

Undiminished Activity

Casual observers relying on general media reports from the air show probably could not help being confused. First there were the predictions that activity would be reduced as the world's aerospace community cinched up its belt to survive the downturn, then the predictors' initial reports confirmed that they were right, and then the final outcome, with several major new programs launched and equipment orders announced totaling nearly US\$89 billion, more than double the previous show's record. Airbus alone booked more than \$40 billion in orders.

The disconnect between predictions and reality had a lot to do with the nationality of the predictors, largely North American and European, who believed their regions' economic downturns would be reflected in the show's activity. And, in truth, there was very little ordering from those regions. But the strong economic growth shown in rapidly developing regions continues unabated, and so did orders from Asia and the Middle East, meaning that the areas with strong aviation growth and a

major backlog of ordered airplanes will have an even greater need for trained personnel.

Somewhat surprising even to show veterans was the launch during supposedly down times of several programs — Bombardier giving the go-ahead to its 100–149 passenger CSeries with a geared turbofan engine for it from Pratt & Whitney, the PurePower PW1000G, and CFM International, a joint venture of GE and SNECMA, launching its Leap-X turbofan that seems to put the Boeing 737/Airbus A320 replacement cycle in motion. Further, the CFM partnership was extended to the year 2040.

In short, many of the companies exhibiting at Farnborough behaved as if their current business is quite healthy and that forecasts of continued growth for decades to come are being either affirmed or increased.

Boeing's revised Current Market Outlook (CMO) showed a significant shift in buying patterns, "with replacement airplanes taking a greater share of demand (43 percent) than we previously forecast (36 percent), and a smaller fleet size at the end of the 20-year

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Economic slowdowns in the developed world are largely unnoticed as the developing world sustains the momentum.



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period (35,800 airplanes) than we predicted in the previous outlook (36,400 airplanes).” The increased number of retired aircraft will provide a ready pool for conversion to freighters, the Boeing analysis said, but even so the number of freighters needed by 2027 will total 3,358, of which 2,495 will be conversions from passenger aircraft despite the fact that Boeing’s predicted annual average freight traffic growth is now set at 5.9 percent, down from last year’s 6.1 percent.

The passenger aircraft fleet at the end of that period will be made up of aircraft that, on average, are larger than those in the existing fleet as fuel costs force airlines to not only modernize faster than previously thought, but also to go up in size, resulting in an annual fleet growth of only 3.2 percent to handle passenger numbers expected to rise at an annual rate of 5 percent, the CMO said.

Buying into the notion that the future is bright, Bombardier surprised many announcing the CSeries launch without a firm order for the aircraft, although Lufthansa has signed a letter of interest for 30 aircraft plus 30 options.

Gary Scott, president of Bombardier Commercial Aircraft, said, “These game-changing aircraft emit up to 20 percent less CO₂, up to 50 percent less NO_x, fly four times quieter and deliver dramatic energy savings, up to 20 percent fuel burn advantage as well as up to 15 percent better cash operating costs versus current in-production aircraft.” The first CSeries will enter service in 2013, he said.

Scott Carson, president and chief executive officer of Boeing Commercial Airplanes, did not see the CSeries as a threat, although he chose to refer to it as a “100–125-seat” aircraft. “Bombardier took a bold step ... but fuel prices will result in an up-gauging of our smaller aircraft.”

Carson said that the launch by CFM of its Leap-X turbofan for delivery in the 2016–2017 period “is consistent with what we were talking about” for a 737 replacement or step upgrade, “about 2017–2018.”

However, neither Boeing nor Airbus, with the A320 and 737 families’ production “largely sold out through 2014,” as Carson said, are eager to advance the planned replacement.



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The management of Air France-KLM, however, have voiced frustration reported at the show at delays in launching replacement programs, saying the airline needs a replacement by 2015, a new engine and airframe that will cut fuel burn 20 percent.

CFM said that advanced material development has enabled a better next-generation engine than would have been possible last year. The Leap-X is a conventional configuration turbofan that promises up to 16 percent reduction in fuel burn, a 16 percent reduction in CO₂ and a reduction of 10–15 effective perceived noise decibels over the International Civil Aviation Organization’s Chapter 4 noise rules.

However, CFM will proceed on a parallel development track working on technologies needed to produce an open-rotor engine in the same

It wouldn’t be Farnborough without the Royal Air Force Red Arrows display team, which arrived unannounced early on the first day.

20–30,000 lb-thrust class (89–134 kN) the Leap-X program has targeted, but promising up to a 26 percent fuel burn reduction if noise and installation challenges can be hammered out.

Rolls-Royce also is working on both a ducted fan and open rotor, and likewise has concerns about open rotor noise issues.

Among the safety-related news at the show was Raytheon's announcement that it will lead a study of the impact of new classes of aircraft on the U.S. Federal Aviation Administration's next generation air traffic control (ATC) system, called NextGen. Four classes of new aircraft — very light jets, super-heavy transports, unmanned aircraft systems (UAS) and supersonic transports — are the subjects of the study, designed to augment the U.S. National Aeronautics and Space Administration's Advanced Concept Evaluation System. First focus of the study will be the development of recommendations for new operational procedures and the establishment of system-level metrics.

Meanwhile, Raytheon is working on UAS control technology, showing a pilot and sensor-operator ground control station that presents a 270-degree view around the aircraft. While much of the initial development work is directed towards military usage, the fact that there have been several UAS midair collisions over Iraq has elevated the importance of developing collision avoidance technology in that arena, as well, Raytheon officials said, easing the task of integrating UAS into civil air space. The current ATC system would find it very difficult to accommodate

a number of UAS operations, so Raytheon is working right now to perfect the ground-based control of the aircraft. When NextGen is introduced, the UAS can be more neatly tied into it, officials said.

Rockwell Collins at the show discussed the certification for helicopter use of a traffic-alert and collision avoidance system (TCAS II) in cooperation with Bristow and Shell Aircraft. Collins said the European Aviation Safety Agency certification was the first TCAS II to be approved for helicopter use. The application used without modification the existing TCAS-4000 unit.

Honeywell said that its Runway Awareness and Alerting System (RAAS) has been added to Airbus' e-catalog of options available on all aircraft. RAAS is a software enhancement of Honeywell's Enhanced Ground Proximity Warning System that provides aural identification of runways and warnings if a takeoff is attempted from a taxiway.

Goodrich said its Vigor Health Usage and Management System was selected by Sikorsky for its S-76D executive transport helicopter. The system will monitor the entire aircraft mechanical drive train to detect exceedances to allow preventative maintenance that will head off failures or expensive repairs.

It also was reported at Farnborough that CAE, after a period of study, is nearing the start in Canada of its first multi-crew pilot license training class. Calling the class a "beta program," CAE officials will keep close track on the class' progress.

Also on training, FlightSafety International has launched a new one-day course to support Gulfstream aircraft using Honeywell's PlaneView advanced cockpit technology. The course includes three hours of ground school and four simulator sessions.

Vision System International said it collaborated with Elbit Systems to produce a new series of light helmet-mounted displays labeled HMD-Lite. While many of its uses are military, the company said it also is suited for helicopter and transport usage. The helmet visor projects imagery and symbology, and can be tied into existing avionics with minimal hardware modifications and low cost, the company said. ➤

Bombardier's newly launched CSeries will nudge into the bottom tier of the Boeing 737 and Airbus A320 lineups.

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