WHAT IS CLAIMED IS:

1. Apparatus (28, 30) adapted for interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, the apparatus being configured to generate a scheduling map (40), the scheduling map being configured to inform at least one of the circuit switched (CS) Global System for Mobile Communication (GSM) network and the Long Term Evolution (LTE) network of time intervals that can be used for data transmissions to or from the wireless terminal;

characterized in that that a length of the scheduling map is a multiple of sixty or one hundred twenty transmission time intervals of the Long Term Evolution (LTE) network.

2. The apparatus of claim 1, further comprising:

a communications interface (52, 42) configured to facilitate the interleaved transmissions over the radio interface (32);

a communications handler (44, 54) is configured to operate in accordance with the scheduling map for processing the interleaved transmissions;

a scheduling map generator (46, 56) configured to generate the scheduling map.

3. The apparatus of claim 1, wherein the apparatus comprises a node (28) of a radio access network.

4. The apparatus of claim 1, wherein the apparatus comprises a wireless terminal (30) which communicates over the radio interface (32) with a node of a radio access network.

5. A method of generating a scheduling map (40) for use in a radio access network, the method comprising:

configuring the scheduling map (40) to prescribe time intervals that can be used for interleaved transmissions over a radio interface (32) to or from a wireless terminal, the interleaved transmissions to or from the wireless terminal being interleaved with respect to a circuit switched (CS) Global System for Mobile Communication (GSM) network and a Long Term Evolution (LTE) network;

the method characterized by setting a length of the scheduling map (40) to be a multiple of sixty or one hundred twenty transmission time intervals of the Long Term Evolution (LTE) network.

6. The method of claim 5, further comprising generating the scheduling map (40) at a node of a radio access network.

7. The method of claim 5, further comprising generating the scheduling map (40) at the wireless terminal.

8. Apparatus (28, 30) adapted for interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, the apparatus being configured to generate a scheduling map (40), the scheduling map (40) being configured to inform at least one of the circuit switched (CS) Global System for Mobile Communication (GSM) network and the Long Term Evolution (LTE) network of time intervals that can be used for data transmissions to or from the wireless terminal;

characterized in that the apparatus is configured to generate the scheduling map (40) using two or more of the following variables or parameters:

an offset delay between transmission time intervals of the Long Term Evolution (LTE) network and a start of a GSM traffic multi-frame;

a guard delay required by at least one of hardware and software of the wireless terminal to move from a GSM transmit operation to a LTE receive or from a GSM receive operation to a LTE transmit operation;

a time slot number used for GSM voice transmissions both in an uplink (UL) communication across the radio interface (32) from the wireless terminal and a downlink (DL) communication across the radio interface (32) toward the wireless terminal;

a GSM time delay difference between uplink (UL) and downlink (DL) timeslots;

an indication whether a half rate or a full rate codec is used;

an indication whether a dual receiver structure or a single receiver structure is used; and

an indication of what type time division method is to be implemented.

9. The apparatus of claim 8, wherein the apparatus comprises a node (28) of a radio access network.

10. The apparatus of claim 8, wherein the apparatus comprises a wireless terminal (30) which communicates over the radio interface (32) with a node (28) of a radio access network.

11. The apparatus of claim 8, wherein the apparatus is configured to regenerate at least a portion of the scheduling map (40) when there is change of the one or more of the variables or parameters.

12. The apparatus of claim 11, wherein where there is the change of the one or more of the variables or parameters the wireless terminal is configured to send either a regenerated scheduling map (40) or a changed variable or parameter to a node of a radio access network.

13. The apparatus of claim 8, further comprising:

a communications interface (52, 42) configured to facilitate the interleaved transmissions over the radio interface (32);

a scheduling map (40) generator (46, 56) configured to generate the scheduling map (40).

14. A method of generating a scheduling map (40) configured to prescribe time intervals that can be used for interleaved transmissions over a radio interface (32) to or from a wireless terminal (30), the interleaved transmissions to or from the wireless terminal (30) being interleaved with respect to a circuit switched (CS) Global System for Mobile Communication (GSM) network and a Long Term Evolution (LTE) network; the method characterized by generating the scheduling map (40) using two or more of the following variables or parameters:

an offset delay between transmission time intervals of the Long Term Evolution (LTE) network and a start of a GSM traffic multi-frame;

a guard delay utilized by at least one of hardware and software of the wireless terminal to move from a GSM transmit operation to a LTE receive or from a GSM receive operation to a LTE transmit operation;

a time slot number used for GSM voice transmissions both in an uplink (UL) communication across the radio interface (32) from the wireless terminal and a downlink (DL) communication across the radio interface (32) toward the wireless terminal;

a GSM time delay difference between uplink (UL) and downlink (DL) timeslots;

an indication whether a half rate or a full rate codec is used;

an indication whether a dual receiver structure or a single receiver structure is used; and

an indication of what type time division method is to be implemented.

