A ramp services control system and method

The present invention relates to a ramp services control system and method. The invention more particularly relates to a ramp services control system and method for use in an airport to control ramp service operations provided by ground operators in an airport.

Technical ramp services are an aspect of aircraft ground handling which enable aircraft to be serviced at an airport. Ramp services include, but are not limited to: aircraft pushback and towing, aircraft martialling, ground-to-cockpit communication, water and lavatory servicing, the provision of ground power, air conditioning and air-starter services and the provision of mobile steps/aerobridges services for passengers boarding and alighting from aircraft.

The majority of ramp services involve the movement of heavy vehicles and the operation of aviation ground equipment.

Conventionally, ramp service operations operate with a central control centre printing a paper flight assignment document for each ground operator. The ground operators must go to the central control centre to collect the flight assignment printout and then make their way to the correct location at the airport to complete the flight assignment.

Each ground operator carries a walkie-talkie to receive updates from the central control centre. For instance, the central control centre may communicate details of a change to a flight assignment to the ground operators by radio to the walkie-talkies for immediate action by the ground operators.

One problem with this conventional ground services system is that ground operators who are working from flight assignment printouts can miss updates to the flight assignment. The operators are then left working from outdated

flight assignment printouts. This can lead to the ground operators making mistakes in the flight assignments which can cause service mishandlings and flight delays.

A further problem with this conventional system is that ground operators are required to listen and communicate via a walkie-talkie while simultaneously carrying out ground services tasks. This can be dangerous, particularly when a ground operator is driving a heavy vehicle because there is a risk that the ground operator will lose concentration and crash the vehicle. This risk not only puts the life of the ground operator in danger, but also the lives of the other ground operators and potentially also the passengers and staff on an aircraft.

The present invention seeks to provide an improved ramp services control system and method.

According to one aspect of the present invention, there is provided a ramp services control system for use in an airport, the system comprising: a central control station which is configured for wireless communication; and a plurality of wearable mobile devices which are each configured to be worn by a respective operator and configured to communicate wirelessly with the central control station, each wearable mobile device comprising: a communication unit which is configured to receive a ramp services instruction wirelessly from the central control station; a screen which is configured to output the ramp services instruction visually to an operator; and an input device which is configured to receive an input from the operator in response to the received ramp services instruction, the communication unit being configured to transmit data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the wearable mobile devices and responses transmitted from the wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport; wherein the central control station is configured to: select a subset of the plurality of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport, and transmit a ramp services instruction to only the selected subset of wearable mobile devices.

Conveniently, each wearable mobile device is a smartwatch.

Advantageously, the screen of each wearable mobile device is a touchscreen.

Preferably, each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the determined position of the wearable mobile device to the central control station.

Conveniently, each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station.

Advantageously, each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the direction of travel of the wearable mobile device to the central control station.

Preferably, the system further comprises: a plurality of audio output devices, each audio output device being configured to be carried by an operator and configured to provide an audio output corresponding to the ramp services instruction to the operator.

Conveniently, each audio output device is a bone conduction headset.

Advantageously, each bone conduction headset is integrated into protective headgear to be worn by an operator.

Preferably, the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

Preferably, the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

Preferably, the central control station comprises: a display unit which is configured to display a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

Conveniently, the display unit of the central control station is configured to display the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

Advantageously, the display unit is configured to display one or more of each staff's position, availability, ability to operate certain equipment or carry out

certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

Preferably, the display unit is configured to display one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

According to another aspect of the present invention, there is provided a method for controlling ramp services in an airport, the method comprising: selecting a subset of a plurality of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport; transmitting a ramp services instruction wirelessly from a central control station to only the selected subset of wearable mobile devices, each of the plurality of wearable mobile devices being worn by a respective operator; receiving the ramp services instruction via a communication module in each wearable mobile device of the subset of wearable mobile devices; outputting the ramp services instruction visually via a screen in the at least one wearable mobile device to an operator carrying the wearable mobile device; receiving an input from the operator via an input device in the wearable mobile device in response to the received ramp services instruction; and transmitting data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the subset of wearable mobile devices and responses transmitted from the subset of wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport; wherein each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the method comprises: transmitting data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station ; and analysing, at the central control station, the data indicative of the measured acceleration or deceleration of the wearable mobile device to detect accelerations or decelerations which are indicative of dangerous vehicle operation or a crash situation.

Conveniently, each mobile device is a smartwatch.

Advantageously, the screen of each wearable mobile device is a touchscreen.

