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*Airbus A220-300 gets
traction at Farnborough*



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ATAC is developing a new resource designed to introduce young people to the possibilities of an aviation career.

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LOOKING UP

Canada's success at the 2018 Farnborough International Airshow is a sign of general optimism in commercial aviation.

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By Kenneth I. Swartz



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ON THE COVER

With a new name and a new brand, the former Bombardier C Series family seems poised for new heights.

Rich Cooper Photo



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FACEBOOK PHOTO PICK

An Air Transat Boeing 737-8Q8 aircraft takes off from Runway 24L at Montreal-Trudeau airport, on its way to Calgary. **Trystan Dupre Photo**



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Column

FROM THE EDITOR
BY LISA GORDON

Lisa Gordon is editor-in-chief of *Skies* magazine, Canada's largest and most-read aviation industry publication. Contact her at lisa@mhmpub.com.



Change and mixed emotions

It gave me a funny feeling to see the Airbus A220-300 making its debut at the Farnborough International Airshow this year.

Its crisp new blue-and-white livery and Airbus brand were familiar, but a bit confusing, too.

I imagine it's akin to the feeling you get when your child graduates from university or college. Your baby's in there somewhere, but they're all grown up. You feel tremendous pride, but also a touch of sadness.

It made me wonder how the rebranding of the C Series makes the folks at Bombardier feel—the people who poured their blood, sweat and talent into that plane over the last 14 years.

No doubt they were justifiably proud to see the jet soaring over Farnborough, its graceful lines and tremendous manoeuvrability a testament to Canadian innovation at its finest.

delivered and into service, that aircraft would be successful.”

Indeed, the C Series achieved an impressive in-service launch with operators Swiss International Air Lines (CS100) and later airBaltic (CS300). But, while the aircraft was clearly a winner, the orders were slow to come and Bombardier struggled financially.

Neither Dewar nor anyone else at Bombardier could possibly have foreseen what was to come: a critical trade dispute prompted by a Boeing petition that could have resulted in massive U.S. government duties on any C Series aircraft sold to American customers. Such an outcome would deal a fatal blow to the fledgling aircraft program, effectively blocking it from one of its most lucrative markets.

Enter the world's other aerospace giant, Airbus, and the deal that probably saved the

further its commercial success worldwide.”

As Airbus takes the torch and begins to run with it, we can only hope the program will never lose touch with its Canadian roots.

Speaking of mixed feelings, there's been much debate over the fate of Avro Lancaster FM 104. This is the bomber that proudly posed at Coronation Park on Toronto's shoreline from 1965 to 1999. The aircraft was displayed on a plinth as a tribute to the 10,000 local Victory Aircraft workers who built 430 Lancasters for the Second World War effort.

After being transferred from its waterfront post to the Toronto Aerospace Museum (later called the Canadian Air and Space Museum) in Downsview, the aircraft was subsequently dismantled and put into storage in 2012 when the museum was evicted from its hangar.

Recently, Toronto city council decided to remove the aircraft from its historical collection and began the search for a new home for Lancaster FM 104.

After much debate, council favoured a proposal from the British Columbia Aviation Museum in Victoria, which promised a complete restoration of the Lancaster.

The plan sparked intense opposition from Toronto citizens' groups as well as Hamilton, Ont.-based Canadian Warplane Heritage Museum, which stepped in with an offer to restore the aircraft to taxable condition (and airworthy status if possible) at no cost to taxpayers.

The fate of Lancaster FM 104 is an emotionally-charged topic, with Toronto residents maintaining the aircraft belongs in the Greater Toronto Area as a memorial to those who built it.

On the other hand, Ontario is also home to one flying Lancaster and non-flying aircraft displays in Ottawa, Windsor and Trenton.

FM 104 would be the first Lancaster in British Columbia.

While many do not like it, FM 104 is moving on to the next stage of its life. If that Lancaster is moved to B.C., it will carry the spirit of thousands of Torontonians who built and cared for it.

It will be up to the British Columbia Aviation Museum to accept that heritage, and celebrate it. ■

“AS CLEAR AS THE NEW NAME PAINTED ON ITS FUSELAGE, THE C SERIES HAS MOVED ON TO THE NEXT PHASE OF ITS LIFE.”

But, I'd also hazard a guess that the moment was bittersweet.

As clear as the new name painted on its fuselage, the C Series has moved on to the next phase of its life.

When I interviewed Rob Dewar, then vice-president of the C Series program, for the September/October 2016 edition of *Skies*, he told me his faith in the aircraft had never been shaken, despite the bumpy road to market.

First assigned to the program in 2004, Dewar oversaw the clean-sheet aircraft's design, development, engineering and supply chain operations. The C Series had consumed more than a third of his aerospace career at that point.

“I just really believed in the market and I believed in the product,” he said at the time. “I knew that once we got the aircraft

C Series from relative obscurity. In lending its name and marketing expertise to the program, Airbus was able to instill a sense of stability that seems to have reassured buyers.

Indeed, just before Farnborough, JetBlue announced a firm order for 60 A220-300 aircraft, with options for 60 more. At the airshow, an unidentified U.S. airline start-up announced a commitment to a further 60 Airbus A220-300 aircraft.

At the official renaming ceremony for the A220 family on July 10, Guillaume Faury, Airbus president of Commercial Aircraft, acknowledged the jet's heritage.

“I pay tribute to all the women and men at Bombardier and the supply chain who have strived over the past years to bring this fantastic aircraft to the world. The A220 now enters a new phase in its career with all Airbus's resources behind it to

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Column

IN THE JUMPSEAT
BY MARK MORABITO

Mark J. Morabito is executive chairman of Vancouver-based Canada Jetlines.



The ingredients of a genuine ULCC for Canada

There have been a lot of headlines lately about ultra-low-cost carriers (ULCCs) finally coming to Canada. As the only G7 country without one and with Canadians paying some of the highest airfares in the world, this enthusiasm is understandable. However, the question remains whether we have yet to see a genuine ULCC enter the Canadian marketplace.

Let's take a broad look at the ingredients that have made ULCCs work worldwide.

Since their emergence 20 years ago, ULCCs have moved from the periphery to become significant players in the airline industry. In 2016, according to *Airline*

seat is occupied or not.

Canada's two major airlines, which control over 90 per cent of the domestic market, have relatively high metrics. Air Canada reported a CASM of 16.4 cents per passenger and WestJet reported 14.15 cents in the first quarter of 2018. By comparison, U.S.-based ULCCs Spirit Airlines and Allegiant Air reported CASMs in the neighbourhood of 12 cents (CDN) during the same period.

What separates these lower cost airlines from legacy carriers are a few key ingredients, which also provide a litmus test for assessing Canada's emerging

expects to welcome one million passengers a year by 2020.

Currently, the Canadian landscape shows deviations from the ULCC model, as evidenced by the types of aircraft employed and challenges faced in reducing operating costs.

Both Swoop and Flair have unionized pilots and crews, which may ultimately make it difficult to keep costs down.

Meanwhile, Flair faces a double challenge. On the one hand, it is operating an aging Boeing 737-400 series fleet, with an average age of 25 years. Additionally, Flair deviates from the ULCC model by flying out of some higher-cost airports, including Toronto's Pearson International Airport and Vancouver International Airport.

For Canadians looking for affordable airfares, there is still light at the end of the runway. Vancouver-based Canada Jetlines has been working tirelessly to line up the right ingredients for a successful ULCC, following a proven model.

We have finalized our leasing agreement for two Airbus A320s, which are the most-used aircraft by ULCCs worldwide. These sister aircraft are 12 years old and were previously flown by Air New Zealand, which consistently ranks as one of the world's safest airlines.

In addition, we have established partnerships with airports in Abbotsford, Hamilton and Halifax, which serve large populations but charge 20 per cent less than those in Toronto and Vancouver.

We have also recruited a new CEO, Lukas Johnson, who helped Allegiant Air increase its annual revenue per plane by over 30 per cent while in charge of commercial functions. Finally, our incoming chief commercial officer, Javier Suarez, has fantastic experience at ULCCs Vueling and VivaAerobus.

Although we might not be the first off the tarmac, Canada Jetlines will be the first genuine ULCC and will finally bring affordable airfares to Canadians over the long haul. ■

“NO-FRILLS AIRLINES HAVE BEEN SO SUCCESSFUL, BOTH COMMERCIALY AND FOR INVESTORS, BECAUSE THEY HAVE FOLLOWED A SPECIFIC BUSINESS MODEL.”

Weekly, three of the world's four most profitable carriers were ULCCs. These no-frills airlines have been so successful, both commercially and for investors, because they have followed a specific business model.

At its core, this model is about delivering quality air travel at a low price and in a way that also keeps costs down, so that the business is profitable and sustainable. The key measure to track is the operating cost per available seat mile. Known as CASM, this industry standard identifies how much an airline spends to fly a single seat per mile, whether that

ULCC landscape: flying one type of efficient aircraft; offering one class of unbundled fares; the use of lower-cost airports; committing to cost discipline throughout all operations; and managing labour costs.

With respect to new ULCCs coming to Canada, the focus on secondary airports has been a priority. It is not a coincidence that Hamilton's John C. Munro International Airport was Canada's fastest-growing airport by passenger volume in 2017. On the West Coast, Abbotsford International Airport is currently undergoing a major expansion to accommodate ULCCs, as it

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Column

VIEW FROM THE HILL
BY KEN POLE

Ken Pole has had a life-long passion for aerospace, writing about all its aspects for nearly 40 years. The longest-serving continuous member of the Canadian Parliamentary Press Gallery, he's also an avid sailor.



Bright idea: The government is finally cracking down on laser loonies

The number of aircraft reportedly targeted by hand-held lasers in Canada continues to decline from a 2015 peak of 590. But, this particular display of “you can’t fix stupid” remains an issue, not only for the flying community but also for law enforcement and the federal government.

Hence Transport Minister Marc Garneau’s confirmation this summer that he was using a ministerial interim order, provided for in Section 6.41(1) of the *Aeronautics Act*, to prohibit anyone from carrying a laser of more than one milliwatt capacity (typically powered by one or two AA batteries) outside their residence. The only exception would be for specific

“only” 63 strikes had been reported, although six were logged at YUL in just two days in February.

Nitwits in Quebec, Ontario and British Columbia have been the most persistent over the years. That’s perhaps reflective of air traffic density, but that’s no excuse.

The Northwest Territories is the only jurisdiction in which no incidents have been reported since 2012. So far this year, the two other northern territories, the four Atlantic provinces and Saskatchewan have been incident-free.

While there are no documented accidents attributed to laser-induced vision problems in Canada, Garneau stressed the danger.

possibility of on-the-spot fines of up to \$5,000 for individuals or, in the unlikely case of a company doing, say, laser-based survey work, up to \$25,000.

Currently, conviction under the *Aeronautics Act* on a charge of deliberately targeting an aircraft can result in a five-year prison term, a fine of up to \$100,000, or both.

It’s to be hoped that if a case is prosecuted successfully, the court will see fit to deal with it appropriately—possibly as severely as it would if a firearm had been discharged. Some might argue that’s using a hammer to swat a fly, but a precedent would be helpful.

The Air Canada Pilots Association would like to see hand-held lasers added to the government’s list of prohibited weapons, which already includes certain firearms, gravity or switchblade knives, brass knuckles, etc. That would enable police and Canada Border Services Agency officers to seize them.

(I’m referring here to low-powered hand-held lasers, which can be purchased at the neighbourhood dollar store. The sale or importation of their high-powered siblings [five milliwatts or more] is prohibited under the *Canada Consumer Product Safety Act*.)

That said, I’m sure the devices will find their way across the border from the U.S., where they are perfectly legal under federal law as long as the laser complies with labelling, safety features, quality control and is not advertised as a “pointer.” Sure.

Just how damaging can lasers be? Well, while I’ve been raving on about little hand-helds, Raytheon Company is developing a 100-kilowatt demonstration weapon for the U.S. Army. Estimated to use US\$30 worth of power for each single “shot,” it’s designed to take down rockets, artillery rounds and unmanned aerial systems.

Now there’s something to consider when deciding how to tackle “drones” around airports. Just kidding. Maybe. ☒

“EVEN A SPLIT-SECOND INTRUSION INTO A FLIGHT CAN DISTRACT OR BLIND PILOTS AT THE MOST CRITICAL TIMES OF TAKEOFF OR LANDING.”

purposes related to work or education.

Effective immediately and formally sanctioned by cabinet, the prohibition applies in the greater municipalities of Vancouver, Toronto and Montreal, as well as within 10 kilometres of any airport or heliport.

Until that 2015 peak, the incidence of laser strikes had been steadily rising from 333 in 2012, to 469 in 2013, and 474 in 2014. The number slipped to 517 in 2016, most likely thanks to a Transport Canada publicity blitz, but there were still 379 in 2017.

“The education is working, but it’s not working fast enough,” Garneau acknowledged to reporters at Montreal-Trudeau airport (YUL).

However, by the end of April 2018,

Even a split-second intrusion into a flight can distract or blind pilots at the most critical times of takeoff or landing. It leaves little, if any, time for a co-pilot—if there is one—to react.

And temporary “flash blindness” can take a pilot out of commission for an extended period, at an unwarranted cost to his or her employer and to our health care system. Then, there is psychological damage to consider.

Unfortunately, the physically unobtrusive nature of the hardware might mean that catching someone in the act could rely on the luck of having a civilian complainant or a police officer in the right place at the right time.

Accordingly, the new measures announced by Garneau include the



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Column

FOCAL POINTS BY TONY KERN

Editor of the *Controlling Pilot Error* series, Tony Kern is one of the world's leading authorities on human factors training in aviation. A former lieutenant colonel in the U.S. Air Force (USAF), he served as chief of cockpit resource management plans and programs at the USAF Air Education and Training Command. He is author of three bestselling aviation books: *Redefining Airmanship*; *Flight Discipline*; and *Darker Shades of Blue: The Rogue Pilot*, all from McGraw-Hill.



Menteeship: the real key to successful onboarding



Let me get this off my chest right up front. I hate the term “mentee;” it reminds me of a large aquatic mammal I’ve caught rare glimpses of in Florida’s mangrove canals. I much prefer “protégé” or even “Padawan learner,” but since the regulators seem to like mentee, I guess we are all stuck with it.

Whatever we call these millennial and Generation Z new hires to whom we are handing our industry, I think we are missing a critical point in our discussions about mentorship and the passing of the torch. It’s about them, not us.

Let me begin with a bit of wisdom from my first mentor in this industry, a crusty old Air Force major who was my instructor pilot at undergraduate training in 1981. One week into our flight line training, he began our first simulator pre-brief with a simple statement I have never forgotten: “It’s not my job to teach you how to fly. It’s your job to learn.”

With those 15 words, he set our relationship—and my entire career—on the proper path. Some might take his statement the wrong way, thinking this seasoned veteran was lazy, uncaring, or both. I quickly learned that nothing could be further from the truth.

Maj Wise (yes, that was his real name) knew that true mentorship is about activating and engaging the learner in his or her own development.

While other younger instructors were debriefing their students from flight notes, observations, and offering personal techniques for improvement, he began every debrief with long, awkward periods of silence, followed with the same question: “Well, Tony, what did we learn today?”

In this manner, he allowed me—better said, forced me—to be an active participant in my own professional development. Our mentor-mentee relationship was not one-sided wisdom from the expert sage, it was based on my obvious naiveté and sincere desire to improve, which are two critical forces for learning.

I quickly learned, and freely admitted, what I didn’t know. He identified my knowledge and skill gaps. My learning and

acceptance curve for what he would share with me during these sessions was nearly vertical. His most lasting impact was not teaching me how to fly, but rather how to learn from others. In a word: menteeship.

Most modern mentorship programs don’t leverage this powerful insight. If you Google “attributes of a good mentor” you will see well over 15 million links. While I haven’t had a chance to look at all of them, I would hazard a guess that few would share Wise’s menteeship approach. In his view, mentorship was not about transferring wisdom or knowledge as much as it was about developing my ability and desire to continuously pursue improvement.

Nearly every new hire coming into our industry wants to do well, and traditional top-down mentorship is still important. But, if we do one thing to make this new professional thrive, it should be teaching them that they are responsible for their own professional development, and that we (and others) will be there to assist them at every waypoint along the journey.

Wisdom is not free; it is earned. It is better pulled, and not pushed.

New pilots, technicians, dispatchers, and support personnel want to succeed. The best way we can help them is to put the expectation for their professional development on them from the start.

We need to be there for them, but we must resist the traditional, “Here’s what you need to know, kid.” That’s a one-way transmit mode that is difficult enough across any age divide, but even more so given the communications challenges we face with millennials and Gen Z.

Wise left me with a simple 10-word, 20-letter insight I have never forgotten.

“If it is to be, it is up to me.” 📌

“TRUE MENTORSHIP IS ABOUT ACTIVATING AND ENGAGING THE LEARNER IN HIS OR HER OWN DEVELOPMENT.”

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In most airplanes, you have the yoke in the middle; it can be very confining. We had a long trip, about five hours and 45 minutes, and I remember that trip, in the cockpit, I was able to cross my legs. I looked over at the other pilot and said 'Boy, this is nice. When was the last time you were able to cross your legs in the cockpit?' And you're able to do that in the Legacy 500.

The passengers are really taken aback, especially on takeoff. And they're shocked at how quickly we get to altitude and also how steep of a climb we're doing. They're really impressed by that. They're like 'Wow, that's pretty amazing.'



- Brad Knaack, Legacy 500 Pilot
Watch Brad's story and request more information at
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AVIATION INDUSTRY NEWS



WestJet grapples with growth



Expansion to a variety of markets has necessitated a move away from WestJet's original, simple business model. **Michael Durning Photo**



Brent Jang
Airline News

WestJet Airlines Ltd. has steadily expanded since being founded in 1996, and with its growth, the carrier's corporate culture has undergone a shakeup.

WestJet pilots voted to join the Air Line Pilots Association (ALPA) in May 2017.

In April 2018, the two sides remained far apart at the negotiating table. One month later, ALPA announced that WestJet pilots authorized a strike, setting the stage for a walkout as early as the day after the May long weekend.

Robert Kerton, an economics professor at the University of Waterloo, recalls how uncertainty in the spring about WestJet's flight schedule influenced his own travel plans. He said he needed to attend a May conference in Florida, and opted to fly Air Canada at a higher price, rather than taking a chance that his flight might be cancelled due to labour strife.

In late May, WestJet and ALPA reached a deal, agreeing to a settlement process via the federal mediation and conciliation service.

Kerton said the frosty relations between management and pilots during the contract talks underscore WestJet's transition from

a laid-back company in 1996 to a large organization in 2018.

He pointed to the dominance of Air Canada and WestJet on major routes, though players such as Porter Airlines Inc. have managed to carve out a niche regionally.

But nationally, "there is a duopoly in Canada," said Kerton.

In WestJet's world, employees are called WestJetters or "people," while passengers are referred to as "guests."

WestJet's growth, however, has resulted in the emergence of more formal management systems compared with the past. "You need to have some

organizational consistency, which prevents you from being agile,” said Kerton.

Clive Beddoe, a co-founder of WestJet, is chairman of the carrier’s board of directors. The 12-member board includes Brad Armitage, chairman of the WestJet Employee Association, an entity that represents non-union staffers.

Kerton said having a director who represents employees remains a good idea at WestJet, though the push for greater efficiency has eroded the airline’s traditionally strong customer focus.

When WestJet started out in its early years, it modelled itself after Southwest Airlines Co. in the United States, including operating a single aircraft type: the Boeing 737.

WestJet now deploys different aircraft types, notably Bombardier Q400 turboprops at its regional Encore operation, and WestJet’s ultra-low-cost carrier, Swoop, flies Boeing 737-800s.

“WestJet has really evolved away from the Southwest model and having a standard, single fleet type,” said Geoff Malleck, a lecturer at the University of Waterloo and a founding director at Research Entrepreneurs Accelerating Prosperity.

“WestJet has moved closer to an Air Canada model” with international routes and different aircraft for various missions, from short to long haul, he said.

“WestJet’s original model was really simple, and it’s moved quite far away, but frankly, that is the reality of the business and diversifying to serve multiple market segments,” said Malleck.

Ed Sims replaced Gregg Saretsky as WestJet’s chief executive officer in March 2018.

In an internal message to staff in mid-May, Sims acknowledged that the gulf needed to be bridged between management and unionized pilots.

“I am not, contrary to what some may believe, anti-union. I have found some of them quite rational and [they] can be good partners. I am however, very pro-company,” said Sims.

Both Air Canada and WestJet face continuing challenges in operating domestically, with most of Canada’s population spread out and residing relatively close to the Canada-U.S. border.

Air Canada went through its own labour turbulence seven years ago, and now WestJet is getting a taste of unrest from quarters that were quiet in the past.

Last year, WestJet pilots became the first group of employees to join a union at the Calgary-based airline.

In June 2018, the Canadian Union of Public Employees (CUPE) claimed that the time is ripe to organize WestJet’s flight attendants, and accused management of

“ramping up anti-union activities.”

One month later, WestJet announced that CUPE applied for certification to represent the cabin crew, adding that the carrier respected the decision, even though it preferred the non-union climate of the past.

Malleck said the labour pains are understandable, given how WestJet has shifted into a large, sophisticated airline, compared with its humble roots with three planes back in 1996.

Sims emphasizes that the stakes are high, having personally witnessed the shutdown of Melbourne-based Ansett, a carrier in Australia that folded shortly after the terror attacks on New York on Sept. 11, 2001.

“The union had put their arms so tightly around us; we fell into the abyss together. Two weeks later, just after the unforeseeable events of 9/11, Ansett went under after 66 years of flying. Everyone lost their jobs,” said Sims.

“I will never forget those days and those colleagues. I also vowed to carry an obligation to preserve the interest of every employee in everything I did, everywhere I worked.”

Sims notes that he has nearly two decades of experience in dealing with bargaining agents, and pledges to take WestJet to the next level: “I came to Canada with a very clear ambition to grow WestJet to become a world-class, international carrier, in every sense.” ✦

First Air and Canadian North plan merger

On July 6, 2018, Makivik Corporation (Makivik) and the Inuvialuit Corporate Group (ICG) announced the signing of an agreement in principle to merge First Air and Canadian North.

Makivik initiated the discussion under the direction of its president, Charlie Watt, Sr.

Following the execution of definitive agreements and the receipt of applicable regulatory approvals, the proposed Pan-Arctic airline will operate under the name “Canadian North” and its aircraft will feature First Air livery, including its Inukshuk logo.

Headquarters for the proposed airline will be located in Ottawa. Both Makivik and the Inuvialuit Development Corporation (IDC) recognize the potential in the northern and Alberta markets, and remain committed to supporting and growing the Alberta presence.

The parties expect to complete the merger by the end of 2018.

Makivik said the combined airline will offer customers greater reliability, better on-time service and fewer interruptions. “Air service is not a luxury for northerners; it is a vital lifeline which requires ongoing investment,” said Patrick Gruben, IDC chair.

“We are proud of Canadian North’s tremendous success while fulfilling its

mandate to provide safe, stable air service to customers in Canada’s northern regions, and we look forward to further improving these services in partnership with Makivik Corporation.”

“The world is changing and we need to adapt to new realities,” added Charlie Watt, Sr. “This is one way to assert our sovereignty across the Arctic.”

A report commissioned by the Government of Nunavut supports the need for more efficiency in the territory’s air transportation services. A merger of First Air and Canadian North is seen as the only viable way to both meet and exceed the essential needs of Nunavummiut and all northerners.

Customers of First Air and Canadian

North will not see changes to services, including fares and scheduling, while Makivik works toward achieving regulatory approval and finalizing the merger.

Both parties are committed to keeping customers up-to-date on all developments related to scheduled and commercial flights on an ongoing basis.

“By merging these airlines we look forward to new economic opportunities in Canada and internationally, and to better air services for Inuit across the circumpolar region,” said Makivik in a statement.

“In the meantime, both First Air and Canadian North will continue providing northerners with access to safe, friendly and reliable air travel services across the Arctic.” ✦

First Air and Canadian North will maintain status quo operations while the merger is finalized. The new airline’s livery will be adopted from First Air, shown here. **First Air Photo**



Swoop takes off

WestJet's ultra-low-cost carrier is off and running. This summer will be a proving ground for the company, and for the ULCC model in Canada.



