No speed-up in civil supersonics

by Mark Phelps & James Wynbrandt

There has been no great acceleration toward the finish line in the journey to reinstitute supersonic civil air travel. The process of revisiting the halcyon days of Concorde—which last flew in 2003—has been slow and, at times, controversial. The hurdles are not only technical but perhaps, more significantly, economic, political, and social.

A 13-page working paper released yesterday by the International Council on Clean Transportation (ICCT) casts a shadow on optimism for successfully reintroducing supersonic flight, though it leaves smaller supersonic business jets—such as Aerion’s AS2—out of its line of fire.

This week at the Farnborough Airshow, Boom Aerospace told AIN it now expects to fly its GE J85-powered “Baby Boom” demonstrator sometime next year, a precursor to its planned 55-seat, Mach 2.2 Boom airliner. As of January, the plan had been to get the demo ship airborne this year. It is now under assembly near Denver, Colorado, with flight tests slated for California, in 2019.

Boom founder and CEO Blake Scholl said here at the show that engines and hydraulic systems have been powered up, and the development team has tested the wing spar, composite joints, and completed low-temperature trials. A second, separate engineering team is working on the final product.

Scholl reports the company is funded through first flight and has already raised $85 million, including $10 million from launch customer Japan Airlines. In December, JAL placed an order for 20 at a price of $200 million each.

Scholl answered the question of where the Boom would be produced—in the U.S. He also projects fares for supersonic flights continues on page 8
Rickard Gustafson
CEO > Scandinavian Airlines
leaders & builders
Rickard Gustafson & Bombardier CRJ Series

If asked about his heroes, Rickard Gustafson would likely cite the SAS crews that pioneered commercial aviation’s first polar routes in the ’50s. These men and women were armed and trained for the “unlikely event” of a polar bear encounter. Possessing that same adventurous spirit that’s so much a part of every Scandinavian’s DNA, he’s pushing SAS to new heights in both service and efficiency as an innovative explorer of exciting possibilities and new frontiers.

leadersandbuilders.com
VietJet’s $12.7B deal for Boeing Maxs gilds FIA 2018

by Charles Alcock

VietJet and Boeing on Wednesday signed a $12.7 billion contract for 100 Max aircraft at the Farnborough Airshow. The deal calls for 80 Max 10s and 20 Max 8s to go to Vietnam’s first private airline, which previously ordered another 100 Max 8s in 2016.

Boeing later said it had received further orders, from four unnamed customers, for 40 high capacity Max 8s and 53 Max 8s—deals worth $1B in total.

Also on the third day of the airshow, Airbus signed a memorandum of understanding (MoU) with an undisclosed customer for six of the new A320neo widebodies. Mexican ultra-low-cost carrier Viva Aerobus firmed up an order for 16 A321neos. This brings the all-Airbus operator’s total order book to 15 A320neos, 24 A320ceos, and 41 A321neos.

On the regional aircraft front, Japan’s Hokkaido Air System signed an MoU for a pair of ATR 42-600 turboprop twins, as well as an option for a third, that will replace its Saab 340s. EasyFly of Colombia came in late signing an MoU with ATR for three ATR 72-600s and two ATR 42-600s.

Uganda National Airlines signed a $90 million firm order for four new Bombardier CRJ900 regional jets with the new Atmosphere cabin, as well as two A330-800s.

Air Lease Corp. signed two orders with CFM International with a collective value of $5.3 billion. The first calls for Leap 1A engines to power 34 Airbus A320neo aircraft, and the second for Leap 1B engines for 83 Boeing 737 Max twinjets.

Pratt & Whitney announced that Tianjin Airlines and West Air signed long-term EngineWise Comprehensive service agreements to support geared Turbofan engines on their new A320neos; and Rolls-Royce announced CDB Aviation as a customer for its new LessorCare program.

L3 Longsword brandishes new sensors at this year’s Farnborough Airshow

The L3 Longsword is evolving from a rugged light attack aircraft into a multi-sensor, multimission platform, as can be seen in the static park this week at Farnborough 2018. L3 Aerosystems (Chalet A15) flew this aircraft, which is based on the Air Tractor AT-802U cropduster, from Texas to Farnborough in six hops, and then hung some new equipment beneath it.

For instance, a new plug-and-play ISR pod from British company Horizon Technologies can monitor satellite telephone calls, as well as ship movements via the automatic identification system (AIS). Named the XPOD, it also houses an L3 Wescam MX-15D EO/IR imaging turret. The MX-15D was previously installed beneath the nose of the Longsword, but now a Thales i-Master surveillance radar can be found there, also in a 15-inch turret. Meanwhile, the left outer wing station houses a “Cobra” SIGHT and electronic warfare pod from BAE Systems.

The Longsword offers a total payload of more than 3,629 kg (8,000 pounds) from eight wing and three fuselage stations. So other the stations can carry a range of laser-guided bombs, missiles and gun pods. New this week at Farnborough is an Alkan dual 7-cm (2.75-inch) rocket launcher on the right outer-wing station. L3 still awaits a first customer, but at £7.6 to £9.1 million ($10 to $12 million) apiece, the Longsword is a survivable and effective replacement for attack aircraft that cost much more to acquire and operate.

ATR ‘Rocking’ a Turboprop Renaissance

by Bernie Baldwin

“ATR is rocking,” declared the company’s CEO, Christian Scherer, as he settled into a briefing at the Farnborough Airshow. Calming slightly from his introductory words, he reported the organization as having a “stabilized industrial system with improving operational performance indicators.”

“Commercially, we are doing well with a book-to-build ratio comfortably greater than one, and it’s a trend we see continuing,” Scherer added, noting that he observes the operation not only as CEO but also, at present, as head of sales.

Behind that trend, the CEO views a growing recognition by the traveling customers of the better environmental performance of turboprops. “Because of this, I will bet that there will be more turboprops in the future than the current predictions,” he proclaimed. ATR intends to make a strong effort to “ride the wave of awareness that flying can be eco-responsible.”

The ATR 42-600 is the focus for the OEM at Farnborough 2018, where it is displaying an aircraft in the livery of Silver Airways, which is set to become the first new aircraft operator of ATRs in the U.S. for many years. Silver’s choice has also underlined the message that 30- to 40-seat aircraft can be replaced by the smaller member of the ATR family.

Scherer explained that Silver, currently operating Saab 340s, will show “that you can take a 34-seater with low capital costs and replace it with a 46-seater that will operate at the same costs. That’s the renaissance opportunity of the ATR 42-600.”

As for Bombardier refocusing on regional aircraft following the C Series’ transfer to Airbus, Scherer welcomes the increased competition. “I hope it will be good for all of us to have them singing the praises of turboprops again,” he remarked.

However, he does not see that competition prefaceing a new model. “We’re not on the eve of a new program, simply because [the ATR -600 Series] is as contemporary as it is. It consumes 40 percent less fuel than any other turboprop,” he claimed.

Scherer followed the briefing by signing an MoU with Hokkaido Air System for two ATR 42-600s, with an option for another. Deliveries will begin in November 2019.
Aero Vodochody resurges

by Samantha Cartaino and David Donald

Czech airframer Aero Vodochody has seen something of a turnaround in fortunes in recent years, with the upgraded L-39NG with Williams FJ44-4M turbofan and revised cockpit avionics revitalizing its offering in the military trainer market, as well as the restart of L-159 production. L-159s have also become combat-proven during operations with the Iraqi air force.

This year the company teamed with IAI to produce a fighter/attack version of the L-39NG at answering the U.S. Air Force’s OA-X requirement. It was unveiled this week at Farnborough 2018 as the F/A-259 Striker. Powered by a Honeywell F124 turbofan, the Striker has an avionics suite provided by IAI that offers advanced combat capabilities. IAI can also provide an Elta multi-mode radar if required.

Meanwhile, Aero Vodochody (Hall 1, Stand 1170) announced that its L-39NG trainer has logged orders from SkyTech and RSW Aviation. SkyTech signed an agreement for 10 L-39NGs, including an option for an additional six aircraft. The aircraft will be available to SkyTech customers for flight training by the hour, as well as through short-, mid-, and long-term leasing options.

RSW Aviation, which is a U.S. military training provider, signed a letter of intent (LOI) for 12 L-39NGs and an additional upgrade of six legacy L-39 into the similar L-39CW variant. Aero Vodochody also agreed to leverage the skills of RSW Aviation and its affiliate companies for military systems integration into the L-39NG/CW fleet. Additionally, RSW can perform operational support for L-39NG overseas customers.