Preferably, each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the

wearable mobile device, and wherein the method comprises transmitting data indicative of the determined position of the wearable mobile device to the central control station.

Advantageously, each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the method comprises transmitting data indicative of the direction of travel of the wearable mobile device to the central control station.

Preferably, the method further comprises: providing an audio output corresponding to the ramp services instruction to an operator via an audio device carried by the operator.

Conveniently, the audio output device is a bone conduction headset.

Advantageously, the bone conduction headset is integrated into protective headgear to be worn by the operator.

Preferably, the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

Preferably, the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

Preferably, the method further comprises: displaying on a display unit at the central control station a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

Conveniently, the method comprises displaying the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

Advantageously, the method comprises displaying on the display unit one or more of each staff's position, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

Preferably, the method comprises displaying on the display unit one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

So that the present invention may be more readily understood, embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a schematic diagram of a ramp services control system of one embodiment of the invention,

Figure 2 is a diagrammatic perspective view of a mobile device in the form of a smartwatch,

Figure 3 is a diagrammatic perspective view of the smartwatch of figure 2, showing a first user interface,

Figure 4 is a diagrammatic perspective view of the smartwatch of figure 2, showing a second user interface,

Figure 5 is a diagrammatic perspective view of the smartwatch of figure 2, showing a third user interface,

Figure 6 is a diagrammatic perspective view of an audio output device in the form of a bone conduction headset,

Figure 7 is a diagrammatic perspective view of an article of protective headgear with an integrated bone conduction headset,

Figure 8 is a diagrammatic view showing the screen of a central control station of an embodiment of the invention, and

Figure 9 is a diagrammatic view of a display output of the control screen of the central control station of figure 8.

Referring initially to figure 1 of the accompanying drawings, a ramp services control system 1 of an embodiment of the invention comprises a central control station 2. The central control station 2 is, in this embodiment, a computer terminal or server with a display screen or display unit (not shown). The

central control station 2 comprises a communication unit 3 which is configured to transmit and receive signals wirelessly. In embodiments of the invention the wireless communication is carried out using at least one or more of a wireless local area network (wireless LAN), WiFi® or a cellular communications network.

The ramp services control system 1 further comprises a plurality of mobile devices 4. In this embodiment, the mobile devices 4 are each identical to one another. Each mobile device 4 is configured to be carried by a respective operator working on the ground in an airport. Each mobile device 4 comprises a communication unit 5 which is configured to receive a ramp services instruction and other instructions or messages wirelessly from the central control station 2. In embodiments of the invention the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning. The ramp services instruction may or may not require acknowledgment by the operator.

Each mobile device 4 comprises a screen (not shown in figure 1) which is configured to output or display the ramp services instruction or other received messages visually to an operator.

Each mobile device 4 further comprises an input device (not shown in figure 1) which is configured to receive an input from an operator in response to a received message or ramp services instruction. The communication unit 5 of each mobile device is configured to transmit data indicative of the input from the operator to the central control station 2. The central control station 2 can therefore monitor ramp services instructions sent to the mobile devices 4 and responses transmitted from the mobile devices 4 in response to the ramp services instructions to control ramp service operations in an airport

Referring now to figure 2 of the accompanying drawings, in a preferred embodiment each mobile device 4 is preferably a smartwatch 6 which is

configured to be worn on the wrist 7 of an operator. The smartwatch 6 comprises a screen 8 which, in this embodiment, is a touchscreen that is configured to receive a touch input from an operator. In other embodiments, the smartwatch 6 does not have a touchscreen and in these embodiments the input device is in the form of a button 9 provided on the body of the smartwatch 6. In further embodiments, the smartwatch 6 is configured to receive an input via the touchscreen 8 and/or a button 9.

The mobile device 4 which, in this embodiment, is in the form of a smartwatch 6, preferably comprises a ground navigational system using satellites (not shown). The ground navigational system using satellites is preferably a GPS receiver, but in other embodiments may be a different ground navigational system using satellites, such as GLONASS.

The ground navigational system using satellites is configured to detect the global position of the smartwatch 6 and to transmit the position via the communication unit 5 to the central control station 2. This implementation enables the central control station 2 to monitor the position of each of the smartwatches 6 and hence the position of the operators wearing the smartwatches 6.

