CLAIMS

1. A method for discontinuous reception operation for carrier aggregation comprising:

receiving a first set of discontinuous reception parameters for a first carrier and a different set of discontinuous reception parameters for a second carrier; and

configuring discontinuous reception parameters on the first carrier and second carrier.

2. The method of claim 1, wherein the second carrier is associated with the first carrier for discontinuous reception operation.

3. The method of claim 1 wherein the discontinuous reception parameters comprise at least one of:

an inactivity timer;

a retransmission timer; and

an on duration timer.

4. The method of claim 3, further comprising explicitly enabling the second carrier through messaging from a base station.

5. The method of claim 3, further comprising disabling reception on the second carrier at the later of the expiration of the inactivity timer and retransmission timer.

6. The method of claim 1, further comprising disabling reception on the second carrier based on an explicit message from a base station.

7. The method of claim 1, further comprising utilizing a flag or value for an inactivity timer, wherein a first setting for the flag or the presence of the value indicates that the inactivity timer should be utilized and a second setting for the flag or the absence of the value indicates that the inactivity timer should not be utilized.

8. The method of claim 1, further comprising transitioning a second carrier to an active time in accordance with the first carrier transitioning to an active time.

9. The method of claim 1, wherein the first carrier is a designated carrier and the second carrier is a non-designated carrier.

10. The method of claim 1, wherein the first carrier is a primary carrier and the second carrier is a secondary carrier.

11. The method of claim 1, further comprising disabling reception on the second carrier based on the first carrier transitioning from an active time to a discontinuous reception state.

12. The method of claim 11, further comprising disabling reception on the second carrier upon receipt of an explicit message from a base station.

13. The method of claim 11, wherein the different set of parameters for the second carrier includes an inactivity timer, said second carrier disabling reception upon the earlier of the expiration of the inactivity timer and the first carrier transitioning to discontinuous reception mode.

14. The method of claim 11, wherein the different set of parameters for the second carrier includes an on duration timer, said second carrier disabling reception at the earlier of the expiration of the on duration timer and the first carrier transitioning to discontinuous reception mode.

15. The method of claim 14, wherein the different set of parameters for the second carrier further comprises an inactivity timer, the second carrier disabling reception at the later of the expiration of the on duration timer and inactivity timer.

16. The method of claim 15, wherein the first carrier extends its active time when the inactivity timer on the second carrier is running.

17. The method of claim 1, wherein the different set of parameters for the second carrier comprises a timer, wherein the second carrier is enabled or disabled based on whether the first carrier is in active time for the duration of the timer.

18. The method of claim 1, further comprising:

aligning a start of active time of a second carrier to be within the active time of the first carrier.

19. The method of claim 18, wherein a short discontinuous reception cycle and a long discontinuous reception cycle configuration are configured for a second carrier, wherein the second carrier can transition from the short discontinuous reception cycle to the long discontinuous reception cycle if no data is received at the second carrier for the duration of the short discontinuous reception timer value.

20. The method of claim 1, wherein the different set of parameters includes a short discontinuous reception cycle and a long discontinuous reception cycle configuration, wherein the second carrier can transition from the short discontinuous reception cycle to the long discontinuous reception cycle if no data is received at the second carrier for the duration of the short discontinuous reception timer value.

21. The method of claim 1, wherein the set of discontinuous reception parameters for the second carrier is signaled through radio resource control signaling.

22. The method of claim 21, wherein multiple second carriers are configured with discontinuous reception parameters.

23. The method of claim 21, wherein multiple second carriers are configured with different sets of discontinuous reception parameters which have the same values as those of the first carrier.

24. The method of claim 21, wherein the second carrier is configured independently from other second carriers.

25. A method for enabling or disabling a carrier for a user equipment in a wireless network, the method comprising:

receiving, by the user equipment, a carrier enable or disable command medium access control (MAC) control element over a downlink shared channel; and

transmitting, by the user equipment, an acknowledgment of the carrier enable or disable command MAC control element.

26. The method of claim 25, wherein the MAC control element comprises at least one of:

a single bit for designating whether to enable or disable a carrier;

a carrier index field to identify a carrier;

an action time for when the carrier should be enabled or disabled; [[and]]or

a subframe within the radio frame with a subframe number equal to an action time.

27. The method of claim 26, wherein the acknowledgment comprises a carrier index corresponding with the carrier index field from the MAC control element.

28. The method of claim 25, wherein the MAC control element comprises at least one of:

a plurality of bit fields corresponding with carrier identifiers, each of said plurality of bit fields designating whether a carrier corresponding with the carrier identifier of the bit field should be enabled or disabled;

an action time for when the carrier should be enabled or disabled; and

a subframe within the radio frame with a subframe number equal to an action time.

29. The method of claim 28, wherein the acknowledgment comprises a plurality of bit fields corresponding with the plurality of bit fields in the MAC control element.