Executive v-p of the L-39NG program, Marco Venanzetti, explained that a new training program, which focuses on the “digital native generation” of millennials and generation Z, is based on using new methods and tools such as lessons through mobile applications and gamification to be more effective. Additionally, participants will be trained through two stages, focusing on how to fly and how to fight. The flying stage features 142 training events, while the fighting stage is broken into two sections that teach trainees how to fight individually in their own aircraft (70 training events) and as a team (68 training events).

Leonardo launches new ASW capabilities

Through two separate partnerships—one with L3 Technologies and one with Ultra Electronics—Leonardo has developed a suite of anti-submarine warfare (ASW) capabilities that can take advantage of the company’s compact and lightweight Ulisses (ultra-light sonics enhanced system) processor that has been unveiled this week at the Farnborough Airshow.

Ulisses weighs just 6.5 kg (14.3 pounds) yet offers increased functionality over the OTS-90 system that Leonardo (Outdoor Exhibit L1) previously developed for the NH90 ASW helicopter. Crucially, Ulisses can process data from both sonobuoys and dipping sonar, combining the signals from many sources to create an enhanced underwater “picture.”

The system can handle data from up to 64 sonobuoys, or 52 buoys and a dipping sonar. In terms of dipping sonar, Leonardo is offering L3’s low-frequency HELRAS and mid-frequency Firefly as part of an integrated ASW suite, while Ulisses is compatible with Ultra’s new range of mini-sonobuoys that are being developed with UK MoD funding for multistatic operations. The SSO 92X is a passive buoy weighing in at 3.5 kg (77 pounds), while the SSO 95X active buoy weighs 7.8 kg (17.2 pounds).

Ultra has developed a self-contained pod that can be carried by helicopters—both manned and unmanned—to provide an ASW capability to multirole platforms. The modular pod can be expanded to carry 12 to 48 mini-sonobuoys, and features the Ulisses processor.

Trials of the ASW system are scheduled to begin later this year, with an aim of having the Ulisses processor fully developed by 2019. The buoys and pod are expected to be ready in 2020. Leonardo has received significant interest in Ulisses already and is involved in a number of campaigns to answer fixed-wing ASW requirements.

FlightSafety to propel Delta Air Lines pilots

Delta Air Lines has chosen FlightSafety International to provide flight training to the company’s employees through the Delta Propel Pilot Career Path. According to Delta executive v-p David Davenport, “This new approach to hiring the next generation of pilots, while advancing employees from within, is an excellent opportunity for Delta employees to benefit from the highest-quality and most comprehensive programs available. We look forward to welcoming Delta employees to the FlightSafety Academy in Vero Beach, Florida, starting in December.”

The employees chosen by Delta to participate in the Propel program will earn FAA multi-engine commercial instrument ratings and become qualified as certified flight instructors at FlightSafety Academy. They’ll then get the chance to work at the academy as an instructor while accumulating the 1,500 flying hours needed to meet FAA requirements for an Airline Transport Pilot (ATP) certificate. Upon completion, they will then fly for a Delta Connection regional carrier and transfer to Delta Air Lines in 42 months or less.

FlightSafety Academy offers a variety of programs tailored to the specific needs of domestic and international airlines; corporate flight departments; government and military agencies; other flight training organizations; and individuals with no prior flight experience. The academy’s fleet of more than 100 aircraft includes Piper Warriors, Arrows, and Seminoles equipped with Garmin G500/650 series avionics, ADS-B In/Out, and iPad compatibility.

Its 30-acre campus, which can accommodate more than 500 students, features multi-media classrooms, flight training devices, and an air traffic control communications lab. Meanwhile the company also has a simulator training facility specializing in business aircraft and helicopters at TAG Farnborough Airport, opposite the Farnborough Airshow site.

Mitsubishi’s MRJ makes showstopping debut

It has been quite a show for Mitsubishi Aircraft’s MRJ—literally. The company’s new MRJ90 turned heads during its airshow debut on Monday, powered by a pair of high-thrust, low-noise Pratt & Whitney Geared Turbopfan engines. After several rocky years and numerous delays, the development program is making steady progress toward service entry in 2020 with launch customer All Nippon Airways. The program is about halfway through flight testing and will start increasing certification work later this year.

G.P.
We're on a mission. Actually, thousands of them. Around the world, high above it and under the sea, UTC Aerospace Systems military and defense products have helped enable the safe, efficient completion of countless missions.

Today, as the modern battlefield changes, we're changing with it. We deliver critical technologies including the ACES 5® ejection seat to protect pilots of all sizes, laser warning systems to give warfighters more time to react and survive, our airborne imaging sensors and SCi-Toolset for better real-time intelligence, plus propellers, landing gear and more for the most advanced fighter planes in the sky. It's all part of how we're powering the missions of tomorrow and keeping forces safe as they protect entire nations – and that's an idea worth fighting for.

IDEAS BORN TO FLY™

Visit us in Chalet OE-4 at the Farnborough International Airshow
We’re on a mission. Actually, thousands of them.

Around the world, high above it and under the sea, UTC Aerospace Systems military and defense products have helped enable the safe, efficient completion of countless missions. Today, as the modern battlefield changes, we’re changing with it. We deliver critical technologies including the ACES 5® ejection seat to protect pilots of all sizes, laser warning systems to give warfighters more time to react and survive, our airborne imaging sensors and SCI-Toolset for better real-time intelligence, plus propellers, landing gear and more for the most advanced fighter planes in the sky. It’s all part of how we’re powering the missions of tomorrow and keeping forces safe as they protect entire nations – and that’s an idea worth fighting for.

Visit us in Chalet OE-4 at the Farnborough International Airshow
Goonhilly takes inside track in the UK’s race to space
by Ian Sheppard

The iconic Goonhilly Earth Station, situated close to the southwest extremity of the UK, has set out a roadmap following an injection of £32.4 million ($40 million) that has saved the site from being mothballed.

“Goonhilly offers tracking and mission operations services for all launch operators,” said a spokesperson. “And we will be providing mission operations and tracking services to Spaceport Cornwall... we will be an integral part of the Spaceport Cornwall, Cornwall Council, and Virgin Orbit partnership.”

An £8.4 million contract from the European Space Agency was enough to attract the further £24 million of private investment, said Goonhilly.

It intends to use the funding to establish the first private deep-space communication network to support commercial lunar and Mars missions from 2020; to invest in projects in the U.S. and Australia to support deep space activities, LEO constellations and other projects; and to open up an R&D and manufacturing facility to support the industry.

Neo-impressionistic Art

EasyJet took delivery of its first A321neo at the show Wednesday, following a flight from Gatwick Airport with UK Transport Secretary Chris Grayling on board. The delivery consummates an agreement to convert positions for 30 A320neos to the largest of the family's variants, appearing close to the southwest extremity of the UK, the iconic Goonhilly Earth Station situated by Ian Sheppard.

“A cash infusion has placed Goonhilly Earth Station in a lead spot of the UK’s space plans.”

> continued from page 1

No speed-up for civil supersonics

on the Boom to be on par “with subsonic business class.” He projected costs per seat mile to be in that range, adding, “We want to get the cost of speed down.” Entry into service has also stretched out, previously predicted as early as 2023 but now set for 2025.

For its part, ICCT believes that the best-case, per-passenger fuel burn for a supersonic airliner would be three times that of a business-class traveler on a current subsonic airliner.

That jumps to nine times as much fuel for an economy-class passenger flying in a supersonic airliner at subsonic speeds, which would be required over territorial North America.

Boeing Next Aims To Shorten ‘The Last Mile’

It takes nine hours to fly the 4,799 miles from Seattle to London and about one hour to drive from Heathrow to Farnborough, with the latter stage representing one-ninth of the time to go less than 1 percent of the distance. That is the sort of problem that Boeing aims to solve with its new venture, Boeing Next, announced on Tuesday morning at the Farnborough Airshow.

Boeing Next’s aim is to turn what sounds like science fiction now into every day in tomorrow’s world. “Future travelers will expect an on-demand world,” said Steve Norland, the first head of Boeing Next.

Next is focused on driving innovation within the company toward a more integrated, more seamless travel ecosystem, whereas HorizonX, which Norland previously oversaw, invests in outside companies. Two key areas for innovation are more efficient air traffic management and autonomous vehicles.