Ben Forrest

Airline News

Swoop president and CEO Steven Greenway paused briefly at the podium at John C. Munro Hamilton International Airport, gathered himself, and made a joke. His approach had been met with cheering and enthusiastic applause, much of it likely from the team of eager “Swoopsters” on hand to launch WestJet’s new ultra-low-cost airline on June 19.

“I’m actually standing here in a bit of shock,” said Greenway, dressed in blue jeans, a black jacket and a bright pink Swoop t-shirt that echoed the airline’s pink-and-white logo and livery.

“I didn’t expect this,” he said. “I feel like a bit of a rock star, but I can’t sing.”

His casual approach, sprinkled with self-effacing humour, was in keeping with the tone of the day, and with the preliminary branding of an airline that hopes to shake up Canadian travel.

“The mission statement for Swoop is to make air travel easy, accessible and affordable,” said Greenway. “We believe that we’re at the start of a tipping point here.

“Just as WestJet, 22 years ago, revolutionized air travel in Canada, we

too believe it is our time—it is Swoop’s time—to revolutionize travel in Canada.”

FRIENDLY, AFFORDABLE AND FUN

Swoop is the kind of airline that will add a hashtag to the official name of its first aircraft—literally, #Hamilton and #Abbotsford—as a nod to two of its launch markets.

It is the kind of company that jokes in promotional material that passengers must be a certain height to fly, then admits it was a ruse.

“Extra tall, super short, or statistically average—we LOVE you all! #FlySwoop,” read a banner in the passenger terminal at Swoop’s media launch.

Fun, inclusive, social media-savvy and affordable—that’s the Swoop brand, in a nutshell.

And starting with its inaugural flight from Hamilton to Abbotsford, B.C., at 5:45 a.m. on June 20, it may be a solid indicator of the demand for ultra-low-cost air travel in Canada.

“I think there’s a huge appetite,” said Greenway in an interview with *Skies*.

“When I go around this countryside, I hear things from potential customers and people at the bars and whatever the case may be, saying: ‘I wish I could travel more.’”

MARKET POTENTIAL

Swoop’s target market is people who might fly instead of driving a car or catching the bus. It’s people who can only afford one flight a year, but who can now afford two or three. It’s Canadians who cross the border to fly out of the United States.

“I think just those three markets alone is a huge opportunity for us,” said Greenway.

“And then there’s just natural stimulation in the market, in terms of just stimulating new travel patterns, new destinations, and people going for—as an example, long weekends.

“Where it was prohibitive before, they can now go with their mates to Vegas for the long weekend for three days, and it’s cost-effective.”

OTHER PLAYERS

Swoop bills itself as the first Canadian ultra-low-cost carrier (ULCC) in a market that could soon have many.

NewLeaf Travel Co., a low-cost option that launched in 2016, was technically a ticket reseller and not an airline.

Flair Airlines, which acquired NewLeaf in 2017, said this year it is adapting the ULCC model to Canada, but had previously backed away from the ULCC label.

Other potential players include Canada

Swoop’s maiden flight touches down in Abbotsford, B.C., on June 20. The WestJet subsidiary bills itself as Canada’s first ultra-low-cost carrier (ULCC). **Mike Luedey Photo**





Swoop aircraft are configured for 189 seats, with seat pitch that ranges from 33 inches to 29 inches. **Ben Forrest Photo**



Swoop president and CEO Steven Greenway, right, stands with Cathie Puckering, CEO of John C. Munro Hamilton International Airport, and Hamilton Mayor Fred Eisenberger at the Swoop media launch. **Ben Forrest Photo**



A large crowd of media, dignitaries and other guests had the chance to tour Swoop's first aircraft in Hamilton, ahead of its inaugural flight. **Ben Forrest Photo**

Jetlines, which cancelled plans to launch in June 2018 but said it expects delivery of two leased Airbus A320 aircraft in the first half of next year; and FlyToo, an initiative of Calgary-based Enerjet that has not announced a launch date.

With one-way base fares as low as \$49 and add-on fees for carry-on luggage and checked bags, Swoop is piloting a model other contenders are eager to employ.

"We are shamelessly unbundled," said Greenway. "That is, that you purchase a seat and then you create the travel experience around you.

"And we think that through this, Canadians will actually get used to the experience very quickly.

"It happens everywhere else in the world; Canada's a bit behind in terms of what we're seeing in the rest of the world."

STARTING A REVOLUTION

Swoop had just two Boeing 737-800 aircraft as of its launch date, both of which are based at the Hamilton airport. A third aircraft was added on July 24, serving the Edmonton-Abbotsford market.

The airline plans to have six planes by the end of 2018 and 10 by the middle of 2019, said Greenway.

All will be Boeing 737-800s and all are from the WestJet fleet, with an average age of two-and-a-half years, he said.

Swoop aircraft are configured for 189 passengers and seat pitch varies from 33 inches at the bulkheads down to 29 inches.

Initial destinations include Edmonton, Halifax, Winnipeg, Hamilton and Abbotsford, but Swoop's winter schedule will "hopefully include some international destinations," said Greenway.

"This is the start of what I think is a travel revolution ... to get Canadians flying more, to see their beautiful country," he said.

"But also to go overseas and explore the world in a more economical way.

PILOTS

The question of who will fly for Swoop was a sticking point in contract negotiations between WestJet and the union representing its pilots, but an interim arbitration in June indicated WestJet pilots would be allowed to fly Swoop aircraft.

They will be paid a competitive wage, but less than the wage given to WestJet pilots, said Greenway.

"It is less, but the flying is different," he added. "So for us it's out and back, which is very attractive.

"It's a lifestyle choice for a lot of pilots, those who want to leave for work in the morning and come back in the afternoon, rather than being punted around the countryside ...

"It's a different lifestyle, and that needs to be balanced out with the paying conditions that we offer."

SECONDARY AIRPORTS

Like other ULCCs, Swoop is targeting secondary airports rather than larger centres, an arrangement that could be a boon for smaller markets.

John C. Munro airport in Hamilton is hoping ULCCs will help further the momentum that made it Canada's fastest-growing airport in 2017.

"To the customers and the passengers that have waited so long for this in Hamilton, we want to thank you for that support," said Cathie Puckering, CEO of the Hamilton airport, in a speech at the Swoop launch.

"You will provide to the passengers opportunities and choice, not only to Hamilton but expanding into the GTA, Niagara, and again, across the border.

"Let's bring those four to five million people home."

On June 25, Swoop announced Edmonton as its second base, a move that is expected to create around 90 jobs in the region. As of July 25, the airline planned to offer three daily flights between Edmonton and Abbotsford, stimulating the market between Western provinces.

In a few months, when Swoop has four aircraft based in Hamilton, its employees in that city will number just short of 200, said Greenway.

"That doesn't include ground handlers, it doesn't include all the support staff—the staff here at Hamilton airport—either," he added.

"So just with four aircraft, you can see the economic impact that we will have on the Hamilton region."

READY TO GROW

Near the end of his remarks at Swoop's media launch in Hamilton, Greenway paraphrased the title of a protest song by the Australian group Paul Kelly & The Messengers.

"Of little things, big things grow," said Greenway, who is also Australian.

"Today, Swoop only has two aircraft. We are small; compared to our competitors, we are very small.

"But I'd like to think that when you reflect back in five years' time, 10 years' time—perhaps not even that long—you reflect back and you reflect back to the fact that Swoop was only two aircraft.

"And who knows what we'll be in a couple of years' time and how many million people we have carried safely across this country, and also overseas?"

"But we need to start somewhere, and today is where we're going to start." ✨

Textron debuts full-scale Denali mockup at Oshkosh

Textron Aviation Inc. unveiled a new full-scale Cessna Denali mockup at EAA AirVenture 2018 in Oshkosh, Wis.

The mockup features a complete cockpit with functioning avionics, fully updated interior and the McCauley 105-inch diameter composite, five-blade, constant speed propeller.

Textron said the turboprop features the widest cabin cross-section in the segment, providing passengers with additional head and shoulder room—and more room for cargo and baggage.

The Denali also features larger seats and windows, as well as a modular refreshment centre and an aft-located lavatory. The cabin can be transformed from an executive configuration to a combi layout for both passengers and cargo.

“The mockup presents the first opportunity for customers to experience the full power of the Denali cockpit—one that revolutionizes the single-engine turboprop segment,” said Rob Scholl, senior vice-president, Sales and Marketing at Textron.

“The Catalyst engine, developed by GE Aviation, is the segment’s first powerplant with FADEC (Full Authority Digital Engine Control), equipping pilots with a digitally optimized single-lever engine and propeller control for ease of handling in flight. The Garmin G3000 flight deck modernizes turboprop avionics and significantly reduces pilot workload with dual touchscreen controllers and automatic speech recognition (ASR) technology, enabling pilots to easily perform common tasks and manage the flight deck.”

The Cessna Denali program is on schedule, with Textron anticipating the first wing mate and completion of the prototype airframe as the aircraft nears first flight in early 2019. ✈️

The Denali’s Garmin G3000 flight deck reduces pilot workload with dual touchscreen controllers and automatic speech recognition technology. **Textron Image**



Gulfstream G500 earns FAA type and production certificates



The G500 is the first clean-sheet Gulfstream aircraft to achieve type certification using Gulfstream’s FAA Organizational Designation Authorization. **Gulfstream Photo**

Gulfstream Aerospace Corp. announced on July 20 that its clean-sheet G500 business jet has received its type certification and production certificate from the U.S. Federal Aviation Administration (FAA). These certifications pave the way for the first G500 delivery to a customer as planned later this year.

“Receiving the type certification and production certificate on the same day speaks to the rigour inherent in the G500 program and the commitment to excellence of the entire Gulfstream team,” said Mark Burns, president, Gulfstream.

“The tens of thousands of lab hours combined with the more than 5,000 hours we’ve flown the five G500 flight-test aircraft will help ensure we deliver a high-performing, reliable, mature aircraft to customers. We’re excited to conclude the type certification effort, complete the production-certificate audit and move on to the next phase of this program: delivering aircraft. We appreciate the FAA’s diligence and cooperation in certifying this aircraft and confirming the capabilities of our new manufacturing facilities. We look forward to seeing the G500 in our customers’ hangars soon.”

The FAA type certification verifies the airworthiness of the aircraft’s design, while the production certificate confirms that the company’s production processes comply with federal aviation regulations. The G500 is the first clean-sheet Gulfstream aircraft to receive its type and production certificates on the same day.

During the G500 certification program, Gulfstream demonstrated even better performance for the aircraft, including a takeoff distance of just 5,200 feet, 200 feet less than originally projected. Expected to fly 5,000 nautical miles at its long-range cruise speed of Mach 0.85, the certified G500 can actually fly 5,200 nautical miles.

Gulfstream is the first original equipment manufacturer in business aviation to offer active control sidesticks, 10 touchscreens in the flight deck and a third-generation enhanced vision system, optimizing pilot awareness in low visibility. The award-winning Symmetry Flight Deck also includes Synthetic Vision-Primary Flight Display and Head-Up Display II.

The G500 is the first aircraft certified to use enhanced vision to land and the first business aircraft certified to Stage 5 noise standards. ✈️





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Kate Latis stands with her fellow co-founders Donald Wheaton, left, and Gray Norman. BizAv YTI Photo



Ben Forrest
Business Aviation News

Soon after she graduated from Western University's four-year Commercial Aviation Management program, Kate Latis saw a Facebook post about a job opening at Aurora Jet Partners, an Edmonton-based private jet management company.

Her dream at the time, based on her understanding of available careers in aviation, was to work in crew scheduling and flight operations at an airline. She didn't even know business aviation was an option. But she applied, got the job, and quickly fell in love with the industry.

"I am incredibly passionate about what I do," said Latis, 25, an administrative assistant with Aurora Jet Partners. "It's a merit-based industry, so your ambition sets the pace for your career."

"You don't have to work through seniority ranks. If you've got the drive and the determination, business aviation is the place for you to excel."

Business aviation's relatively low profile, along with a shortage of pilots, aircraft maintenance engineers and other professionals, prompted Latis and two colleagues to spread the word.

Along with Gray Norman, a regional sales associate with Textron Aviation, and Donald Wheaton, aviation finance director for the

General Bank of Canada, she co-founded the BizAv Young Talent Initiative (BizAv YTI) to attract more young people to the industry and help them network.

"What a lot of us have noticed—young professionals in the industry—is that we stumbled upon our jobs by complete chance," said Latis. "We didn't know this side of the industry existed."

Within a few months, the team of three grew to a team of six, with the addition of Alex Hummer, a sales and marketing executive for Edmonton Shell Aerocentre; Taylor Davis, an associate at the Bennett Jones law firm; and Alethia Forsberg, a first officer on the Embraer Phenom 100 at Aurora Jet Partners.

BizAv YTI is officially backed by the Canadian Business Aviation Association (CBAA) and launched June 14, 2018, at the CBAA Convention and Exhibition in Waterloo, Ont. The group is inspired in part by Young Professionals in Business Aviation (YoPro), a similar organization from the U.S. National Business Aviation Association.

"We want to raise awareness in flight schools and post-secondary institutions," said Latis. "And we're not just limited to pilots. We want to reach out to maintenance engineers, even business schools, marketing, communications. There are needs for everything—even lawyers and accountants—in our industry."

BizAv YTI's six-member executive is based in Alberta and is planning presentations in Edmonton and Calgary this fall, she said. Networking events will follow, along with more presentations in other provinces as early as the spring of 2019.

"This is run entirely by volunteers who do have full-time jobs in the industry," said Latis. "So the expansion and the rate at which we grow is kind of dependent on the help we can get. But the team of young professionals in business aviation is fantastic. Everyone's very supportive."

Business aviation is feeling the effects of an industry-wide labour shortage that sees many employees leave for airlines grappling with their own staffing issues, according to Latis.

In an attempt to promote this side of the industry and the career opportunities available for young professionals, the BizAv YTI team is starting two projects on its social media accounts.

Talent Tuesdays will feature weekly interviews with young professionals in business aviation, sharing more about their careers on the business/operations side of the industry.

Flight Crew Fridays will feature similar interviews with young business aviation captains and first officers across Canada.

Follow the group on Twitter and Instagram @BizAvYTI, or find them on Facebook. ✂

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Coulson retardant system available on new FireHerc

Coulson Aviation's Retardant Aerial Delivery System (RADS) will be available as a pre-installed option on Lockheed Martin's new C-130 model, the LM-100J FireHerc.

The LM-100J FireHerc is a variant of the C-130J Super Hercules, but made for the civilian aerial firefighting market. It is designed for use in wildfire situations, able to withstand the incessant turbulence of flying over them, and outfitted with specialty avionics.

Coulson Aviation's RADS represents the best value and highest capacity C-130 retardant delivery system in the world.

Below the tank, installed into the bottom of the fuselage, is a set of doors. These doors are computer controlled and can be adjusted with extreme precision in order to carefully guide the flow of fire retardant out of the tank. The resulting drop pattern allows a much better and more consistent coverage level of fire retardant on the ground, even when dropped from higher altitudes.

The better the coverage level, the less likely a fire will be able to burn the vegetation blanketed by the retardant. The high flow rate also provides the flight crew with an increased level of safety since, if required, the airplane can release 36,000 pounds of fluid in less than two seconds.

If the system is selected by the customer, Lockheed Martin will carry out the RADS floor modification at its facility, in conjunction with Coulson. Once the permanent modification is complete, installation of the RADS tank takes only 30 minutes and it can be removed and reconfigured at will, returning the aircraft back to a standard configuration with no limitations.

"Coulson Aviation is proud to partner with Lockheed Martin in outfitting these incredible aircraft with the best retardant delivery system in the world," said Britton Coulson, vice-president of Aviation for the Coulson Group of companies. "To have another major OEM recognize our RADS-XXL system as having superior performance is a testament to our company's commitment to excellence." ❖

The LM-100J FireHerc performs at the 2018 Farnborough International Airshow, where it was unveiled. Buyers will be able to select Coulson Aviation's retardant delivery system as optional equipment. **Rich Cooper Photo**



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Eagle Copters announces first 407HP air medical conversion

Calgary-based Eagle Copters has completed the first air medical conversion of a Bell 407 to the Eagle 407HP. AirLife Denver and its Federal Aviation Administration (FAA) part 135 operator, Air Methods, partnered with Eagle Copters to bring increased performance

and reliability, especially in high altitude environments, to their fleet of helicopters. Part of HCA-HealthONE, AirLife Denver serves as the critical care air and ground transport for a system that includes eight hospitals, seven freestanding emergency departments, and a variety of additional

access points in the Denver metro area. AirLife has completed more than 62,000 missions over its 35 years of operation, logging more than 3,000 transports per year. The company's geographical location is ideal for proving the Eagle 407HP's ability to operate in hot and high conditions.

"Being the first air medical operator to configure to the Eagle 407HP is a significant milestone for AirLife, but more importantly for the communities and patients that we serve," said Brian Leonard, director of business development for AirLife Denver.

Boasting the latest in next generation technology, the Eagle 407HP features the Honeywell HTS900 engine with a dual centrifugal compressor, cooled turbine blades and nozzles, and a Dual Channel FADEC.

The Eagle 407HP has been proven in the utility market, accumulating over 6,000 hours across the deployed fleet of 18 aircraft.

The increased payload capacities, fuel savings, and performance in hot and high conditions are the result of combining the proven airframe of the Bell 407 and the HTS900 engine. ✦

AirLife Denver's geographical location is ideal for proving the Eagle 407HP's ability to operate in hot and high conditions. **Eagle Copters Photo**



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BlackFly is first Canadian-qualified all-electric ultralight PAV

In July, Opener Inc. revealed BlackFly—the world’s first ultralight all-electric fixed-wing extreme short/vertical takeoff and landing (ESTOL/VTOL) aircraft.

BlackFly is a single-seat personal aerial vehicle (PAV) designed and built for a new world of three-dimensional transportation.

The craft has simple controls and requires no special skills to master and operate safely. Though BlackFly has full amphibious capabilities, it is primarily designed to operate from small grassy areas and travel distances of up to 64 kilometres at a speed of 115 kilometres per hour.

“Opener is re-energizing the art of flight with a safe and affordable flying vehicle that can free its operators from the everyday restrictions of ground transportation,” said Marcus Leng, CEO.

“We will offer competitive pricing in an endeavour to democratize three-dimensional personal transportation. Safety has been our primary driving goal in the development of this new technology. BlackFly operators will be required to complete company-mandated vehicle familiarization and operator training. In Canada, ultralight pilot licences are also required.”

The Opener team has spent the last nine years in stealth mode, designing, developing, and testing new innovative technologies for the zero-emission BlackFly vehicles.

Fault-tolerant design and triple modular redundancy reside at the core of these vehicles. Eight propulsion systems, spread across two wings, provide for multiple-failure security. Years of continuous testing, combined with 1,000-plus flights and 10,000-plus miles flown, form the bedrock of Opener’s development program.

After working collaboratively with Transport Canada for several years, Opener received permission to operate BlackFly as a basic ultralight aircraft on July 6, 2018.

Opener hopes to continue to collaborate with Transport Canada to safely and progressively expand the use and operating profile of these uniquely capable vehicles.

The company’s long-term vision is to integrate BlackFly vehicles into a rural/urban commuting network. These networks would be powered by renewable energy sources requiring only a fraction of the transportation energy used currently.

“The future of aviation begins today,” said Alan Eustace, director at Opener

and former senior vice-president of knowledge at Google.

“The dream of flight, which was so difficult and expensive to obtain, will soon be within the reach of millions. Opener said it is putting the fun back into flying and opening up a new world of possibilities.” ✈



California-based Opener has spent the last nine years in stealth mode, designing, developing, and testing new innovative technologies for the zero-emission BlackFly vehicles. The vehicle’s first manned flight actually took place near Warkworth, Ont. **Opener Photo**



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Cyclone marks first operational deployment

On July 18, 2018, Canada's new maritime helicopter, the CH-148 Cyclone, departed Halifax, N.S., on its first operational deployment aboard Her Majesty's Canadian Ship (HMCS) Ville de Québec.

The ship will replace HMCS St. John's, joining Standing NATO Maritime Group 2 (SNMG2)—one of NATO's maritime immediate reaction forces—on its way to the Mediterranean Sea, as part of Op Reassurance in Central and Eastern Europe.

It's an important development for the Cyclone, the Royal Canadian Air Force (RCAF) and the Royal Canadian Navy (RCN).

The new helicopter is capable of a full range of missions, including anti-submarine and anti-surface warfare, search and rescue and utility missions, while conducting operations from RCN warships.

"This deployment marks an exciting period for the Royal Canadian Air Force



In this file photo, a CH-148 Cyclone helicopter prepares to land onboard HMCS Montreal in the Atlantic Ocean during a 2016 exercise. The Cyclone is now on its first operational deployment as part of Op Reassurance. **MCpl Jennifer Kusche Photo**

as we transition maritime helicopter operations to our new fleet of state-of-the-art, combat-capable CH-148 Cyclones," said LGen Al Meinzinger, commander of the RCAF.

"During this mission, the Cyclone will provide the necessary air power to HMCS Ville de Québec as it delivers on Canada and NATO's objectives for this operation. We

are proud to provide 'Wings for the Fleet.' "

As it brings the Cyclone into service, the RCAF is rapidly phasing out the CH-124 Sea King.

One of those 1960s-era maritime helicopters returned to Halifax in late July aboard HMCS St. John's. The conclusion of that mission marks the Sea King's last operational deployment on Op Reassurance. ✈️

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HELICOPTERS

CAE launches military helicopter sim

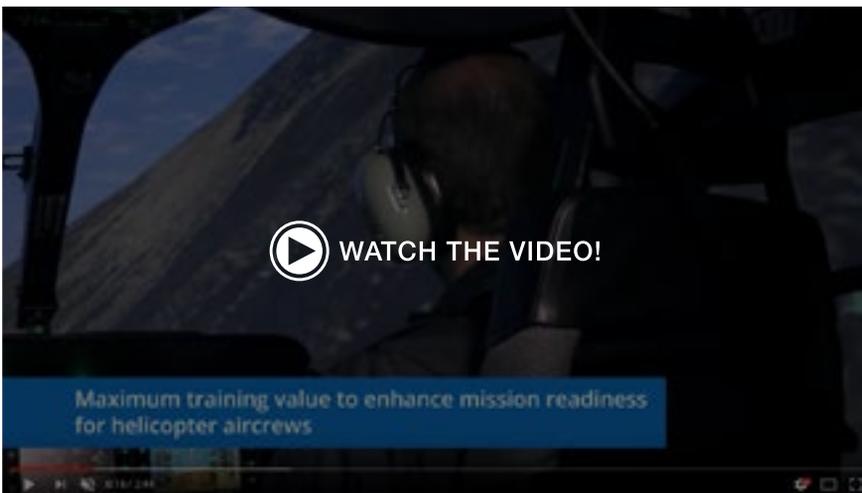


A spacious area behind the cockpit supports rear-crew training if desired, and the CAE 700MR FTD features an advanced instructor operator station with easy-to-use scenario development and editing capabilities. **CAE Photo**

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CAE has announced the launch of the CAE 700MR Series flight training device (FTD), a next-generation FTD designed specifically for military helicopter flight and mission training.

“We listened to our customers to design and develop a high-end flight training device that addresses the highest priorities for military helicopter mission training, such as a realistic tactical synthetic environment, extreme field-of-view visual system, and architecture designed for networking and interoperability,” said Gene Colabatistto, CAE’s group president, Defence and Security.

Through internal and customer research, CAE identified a market requirement for high-end, fixed-base helicopter FTDs. CAE won contracts in 2015 and 2016 to

provide two AW101 Merlin Mk4 FTDs for the Royal Navy and seven H135/H145 FTDs for the United Kingdom's Military Flying Training System (MFTS) program, all of which will be delivered during 2018 and 2019.

Development of these high-end helicopter FTDs led to the further development and refinement of the new CAE 700MR Series FTD.

The CAE 700MR offers an immersive, realistic and cost-effective simulator for military helicopter flight and mission training. It is based on the proven CAE 3000MR Series full-mission helicopter simulator, but features a fixed-base platform with dynamic seat for vibration and motion cueing.

