

WHAT IS CLAIMED IS:

1. A method for wireless communications by a user equipment (UE), comprising:
 - receiving a system information block (SIB), from a base station (BS), containing system information indicating a resource set of a plurality of configured resource sets, each resource set containing a plurality of resources;
 - receiving downlink control information (DCI) in a physical downlink control channel (PDCCH), from the BS, containing resource indicator (RI) bits indicating a resource of the plurality of resources of the indicated resource set available for the UE to use for transmitting uplink control information (UCI) in a physical uplink control channel (PUCCH) transmission;
 - determining the resource based on the SI, the RI bits, and a control channel element (CCE) index of the PDCCH; and
 - transmitting the UCI in the PUCCH using the determined resource.
2. The method of claim 1, wherein the system information is received via remaining system information (RMSI) bits.
3. The method of claim 2, wherein
 - The RMSI bit comprise 4 bits, and
 - the RI bits comprise 3 bits.
4. The method of claim 2, wherein determining the resource includes determining the resource set based on a value of the RMSI bits and an associated mapping.
5. The method of claim 4, wherein the associated mapping maps each value of the RMSI bits to at least one of: a set of durations of the PUCCH transmission, a set of repetition factors for the PUCCH transmission, a set of resource block (RB) indexes, a set of initial shift indexes per RB, or a set of orthogonal cover code (OCC) indexes per RB.
6. The method of claim 5, wherein at least one of:
 - the set of durations comprises one or more durations of 2 symbols, 4 symbols, 10 symbols, or 14 symbols,

the set of RB indexes indicates 2, 4, or 8 RBs, or
the set of OCC index indicates 1 or 2 OCCs.

7. The method of claim 5, wherein:
a first RB index is for a first hop of a frequency hopping pattern, and
the method further comprises determining a second RB index for a second hop of the frequency hopping pattern based on the frequency hopping pattern and the first RB index for the first hop.
8. The method of claim 1, wherein:
determining the resource is based on a mapping of the plurality of resource indexes of the indicated resource set to values of the RI bits and the CCE index, and
the resource indexes are further mapped to at least one of: resource block (RB) indexes, orthogonal cover code (OCC) indexes, or shift indexes.
9. The method of claim 8, wherein:
the value of the RI bits explicitly indicates the RB index and the OCC index,
and
the method further comprises deriving the shift index implicitly based on the relative resource index.
10. The method of claim 8, wherein each of the plurality of resource sets is associated with a different mapping.
11. The method of claim 1, wherein:
the plurality of resource sets comprises sixteen resource sets, and
the plurality of resources comprises sixteen resources.
12. The method of claim 1, wherein the indicated resource is at an edge of the system bandwidth.

13. A method for wireless communications by a base station (BS), comprising:
transmitting a system information block (SIB), to a user equipment (UE),
containing system information indicating a resource set of a plurality of predefined
resource sets, each resource set containing a plurality of resources;
transmitting downlink control information (DCI) on physical downlink control
channel (PDCCH) associated with a control channel element (CCE) index, to the UE,
containing resource indicator (RI) bits to indicate a resource of the plurality of resources
of the indicated resource set available for the UE to use for transmitting uplink control
information (UCI) in a physical uplink control channel (PUCCH) transmission; and
monitoring the indicated resource for the PUCCH transmission.
14. The method of claim 13, wherein the system information is provided via
remaining system information (RMSI) bits.
15. The method of claim 14, wherein:
the RMSI bits comprise 4 bits, and
the RI bits comprise 3 bits.
16. The method of claim 14, wherein resource set of the plurality of predefined
resource sets is indicated via a value of the RMSI bits based on an associated mapping.
17. The method of claim 16, wherein the associated mapping maps each value of the
RMSI bits to at least one of: a set of durations of the PUCCH transmission, a set of
repetition factors for the PUCCH transmission, a set of resource block (RB) indexes, a
set of initial shift indexes per RB, or a set of orthogonal cover code (OCC) indexes per
RB.
18. The method of claim 17, wherein at least one of:
the set of durations comprise one or more durations of 2 symbols, 4 symbols, 10
symbols, or 14 symbols,
the set of RB indexes indicates 2, 4, or 8 RBs, or
the set of OCC index indicates 1 or 2 OCCs.

19. The method of claim 17, wherein:
 - a first RB index is for a first hop of a frequency hopping pattern, and
 - a second RB index is for a second hop of the frequency hopping pattern based on the frequency hopping pattern and the first RB index for the first hop.
20. The method of claim 13, wherein:
 - the resource of the plurality of resources of the indicated resource set is indicated via a mapping of the plurality of resources to values of the RI bits and the CCE index, and
 - the resource indexes are further mapped to at least one of: relative resource indexes, resource block (RB) indexes, orthogonal cover code (OCC) indexes, or shift indexes.
21. The method of claim 20, wherein:
 - the value of the RI bits explicitly indicates the RB index and the OCC index, and
 - the shift index is implicitly derived based on the relative resource index.
22. The method of claim 20, wherein each of the plurality of resource sets is associated with a different mapping.
23. The method of claim 13, wherein:
 - the plurality of resource sets comprises sixteen resource sets, and
 - the plurality of resources comprises sixteen resources.
24. The method of claim 13, wherein the indicated resource is at an edge of a system bandwidth.
25. An apparatus for wireless communications, comprising:
 - means for receiving a system information block (SIB), from another apparatus, containing system information indicating a resource set of a plurality of configured resource sets, each resource set containing a plurality of resources;
 - receiving downlink control information (DCI) in a physical downlink control channel (PDCCH), from the another apparatus, containing resource indicator (RI) bits

indicating a resource of the plurality of resources of the indicated resource set available for the apparatus to use for transmitting uplink control information (UCI) in a physical uplink control channel (PUCCH) transmission;

determining the resource based on the SI, a control channel element (CCE) index of the PDCCH, and the RI bits; and

transmitting the UCI in the PUCCH using the determined resource.

26. The apparatus of claim 25, wherein:

the SIB comprises remaining system information (RMSI) bits, and

determining the resource includes determining the resource set based on a value of the RMSI bits and an associated mapping.

27. The apparatus of claim 26, wherein the associated mapping maps each value of the RMSI bits to at least one of: a set of durations of the PUCCH transmission, a set of repetition factors for the PUCCH transmission, a set of resource block (RB) indexes, a set of initial shift indexes per RB, or a set of orthogonal cover code (OCC) indexes per RB.

28. The apparatus of claim 27, wherein:

a first RB index is for a first hop of a frequency hopping pattern, and

the apparatus further comprises means for determining a second RB index for a second hop of the frequency hopping pattern based on the frequency hopping pattern and the first RB index for the first hop.

29. The apparatus of claim 25, wherein:

determining the resource is based on a mapping of the plurality of resources of the indicated resource set to values of the RI bits and the CCE index, and

the values of the RI bit are further mapped to at least one of: relative resource indexes, resource block (RB) indexes, orthogonal cover code (OCC) indexes, or shift indexes.

30. An apparatus for wireless communications, comprising:
- means for transmitting a system information block (SIB), to another apparatus, containing system information indicating a resource set of a plurality of predefined resource sets, each resource set containing a plurality of resources;
 - means for transmitting downlink control information (DCI) on physical downlink control channel (PDCCH) associated with a control channel element (CCE) index, to the another apparatus, containing resource indicator (RI) bits to indicate a resource of the plurality of resources of the indicated resource set available for the UE to use for transmitting uplink control information (UCI) in a physical uplink control channel (PUCCH) transmission; and
 - means for monitoring the indicated resource for the PUCCH transmission.