Its other projects include a hypersonic passenger plane concept and electric vertical takeoff and landing vehicles capable of moving cargo and people on demand.

“These vehicles are going to start flying around in the next few years,” Boeing chief technology officer Greg Hyslop said.

Turning Boeing’s vision into reality means overcoming technological and psychological challenges. A fatal car crash in March involving a self-driving car being developed by Uber highlighted many people’s unease at the thought of turning the wheel over to an artificial intelligence program. At the same time, following the crash Uber backed off but did not stop its self-driving development work.

“That’s why the first words out of our mouth are safety and reliability,” Hyslop said. While he hopes to begin trial programs in the next two to five years, huge technology problems remain to be solved. “We don’t think its unsolvable, but there is hard work to be done around that.”
THE SKY IS NOT THE LIMIT.

AT LOCKHEED MARTIN, WE'RE ENGINEERING A BETTER TOMORROW.®

For all the achievements of humanity’s early ventures into space, far greater wonders still await. Orion will carry explorers on bold missions to the far side of the Moon, to near-Earth, and to Mars—missions that will excite the imagination and advance the frontiers of science. Because at Lockheed Martin, we’re designing ships to go as far as the spirit of exploration takes us.

Learn more at lockheedmartin.com/orion
GE Aviation looks to cloud for predictive mx services

by Dan Catchpole

GE Aviation’s digital solutions business is combining its data and analytics domain expertise with the scale of Microsoft’s Azure cloud service to speed up digitization in aerospace, the two companies announced on Tuesday at the Farnborough Airshow.

“Microsoft’s cloud, with its strong enterprise capability, including global reach, scale and security were all important in our decision to partner with them,” said GE Aviation chief digital officer John Mansfield.

Azure will allow GE Aviation (Chalet P2) to speed up its worldwide deployment of existing products, as well as offer new analytic workbench capabilities. In fact, Microsoft’s cloud is allowing GE Aviation to expand its collaboration with Emirates Airline to include predictive maintenance and diagnostics. The effort uses the emerging digital capabilities, such as artificial intelligence, coupled with airlines’ real-world operations experience, to make better use of resources and automate operations.

Honda Engine Work

Also at the Farnborough Airshow, GE announced its GE Additive division has been selected by the Honda Aircraft Engine R&D Center to help determine how additive manufacturing could help the Japanese company. The two companies developed the GE Honda HF120 engine that powers the HondaJet business aircraft.

Meanwhile, GE Aviation said it had won a contract for avionics systems on the Boeing AH-64 Apache attack helicopter, including delivery of the pylons interface unit, with deliveries taking place through to December 2018.

The company also announced it would become an exclusive provider of Terradata’s high-performance “analytics in the cloud” for airlines.

An example of this application is GE’s FlightPulse, which “automatically merges complex aircraft data with crew schedules, allowing commercial pilots to… conduct their own analysis and peer comparisons,” discovering areas “to optimize operations and efficiency, while reducing risk, fuel consumption and carbon emissions.” At a management level it allows “enterprise-level insights,” said GE.

Finally, GE Aviation has signed an agreement with South Korea’s Kookmin University for continued work on the validation of unmanned systems. Kookmin University established the Defense UAS Research & Development Center in April this year.

GoFly reveals one Challenge winning team

Following up on the earlier announcement that Pratt & Whitney has joined main sponsor Boeing as a supporter, the GoFly competition held a brief event on Tuesday at the United Technologies Farnborough Airshow chalet (Outdoor Exhibit 4). Representatives from both sponsor companies displayed the passion for the project that their companies are backing with their checkbooks—Boeing has committed $2 million; P&W, $100,000, so far. The mission is to use teamwork to design and build a personal flying device that can lift off vertically and safely carry a person for 20 miles without refueling or recharging.

The big stars of the show were three members of UK-based “Team Leap,” organized by team leader Bruno Howard and one of 10 winners of Phase 1, $20,000 awards for its Vantage five-rotor flying bike design. With a degree in mechanical engineering and experience in the field of venture capital, Howard met up with the other members of the team on a GoFly online forum. Also at the event were team members Jakob Howard (no relation), who is responsible for integrating rotor drive system; and Nikhil Aggarwal, in charge of structural design.

Team Leap and other contenders are set to launch Phase 2, with an eye toward flying a prototype of their designs and earning the next-level prize of $50,000 from Boeing.
Airbus’ Eric Schulz redefines the role of top salesman

by Dan Catchpole

Airbus’s new top salesman, Eric Schulz, has a simple message this week at the Farnborough Airshow: he is his own man. He could be forgiven for feeling intimidated to follow his predecessor, John Leahy, who headlines called “legendary” and “salesman supremo” when he handed the reins over to Schulz in January.

“Intimidated? No,” Schulz said of Leahy. “I would have been intimidated if I wanted to do the job the way he was doing it.”

Unlike his predecessor, Schulz is an engineer and has extensive experience with airlines and aerospace manufacturing. “I come with an intimate knowledge of the industry and an absolute understanding of what...people [are] thinking when they buy an airplane, and what they do with it,” he said. “That makes me more focused on what an airplane can do for a customer and how to get the most out of it.”

Schulz doesn’t want to simply talk over the price tag with customers, but rather discuss what they need, which airplane is the best fit, and how to get the most value out of it. That might mean optimizing configurations or signing service contracts to cut a carrier’s maintenance overhead costs.

He has some things in common with Leahy, though, Schulz said: “The fighting spirit, the determination, the tenacity, the ability to find innovative solutions to make sure we can do a deal.” He is not taking his eye off the competition in Seattle, either. “There are only two jobs like mine in the world”—his and Ilhassane Mounir’s role as head of sales for Boeing Commercial Airplanes, Schulz said.

In recent years, Airbus has claimed annual leads in new orders, thanks to its popular A320 family. Boeing is considering a New Mid-market Airplane (NMA) to challenge Airbus’ long-range A321. On Sunday, Boeing CEO Dennis Muilenburg said the aerospace giant had put off a decision on the NMA until 2019. The company is still working to close the business case, Boeing Commercial Airplanes chief Kevin McAllister said.

Airbus already has solidified its dominance in the longest-haul single-aisle sector, thanks to the A321LR, Schulz said. “That explains why the NMA decision has still not been made.”

“It’s nice to believe that you can come right into the middle of the market with an airplane that will be optimized and will do everything,” he added. But the NMA will lack commonality with Boeing’s slightly smaller 777x and larger 787x. “It’s a lost airplane in the middle of the page.” Schulz concluded.

---

Meggitt expands to meet growing demand

Already one of the 50 biggest aerospace and defense companies in the world, Meggitt (Chalet A28) is expanding production facilities globally to keep up with growing demand. “There’s a lot of stress across the industry right now” to keep pace with air-craft manufacturers’ plans to increase production, Meggitt CEO Tony Wood told AIN.

Wood has worked to make sure Meggitt is ready to meet OEMs’ growing demands, and has focused the company more on aerospace and defense. “I made the decision in the fairly early days that we needed to be sharper in our strategy,” he said.

That meant selling off seven business units in the automotive, medical, and light industrial sectors, acquiring one aerospace company, and investing more than $100 million to expand Meggitt’s capabilities.

“This is the steepest ramp-up curve that I think the industry has seen in history” outside of wartime, he said. “That means a huge investment in industrialization.”

Meggitt is spending nearly $170 million on a new manufacturing and office campus at Ansty Park in Coventry, UK, which will become the site of its new headquarters. This site also will produce wheel and brake systems.

The company is also expanding production facilities in Mexico, Vietnam, and the U.S. (in San Diego, Miami, and Danville, Kentucky). “We are the largest aerospace business in Vietnam,” with nearly 1,000 employees, he said.

Meggitt broke into the large commercial jetliner segment when Wizz Air selected Meggitt’s electric braking system for its Airbus A321neos. Its system is also on the Airbus A220 (formerly C Series).

Meggitt is increasing its aftermarket and MRO work. “We’re providing lots of proprietary equipment,” Wood said. “Essentially we’re becoming much more embedded with our customers. Also, we are using data to improve performance and maintenance, and predict failures.”

---

L3 acts as guardian angel against drone threats

by Charles Alcock

Businesses wanting to protect their facilities from possible security breaches by unmanned aircraft are looking for ways to be able to monitor and potentially block drone activity. According to L3 Communications, its Drone Guardian Counter-Unmanned Aircraft System provides a flexible and scalable way to put this protection in place in settings as diverse as a city center financial institution, a large, stand-alone industrial site, or the home of a high-net-worth individual.