Some of the key features included in the CAE 700MR Series FTD include an extreme field-of-view visual system with CAE Medallion-6000XR image generator to provide an immersive training experience; computer-generated forces software for realistic tactical synthetic environment; simulation architecture designed for distributed mission operations and integrated live-virtual-constructive (iLVC) training to facilitate networking and interoperability.

The FTD also supports Open Geospatial Consortium Common Database (OGC CDB) to enhance interoperable training and mission rehearsal capabilities, as well as military-specific mission training scenarios, such as ship deck landings, night vision goggle (NVG) training, and confined area landing training.

A spacious area behind the cockpit supports rear-crew training if desired, and the FTD features an advanced instructor operator station with easy-to-use scenario development and editing capabilities.

The CAE 700MR Series FTD is designed to meet or exceed global accreditation standards for helicopter flight simulation training devices (FSTD), such as the International Civil Aviation Organization (ICAO) Type IV and Federal Aviation Administration (FAA) FTD Level 7.

The CAE MR (Mission Reality) Series training equipment suite covers all phases of fixed-wing and rotary-wing training for military aircrews. The product suite ranges from CAE Simfinity ground school desktop and procedures trainers to fixed-based flight training devices and full-mission, full-motion simulators, such as the CAE 7000MR Series for fixed-wing platforms and CAE 3000MR Series for rotary-wing platforms. 

 If you would like to submit a press release or if you have a new product or service that you believe is newsworthy, please email our news editor at news@skiesmag.com.



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PlaneSPOTTING

◻ RIGHT: A Porter Airlines Bombardier Q400 aircraft passes over Lake Ontario, with the Toronto skyline as a backdrop. **John Chung Photo**

◻ BELOW: An Air Transat Airbus A330-342 flies over Montreal-Trudeau airport, showcasing its new livery. **Steve Latulippe Photo**

◻ BOTTOM: An Air Canada Rouge Boeing 767-300ER touches down at Montreal-Trudeau airport about 20 minutes after sunset in late June 2018. **William Filion Sauro Photo**





◊ ABOVE: **Rich Cooper** from the The Centre of Aviation Photography took this incredible air-to-air shot of an RCAF CC-177 Globemaster from 429 Squadron upon its arrival at the the Royal International Air Tattoo in Fairford, U.K.



◊ LEFT: An eye-catching Alpine Aviation DHC-2 Beaver climbs into the Yukon skies from Schwatka Lake. **Simon Blakesley Photo**

Looking UP

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DOWNLOAD THE WALLPAPER!

After a chaotic year, Airbus's A220 aircraft program—formerly the Bombardier C Series family—is showing signs of life, following a couple of significant orders for the A220-300 announced around the Farnborough Airshow.



Canada's success at the 2018 Farnborough International Airshow is a sign of general optimism in commercial aviation.

► **BY BEN FORREST | PHOTOS BY RICH COOPER**

As it launched into the blue, cloud-streaked sky over Farnborough International Airport in mid-July, the aircraft formerly known as Bombardier's C Series CS300 seemed to blend in as much as it stood out.

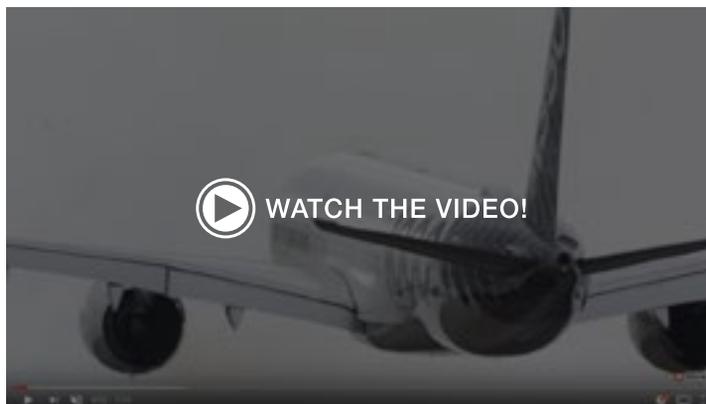
It was just days removed from a major rebrand, after Airbus' controlling stake in the C Series took effect on July 1, and the aircraft arrived at Farnborough in a simple, white-and-blue livery and with a new name painted on its side: Airbus A220-300. Appearances aside, the A220-

300's arrival at the Farnborough International Airshow (FIA), which ran July 16 to 22, may have been a turning point in the program.

After a chaotic year, punctuated with the threat of massive tariffs from the United States that threatened the future of the C Series and prompted the deal with Airbus, the program is showing signs of life.

Airbus announced a memorandum of understanding (MoU) at Farnborough to provide 60 A220-300 aircraft to a new start-up airline backed by JetBlue founder David Neeleman.

 **WATCH THE VIDEO!**



That deal followed on the heels of a similar agreement with JetBlue itself for 60 A220-300s, announced just prior to Farnborough, which bills itself as the world's largest airshow.

"After years of U.S. airline consolidation, the conditions are improving for a new generation of U.S. airline to emerge, focused on passenger service and satisfaction," said Neeleman in a news release.

"The A220 will enable us to serve thinner routes in comfort without compromising cost, especially on longer-range missions."

Deliveries to the start-up airline are set to begin in 2021, and JetBlue expects its first deliveries in 2020.

"This U.S. airline startup's decision for the A220 as the platform on which to launch their new business model is a testament to the passenger appeal and operating economics of this

NEW FOCUS

Bombardier used Farnborough to refocus on its business jet and regional airline offerings, making several announcements that may boost sales down the line.

The company revealed its Challenger 350 business jet has achieved Transport Canada steep approach certification, allowing operators to land at the steep 5.5 degree approach angle, and on the short runway at London City Airport.

Both European Aviation Safety Agency (EASA) and Federal Aviation Administration (FAA) steep approach certifications are expected this year.

Bombardier also unveiled its new Atmosphere cabin design for CRJ Series aircraft, in partnership with launch operator Delta Air Lines and supplier Zodiac Aerospace.

The company bills Atmosphere as a philos-

Canadian aerospace companies to the airshow.

Bains and his colleagues held meetings with leaders of aerospace companies based in Canada and around the world, according to a news release.

"I am proud to have had the opportunity to share with the world why Canada is a destination of choice for companies and investors in the aerospace industry," said Bains.

"Canada is a world leader in aerospace innovation, and we want to keep that enviable position."

CAE

Montreal-based CAE used Farnborough to launch the CAE 700MR Series flight training device (FTD), a next-generation platform designed specifically for military helicopter flight and mission training.



Industry confidence was high at Farnborough 2018. Deals were signed for more than 1,400 commercial aircraft, in addition to 1,432 engine orders.



Shark at the show: Embraer's E190-E2 'Profit Hunter' attracted a lot of attention with its unique paint scheme.



Bell is marketing its 505 commercial helicopter as a global low-cost military training solution.

outstanding aircraft," said Eric Schulz, chief commercial officer for Airbus.

This was not the tsunami of new orders Airbus may have hoped for, but it was certainly a wave worth catching, and perhaps a sign of things to come.

LOOKING UP

While the A220 orders were a major story for Canadian aerospace—Bombardier still has a 34 per cent stake in the program, and Investissement Quebec owns about 16 per cent—they were symptoms of general optimism at Farnborough.

It was a remarkably successful show for many of the major OEMs, with more than 1,400 orders and commitments announced.

Boeing says it won a total of 673 aircraft orders valued at nearly US\$100 billion.

Airbus confirmed agreements for 431 new commercial aircraft, although it did not disclose a corresponding value for those orders.

Embraer announced orders and commitments for 300 aircraft, valued at US\$15.3 billion, while Bombardier added just one firm order for four CRJ900 aircraft to Uganda National Airlines.

"Boeing led the way at Farnborough," said Dennis Muilenburg, the company's chairman, president and CEO.

"We will continue to win in the marketplace thanks to our talented team."

ophy as well as a design, aimed at delivering a higher level of passenger comfort, convenience and accessibility while ensuring maximum branding opportunities for airlines.

Its features include spacious overhead bins, the largest windows in its class, Internet connectivity, and an accessible lavatory for passengers with reduced mobility (PRM). The CRJ Series is the first and only regional aircraft to offer a PRM lavatory option, according to Bombardier.

At Farnborough, the company also showcased its Q400 turboprop, in Ethiopian Airlines livery, and the Global 6000 business jet.

Bombardier announced during the show that TAG Aviation Europe, a leading private and business aviation service provider, is the first to offer the long range Global 5000 aircraft with Premier cabin, for charter to European customers.

GOVERNMENT PRESENCE

Canada's federal government had a considerable presence at Farnborough, sending cabinet ministers Navdeep Bains, Marc Garneau and Carla Qualtrough to spread the word about Canada's world-class aerospace industry.

Bains, who is minister of innovation, science and economic development, led the government's charm offensive and highlighted the country's globally-integrated, export-oriented and innovation-driven approach.

The three ministers accompanied a delegation of 420 representatives from more than 130

The CAE 700MR Series FTD is based on the CAE 3000MR Series full-mission helicopter simulator, but in a fixed-base platform with a dynamic seat for vibration and motion cueing.

Key features include an extreme field-of-view visual system with a CAE Medallion-6000XR image generator to provide an immersive training experience; computer-generated forces software for a realistic tactical synthetic environment; and support for military-specific training scenarios, including ship deck landings, night vision goggle training and confined area landing training.

"We listened to our customers to design and develop a high-end flight training device that addresses the highest priorities for military helicopter mission training," said Gene Colabatistto, CAE's group president, Defence and Security.

CAE also introduced its new Women in Flight scholarship program at Farnborough with the goal of helping women advance in the aviation industry.

Through the program, CAE intends to provide financial support to aspiring female pilots by awarding up to five full scholarships to one of the cadet pilot training programs in its global training network.

CAE also plans to give selected candidates access to their first job through the company's global partners. Another objective is to elevate selected candidates to become aviation role models and inspire even more women to become pilots.



Lockheed Martin debuted a civilian firefighting version of the Super Hercules, the LM-100J FireHerc. The aircraft demonstrated its agility during a sporty performance in Farnborough, which included a loop!

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The U.K. defence secretary revealed plans to build a new sixth-generation fighter, the Tempest. Capable of both manned and unmanned flight, it will eventually replace the Eurofighter Typhoon (shown here).



An Airbus A330-900neo, the extended fuselage member of the A330neo family, lands at Farnborough.



Farnborough brings the global aerospace industry together for one intense week.

BELL

Bell announced at Farnborough it will collaborate with Subaru Corporation on a commercial enhancement of the Bell 412 EPI helicopter—type certified in July as the Subaru Bell 412EPX—in support of the Japan UH-X program.

Subaru was awarded the contract to replace Japan Ground Self Defence Force’s (JGSDF’s) current fleet of UH-1J aircraft with a militarized derivative of the Subaru Bell 412 EPX.

The 412 EPX will benefit from a more robust main rotor gearbox dry run capability, increased internal maximum gross weight to 12,200 pounds (5,533 kilograms) and mast torque output of more than 11 per cent at speeds below 60 knots.

A commercial prototype has undergone testing at Bell’s facility in Mirabel, Que., and it received Federal Aviation Administration (FAA) certification on July 5, 2018.

Bell also announced the Bell 429 global fleet has exceeded 330,000 hours of operation.

There are 325 Bell 429 aircraft operating in countries around the world, including Australia, Canada, France, Indonesia, Kuwait, Oman, Switzerland, Slovakia, Sweden, Turkey, Thailand, the United States and the United Kingdom.

P&WC

Pratt & Whitney Canada (P&WC) announced at Farnborough it has signed an agreement with Hawker Pacific that will see the two companies work together to enhance the delivery of customer services and solutions.

The agreement spans most P&WC engine models and diagnostics and prognostics products across all segments, including business aviation, general aviation, offshore, utility, regional aviation and defence and security.

Under the agreement, Hawker Pacific will provide an array of maintenance, repair, engineering and customer support services to P&WC engine customers, as well as mobile repair technician services.

The two companies will collaborate to deliver and install P&WC’s diagnostic, prognostics and engine health management solutions, including its FAST prognostics solution, under its Digital Engine Services portfolio.

P&WC also announced that China Southern Airlines has selected the APS3200 auxiliary power unit (APU) for the airline’s order of 104 purchased and leased aircraft from the Airbus A320 family.

The airline has signed a long-term, comprehensive support agreement with P&WC to cover APS3200 maintenance. With this contract award, China Southern will operate more than 250 Airbus A320 family aircraft with the APS3200.

OTHER PLAYERS

MDA announced during the show it has acquired Neptec Design Group Ltd., a leading electro-optical and electro-mechanical systems and high-performance intelligent light detection and ranging (LiDAR) company, for \$42 million.

The transaction is comprised of about \$8 million in cash, with the balance in Maxar common shares, according to a news release.

With Neptec, MDA intends to deliver end-to-end robotic systems and an expanded set of solutions, positioning the company to capture growth in U.S., Canadian and international global space exploration markets.

Heroux-Devtek announced it has been awarded a five-year contract from Lockheed Martin to manufacture landing gear for C-130J Super Hercules aircraft.

Under the agreement, Heroux-Devtek will manufacture and assemble landing gear for Lockheed Martin’s global production of C-130J aircraft and provide spare parts over a five-year period beginning in January 2020.

Boeing also selected Heroux-Devtek to manufacture main landing gear and side braces for F/A-18 Super Hornet and EA-18G Growler aircraft, with first deliveries in the third quarter of 2020.

SkyX, a drone manufacturer based in Markham, Ont., launched its latest product at Farnborough 2018: the SkyTwo unmanned aircraft system (UAS).

SkyTwo is an electric vertical takeoff and landing (eVTOL) drone that flies beyond visual line of sight (BVLOS), with a planned range of 170 kilometres on a single charge.

It would then recharge for about 2.5 hours on a remote xStation before continuing a mission.

At press time, SkyTwo was in the research and development phase, with test flights expected to begin in September. SkyX expects the product to be market-ready in 2019.

BRIGHT FUTURE

While Embraer made a bigger splash than Bombardier and the A220 family combined at Farnborough, all could benefit from a commercial airline market expected to swell in size over the next 20 years.

Embraer is projecting demand for 10,550 new aircraft with up to 150 seats worldwide over the next two decades, depending on the economic health of the airline industry.

If the forecast comes close to reality, the A220 family will likely battle head-to-head with Embraer’s E-Jets E2 family, with Boeing as a likely partner for the Brazilian OEM.

“This commitment confirms the important role the A220 aircraft now occupies in our Airbus single-aisle portfolio,” said Eric Schulz, chief operating officer for Airbus, as he announced the company’s 60-aircraft deal with the U.S. startup.

It was an understated way of saying this flashy, intentionally disruptive Canadian creation is now a relatively discreet member of the much larger Airbus family.

It seems to blend in as much as it stands out, but it shows no signs of fading away. ■



BEN FORREST

Ben Forrest is editor of *Insight Magazine* and assistant editor of *Skies*. He is a graduate of Western University’s Master of Arts in Journalism program.

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Creating a Career Hub

BY LISA GORDON

ATAC is developing a new resource designed to introduce young people to the possibilities of an aviation career.

The Air Transport Association of Canada (ATAC) is chipping in \$50,000 towards addressing the aviation and aerospace labour shortage, and it is calling on industry donors to match that amount.

The money will be used by ATAC's Aviation Professionals Recruitment Working Group to fund a plan designed to entice more young people to join the industry.

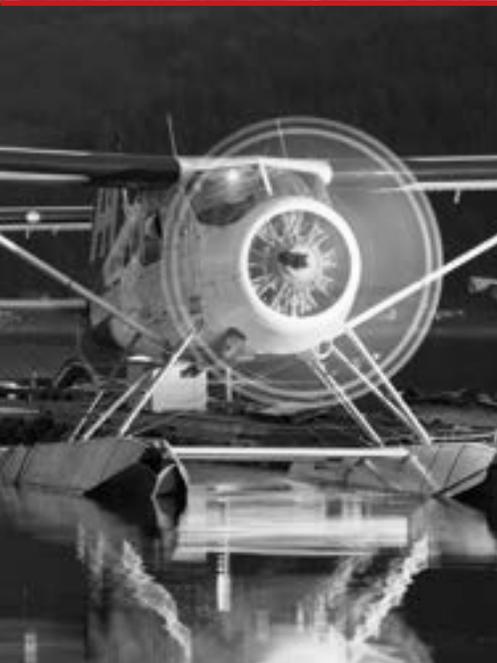
The need is dire: A March 2018 labour market study performed by the Canadian Council for Aviation & Aerospace (CCAA) found that industry will need a whopping 55,000 new workers by the year 2025. The shortfall is being driven by industry growth and workforce demographics, with many employees

scheduled to retire in the coming years.

Canada's existing educational network is expected to produce just one quarter of the needed employees.

That means aviation and aerospace will need to find 41,000 workers from other industries and outside of Canada, said the CCAA report. It's a formidable challenge, especially when many other industries are competing for the same highly skilled workers.

Formed in May 2017, the ATAC working group includes the association's flight training directors as well as operators such as WestJet, Porter Airlines, Air Georgian and Jazz. ATAC represents about 45 flying schools who conduct 85 per cent of all flight training done in Canada.





The new website flycanada.org will be a hub that educates and informs young people, as well as their parents and advisers, about aviation careers. **Blake Guidry Photo**



ATAC represents about 45 flying schools who conduct 85 per cent of all flight training done in Canada. **Mike Reyno Photo**



The pilot shortage is affecting all levels of industry, particularly the smaller operators. ATAC is co-ordinating a pan-industry response to the problem. **Michael Durning Photo**

“THIS IS AN INDUSTRY INITIATIVE BEING LED BY ATAC, BUT YOU DON'T HAVE TO BE AN ATAC MEMBER TO BE INVOLVED.”

“This is an industry initiative being led by ATAC, but you don't have to be an ATAC member to be involved,” said association president John McKenna. “People are getting involved. There is a realization this is their livelihood, too.”

The group has launched a plan to help educate young people, parents and school guidance counsellors about potential aviation-related careers.

The website flycanada.org is the linchpin of this initiative, envisioned as a hub that will route people to reliable information about a variety of industry jobs.

While the site will initially focus on pilot careers, its scope will eventually broaden to include information about employment opportunities in aircraft maintenance, avionics, air traffic control, dispatching, and other related careers.

“There are two primary target audiences,” explained Bob Connors, general manager of Waterloo-Wellington Flight Centre (WWFC) and an ATAC board member and working group leader. “They are youth and career-seekers, and secondly, educators and advisers, including parents.”

He said the site will feature resources, links, FAQs, and a news section. It will be marketed through social and traditional media platforms to build traffic.

So far, ATAC has spent about \$12,000 designing the new flycanada.org, which is expected to be live and online this September. As of early July, ATAC had received an additional \$22,000 in response to its call for funds to match the original donation of \$50,000.

Connors said he hopes to link the site to the Ontario School Counsellors' Association and other similar groups across the country.

“In conjunction, we want to launch a series of career success stories on the site that will be marketed through social and traditional media platforms. Ultimately, we'd like to get radio time and articles in major newspapers.”

He said that collateral material—including brochures and signage—was finalized in May and will now be distributed to the aviation community.

INDUSTRY SYNERGY

While all kinds of operators are welcome to participate in the Aviation Professionals Recruitment Working Group, ATAC is developing alliances with other industry groups, too.

For instance, the CCAA is working on a complementary project that involves studying why girls don't choose aviation careers. Connors said the results of that study will help inform the content for flycanada.org.

As well, the Canadian Owners and Pilots Association (COPA) worked with the Air Canada Pilots Association (ACPA) to develop the 2018 Aviation Career and Scholarship Guide, a list of scholarships currently available for flight training. Connors said the site flycanada.org will include this information as well, since financial hurdles continue to be a major roadblock for aspiring students.

The Canadian Business Aviation Association and Nav Canada are also represented at working group meetings. "We're talking about various initiatives that are trying to bring attention and movement to this issue," added ATAC's McKenna, who said the labour shortage is a long-term problem that will take at least a decade to resolve.

"We have a severe labour shortage; our industry is growing by three to five per cent annually. We just don't have the pilots [to accommodate that growth] and it takes a long time to train pilots. So, it's a double whammy."

Along with increasing public awareness of aviation careers, ATAC is also tackling the labour shortage through a government relations campaign in Ottawa.

McKenna said perhaps the biggest deterrent to students is the cost of training. "We are approaching financial institutions and we are approaching the government. We need to get aviation included in existing programs such as student loans, apprenticeship grants, etc."

ATAC's goal is to educate government about the labour shortage so it can help create the solution. At the association's spring symposium in May, 35 members of Parliament attended an Ottawa reception where the pilot shortage and the pending flight and duty time regulations were the only two agenda items.

"We need to get everyone working together on this; we've identified areas where we need to apply solutions," said McKenna.

NEXT STEPS

He said the ATAC working group may soon be sub-divided, with smaller groups tackling targeted issues to achieve greater progress.

Meanwhile, the association has developed the flycanada.org platform, and is currently in the process of determining how to populate the site with relevant content.

"We need to put information in, testimonials, and we also need to start educating the educators," said McKenna. "The guidance counsellors in schools don't know anything about our sector. Education is a provincial jurisdiction, and they've never known much about it."

Other industries may use different recruitment methods, and he said those may offer a clue to addressing the pilot shortage. "We will start by spreading the word

through the social network. We are trying to identify the best way to reach our markets."

Connors agreed, adding that ATAC will work with anyone who can help carry its message to the appropriate audience.

That inclusive approach is validated by the CCAA labour market study, which calls for a "multi-faceted national strategy" to counter one of the biggest challenges to face Canadian aviation and aerospace in decades. ❖



• **LISA GORDON**

Lisa Gordon is Editor-in-Chief of *Skies* Magazine. Contact her at lisa@mhmpub.com.


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Since 2005, Sunwing Airlines has flown countless Canadians to sunny holidays throughout the U.S., Mexico, the Caribbean and Central America. The airline owes its success to a unique business model that moves aircraft and people from one side of the Atlantic to the other, depending on seasonal demand. **BY LISA GORDON**



W

hen Piyush Gandhi was vice-president of Flight Operations at Porter Airlines, he used to advise pilots not to take a job with a charter airline.

Now, he's eating his words. Last November, after almost 12 years with Porter, Gandhi made the jump to Sunwing Airlines, and he hasn't looked back since. With the same title he had at Porter, Gandhi is enthusiastic about

this chance to learn how a charter airline operates.

"I find it very exciting," he told *Skies*. "This airline is a very unique operation. I've done the OEM side [at Bombardier], the scheduled airline side, and now I can explore the charter airline side."