15. The method of claim 14, further comprising regenerating at least a portion of the scheduling map (40) when there is change of one or more of the variables or parameters.

16. The method of claim 9, further comprising acquiring at least one of the variables or parameters by a node of a radio access network from the wireless terminal.

17. Apparatus (28, 30) adapted for interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, characterized in that the apparatus is configured to generate both an uplink (UL) scheduling map (40) and a downlink (DL) scheduling map (40), the uplink (UL) scheduling map (40) being configured to prescribe time intervals in which a wireless terminal can send information in LTE transmission time intervals across the radio interface (32), the downlink (DL) scheduling map (40) being configured to prescribe time intervals in which the wireless terminal can receive information in LTE transmission time intervals from the radio interface (32).

18. The apparatus of claim 17, wherein the apparatus comprises a node (28) of a radio access network.

19. The apparatus of claim 17, wherein the apparatus comprises a wireless terminal (30) which communicates over the radio interface (32) with a node (28) of a radio access network.

20. The apparatus of claim 17, wherein the wireless terminal (30) is further configured to send both the uplink (UL) scheduling map (40) and the downlink (DL) scheduling map (40) across the radio interface (32) of an LTE radio access network.

21. The apparatus of claim 17, further comprising:

a communications interface (52, 42) configured to perform transmissions across the radio interface (32) in accordance with the uplink (UL) scheduling map (40) and in accordance with the downlink (DL) scheduling map (40);

a scheduling map (40) generator (46, 56) configured to generate the LTE transmit scheduling map (40) and the LTE receive scheduling map (40).

22. The apparatus of claim 17, wherein the apparatus comprises a node of a radio access network configured to receive, across the radio interface (32), one or more variables or parameters from the wireless terminal, the node being further configured to use the one or more variables or parameters to generate both the uplink (UL) scheduling map (40) and the downlink (DL) scheduling map (40).

23. A method of generating a scheduling map (40) for scheduling interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, the method characterized by configuring both an uplink (UL) scheduling map (40) and a downlink (DL) scheduling map (40), the uplink (UL) scheduling map (40) being configured to prescribe time intervals in which a wireless terminal can send information in LTE transmission time intervals across the radio interface (32), the downlink (DL) scheduling map (40) being configured to prescribe time intervals in which the wireless terminal can receive information in LTE transmission time intervals from the radio interface (32).

24. The method of claim 23, further comprising generating the uplink (UL) scheduling map (40) and the downlink (DL) scheduling map (40) at a node (28) of a radio access network.

25. The method of claim 23, further comprising generating the uplink (UL) scheduling map (40) and the downlink (DL) scheduling map (40) at a wireless terminal (30).

26. Apparatus (28, 30) adapted for interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, the apparatus being configured to generate a scheduling map (40), the scheduling map (40) being configured to inform at least one of the circuit switched (CS) Global System for Mobile Communication (GSM) network and the Long Term Evolution (LTE) network of time intervals that can be used for data transmissions to or from the wireless terminal;

characterized in that the apparatus is configured to use the scheduling map (40) to determine a LTE transmission time interval in which to send a scheduling request on an uplink (UL) over the radio interface (32) to the LTE network.

27. The apparatus of claim 26, further comprising:

a communications interface (52, 42) configured to facilitate sending of the scheduling request to the LTE network;

a scheduling map (40) generator (46, 56) configured to generate the scheduling map (40);

a scheduler which operates in accordance with the scheduling map (40) to determine the LTE transmission time interval in which to send the scheduling request over the radio interface (32) to the LTE network.

28. The apparatus of claim 27, wherein the apparatus is further configured to use the scheduling map (40) to determine when a LTE uplink (UL) data transmission can occur depending on a timing of a grant from the LTE network.

29. The apparatus of claim 27, wherein the apparatus is further configured to use the scheduling map (40) to determine when an ACK or NACK can be received from the LTE network.

30. A method of generating a scheduling map (40) configured to inform at least one of a circuit switched (CS) Global System for Mobile Communication (GSM) network and a Long Term Evolution (LTE) network of time intervals that can be used for data transmissions to or from a wireless terminal, the method characterized by using the scheduling map (40) to determine a LTE transmission time interval in which to send a scheduling request on an uplink (UL) over the radio interface (32) to the LTE network.

CLAIMS

1. An apparatus (28, 30) adapted for interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, wherein the apparatus is configured to generate both an uplink (UL) scheduling map (40) and a downlink (DL) scheduling map (40), the uplink (UL) scheduling map (40) being configured to prescribe time intervals in which a wireless terminal can send information in LTE transmission time intervals across the radio interface (32), the downlink (DL) scheduling map (40) being configured to prescribe time intervals in which the wireless terminal can receive information in LTE transmission time intervals from the radio interface (32), such that the transmission time or reception time of an ACK or NACK over the LTE network is dependent upon at least one of the uplink or downlink scheduling maps.