The company is currently trialing the use of Drone Guardian in the city of Manchester in northwest England. “Drone Guardian involves the integration of multiple sensors into a command and control capability that can detect drones and deploy an appropriate response to them,” explained Chris Knappman, L3 vice president of business development. “It correlates and creates a single picture of the drone threat.”

The system harnesses advanced sensor fusion technology to integrate inputs from real-time sensors such as radio frequency detection, radars, electro-optical cameras that can be cued from the system or other sensors. It can also manage and initiate responses to drone threats, such as jammers or kinetic energy.

L3 can help customers to establish a distributed sensor network around the area to be protected. It can also help to train security personnel to use the technology to manage the response to drone threats in a way that takes full account of the location.

The U.S.-based group has set up a Drone Guardian network this week at the Farnborough Airshow site. This consists of four radio frequency nodes around the airfield and a 30-degree arc camera, with starring capability that looks for individual pixel movement across the field of view. The camera can zoom and its pictures integrated with CCTV cameras.

Manned-to-unmanned Teaming

L-3 also is demonstrating the latest version of its Manned-to-unmanned Team (MUMT) suite of integrated products for improving situational awareness and decision-making in a combat situation. The technology allows pilots to share high bandwidth data, video and intelligence, surveillance and reconnaissance information with other pilots or unmanned aircraft.

According to Rob Johnston, L3 Communications’ director of business development, MUMT facilitates faster and more informed decision-making in the battlefield—reducing the danger of friendly-fire incidents. It also saves cost by increasing the capacity of warfighters to monitor and deal with hostile targets. For instance, the equipment is ideal for situations in which a pilot needs to hand off a mission to a colleague.

MUMT is being used by the U.S. Army’s Apache attack helicopters and various unmanned platforms. It has also been selected by the Dutch military.
From the fastest ramp-up in commercial aviation history to achieving 1.5 million engine flight hours in less than two years. Clearly, the LEAP engine is delivering.

CFM International is a 50/50 joint company between GE and Safran Aircraft Engines

www.cfmaeroengines.com
LEAP | The clear advantage

From the fastest ramp-up in commercial aviation history to achieving 1.5 million engine flight hours in less than two years. Clearly, the LEAP engine is delivering.

www.cfmaeroengines.com

CFM International is a 50/50 joint company between GE and Safran Aircraft Engines
V-22B Osprey to commence refueling tests in 2019

by David Donald

Having earlier conducted concept validation flights, the Bell Boeing MV-22B Osprey is set to begin midair refueling trials early next year, with an aim of clearing the capability for service by 2020. Adding the ability to refuel other aircraft from the MV-22B will provide the Air Combat Element (ACE) of deployed Marine Expeditionary Units with an organic refueling capability to free the ACE from reliance on shore-based tankers or carrier-based Navy refuelers.

Using the Osprey as a tanker was first evaluated in 2013 when a F/A-18 Hornet flew in close proximity to a representative hose and drogue trailed from the rear ramp of an MV-22B without any issues. In October 2016 Cobham Mission Systems was contracted to develop the V-22 aerial refueling system (VARS), basing the equipment on the company's FR300 hose drum unit (HDU).

The VARS is palletized so that it can be rolled on or off the Osprey as required. The MV-22 has been tested in the forward rapid refueling role on the ground, but VARS will allow the in-flight offload of around 4,535 kg (10,000 pounds) of fuel to receivers such as the F-35B, F/A-18, AV-8B, and CH-53, as well as other MV-22Bs. For now, the VARS is a U.S. Marines-only program.

In late 2019, the U.S. Navy is expected to receive the first two CMV-22Bs for trials. The Navy has ordered 39 CMV-22Bs, to be primarily used for carrier onboard delivery duties as a replacement for the C-2 Greyhound. Compared with the Marines’ MV-22B, the Navy version has additional fuel in the wings and enlarged fuselage-side sponsons, HF radio, and a public address system in the cabin for when it is carrying passengers.

Production CMV-22Bs are scheduled to begin delivery in 2020, with initial fielding on carrier USS Carl Vinson planned for 2021. For both the Navy and Marine Corps, the V-22 is an integral element of supporting the Lockheed Martin F-35 fighter at sea, as it is the only means of transporting the F-35’s engine power module to a carrier or “L-class” assault vessel.

To date, the Bell Boeing joint venture has delivered 289 of 360 Marine Corps MV-22Bs on order, and 50 of 54 CV-22Bs for U.S. Air Force special forces operations. Japan has ordered 17, the first five of which are due to be delivered next year.

Middle Eastern customer selects Miysis DIRCM system

An undisclosed Middle Eastern country has become the latest customer for Leonardo’s new Miysis directed infrared countermeasure (DIRCM) system, which uses high-powered lasers to protect aircraft from heat-seeking missiles by confusing their targeting sensors. The manufacturer recently started making deliveries of Miysis to the Royal Canadian Air Force for use on its CP-140 ARW/SW aircraft.

According to Leonardo’s UK-based division, demand for DIRCM systems has increased in recent years because older countermeasures, such as decoy flares, are no longer able to protect against the latest infrared guided missiles. Miysis accurately locates and tracks incoming missiles, and then shines a high-powered laser onto their targeting sensors to direct the weapons away from the aircraft.

The Miysis equipment is smaller, lighter, and draws less power than other DIRCM systems. It provides full spherical coverage that Leonardo says is now needed to counter advanced threats. Its open architecture makes it easier to fit on a variety of aircraft, the company added.

Aviall inks series of deals at Farnborough Show

Boeing’s Aviall subsidiary (Chalet B6) has signed a supply chain management agreement with Ukraine’s Antonov, a distribution deal with Canada’s International WaterGuard (IWG), and a parts-support contract with Luxembourg’s Cargolux. Aviall announced on Wednesday at the Farnborough Airshow.

The agreement with Antonov includes support for production of the Ukrainian company’s newest aircraft program, the An-138. Under the deal, Aviall will manage supply-chain procurement for Antonov production, including logistics and forward-stocking concepts.

News Clips

BAE Systems to expand in Alabama

BAE Systems has agreed to take on a $45.5 million project to expand its operations in the state of Alabama. The company said the multi-phase growth plan calls for the immediate expansion of its existing offices in Huntsville and develop a manufacturing and office space facility in the city’s Cummings Research Park.

Work at the facility will consist of new programs and existing business, including the design, development, and manufacturing of precision munitions and aircraft survivability technology. BAE Systems (Outdoor Exhibit L.1) is working with a Huntsville developer to build its new 83,000-square-foot facility, plans for which include engineering development space, manufacturing space, and a Department of Defense lab. BAE expects construction of the new building to start this year and conclude in 2019.

Grob is now H3 Aerospace and has new ISR solutions

by Chris Pocock

The H3 Aerospace Group is making its debut with a prominent outside display this week at the Farnborough Airshow. While the branding is new, the man behind H3—Andre Hiebeler—is a familiar face in the aerospace world. Hiebeler and his brother and sister bought Grob Aircraft out of bankruptcy nine years ago and developed it into a premier provider of basic training aircraft.

Now the company has expanded its range of activities and the new label is more appropriate, Hiebeler told AIN. In particular, H3 (Outside Exhibit 3) sees great opportunity in providing ISR mission systems, where it is merging sensors, datalinks, and displays from a variety of non-U.S. suppliers. The company has been working in earnest for the past three years on the ISR solutions that are displayed this week at Farnborough—a Cessna 208B Grand Caravan, Grob G120TP, and a German MAN all-terrain truck converted as a ground control station.

The Caravan features a new underbelly radome that H3 has designed as a substitute for the OEM's standard cargo pod. It can contain various sensors and a datalink, and is already certified. Hiebeler told AIN that the Caravan is already serving widely in Africa, which is a key target market for H3.

Italy is a customer and H3 hopes to close more deals with others “in the next couple of weeks,” according to Hiebeler.

Meanwhile, the G120TP carries the ISR pod that H3 has designed for quick fit and removal. It also could be fitted to a variety of aircraft, including Textron Beechcraft King Air, the Embraer Super Tucano, and helicopters. The EO/IR turret on the Caravan is from Hensoldt’s South African subsidiary; the control station from Spanish company Sainsel; and the datalink from Italian company IPR. But H3 is offering to integrate a variety of other sensors, such as radars from Leonardo or Thales, the Wescam MX-20 EO/IR turret, and various SIGINT or AIS systems.