Gandhi oversees Sunwing's safety department and the operations control centre, which includes crew scheduling and crew planning, as well

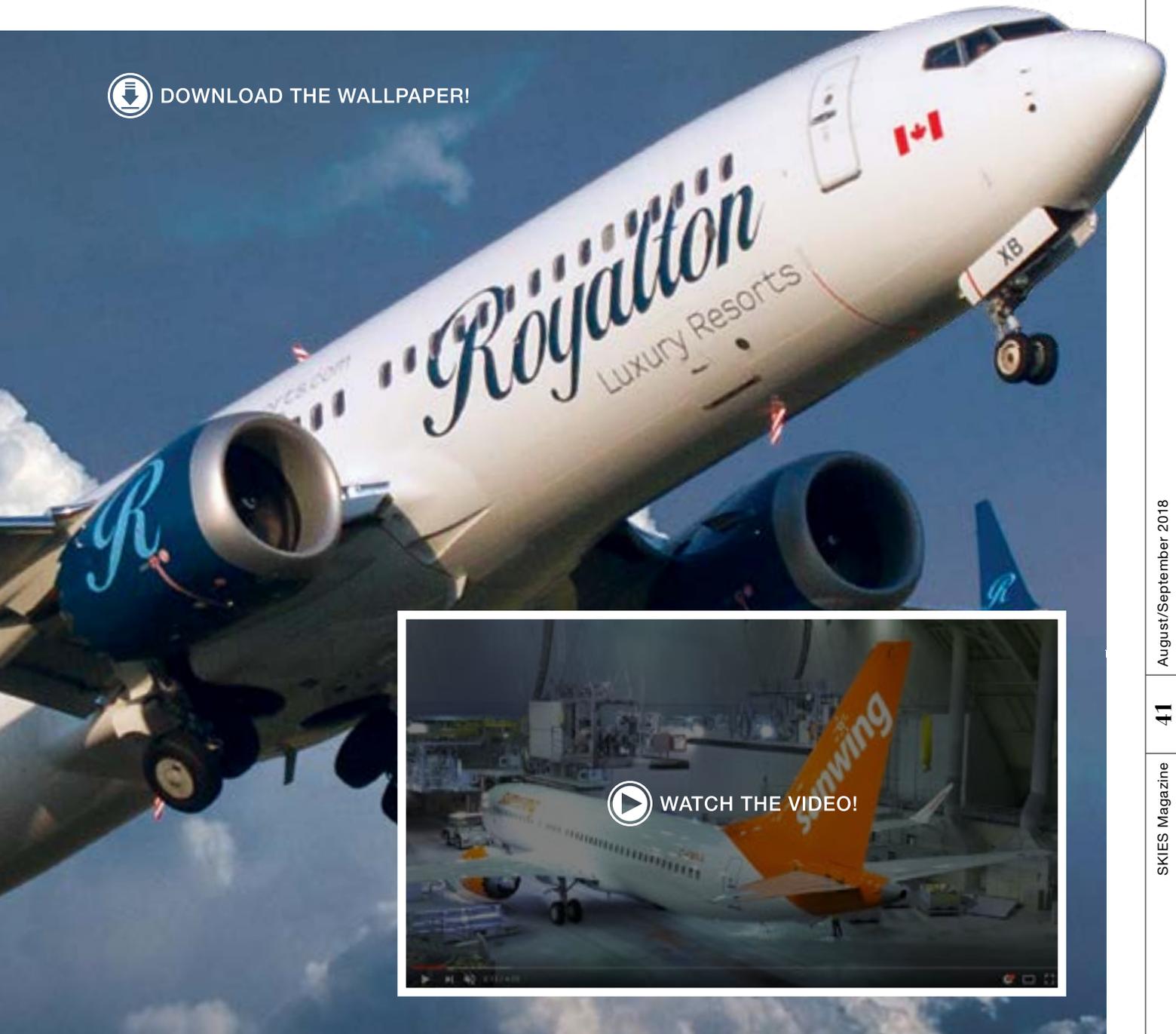
as the airline's 400-plus pilots and the training administration division.

With around 2,600 employees in Canada, the airline is a branch of Sunwing Travel Group, a vertically-integrated behemoth that generates over \$2 billion in annual revenue and is the largest tour operator in North America.

Along with the airline, the group also includes three tour operators, two travel retailers, a hotel division offering



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more than 14,000 rooms, a vacation club, and a destination management company. It employs close to 20,000 people worldwide.

Originally started by father and son entrepreneurs Colin and Stephen Hunter—whose family still owns 51 per cent of the company—Sunwing Travel Group’s 49-per cent minority shareholder is Hanover, Germany-based Tui Group, the world’s biggest travel and tourism organization.

“Certainly, in North America, we’re

unique in what we do,” said Mark Williams, president of Sunwing Airlines. “We’re the only company that’s got that much vertical integration, which includes the hotel group as well as the rest of the businesses. But it’s not uncommon in Europe for companies to be that integrated; in fact, Tui is vertically integrated in the same way.”

Tui bought its stake in Sunwing in 2010, but the Canadian airline’s connection to Europe predates that agreement. In fact, that

▲ ABOVE: Sunwing’s second Boeing 737 MAX 8 aircraft is decked out in the Royalton Luxury Resorts livery. Royalton is part of Blue Diamond Resorts, a division of Sunwing Travel Group. **Andy Cline Photo**



Cutting the ribbon for Sunwing's first 737 MAX 8 delivery were (L-R) John L. Plueger, president and CEO of Air Lease Corporation; Mark Williams, president of Sunwing Airlines; Matthew J. Hart, chairman of Air Lease Corporation's Audit Committee and Governance Committee; and Tobias Lutterodt, sales director for The Boeing Company. **Marian Lockhart / Boeing Photo**

connection is what has allowed Sunwing Airlines to thrive since its first flight in 2005.

With its seats sold by the travel group, the key to the airline's success is its seasonal operational model—a formula that allows it to bulk up in the busy winter travel season while leaning out in the summer.

"If you look at the business in Canada, in the markets we're in, it's about 70 per cent winter and 30 per cent summer," explained Williams. "The airplanes are really expensive assets, say roughly \$50 million dollars U.S. each. And if you have enough capacity in the winter time, you have way too much in the summer.

"For us, the only way to make that business work was to find people in Europe with a counter-seasonal business that would be interested in swapping assets back and forth."

Last winter, Sunwing Airlines operated 40 airplanes out of 33 Canadian airports—ranging from Vancouver, B.C. to tiny Deer Lake, N.L.—flying to a total of 35 destinations in the U.S., Caribbean, Mexico and Central America.

By the time spring was in the air, the airline was well on its way to thinning out the Canadian fleet to just nine aircraft, all of them Boeing 737-800 NGs in a 189-seat configuration. The remainder of the fleet

was transferred to Tui and Travel Service Airline in Europe for the summer season.

"If you look at what Canadians want to do in the summertime, they fly domestic, to the U.S., to Europe and to the Caribbean and Mexico," said Williams. "We don't do the European bit, but we do run a small domestic air-only program in the summer. And the big destinations in the Caribbean for us, we do those on a year-round basis. We focus on the big cities where there's still demand, and send the rest of the planes to Europe."

It's a complicated dance that sees both airplanes and crews shuffle between Sunwing's permanent bases in Toronto and Montreal (along with its four winter locations in Vancouver, Calgary, Winnipeg and Quebec City), and the airline's seven European bases. Those include Dublin and Belfast in Ireland; Leeds and Norwich in England; Amsterdam, Netherlands; and Warsaw and Katowice in Poland.

As the temperatures begin to drop in Canada, Sunwing's aircraft roster will start growing once again. For the 2018-2019 winter season, the airline will operate 43 aircraft, with demand driven by the tour company's projections.

Each time an aircraft is transferred for the season, it is de-registered and re-registered

in its new "home" country. The process creates a mountain of paperwork and heavy logistical demands on Sunwing's maintenance department, which oversees the process.

And that's just for the aircraft. Imagine the complications of transferring pilots overseas for the summer, too.

"We have 280 or so pilots moving around at various points—and each one of them has individual needs," said Gandhi.

Twenty-seven pilots called the Amsterdam base home for the summer of 2018, all of them staying in a group of company cottages, many of them with their families.

"It's a real community. Kids have grown up spending summers in Europe. The company pays for all of that travel and even a return trip in the middle of the summer," said Gandhi. "It's a way of life. For some people, it doesn't work, so they can stay in Canada and keep operating from there."

But he said the opportunity for an overseas deployment is one of the perks of working at Sunwing.

"We're going with this mantra of 'choose your lifestyle' when you come to Sunwing. You could do a three-month deployment, a six-month deployment, or even a short-term two-week deployment to cover for someone."



Mark Williams launched Sunwing Airlines 13 years ago, using a seasonal formula that has proven to be key to its success. **Andy Cline Photo**



Marcella Howley, vice-president of Inflight Operations, will be hiring about 200 new cabin crew members this season. **Andy Cline Photo**



Capt John Hudson oversees the Sunwing cadet program, which will take on 14 new hires this year. **Andy Cline Photo**



Capt Jose Moreno has been with Sunwing for 12 years. He served in the Royal Canadian Air Force before joining the airline, as many of its pilots did. **Andy Cline Photo**

ENTREPRENEURIAL CULTURE

Largely due to its seasonal model, Sunwing Airlines is by nature a nimble operator. While its business plan responds to the changing needs of the tour operator and hotel group, president Mark Williams himself is a man of action—a quality he instilled in the airline he launched 13 years ago.

Just before Sunwing Airlines was born, its harried leader found himself speeding along Highway 409.

Like an expectant father racing to the hospital, Williams was enroute from the Transport Canada offices at 4900 Yonge Street in North York to Sunwing's office near Pearson airport. A missing certificate of airworthiness (C of A) had necessitated an 11th hour visit to the regulator.

Without that paper, the airline's first sold-out flight—Toronto to Santiago de Cuba—would not get off the ground on Nov. 17, 2005.

"So I got it; but the irony is, when I got back to the office, they had found the faxed C of A! So I didn't have to do it after all."

Williams raced back to Pearson at 6 a.m. the next day.

"We had cake at the airport; we had a band there. I got my wife and children passes so they could be there for the first flight. We were handing out cake

to everybody. We had little chocolate airplanes we gave out to the passengers."

Williams said that first flight also marked the beginning of Sunwing's signature sparkling wine "cheers to your vacation" service—a perk that passengers enjoy to this day.

And while that inaugural trip didn't exactly go off without a hitch, it was certainly the first of many examples illustrating the nimbleness that is a characteristic of Sunwing Airlines.

"We still have a real entrepreneurial culture here," said Williams. "We don't have a lot of layers of management or decision-making, and I think that's been one of our strengths. And so when we decide to move in a different direction, we don't have to sit through a bunch of committees or analysis in order to make a decision. We focus on what's important for the customer and how quickly we can make things happen, and then we just get it done."

Making sound business decisions on the fly is a hallmark of the airline. One day, Marcella Howley, vice-president of Inflight Operations, made an offhand remark to Stephen Hunter, CEO and president of Sunwing Travel Group, that they needed a chef to help them design their on-board menu.

"He came back to me and said, 'What about a celebrity chef?' So I think we're

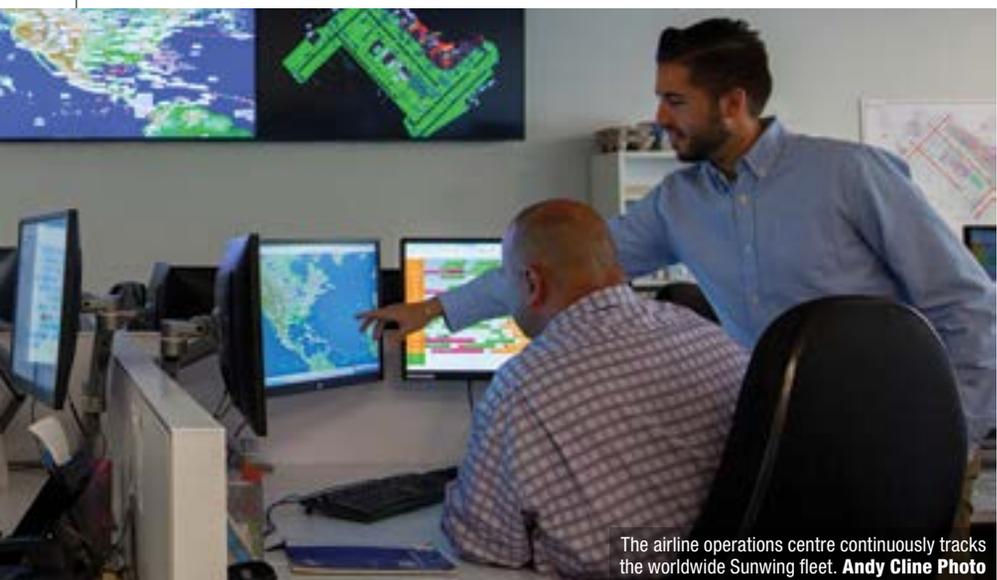
“THE KEY TO THE AIRLINE'S SUCCESS IS ITS SEASONAL OPERATIONAL MODEL—A FORMULA THAT ALLOWS IT TO BULK UP IN THE BUSY WINTER TRAVEL SEASON WHILE LEANING OUT IN THE SUMMER.”



Sunwing president Mark Williams (standing, far right) visits the crew room prior to a flight. **Andy Cline Photo**



The Sunwing Vacations call centre staff hard at work in Toronto. **Andy Cline Photo**



The airline operations centre continuously tracks the worldwide Sunwing fleet. **Andy Cline Photo**

probably one of the first airlines in Canada to bring a celebrity chef on board. We've been working closely with Lynn Crawford of The Food Network since October 2016," said Howley, who is responsible for the people, products and service delivered in the cabins of Sunwing's 22,500 annual flights.

She said the airline was also the first to sell excursions on board, which has been a "huge success," with other operators following suit.

From the Kidcations backpacks that keep young travellers busy to Sunwing's signature sparkling wine toast, Howley said her well-trained team of more than 1,000 cabin crew members delivers an unforgettable vacation experience.

"I get the survey results on a weekly basis. The friendliness of our flight attendants is our number one ranking, and I'm very proud of that."

SEARCHING FOR SAVINGS

In the airline business, costs are the chief concern—and keeping them in check is the reason why many airlines are working to hone efficiencies. Every little bit counts, and it's sometimes surprising where savings can be found.

"The cost aspect is so important to the overall price of the package for our customers," said Williams. "So there's a constant flow of initiatives in every area of the company, looking for cost cutting opportunities and enhancements to the business."

He said Sunwing can impact the amount of fuel it burns by operating its aircraft more efficiently. That may include flying different approaches, implementing single-engine taxiing on the ramp, or even an engine washing program.

To Williams, there is no big home run in any one area—but they all add up.

"Here's a great example: We fly, say, 3.4 million passenger segments annually, so maybe almost two million roundtrip passengers. So if we can save 50 cents on our onboard product, when it comes to finding different suppliers, that's a million bucks. So we look at that in every aspect of what we do."

Gandhi added that sometimes Sunwing will tanker fuel to save money. "Fuel that may cost so many dollars in Toronto through a fuel consortium may cost double that in Cuba. So we carry extra fuel out of Toronto so we don't take on as much in Cuba."

Saving fuel is one of the surest ways to cut operational costs.

There's no doubt that fuel efficiency was one of the biggest drivers that led Sunwing to begin transitioning its fleet from the Boeing 737-800 NG to the 737 MAX 8.

On May 25, 2018, about 40 Sunwing employees applauded on the tarmac outside the Boeing delivery centre in Seattle, Wash., as Williams officially took delivery of the airline's first MAX 8. That plane is the first of six scheduled for delivery by the end of 2019, and it



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Sunwing's first Boeing 737 MAX 8 sports its customary orange-and-white livery. The new aircraft type offers a 14 to 15 per cent fuel savings when compared to the airline's current 737-800 NG fleet. **Patrick Cardinal Image**

Sunwing's headquarters in Toronto is the former home of Canada 3000 Airlines. The renovated facility opened in 2016, and is connected by a bridge to the neighbouring Sunwing Airlines building. **Andy Cline Photo**



was followed in just a few days by a second jet. Four more will be coming next year.

The new aircraft represent a real opportunity for Sunwing. New CFM LEAP-1B engines, advanced technology winglets and other aerodynamic improvements combine to make the MAX aircraft 14 per cent more fuel efficient than the older NG models currently operated by the airline.

Sunwing's first MAX 8 touched down in Toronto late on May 25. Bright and early the next morning, it was off again on its first revenue flight.

Williams said the new aircraft are performing as advertised. The airline has been using the less busy summer season to ensure infrastructure and support for the MAX 8 are in place prior to the winter travel peak.

"The dispatch reliability on the plane so far has been excellent. We target a 99 per cent maintenance dispatch reliability, and we're there already, and the fuel burn is as advertised. We're seeing a 14 to 15 per cent fuel reduction versus the 737-800 NG."

He added that the goal is to deploy the planes from Western Canada into the Eastern Caribbean, flights where in addition to the fuel burn savings, the airline can realize about 500 miles of additional range. That will open up new destinations, such as Vancouver to Panama or Costa Rica.

The load restrictions that had to be respected with the NG models are now almost non-existent.

"The highest load restricted flight we have out of Vancouver, with the plane having 189 seats, we fly at 155," said Williams. "We have a fairly significant number of load-restricted flights from Western Canada, and in almost every case with the routes we're flying now, we can reduce the load restriction completely, so we can sell it to 189."

Sunwing leases all its aircraft, which Williams said allows the airline to upgrade its fleet more easily. When NG leases come due, he said Sunwing plans to replace them with the MAX.

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FUTURE FORWARD

There's no denying the impact of technology on every facet of our lives, so it's no surprise that Sunwing is looking for ways to harness the power of instant customer communication.

"There's a real opportunity for us to be more efficient in getting information out to people through phones and apps, about changes in flight times or minor delays or whatever," said Williams.

New technology is also making inroads on the flight deck.

Capt John Hudson, Sunwing's fleet manager, keeps a keen eye on the latest trends. There are two that he thinks will be big for the airline: connecting the pilots' electronic flight bags (EFBs) to the airplane, and implementing domestic controller-pilot data link communications (CPDLC).

In the first case, Hudson was involved in rolling out personal iPads to each company pilot earlier this year. The devices employ Boeing's Jeppesen Aviator software, an all-encompassing program that brings information from stand-alone EFB apps into one easy-to-use dashboard. Pilots can easily reference charts, flight briefings, performance data, weather, and more.

Hudson believes the data-driven approach inherent in the MAX 8 will open up exciting

new possibilities for capturing and using important aircraft-generated information.

"There's going to be connectivity coming in the future between the EFB and the airplane, which then leads us to ATC [air traffic control] and the airplane and your EFB. So those three items will all be connected," said Hudson.

With datalink messaging taking over from traditional voice communications—and text messaging between pilots and ATC becoming increasingly popular—Hudson is also focused on streamlining interactions between the flight deck and air traffic controllers.

"We do our ATC clearances through ACARS [aircraft communications addressing and reporting system] right now, through the pre-departure clearance (PDC) program. So wherever we go, whenever we can, we use PDC. So we don't have to talk."

THE PILOT PREDICAMENT

Like most other commercial operators in North America, Sunwing is feeling the pinch of the pilot shortage.

As a mid-tier charter carrier that sometimes loses pilots to scheduled airlines, it could see a labour shortage coming down the line—so four years ago, the company took steps to create its own solution.

In partnership with the aviation programs at

Seneca College in Peterborough, Ont., and the University of Waterloo (where students train at Waterloo Wellington Flight Centre in Breslau, Ont.), the airline interviews top students recommended by the schools and offers selected candidates a first officer position.

The program is overseen by Hudson, who happens to be a graduate of both the University of Waterloo and Seneca College's aviation program. He said Sunwing put the onus on the schools to become familiar with the airline's unique seasonal operating model and present students who they felt would be the best fit.

The airline's cadet program started small, with six cadets in the first year, then four last year. In 2018, Hudson said Sunwing plans to hire 14 new graduates.

"We have more confidence in the program. We've looked at it; we've done all the risk assessments. Now everything's coming to fruition and we haven't seen any markers that show us that we should keep the number down to anything less than that."

Sunwing cadets are streamed through a different training program than other hires with more experience.

"The risk assessment drove the changes to our normal training program," explained Hudson. "What it identified was that they're really good learners. They just came through



In May, Sunwing brought about 40 staff and members of the media to Seattle, Wash., to pick up the airline's first Boeing 737 MAX 8 aircraft. Here, the aircraft departs for Toronto, where it was on the ground for one night before doing its first revenue flight the next day. **Boeing Photo**

a four-year degree. And so through academic and simulator training phases they're really good. Where they needed to work the hardest was in a crew environment, but both schools have some crew training now baked into their programs, which really helps."

To ensure cadets get off to a good start, Sunwing assigns each new hire to work with a dedicated training captain.

"For approximately their first 50 hours or so, they just have one training pilot, which really helps for continuity. Then we release them to the training pilot group [a group of experienced pilots who volunteered to work with the cadets], and then the cadet is exposed to multiple different trainers, which is normal during line indoctrination training."

Hudson said a normal line indoc for a 3,000-hour new hire pilot is 75 hours at most. Cadets, on the other hand, get around 200 hours. They are line checked at 75 hours and then continue to fly under the supervision of a training pilot. During this time, they are also meeting Sunwing's "geographic" requirement—in other words, a pilot must experience specific airports that present unique challenges to flight crew. That includes Mexico's mountainous west coast, Cancun's high density traffic, and the Caribbean's unique flight rules.

After 200 hours, cadets are released to the line. Six months after their pilot proficiency check (PPC), they're back in the simulator for their first recurrent training session, which Hudson said is a good opportunity to check their progress.

Sunwing pilots log about 800 hours of flying annually. The airline expects to employ 430 pilots by January, adding about 40 to its current roster to meet expected winter demand. (Fourteen of those 30 will be new cadets.)

While Sunwing works to address the pilot shortage, the same difficulties are not felt on the cabin crew side of the operation. Marcella Howley said she expects to hire about 200 new crew members this season. They'll be joining more than a thousand colleagues who are spread across the county in eight bases, from Vancouver to Halifax.

ON THE REGULATORY HORIZON

In the midst of the air crew shortage, Sunwing—like all other Canadian operators—is keeping a close eye on the proposed changes to pilot flight and duty time regulations.

Transport Minister Marc Garneau is currently overseeing what he called science-based changes that would see a pilot's duty day reduced to between nine and 13 hours—depending on what time of day they start, as well as how many

times they take off and land.

For Sunwing, the proposed changes would have a big impact on operations.

Gandhi provided an example: "We currently fly a standard pairing of Toronto to Cancun. In the new regs, duty time is impacted by the time of day the pairing starts. Our pairing starts at 4:45 a.m. for a 6:45 a.m. departure.

"You would take off from Toronto, go to Cancun, have a one-hour turnaround and come back. That meets the regulations today because it ends up being around 12 hours of duty. But under the new regs, that duty time is reduced because of the time of day the

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Sunwing leases all its aircraft, which allows it to upgrade the fleet more easily. Its collection of Boeing 737-800 NG aircraft (shown here) will eventually be replaced by the more efficient 737 MAX 8, according to president Mark Williams. **Eric Dumigan Photo**

pairing starts. That means we'll have to put another crew in Cancun and swap the crews there. So you are basically doubling the requirement of pilots for that trip."

Gandhi estimated that Sunwing would require about 30 per cent more pilots to comply with the new regulations, which are currently in the final stages of approval.

Williams added that Sunwing is certainly in favour of examining pilot fatigue and its impact on safety. However, he believes Canada already sets a very high standard.

"While I'm saying we should look at fatigue and it's important to always improve, there's no real indication that it's a significant problem at the moment," he told *Skies*.

"That doesn't mean we shouldn't be looking at continuing to get better. But my concern is that the regulations will require a significant number of additional pilots within the system overall. We're already experiencing a pilot shortage in Canada even before the regulations come in, which will likely make it worse."

He believes the resulting scramble to hire even more pilots will ultimately drive the collective pilot experience level down, as those with fewer hours are fast-tracked through the system.

"I think in this case the unintended consequence, which will be lowering the experience levels within the industry overall, is a bigger problem than the fatigue issue they're trying to fix."

Also on the regulatory horizon is the coming passenger rights bill, which is expected to change the framework of air carriers' obligations to the travelling public.

In May, the federal government passed Bill C-49, the *Transportation Modernization Act*. It's a wide-ranging piece of legislation that includes, among other things, a requirement for the Canadian Transportation Agency

(CTA) to introduce new regulations governing passengers' rights to recourse for a host of issues, including flight delays and cancellations, lost luggage, overbooking and tarmac delays.

A series of cross-country public consultations took place this summer, and the CTA continues to accept input from Canadians until Aug. 28. At that point, the agency will assemble a list of recommendations for the new passenger rights framework and will submit it for a vote in the House of Commons.

Air carriers across the country are watching this process closely.

While all of them have been under the service microscope at one time or another, Sunwing was front and centre in April 2018. A series of incidents and subsequent passenger complaints prompted an ongoing CTA review of the airline's flights through Toronto and Montreal from April 14 to 18, 2018.

During that time, Toronto was in the grip of an ice storm and Swissport, the company that handles Sunwing's baggage, was short-staffed.

Sunwing has worked closely with the CTA during its investigation.

On July 19, the CTA told *Skies* the period for submissions from any affected parties closed on May 31. The inquiry officer's report is currently being drafted and is expected to be completed by the end of August, at which point it will be submitted to the CTA for consideration.

"While the major issue around the ice storm delays was staffing levels on the ramp at Swissport, we did not perform up to the high expectations we set for ourselves," said Gandhi. "We've taken our lumps for that situation and we'll be a better airline as a result. We're really focused on it; we have established working groups now to look at how to improve various elements of customer service."

"THE SUNWING WAY"

For his part, Williams is proud of Sunwing—the airline he started and still considers his baby—and is urging his staff to strive for constant improvement.

