

CLAIMS

What is claimed is:

- 1 1. A method for wireless communications at a user equipment (UE),
2 comprising:
3 receiving a first downlink control information transmission from a base station
4 that provides a first set of group-based acknowledgment feedback parameters associated with
5 a first downlink transmission, wherein the first set of group-based acknowledgment feedback
6 parameters includes a first new acknowledgment feedback indicator and a first feedback
7 timing that indicates a first uplink transmission that is to include a first group-based
8 acknowledgment feedback;
9 receiving a second downlink control information transmission from the base
10 station that provides a second set of group-based acknowledgment feedback parameters
11 associated with a second downlink transmission, wherein the second set of group-based
12 acknowledgment feedback parameters includes a second new acknowledgment feedback
13 indicator that is different than the first new acknowledgment feedback indicator, and a second
14 feedback timing that indicates the first uplink transmission is to include the first group-based
15 acknowledgment feedback; and
16 determining, based at least in part on which of the first new acknowledgment
17 feedback indicator or the second new acknowledgment feedback indicator is received earliest
18 or latest in time, the first group-based acknowledgment feedback.
- 1 2. The method of claim 1, wherein the determining further comprises:
2 identifying that the second new acknowledgment feedback indicator being
3 different than the first new acknowledgment feedback indicator for the first group-based
4 acknowledgment feedback is interpreted as the second new acknowledgment feedback
5 indicator being toggled from the first new acknowledgment feedback indicator.
- 1 3. The method of claim 2, further comprising:
2 transmitting only a latest subset of feedback information associated with a
3 latest received new acknowledgment feedback indicator.
- 1 4. The method of claim 1, wherein the determining comprises:

2 identifying that the second new acknowledgment feedback indicator being
3 different than the first new acknowledgment feedback indicator for the first group-based
4 acknowledgment feedback corresponds to an error case; and
5 discontinuing generating the first group-based acknowledgment feedback to be
6 transmitted in the first uplink transmission.

1 5. The method of claim 4, wherein the determining further comprises:
2 determining that the second new acknowledgment feedback indicator resets
3 the first group-based acknowledgment feedback for a subsequent second uplink transmission
4 that is to include group-based acknowledgment feedback.

1 6. The method of claim 1, wherein the first downlink control information
2 and the second downlink control information each further include a group indicator that
3 indicates that both the first downlink transmission and the second downlink transmission are
4 in a same group of downlink transmissions.

1 7. The method of claim 1, wherein the determining further comprises:
2 determining a first acknowledgment (ACK)/negative-acknowledgment
3 (NACK) to be reported as feedback for the first downlink transmission and a second
4 ACK/NACK to be reported as feedback for the second downlink transmission; and
5 formatting the first group-based acknowledgment feedback to include the first
6 ACK/NACK and the second ACK/NACK based at least in part on the first new
7 acknowledgment feedback indicator or the second new acknowledgment feedback indicator;
8 and
9 transmitting a latest subset of feedback information associated with a latest
10 received new acknowledgment feedback indicator.

1 8. The method of claim 7, wherein the first group-based acknowledgment
2 feedback is formatted based on which of the first new acknowledgment feedback indicator or
3 the second new acknowledgment feedback indicator is received earliest or latest in time.

1 9. The method of claim 7, wherein a downlink assignment indicator field
2 is not reset within an acknowledgment/negative-acknowledgment opportunity.

1 10. The method of claim 7, wherein:

2 the first group-based acknowledgment feedback is formatted relative to a prior
3 group-based acknowledgment feedback based on whether the first new acknowledgment
4 feedback indicator is different than a prior new acknowledgment feedback indicator
5 associated with the prior group-based acknowledgment feedback; and
6 a subsequent group-based acknowledgment feedback is formatted relative to
7 the first group-based acknowledgment feedback based on whether a subsequent new
8 acknowledgment feedback indicator is different than the second new acknowledgment
9 feedback indicator.

1 11. The method of claim 7, wherein the first group-based acknowledgment
2 feedback is formatted based on which of the first new acknowledgment feedback indicator or
3 the second new acknowledgment feedback indicator is received in a majority of sets of
4 group-based acknowledgment feedback parameters associated with the first group-based
5 acknowledgment feedback.

1 12. The method of claim 7, further comprising:
2 transmitting, to the base station, the first group-based acknowledgment
3 feedback in the first uplink transmission.