Notably, these are all ITAR-free systems that can be offered as “no-nonsense solutions,” according to Hiebeler. He admitted that H3 is entering a crowded field, but said that Grob’s experience with a wide customer base will pay off. “We can make every installation a success story,” Hiebeler claimed.

Moreover, the company is preparing to restart production of the G240 Egrett high-altitude turboprop, which he said is a viable ISR platform. “We are in the last stages of negotiation for three to four new-generation G520NG versions,” Hiebeler told AIN.
At UTC Aerospace Systems, it’s our mission to provide safer ejections for pilots of all sizes.

That’s why we equipped the ACES 5® ejection seat with advanced restraint systems, innovative technologies to stabilize the seat and better protect the head and neck during ejection, and an improved recovery parachute for safer descents. The ACES 5® ejection seat meets all 62 USAF T-X requirements, making it the best choice for the T-X and the Next Generation Ejection Seat for the A-10, F-15, F-16, F-22 and B-1. It’s advanced protection for the pilots of today and tomorrow – and just one of many ideas born to fly.

utcaerospacesystems.com/aces5
ST Aero opens Florida MRO facility, signs UPS

by Chad Trautvetter

ST Engineering Aerospace (Chalet B18) recently opened a new $46 million, 173,500-sq-ft airframe MRO hangar at Florida’s Pensacola International Airport. The new facility, which is the company’s third airframe MRO location in the U.S., can perform heavy and line maintenance, as well as modifications, on narrowbody and widebody jets. UPS is the launch customer for the new maintenance center.

Able to accommodate six Airbus A321s simultaneously, the facility includes one of the largest hangars in Singapore-based ST Engineering’s global network of airframe maintenance facilities. It carries an annual capacity of 650,000 labor hours, according to the company.

UPS director of engineering Edward Walton told AIN that its fleet of seventy-five 757 freighters cycle through the Pensacola facility for C-check inspections, with 21 to be performed there this year and 40 per year thereafter. The 757 is UPS’s smallest aircraft in its fleet and is thus used to serve thinner markets.

Meanwhile, UPS’s 757 and 767 freighters are also receiving avionics upgrades at ST Engineering Aerospace’s facility in nearby Mobile, Alabama. That involves swapping out the aircraft’s legacy CRT-based avionics with a Rockwell Collins LCD-based “large display system,” Walton said.

This week at the Farnborough Airshow, ST Engineering Aerospace secured a multi-year component maintenance contract from Solased Air. Under the new agreement, ST Engineering Aerospace will expand its scope of support services for the airline’s fleet of Boeing 737-800s.

ST Engineering Aerospace’s maintenance-by-the-hour (MBH) program involves a global network of distribution centers, satellite stores, and repair shops, allowing airlines to choose a range of support services and pay a corresponding flight-hour rate. The company provides MBH component support to more than 20 operators flying more than 600 aircraft in the Asia-Pacific, Europe, and the Middle East.

Daher assumes warehousing duty for R-R

Building on a 15-year working relationship, Daher and Rolls-Royce have agreed that the former will assume full warehousing duties for some 28,000 tools used to manufacture Rolls-Royce jet engines across the UK. Daher will centralize and stock the support tooling in a 30,000-sq-m warehouse in Doncaster in northwest England.

The tools, which range from hand tools to those weighing up to 30 metric tons, serve the nationwide production network, handling components from fan blades to large powerplant modules. Daher will package and dispatch the tools to the sites where they are needed, then supervise their return and storage.

This arrangement is part of R-R’s program to simplify its logistics operating model, adopting industry-standard practices, and enhancing transparency and accountability throughout the supply chain, according to the engine maker. Reducing transport costs is another goal.

Daher has created a constantly updated internal web portal with the warehouse’s inventory of handling tools. Operators with camera-equipped glasses are directed via Wi-Fi prompts to find specific tools throughout the warehouse.

“We are proud that Rolls-Royce has renewed its confidence in us, and our teams are fully committed to meeting the engine manufacturer’s current and future warehousing and logistical challenges,” said Jacques Grimal, managing director of Daher UK. Stewart Morris, R-R programs executive for civil aerospace operations, said, “Daher’s services are part of a new way of working and represent a significant step in improving our processes.”

Esterline contracts diversify bizav portfolio

Esterline Corp. is increasing its business aviation portfolio, winning contracts to provide a range of advanced components for Rolls-Royce’s new Pearl 15 engine, as well as the throttle quadrant assembly for Textron Aviation’s Cessna Denali turboprop single.

Rolls-Royce (Chalet D3; Hall 4, Stand 41394) in May unveiled the new Pearl family for large-cabin and ultra-long-range business jets after years of keeping the program under wraps. The Pearl 15, the first member of that family, will power Bombardier’s newly announced Bombardier 5500 and 6500 ultra-long-range jets that are set to enter service in 2019.

The engine will produce 15,125 pounds of thrust (55A15), providing up to 9 percent more thrust during climb than the BR710, but at the same time providing a 7 percent improvement in specific fuel consumption while being two decibels quieter.

Esterline (Hall 1, Stand 1180) is providing components that the company said “contribute to the advanced materials science” behind the engine design, including lighter-weight materials, advanced cooling, and insulation products that can withstand higher temperatures and pressure.

These include Esterline’s Inconel 625 exhaust mixer, Nimonic 75 exhaust cone, titanium full core engine fairings, titanium low-pressure turbine housing, titanium turbine case cooling manifold assembly, and stainless intercase fire shield. The company will produce the components at its facility in Stillington, UK.

Meanwhile, Esterline’s Mason unit in San Fernando, California, will build the throttle quadrant assembly for Textron’s (Chalet L2) Cessna Denali. The contract builds on the recent award for Esterline to provide the control wheel for the new turboprop, which is slated to enter service in 2020.

“Esterline’s heritage of being a renowned leader in technology, along with decades of human-machine interface expertise and countless product mission hours, is positive proof that our controls are reliable, valuable tools in military, commercial, or civil venues,” said David Tessier, president of Esterline Mason. K.L.

Esterline steps up game with system controllers

by Samantha Cartaino

Esterline’s Mason product team is displaying its newest Harm’s Way Controllers (HaWC—pronounced “hawk”) this week at Farnborough International Airshow. The rugged controllers, which are shaped like PlayStation and Xbox gaming controllers, come in two different models: the InSight HaWC and the Mighty HaWC.

Operators can stand at a distance while using the controllers to operate different devices, including cranes, weapons, pipelines, crawlers, and more.

As a company focused on human-machine interface technology, Esterline Mason (Hall 1, Stand 1180) manufactures products including control wheels, throttle quadrants, rudders, and brake pedals. Esterline Mason president David Tessier told AIN that the company is doing well in the North American market and is trying to break into the European market. While Esterline does have some undisclosed European customers, the HaWCs are a way to break into the market while adding diversity to the company’s inventory.

The InSight HaWC and Mighty HaWC offer different options for users. The InSight, which was the first model created, does not have a display screen. It is primarily for users who have a direct line of sight to the object they are working around.

Meanwhile, the Mighty features a 5.6-inch display on the controller. Within these series, there are three different configurations available: trigger versus joystick, palm buttons that must be held down to enable the controller, and a basic model without these features.

One of the reasons why the HaWCs are shaped like gaming controllers is because of ease and familiarity. “We’ve gotten positive feedback from our customers,” Tessier told AIN. “People pick it up and within three minutes they know exactly what they’re doing. The HaWCs are efficient and the training is very minimal.”
European partners lend support to GA-ASI
by Chris Pocock

After the excitement of last week’s trans-atlantic flight by the MQ-9B Sky Guardian unmanned aerial system (UAS), Tuesday’s media briefing at Farnborough 2018 by General Atomics Aeronautical Systems Inc (GA-ASI; Hall 2, Stands 2078 and 2175) was a low-key affair. But it served to emphasize the expanding possibilities for adding non-U.S. systems to the latest version of the famous MQ-9 series of UASs, as GA-ASI seeks more international customers. Coincidentally, GA-ASI announced that the Netherlands had confirmed a long-awaited order for four MQ-9 Reapers, thus becoming the fifth European operator.

