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CLAIMS

1. A method of wireless communication comprising:
receiving downlink signaling on a plurality of downlink carriers;
determining hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers;
selecting a first HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers, wherein the first HARQ feedback symbol is selected from one of a plurality of codebooks which store symbols corresponding to a composite value representing a decoding status of information received on the at least two of the plurality of carriers;
selecting a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers, wherein the second HARQ feedback symbol is selected from one of a plurality of codebooks which store symbols corresponding to a composite value representing a decoding status of information received on the at least one of the plurality of carriers; and
transmitting the first and second HARQ feedback symbols on an uplink.
2. The method of claim 1, wherein the transmitting comprises modulating at least a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol.

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3. The method of claim 2, wherein the transmitting further comprises modulating a second portion of the time slot of the uplink carrier, other than the first portion of the time slot, with the second HARQ feedback symbol.
4. The method of claim 3, wherein the modulating of the first and second portions of the uplink carrier each comprises utilizing a spreading factor of less than 256 chips per bit.
5. The method of claim 4, wherein the spreading factor is 128.
6. The method of claim 2, wherein the modulating of at least the first portion of the time slot comprises modulating substantially the entire time slot of the uplink carrier with the first HARQ feedback symbol; and
the transmitting further comprises modulating substantially the entire time slot of the uplink carrier with the second HARQ feedback symbol.
7. The method of claim 6, wherein the modulating of the time slot with the first HARQ feedback symbol and the modulating of the time slot with the second HARQ feedback symbol each comprises utilizing a spreading factor of 256 chips per bit.
8. An apparatus for wireless communication comprising:
a receiver for receiving downlink signaling on a plurality of downlink carriers;

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a processor for determining hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers, selecting a first HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers, wherein the first HARQ feedback symbol is selected from one of a plurality of codebooks which store symbols corresponding to a composite value representing a decoding status of information received on the at least two of the plurality of carriers, and selecting a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers, wherein the second HARQ feedback symbol is selected from one of a plurality of codebooks which store symbols corresponding to a composite value representing a decoding status of information received on the at least one of the plurality of carriers; and

a transmitter for transmitting the first and second HARQ feedback symbols on an uplink.

9. The apparatus of claim 8, wherein the transmitter is configured to modulate at least a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol.

10. The apparatus of claim 9, wherein the transmitter is further configured to modulate a second portion of the time slot of the uplink carrier, other than the first portion of the time slot, with the second HARQ feedback symbol.

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11. The apparatus of claim 10, wherein the modulating of the first and second portions of the uplink carrier each comprises utilizing a spreading factor of less than 256 chips per bit.
12. The apparatus of claim 11, wherein the spreading factor is 128.
13. The apparatus of claim 9, wherein the modulating of at least the first portion of the time slot comprises modulating substantially the entire time slot of the uplink carrier with the first HARQ feedback symbol; and
the transmitter is further configured to modulate substantially the entire time slot of the uplink carrier with the second HARQ feedback symbol.
14. An apparatus comprising means for performing a method in accordance with any of claims 1 to 7
15. A computer program product comprising a computer readable medium, the computer readable medium comprising at least one instruction for causing a computer or processor to perform a method in accordance with any of claims 1 to 7.

CLAIMS

1. A method of wireless communication comprising:
receiving downlink signaling on a plurality of downlink carriers;
determining hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers;
selecting a first HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers;
selecting a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers; and
transmitting the first and second HARQ feedback symbols on an uplink,
wherein the transmitting comprises modulating a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol and modulating a second portion of the time slot of the uplink carrier, other than the first portion of the time slot, with the second HARQ feedback symbol.
2. The method of claim 1, wherein the modulating of the first and second portions of the uplink carrier each comprises utilizing a spreading factor of less than 256 chips per bit.
3. The method of claim 1, wherein the spreading factor is 128.

4. A method of wireless communication comprising:
providing a first feedback symbol corresponding to a status of decoding information received on a plurality of downlink carriers, wherein the plurality of downlink carriers comprises a first downlink carrier and a second downlink carrier; and
providing a second feedback symbol corresponding to a status of decoding information received on at least one downlink carrier,
wherein the first feedback symbol is provided in a first portion of a time slot of an uplink channel, and the second feedback symbol is provided in a second portion of the time slot of the uplink channel other than the first portion of the time slot, and wherein the providing of the first and second feedback symbols each comprises modulating the respective first and second portions of the time slot of the uplink channel with the first and second feedback symbols, respectively.
5. The method of claim 4, wherein the at least one downlink carrier consists of a third downlink carrier.
6. The method of claim 4, wherein the at least one downlink carrier consists of a third downlink carrier and a fourth downlink carrier.
7. The method of claim 4, wherein the modulating of the respective first and second portions of the time slot of the uplink channel each comprises utilizing a spreading factor of less than 256 chips per bit.
8. The method of claim 7, wherein the spreading factor is 128.

9. The method of claim 4, wherein the providing of the first feedback symbol comprises modulating a time slot of an uplink channel with the first feedback symbol; and

the providing of the second feedback symbol comprises modulating the time slot of the uplink channel with the second feedback symbol.

10. An apparatus for wireless communication comprising:
a receiver for receiving downlink signaling on a plurality of downlink carriers;

a processor for determining hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers, selecting a first HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers, and selecting a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers; and

a transmitter for transmitting the first and second HARQ feedback symbols on an uplink,

wherein the transmitter is configured to modulate a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol and a second portion of the time slot of the uplink carrier, other than the first portion of the time slot, with the second HARQ feedback symbol.