"Obviously, we're always interested in improving the product," he said. "My challenge to my staff is that we can always do better. Let's raise the bar even more; let's improve on our performance even more. Let's get the customer satisfaction ratings up even higher. And, you know, that's the way the airline can support the [travel] group."

While there are countless examples of satisfied passengers, their stories do not usually make the mainstream news. A notable exception was the time Sunwing arranged for a couple to be married at Calgary airport's new International Terminal in 2017—a memorable way to start their honeymoon.

In the last year, Howley said she's worked with four men to arrange on-board proposals. She said in every case, the crew has worked to make it a special experience.

"For one couple they participated in a game where each had to answer travel questions for prizes," she recalled. "As the entire cabin watched this onboard game show, we announced that there was only one remaining question—but her boyfriend needed to ask it. To her surprise, he got down on one knee and proposed. We scheduled the sparkling wine toast to follow. These were memorable flights for our passengers and crew."

As summer draws to a close and temperatures begin to fall, Sunwing's seasonal model will ramp up for another busy winter of flying sun-starved Canadians to all points south. Along the way, the airline will be focusing on innovation, cost control, new markets and product improvements.

That's just the Sunwing way. **✈**

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Despite being disbanded and reformed on multiple occasions, the 401 "Rams" have remained a tactical fighting force for 100 years. **Mike Reyno Photo**



RAM TOUGH



Even as 401 Tactical Fighter Squadron marks its 100th anniversary, it is also on high readiness, manning the NORAD mission and training for global deployment.

BY CHRIS THATCHER





CF-188 Hornets are refueled by a KC-135 Stratotanker assigned to the 340th Expeditionary Air Refuelling Squadron over Iraq in October 2014 supporting Operation Inherent Resolve. **SSgt Perry Aston Photo**



RCAF ground crew align a bomb as they mount munitions on a CF-188 fighter jet prior to the first combat mission over Iraq in support of Operation Impact in October 2014. **DND Photo**



CF-188 Hornet aircraft conduct a fly past at 4 Wing Cold Lake, Alta., prior to deploying to Kuwait in October 2014. **Cpl Audrey Solomon Photo**

Within three months of being reactivated in June 2015, 401 Tactical Fighter Squadron (TFS) was on the ground at an airbase in Kuwait, ready to conduct and support strike missions against ISIS targets in Iraq and Syria as part of the Canadian Armed Forces (CAF) Operation Impact.

For those with a sense of history, the rapid deployment hearkened back to the squadron's experience in the Second World War. Less than 24 hours after the Allied landings in Normandy on June 6, 1944, No. 401 Squadron (renumbered from No. 1 Squadron in 1941) had set up an airfield in France and was defending the skies against German aircraft and attacking targets of opportunity.

"When you think of the logistics required to set up an airfield in a day—and the place was still crawling with Germans—that is outstanding," said Capt Christopher Mileusnic, a CF-188 fighter pilot and 401 TFS's unofficial historian. "Then the ability of our squadron to move eight or nine bases in the space of about three months; when we think today about how

much effort it takes to go on a deployment—we need significant time to plan that—to be able to pick up everything you need, find a grass field and start not just flying, but fighting from there, it is just incredible."

By comparison, the three months of planning and preparation for Op Impact might seem like a luxury. But for commanding officer LCol Joseph "Scotty" Mullins and the newly formed squadron, nicknamed the Rams, it was nothing short of remarkable to deploy almost the entire team from 4 Wing Cold Lake, Alta., into a theatre around the world and operate for six months.

The feat was just another in a litany of extraordinary accomplishments for the Royal Canadian Air Force's oldest squadron. Though there is some debate among historians, 401 TFS traces its roots back to Canadian Air Force No. 1 Squadron, formed in November 1918 in Upper Heyford, England.

"When No. 1 Squadron was stood up, it was essentially every Canadian pilot who had flown in the Great War. So the history of 401 TFS, or No. 1 Squadron, is

the history of the RCAF," said Mileusnic. "Some of the battles of the First World War defined the Canadian Army as an independent, capable force, no longer just a division of the British Armed Forces. I think that is what No. 1 Squadron represents for the Air Force."

To commemorate the 100th anniversary, 401 TFS has been planning a series of events that will hopefully culminate with a mess dinner on Nov. 20 near the ground where the squadron was originally formed.

The centennial is also a unique opportunity to reconnect with the squadron's veterans and their families and to engage more broadly with Canadians, reminding them of the linkages between current operations and those formative years.

"We want to make the anniversary something all of us are proud to be a part of," said commanding officer LCol Forrest Rock, who has been using social and print media campaigns to engage widely.

The squadron formed a committee to manage its own planning, but the outreach

has triggered a cavalcade of boxes, envelopes and crates containing rare artifacts: photo albums, scrap books, guest books, paintings, videos of scramble drills before the Battle of Britain, even the bomber jacket of Ernest A. McNab, the squadron's first wartime commander, and the bar bill of a squadron leader shot down over France who, with help of the Resistance, made it back to the White Hart Hotel in Bromley, Kent, to celebrate with a tab that included seven bottles of whiskey, six bottles of rum, 24 brown ale, 32 pints of beer, 26 ports, and 50 cigars.

"Everything you can imagine is in those boxes," said Rock as he displayed a few prized possessions.

Some will eventually adorn the walls and displays of the squadron, others will find their way to Air Force museums. All of it, however, was scheduled to be on display during the Cold Lake Air Show in July, along with Hurricane and Spitfire aircraft, the former once flown by No. 1 Squadron.

"We're all secretly history and aeroplane geeks, although we don't admit it," said Mileusnic, a member of the anniversary committee. "When we started planning this last summer, there was so much interest from around the squadron, but everyone was going in different directions. We set up the 100th anniversary committee to ensure that anniversary-themed items and events were appropriately identified and executed."

The squadron has produced a commemorative patch and coin as well as a painting by the father of a U.S. Marine Corps exchange officer, and even found a local brewer to develop a special edition 100th anniversary beer.

For Capt Patrick Shaver, who designed the anniversary patch, there is a very personal connection to the squadron's lineage. His brother, father and both grandfathers all flew with the RCAF. But his great granduncle, Andrew "Hawkeye" McKeever, served as the first commanding officer of No. 1 Squadron. A picture in the squadron bar shows McKeever standing next to a German Fokker D.VII that he captured.

"With the 100th coming up, it's almost too good to be true," said Shaver. Though he admitted his great relative's call sign might not have been for his bird-like vision. "I don't think [it] was necessarily a compliment. I think it was a snide remark on his generous claims on all his kills."

Among the historical vignettes Mileusnic has collected are the fact No. 1 Squadron was the first to shoot down a Messerschmitt Me 262 and the squadron's 186.5 kills were the highest in the Second Allied Tactical Air Force. More ignominiously, four of the squadron's commanding officers were shot down during the war.

Many of the squadron's greatest honours, though, were accumulated during the Battle of Britain and Rock has requested that 401 TFS be part of the National

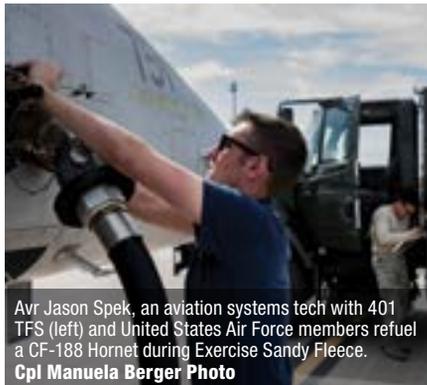
RCAF ground crew perform post flight checks on a CF-188 Hornet in Kuwait after a sortie over Iraq during Operation Impact. **DND Photo**



ABOVE: Maj A.E. McKeever, commanding officer of No. 1 Squadron, with a captured Fokker D. VII aircraft of the German Air Force. **DND Photo**



401 TFS load crew chief, Cpl Francis Beaudin, arms an inert laser guided training round on a CF-188 Hornet at Holloman Air Force Base, New Mexico.
Cpl Manuela Berger Photo



Avr Jason Spek, an aviation systems tech with 401 TFS (left) and United States Air Force members refuel a CF-188 Hornet during Exercise Sandy Fleece.
Cpl Manuela Berger Photo



Cpl Smile Pimentel Burgos, an aviation systems tech from 401 TFS, watches as the wings unfold on a CF-188 Hornet at Holloman Air Force Base in February 2018.
Cpl Manuela Berger Photo

Battle of Britain parade in September. “I can’t think of a better unit to represent the Air Force at the national parade than the only squadron with battle honours, on their 100th anniversary,” he said.

READY FOR GLOBAL DEPLOYMENT

At the same time as the squadron looks back over its history, 401 TFS is also focused on its core responsibilities today. As the RCAF squadron on high readiness, it is alternating NORAD Quick Reaction Alert duty with 409 TFS, also at 4 Wing Cold Lake, and training to conduct operations around the world should the government decide to deploy a fighter detachment.

The squadron began the year with a three-week exercise at Holloman Air Force Base in New Mexico, deploying 135 personnel and all 13 CF-188 Hornets. Although the squadron had deployed to Iraq shortly after being stood up following the division of 409 TFS, much of the infrastructure and other necessities to support it were already in place.

“We had never really exercised deploying as a unit ourselves,” said Rock. “Holloman was a fantastic confirmation exercise. It was the way I would envision the squadron moving out the door” if called upon by the government.

In addition to allowing pilots to accumulate significant flying hours at a time of year when flying can be limited in Cold Lake, it also provided the squadron an opportunity to fly with U.S. counterparts and “achieve multiple



LCol Forrest Rock, commanding officer of 401 Tactical Fighter Squadron, prepares for flight during Exercise Sandy Fleece.
Cpl Manuela Berger Photo

tactical evaluations ... and complete multiple upgrades for pilots on the unit,” said Rock.

“We put a lot of focus on making sure all of our folks had all of their personal verification checklists complete, all the required training complete, to the point where we have the squadron 95 per cent ready to go out the door if we are asked.”

Holloman also validated the capabilities of the maintenance technicians and logistics specialists, who had to ensure parts, tools and all other needs were available and delivered before the exercise began.

“You asked for volunteers and everyone was in, no questions,” said MCpl James Ferris, an avionics technician.

“The number of technicians who came in on that last weekend before we deployed was incredible,” added Sgt Glen Jefferson, an air weapons specialist. “We had eight to 10 technicians working on one particular plane to ensure it was ready to leave on time.”

Pilots might get the glory, but no squadron would function without logistics. From parts to finance, IT equipment to human resources, “everything falls into logistics,” said Sgt Joanne Bedard, a supply technician. “If you want to move from point A to point B you have to start with logistics. That jet can’t get up in the air without us.”

While the workload will often find a steady rhythm during an exercise, logisticians see a high operational tempo before and after it

begins as they scramble for parts and sort paperwork, said MCpl Katherine Temple, senior financial services administrator.

The entire squadron will experience the challenge of a large move again later this year when they deploy to Norway in October for Exercise Trident Juncture 18, NATO’s largest exercise since the end of the Cold War that will include both day and night scenarios.

A BRIDGE TO THE NEXT FIGHTER

As one might expect with a 30-year-old platform, finding parts for the CF-188 can be one of the toughest challenges. Technicians quickly develop the scrounging skills of M*A*S*H character Radar

O’Reilly, admitted MCpl Kim Rehberg, a supply technician. “Usually we can find it somewhere, but sometimes we have to go to other squadrons.”

“A lot of the manufacturers don’t make parts anymore,” said Bedard. “But us and the technicians are very resilient. If a jet needs a part, we will find it. I don’t always know how it gets found, but it gets found.”

“It’s a big team effort to make every jet fly every day,” added Jefferson.

Repair tools and other components can be in short supply. And on an exercise where the supply chain can be slow due to geographic location, problems are often resolved by picking apart a “hangar queen,” the first jet to seriously break down. “When parts come in, we’ll bring it back up to speed.”

Rock, who has been flying various iterations of the legacy Hornet since 2005, acknowledged the aircraft is starting to show its age and he credited the maintenance and supply technicians with resolving any and all problems that have emerged.

But he said the aircraft systems have evolved over the years, to the point where the “average wingman these days can be responsible for a lot more based on the amount of information that they have available.” Rather than waiting to be told what to target and shoot, “wingmen are now capable of doing much more independently before being told, because of the amount of situational awareness everyone is afforded based on the systems in the aircraft ... [In] terms of the avionics and the sensor suite, it’s exceptional.”



As the RCAF fighter squadron currently on high readiness, 401 TFS is alternating NORAD Quick Reaction Alert duty with 409 TFS and training to conduct operations around the world. **Mike Reyno Photo**

Led by the Rams' colour bird that had its tail painted to commemorate Operation Impact, the squadron was granted permission to apply the same "YO" codes on the tail fin of its CF-188s as it did on its Hurricanes and Spitfires during the Second World War. **Mike Reyno Photo**



MCpl Dave Porter, an 401 TFS avionics systems tech, performs a pre-flight check on a CF-188 Hornet. **Cpl Manuela Berger Photo**



CF-188 Hornet 729 from 401 TFS refuels over New Mexico during Exercise Sandy Fleece in February 2018. **Cpl Manuela Berger Photo**



The load crew of air weapons systems technicians from 401 TFS arm a CF-188 Hornet with an inert laser guided training round. **Cpl Manuela Berger Photo**



Pilots and ground crew from 401 TFS prepare for the final training mission of Exercise Sandy Fleece. **Cpl Manuela Berger Photo**

As an example, he noted that on NATO's Operation Unified Protector over Libya in 2011, Canadian pilots had cockpit delegated release authority. "There was no way for us to reach back to a CAOC [Combined Air Operations Centre] and get every target vetted, so if the targets met certain criteria in terms of collateral damage and national restrictions, then individual pilots in the cockpit could choose whether or not to engage, which is a tremendous responsibility, one that I don't think would have been afforded" with previous targeting pods and situational information, he said.

That sensor capabilities integral to the current CF-188 are providing today's young pilots with a bridge to whatever fighter jet replaces the Hornet, he added: "We are at a good spot to transition to the next level of fighter."

WELL-OILED MACHINE

When 401 TFS deployed on Op Impact, "I think the paint was still drying on the walls as they were walking out the door," said Rock. But the experience of building a new unit on the fly had a galvanizing effect on the squadron. "Morale was incredibly high" when they returned from Kuwait, he noted. "The unit had gelled. Everybody is on the same page, working like a well-oiled machine."

His team would agree. "We went from a super squadron where no one really knew you, because it was such a mass of people, to a family," said Jefferson. "When we came back [from deployment], the amount of corporate knowledge and skill sets we had gained ... and the relationships was amazing."

Whether it's ancient or recent history, the members of 401 TFS are justifiably proud of all that they have accomplished. 🇨🇦



The load crew of 401 TFS work on a CF-188 Hornet at Holloman Air Force Base, New Mexico. **Cpl Manuela Berger Photo**

After 55 years of operation, 401 Sqn was stood down in 1996. At the time, it was equipped with the CH-136 Kiowa helicopter. It wasn't until June 30, 2015 when 401 Sqn was stood up again, that it returned to its roots as a fighter squadron. **Mike Reyno Photo**



▶ CHRIS THATCHER

Chris Thatcher is editor of *RCAF Today* and a contributing editor to *Skies*.

A Canadian's PATH TO THE STARS

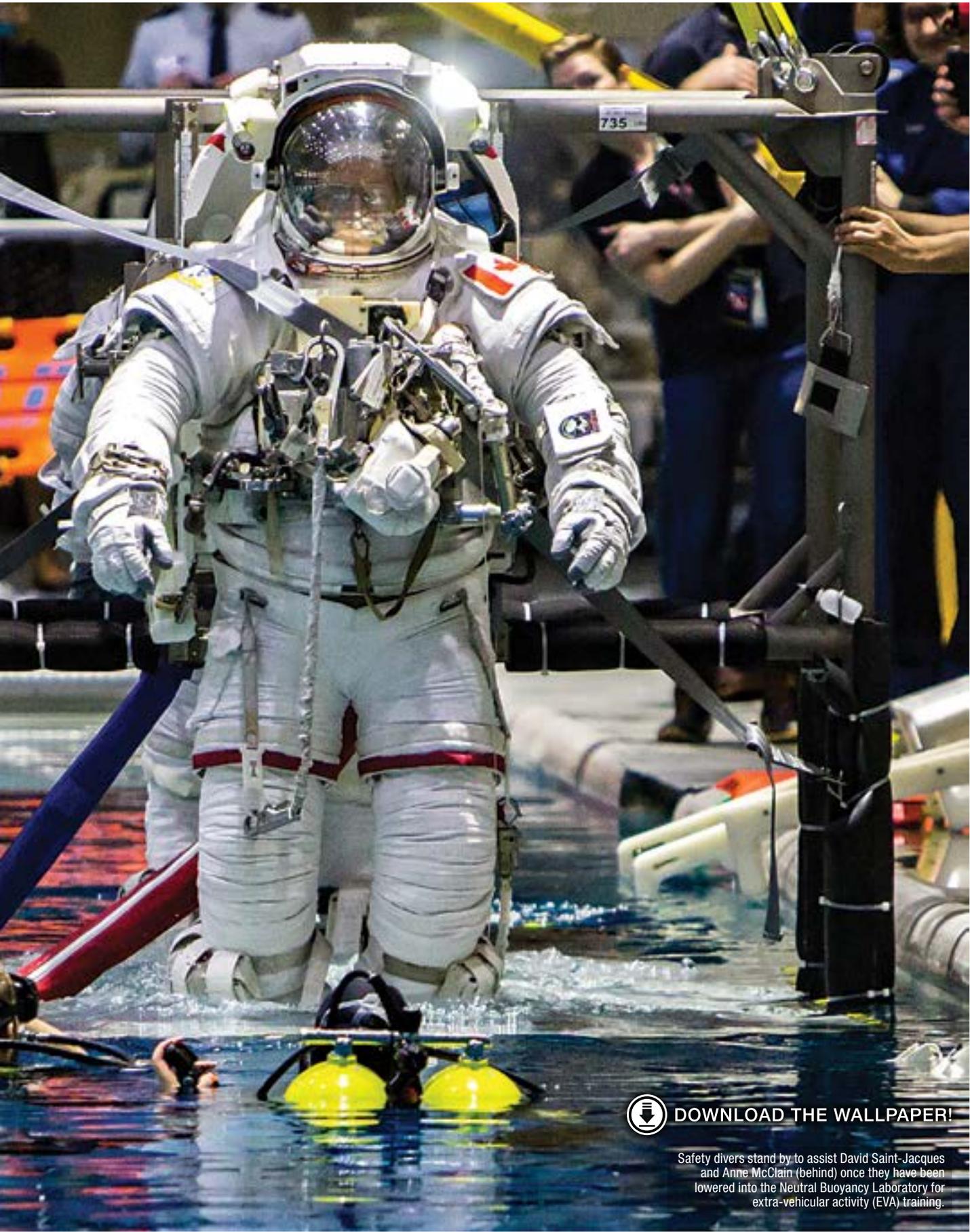
Some nine years after David Saint-Jacques first reported for training at the Johnson Space Center in Houston, Texas, the flight of his dreams is now just months away.

▶ STORY AND PHOTOS BY SEAN COSTELLO

Selected in 2009 by the Canadian Space Agency (CSA) as one of two Canadians to be trained as part of that year's National Aeronautics and Space Administration (NASA) Astronaut Candidate class, David Saint-Jacques is now closing out the final phase of his mission-specific training and is in the midst of completing his final flight-readiness exams; he is preparing to fly on Dec. 20, 2018.

Skies correspondent Sean Costello, in conjunction with SpaceFlightInsider.com, has been covering the professional development of Saint-Jacques and others within the CSA since 2011, tracking Canada's progress and investments in critical science and health research. In the following report, Costello takes us behind closed doors and into restricted operational areas to learn from instructors, program managers and CSA leaders about all that goes into the preparation of a mission-ready Canadian astronaut.





DOWNLOAD THE WALLPAPER!

Safety divers stand by to assist David Saint-Jacques and Anne McClain (behind) once they have been lowered into the Neutral Buoyancy Laboratory for extra-vehicular activity (EVA) training.

“ASSUMPTIONS THAT ASTRONAUT CANDIDATES NEED TO BE SERVING IN THE MILITARY OR ALREADY BE A LICENSED PILOT IN ORDER TO QUALIFY ARE INCORRECT.”



Saint-Jacques watches intently as the Soyuz MS-09 launcher (Expedition 56/57) rolls toward its launchpad in Baikonur, Kazakhstan.

From a “Canadians in space” perspective, Canada has a strong track record of selecting, preparing and flying some pretty impressive astronauts. From our nation’s first astronaut to fly, the Hon. Marc Garneau (now Minister of Transport) through to our current Governor General, the Rt. Hon. Julie Payette, a total of eight Canadians have flown 16 different missions. Most recently, Col Chris Hadfield (retired, Royal Canadian Air Force) flew to new heights as the first Canadian commander of the International Space Station (ISS), launching aboard a Russian Soyuz capsule in December 2012.

During Hadfield’s five-month mission, he and the CSA made what many would call a science out of creating and sharing a unique mix of engaging photos, informative tweets and entertaining videos about the Earth,

space, science and of course—most memorably through his recording of a cover of David Bowie’s “Space Oddity”—music.

But at the core of his mission and efforts, Hadfield was predominantly focused on working through his complex list of medical and scientific research tasks, as well as performing his required station commander duties, all in conjunction with Mission Control in Texas.

It raises the question: How can one person become so well trained and prepared to accomplish so much, especially when they are so physically isolated and separated from the wealth of common resources available to folks still on the ground?

During visits to Johnson Space Center, Baikonur Cosmodrome, Roscosmos Mission Control and some Canadian locations, a clear picture emerged of a typical Canadian astronaut’s path to the stars.

SHAPING A FUTURE CANDIDATE

In the pre-applicant phase, would-be astronauts are actively defining themselves through their studies, their career development and other goal-oriented, personal growth activities. While some lines of study might clearly relate to the astro-sciences, other perfectly appropriate fields include those focusing on science, engineering or medicine—as long as candidates follow their passion and establish a pattern of successful learning and retention of complex material.

Ultimately, that is what selection boards are concerned with; that, and evidence of some highly valuable personal qualities such as resourcefulness, good judgment and a sense of teamwork.

Assumptions that astronaut candidates need to be serving in the military or already be a licensed pilot in order to qualify are incorrect.

Speaking of Saint-Jacques, Edward Tabarah, head of the Canadian Astronaut Corps, told *Skies*: “David had never flown an airplane when we hired him, but he came up to speed very, very rapidly. He started with an instructor, then he soloed, then he got his IFR [instrument rating].

He acquired that additional skill, but he came to us having already earned a PhD in astrophysics, having worked in astrophysics in Japan [in Japanese, having learned the language], and then switching directions, by becoming a physician—a medical doctor working in the North, in isolated areas. Obviously, he had enough ‘right stuff’ without having to be a pilot.”

APPLYING AND INTERVIEWING

During an astronaut recruitment campaign (Canada has held four to date), would-be candidates begin the selection phase by completing and submitting very thorough application packages, detailing such information as their school and professional work history, very specific health and fitness information, as well as the applicant’s personal thoughts and motivations associated with their application.

During the selection phase, which typically takes close to a full year, candidates are subjected to great scrutiny, ensuring that only the strongest, mentally and physically speaking, will advance. For reference, during the last two campaigns in 2009 and 2017 (each of which were held to find two candidates), the CSA received more than 5,300 and 3,700 applications respectively.

So, what is the key to advancement during this phase? Candidates must show they can learn quickly and apply the knowledge practically.

“The robotics course itself is over two weeks in length, but within six hours we’re able to give [potential candidates] a classroom and an activity and test them on fairly difficult tasks,” said Tabarah. “That, to me, gives me the confidence that they will succeed in the robotics training. We’re not teaching the robotics now; we’re just making sure they have what it takes to do the mental gymnastics to be able to excel in the robotics training.”

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Col Jeremy Hansen, right, provides assistance as Saint-Jacques prepares for an EVA simulation at Johnson Space Center in Houston, Texas.



Staying healthy while on station includes hours of daily exercise and resistance training. Here, Saint-Jacques practices running on Treadmill 2 in Houston, Texas.

