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Flight trials have demonstrated technology that gives aircraft fast connectivity to multiple data sources. While passengers get fast internet, pilots and flight computers can access real-time air traffic information and communicate more easily with the ground and other planes. And it is the first research project in Europe to demonstrate a new wireless protocol developed specifically for the air industry.

The skies above Europe are busier than ever. We are a generation of jetsetters, and demand for air travel continues to rise. By 2025 the number of flights worldwide is expected to double what it is today.

With so many planes in the air and taxiing around airports, are we still safe?

Pilots are certainly under greater pressure as they navigate planes through congested airspace. To make rapid decisions they need real-time access to satellite and air traffic data.

The EU-funded SANDRA project has successfully integrated all of a plane’s communication systems into a single system. This makes data connectivity much faster and replaces banks of heavy radio hardware with state-of-the-art software-based systems.

“With the new systems successfully tested in SANDRA, flight computers will receive detailed air traffic and weather information in real-time,” says project co-ordinator Paolo Di Michele, from the aerospace electronics and IT company Selex ES. “At the moment, pilots typically rely on air traffic control to relay this kind of data verbally. But thanks to the work performed by the SANDRA project both pilots and automated systems could be able to make faster, more informed decisions – and easily communicate their intentions or actions to air traffic controllers and nearby planes through the same system. We have tried to help make air travel safer despite increases in congestion.”

The novel system seamlessly integrates an aircraft’s many different communication channels – from VHF radio for spoken conversation to numerous data links – using the latest internet protocol.
On-board internet

SANDRA is the first project in Europe to demonstrate a new wireless protocol, called AeroMACS, developed specifically for the air industry. It is based on an international standard for long-range wireless connections and provides wireless data connectivity between planes and air traffic control when they are on the ground at an airport.

But SANDRA also supports in-flight digital communications, bringing extra benefits beyond flight safety: now passengers can all access broadband internet too. People can browse the web, check emails and even make conference calls while cruising the skies.

The project’s researchers also found a way to replace the heavy, inefficient radio sets that all planes currently carry to communicate across many different bands of the radio spectrum. SANDRA has developed and in-flight tested a new on-board system – known as a software-defined radio – that can connect to multiple bands at once and simplify the radio hardware on-board.

Flying to success

In 2013, SANDRA’s new communications architecture was put to the test in an unprecedented series of Airbus A320 in-flight trials in Oberpfaffenhofen, near Munich. The tests were a resounding success and proved that the project’s technology works properly.

Several applications were used during the test flights, from web-based flight planning to telemedicine and Skype.

SANDRA is the first step in creating flight systems that can exchange vast amounts of data. “Over the next 10 years we will move from voice communications between air traffic controllers and pilots to an air traffic control management system based on data communication among computers, where human intervention will be needed only for emergency events,” Di Michele remarks. “With such a clear and practical demonstration, aircraft manufacturers are keen to implement the technologies successfully tested in SANDRA. We hope to see it rolled out to all new aircraft soon.”

See also:
CORDIS [3]

Project:
Seamless aeronautical networking through integration of data links, radios, and antennas

Project Acronym: SANDRA


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Links
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