of component carriers; and

determining a physical downlink shared channel scheduling resource based on at least the virtual component carrier.

2. The machine-readable medium of claim 1, wherein the pool of available component carriers includes at least one component carrier from a licensed band and at least one component carrier from an unlicensed band.

3. The machine-readable medium of claim 1, wherein each group of the plurality of groups of component carriers comprises a scheduling component carrier.

4. The machine-readable medium of claim 3, wherein the selecting the one of the plurality of groups of component carriers comprises:

selecting a group of component carriers that using at least a higher layers signal.

5. The machine-readable medium of claim 3, wherein the selecting the one of the plurality of groups of component carriers is based on at least a Media Access Control (MAC) control element.

6. The machine-readable medium of claim 5, wherein the MAC control element is identified by a MAC protocol data unit sub-header with a dedicated logical channel.

7. The machine-readable medium of claim 6, wherein the MAC control element is a fixed size.

8. The machine-readable medium of claim 6, wherein the MAC control element includes multiple groups of data.

9. The machine-readable medium of claim 3, wherein the selecting the one of the plurality of groups of component carriers is based on at least a component carrier selection field that is transmitted to the user equipment device.

10. The machine-readable medium of claim 1, wherein the forming of the virtual component carrier comprises:

aggregating bandwidth of the plurality of component carriers.

11. The machine-readable medium of claim 10, wherein the aggregating using at least a frequency domain resource allocation field.

12. The machine-readable medium of claim 11, wherein the frequency domain resource allocation field is variably sized.

13. The machine-readable medium of claim 1, wherein the determining a physical downlink shared channel scheduling resource using at least a rate matching pattern.

14. A method to determine a physical downlink shared channel scheduling resource for a user equipment device and a base station, the method comprising:

grouping a plurality of component carriers from a pool of available component carriers associated with a wireless link established between the user equipment device and the base station into a plurality of groups of component carriers, wherein at least one of the plurality of component carriers is included in two of the plurality of groups of component carriers;

selecting a group of component carriers among the plurality of groups of component carriers;

forming a virtual component carrier from the seleted group of component carriers; and

determining a physical downlink shared channel scheduling resource based on at least the virtual component carrier.

15. The method of claim 14, wherein the pool of available component carriers includes at least one component carrier from a licensed band and at least one component carrier from an unlicensed band.

16. The method of claim 14, wherein each group of the plurality of groups of component carriers comprises a scheduling component carrier.

17. The method of claim 14, wherein the forming of the virtual component carrier comprises:

aggregating bandwidth of the plurality of component carriers.

18. A user equipment device comprising:

at least one antenna;

at least one radio, wherein the at least one radio is to perform cellular communications using a radio access technology that establishes a wireless link with a base station; and

one or more processors to:

group a plurality of component carriers from a pool of available component carriers associated with a wireless link established between the user equipment device and the base station into a plurality of groups of component carriers, wherein at least one of the plurality of component carriers is included in two of the plurality of groups of component carriers; select a group of component carriers among the plurality of groups of component carriers; form a virtual component carrier from the selected group of component carriers, and determine a physical downlink shared channel scheduling resource based on at least the virtual component carrier.

19. The user equipment device of claim 18, wherein the pool of available component carriers includes at least one component carrier from a licensed band and at least one component carrier from an unlicensed band.

20. The user equipment device of claim 18, wherein each group of the plurality of groups of component carriers comprises a scheduling component carrier.