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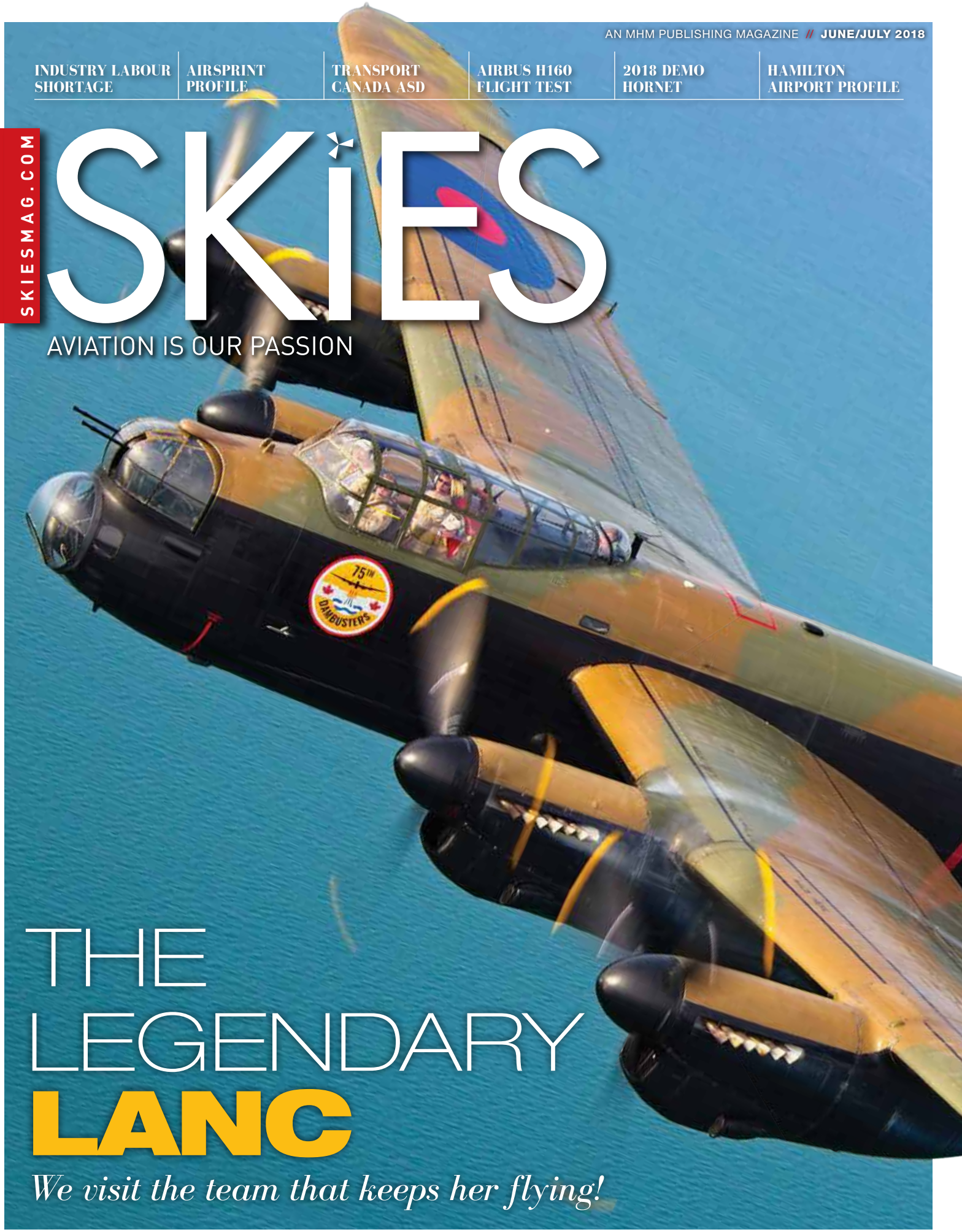

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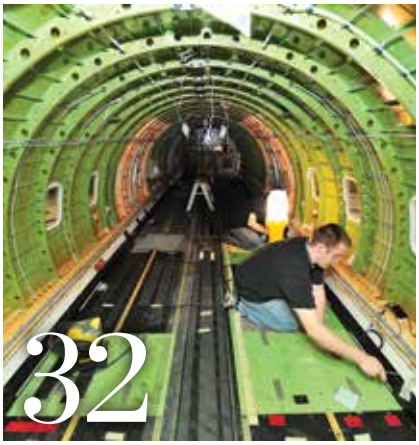
There are just nine pilots in the world who are current on the Avro Lancaster. Six of them fly for the Canadian Warplane Heritage Museum in Hamilton, Ont., where our nation's aviation history takes flight.
Doug Fisher Photo