Officials from five European companies sat alongside GA-ASI president Dave Alexander to explain their ambitions. Alastair Morrison, deputy managing director of Leonardo UK, said that the SAGE electronic intelligence and warning sensor could become a standard fit, as GA-ASI seeks more customers for the MQ-9B. The two companies have just agreed to integrate SAGE, which needs no external pod.

Leonardo is also proposing the BriteCloud active decoy, an infrared countermeasures system, and an infrared search and track system. Morrison noted that Leonardo’s SeaSpray maritime radar had been test-flown on the Reaper six years ago, and was now much improved. A land surveillance radar was also available from the Anglo-Italian company.

James Allibone from MBDA UK noted that the Brimstone dual-mode weapon would be carried by the MQ-9Bs to be operated by the Royal Air Force (RAF), which is the launch customer and which has named the aircraft the “Protector.” Dean Mason from Raytheon UK noted that the ever-improving Paveway IV would be the other precision-guided weapon option on the RAF’s aircraft.

Roland Aarts from GKN Aerospace’s Fokker business noted that his company was now producing landing gear for GA-ASI. Meanwhile, John Corner of Cobham explained his company’s role as GA-ASI’s UK representatives and that in support of the RAF’s current MQ-9 Reaper operation.

Wing Commander Neil Towers, the RAF’s current MQ-9 Reaper operation.

Leonardo’s ATR 72MP is an aircraft on a mission

It’s inevitable that airframes designed to efficiently carry passengers from A to B become the subject of special-mission modifications for the military owing to their endurance and capacious cabins. But few can have been adorned with so many lumps and bumps as the ATR 72-600 that Leonardo has transformed into the P-72A (ATR 72MP) maritime patroler for the Italian air force. The first pair was delivered for service with 41° Stormo at Sigonella in Sicily in November 2016, with another pair completing the order to allow the replacement of the long-serving Breguet Atlantics a year later.

Roboticists take over UK Innovation display
by James Wynbrandt

With robotics and AI expanding their presence in aerospace—and within the Farnborough International Airshow exhibition halls—the British government is highlighting at the UK Research and Innovation airshow display (Innovation Zone 3796) its Robotics for a Safer World Challenge Fund. The Challenge is a £53 million ($123 million) grant program aimed at speeding development of safer and more productive technologies for working in extreme environments.

Potential applications include robots and drones that work in high radiation areas, undersea, in confined spaces, and outer space. While much of the technology is available today, the two major impediments to progress are “regulations and public perception,” said Andrew Tyer, interim director of the Robotics Industrial Strategy Challenge Fund.

The Challenge is currently funding five different use cases for drones in five UK cities. At the Farnborough Airshow display, VTOL Technologies is exhibiting the flying wing built for one of the challenges, designed to deliver medical supplies between hospitals in London—a job currently done by motorbike.

At FIA, Challenge leaders are eager to interface with “technology providers and people who don’t necessarily identify themselves as being in the [drone and robotics] marketplace,” said Tyer. “They have the technology, but realize they can transfer it” to these future applications.

Meanwhile UK engine maker Rolls-Royce is demonstrating how robotics could “revolutionize” the future of engine maintenance. In what it describes as an element of its new “Intelligent Engine” concept, the company is working with the University of Nottingham and Harvard University to see how “snake”-like robots could go into engines “like an endoscope.” This could range up to having a “swarm” of miniature robots that could enter the engine to do inspections and even repairs (in some cases controlled by engineers in what R-R terms “boreblending”). This could, for example, remove the need to take an engine off-wing, or at least make decision-making on maintenance actions more reliable.
Following the recent order for 16 F-16V Block 70 fighters for Bahrain, and the announcement last week that Slovakia has selected 14 of the same version to replace its aging MiG-29 fighters, the Lockheed Martin F-16 is underlining its credentials in the fighter marketplace. And although the prototype first flew in January 1974, the type remains a force to be reckoned with in competition with much younger rivals, the company pointed out.

“We’re seeing a remarkable resurgence in interest in the F-16,” remarked Randy Howard, Lockheed Martin’s F-16 business development executive. “A lot of it has to do with the Block 70.”

The current version, also known as the F-16V, brings together a host of recent developments, including conformal fuel tanks, revised cockpit with two 10- by 10-cm (4-by-4-inch) side displays and a 15- by 20-cm (6-by-8-inch) center pedestal display, auto ground collision avoidance system, advanced helmet-mounted cueing sight, Sniper ATP targeting pod, and Link 16 datalink.

Most importantly, it is the first F-16 with an AESA “E-scan” radar in the form of the Northrop Grumman APG-83. This radar has greater than 90 percent software commonality and more than 70 percent hardware commonality with the APG-81 radar of the F-35. Indeed, much of the Block 70 technology has been drawn from the F-35 program and can continue to benefit from similar updates in the future. It’s not all a one-way street either: F-16 technology such as the Auto-GCAS is finding its way into the F-35.

APG-83 and the F-16V’s new mission computer and high-speed data network provide the aircraft with advanced radar capabilities, such as the ability to track 20 air-to-air targets, with up to six prioritized. The radar can work in interleaved air-to-air and air-to-surface modes, the latter including mapping to 160 nm (296 km). At the same time, the solid-state radar is considerably more reliable than the earlier mechanically scanned radars.

Lockheed Martin is offering the F-16V as both new-build machines and as an upgrade to older Block 40/50 aircraft. The upgrade could be applied to earlier Block 30 machines, but the process would be more invasive and might not be cost-effective for high-time aircraft, the company said.

In terms of structural life, 841 of the U.S. Air Force’s F-16s will go through a service life-extension program that raises their lives from 8,000 to 12,000 hours, sufficient to keep them in service until at least 2045. One test aircraft was put through a simulated life of more than 27,000 hours. New-production aircraft are now being built as 12,000-hour airframes.

With production at Fort Worth coming to an end to provide more space for F-35 assembly, future F-16s—beginning with those for Bahrain—will be built in Greenville, South Carolina, where the production line will start receiving components next year. The first aircraft being delivered from the new plant is expected in late 2021/early 2022.

Howard reported that there are four F-16V upgrade programs under way, covering more than 400 aircraft. He also envisions a realistic market for more than 400 new aircraft.

Of the 4,604 F-16s built to date, nearly 3,000 remain operational in 25 countries, providing good potential for upgrades or follow-on orders. As well as pointing out that the aircraft has flown more than 400,000 combat sorties and has a 75:0 kill-to-loss ratio in air combat, Howard noted that there have been 56 cases of repeat orders throughout the F-16’s history.

Among the most prominent new-build opportunities is that for India, where Lockheed Martin has offered to move the production line if selected. The company has teamed with Tata to compete for the Indian requirement. There would be some local modifications required, including the installation of probe/drogue refueling gear.

Farnborough Airshow News | July 19, 2018 | ainonline.com
Take the future of flight to a higher note

SINGAPORE AIRSHOW 2020

Asia’s largest aerospace and defence event

The show returns in 2020 to propel your business to new heights. Strike a chord with global industry leaders, gain access to top decision makers in this thriving region, and impress them with your latest technologies and innovations.

HIGHLIGHTS FROM SINGAPORE AIRSHOW 2018

1,062 participating companies from 50 countries
287 VIP delegations from 91 countries and regions
54,151 trade attendees from 147 countries and regions
1,464 meetings conducted during the exhibition

SECURE A CHOICE SPOT NOW AT SALES@SINGAPOREAIRSHOW.COM SINGAPOREAIRSHOW.COM

Organised by: experian
Critical Media Partner: AVIATION WEEK NETWORK
Supporting Media Partners: FlightGlobal
Made in: Singapore
IAI heading to Delhi and Mumbai with TaxiBot in tow

by Neelam Mathews

New Delhi and Mumbai International Airports will soon be operating environmentally friendly Israel Aerospace Industries (IAI) TaxiBot vehicles. IAI’s agreement with Delhi-based KSU Aviation includes the first phase of the contract to carry out controlled trials at the airports until later this year. The second phase includes delivery of 38 additional vehicles within four years to the two airports.

TaxiBot is a semi-robotic vehicle that connects to the aircraft and is controlled by the pilot to taxi the airplane from the airport’s jet bridge (“sleeve”) to the runway without using the aircraft’s jet engines.

In October, TaxiBot was officially certified by the U.S. FAA for dispatch tow ing for the Boeing 737 family. The system does not require any modification in airplane systems, APU replacement, added weight, or cargo space, according to the company. “The pilot is in control at all times after pushback using the airplane’s tiller and brakes, transparent to the pilot,” it noted.