The smartwatch 6 preferably further comprises an accelerometer (not shown) which is configured to measure the acceleration or deceleration of the smartwatch 6. For instance, the accelerometer is configured to measure the acceleration or deceleration of the smartwatch 6 as the smartwatch 6 is carried by an operator driving a vehicle. The accelerometer can therefore measure the acceleration and deceleration of a vehicle in the control of an operator. The smartwatch 6 is configured to transmit acceleration and deceleration data via the communication unit 5 to the central control unit 2. This data can be used by the central control station 2 to detect unusual accelerations or decelerations which might be indicative of dangerous vehicle operation and/or a crash situation.

The smartwatch 6 preferably further comprises a digital compass (not shown) which is configured to measure the direction of travel of the smartwatch 6 and to transmit direction data via the communication unit 5 to the central control station 2. The central control station 2 uses the direction data to monitor the directional movement of the smartwatch 6 and its respective operator, for instance to monitor an aircraft pushback or towing direction as the aircraft is moved by the operator.

In use, the central control station 2 transmits flight assignments wirelessly to the mobile devices 4. The mobile devices 4 will be referred to hereinafter smartwatches 6 in this embodiment of the invention.

Referring now to figure 3 of the accompanying drawings, ramp services instructions, in the form of a flight assignment 10 are displayed on the screen 8 of the smartwatch 6. The flight assignment 10 is displayed in detail on the screen 8 to enable the operator to see the details of the flight assignment. An acknowledgement icon 11a is also displayed on the screen 8 so that an operator can provide a touch input to the acknowledgement icon 11a to acknowledge that the operator will complete the flight assignment. This acknowledgement input is transmitted by the smartwatch 6 to the central control station 2.

The smartwatch 6 also preferably displays a reject icon 11b on the screen 8. If the operator cannot or will not complete the flight assignment, the operator can provide an instant rejection response by touching the reject icon 11b. The smartwatch 6 transmits the rejection response to the central control station 2 so that the central control station 2 can re-assign the flight assignment to a different operator.

Referring now to figure 4 of the accompanying drawings, the smartwatch 6 is preferably further configured to display a detailed flight assignment schedule 12 on the screen 8 which indicates multiple flight assignments.

The provision of the flight assignment to the smartwatch 6 provides an immediate notification to an operator which avoids the need for a paper flight assignment document. The operator can receive the flight assignment via their smartwatch 6 at any location in the airport, removing the need for the operator to travel to the central control station. This avoids time being wasted by the operator travelling to the central control station.

The flight assignment which is delivered directly to the smartwatch 6 is an up-to-date flight assignment which is delivered in real-time to the operators. This real-time delivery maximises the efficiency of the system and minimising service handling errors.

The system 1 is also configured to transmit updates to flight assignments to the smartwatches 6 in a similar manner as described above regarding the flight assignments. The flight updates provide real-time corrections or alterations to flight assignments which can be acted on immediately by operators. These real-time updates minimise the possibility of ramp handling errors occurring which might otherwise happen when an operator is working from an outdated paper flight assignment.

Referring now to figure 5 of the accompanying drawings, the smartwatch 6 is preferably further configured to enable additional control icons 13-15 to be displayed on the screen 8. An operator can provide further control inputs to the smartwatch 6 via these further control icons 13-15 in order to provide additional feedback to the smartwatch 6 which is transmitted to the central control station 2. This further feedback provides additional flexibility to the system to facilitate communication between the operator and the central control station 2.

Referring now to figure 6 of the accompanying drawings, in a preferred embodiment of the invention the system comprises a plurality of audio output devices which are each carried by a respective operator. In this embodiment, each audio output device is a bone conduction headset, such as the bone conduction headset 16 shown in figure 6.

The bone conduction headset 16 comprises a band 17 which fits around part of an operator's head. Bone conduction transducers 18, 19 rest on either side of the operator's head and are configured to communicate audio to the operator via vibrations transmitted through the skull of the operator. The bone conduction headset 16 does not cover or close the ear canals of an operator and does not prevent the operator from hearing sounds in the surrounding environment. The bone conduction headset 16 can therefore be used to communicate audio to an operator who is wearing earplugs or mufflers for protection from loud noise.

The bone conduction headset 16 can also be used in place of conventional earphones to overcome the problem of conventional earphones blocking environmental sounds. The bone conduction headset 16 is safer to use than conventional earphones which might prevent an operator from being alerted to a dangerous situation, such as an approaching vehicle.