IN EVERY ISSUE

ON THE COVER

Skies publisher Mike Reyno hopped into a North American Harvard belonging to the Canadian Warplane Heritage Museum for a photo flight alongside the Mynarski Memorial Lancaster. Here, the bomber soars over Lake Ontario. **Mike Reyno Photo**

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FACEBOOK PHOTO PICK

Photographer **Simon Blakesley** caught this Black Sheep Aviation Cessna 208 Supervan 900, with a Texas Turbines engine upgrade, departing Schwatka Lake, Yukon.

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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.

On passion and purpose

It is human nature to take the things around us for granted.

We don't pause often enough to reflect on how lucky we are to be Canadian, free to enjoy the advantages of living in this wonderful country.

We may not thank our friends and loved ones enough for all they do, even though we count on them to always be there when we need them.

And we may not realize that an ordinary sight for us is, in fact, a rare and treasured experience for someone else.

I grew up about 10 minutes south of the Hamilton airport. Many times, I would see warbirds from the Canadian Warplane Heritage Museum flying overhead. It was not uncommon to see the Avro Lancaster soaring over our backyard after it was restored to airworthy status in 1988.

Later, when I got a part-time job at the airport, I'd see them taxiing by the flying school. Some of the instructors were volunteer pilots at the museum and would talk about flying the vintage aircraft, and it was hard to miss the Avro Canada CF-100 Canuck proudly displayed in the parking lot of the 447 Wing.

Warbirds were a familiar sight. Back then, I had no idea how truly special it was to hear the roar of Merlin engines on a regular basis.

Now, I know better.

I know how many people would love to have been in my backyard, gazing skyward as the Lanc, the B-25 Mitchell or maybe the North American Harvard droned overhead.

The rarity and privilege of such an experience was driven home when I visited the museum to conduct interviews for my Lancaster story (see page 46).

I heard Dave Rohrer and Leon Evans, two of only nine current Lancaster pilots in the world, speaking about the honour of safeguarding Canada's aviation heritage.

> "NOW, WITH OUR INDUSTRY FACING A SEVERE LABOUR SHORTAGE THAT THREATENS TO CRIPPLE COMPANIES AND STALL INNOVATION, IT'S TIME TO CALL ON OUR COLLECTIVE PASSION ONCE AGAIN."

What the museum has managed to do—without any regular government or corporate assistance—is nothing short of miraculous. On paper, its business plan looks destined to fail. But what can never be truly valued on paper is the commitment of the volunteers who put in 65,000 hours a year to keep the museum in business.

They do not go there to work. They go there to simply be around those aircraft, because aviation is their passion.

Now, with our industry facing a severe labour shortage that threatens to cripple companies and stall innovation, it's time to call on our collective passion once again.

The Canadian Council for Aviation & Aerospace says Canada will need 55,000 new workers by 2025 to meet projected labour needs—including 7,300 pilots and 5,300 new aircraft mechanics.

Where will they come from? Our domestic training industry is on track to produce only one quarter of the people needed to fill these jobs.

Canada will be competing with the world to attract the best and brightest talent to an industry that has always taken the availability of such talent for granted.

But the pipeline of people is drying up.

Now is the time to invest in developing the next wave of workers to drive the industry, as we strive to not only attract but also retain our best employees. Government, educators, employers, associations and regulatory bodies must collaborate now to safeguard our economic future and foster growth.

Perhaps this is another opportunity to learn from the Lancaster and its Canadian history.

From the time the "pattern" aircraft arrived at Victory Aircraft in Malton, Ont., in August 1942, it took just one year for the Canadian factory to produce its first prototype.

When pressed, Canadians responded in countless ways. At Victory Aircraft, the workforce grew from 3,300 in 1942 to an astonishing 9,521 in 1944—and most of the workers were unskilled with no prior aerospace experience. But they learned together, and they succeeded.

At the peak of its production, Victory Aircraft turned out one Lancaster every day, and would go on to build 430 bombers in total for the war effort.