The final tests of the vehicles designated for New Delhi Airport are being completed at Germany’s Frankfurt Airport with the support of Luft Hansa, Luft Hansa Engineering and Operational Services (LEOS), and ground support equipment company TLD, in collaboration with IAI.

The two Indian private metro airports are working hard to adhere to strict standards for emissions set by the government. Recently, GVK Mumbai International Airport became one of the two airports in Asia-Pacific to achieve a three-year extension of Airports Council International’s (ACI) Airport Carbon Accreditation (ACA) “Level 3+ Neutral ity” certification.

Hauling of the aircraft by the TaxiBot saves 85 percent of the fuel consumed during standard taxi and provides a similar reduction of greenhouse gases emitted by the aircraft’s main engines. The TaxiBot also reduces noise levels by 60 percent and foreign object damage (FOD) by 50 percent, as foreign objects can’t be sucked into the aircraft engines if they are not running.

“We trust the TaxiBot will prove itself effective in reducing air pollution, which is intensifying due to the fast growth of India’s aviation market, with the significant savings in fuel…and improvement in gate congestion. We believe this agreement will open the path for many more significant contracts for this product worldwide,” said Shaul Shahar, IAI executive v-p and general manager of IAI’s Military Aircraft Group.

“The use of TaxiBot at Indian airports in the next five years will bring about a saving of $1.5 billion to Indian airlines and reduce environmental damage of greenhouse gases by four million tons,” explained Yogesh Sethi, the founder of KSU Aviation.
With funding support from the UK government, Rolls-Royce is working on all-electric aircraft.

**UK supports Rolls-Royce in disruptive tech efforts**

by Mark Phelps

Rolls-Royce’s experimental Advance3 civil aerospace engine is now running at full power, the company announced this week at the Farnborough Airshow. Release of the news followed on the heels of the UK government Monday confirming further funding for R-R’s future engine designs.

The Advance3 demonstrator is built around a new engine core developed for optimum fuel efficiency and low emissions. The new core is a fundamental element in the upcoming UltraFan engine. Run at full power, the Advance3 is gathering engine performance data across more than 2,800 parameters.

In addition, the UK also confirmed further funding for other Rolls-Royce future technology projects, such as the E-Fan X program, a joint hybrid-electric project involving R-R, Airbus, and Siemens. Work continues on an Avro RJ100 testbed aircraft that is expected to fly as early as 2020.

Rolls is currently planning to ground test the project’s flying generator—the world’s most powerful—before year-end. Also on Monday, R-R announced further UK government funding for research on all-electric propulsion. Together with new partner YASA, Rolls is leading exploration in using a high-power electrical system in a demonstrator aircraft. YASA manufactures high-power, lightweight electric motors, and controllers for automotive, aerospace, and industrial applications.

“Taking advantage of R-R’s experience in aero engines and their safety and reliability requirements, the team hopes to flight test the system to explore the practical potential of electric flight. Rob Watson, director of electrical at R-R, said, “The increased use of electrical systems is an inescapable trend in our markets and championing electrification is a core part of our long-term strategy at Rolls-Royce.”

**News Clips**

**CFM brings fat order book to Farnborough**

CFM’s 2018 sales ledger shows orders for 1,571 engines as of the end of June, including 1,306 examples of the Leap turbofan. On July 13, celebrating the ten-year anniversary of the Leap program’s launch, the company (Outdoor Exhibit 22) had collected orders and commitments for 15,450 of the narrowbody workhorses valued at more than $220 billion (€167 billion).

Meanwhile, the company expects to deliver more than 2,100 CFM56s and Leap engines this year. This month, the company will for the first time build more Leaps than CFM56s, and plans call for Leap production rates to nearly double by 2020, to 2,000 engines annually. CFM continues to recover from a four-to-five-week delivery delay, mainly generated by irregularities in casting and forgings delivered by suppliers.

**Israel Aerospace Industries shoots for the moon**

Israel Aerospace Industries and nonprofit Spaciel plan to send an unmanned spacecraft to the Moon in December. Through a specific launch date has not been set, the spacecraft is expected to land on the Moon on Feb. 13, 2019, making Israel only the fourth country to do so. This mission follows eight years of work between IAI (Chalet A29) and Spaciel. The spacecraft will be launched as a secondary payload of a SpaceX Falcon 9 rocket from Cape Canaveral, Florida, and is expected to take two months to reach the Moon. At 600 kilograms (1,322 pounds), it will be the smallest craft to land on the Moon.

The project has cost about $88 million, much of which came from private donations. Spaciel president Morris Kahn donated $27 million to the effort. Three Spaciel founders—Yivi Bash, Kfir Damari, and Yonatan Winetraub—also provided financial support.

The spacecraft was built at IAI’s Mabat plant, part of the company’s electronics division.

**Jordan taps Raytheon for cybersecurity services**

Raytheon has been selected as the cybersecurity advisor to the Royal Hashemite Court of the Kingdom of Jordan, the U.S. company announced this week at the Farnborough Airshow. Through its Intelligence, Information and Services (IIS) division, Raytheon (Chalet C9, Outside Exhibit 9) will protect the Kingdom’s critical infrastructure systems, conducting vulnerability assessments and providing cyber test range services, as well as cyber governance and policy strategy. Additionally, the company will conduct a holistic vulnerability assessment on the Royal aviation fleet to ensure all integrated systems are hardened and resilient to cyberattacks.

“The cyber threat is increasing globally,” said Dave Wajsgras, president of the company’s ISS branch. “We’ve been protecting large-scale systems for decades and know how to help nations protect themselves from those who want to exploit our interconnected world.”

**SteelRock launches Odin Counter-UAV system**

UK-based SteelRock Technologies is launching the Odin counter-UAV system this week at the Farnborough Air Show. SteelRock (Hall 1, Stand 1955) has developed the system in cooperation with technology partner Silent Sentinel. Odin is meant for civil, public protection, and military applications and is available to buyers formally approved by the British government.

Odin has a modular architecture that enables integration with existing detection and tracking systems. It can detect, track, and control threat UAVs at a range of up to three kilometers (1.9 miles). Combined with partner Silent Sentinel’s advanced pan-and-tilt system and electro-optical array, Odin can also be the hostage UAV with SteelRock’s existing Night Fighter options—hover, land, and return.

**CAE starts scholarship for female pilots**

CAE (Chalet A30) launched a new scholarship program called CAE Women in Flight, which is committed to supporting the advancement of women in the aviation industry. One of the program objectives is to ensure selected candidates become role models and inspire more women to join the industry.

Through this program, CAE will offer five full scholarships to aspiring female pilots for one of its cadet pilot training programs through its global training network. Additionally, CAE will help selected candidates find their first job through its global partners.

“By leveraging our global training network and our relationships with operators, CAE can provide aspiring female pilots direct access to our numerous active pilot creation programs around the world, facilitating their journey to the cockpit,” said Nick Leonidas, CAE group president of civil aviation training solutions.
Spurred by MH370 tragedy, flight tracking is evolving

by Chris Kjelgaard

The flight-tracking industry is set not only to allow operators to meet ICAO’s deadlines for normal and distress tracking (the former is November 8 this year), but also to evolve rapidly to provide powerful new capabilities. The industry’s commercial prospects have been boosted by requirements mandated for aircraft operators by ICAO’s Global Aeronautical Distress & Safety System (GADSS) following the disappearance of Malaysia Airlines Flight MH370 in March 2014.

A number of factors are combining to allow providers of flight-tracking services to offer new predictive flight-tracking capabilities that will give aircraft operators a range of commercially important benefits, according to Daniel Baker, CEO of FlightAware, a provider of flight-tracking data. Those benefits range from alerting operators automatically when aircraft behave unexpectedly in flight to improving flight efficiency and boosting operators’ resource-scheduling, gate-allocation, and flight-connection capabilities. Additional new benefits will emerge over the next decade as operators’ flight- and resource-planning and flight-tracking automation platforms become increasingly integrated, Baker told AIN.

“We’re at a really interesting time in computer technology and computer science,” said Baker. “Until one or two years ago, the vast majority of the decision-making in HyperFeed [FlightAware’s flight-tracking data-analysis engine] was algorithmic,” he added. At that point, HyperFeed used approximately 1,000 separate software algorithms to process raw flight-plan and radar data from air traffic control systems in 55 countries. It also tapped FlightAware’s network of terrestrial ADS-B ground stations in 175 countries and more recently, space-based global ADS-B data feeds provided by Aireon. All these resources enabled the company to track aircraft in flight all over the world. However, virtually all of the processed data reflected the history of each flight; it provided little in the way of predictive capability.