1 13. The method of claim 1, wherein the determining further comprises:
2 determining a first acknowledgment (ACK)/negative-acknowledgment
3 (NACK) to be reported as feedback for the first downlink transmission and a second
4 ACK/NACK to be reported as feedback for the second downlink transmission;
5 identifying that the second new acknowledgment feedback indicator being
6 different than the first new acknowledgment feedback indicator for the first group-based
7 acknowledgment feedback is interpreted as the second new acknowledgment feedback
8 indicator being untoggled from the first new acknowledgment feedback indicator; and
9 formatting the first group-based acknowledgment feedback to include the first
10 ACK/NACK and the second ACK/NACK based at least in part on the first new
11 acknowledgment feedback indicator or the second new acknowledgment feedback indicator.

1 14. The method of claim 1, wherein the determining further comprises:
2 identifying that the second new acknowledgment feedback indicator being
3 different than the first new acknowledgment feedback indicator for the first group-based

4 acknowledgment feedback is interpreted as the second new acknowledgment feedback
5 indicator being toggled from the first new acknowledgment feedback indicator; and
6 formatting a first subset of feedback information associated with the first new
7 acknowledgment feedback indicator in the first group-based acknowledgment feedback and a
8 second subset of feedback information associated with the second new acknowledgment
9 feedback indicator in the first group-based acknowledgment feedback.

1 15. The method of claim 14, further comprising:
2 concatenating the first subset of feedback information and the second subset of
3 feedback information in the first group-based acknowledgment feedback.

1 16. The method of claim 14, wherein a downlink assignment indicator
2 field is reset upon receipt of a changed new acknowledgment feedback indicator value, and
3 wherein different subsets of feedback information are determined for each reset of the
4 downlink assignment indicator field.

1 17. The method of claim 14, further comprising:
2 identifying a first codebook entry associated with the first subset of feedback
3 information;
4 identifying a second codebook entry associated with the second subset of
5 feedback information; and
6 transmitting, to the base station, the first group-based acknowledgment
7 feedback in the first uplink transmission based at least in part on the first codebook entry and
8 the second codebook entry.

1 18. An apparatus for wireless communications at a user equipment (UE),
2 comprising:
3 means for receiving a first downlink control information transmission from a
4 base station that provides a first set of group-based acknowledgment feedback parameters
5 associated with a first downlink transmission, wherein the first set of group-based
6 acknowledgment feedback parameters includes a first new acknowledgment feedback
7 indicator and a first feedback timing that indicates a first uplink transmission that is to
8 include a first group-based acknowledgment feedback;

9 means for receiving a second downlink control information transmission from
10 the base station that provides a second set of group-based acknowledgment feedback
11 parameters associated with a second downlink transmission, wherein the second set of group-
12 based acknowledgment feedback parameters includes a second new acknowledgment
13 feedback indicator that is different than the first new acknowledgment feedback indicator,
14 and a second feedback timing that indicates the first uplink transmission is to include the first
15 group-based acknowledgment feedback; and

16 means for determining, based at least in part on which of the first new
17 acknowledgment feedback indicator or the second new acknowledgment feedback indicator
18 is received earliest or latest in time, the first group-based acknowledgment feedback.

1 19. The apparatus of claim 18, further comprising:

2 means for identifying that the second new acknowledgment feedback indicator
3 being different than the first new acknowledgment feedback indicator for the first group-
4 based acknowledgment feedback corresponds to an error case; and

5 means for discontinuing generating the first group-based acknowledgment
6 feedback to be transmitted in the first uplink transmission.

1 20. The apparatus of claim 19, further comprising:

2 means for determining that the second new acknowledgment feedback
3 indicator resets the first group-based acknowledgment feedback for a subsequent second
4 uplink transmission that is to include group-based acknowledgment feedback.

1 21. The apparatus of claim 18, wherein the first downlink control
2 information and the second downlink control information each further include a group
3 indicator that indicates that both the first downlink transmission and the second downlink
4 transmission are in a same group of downlink transmissions.

1 22. The apparatus of claim 18, further comprising:

2 means for determining a first acknowledgment (ACK)/negative-
3 acknowledgment (NACK) to be reported as feedback for the first downlink transmission and
4 a second ACK/NACK to be reported as feedback for the second downlink transmission;

5 means for formatting the first group-based acknowledgment feedback to
6 include the first ACK/NACK and the second ACK/NACK based at least in part on the first

7 new acknowledgment feedback indicator or the second new acknowledgment feedback
8 indicator; and
9 means for transmitting a latest subset of feedback information associated with
10 a latest received new acknowledgment feedback indicator.