HIRED! TIME TO BEGIN YOUR TRAINING

Once selected and hired, astronaut candidates have a few months to make the necessary arrangements for transitioning to their new lives and career, eventually making their way down to Houston, Texas. All Canadian, American and Japanese astronaut candidates are required to live near the Johnson Space Center (JSC) training facilities, while European Space Agency (ESA) and Russian trainees live and train overseas, visiting JSC as required.

Following the May 2009 CSA announcement confirming Saint-Jacques and fellow classmate Jeremy Hansen as the successful candidates, they joined three Japanese and nine American candidates to form a 14-person international class, nicknamed “The Chumps.” This class was NASA’s 20th astronaut candidate group.

At this stage, Tabarah explained, a modern-day astronaut candidate is expected to complete two years of basic training to bring all candidates to the same level.

“We give them language training, EVA (extra-vehicular activity, or spacewalk) training, robotics training—but there’s an awful lot of other training as well, like survival training and pilot training,” he said.

“They all pilot the T-38 [Talon] jet, but we also give them private pilot training because although we’re not flying a shuttle anymore, we feel that pilot training is real. Your decisions have consequences. It’s very operational, it’s very much rooted in good communication, being good at following procedures, attention to detail, hand-eye co-ordination—all of those good things that will serve you in your astronaut training and in being a good, effective crew member.”

According to CSA astronaut and RCAF Col Jeremy Hansen, class supervisor for NASA’s Astronaut Class of 2017 (including Canadian candidates Joshua Kutryk and Jenni Sidey-Gibbons), this is also when the candidates get their first exposure to the ISS partner agency properties.

“They won’t all go as one group, but they will all go to do what we call their pre-assignment training in Japan (for the Kibo module), in Germany for the ESA (Columbus) module, and at the CSA in St. Hubert (Montreal) for Canadarm2 training, for robotics training.”

ARGOS, the Active Response Gravity Offload System, is one of many simulators used to help prepare astronauts for living and working in microgravity.



YOUR MISSION: CONTINUOUS LEARNING AS YOU AWAIT ‘THE CALL’

Following graduation, successful candidates are now considered mission-assignable astronauts. Two years into their new career, it is at this stage that one could conceivably be tasked with preparing to fly a specific mission, although it is much more likely that they will be assigned a support role within the space program. There, they will continue to develop their skills, being challenged to grow and work in international teams as they will when they fly aboard the ISS.

For Saint-Jacques, this phase of astronaut development lasted five years, during which time he was very active with additional training and duties, including participation in different Earth-based analogous training expeditions, including the underwater NEEMO 15 mission and the underground CAVES 2013 mission.

According to Hansen, the importance of these expeditionary missions cannot be overstated: “We’re developing astronauts to become explorers by exploring here on Earth, but we are also leveraging these Earth exploration opportunities to exercise how we would explore the lunar surface, or even Mars.”

“IN ADDITION TO PREPARING FOR THE WORK AND SCIENCE THAT THEY WILL BE PERFORMING ON STATION, ASTRONAUTS ALSO NEED TO PREPARE FOR HEALTHY LIVING IN MICROGRAVITY.”

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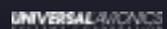
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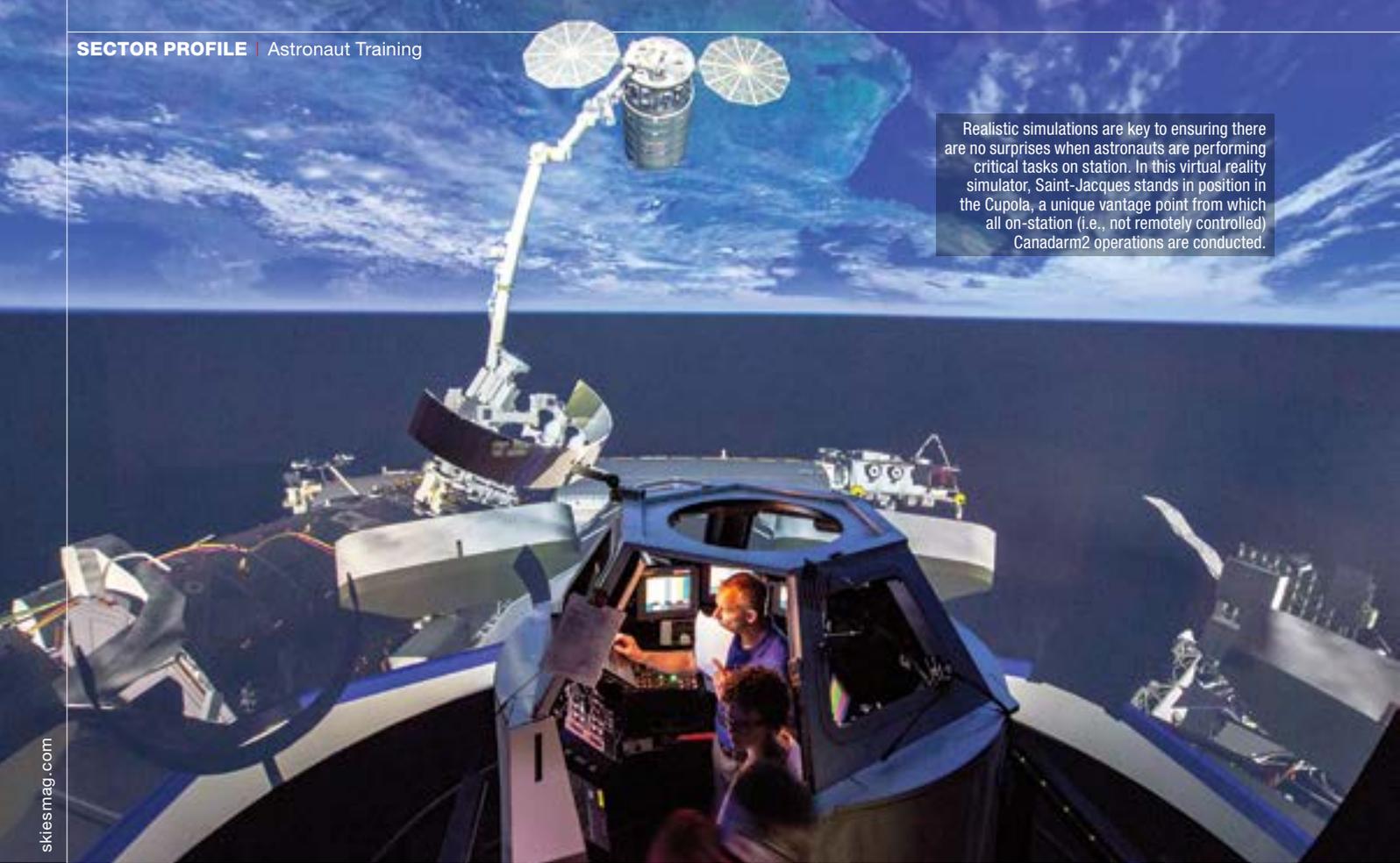
THIRD // \$125 cash award // 3 Winners, 1 in each of the 3 categories

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Realistic simulations are key to ensuring there are no surprises when astronauts are performing critical tasks on station. In this virtual reality simulator, Saint-Jacques stands in position in the Cupola, a unique vantage point from which all on-station (i.e., not remotely controlled) Canadarm2 operations are conducted.

CONGRATULATIONS, YOU'RE MISSION ASSIGNED!

Due to the vast amount of preparation and mission-specific training which must occur prior to launch day, the announcement that an astronaut has been mission-assigned usually comes some 30 to 36 months ahead of their flight.

In the case of Saint-Jacques, his assignment was shared with the world on May 16, 2016, at the Canada Aviation and Space Museum. His training began that August.

"Today, I stand on the shoulders of all the astronauts who came before me," Saint-Jacques said moments after the announcement. "They inspired me—they were my role models. They sparked my curiosity about space and made me want to experience space flight for myself. Space exploration is the next step for humanity, and I am proud to be part of it. I would like to thank the Canadian Space Agency for giving me this incredible opportunity. I am humbled to represent Canada on this mission and promise to give it my very best."

MISSION TRAINING: YOU ONLY THOUGHT YOU KNEW WHAT BUSY WAS...

Mission-specific training is the next chapter in every astronaut's journey to the stars, and it's a complex and very tightly choreographed ballet of learning and practical simulations. In addition to preparing

for the work and science that they will be performing on station, astronauts also need to prepare for healthy living in micro-gravity, including training on specialized strength-training equipment, as well as learning everything that one would need to know in order to maintain and operate their football-field sized orbiting home, all while travelling at 27,000-plus kilometres per hour and at an altitude of some 400 kilometres.

Sitting with *Skies* for an onsite interview in Baikonur, Kazakhstan, Tabarah explained the complexity of the coordinating efforts: "Training happens in all five partner countries; mostly in Houston at JSC, but also in Tsukuba, Japan; Cologne, Germany; Star City in Russia and of course at CSA headquarters in St. Hubert."

When asked about the approach to planning and scheduling, Tabarah continued, "What we do is script basically all the training for the entire 26 months (of mission-specific training) and we just divide by week; these weeks are in the U.S., then you go to Russia. On your way to Russia, sometimes you'll go to Europe; occasionally we give them a week of vacation."

Taking a moment to expand on the human aspect of the training, Tabarah was quick to point out that the CSA recognizes that the astronaut is not the only person impacted by the heavy demands.

"You never want to send someone to Russia for a week and then straight back to the U.S. We're

conscious of the jet lag and all of the effects of changing time zones, but we are also conscious of the family life. David has three very young children; although he has a very capable spouse, the children don't understand that their father is gone for a long time, shows up and then he is soon gone again—so we are very conscious to try to minimize the impact of the schedule."

PRE-LAUNCH: BRIDGING THE GAP BETWEEN YOUR FUTURE AND THE PAST

Following the bulk of an astronaut's mission-specific workups, pre-launch activities begin to take centre stage. As all ISS crew members currently fly to orbit in Russian Soyuz MS spacecraft, much of this time is spent in Star City, just outside Moscow.

The Russian State Commission evaluates the assembled crew as they perform fully-suited launch and landing simulations, injecting challenges to gauge their readiness to address the many contingencies which may appear during flight. Based on his experience and training, Saint-Jacques was assigned to fly as Flight Engineer 1, the co-pilot of the Soyuz capsule, colloquially referred to as the "left-seater."

Not all pre-launch activities are technical in nature; crewed Russian launches are always preceded by a number of traditional cultural ceremonies and activities, from the planting of a tree alongside another similarly planted by Yuri Gagarin (the first human to fly to



Becoming familiar with emergency equipment is key to mission training; here, Saint-Jacques manipulates the controller for the Simplified Aid For EVA Rescue (SAFER) self-contained manoeuvring unit.



Containing 23.5 million litres of water, the Neutral Buoyancy Laboratory (NBL) training pool in Houston is large enough to accommodate full-size ISS module mockups.



ISS astronauts are responsible for the maintenance and operation of all environmental systems. Prior to launch, textbook learning must be validated through multiple evaluations and mock simulations.

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Retractable gantry platforms are raised on either side of the Soyuz MS-09 launcher shortly after being raised from its rail transport car on June 4, 2018.



Soyuz MS-09, carrying the crew of Expedition 56/57, climbs away from the Baikonur Cosmodrome in Kazakhstan on June 6, 2018.



After blessing the Soyuz MS-09 launcher and spacecraft, a Russian Orthodox priest blesses the working media.



During the Expedition 56/57 press conference, the prime crew (left three astronauts) and backup crew remained quarantined behind glass.



space), to the launcher, crew and families being blessed by a Russian Orthodox priest.

During the pre-flight press conference and family visits, both the prime (flying) crew and the backup crew are seated behind a glass wall, part of their two-week quarantine period. They are permitted outside, but three metres is the typical buffer maintained between crew members and non-quarantined individuals.

Two days prior to launch, the assembled launcher is rolled out to the launch pad and raised into position. The backup crew attends and witnesses these events, both to learn from the experience as well as to report back to the prime crew on the progress of their ship; it is considered bad luck for the prime crew to watch these proceedings themselves.

As Saint-Jacques, a member of the backup crew for the June 2018 Soyuz MS-09 launch, stood in quarantine watching the prime crew's Soyuz roll out, he shared some thoughts on becoming one with his crew-mates.

"This is an interesting time for us to be here as a crew," he said. "We've had a lot of time together, training in Star City. We've already become 'one' technically; we're like one machine controlling the spacecraft, but all

the time that we've spent here in isolation, it's helped us form more personal bonds. This is a little glimpse of what our life will be like on orbit, when we're actually roommates!"

LAUNCH DAY: YOUR FLIGHT IS NOW BOARDING

Finally, it's the day they've been dreaming of and working toward.

Following a joint crew breakfast and the autographing of their room doors at the Cosmonaut Hotel, astronauts walk to waiting buses while being serenaded by the classic Russian song, Trava U Doma.

Prime crew on one bus, backup crew on another, it's off to building 254 for suit-up and pressure checks. Following some final terrestrial words with loved ones (still through glass), the prime crew marches out to present themselves to the State commission, obtaining final permission to fly.

Standing with Saint-Jacques at the June 2018 launch, just 1,400 metres south of the now-crewed Soyuz, his mind was clearly following along the checklists he's learned during training. As the countdown clock

ticked down, he mused, "For me, it's a very personal moment, because I know and love these people. I know exactly where they are in their training; I know exactly what they're doing right now. I can imagine myself in their shoes, right now.

"I think, in their hearts, the mission has already started, because now the last helper from the launch platform team has left the spacecraft, the hatch is closed, they're strapped in, power is up and they're already working their procedures. In their hearts and minds, they've already started their mission to the International Space Station."

Saint-Jacques' inaugural mission, Expedition 58/59, is scheduled to launch on Dec. 20, 2018. Readers wishing to follow the mission's progress or learn more about the science which Saint-Jacques will be performing on orbit can visit the Canadian Space Agency's website. 🇨🇦



SEAN COSTELLO

Sean Costello is a freelance photo journalist and new media producer, specializing in the study of high performance organizations, teams and individuals. Contact him via www.SeanInMotion.ca/contact.

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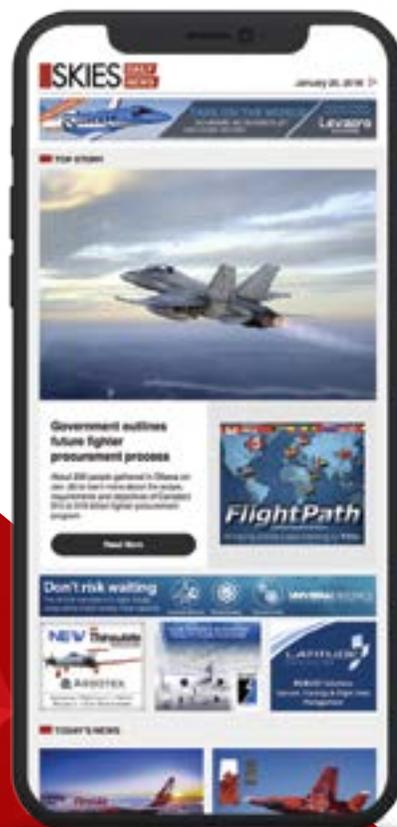
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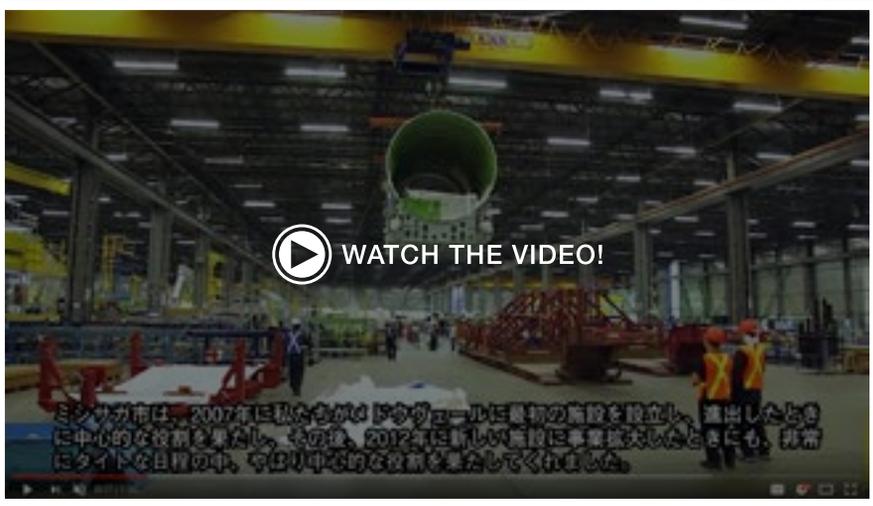
SKIES DAILY NEWS

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MHI Canada's 250,000-square-foot factory was designed to incorporate innovative processes, including automation (robotics), lean manufacturing, and flexible work cells. The Bombardier Challenger 350 vertical wing assembly jig is shown here. MHI first became a risk-sharing partner in the Challenger program in 1999. **Warren Liebmann Photo**

WINGS TO FLY

MHI Canada is carrying on a tradition of aerospace excellence in Mississauga, Ont., following in the footsteps of industry giants who called that area home. Today, the company is aiming to capture new wing and fuselage production work from major aircraft manufacturers.

► BY KENNETH I. SWARTZ

Modern aircraft design is both an art and a science. Aircraft design and manufacturing was once the almost exclusive domain of vertically-integrated companies that assembled parts made by hundreds, if not thousands, of subcontractors and suppliers. Bombardier Aerospace broke with tradition in the mid-1990s, when it launched the Global Express by splitting the \$1 billion development cost with risk-sharing Tier 1 partners, led by

Mitsubishi Heavy Industries (MHI) of Japan. MHI learned a lot while designing, building and integrating the Global's complex super-critical wing and centre fuselage. A little over a decade later, MHI was designing and assembling the outer wing box of the 787 Dreamliner, the most advanced airliner in the world. MHI's partnership with the Canadian aerospace industry was mutually beneficial—so much so that in April 2006, MHI decided to join the Canadian aerospace industry when it

opened an aerostructures facility in Mississauga, Ont., to support its work with Bombardier. This significant 'on-load' of aerospace work from Asia occurred because MHI "had confidence in Canada ... in our technology, our skills, access to talent, (and) proximity to the customer," said MHI Canada CEO Michael McCarthy, during a recent newspaper interview. "In the aerospace industry, this is probably the largest 'on-load' of ... highly skilled manufacturing jobs in Canada in recent history."

MHI Japan has gradually transferred manufacturing responsibility for Bombardier's Challenger 300/350 and Global 5000/6000 wings and the Global centre fuselage to MHI Canada. Shown here is the Global 5000/6000 wing and centre fuselage final assembly line. **MHI Canada Photo**



The trend in recent years has been for major OEMs to shift aerospace work to regions with lower labour costs, but this can impact schedule and quality. As demonstrated by MHI and MHI Canada, a better solution is a combination of highly skilled workers and greater automation.

McCarthy sees plenty of opportunities for growth, and looks to both the future and the past for his inspiration.

"I want to revitalize aerospace manufacturing in Malton, once home to industry giants like Victory Aircraft, A.V. Roe Canada, McDonnell Douglas Canada and Boeing Toronto," said McCarthy on the occasion of MHI Canada's 10th anniversary in 2016.

A total of 2,091 aircraft were built at Malton [now Mississauga] between 1938—when National Steel Car's Aircraft Division opened a factory at the new airport—and Ottawa's cancellation of the Avro Arrow on Feb. 20, 1959.

Not many people know that Malton's greatest contribution to commercial aviation occurred between 1964 and 2006, when up to 7,000 people built wings for every McDonnell Douglas passenger jet (except the DC-8) and the Boeing 717.

This established Malton as one of the top four sites in the world for designing and building large commercial aircraft wings. (The others were Boeing's plant in Seattle, Wash., and the Airbus plants in Filton and Broughton in the U.K.)

Now, MHI Canada is looking to write a new chapter by almost doubling the size of its manufacturing facility in Mississauga, to capture new wing and fuselage production work from the leading aircraft manufacturers.

MITSUBISHI HEAVY INDUSTRIES

MHI is a US\$40 billion a year Fortune 500 company that employs 84,000 people at 300 domestic and international subsidiaries. The company is active in nine core industrial sectors: aircraft, space, energy, ship and ocean, transportation, material handling, environment, automotive and industrial machinery.

Mitsubishi started building Renault aircraft engines under licence in 1916 and flew its first aircraft in Nagoya in the early 1920s. The company was the largest producer of aero engines and a major producer of military aircraft during the Second World War, and in the postwar years rebuilt its capability by building American-designed aircraft under licence for the Japanese military.

This included the F-86F Sabre fighter jet in the 1950s, followed by the F-4 Phantom, F-15J Eagle and Sikorsky SH-60J Sea Hawk helicopter. Home-grown MHI designs included the MH2000 helicopter, F-2 (based on the General Dynamics F-16), and the MHI X-2 advanced technology demonstrator jet.

In the 1960s, the Japanese government also jump-started the civil aircraft manufacturing industry by funding a consortium (that included MHI) to develop the 60-seat NAMC YS-11 twin turboprop airliner, which was exported to customers in 15 countries, including Transair in Canada.

The Mitsubishi MU-2 turboprop (700 built) has been flown in Canada for almost 50 years, and the MU-300 Diamond business jet first appeared in the early 1980s before Beechcraft purchased the design and rebranded it the Beechjet 400/400A, T-1 Jayhawk and Hawker 400/400XP.

BOMBARDIER TIER 1 PARTNER

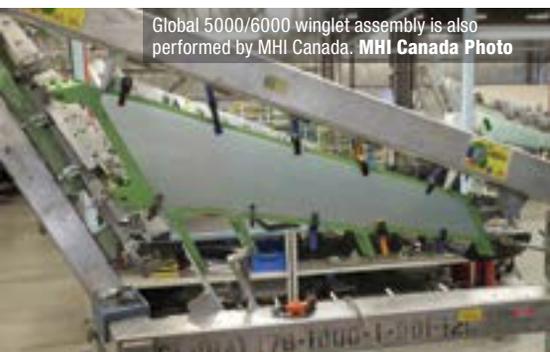
When Bombardier embarked on advance studies for an ultra-long-range business jet that would leapfrog the competition, company engineers told Bombardier chairman Laurent Beaudoin in 1991 that the aircraft would cost \$1 billion to develop.

The cost was too much for Bombardier to carry on its own, so it partnered with leading Tier 1 aerospace suppliers—MHI, Rolls-Royce BMW, and Safran (Messier-Bugatti-Dowty)—to share the development cost in exchange for a share of future profits.

Tier 1 systems integrators by definition take full responsibility for equipment and systems



An employee at MHI Canada works on the outer wing of a Challenger 350. **Warren Liebmann Photo**



Global 5000/6000 winglet assembly is also performed by MHI Canada. **MHI Canada Photo**

provided to an original equipment manufacturer (OEM), including design, assembly and services, with the expectation of technical and financial risk. Bombardier pioneered the Tier 1 risk-sharing model, but it was later adopted by Embraer, Boeing and Airbus.

Mitsubishi Heavy Industries signed on as a risk-sharing partner in September 1993 to build the Global Express' 28.7-metre (94-foot) wings, featuring an advanced supercritical airfoil with a 35-degree sweep and winglets. The work package included the design and fabrication of the wing and centre fuselage, structural assembly, wing/centre fuselage joint (pre-fit), flight control installation and riggings, and

“MHI CANADA COULD BUILD WINGS (OR FUSELAGES) FOR A SINGLE-AISLE COMMERCIAL JET, BUSINESS JET AND REGIONAL AIRCRAFT ON THE SAME PRODUCTION LINE TO REDUCE LABOUR AND OVERHEAD COSTS.”

systems installation and functional test.

MHI began machining the lower wing skins for the prototype at its Oye plant in Nagoya in February 1995.

In October 1995, Bombardier and MHI partnered on the Q400 airliner, with MHI designing and building the forward-, mid-, and aft-fuselage, vertical fin, horizontal stabilizer, elevator, rudder and door.

And, in 1999, MHI became a risk-sharing partner on the Bombardier Challenger 300 (first known as the Continental), responsible for designing and building the 21-metre (69-foot) span wing with a 27-degree sweep, plus structural assembly, systems installation and functional test.

