CLAIMS

1. A user equipment comprising:

a receiver configured to receive information including both (i) first information related to a reference frequency of a communication band, the communication band including a first component carrier and a second component carrier added to the first component carrier, in which a synchronization signal is mapped around a center of each of the first component carrier and the second component carrier, and (ii) second information used for determining the second component carrier, said information including both the first information and the second information being received in the first component carrier on a Physical Downlink Shared Channel (PDSCH), and

a controller configured to set the reference frequency of the communication band based on the first information, and to acquire a Physical Downlink Control Channel (PDCCH) in the second component carrier based on the second information, and to perform communication simultaneously on the first component carrier and the second component carrier.

2. The user equipment according to claim 1, wherein the second information includes a downlink frequency bandwidth, a number of antennas for use, and resources used to carry a response signal in response to an uplink data signal.

3. The user equipment according to claim 1, which is configured to initiate reception of downlink data signal on the first component carrier prior to setting the reference frequency based on the first information.

4. The user equipment according to claim 1, wherein the receiver receives a message that includes the first information and the second information.

5. The user equipment according to claim 1, wherein the first component carrier is a component carrier used for communication between the user equipment and a base station apparatus before the reference frequency is set.

6. The user equipment according to claim 1, wherein the reference frequency is a center frequency of the first component carrier and is a center frequency of the second component carrier.

7. A reception method comprising:

receiving information including both (i) first information related to a reference frequency of a communication band, the communication band including a first component carrier and a second component carrier added to the first component carrier, in which a synchronization signal is mapped around a center of each of the first component carrier and the second component carrier, and (ii) second information used for determining the second component carrier, said information including both the first information and the second information being received in the first component carrier on a Physical Downlink Shared Channel (PDSCH);

setting the reference frequency of the communication band based on the first information, and acquiring a Physical Downlink Control Channel (PDCCH) in the second component carrier based on the second information; and

performing communication simultaneously on the first component carrier and the second component carrier.

8. An integrated circuit controlling a process comprising:

receiving information including both (i) first information related to a reference frequency of a communication band, the communication band including a first component carrier and a second component carrier added to the first component carrier, in which a synchronization signal is mapped around a center of each of the first component carrier and the second component carrier, and (ii) second information used for determining the second component carrier, said information including both the first information and the second information being received in the first component carrier on a Physical Downlink Shared Channel (PDSCH);

setting the reference frequency of the communication band based on the first information, and acquiring a Physical Downlink Control Channel (PDCCH) in the second component carrier based on the second information; and

performing communication simultaneously on the first component carrier and the second component carrier.

9. A base station apparatus comprising:

a controller configured to allocate a communication band to a user equipment, the communication band including a first component carrier and a second component carrier added to the first component carrier, in which a synchronization signal is mapped around a center of each of the first component carrier and the second component carrier, and

a transmitter configured to transmit, to the user equipment, information including both (i) first information related to a reference frequency of the communication band and (ii) second information for use by the user equipment to determine the second component carrier, said information including both the first information and the second information being transmitted in the first component carrier on a Physical Downlink Shared Channel (PDSCH),

wherein said controller performs communication simultaneously on the first component carrier and the second component carrier.

10. The base station apparatus according to claim 9, wherein the second information includes a downlink frequency bandwidth, a number of antennas for use, and resources used to carry a response signal in response to an uplink data signal.

11. The base station apparatus according to claim 9, which is configured to initiate transmission of downlink data signal on the first component carrier prior to setting the reference frequency based on the first information.

12. The base station apparatus according to claim 9, wherein the transmitter transmits a message that includes the first information and the second information.

13. The base station apparatus according to claim 9, wherein the first component carrier is a component carrier used for communication between the user equipment and a base station apparatus before the reference frequency is set.

14. The base station apparatus according to claim 9, wherein the reference frequency is a center frequency of the first component carrier and is a center frequency of the second component carrier.

15. A transmission method comprising:

allocating a communication band to a user equipment, the communication band including a first component carrier and a second component carrier added to the first component carrier, in which a synchronization signal is mapped around a center of each of the first component carrier and the second component carrier,

transmitting, to the user equipment, information including both (i) first information related to a reference frequency of the communication band and (ii) second information for use by the user equipment to determine the second component carrier, said information including both the first information and the second information being transmitted in the first component carrier on a Physical Downlink Shared Channel (PDSCH), and performing communication simultaneously on the first component carrier and the second component carrier.

