



Airbus and Rockwell Collins: Innovating together for the A350 XWB

In response to demand for a series of highly efficient, medium-capacity, long-range, wide-body aircraft, Airbus is launching its A350 XWB (“Extra-Wide Body”) family.

With the widest fuselage in its category, the A350 XWB offers unprecedented levels of comfort as well as the lowest operating and seat-mile costs of any aircraft in the 270- to 350-seat market segment. Key design elements address the challenges of volatile fuel prices, rising passenger expectations and environmental concerns.

Rockwell Collins has been an Airbus avionics supplier since the 1970s. Our equipment is on board all in-production Airbus aircraft, and our consistently high level of service has earned us a number of Airbus customer performance awards.

For the A350 XWB, we’re providing significantly more content than on any other Airbus aircraft. This includes navigation and data-network capabilities, landing guidance systems, flight control equipment, information management and communications.

Airbus is also relying on us to lead new complex integration activities, introducing a new level of trust.

“We appreciate the constant drive of Rockwell Collins to deliver high-quality packages and the solutions that best fit our needs in a positive collaborative environment”.

– Regis Delpierre,
A350 XWB Systems & Testing Vice-President, Airbus



**Rockwell
Collins**

Building trust every day

Rockwell Collins systems aboard the A350 XWB

Communication global work package

This package ensures the management of voice and data communications of the aircraft, between pilots, flight crew, controllers and the airline company.

It represents the consolidation of five separate packages into one, and encompasses full system integration responsibilities. The package includes:

- ▶ Next-generation VHF and HF systems with improved size, weight and power
- ▶ ARINC 781 satellite communications system with low-profile antenna featuring Safety Services and dual SwiftBroadband channel capabilities
- ▶ Avionics communications router for datalink with aeronautical telecommunication network and future air navigation system (both A and B) capabilities
- ▶ Radio and audio management system
- ▶ Airline operational control software and Gatelink, based on cellular and Wi-Fi® technology, which links airplanes to ground crews at the airport

Avionics data network

This secure AFDX network represents the backbone of flight avionics data communications. It connects all the aircraft systems and applications. Rockwell Collins is the exclusive supplier of this critical data network on the Airbus A350 XWB, A380 and A400M.

Information management on-board solution

This solution is an airborne hosting platform for flight operations, aircraft maintenance and airline cabin applications. Monitoring all the systems of the aircraft, it assists maintenance crews by providing detailed information and trends on the health of each component.

In addition, it hosts data to the electronic flight bag, helping pilots get easy and instant access to flight plans, aircraft manuals, maps, etc.

Rockwell Collins provides hardware, software and system integration. An intelligent IP router is able to select the most optimized connection and quality of service (Wi-Fi, Global Systems Mobile or SATCOM).

Rockwell Collins is cooperating with Airbus Avionics and Simulation Products to develop the infrastructure portion of the system.

Landing systems

Airbus selected the Rockwell Collins Multi-Mode Receiver and Digital Low Range Altimeter, confirming Rockwell Collins' leadership in flight landing avionics. The Multi-Mode Receiver provides Instrument Landing System and GPS Landing System capabilities and Space Based Augmentation System, as well as the aircraft's position, velocity and time reference. It implements the latest satellite navigation features and is prepared for future airspace requirements such as Galileo.

The Digital Radio Altimeter provides precise height measurements above terrain during aircraft approach, landing and climb-out phases of flight. This information is provided to the automatic flight control system, instrument system and terrain awareness and warning system. The Rockwell Collins Digital Low Range Altimeter is the first digital radio altimeter for commercial aircraft. It represents a step forward compared with traditional analog radio altimeters installed on previous aircraft.

Other navigation components

Rockwell Collins was selected to provide navigation system components consisting of the ADF-900 Automatic Direction Finder, DME-2100 Distance Measuring Equipment and the VOR-900 VHF Omnidirectional Radio receiver for the A350 XWB.

Flight control – actuation

Rockwell Collins is providing the Trimmable Horizontal Stabilizer Actuator. It provides a physical link between the aircraft structure and the Trimmable Horizontal Stabilizer and achieves the longitudinal pitch trim control of the aircraft.

Rudder/brake pedal assembly

As a longer term improvement of the A350 XWB aircraft, Airbus selected Rockwell Collins for the rudder/brake pedal assembly, which is part of the pilot control system.

The Rockwell Collins teams working on the A350 XWB program are based in Toulouse, France; Cedar Rapids, Iowa; Melbourne, Florida; Tustin, California; and Hyderabad, India.