There was a lot of pride at MHI in Japan when the first Bombardier Global Express flew in October 1996, the first Q400 in January 1998, and the first Challenger 300 in August 2001.

BOEING SUBCONTRACTOR

Japan has always been a large market for Boeing wide-body jets, which fly numerous short-haul, high-traffic domestic routes and long-haul services.

In the 1980s, Boeing enlisted the largest Japanese aerospace companies—MHI, Subaru (formerly Fuji Heavy Industries), Kawasaki Heavy Industries and ShinMaywa Industries—as major parts suppliers on each new jet.

Today, MHI produces the inboard flaps for the Boeing 737, the centre wing box and inboard flaps for the 747, aft fuselage panels and cargo doors for the 767, and the aft fuselage panels, tail fuselage section and passenger entry doors for the 777 and new 777X.

When Boeing launched development of the 787 Dreamliner, it aggressively outsourced major assemblies of the advanced technology aircraft to Tier 1 partners.

“Team Japan” secured 35 per cent of the work on the 787 program, with MHI responsible for the structural design, manufacturing and assembly of the 787’s outer wing box (including composite spars, skins and stringers), which has a high aspect ratio combined with efficiency-enhancing raked wingtips.

MHI and Bombardier agreed to transfer Q400 fuselage and parts manufacturing from Nagoya to Shenyang Aircraft Co. in China and the CRJ700/900 aft fuselage production to Shorts in Northern Ireland.

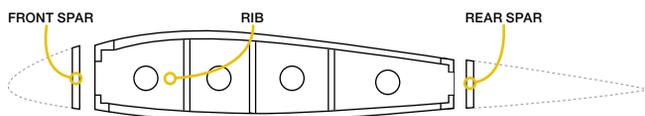
In 2008, the Japanese government announced the development of Japan’s first commercial aircraft since the YS-11. This became the Mitsubishi Aircraft Corp. (MAC) MRJ70 and MRJ90, powered by the Pratt & Whitney PW1200G geared turbo fan (GTF) engine. The MRJ90 is expected to enter service in 2020 and the MRJ70 in 2021.

NEW CANADIAN FACTORY

In April 2006, MHI decided to open a 90,000-square-foot facility in Mississauga to take over work previously done in Japan and at the Bombardier factory.

Global wings and centre fuselages were shipped from Japan to a factory on Meadowvale Drive, where MHI Canada employees used lasers to precisely set the dihedral, sweep and incidence of the wing-fuselage splice and hard drill the

HOW TO BUILD A WING



FIRST STEPS

The first step in wing construction is the build-up of subassemblies, including the front and rear spars, wing ribs and wing skin assemblies, with stringers attached.

FINAL ASSEMBLY

During final assembly, the front and rear spars are joined to the wing ribs in a tooling assembly jig and covered with upper and lower wing skins to create the wing box.



FINISHING TOUCHES

Then, the electrical, fuel and hydraulic systems are installed, followed by the leading and trailing edges and flight controls.



FUNCTIONAL TESTING

Functional testing of systems takes place throughout the assembly process.



An innovative flexible work cell at MHI Canada uses a “superframe” to assemble Global 5000/6000 wings. The superframe is mounted on an automated guided vehicle (AGV) and can be modified to handle a wide variety of different wing sizes, allowing the company to adjust quickly to market needs. **MHI Canada Photo**



On the final assembly line, Challenger 350 systems are installed in the wing. **Warren Liebmann Photo**



A Global 5000/6000 wing-to-centre fuselage join. **MHI Canada Photo**

slightly undersized holes (using contoured drill plates) that would be used to permanently fasten the parts together on Bombardier’s final assembly line.

“They say that the ‘devil owns the interface’ because mating the wings and fuselage of an aircraft is a very complex task usually only performed by major aircraft manufacturers,” said Alex Tsoulis, director of Business Development and Advanced Technologies at MHI Canada, during an interview with *Skies*. “MHI is the only Tier 1 aerostructures company that performs this kind of work.”

After a centre fuselage was shipped to Bombardier, MHI Canada completed all the downstream work on the wings (including installation of flight controls, fuel, electric, hydraulic systems and functional test).

Then, MHI established a low-rate second source assembly line for the Challenger 300 at its Canadian division, utilizing tooling assembly jigs and parts made in Japan. This started out as a low-rate/low-risk experiment; but as results improved, the Canadian plant became the high-rate source for Challenger 300 wings, backed up by low-rate production in Japan.

That’s when Ontario drivers began to see Quebec-bound trucks hauling Challenger

300 wings wrapped in blue plastic down Highway 401.

MOVING TO NORTHWEST DRIVE

MHI Canada outgrew its Meadowvale facility after six years. In 2012, a new 250,000-square-foot factory with 20,000 square feet of office space opened on Northwest Drive in Mississauga, at a location directly under the glide path to Runway 23 at Toronto Pearson International Airport.

From the beginning, the new MHI Canada factory was designed to incorporate innovation, automation (robotics), lean manufacturing, and flexible work cells, but the transformation was gradual since it involved many technology demonstration projects, according to Tsoulis.

Two different approaches were taken to upgrade the tools and methods used to build the Challenger 300/350 and Global 5000/6000 wings, which is evident during a factory tour. One production bay is dedicated to the Challenger 350 and three to the Global 5000/7000 wing and centre fuselage.

For the Challenger 300, the company gradually modified the twin assembly lines built in Japan so they could accommodate automated drill

(auto-drill) equipment designed to safely work alongside staff. Experimental development of the auto-drill was performed on the Challenger 300 assembly line prior to its gradual phase-in.

Bombardier launched the Challenger 350 in May 2013, incorporating a new winglet and changes to the wing skins, spars and ribs. A dedicated Challenger 350 wing assembly line was created without auto-drill capability.

MHI Canada built wings for the Challenger 300 and 350 in parallel until the “market voted” and production of the 300 was phased out. At that point, the twin Challenger 300 wing assembly lines with auto-drill were converted to Challenger 350 build capability, and the dedicated 350 line without auto-drill was decommissioned and stored.

For the Global 5000/6000, MHI developed a completely new manufacturing process for the wing.

The foundation was the development of a new flexible work cell that uses a ‘super-frame’ to assemble the Global wings.

“The Global wing and fuselage are actually more complex than the wings of a narrow body jetliner (like a 737 or A320) because of the Global’s higher speed, ceiling and longer range,” explained Tsoulis.

The superframe is mounted on an automated guided vehicle and can be modified to handle wings up to approximately 1,400 square feet or 180,000 pounds maximum take-off gross weight, which pretty well covers all contemporary business jets and single-aisle airliners.

This gives MHI the ability to quickly adapt to market needs and conditions.

Last year, the company made 72 per cent of the wings on business aircraft delivered by Bombardier. The company will also produce the new Global 5500 and 6500 wings, each with about 7,000 parts.

AUTO-DRILL

The amount of fabrication work required to build a wing is roughly proportional to the area of the wing. For example, the Challenger 300 has a wing area of 48.5 square metres (522 square feet) and the Global 5000/6000 a wing area of 94.9 square metres (1,021 square feet).

MHI Canada worked with Brown Aerospace, a leader in automated drilling technology, to develop a custom five-axis drilling system that can be used side-by-side on a production line with workers, rather than in an isolated cell.

"The automated drilling technology is a fusion of Canadian, Japanese and American innovation with a considerable amount of

experimental development on behalf of the MHI Team in Canada and Japan," said Tsoulis. "The drill is designed to perfectly align itself with the complex shape of a modern wing that has a continually changing profile."

The auto-drill creates a full-sized hole, counter-sinks it, and leaves no coolant residue or metal chips on the metal surface. It's designed to drill wing skins, ribs, spars and stringers mounted on both horizontal and vertical jigs.

SUPPLY CHAIN

When MHI's Mississauga factory opened, all the parts for the Challenger 300 and Global 5000/6000 were sourced in Japan.

"MHI did well building Challenger 300 wings in Mississauga with parts sourced from Japan," said Tsoulis. "After that, MHI allowed us to gradually source greater amounts of the wing and fuselage parts, with approximately 70 per cent of all parts now obtained from our Canadian supply chain and others coming from elsewhere in North America and Europe."

In the 2012 aerospace industry review titled *Beyond the Horizon: Canada's Interests and Future in Aerospace* (the so-called Emerson Report), the authors place a major emphasis on the development of Canadian Tier 1 systems integrators, as major OEMs strategically

reduce their number of approved suppliers.

Canada lost a major Tier 1 aerostuctures capability when Boeing closed the former McDonnell Douglas wing factory at Pearson Airport in July 2005.

"The Tier 1s have to get close to the Tier 2 and Tier 3 companies to collaborate, stimulate innovation, and jointly lower costs," said Tsoulis.

MHI Canada has been actively growing its Tier 2 and Tier 3 supply chain as part of its "Team Canada" strategy to stimulate innovation and lower costs. It is now developing major supply chain partners in Canada, the U.S., Mexico, and the U.K. to support its growth—in addition to MHI's highly capable and competitive supply chain in Japan, Vietnam and Asia.

To support and grow innovation, MHI Canada has developed close working relationships with academic and R&D organizations and works closely with municipal, provincial and federal agencies.

MARKET DEMAND

The market for aircraft wings is directly related to global demand for business and commercial aircraft.

Boeing has forecasted a need for 41,030 new commercial aircraft valued at \$6.1 trillion by




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the year 2036. This includes a requirement for about 2,400 regional, 29,500 single-aisle jets, and 9,100 wide-body aircraft.

In addition, Bombardier Business Aircraft forecasted 8,300 deliveries in that segment between 2016 and 2025.

The growing demand for single-aisle commercial aircraft has already pushed production for the Boeing 737 and Airbus A320 (and their wings) to record levels, putting a serious strain on the supply chains.

FUTURE OPPORTUNITIES

Leading Tier 1 aerostructures companies grow by becoming a supplier on a brand

new aircraft platform, a second source for an existing aircraft program, a partner in a government procurement or offset contract, or they step in to replacing a supplier that is exiting the business or can't meet OEM targets (e.g. cost, schedule or quality).

Tsoulis sees many opportunities for growth since MHI Canada is one of the only aerostructures companies in the world that builds large, fully functional wing and fuselage assemblies, and performs the complex wing-to-fuselage join operation.

Boeing is actively studying the business case for a New Mid-market Aircraft (NMA) that will fill the payload/range gap between

the Boeing 737 MAX 9 and the 787-8.

Tier 1 suppliers want to play a major industrial role on the so-called 797, but Boeing might bring a lot of the production in-house after the painful development phase of the 787. However, since then the 787 has become a long-term success and has changed the face of aviation.

Boeing and Airbus are applying upward pressure on production rates of the most popular single-aisle jets to clear backlog and stimulate new sales.

Boeing is increasing production of its best-selling 737 MAX aircraft to 52 per month in 2018, and is aiming for 57 in 2019.

Airbus told Reuters in April 2018 that it is planning to increase production of its A320 family to 63 per month in 2019.

Both aircraft programs, plus perhaps the newly-christened Airbus A220 (formerly C Series), could benefit from a second source for wings. Airbus has already indicated that it would like to grow a low-cost North American supply chain for its A321 final assembly line in Mobile, Ala., and has voiced its concern regarding the impact of Brexit—the U.K. leaving the European Union in 2019—since all Airbus wings are made in the U.K.

In Canada, Bombardier Commercial Aircraft has stated it would like to reduce the cost of building a Q400 wing, and there has been turmoil in business aviation related to wing contracts.

One of the advantages of MHI Canada's investment in automation and flexible work cells is that it could build wings (or fuselages) for a single-aisle commercial jet, business jet and regional aircraft on the same production line to reduce labour and overhead costs.

Another Canadian opportunity for MHI is the production of the country's future fighter jet. When Canada ordered the CF-188 Hornet more than 30 years ago, companies like Canadair and McDonnell Douglas of Canada got contracts to build parts, while other companies won commercial work that was part of an offset agreement.

A year ago, MHI rolled out the first Lockheed Martin F-35 Lightning II it assembled for the Japan Air Self-Defense Force. Japan and other countries have created successful in-country fighter assembly programs, and MHI Canada believes this country is more than capable of doing the same. ■



► KENNETH I. SWARTZ

Kenneth I. Swartz has spent most of his career working in international marketing and PR with commercial aircraft manufacturers, airlines and helicopter charter operators. An award-winning aviation and rotorcraft journalist, he runs Aeromedia Communications.



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NEW GLOBAL DEBUT

BY KENNETH I. SWARTZ

In May, Bombardier Business Aircraft (BBA) upstaged its major competitors at the annual European Business Aviation Convention & Exhibition (EBACE) in Switzerland when it revealed it had been secretly flying a new member of the Global corporate jet family, powered by a brand new turbofan engine.

One day prior to the opening of EBACE, industry and media guests were attending a Bombardier reception in the Tag aviation hangar when BBA president David Coleal surprised the audience by dropping a curtain to reveal a luxurious bronze-painted Global 6500 flight test vehicle (FTV1). The shiny jet is powered by a pair of brand new 15,125-pound-thrust Rolls-Royce Pearl 15 turbofans tucked into the nacelles.

The well-executed staging signalled BBA's strength in the business aviation market and re-established Rolls-Royce as a next generation business aircraft engine provider.

FTV1 only appeared in the pre-show unveiling and flew back to Wichita, Kan., immediately afterwards.

"The Global 5500 and Global 6500 aircraft have the longest range, the largest cabins and the smoothest ride in their class, and we are very proud that they will be powered by the advanced and efficient Pearl engine, purpose-built for these aircraft by our longstanding partners at Rolls-Royce," said Coleal.

Despite delivering up to nine per cent more thrust during takeoff than the Rolls-Royce BR700 used on the Global 5000 and Global 6000, the Pearl engine will be two decibels quieter and operators will benefit from a seven per cent improvement in specific fuel consumption (SFC).

The engine will also deliver world-leading emissions performance, including best in class nitrogen oxide (NOx) emissions, despite pro-

Bombardier unveiled the newest members of the Global business jet family at EBACE 2018. With longest-in-class range, the Global 5500 and 6500 will be powered by a new Rolls-Royce Pearl engine that neatly fits inside the previous BR710 engine cowling.

ducing customers at speeds approaching the speed of sound (Mach 0.90).

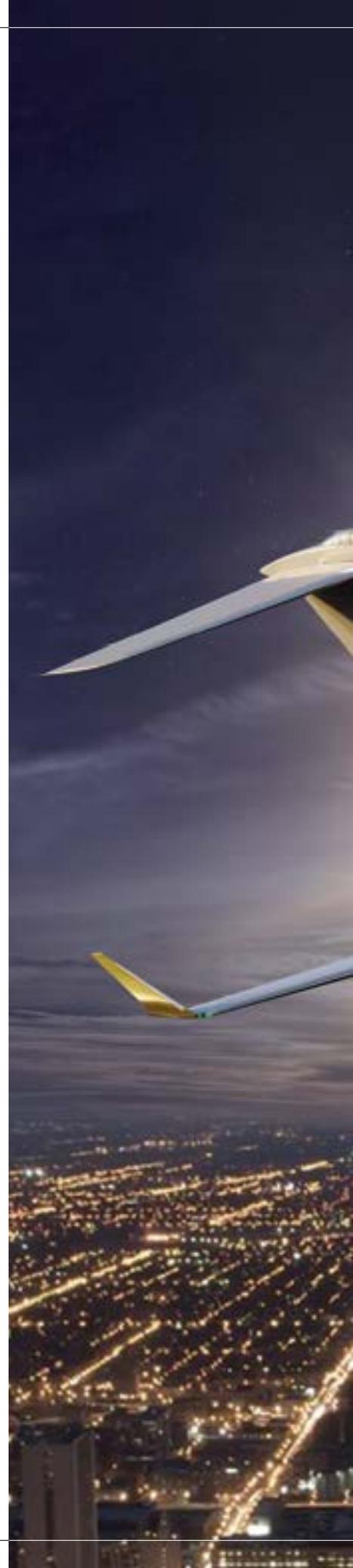
"The combination of outstanding performance, economy, and reliability levels make it the perfect fit for Bombardier's newest Global aircraft," said Chris Cholerton, president, Civil Aerospace, Rolls-Royce. "With the Pearl engine, we are extending our successful relationship with Bombardier, which started more than 20 years ago. Together, we made history by creating a whole new class of aircraft and that success story enters a new chapter today."

The list prices for the Global 5500 and Global 6500 are lower than those for the Global 5000 and Global 6000, which is aligned with industry pricing practices for new aircraft, said Bombardier.

"Ultimately, the market will decide the price, but we expect the Global 5500 and Global 6500 aircraft to fetch a premium price versus the Global 5000 and Global 6000," Mark Masluch, BBA's director of communications and public affairs, told *Skies*.

Bombardier recently delivered its 800th Global aircraft to a customer, and HK Bellawings Jet Limited in Hong Kong has signed a letter of intent (LOI) for up to 18 Global 6500 and Global 7500 business jets.

The first Global 5500 and Global 6500 aircraft will enter service in late 2019, following certification.



The newest Global business jets will feature new Rolls-Royce Pearl engines that will deliver class-leading range, speed and agility, says Bombardier. **Bombardier Image**



DOWNLOAD THE WALLPAPER!



Bombardier Business Aircraft president David Coleal describes the newest members of the Global business jet family to an EBACE audience. **Bombardier Photo**



The Bombardier Vision flight deck in the Global 5500 combines a comprehensive avionics suite with modern aesthetics. **Bombardier Photo**



Open spaces and a refined interior design are hallmarks of the Global 6500. **Bombardier Photo**

GLOBAL FAMILY

In 1999, the first Bombardier Global Express long-range business jets entered service, powered by a pair of 14,750-pound-thrust BMW Rolls-Royce BR710-A2-20 turbofans.

The new jets were assembled in Toronto and completed at Bombardier in Montreal and other independent companies, until Bombardier brought most of the completion work in-house.

In 2005, Bombardier launched the lower priced Global 5000, a three-zone cabin 4,800 nautical mile version of the airplane, and an improved Global Express XRS (replacing the Global Express) offering greater range and performance and new cabin and cockpit upgrades, including the Bombardier Enhanced Vision System (BEVS) as standard equipment.

The most notable engineering change was the addition of a new fuel tank in the wing root to provide more range—6,150 nautical

miles (11,400 km) at a cruise speed of Mach 0.85, and 5,450 nautical miles (10,100 km) at Mach 0.87.

The engineers working on the Bombardier Vision flight deck described the avionics change as a very significant upgrade that gave the aircraft “a new brain.” This was also the first aircraft with synthetic vision on a head-up display (HUD).

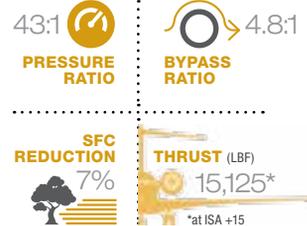
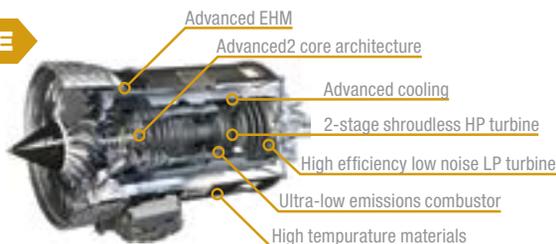
The Global Express XRS rebranded as the Global 6000 in 2012, which coincided with the introduction of the Rockwell Collins Pro Line Fusion-based Vision flight deck on both the Global 5000 and Global 6000 aircraft. In addition to a brand new flight deck, the Global 5000’s range also increased to 5,200 nautical miles.

With the introduction of the Global 6000, the numerical designation of the Global family now represented the maximum range in nautical miles of each family member (at 0.85 M with NBAA reserves).

ROLLS-ROYCE PEARL AT A GLANCE

The Pearl 15 is the industry’s most advanced business aviation engine, delivering greater power and efficiency for the Bombardier Global 5500 & 6500 aircraft and enabling top speeds of Mach 0.90.

In addition to the most efficient core in business aviation, the engine also benefits from the world’s most advanced health monitoring system, harnessing digital capability to make intelligent decisions.





Bombardier Business Aircraft president David Coleal surprised an EBACE audience by unveiling a luxurious bronze-painted Global 6500 flight test vehicle at a reception. **Bombardier Photo**

MARKET DEMAND

In 2016, Bombardier Business Aircraft forecasted 8,300 new business jet deliveries between 2016 and 2025, valued at US\$250 billion.

The same year, market research firm Forecast International published a study on Bombardier that predicted the Canadian company would deliver 1,470 Global business jets between 2016 and 2026.

The study said 85 per cent of demand will centre on current production models of the Global 5000 and 6000, while the remainder will be focused on the ultra-long-range and higher-priced Global 7000, which will enter service in late 2018.

BACK TO ROLLS-ROYCE

It's a maxim in the aircraft industry that a new generation aircraft needs a new engine, but engine development takes longer.

Rolls-Royce once owned the top end of the

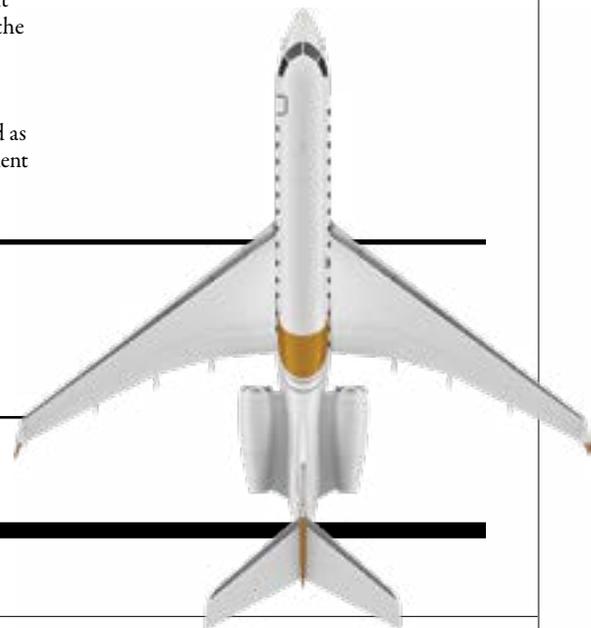
business jet engine market with the Spey, Tay, BR710, BR725 and AE3007 engine families.

Then, Bombardier selected the GE Passport to power the Global 7500 and Global 8000, and Gulfstream selected the Pratt & Whitney Canada PW814GA and PW815GA in 2014 to power the all-new G500 and G600 respectively.

Six years ago, Bombardier and Rolls-Royce secretly began to discuss a new turbofan for the Global business jets based on technology drawn from the successful BR700 engine family and the Advance2 technology development engine program. An important requirement was that the Pearl 15 could fit inside a BR710 engine cowling, to retain the existing drag-reducing fuselage to nacelle integration of the Global aircraft.

The Pearl 15, certified by the European Aviation Safety Agency in February, is billed as being lighter, more powerful and more efficient than previous Rolls-Royce engine families.

PEARL 15 KEY MILESTONES



“THE ROLLS-ROYCE PEARL ENGINE WILL DELIVER WORLD-LEADING EMISSIONS PERFORMANCE, INCLUDING BEST IN CLASS NITROGEN OXIDE EMISSIONS.”

Drawing from the Advance2 technology demonstrator program, the Pearl 15 combines proven attributes from the BR700 engine with a completely new core, featuring a 10-stage HP compressor with six titanium blisked stages, and advanced materials to achieve higher temperatures and record-level pressure ratios.

A new two-stage HP turbine engineered especially for the Pearl 15 provides enhanced aerodynamics and blade cooling. High temperature materials were used to develop an enhanced three-stage LP turbine, enabling higher fan power for increased thrust.

The Pearl family will also benefit from a new generation engine vibration health monitoring system that utilizes big data and cloud-based analytics to improve engine availability.

PEARLS IN WICHITA

In late 2017, the first Rolls-Royce Pearl 15 engines were shipped from the company’s factory in Dahlewitz, Germany, to the Bombardier Flight Test Center in Wichita, Kan. The new engines were installed on Global 6500 FTV1 in BR710 nacelles and ground-run on Jan. 3, 2018, for the first time.

After comprehensive testing, the Canadian-registered Global 6500 FTV1 made its first flight under Pearl 15 power on Jan. 31, 2018. The flight lasted three hours and two minutes, and reached an altitude of 41,000 feet.