2. The apparatus of claim 1, further comprising:

a communications interface (52, 42) configured to perform transmissions across the radio interface (32) in accordance with the uplink (UL) scheduling map (40) and in accordance with the downlink (DL) scheduling map (40);

a scheduling map (40) generator (46, 56) configured to generate the LTE transmit scheduling map (40) and the LTE receive scheduling map (40).

3. The apparatus of claim 1 or 2, wherein the apparatus is configured to use the uplink scheduling map (40) to determine a LTE transmission time interval in which to send a scheduling request on an uplink (UL) over the radio interface (32) to the LTE network.

4. The apparatus of claim 3, further comprising:

a scheduler arranged to operate in accordance with the uplink scheduling map (40) to determine the LTE transmission time interval in which to send the scheduling request over the radio interface (32) to the LTE network.

5. The apparatus of claim 4, wherein the apparatus is further configured to use the uplink scheduling map (40) to determine when a LTE uplink (UL) data transmission can occur depending on a timing of a grant from the LTE network.

6. The apparatus according to any preceding claim, wherein a length of the uplink and/or downlink scheduling map is a multiple of sixty or one hundred and twenty transmission time intervals of the Long Term Evolution (LTE) network.

7. The apparatus according to any preceding claim, wherein the apparatus is configured to generate the uplink and/or downlink scheduling map (40) using two or more of the following variables or parameters:

an offset delay between transmission time intervals of the Long Term Evolution (LTE) network and a start of a GSM traffic multi-frame;

a guard delay required by at least one of hardware and software of the wireless terminal to move from a GSM transmit operation to a LTE receive or from a GSM receive operation to a LTE transmit operation;

a time slot number used for GSM voice transmissions both in an uplink (UL) communication across the radio interface (32) from the wireless terminal and a downlink (DL) communication across the radio interface (32) toward the wireless terminal;

a GSM time delay difference between uplink (UL) and downlink (DL) timeslots;

an indication whether a half rate or a full rate codec is used;

an indication whether a dual receiver structure or a single receiver structure is used; and

an indication of what type time division method is to be implemented.

8. The apparatus according to claim 7, wherein the apparatus is configured to regenerate at least a portion of the uplink and/or downlink scheduling map (40) when there is a change of the one or more of the variables or parameters.

9. The apparatus according to claim 8, wherein when there is the change of the one or more of the variables or parameters the wireless terminal is configured to send either a regenerated scheduling map (40) or a changed variable or parameter to a node of a radio access network.

10. The apparatus of any preceding claim, wherein the apparatus comprises a node (28) of a radio access network.

11. The apparatus of any of claims 1 to 9, wherein the apparatus comprises a wireless terminal (30) arranged to communicate over the radio interface (32) with a node (28) of a radio access network.

12. The apparatus of any preceding claim, wherein the wireless terminal (30) is further configured to send both the uplink (UL) scheduling map (40) and the downlink (DL) scheduling map (40) across the radio interface (32) of an LTE radio access network.

13. A method of generating a scheduling map (40) for scheduling interleaved transmissions over a radio interface (32) with both a circuit switched (CS) Global System for Mobile Communication (GSM) network and Long Term Evolution (LTE) network, the method comprising configuring both an uplink (UL) scheduling map (40) and a downlink (DL) scheduling map (40), the uplink (UL) scheduling map (40) being configured to prescribe time intervals in which a wireless terminal can send information in LTE transmission time intervals across the radio interface (32), the downlink (DL) scheduling map (40) being configured to prescribe time intervals

in which the wireless terminal can receive information in LTE transmission time intervals from the radio interface (32), such that the transmission time or reception time of an ACK or NACK over the LTE network is dependent upon at least one of the uplink or downlink scheduling maps.

14. The method of claim 13, further comprising the step of setting a length of the scheduling map (40) to be a multiple of sixty or one hundred and twenty transmission time intervals of the Long Term Evolution (LTE) network.

15. The method of claim 13 or 14, further comprising the step of generating the scheduling map (40) using two or more of the following variables or parameters:

an offset delay between transmission time intervals of the Long Term Evolution (LTE) network and a start of a GSM traffic multi-frame;

a guard delay utilized by at least one of hardware and software of the wireless terminal to move from a GSM transmit operation to a LTE receive or from a GSM receive operation to a LTE transmit operation;

a time slot number used for GSM voice transmissions both in an uplink (UL) communication across the radio interface (32) from the wireless terminal and a downlink (DL) communication across the radio interface (32) toward the wireless terminal;

a GSM time delay difference between uplink (UL) and downlink (DL) timeslots;

an indication whether a half rate or a full rate codec is used;

an indication whether a dual receiver structure or a single receiver structure is used; and

an indication of what type time division method is to be implemented.