11. The apparatus of claim 10, wherein the modulating of the first and second portions of the uplink carrier each comprises utilizing a spreading factor of less than 256 chips per bit.

12. The apparatus of claim 11, wherein the spreading factor is 128.

13. An apparatus for wireless communication comprising:
means for receiving downlink signaling on a plurality of downlink carriers;
means for determining hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers;
means for selecting a first HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers;
means for selecting a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers; and
means for transmitting the first and second HARQ feedback symbols on an uplink,
wherein the means for transmitting comprises means for modulating a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol and a second portion of the time slot of the uplink carrier, other than the first portion of the slot with the second HARQ feedback symbol.

14. The apparatus of claim **13**, wherein the means for modulating the first and second portions of the uplink carrier each comprises means for utilizing a spreading factor of less than 256 chips per bit.

15. The apparatus of claim **14**, wherein the spreading factor is 128.

16. An apparatus for wireless communication comprising:
means for providing a first feedback symbol corresponding to a status of decoding information received on a plurality of downlink carriers, wherein the plurality of downlink carriers comprises a first downlink carrier and a second downlink carrier; and

means for providing a second feedback symbol corresponding to a status of decoding information received on at least one downlink carrier,

wherein the first feedback symbol is provided in a first portion of a time slot of an uplink channel, and the second feedback symbol is provided in a second portion of the time slot of the uplink channel other than the first portion of the time slot, and wherein the providing of the first and second feedback symbols each comprises modulating the respective first and second portions of the time slot of the uplink channel with the first and second feedback symbols, respectively.

17. The apparatus of claim 16, wherein the at least one downlink carrier consists of a third downlink carrier.

18. The apparatus of claim 16, wherein the at least one downlink carrier consists of a third downlink carrier and a fourth downlink carrier.

19. The apparatus of claim 16, wherein the means for modulating the respective first and second portions of the time slot of the uplink channel each comprises means for utilizing a spreading factor of less than 256 chips per bit.

20. The apparatus of claim 19, wherein the spreading factor is 128.

21. A computer program product, comprising:

a non-transitory computer-readable medium comprising:
instructions for causing a computer to receive downlink signaling on a plurality of downlink carriers;
instructions for causing a computer to determine hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers;
instructions for causing a computer to select a first

HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers;

instructions for causing a computer to select a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers; and

instructions for causing a computer to transmit the first and second HARQ feedback symbols on an uplink, wherein the instructions for causing a computer to transmit comprise instructions for causing a computer to modulate a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol and modulate a second portion of the time slot of the uplink carrier, other than the first portion of the time slot, with the second HARQ feedback symbol.

22. The computer program product of claim **21**, wherein the instructions for causing a computer to modulate the first and second portions of the uplink carrier each comprises instructions for causing a computer to utilize a spreading factor of less than 256 chips per bit.

23. The computer program product of claim **22**, wherein the spreading factor is 128.

24. A computer program product, comprising:

a non-transitory computer-readable medium comprising:

instructions for causing a computer to provide a first feedback symbol corresponding to a status of decoding information received on a plurality of downlink carriers, wherein the plurality of downlink carriers comprises a first downlink carrier and a second downlink carrier; and

instructions for causing a computer to provide a second feedback symbol corresponding to a status of decoding information received on at least one downlink carrier,

wherein the first feedback symbol is provided in a first portion of a time slot of an uplink channel, and the second feedback symbol is provided in a second portion of the time slot of the uplink channel other than the first portion of the time slot, and wherein the providing of the first and second feedback symbols each comprises modulating the respective first and second portions of the time slot of the uplink channel with the first and second feedback symbols, respectively.

25. The computer program product of claim **24**, wherein the at least one downlink carrier consists of a third downlink carrier.

26. The computer program product of claim **24**, wherein the at least one downlink carrier consists of a third downlink carrier and a fourth downlink carrier.

27. The computer program product of claim **24**, wherein the instructions for causing a computer to modulate the respective first and second portions of the time slot of the uplink channel each comprise instructions for causing a computer to utilize a spreading factor of less than 256 chips per bit.

28. The computer program product of claim **27**, wherein the spreading factor is 128.

29. An apparatus for wireless communication, comprising:
at least one processor; and
a memory coupled to the at least one processor,

wherein the at least one processor is configured to:

- receive downlink signaling on a plurality of downlink carriers;
- determine hybrid automatic repeat request (HARQ) feedback corresponding to each of the plurality of carriers;
- select a first HARQ feedback symbol for encoding HARQ feedback corresponding to a first subset of the plurality of carriers comprising at least two of the plurality of carriers;
- select a second HARQ feedback symbol for encoding HARQ feedback corresponding to a second subset of the plurality of carriers comprising at least one of the plurality of carriers; and
- transmit the first and second HARQ feedback symbols on an uplink,

wherein the transmitting comprises modulating a first portion of a time slot of an uplink carrier with the first HARQ feedback symbol and modulating a second portion of the time slot of the uplink carrier, other than the first portion of the time slot, with the second HARQ feedback symbol.

30. The apparatus of claim **29**, wherein the modulating of the first and second portions of the uplink carrier each comprises utilizing a spreading factor of less than 256 chips per bit.

31. The apparatus of claim **30**, wherein the spreading factor is 128.