30. The method of claim 25, wherein the MAC control element comprises at least one of:

a plurality of bit fields corresponding with downlink and uplink carrier identifiers, each of said plurality of bit fields designating whether a downlink or an uplink carrier corresponding with the carrier identifier of the bit field should be enabled or disabled;

an action time for when the carrier should be enabled or disabled; and

a subframe within the radio frame with a subframe number equal to an action time.

31. The method of claim 30, wherein the acknowledgment comprises a plurality of bit fields corresponding with the plurality of bit fields in the MAC control element.

32. A user equipment comprising:

a communications subsystem,

wherein the communication subsystem is configured to perform the method of claim 25.

33. The method of claim 25, wherein transmitting the acknowledgment comprises using a hybrid automatic repeat request (HARQ) feedback.

34. The method of claim 25, wherein transmitting the acknowledgment comprises using a carrier enable or disable acknowledgment medium access control (MAC) control element (CE).

35. The method of claim 25, wherein receiving the carrier enable or disable command MAC control element comprises using a logical channel ID (LCID) value.

36. A method for enabling or disabling a carrier for a user equipment in a wireless network including an evolved node B (eNB), the method comprising:

transmitting, by the eNB, a carrier enable or disable command medium access control (MAC) control element over a downlink shared channel; and

receiving, by the eNB, an acknowledgment of the carrier enable or disable command MAC control element.

37. The method of claim 36, wherein the carrier enable or disable command MAC control element includes a logical channel ID (LCID) value.

38. The method of claim 36, wherein receiving the acknowledgment comprises using a hybrid automatic repeat request (HARQ) feedback.

39. An apparatus for a wireless network, the apparatus comprising:

a communications subsystem,

wherein the communication subsystem is configured to perform the method of claim 36.

CLAIMS

1. A method for enabling or disabling a carrier for a user equipment in a wireless network, the method comprising:

receiving, by the user equipment, a carrier enable or disable command medium access control (MAC) control element over a downlink shared channel; and

transmitting, by the user equipment, an acknowledgment of the carrier enable or disable command MAC control element;

wherein the MAC control element comprises at least one of:

a plurality of bit fields corresponding with carrier identifiers, each of said plurality of bit fields designating whether a carrier corresponding with the carrier identifier of the bit field should be enabled or disabled;

an action time for when the carrier should be enabled or disabled; and

a subframe within the radio frame with a subframe number equal to an action time.

2. The method of claim 1, wherein the MAC control element comprises at least one of:

a single bit for designating whether to enable or disable a carrier;

a carrier index field to identify a carrier;

an action time for when the carrier should be enabled or disabled; or

a subframe within the radio frame with a subframe number equal to an action time.

3. The method of claim 1, wherein the acknowledgment comprises a carrier index corresponding with the carrier index field from the MAC control element.

4. The method of claim 1, wherein the acknowledgment comprises a plurality of bit fields corresponding with the plurality of bit fields in the MAC control element.

5. The method of claim 1, wherein the MAC control element comprises at least one of:

a plurality of bit fields corresponding with downlink and uplink carrier identifiers, each of said plurality of bit fields designating whether a downlink or an uplink carrier corresponding with the carrier identifier of the bit field should be enabled or disabled;

an action time for when the carrier should be enabled or disabled; and

a subframe within the radio frame with a subframe number equal to an action time.

6. The method of claim 5, wherein the acknowledgment comprises a plurality of bit fields corresponding with the plurality of bit fields in the MAC control element.

7. A user equipment comprising:

a communications subsystem,

wherein the communication subsystem is configured to perform the method of claim 1.

8. The method of claim 1, wherein transmitting the acknowledgment comprises using a hybrid automatic repeat request (HARQ) feedback.

9. The method of claim 1, wherein transmitting the acknowledgment comprises using a carrier enable or disable acknowledgment medium access control (MAC) control element (CE).

10. The method of claim 1, wherein receiving the carrier enable or disable command MAC control element comprises using a logical channel ID (LCID) value.

11. A method for enabling or disabling a carrier for a user equipment in a wireless network including an evolved node B (eNB), the method comprising:

transmitting, by the eNB, a carrier enable or disable command medium access control (MAC) control element over a downlink shared channel; and

receiving, by the eNB, an acknowledgment of the carrier enable or disable command MAC control element;

wherein the MAC control element includes at least one of:

a plurality of bit fields corresponding with carrier identifiers, each of said plurality of bit fields designating whether a carrier corresponding with the carrier identifier of the bit field should be enable or disabled;

an action time for when the carrier should be enabled or disabled;

and

a subframe within the radio frame with a subframe number equal to an action time.

12. The method of claim 11, wherein the carrier enable or disable command MAC control element includes a logical channel ID (LCID) value.

13. The method of claim 11, wherein receiving the acknowledgment comprises using a hybrid automatic repeat request (HARQ) feedback.

14. An apparatus for a wireless network, the apparatus comprising:

a communications subsystem,

wherein the communication subsystem is configured to perform the method of claim 11.