In 2016, Canada's aerospace industry contributed close to $28 billion in gross domestic product and 208,000 good-paying jobs to the Canadian economy.

Just like they did back at Victory Aircraft, it is time to rev up the production line and make our contribution.

A coordinated industry response to the labour shortage is needed, and it's needed now.

Who will step forward to lead the charge?

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Column

IN THE JUMPSEAT
RUDY TOERING
Rudy Toering is the interim president and CEO of the Canadian Business Aviation Association (CBAA).

Different but equal

Whether it's business aviation or a scheduled commercial flight, it's a similar job: to deliver passengers, crew, cargo and multi-million dollar aircraft to a destination safely and efficiently. But, we differ in how we get it done.

Scheduled carriers are great at what they do, but they can't do what business aviation does every day. They cannot serve every community, they can't give a corporation a competitive edge by getting there first, and they are not set up to respond to emergencies. But business aviation does all that and more. It's in our DNA: We are on call 24/7, providing one-of-a-kind customized services, on-demand and when needed.

To a casual observer, and frankly, to some people who should know better, business aviation is considered to be a lesser version of the airlines, flying fewer hours and with fewer passengers. When those misguided people have decision-making powers, the impact can be devastating—not only for business aviation, but for the hundreds of Canadian communities and companies that depend on non-scheduled air services.

Too often, we find that business aviation has been put in a position where it has to compete with, or be compared to, airlines. But, like David and Goliath, bigger isn't always better. In the air service world, volume is not a measure of value.

Which flight should be delayed for the sake of the other? The flight carrying one executive to three locations in one day, to sign up new business and create new jobs in Canada, or the flight carrying 150 tourists to Las Vegas? I maintain that each has its role—and its value—but the two cannot be compared.

Believing that business aviation is simply a smaller-sized version of commercial airlines is the same as believing that Canada is just a miniature version of the United States. Whatever action is taken based on that assumption is virtually guaranteed to fail.

And that is the CBAA's real challenge: educating regulators and policy-makers to do their homework, look beyond stereotypes, and make evidence-based decisions that are rooted in how business aviation operates in the real world. As someone once said, everyone is entitled to their own opinion, but not their own facts.

> "IT IS ALSO A FACT THAT, ONCE WE ACKNOWLEDGE OUR DIFFERENCES, IT IS EASIER TO WORK TOGETHER TO FIND SOLUTIONS FOR EVERYONE."

For example, it is a fact that private business aviation is safer than commercial flights—a fact acknowledged publicly by the chair of Canada's Transportation Safety Board, Kathy Fox.

It is a fact that the imposition of one-size-fits-all regulations that neither acknowledge nor accommodate the needs of different flight segments are counterproductive, and that the most effective regulations, and the ones that are most likely to create the safest environment, are those that are customized to the particular nature of the flights they govern.

It is a fact that Canadian companies and communities would be poorer without business aviation to serve their needs, whether we are helping access hamlets in the high Arctic, oil sand sites in Alberta, or a critical meeting in Dubai.

It is also a fact that, once we acknowledge our differences, it is easier to work together to find solutions for everyone.

Here is an example. CBAA is working with the Greater Toronto Airports Authority to resolve landing restrictions and slot issues. Business aviation is part of the airport's ecosystem, and based on what we've heard from corporate Canada and business aviation clients, we need to keep it that way. Recently, I was able to counter some of the airport's assumptions using international data from our partner, the International Business Aviation Council. I trust that this new information will help us to come up with new and better solutions for everyone involved—business aviation, airlines and the airport alike.

And finding solutions that work for both business aviation and airlines is the best of all worlds. We have many issues in common: labour shortages, the pending legalization of marijuana, the advent of cap and trade schemes, and more. CBAA will be addressing many of these topics at its annual convention in Waterloo, Ont., June 12 to 14. And while the sessions are aimed at the CARs 604 and 704 world, there is enough commonalty in what we do that they would resonate with almost all segments, from personal aircraft to 705 international carriers. Despite our differences, we really are all in it together, and together we can find solutions.

It is time to start thinking of ourselves—private and public sector alike—as partners, not adversaries. It has been my experience that heated discussions inevitably lead to failure.

The CBAA—and the other associations that represent aviation in Canada—are repositories of expertise and practical knowledge, plus an unwavering commitment to safety. Collectively, we are an invaluable resource for the government. Working together, we can use our expertise to get to the right solutions: creating balanced regulations that promote safety and allow Canadian aviation to thrive in a competitive environment.