Rockwell Collins plays a vital role in the A350 XWB program

Regis Delpierre, A350 XWB Systems & Testing Vice-President, Airbus

Q: What are the key challenges you faced for the conception and production of the A350 XWB?

A: The new fuselage and wing structure, primarily made of carbon fibre-reinforced polymer, combined with a very fast ramp-up will be some of the key challenges for the A350 XWB.

This means that we tested the robustness and maturity of the equipment for this new environment.

Q: Why did you involve your key suppliers much earlier in the definition process than on previous aircraft, with deeper responsibility for design and integration?

A: We decided to give system-level responsibilities to some of our key partners for the first time, proposing larger work packages as part of our New System Policy. Airbus relied more on our suppliers' expertise, from development phase through the aircraft's entire life cycle.

Selecting main suppliers earlier than ever was effectively part of our strategy. We wanted them to influence our design by incorporating latest research results. It was a good way to foster innovation and optimization.

Enhancing the package maturity process was also one of our main objectives. We gave selected suppliers wider work packages to take advantage of efficiencies in their pre-integration activities.

We wanted to give more responsibilities to key partners in a real partnership, with a common goal: Develop the best aircraft together. Here are a few examples:

Rockwell Collins supported pre-integration with other suppliers. This activity was performed before delivery to Airbus, which significantly reduced the risk of integration at Airbus and resulted in more mature deliveries.

In equipment design, Rockwell Collins proposed replacing aluminum covers on the switches of the Avionics Full Duplex Switched Ethernet (AFDX) network with conductive plastic covers, making the equipment lighter.

Finally, Rockwell Collins was a co-leader with Airbus of a Systems Suppliers Council project called Joint Testing. The objective is to improve efficiency, reaction time and effectiveness of testing by developing process and rules of enhancement.

Q: Why did you select Rockwell Collins for major packages on this aircraft?

A: Rockwell Collins was selected for several work packages – including the communication package and the on-board information management solution – following rigorous fair and open calls for tender, addressing technical, commercial, customer service and industrial aspects. Systems integration capability and expertise level were clearly part of the engineering and industrial criteria.

The expertise that Rockwell Collins provides in communication, navigation and information technologies was judged as a key asset.

Q: How did Rockwell Collins manage this change?

A: During the development phase, Rockwell Collins proved to be a strong contributor to the Airbus New System Policy.

The global work package communication test bench in Rockwell Collins facilities is an example of such a key achievement. It demonstrates the important systems-level role Rockwell Collins is playing for the first time on the A350 XWB. With some delays and difficulties in tier-two management, this can be a very challenging exercise.

Rockwell Collins globally showed good reactivity when Airbus proposed sharing common tools through Extended Enterprise, and when we decided to formalize external support for Airbus test phase. Rockwell Collins quickly understood the common interest of these initiatives.

Q: How would you qualify Rockwell Collins' involvement in your Extended Enterprise project to harmonize the methods and tools between Airbus and its major suppliers?

A: Extended Enterprise was set up to allow Airbus and its supplier teams to share the same Methods and Tools. Rockwell Collins was selected to be part of one of the two pilot cases for the systems perimeter.

Rockwell Collins was the first to sign the Extended Enterprise Contractual Amendment.

Q: What are your criteria for measuring the performance of your suppliers, and how would you rate Rockwell Collins?

A: Airbus has a formal rating process for evaluating suppliers, in the fields of supply-chain performance, technical, commercial and customer support behaviour, of which Rockwell Collins is part. This rating is established on a yearly basis. Rockwell Collins has consistently been well rated in recent years.

For the A350 XWB, and more in the field of development, supplier performances are assessed mainly through respect of commitments in terms of deliveries, content and schedule, and also on reactivity and behaviour in the Joint Change Process.

As in any complex development, Rockwell Collins faced some challenges. We recognize Rockwell Collins' willingness to work together to find the best solutions to solve issues when they arise. Its teams closely collaborate with a large number of functions, such as program management, design, test and analysis, procurement, supply chain and customer support.

Q: What do you appreciate about working with Rockwell Collins teams?

A: Rockwell Collins has a wide spectrum of competencies and products, along with a strong will to position itself as an integrator.

We appreciate the constant drive of Rockwell Collins to deliver high-quality packages and the solutions that best fit our needs in a positive collaborative environment.

Building trust every day.

Rockwell Collins delivers smart communication and aviation electronic solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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