The bone conduction headset 16 is preferably configured to communicate wirelessly with the smartwatch 6 so that ramp services instructions can be communicated from the smartwatch 6 to the bone conduction headset 16. The bone conduction headset 16 delivers the ramp services instructions to the operator in audio form, without the operator needing to look at the screen 8 of the smartwatch 6. In other embodiments, the bone conduction headset 16 is connected to a radio transceiver which communicates directly with the central control station 2 so that the bone conduction headset 16 can receive ramp services instructions directly via radio from the central control station 2.

Referring now to figure 7 of the accompanying drawings, in a further embodiment, a bone conduction headset 20 is integrated into an article of protective headgear, such as a bump cap 21. An operator wearing the protective headgear can benefit from the enhanced safety aspects of the bone conduction headset 20 while still wearing protective headgear, for instance when working beneath the wings of an aircraft.

The bone conduction headset of an embodiment of the invention enables an operator to receive hands free audio instructions from the central control station 2. This avoids the need for the operator to hold a walkie-talkie to their ear and/or press buttons on a walkie-talkie, both of which might lead to an accident, particularly when the operator is driving a vehicle.

The audio device, which in this embodiment is in the form of the bone conduction headset 16, preferably further comprises a microphone. The microphone enables two-way communication between the operator and the central control station 2 as well as with other mobile devices.

Referring now to figure 8 of the accompanying drawings, the central control station 2 comprises a display unit 22 to display information to central controllers 23 who are overseeing the ramp operations.

The display unit 22 is preferably a large display unit which is configured to display a map 24 of the airport along with other information.

Referring now to figure 9 of the accompanying drawings, the display unit 22 preferably displays the map 24 with different coloured or shaded sections to indicate different areas of the airport. The central control station 2 is configured to plot the location of each of the mobile devices 4 around the airport on the map 24 so that the central controllers 23 can view a current location for each mobile device 4 and hence each operator.

The central controllers 23 can easily identify which operators are in an appropriate location to handle a particular ramp service operation, such as those operators that are in close proximity to an incoming aircraft. The central controllers 23 can then identify a subset 25 of the mobile devices 4, as indicated by the dotted line in figure 1. The central control station 2 can elect to transmit a ramp services instruction to only the subset 25 of mobile devices. This avoids bandwidth in the system being used unnecessarily to transmit ramp services instructions to operators that are not in the correct location to perform the required ramp services tasks.

In some embodiments, the central control station 2 is configured to select a subset of mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the mobile devices in an airport.

In embodiments of the invention, the central control station 2 is configured to display additional information on the display unit 22 to enable a central controller 23 to select and match staff to equipment and/or flights in order to perform the necessary ramp services. The additional information preferably comprises one or more of each staff's availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring ramp services or proximity to certain ramp equipment required to carry out the ramp services.

The additional information output via the display unit 22 preferably also comprises one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

When used in this specification and the claims, the term “comprises” and “comprising” and variations thereof mean that specified features, steps or integers and included. The terms are not to be interpreted to exclude the presence of other features, steps or compounds.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilized for realising the invention in diverse forms thereof.

CLAIMS:

1. A ramp services control system for use in an airport, the system comprising:

a central control station which is configured for wireless communication; and

a plurality of wearable mobile devices which are each configured to be worn by a respective operator and configured to communicate wirelessly with the central control station, each wearable mobile device comprising:

a communication unit which is configured to receive a ramp services instruction wirelessly from the central control station;

a screen which is configured to output the ramp services instruction visually to an operator;

an input device which is configured to receive an input from the operator in response to the received ramp services instruction, the communication unit being configured to transmit data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the wearable mobile devices and responses transmitted from the wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport; and

an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station;

wherein the central control station is configured to:

select a subset of the plurality of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport, and

transmit a ramp services instruction to only the selected subset of wearable mobile devices, wherein the central control station is further configured to:

analyse the data indicative of the measured acceleration or deceleration of the wearable mobile device to detect accelerations or decelerations which are indicative of dangerous vehicle operation or a crash situation.

2. The ramp services control system of claim 1, wherein each wearable mobile device is a smartwatch.

3. The ramp services control system of claim 1 or claim 2, wherein the screen of each wearable mobile device is a touchscreen.

4. The ramp services control system of any one of the preceding claims, wherein each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the determined position of the wearable mobile device to the central control station.

5. The ramp services control system of any one of the preceding claims, wherein each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the communication unit is configured to transmit data indicative of the direction of travel of the wearable mobile device to the central control station.