“But now the state of technology has changed; we’re moving into machine learning, using artificial intelligence to leverage big data to predict the future world,” said Baker. “We’re fortunate that we’re at this point where a lot more data is out there and a lot more technology is available to process and analyze it. So two things are converging.”

These two trends are dramatically changing FlightAware’s ability to predict the future behavior of a flight, particularly its ability to predict the elapsed time that key phases of the flight will require. These include the time it will take for an aircraft to negotiate the last 150 to 200 nm of a flight through congested terminal-area airspace. Further, because FlightAware can also now predict the flight’s pathway on taxeways, it can predict the taxiing and ground-holding time after landing, or—after it departs the gate—before takeoff.

“Five years ago, we could only predict to within five to 10 minutes the time it would take a given flight to travel through the terminal airspace surrounding a busy airport because variables such as ATC instructions and runway availability couldn’t be predicted accurately,” said Baker. “If, say, an airline had three flights due to arrive at the airport within a 15-minute period, it couldn’t make an informed decision to allocate specific gates for each flight, because it couldn’t know exactly when each would arrive.”

Now, however, FlightAware “can predict touchdown time to within 30 seconds” for an aircraft 200 nm from its destination and about to enter terminal airspace. The company is already offering the capability for about 100 airport terminal areas as an extra option through its Firehose programming API for customers. The software can process high-volume streams of aircraft positional data entering their automation systems. Through Firehose, FlightAware is also offering the optional ability for customers to track their aircraft while they are moving on the airfield surface.

Arming an airline with this knowledge—and the knowledge of how long the aircraft will take to taxi to the gate once it has landed—might not let the flight arrive any more quickly, but it will help the airline decide which gate to allocate and efficiently schedule vehicle drivers, aircraft-servicing crews, and ground agents meeting the flight, as well as flight crews positioning to operate the aircraft’s next mission. “It’s not always about changing the flightpath; it’s about having the information and what you can do about it,” said Baker.

FlightAware is partnering with Aireon to offer customers flight-tracking data from Aireon’s space-based ADS-B feed through SITA’s Flight Tracker service (for an extra fee over and above the basic Flight Tracker product). Many airlines use it as part of an integrated suite of operations-management capabilities built into SITA’s automation platform.

Baker predicts that, as operators increasingly choose to integrate data from flight-tracking specialists such as FlightAware into the suites of operations-management data tools provided by automation-platform providers such as Rockwell Collins and IBM (FlightAware also provides data for both of these companies’ flight-tracking products), flight-tracking services not only will become more available, but they will also offer operators powerful new decision-making capabilities.

---

**Search ends for MH370 wreckage**

The renewed search for the wreckage of MH370 ended last month. Ocean Infinity, a seabed exploration company, failed to find anything despite covering some 50,000 square miles with multisensor autonomous underwater vehicles. The company and its venture finance backers were working to a “no find, no fee” contract with the Malaysian government, which would have paid them $70 million for success.

A new search area was defined by additional research on the last Inmarsat “log-on” data by the Australian Transportation Safety Board (ATSB). But its assumption that the Boeing 777 made an uncontrolled descent after the engines flamed out through fuel starvation has been questioned. With so much circumstantial evidence pointing to the flight having been diverted by deliberate actions in the cockpit, other investigators have suggested that the airliner made a controlled ditching.

“We’ve always accepted that possibility,” former ATSB commissioner Martin Dolan told an Australian television documentary in May. But, he added, if that were the case “the search is an almost impossible task.”

“We sincerely hope that we will be able to again offer our services in the search for MH370 in future,” said Olvier Piunett, the CEO of Ocean Infinity. C.P.
Born of the High Altitude Pseudo Satellite (HAPS) program, Airbus’s Zephyr is a refined design, with much of the RGB centered on the aircraft’s battery-management technology.

Airbus Zephyr in production, 30-day missions targeted

by Chris Pocock

Airbus Defence and Space has started production of the solar-powered, high-altitude Zephyr S unmanned aerial system (UAS) at a facility just outside the airfield perimeter at TAG Farnborough Airport. While the UK Ministry of Defence is the launch customer, for three of the long-endurance UASs, Airbus has also secured a first commercial customer.

“The Zephyr S is demonstrably years ahead of any comparable system,” said Dirk Hoke, CEO of Airbus Defence and Space. According to the company, Zephyr “endures like a satellite, focuses like an aircraft, and is cheaper than both.” Development of this High-Altitude Pseudo Satellite (HAPS) was started in Farnborough by QinetiQ 16 years ago and Airbus bought the program in 2013.

Since then, it has invested heavily to refine the design, and especially to strengthen the battery-management technology. The “strings” of battery cells must provide energy to the payload during the day, while simultaneously being recharged to enable overnight flight. Currently, Zephyr S has a 25-meter wingspan and weighs less than 70 kg/154 pounds (30-kg/66-pound structure, 30-kg/66-pound battery, and 10-kg/22-pound payload).

A larger, twin-tailed Zephyr T version under development will weigh 140 kg/308 pounds. Operating altitude is 65,000 to 70,000 feet.

The first Zephyr S is currently on its maiden flight from a base in Arizona and can be followed in real-time this week at Airbus’s chalet (K8) at the Farnborough Airshow. The predecessor Zephyr 7 development version already holds the world endurance record for a UAV, set in 2010 at 14 days 22 minutes. Airbus might be trying to beat that, so it said the Zephyr can theoretically fly for up to 120 days, although 30 days is the typical envisioned duration.

Key applications of the Zephyr S are communications and surveillance relay. In the production facility, Airbus is showing a Spider radar payload for Zephyr S weighing 8 kg/11 pounds for ship-detection, location and tracking, and a larger multi-mode imaging radar named Marlin that weighs 20 kg/44 pounds and could be carried by Zephyr T.

QinetiQ is showing a software-defined multi-function LIDAR (SDL) and an automatic track, locate and rebroadcast (ATLR) payload for “red force” tracking, command, and control, and communications rebroadcast. UAV Vision is showing small EO/IR sensor balls. SatixFy is showing a broadband multi-beam communications system that offers 30 Gbps of data speed.

Cargo group inks $10B LOI with Boeing

by James Wynbrandt

CargoLogicHolding, owner of UK-based operator CargoLogicAir, and partner Moscow-based specialty cargo handler Volga-Dnepr Group, signed a joint letter of intent (LOI) with Boeing on Tuesday at the Farnborough Airshow to acquire 29 Boeing 777 freighters, along with converted 767 freighters and converted 737 freighters.

At the same time, the companies reaffirmed an order for five 747-8F freighters. The 747 and 777 deals are worth $8.9 billion and $2 billion, respectively, at list prices, said Boeing.

Crew-pairing solutions and an agreement to explore future freighter projects are also included in the agreements, according to a Volga-Dnepr spokesperson, which said that the 777 freighters would include both the -400 and “ultimately” -800 models. The companies provided no timeline for expected deliveries.

“This is a very significant day in our company’s history,” said Alexey Isaykin, president of Volga-Dnepr Group and chairman of CargoLogicHolding (Cargo Village, Outside Exhibit 32). “With this package of agreements, we will grow our business with the unique and unmatched 747-8F freighter and open new market opportunities with the 777 freighter.”

Boeing Commercial Airlines president and CEO Kevin McAllister said his company is “extremely honored that Volga-Dnepr Group and CargoLogicHolding have once again placed their trust on Boeing’s freighter family to carry their business into the future. We look forward to expanding our relationship with our great partners and delivering new freighters to them for many years to come.”

With the resurgence in the airfreight market—which grew nearly 10 percent last year, according to Boeing—the U.S. manufacturer has reported a big spike in interest for cargo jets, with orders and commitments for more than 100 production and converted freighters received so far this year.
Where inspiration leads, additive journeys follow.

Every additive journey has a beginning. A defining moment that ignites the imagination and sets it on the path of discovery. At GE Additive, we inspire and guide those journeys.

We work with a range of industries, from aerospace to healthcare, sharing our additive experience. Through our integrated offering of additive experts, advanced machines and quality materials, we empower our customers to build innovative new products. Products that solve manufacturing challenges, improve business outcomes and help change the world for the better.

Begin your additive journey at ge.com/additive/journey.