

CLAIMS

1. A wireless device, comprising:
 - a plurality of antennas;
 - a radio operably coupled to the plurality of antennas; and
 - a processor operably coupled to the radio;wherein the wireless device is configured to:
 - establish a first radio resource control (RRC) connection with a base station of a cellular network;
 - transmit, to the base station, capability information related to combinations of codebook types, wherein the capability information includes capability for respective supported combinations of codebook types, and wherein the capability information for the respective supported combinations of codebook types includes a maximum number of ports per channel state information (CSI) resource, a maximum number of CSI resources, and a maximum number of total ports.
2. The wireless device of claim 1,
 - wherein the capability information is useable by the base station in formulating concurrent CSI processing requests.
3. The wireless device of claim 1,
 - wherein the capability information indicates support for concurrent CSI reporting when multiple concurrent instances of CSI processing are requested for two or more different component carriers; and
 - wherein the capability information indicates lack of support for concurrent CSI reporting when multiple concurrent instances of CSI processing are requested for a single component carrier using multiple codebook types.
4. The wireless device of claim 1,
 - wherein the capability information specifies separate concurrent CSI reporting capability for each of the following scenarios:
 - 1) multiple concurrent instances of CSI processing are requested for a single component carrier;

- 2) multiple concurrent instances of CSI processing are requested for multiple component carriers, and the multiple component carriers are in a same operating frequency band; and
 - 3) multiple concurrent instances of CSI processing are requested for multiple component carriers, and the multiple component carriers are in different operating frequency bands.
5. The wireless device of claim 1, wherein the combinations of codebook types are selected from a group including combinations:
Rel-15 Type I Single Panel, Rel-15 Type II; and
Rel-15 Type I Single Panel, Rel-16 Type II.
6. The wireless device of claim 1, wherein the capability information separately specifies capabilities for two or more different component carriers and for a single component carrier using multiple codebook types.
7. The wireless device of claim 1, wherein the capability information includes weighting factors for each of a plurality of codebook types, wherein the weighting factors are usable by the base station in assessing usage of CSI resources in CSI processing requests.
8. A method, comprising:
establishing a first radio resource control (RRC) connection with a base station of a cellular network; and
transmitting, to the base station, capability information related to combinations of codebook types, wherein the capability information includes capability for respective supported combinations of codebook types, and wherein the capability information for the respective supported combinations of codebook types includes a maximum number of ports per channel state information (CSI) resource, a maximum number of CSI resources, and a maximum number of total ports.
9. The method of claim 8, wherein the capability information is useable by the base station in formulating concurrent CSI processing requests.
10. The method of claim 8,

wherein the capability information indicates support for concurrent CSI reporting when multiple concurrent instances of CSI processing are requested for two or more different component carriers; and

wherein the capability information indicates lack of support for concurrent CSI reporting when multiple concurrent instances of CSI processing are requested for a single component carrier using multiple codebook types.

11. The method of claim 8, wherein the capability information specifies separate concurrent CSI reporting capability for each of the following scenarios:

1) multiple concurrent instances of CSI processing are requested for a single component carrier;

2) multiple concurrent instances of CSI processing are requested for multiple component carriers, and the multiple component carriers are in a same operating frequency band; and

3) multiple concurrent instances of CSI processing are requested for multiple component carriers, and the multiple component carriers are in different operating frequency bands.

12. The method of claim 8, wherein the combinations of codebook types are selected from a group including combinations:

Rel-15 Type I Single Panel, Rel-15 Type II; and

Rel-15 Type I Single Panel, Rel-16 Type II.

13. The method of claim 8, wherein the capability information separately specifies capabilities for two or more different component carriers and for a single component carrier using multiple codebook types.

14. The method of claim 8, wherein the capability information includes weighting factors for each of a plurality of codebook types, wherein the weighting factors are usable by the base station in assessing usage of CSI resources in CSI processing requests.

15. An apparatus, comprising: a processor configured to cause a base station of a cellular network to:

establish a first radio resource control (RRC) connection with a user equipment (UE);
and

receive, from the UE, channel state information (CSI) capability information, wherein the CSI capability information comprises information on concurrent CSI processing capability of the UE, wherein the CSI capability information includes capability for each supported combination of codebook types, and wherein the capability information for each supported combination of codebook types includes a maximum number of ports per CSI resource, a maximum number of CSI resources, and a maximum number of total ports.

16. The apparatus of claim 15, wherein the CSI capability information is useable by the base station in formulating concurrent CSI processing requests to the UE.

17. The apparatus of claim 15,
wherein the CSI capability information indicates that the UE supports concurrent CSI reporting when multiple concurrent instances of CSI processing are requested for two or more different component carriers; and
wherein the CSI capability information indicates that the UE does not support concurrent CSI reporting when multiple concurrent instances of CSI processing are requested for a single component carrier using multiple codebook types.

18. The apparatus of claim 15, wherein the CSI capability information specifies separate concurrent CSI reporting capability for each of the following scenarios:

- 1) multiple concurrent instances of CSI processing are requested for a single component carrier;
- 2) multiple concurrent instances of CSI processing are requested for multiple component carriers, and the multiple component carriers are in a same operating frequency band; and
- 3) multiple concurrent instances of CSI processing are requested for multiple component carriers, and the multiple component carriers are in different operating frequency bands.

19. The apparatus of claim 15, wherein the CSI capability information separately specifies capabilities for concurrent CSI per band and per band combination.

20. The apparatus of claim 15, wherein the CSI capability information separately specifies capabilities for two or more different component carriers and for a single component carrier using multiple codebook types.