

Claims

1. Use of a low earth orbit, LEO, satellite for air traffic control; wherein the LEO satellite is adapted for:

a) receiving an Automatic Dependent Surveillance-Broadcast, ADS-B, signal from an aircraft;

b) receiving and/or transmitting a signal from/to a control tower;

c) receiving and/or transmitting a VHF signal from or to said aircraft;

wherein the ADS-B signal emitted by said aircraft comprises information regarding the aircraft's position, speed, and direction;

wherein the LEO satellite is further adapted for receiving a signal from said control tower, and to re-transmit said signal to said aircraft on a compensated VHF frequency for compensating for Doppler frequency shifts, and wherein the compensation is based on the information from said aircraft's ADS-B signal.

2. Use according to claim 1, wherein said LEO satellite is further adapted for receiving a signal from said control tower, and to re-transmit said signal to said aircraft at a narrow transmission bandwidth of 8.33 kHz in regions where aviation VHF channels are operated with nominally 25 kHz separation.

3. Use according to claim 2, wherein said region is identified by the information from said aircraft's ADS-B signal.

4. Use according to any one of the claims 1-3, wherein said LEO satellite is further adapted for:

- detecting a VHF signal from said aircraft;
- correcting for Doppler frequency shifts; and
- re-transmitting said VHF signal to said control tower.

5. Use according to any one of the claims 1-4, wherein said LEO satellite is

further adapted for re-transmitting said ADS-B signal and/or said VHF signal from said aircraft to another LEO satellite in a position closer to said control tower.

- 5 6. Use according to any one of the claims 1-5, wherein said LEO satellite is further adapted for re-transmitting said signal from said control tower to another LEO satellite in a position closer to said aircraft.

7. A system (100) for air traffic control comprising:
- 10 - one or more LEO satellites (110) adapted for:
- a) receiving an Automatic Dependent Surveillance-Broadcast, ADS-B, signal from an aircraft (10);
- b) receiving and/or transmitting a signal from/to a control tower (120);
- c) receiving and/or transmitting a VHF signal from/to said aircraft (10);
- 15 wherein the ADS-B signal emitted by said aircraft (10) comprises information regarding said aircraft's position, speed, and direction;
- one or more control towers (300) adapted for receiving and/or transmitting a signal from or to said LEO satellite(s);
- wherein said LEO satellite(s) are further adapted for receiving a signal from
- 20 said control tower(s), and to re-transmit said signal to said aircraft on a compensated VHF frequency for compensating for Doppler frequency shifts, and wherein the compensation is based on the information from said aircraft's ADS-B signal.

- 25 8. A system for air traffic control according to claim 7, wherein said LEO satellite(s) are further adapted for receiving a signal from said control tower(s), and to re-transmit said signal to said aircraft at a narrow transmission bandwidth of 8.33 kHz in regions where aviation VHF channels are operated with nominally 25 kHz separation.

- 30 9. A system for air traffic control according to claim 8, wherein said region is

identified by the information from said aircraft's ADS-B signal.

10. A system for air traffic control according to any one of the claims 7-9,
wherein said LEO satellite(s) are further adapted for re-transmitting the
5 ADS-B signal and/or the VHF signal from said aircraft to another LEO
satellite in a position closer to said control tower(s).

11. A system for air traffic control according to any one of the claims 7-10,
wherein said LEO satellite(s) are further adapted for:
10 - detecting a VHF signal from said aircraft;
- correcting for Doppler frequency shifts; and
- re-transmitting said VHF signal to said control tower(s).

12. A system for air traffic control according to any one of the claims 7-11,
15 wherein said LEO satellite(s) are further adapted for re-transmitting said
signal from said control tower(s) to another LEO satellite in a position closer
to said aircraft.

13. A LEO satellite for air traffic control, the LEO satellite being adapted for:
20 a) receiving an Automatic Dependent Surveillance-Broadcast, ADS-B,
signal from an aircraft;
b) receiving and/or transmitting a signal from/to a control tower;
c) receiving and/or transmitting a VHF signal from or to said aircraft;
wherein the ADS-B signal emitted by said aircraft comprises information
25 regarding said aircraft's position, speed, and direction;
wherein said LEO satellite is further adapted for receiving a signal from said
control tower, and to re-transmit said signal to said aircraft on a
compensated VHF frequency for compensating for Doppler frequency
shifts, and wherein the compensation is based on the information from said
30 aircraft's ADS-B signal.

14. A LEO satellite for air traffic control according to claim 13, wherein said LEO satellite is further adapted for receiving a signal from said control tower, and to re-transmit said signal to said aircraft at a narrow transmission bandwidth of 8.33 kHz in regions where aviation VHF channels are operated with nominally 25 kHz separation.

15. A LEO satellite for air traffic control according to claim 14, wherein said region is identified by the information from said aircraft's ADS-B signal.

16. A LEO satellite for air traffic control according to any one of the claims 13-15, wherein said LEO satellite is further adapted for re-transmitting the ADS-B signal and/or the VHF signal from said aircraft to another LEO satellite in a position closer to said control tower.

17. A LEO satellite for air traffic control according to any one of the claims 13-16, wherein said LEO satellite is further adapted for:

- detecting a VHF signal from said aircraft;
- correcting for Doppler frequency shifts; and
- re-transmitting said VHF signal to said control tower.

18. A LEO satellite for air traffic control according to any one of the claims 13-17, wherein said LEO satellite is further adapted for re-transmitting the signal from said control tower to another LEO satellite in a position closer to said aircraft.