1 23. The apparatus of claim 22, wherein the first group-based
2 acknowledgment feedback is formatted based on which of the first new acknowledgment
3 feedback indicator or the second new acknowledgment feedback indicator is received earliest
4 or latest in time.

1 24. The apparatus of claim 22, wherein:
2 the first group-based acknowledgment feedback is formatted relative to a prior
3 group-based acknowledgment feedback based on whether the first new acknowledgment
4 feedback indicator is different than a prior new acknowledgment feedback indicator
5 associated with the prior group-based acknowledgment feedback; and
6 a subsequent group-based acknowledgment feedback is formatted relative to
7 the first group-based acknowledgment feedback based on whether a subsequent new
8 acknowledgment feedback indicator is different than the second new acknowledgment
9 feedback indicator.

1 25. The apparatus of claim 22, wherein the first group-based
2 acknowledgment feedback is formatted based on which of the first new acknowledgment
3 feedback indicator or the second new acknowledgment feedback indicator is received in a
4 majority of sets of group-based acknowledgment feedback parameters associated with the
5 first group-based acknowledgment feedback.

1 26. The apparatus of claim 18, further comprising:
2 means for identifying that the second new acknowledgment feedback indicator
3 being different than the first new acknowledgment feedback indicator for the first group-
4 based acknowledgment feedback is interpreted as the second new acknowledgment feedback
5 indicator being toggled from the first new acknowledgment feedback indicator.

1 27. The apparatus of claim 26, further comprising:
2 means for transmitting only a latest subset of feedback information associated
3 with a latest received new acknowledgment feedback indicator.

- 1 28. The apparatus of claim 26, further comprising:
2 means for identifying a first codebook entry associated with a first subset of
3 feedback information;
4 means for identifying a second codebook entry associated with a second
5 subset of feedback information; and
6 means for transmitting, to the base station, the first group-based
7 acknowledgment feedback in the first uplink transmission based at least in part on the first
8 codebook entry and the second codebook entry.
- 1 29. A method for wireless communications at a base station, comprising:
2 transmitting a first downlink control information to a user equipment (UE) that
3 provides a first set of group-based acknowledgment feedback parameters associated with a
4 first downlink transmission, wherein the first set of group-based acknowledgment feedback
5 parameters includes a first new acknowledgment feedback indicator and a first feedback
6 timing that indicates a first uplink transmission that is to include a first group-based
7 acknowledgment feedback;
8 transmitting a second downlink control information to the UE that provides a
9 second set of group-based acknowledgment feedback parameters associated with a second
10 downlink transmission, wherein the second set of group-based acknowledgment feedback
11 parameters includes a second new acknowledgment feedback indicator that is different than
12 the first new acknowledgment feedback indicator, and a second feedback timing that
13 indicates the first uplink transmission is to include the first group-based acknowledgment
14 feedback;
15 transmitting the first downlink transmission and the second downlink
16 transmission to the UE; and
17 receiving at least the first group-based acknowledgment feedback from the UE
18 in the first uplink transmission.
- 1 30. An apparatus for wireless communications at a base station,
2 comprising:
3 means for transmitting a first downlink control information to a user
4 equipment (UE) that provides a first set of group-based acknowledgment feedback
5 parameters associated with a first downlink transmission, wherein the first set of group-based

6 acknowledgment feedback parameters includes a first new acknowledgment feedback
7 indicator and a first feedback timing that indicates a first uplink transmission that is to
8 include a first group-based acknowledgment feedback;
9 means for transmitting a second downlink control information to the UE that
10 provides a second set of group-based acknowledgment feedback parameters associated with a
11 second downlink transmission, wherein the second set of group-based acknowledgment
12 feedback parameters includes a second new acknowledgment feedback indicator that is
13 different than the first new acknowledgment feedback indicator, and a second feedback
14 timing that indicates the first uplink transmission is to include the first group-based
15 acknowledgment feedback;
16 means for transmitting the first downlink transmission and the second
17 downlink transmission to the UE; and
18 means for receiving at least the first group-based acknowledgment feedback
19 from the UE in the first uplink transmission.