CLAIMS

1. A method comprising:

generating a plurality of information bits by a transmitter in a mobile communication network, wherein the plurality of information bits contains a set of timing-related bits known to a plurality of receivers under one or more conditions;

performing a bit mapping for the plurality of information bits such that the set of timing-related bits having a predefined order;

encoding the plurality of information bits using a Polar encoder, wherein the set of timing-related bits is placed at substantially the most unreliable input bit positions of the Polar encoder as a result of the bit mapping; and

broadcasting the encoded bits over an allocated physical broadcast channel (PBCH).

2. The method of Claim 1, wherein the Polar encoder receives a plurality of input bits, wherein each input bit position has an index associated with a channel reliability.

3. The method of Claim 1, wherein the set of timing-related bits comprises ten system frame number (SFN) bits and a half radio frame bit that are known to the plurality of receivers under the one or more conditions.

4. The method of Claim 3, wherein the set of timing-related bits is mapped to Polar encoder input bit positions having indices 441, 469, 247, 367, 375, 444, 470, 483, 415, 485, and 473 with ascending reliability.

5. The method of Claim 1, wherein the plurality of information bits comprises a second set of timing-related bits including a half radio frame bit and three synchronization signal block time index (SSBI) bits.

6. The method of Claim 5, wherein the second set of timing-related bits is placed at the Polar encoder input bit positions with the smallest utilized index values having indices 247, 253, 254, and 255.

7. A transmitting device, comprising:

a control circuit that generates a plurality of information bits in a mobile communication network, wherein the plurality of information bits contains a set of timing-related bits known to a plurality of receivers under one or more conditions;

a bit mapper that performs bit mapping for the plurality of information bits such that the set of timing-related bits having a predefined order;

a Polar encoder that encodes the plurality of information bits, wherein the set of timing-related bits

is placed at substantially the most unreliable input bit positions of the Polar encoder as a result of the bit mapping; and

a radio frequency (RF) transmitter that broadcasts the encoded bits over an allocated physical broadcast channel (PBCH).

8. The device of Claim 7, wherein the Polar encoder has a plurality of input bits, wherein each input bit position has an index associated with a channel reliability.

9. The device of Claim 7, wherein the set of timing-related bits comprises ten system frame number (SFN) bits and a half radio frame bit that are known to the plurality of receivers under the one or more conditions.

10. The device of Claim 9, wherein the set of timing-related bits is mapped to Polar encoder input bit positions having indices 441, 469, 247, 367, 375, 444, 470, 483, 415, 485, and 473 with ascending reliability.

11. The device of Claim 7, wherein the plurality of information bits comprises a second set of timing-related bits including a half radio frame bit and three synchronization signal block time index (SSBI) bits.

12. The device of Claim 11, wherein the second set of timing-related bits is placed at the Polar encoder input bit positions with the smallest utilized index values having indices 247, 253, 254, and 255.