16. An integrated circuit controlling a process comprising:

allocating a communication band to a user equipment, the communication band including a first component carrier and a second component carrier added to the first component carrier, in which a synchronization signal is mapped around a center of each of the first component carrier and the second component carrier,

transmitting, to the user equipment, information including both (i) first information related to a reference frequency of the communication band and (ii) second information for use by the user equipment to determine the second component carrier, said information including both the first information and the second information being transmitted in the first component carrier on a Physical Downlink Shared Channel (PDSCH), and performing communication simultaneously on the first component carrier and the second component carrier.

CLAIMS

1. A user equipment comprising:

a receiver configured to receive directive information on a reference frequency of a communication band, the communication band including a first component carrier and a second component carrier added to the first component carrier, and to receive determination information used for determining the second component carrier, and

a controller configured to set the reference frequency of the communication band based on the directive information, and to acquire a control channel in the second component carrier based on the determination information.

2. The user equipment according to claim 1, wherein the determination information includes a downlink frequency bandwidth, a number of antennas for use, and a number of resources used to carry a response signal in response to an uplink data signal.

3. The user equipment according to claim 1, which is configured to initiate reception of downlink data signal on the first component carrier prior to setting the reference frequency based on the directive information.

4. The user equipment according to claim 1, wherein the receiver receives the directive information and the determination information on the first component carrier.

5. The user equipment according to claim 1, wherein the receiver receives a message that includes the directive information and the determination information.

6. The user equipment according to claim 1, wherein the first component carrier is a component carrier used for communication between the user equipment and a base station apparatus before the reference frequency is set.

7. The user equipment according to claim 1, wherein the reference frequency is a center frequency of the first component carrier and is a center frequency of the second component carrier.

8. A reception method comprising:

receiving directive information on a reference frequency of a communication band, the communication band including a first component carrier and a second component carrier added to the first component carrier, and receiving determination information used for determining the second component carrier, and

setting the reference frequency of the communication band based on the directive information, and acquiring a control channel in the second component carrier based on the determination information.

9. An integrated circuit comprising:

a receiving section configured to control receiving of directive information on a reference frequency of a communication band, the communication band including a first component carrier and a second component carrier added to the first component carrier, and to control receiving of determination information used for determining the second component carrier, and

a controlling section configured to control setting of the reference frequency of the communication band based on the directive information, and to control acquiring of a control channel in the second component carrier based on the determination information.

10. A base station apparatus comprising:

a controller configured to allocate a communication band to a user equipment, the communication band including a first component carrier and a second component carrier added to the first component carrier, and

a transmitter configured to transmit, to the user equipment, directive information on a reference frequency of the communication band and determination information for use by the user equipment to determine the second component carrier.

11. The base station apparatus according to claim 10, wherein the determination information includes a downlink frequency bandwidth, a number of antennas for use, and a number of resources used to carry a response signal in response to an uplink data signal.

12. The base station apparatus according to claim 10, which is configured to initiate transmission of downlink data signal on the first component carrier prior to setting the reference frequency based on the directive information.

13. The base station apparatus according to claim 10, wherein the transmitter transmits the directive information and the determination information on the first component carrier.

14. The base station apparatus according to claim 10, wherein the transmitter transmits a message that includes the directive information and the determination information.

15. The base station apparatus according to claim 10, wherein the first component carrier is a component carrier used for communication between the user equipment and a base station apparatus before the reference frequency is set.

16. The base station apparatus according to claim 10, wherein the reference frequency is a center frequency of the first component carrier and is a center frequency of the second component carrier.

17. A transmission method comprising:

allocating a communication band to a user equipment, the communication band including a first component carrier and a second component carrier added to the first component carrier, and

transmitting, to the user equipment, directive information on a reference frequency of the communication band and determination information for use by the user equipment to determine the second component carrier.

18. An integrated circuit comprising:

a controlling section configured to control allocating of a communication band to a user equipment, the communication band including a first component carrier and a second component carrier added to the first component carrier, and

a transmitting section configured to control transmitting of directive information on a reference frequency of the communication band and determination information for use by the user equipment to determine the second component carrier, to the user equipment.