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.

Airport security: One of the few remaining growth industries?

Billions of dollars are spent annually on worldwide air travel and, anecdotally, the trend shows no signs of slowing down, as authorities deploy new technologies ostensibly designed to make passengers feel safer. Whether they have the desired effect is open to debate.

The folk on the front lines of airport security are employed by companies contracted by the Canadian Air Transport Security Authority (CATSA), the not-for-profit Crown agency which operates on a total cost recovery basis.

The initial five-year contracts, awarded in 2011, included an option for a further five years, which CATSA exercised, explaining that the contractors had "met CATSA's expectations."

That extension, to early 2022, is worth $2.6 billion and, according to then-CATSA president Angus Watt in March 2017, enabled the agency "to realize continuous improvements in the ... services we offer."

The former RCAF Chief of the Air Staff added that CATSA and the contractors would "continue to invest in front-line personnel and training."

Based on personal experience, that training regimen remains a work in progress. In one particularly egregious case I recall, other passengers who offered assistance were told to "back off" by a clearly inept screener who hadn't the foggiest idea of how to deal with a blind woman in a wheelchair. There have been other, mostly minor, issues but they seem to persist.

Airport screening in Canada is dominated by GardaWorld, a Montreal-based company with offices around the world. It has two contracts, totalling $1.424 billion, for services at airports in Ontario, the Prairie provinces and the Northwest Territories.

Quebec, the Atlantic provinces and Nunavut are handled by Securitas Transport Aviation Security Ltd. of Toronto through a $632 million contract, while British Columbia and the Yukon are handled by G4S Secure Solutions (Canada) Ltd. through a $510 million contract. Its corporate parent, G4S PLC, is a British-controlled company which also, among other things, runs prisons in other countries. Might that be translatable into handling airline passengers?

Tongue out of cheek, things are evolving for CATSA, which would be affected by the government's Bill C-49, the draft *Transportation Modernization Act*, a sweeping package of changes introduced a year ago by Transport Minister Marc Garneau.

When the bill was before the Standing Senate Committee on Transport and Communications, CATSA's vice-president for service delivery, Neil Parry, explained that the changes would "formalize policy authority" for cost recovery, particularly at airports trying to expedite passenger screening.

So far, CATSA has undertaken trials at Toronto (YYZ) and Vancouver (YVR) international airports since 2014 and 2017, respectively, necessitating more pre-board screening resources. Parry said that "generally speaking, this cost recovery trial has had a positive impact on passenger wait times" at YYZ. Since he didn't mention YVR, I'm guessing it's too early to tell.

But step back to 2015, when Transport Canada amended regulations to permit other airports to sign CATSA cost-recovery agreements, the goal being to attract new commercial routes in the hope of improving local economies. The fly in that ointment was that these other airports would have to meet the same security standards as other Class 3 facilities.

"CATSA has conducted consultations with 12 non-designated airports to date," Parry told the committee. However, "while discussions have been productive, there have been no agreements signed."

When I requested an explanation, CATSA's spokesperson noted in an email that "the level of service is dependent on the requirement of each individual airport and the amount of money the airport authority determines they can spend."

Factors to be considered included the hours screeners worked, the equipment and maintenance involved and airline flight schedules, i.e., how many passengers would have to be handled in a given period.

"CATSA currently has agreements with YYZ and YVR," the spokesperson said, echoing Parry. "Although we have been approached by a number of non-designated airports regarding the purchase of screening services, no agreements are in place."

For the last three years, CATSA has been able to screen 85 per cent of passengers in less than 15 minutes at Class 1 airports and now is trending toward 88 per cent. C-49 would give smaller airports the option to do likewise.

Asked why passengers should "have to pay for the additional service standards," Parry said that would be a policy decision for Ottawa. He added later that while passengers indicated "that they are overall satisfied . . . it doesn't mean it can't be better and that we aren't committed to improving it."

It all costs money but how much is enough? A cynic might argue that airport security is one of the few real growth industries we have.

> "CATSA HAS BEEN ABLE TO SCREEN 85 PER CENT OF PASSENGERS IN LESS THAN 15 MINUTES AT CLASS 1 AIRPORTS ... BILL C-49 WOULD GIVE SMALLER AIRPORTS THE OPTION TO DO LIKEWISE."

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.