6. The ramp services control system of any one of the preceding claims, wherein the system further comprises:

a plurality of audio output devices, each audio output device being configured to be carried by an operator and configured to provide an audio output corresponding to the ramp services instruction to the operator.

7. The ramp services control system of claim 5, wherein each audio output device is a bone conduction headset.

8. The ramp services control system of claim 6, wherein each bone conduction headset is integrated into protective headgear to be worn by an operator.

9. The ramp services control system of any one of the preceding claims, wherein the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

10. The ramp services control system of any one of the preceding claims, wherein the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

11. The ramp services control system of any one of the preceding claims, wherein the central control station comprises:

a display unit which is configured to display a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

12. The ramp services control system of claim 11 as dependent on claim 1, wherein the display unit of the central control station is configured to display the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

13. The ramp services control system of claim 11 or claim 12, wherein the display unit is configured to display one or more of each staff's position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

14. The ramp services control system of any one of claims 11 to 13, wherein the display unit is configured to display one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.

15. A method for controlling ramp services in an airport, the method comprising:

selecting a subset of a plurality of wearable mobile devices in response to one or more of the position, availability, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services of the staff wearing the wearable mobile devices in an airport;

transmitting a ramp services instruction wirelessly from a central control station to only the selected subset of wearable mobile devices, each of the plurality of wearable mobile devices being worn by a respective operator;

receiving the ramp services instruction via a communication module in each wearable mobile device of the subset of wearable mobile devices;

outputting the ramp services instruction visually via a screen in each wearable mobile device of the subset of wearable mobile devices to an operator carrying the wearable mobile device;

receiving an input from the operator via an input device in the wearable mobile device in response to the received ramp services instruction; and

transmitting data indicative of the input from the operator to the central control station, such that the central control station can monitor ramp services instructions sent to the subset of wearable mobile devices and responses transmitted from the subset of wearable mobile devices in response to the ramp services instructions to control ramp service operations in an airport;

wherein each wearable mobile device comprises an accelerometer which is configured to measure the acceleration or deceleration of the wearable mobile device, and wherein the method comprises:

transmitting data indicative of the measured acceleration or deceleration of the wearable mobile device to the central control station; and

analysing, at the central control station, the data indicative of the measured acceleration or deceleration of the wearable mobile device to detect accelerations or decelerations which are indicative of dangerous vehicle operation or a crash situation.

16. The method of claim 15, wherein each wearable mobile device is a smartwatch.

17. The method of claim 15 or claim 16, wherein the screen of each wearable mobile device is a touchscreen.

18. The method of any one of claims 15 to 17, wherein each of the wearable mobile devices comprises a ground navigational system using satellites which is configured to determine the position of the wearable mobile device, and wherein the method comprises transmitting data indicative of the determined position of the wearable mobile device to the central control station.

19. The method of any one of claims 15 to 18, wherein each wearable mobile device comprises a digital compass which is configured to measure the direction of travel of the wearable mobile device, and wherein the method comprises transmitting data indicative of the direction of travel of the wearable mobile device to the central control station.

20. The method of any one of claims 15 to 19, wherein the method further comprises:

providing an audio output corresponding to the ramp services instruction to an operator via an audio device carried by the operator.

21. The method of claim 20, wherein the audio output device is a bone conduction headset.

22. The method of claim 21, wherein the bone conduction headset is integrated into protective headgear to be worn by the operator.

23. The method of any one of claims 15 to 22, wherein the ramp services instruction is at least one of a flight assignment for an operator and a flight update for an operator.

24. The method of any one of claims 15 to 23, wherein the ramp services instruction comprises at least one of an instruction for an operator to carry out a ramp services task, another instruction or a warning.

25. The method of any one of claims 15 to 24, wherein the method further comprises:

displaying on a display unit at the central control station a map of an airport and the relative positions of each of the wearable mobile devices in the airport.

26. The method of claim 25 as dependent on claim 15, wherein the method comprises displaying the subset of wearable mobile devices differently from the other wearable mobile devices on the map of the airport.

27. The method of claim 25 or claim 26, wherein the method comprises displaying on the display unit one or more of each staff's position, ability to operate certain equipment or carry out certain ramp services, proximity to certain aircraft requiring certain ramp services or proximity to certain ramp equipment required to carry out the ramp services.

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28. The method of any one of claims 25 to 27, wherein the method comprises displaying on the display unit one or more of an indication of the ramp services required for a particular flight and/or the position, status and details of relevant ramp equipment required in order to carry out the ramp services.