

CLAIMS

1. An alternative piloting system (1) arranged to be integrated in a pre-existing aircraft that includes original systems comprising a flight control system (2) and an autopilot system (6), the alternative piloting system comprising:
- a piloting device (26) independent of the original systems, comprising a positioning unit (27) arranged to produce positioning data relating to the aircraft, and a control unit (28) arranged to produce an alternative piloting setpoint for the aircraft;
 - an acquisition and analysis device (30), comprising acquisition means (32) arranged to acquire data produced by the original systems and also the positioning data and the alternative piloting setpoint as produced by the piloting device (26), and decision means (33) arranged to decide whether the alternative piloting setpoint should or should not be used for piloting the aircraft; and
 - an interface device (34) arranged to control the flight control system (2) of the aircraft on the basis of the alternative piloting setpoint when the decision means (33) of the acquisition and analysis device (30) decide that said alternative piloting setpoint should be used for piloting the aircraft.
2. An alternative piloting system according to claim 1, the piloting device (26) being arranged to produce the alternative piloting setpoint in such a manner that the aircraft follows a path serving to avoid the aircraft penetrating into a predefined prohibited area.
3. An alternative piloting system according to either preceding claim, further comprising a main bus (25), the piloting device (26), the acquisition and analysis device (30), and the interface device (34) being arranged to be

connected to the main bus (25) and to communicate with one another via the main bus (25).

4. An alternative piloting system according to claim 3,
5 wherein the piloting device (26) is connected solely to the main bus (25).

5. An alternative piloting system according to any
preceding claim, the alternative piloting system being
10 arranged to pilot the aircraft when the aircraft is in an emergency situation forming part of a predefined list of emergency situations, the predefined list comprising a failure of the autopilot system, unavailability of the pilot of the aircraft, and a situation in which the
15 aircraft is going towards a prohibited area.

6. An alternative piloting system according to claim 5,
wherein the acquisition means (32) of the acquisition and analysis device (30) are arranged to acquire the
20 alternative piloting setpoint, a manual piloting setpoint produced by the pilot, and an automatic piloting setpoint produced by the autopilot system (6), and wherein the decision means (33) of the acquisition and analysis device (30) are arranged to analyze these piloting
25 setpoints and, on the basis of this analysis, to decide whether the alternative piloting setpoint should or should not be used for piloting the aircraft.

7. An alternative piloting system according to claim 6,
30 wherein if a manual piloting setpoint is tending to cause the aircraft to go towards a prohibited area, the decision means (33) of the acquisition and analysis device (30) are arranged to decide that the alternative piloting setpoint should be used for piloting the
35 aircraft so that the aircraft performs a maneuver enabling it to avoid penetrating into the prohibited area.

8. An alternative piloting system according to claim 7,
wherein after performing the maneuver, the acquisition
and analysis device is arranged to decide that the
5 alternative piloting setpoint should no longer be used
for piloting the aircraft, with the automatic piloting
setpoint being used instead of the alternative piloting
setpoint.
- 10 9. An alternative piloting system according to claim 6,
wherein if a pilot of the aircraft becomes unavailable
during a takeoff stage that is normally managed via a
manual piloting setpoint, the acquisition and analysis
device (30) is arranged to decide that the alternative
15 piloting setpoint should be used for piloting the
aircraft during said takeoff stage.
10. An alternative piloting system according to any
preceding claim, further comprising a communication
20 device (37) arranged to set up communication with the
ground, so as to enable the alternative piloting system
(1) to be remotely controlled from the ground.
11. An alternative piloting system according to any
25 preceding claim, further comprising a taxiing control
device (45) arranged to produce an alternative taxiing
setpoint for the aircraft.
12. An alternative piloting system according to any
30 preceding claim, wherein the positioning unit (27) of the
piloting device (26) comprises an inertial measurement
unit, a satellite positioning device including at least
one antenna, and an air data computer, and wherein the
control unit (28) comprises two dissimilar calculation
35 channels (28a, 28b).

13. An alternative piloting system according to any preceding claim, wherein the interface device (34) includes switch means controlled by the decision means (33) of the acquisition and analysis device (30) and
- 5 arranged to connect an output of the piloting device (26) to the flight control system (2) when the alternative piloting setpoint should be used for piloting the aircraft.
- 10 14. An aircraft including an alternative piloting system (1) according to any preceding claim.