The selfishness of professional excellence

After three decades of writing and speaking around the globe on human reliability issues, you get to a point when you think you've heard every question, every angle, on a topic you have supposedly mastered.

Then someone asks you a question that strips you to the bone.

"Isn't professional excellence a selfish behaviour?" one young man asked me, quite sincerely.

"Say again?" I asked, not quite understanding the peculiar question.

"I've followed your writings for some time now, and it seems to me that to reach the level of professional excellence where you can be credible to mentor and advise others, it takes years of practice, self-reflection, self-critique, and self-study. Isn't that selfish?"

As I prepared my pompous response to this 20-something with four stripes on his shoulder, I paused. Something in the back of my mind told me he was on to something.

"Let's grab a cup of coffee," I responded. "I'd like to hear more."

Over the next 30 minutes I came to realize this young man was right. The life-long pursuit of personal and professional excellence is, in many ways, a selfish behaviour. But it's not necessarily a bad one if—and only if—you utilize your long-term growth for the benefit of others.

Maybe selfishness gets a bad rap. Perhaps the most altruistic thing you can do is to be selfish—or at least selfish *enough,* for long enough, to give back. As we continued the discussion, we also came to realize that along this path we become safer and more reliable, providing a service to our employers and customers.

For years, I have preached the gospel of professionalism by telling people that the door to full engagement opens outward—by helping others. But following our discussion, I came to understand that the door to excellence opens *inward*—through self-discipline and mindfulness.

So perhaps we need to be double-hinged doors; and perhaps more importantly, know how, when, and why we should go in or out.

Let's sort this out, starting with what you are doing right now. Reading this column could be considered a selfish act. You could be doing something else, perhaps something for others. You could be spending time with your family, helping homeless veterans, or getting online to donate to needy children in a Third World country. Yet here you are, reading a column on professionalism. You cold-hearted jerk.

The key to understanding this involves a little deeper analysis on what it really means to be selfish. Dr. John Johnson does a nice job in this regard in his blog, *Cui Bono* (to whose benefit). Here, he discusses good, neutral and bad selfishness and explains how to answer the simple question, "Am I being inappropriately selfish?"

"The simple (and wrong) answer to this question is that when I behave selfishly it is always good for me but bad for others. … Stephen Covey calls this a *win-lose transaction* where one person gains while another loses," he writes.

This is an important distinction and begs a few more questions. Is what I am doing good for me? Will it allow me to do more things that are good for others? Will my actions of current self-interest help me keep apathy, frustration, and cynicism at bay and help me re-engage more fully in my life and work?

Since Johnson invoked the hallowed name of Stephen Covey, author of *The Seven Habits of Highly Effective People*, and one of my guiding lights, let's take a look at his seventh habit: Sharpen the saw.

Sharpen the saw includes the elements of self-renewal, self-care, self-respect and self-improvement. That's a lot of selfs. But they all involve *good selfishness*, the kind that does not hurt others unduly, or at least allows for your ability to give back.

I'm going to go out on a limb and say the time and effort you are making to read this column falls into that category.

> "PERHAPS THE MOST ALTRUISTIC THING YOU CAN DO IS TO BE SELFISH—OR AT LEAST SELFISH *ENOUGH,* FOR LONG ENOUGH, TO GIVE BACK."

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BRIEFING ROOM
AVIATION INDUSTRY NEWS

Boeing shifts emphasis to Canadian presence


According to Boeing Canada's Kim Westenskow, Boeing deals with more than 560 suppliers in Canada and employs 2,100 people across the country. **Boeing Photo**

Brent Jang
OEM News

Boeing Co. has turned the page on a cross-border trade dispute as the U.S.-based plane maker looks to strengthen its relationship with Canada.

Canada is the second-largest single contributor to Boeing's global supply chain, trailing only Japan, said Kim Westenskow, managing director for Boeing in Canada.

Looking to the future, Westenskow said Canada is well-positioned to benefit in the aviation sector.

"Aerospace is growing around the world. Having Boeing's second-largest commercial supply chain in Canada means growth and progress for us," she said in an interview with *Skies*. "It's about manufacturing in Canada and growth in the aerospace industry."

She noted that Boeing deals with more than 560 suppliers in Canada, who employ some 17,500 workers. Boeing itself employs 2,100 people across the country, including more than 1,500 employees in Winnipeg, which is one of 13 Canadian locations that help support Boeing's commercial and defence operations.