The aircraft was flown by Bombardier test pilots Dave Marten and Des Brophy, who were accompanied by flight test engineers Andrew Zachar from Bombardier and Bastian Hermann from Rolls-Royce.

The second flight test vehicle (FTV2), based on a Global 5000 platform, is being modified incrementally to support the flight test and certification program.

BETTER PERFORMANCE

The Global 5500 and Global 6500 aircraft will have class-leading ranges of 5,700 and 6,600 nautical miles, respectively, and a top speed of Mach 0.90.

This means the Global 5500 can now connect Sao Paulo and Paris, or Moscow and Los Angeles; and the Global 6500 can connect Hong Kong and London, or Toluca, Mexico, with Madrid.

Performance improvements have resulted in a combination of increased thrust and lower fuel burn, as well as a re-profiling of the rear portion of the aircraft’s supercritical wing to optimize aerodynamic performance.

The engine improvements deliver lower operating costs, and will allow the aircraft to increase its range to 1,300 nautical miles when operating out of hot-weather and high-altitude airports.



The Global 5500 features an advanced air management system that delivers both 100 per cent fresh air as well as a turbo heat and turbo cool feature. **Bombardier Photo**



Get down to business in the Global 5500’s conference suite. **Bombardier Photo**



The Global 6500 private suite is an onboard retreat tucked away in the quietest part of the cabin. **Bombardier Photo**



The Global 6500 aircraft’s cabin management system is supported by a fibre optic backbone. **Bombardier Photo**

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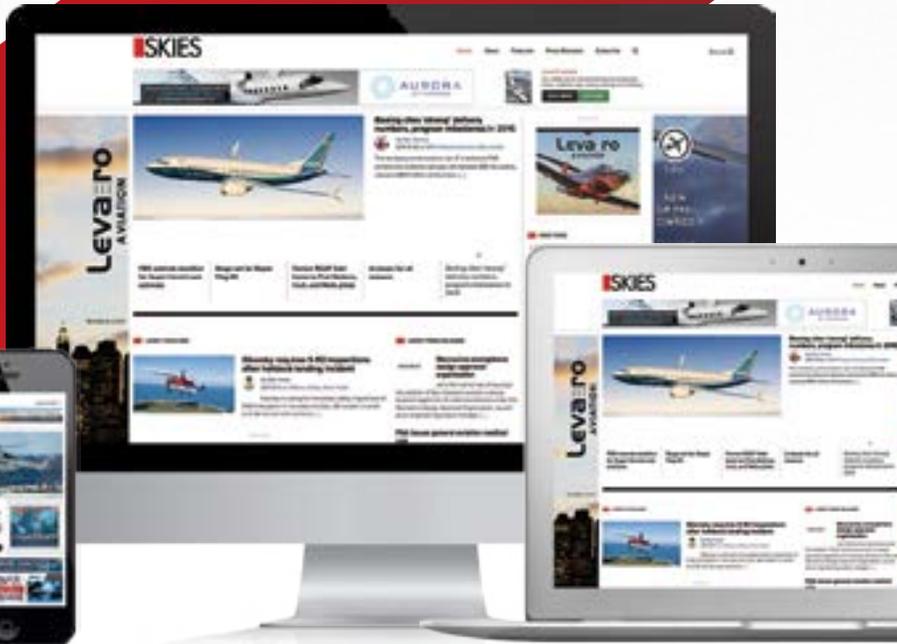
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The new Pearl 15 engine heralds Rolls-Royce's return to business aviation. The cutting edge engines enable top speeds of Mach 0.9 on the Global 5500 and 6500. **Bombardier Photo**



“CUSTOMERS FOR THE GLOBAL 5500 AND GLOBAL 6500 WILL RECEIVE A CABIN WITH SOME OF THE HIGH-END INTERIORS DEVELOPED FOR THE FLAGSHIP GLOBAL 7500 AIRCRAFT.”

MORE COMFORT

In the cockpit, the Bombardier Vision flight deck will feature the first true combined vision system (CVS) in business aviation—the only system to seamlessly merge enhanced and synthetic images in a single view.

Customers for the Global 5500 and Global 6500 will receive a cabin with some of the high-end interiors developed for the flagship Global 7500 aircraft.

This includes Bombardier’s new Nuage seat, “a revolutionary design and the first new seat architecture in business aviation in three decades,” according to Bombardier.

Creature comforts are extremely important on 10-hour plus flights in a business aircraft.

The Nuage seat’s patented tilt link system provides a deep recline position for extraordinary comfort and support. The seat features a unique floating base with a first-ever fully trackless footprint and permanently centred swivel axis, and a tilting headrest for neck support.

Today’s business aircraft passenger experience must also include in-flight connectivity. To this end, in 2016, Bombardier became the first aircraft manufacturer to offer the revolutionary Ka-band high-speed data system in a business aircraft cabin.

The OEM is also first to market with Gogo Business Aviation’s 4G next-generation air-to-ground (ATG) Internet system, which uses the Gogo Biz 4G ground network of more than 250 towers to provide reliable connectivity over the continental U.S. and large parts of Canada and Alaska.

GLOBAL 7500

The success of the Global family was built on the Rolls-Royce BR-710, but Bombardier took a different path in 2010 when it selected the new 18,650-pound-thrust (83kN) GE Passport turbofan for the ultra-long-range Global 7000 and Global 8000 business jets.

Bombardier’s (Canadair’s) commercial relationship with GE began in 1981 with the Challenger CL-601, powered by the CF34-1A turbofan. The CF34 has since powered every member of the Challenger 600 family (601, 604, 605 and 650) and Bombardier CRJ family (CRJ100, CRJ200, CRJ700, CRJ900 and CRJ1000).

The 14,000 to 20,000 pound-thrust Passport is based on GE’s Leap engine and is designed to replace the CF34 engine family.

The Global 7000 is 111 feet long, has a 104-foot wingspan, and attains a top speed of Mach 0.925.

In May 2018, Bombardier changed the aircraft’s name from the Global 7000 to the Global 7500, to reflect an increase in maximum range capability from 7,400 nautical miles to 7,700 nautical miles, confirmed during testing.

In the game of aviation one-upmanship, Bombardier can now claim the larger Global 7500 flies further than the Gulfstream G650ER, which has a maximum range of 7,500 nautical miles. **✈**





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YXX Photo



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LOW COSTS, HIGH PROFILE

Abbotsford International Airport is a major target for ultra-low-cost carriers, in part because it lacks an airport improvement fee.

BY BEN FORREST

A few hours before his airline's inaugural flight touched down at Abbotsford International Airport on June 20, Swoop CEO Steven Greenway stood on the tarmac near the departure point in Hamilton, Ont., and fielded questions from reporters.

Swoop's arrival was a spectacle, drawing a throng of media, a handful of dignitaries and dozens of other guests, to mark the launch of Canada's newest ultra-low-cost carrier (ULCC).

"Abbotsford's always an interesting one," said Greenway in a one-on-one interview with *Skies*. "These secondary airports, I think, are under-utilized in Canada ... a lot of people are going across the border from B.C. to catch cheaper flights in Washington State.

"But equally, it's also very difficult to get to Vancouver [International] Airport. There's a long commute, you have to go through the city; it's quite a difficult geographical location.

"So you have ... the greater metropolitan area of Vancouver that could easily go to Abbotsford and will probably find the whole experience actually a lot more palatable."

What Greenway didn't say, and didn't have to, was that ULCCs also depend on low operating costs to provide ultra-low fares. Abbotsford (CYXX) is one of the least expensive places to operate from in Canada.

"We model our airport as an ultra-low-cost airport that is aligned, fundamentally, with ULCCs," said Parm Sidhu, general manager at CYXX. "I don't know of another one with our cost structure out there."

A major selling point is Abbotsford's lack of an airport improvement fee (AIF), a charge on

airline tickets put toward capital improvements and debt associated with those improvements.

Abbotsford eliminated the fee in June 2017, citing the fact it had nearly \$18 million in reserves and expected to add another \$2 million per year even without an AIF.

It made sense to scuttle the fee and try to attract more carriers. Not surprisingly, ULCCs came calling.

"In many ways, it's the primary decider in a decision-making process," said Lukas Johnson, the new CEO of Canada Jetlines, a ULCC that plans to launch in 2019.

"Without having an airport improvement fee, which can run very high at some of the primary airports in Canada ... Abbotsford already has a big cost difference right out of the gate."

Abbotsford has evolved significantly since it was established as a Royal Canadian Air Force (RCAF) station in 1943.

It played an important role in the British Commonwealth Air Training Plan during the Second World War, hosting a flying school and training unit.

In 1946 the RCAF station in Abbotsford closed, but the RCAF maintained the airport on a caretaker basis. The facility closed entirely from 1952 to 1958, and the RCAF permitted automobile drag racing on the site for part of that time.

A control tower began operating part-time in January 1960 to handle instrument flight rules (IFR) traffic diverted to Abbotsford from Vancouver International Airport.

The tower started full-time operations in December 1961, and in 1962 CYXX hosted the first Abbotsford Air Show, which has

since become one of Canada's marquee aviation events.

In 1997, the City of Abbotsford officially acquired the airport from Canada's federal Department of Transport, and CYXX has grown steadily since then.

This year, Abbotsford is on pace to welcome between 750,000 and 800,000 passengers, and it expects to have nearly one million by 2020.

Swoop, WestJet, Air Canada Rouge, Flair Airlines, and Island Express Air will all offer regular service from CYXX this summer, and cost savings are key.

"As a value carrier, it's incredibly important that our airport partners are on exactly the same page when it comes to costs, and YXX understands this," said Lauren Stewart, a spokesperson for WestJet.

"Abbotsford airport is uniquely positioned in the market to serve several communities in the Fraser Valley with travel options," added David Tait, executive chairman of Flair Airlines.

"Flair has accelerated its growth at the airport based on the steep demand for increased frequency and locations."

Other airport partners include the Chinook Helicopters flight school, Coastal Pacific Aviation flight school, Alpine Aerotech, Shell Aerocentre, Marshall Aerospace, University of the Fraser Valley's aviation program, and Cascade Aerospace, a leading specialty aerospace and defence contractor.

Conair, one of the largest aerial fire-fighting companies in the world, also calls Abbotsford home.

With a growing cluster of aerospace companies and an additional 45,000 square feet of new hangar and building space under construction, the airport is well positioned for growth.

CYXX is also one of the 10 busiest airports in Canada in terms of aircraft movements, with over 134,000 movements in 2017.

In the future, the airport aims to continue courting ULCC traffic, growing passenger volumes, and augmenting the local and regional economy.

"Without the airlines and our valued aerospace partners on the airfield, we're nothing," said Sidhu.

"The brand is Canada, and that's what we're selling when we are attracting new air-carriers ... It's truly a partnership at YXX!" ■

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Column

INSTRUMENT IQ BY JOHN MONTGOMERY

John Montgomery is the founder and president of Professional Flight Centre in Delta, B.C., which was established in 1986. A 12,000-hour ATPL pilot and multi IFR instructor, he also specializes in ground school and seminar instruction. John can be reached at john@proifc.com.



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2. You are positioned 20 NM northwest of the QX NDB on an inbound track of 150 degrees at 7,000 feet. You are cleared for the full procedure ILS approach. To be in a better vertical position for the approach, you may descend to _____.
3. You are positioned on the 17 DME ARC for the straight-in LOC/DME approach, for an anticipated straight-in landing on RWY 13. There are three steps in descent until arriving at MDA. What are the three steps?
4. You are established on the localizer at 2600 on the above approach; to do the CDEA Approach, descent should be initiated at _____.
5. How would the missed approach point (MAP) be identified and would timing be an option?
6. If the required visual reference is not established at the MAP, what should be your course of action?

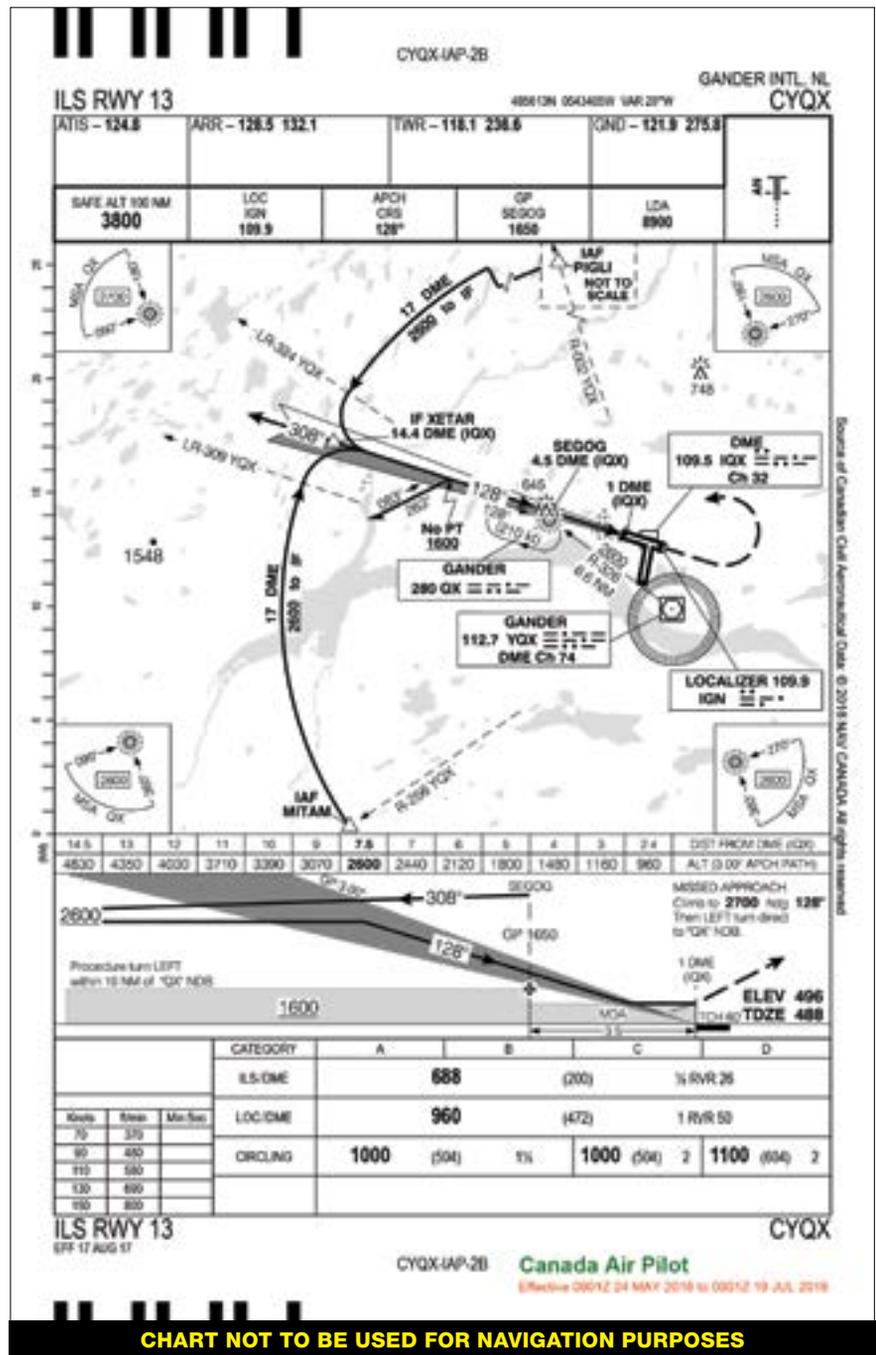


CHART NOT TO BE USED FOR NAVIGATION PURPOSES

Column

FACES OF FLIGHT
BY LISA GORDON



Meet **Jack & Myrna Kingscote**, Purveyors of fine Yukon hospitality

Some people support the Canadian military by flying the flag. Some proudly display “Support our Troops” ribbons.

But it's safe to say no one has supported the troops by reinforcing their living room floor.

Nobody, that is, except for Jack and Myrna Kingscote of Whitehorse, Yukon.

Right now, many current and former members of the Royal Canadian Air Force (RCAF) are smiling. They know all about the Kingscotes and their legendary hospitality. After reading this column, you will, too.

The story begins when the Kingscotes moved to Whitehorse in 1980 with their three sons. In February of the following year, Jack and Myrna attended the famous Yukon Sourdough Rendezvous, a popular winter festival.

They were sipping drinks at a bar and enjoying the view from a mezzanine table. Suddenly, two RCAF pilots appeared, shimmying up the balcony and climbing over to join them.

“They asked if we could hide them because the bouncers were after them,” laughed Jack. “So we sat and chatted. At the time, our three boys were young. They asked if we'd like to come to the airport the next day, so the kids could see the planes.”

The next morning, winter had a tight grip on Whitehorse, with the thermometer reading -42 C.

“We had arranged to meet the pilots at 10 a.m., but it was so cold and I figured it had just been bar talk, so we didn't go. But at about 10:10, the phone rang, and they were asking where we were.”

The two pilots were members of the Flying Instructors School (FIS) Vikings air demonstration team, based in Moose Jaw, Sask.

While the Kingscote boys checked out their silver Canadair CT-114 Tutor aircraft, Myrna asked the two pilots how the festival repaid military visitors for the aerial display they'd do upon arrival.

“They said there was nothing really, they just came up and put on a display and then they went home. So Myrna asked them to come for dinner,” said Jack.

The hungry pilots jumped at the chance for a home-cooked meal.

“We were expecting two guys, and in the afternoon, we got a call asking if they could bring the whole team. We said sure, bring them all. An hour later, they phoned back. A couple of 431 Squadron Snowbirds co-ordinators had just come in. Could they invite them, too?”

“We said, ‘If that's the case, let's turn it into a party.’ We invited some neighbours and had about 30 people for that first soiree,” continued Myrna.

From these simple beginnings, a Sourdough Rendezvous legend was born.

Once the party wound down, the Kingscotes “didn't think any more about it.” But then, closer to April, they received a letter from a Snowbirds coordinator who had been at their home.

“He said they'd love to come by on their northern swing after spring training. So, that's how we ended up having two soirees, in February and April each year.”

The Kingscotes wondered how the Rendezvous could make the crews feel more welcome. They got involved, with Myrna serving on the festival committee and Jack taking on the job of airshow organizer.

“I used to invite every squadron in Canada, and it grew and grew,” he said proudly. “In the peak year, we had 32 military aircraft.” The U.S. military began attending in 1993.

As the airshow grew, so did the now famous “wind-up soiree” at the Kingscote home.

Many community members pitched in to make the party a success. Myrna—with the help of the Rendezvous' famous Can-Can dancers—started making and freezing the food in September.

“The main course was homemade perogies,” she recounted. “We had 70-pound hips of beef—we'd cook those. We had several different salads and a dessert of some sort. No one left hungry.”

Just before the party, the local military would show up to move all the family furniture out of the house and into storage, clearing space for the more than 350 pilots, crewmembers and locals who converged at what became Rendezvous party central.

Those who attended brought their own drinks, but the Kingscotes supplied everything else, including transportation.

“We have a big covered back deck. That's where the bar was. We had two sliding patio doors and we made one-way signs so people would go out one patio door and in the next. It was like salmon going up the river,” chuckled Jack.

As Myrna put it, the house was packed “wall to wall and belly to belly.” When one of their kids called up from the basement to say the floor looked like it was buckling, the Kingscotes promptly called in a contractor, who reinforced it with posts and beams ahead of the next year's soiree.

“Of all those thousands of guys from everywhere, there are maybe 10 we wouldn't invite back,” said Jack. “Most of them were officers—the saying ‘an officer and a gentleman’ is quite true.”

In 1992, Jack and Myrna were named Honorary Snowbirds. They also received the Canadian Forces Northern Area Commander's Commendation, the Queen's Jubilee medal, the Yukon Commissioner's award for public volunteer service, and were named Mr. and Mrs. Yukon in 2010.

Jack, now 82, and Myrna, 76, coordinated their last airshow and hosted their final soiree in 2009. The party has since relocated to the Legion.

Last year, their considerable collection of aviation memorabilia was moved to the Yukon Transportation Museum. Three years ago, the Rendezvous airshow was renamed the Kingscote Air Display.

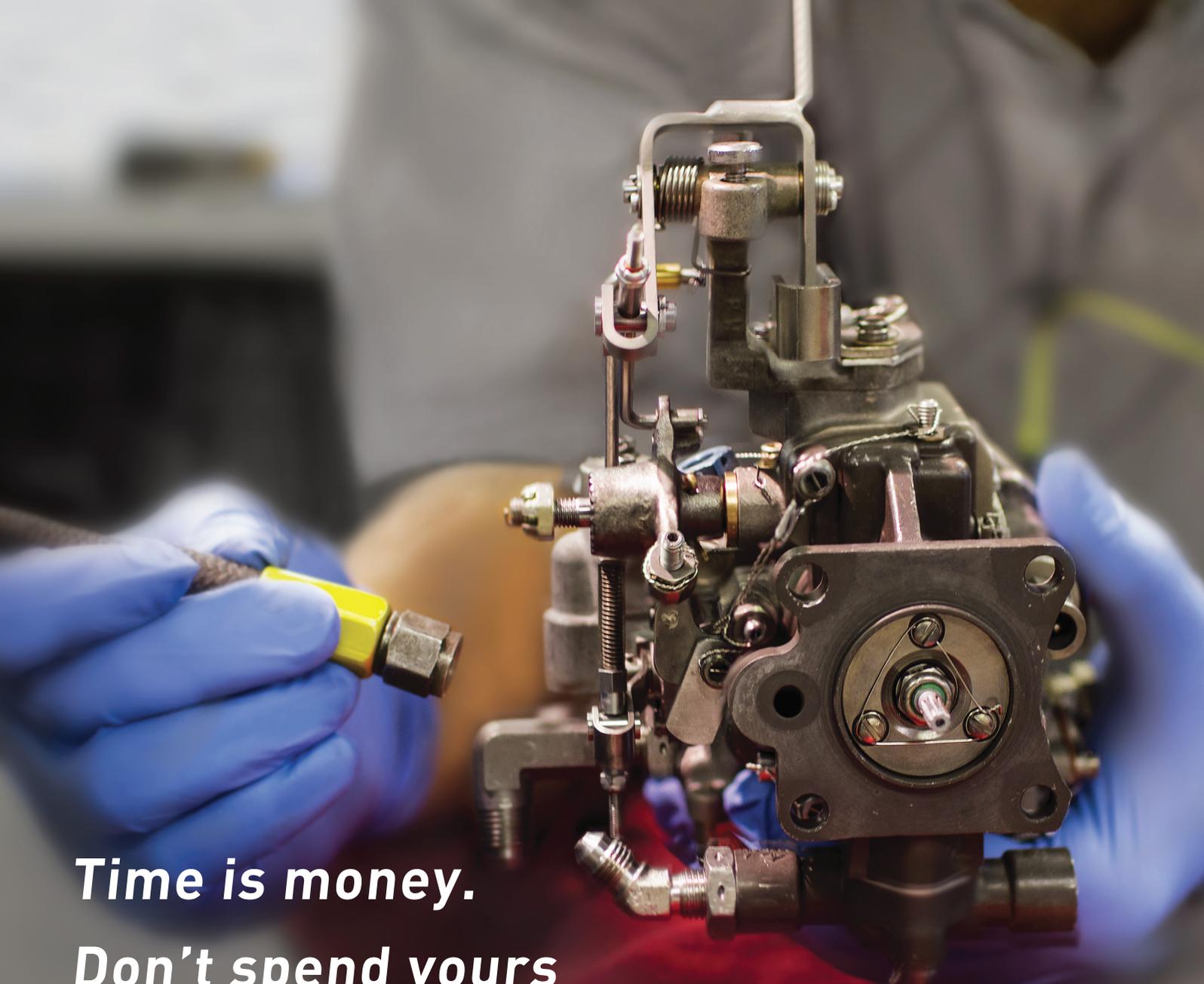
For a couple with no prior connection to military aviation, they've attained a legendary rank.

“I hope everyone had as much fun as we had entertaining them,” said Myrna. “We wouldn't have done it for 28 years if we didn't really enjoy it.”

There's another thing that makes Jack proud.

“In those 28 years, not one of those guys was ever arrested.” ■

Editor's note: If you know an industry personality who should be profiled in this column, please contact lisa@mhmpub.com.



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