The Winnipeg plant is a key commercial facility for Boeing, providing a wide range of items from composite parts to landing gear doors.

"We have a presence across Canada," said Westenskow, an industry veteran who joined Boeing in 1989. "If you look at my supply chain in Canada, a lot of the parts consumed in Winnipeg come from Ontario and Quebec."

Boeing has nearly 400 staff in the Vancouver region (working on areas such as providing maintenance software) and about 70 in Montreal (a Boeing subsidiary, Jeppesen, specializes in crew management and logistics software).

The U.S. aircraft manufacturer is keeping a watchful eye over European-based plane maker Airbus SE, especially with rival Airbus forging new links with Montreal-based Bombardier Inc.'s C Series program.

Final assembly of the C Series takes place at Bombardier's Mirabel plant in Quebec. But last October, Bombardier signed a deal with Airbus to create a joint venture that will result in a second assembly line for the C Series—to be opened in Alabama, targeted at potential U.S. customers for the narrow-body jet.

Boeing had criticized the Alabama joint venture, before the U.S. International Trade Commission (ITC) ruled in January in favour of the C Series. The ITC dismissed a U.S. Department of Commerce decision that had slapped hefty duties on sales of the C Series into the United States.

Boeing decided in late March that it will not appeal the ITC's ruling. The Chicago-based company had argued unsuccessfully that its 737 MAX narrow-bodies faced direct competition due to the C Series allegedly having subsidized pricing.

Industry observers note that instead of dwelling on the trade dispute that made headlines in the past, Boeing has shifted its energy to playing up its wide-ranging role in Canada.

More than a dozen Canadian airlines fly Boeing aircraft, including Air Canada and WestJet Airlines Ltd.

Calgary-based WestJet launched in 1996 with three Boeing 737-200 jets and relies today on various Boeing models as work-horses, including 737-800 narrow-bodies.

WestJet added Bombardier Q400 turbo-props with the launch of the carrier's Encore regional subsidiary in 2013, and is slated to deploy Boeing 737-800s at its Swoop dis-count unit in mid-2018.

Air Canada's fleet, by contrast, includes a mix of Boeing and Airbus aircraft, including a strong Airbus presence for narrow-bodies, and Boeing 777s and 787s dominating the wide-bodies. But Air Canada took delivery of the first of its order of Boeing 737 MAX jets in 2017 as it gradually retires Airbus A320s and A321s.

Montreal-based Air Canada retired the Boeing 747 from its passenger fleet in 2004 and U.S. carriers no longer fly the plane. But some airlines based overseas, such as Germany's Deutsche Lufthansa AG, still fly the distinctive plane with the humped fuselage.

Hans DeHaan, director in Canada for Lufthansa, said the 747 has an iconic place in aviation history.

"It's still the Queen of the Skies," said DeHaan. Lufthansa, however, favours Airbus in its fleet, including the A350 wide-body on the Vancouver-Munich seasonal route.

Air Canada has Embraer regional jets in its current fleet, though it plans to phase out the Embraer 190 narrow-bodies in favour of the C Series, starting in 2019.

Amid the fierce competition, Boeing points out that its roots in Canada run deep. William Boeing, who founded the company in 1916, and pilot Eddie Hubbard flew a C-700 to deliver 60 letters from Vancouver to Seattle in March of 1919.

Almost one century later, Boeing is striving to place the spotlight on the positive econom-ic impacts of Canadian suppliers.

On the defence side, despite the soured rela-tions between Boeing and the Canadian gov-ernment, Boeing's Super Hornet fighter jets could be back on the agenda for discussion.

"Boeing and the U.S. government have taken the first step in Canada's Future Fighter Capability Project (FFCP), and the Super Hornet is among the aircraft included on the FFCP Supplier List by the government of Canada," a Boeing spokesman said in a statement.

"We continue to believe that the Super Hornet is the low-risk, low-cost approach and has all the advanced capabilities the Royal Canadian Air Force needs now and well into the future."

Bombardier sells Downsview, plans move to Pearson

Bombardier announced it has entered into a definitive agreement to sell its Downsview property in Toronto to the Public Sector Pension Investment Board for $816 million (US$635 million).

The deal is subject to customary closing conditions and is expect-ed to be finalized in the second quarter of 2018, Bombardier announced on May 3, 2018.

Bombardier intends to continue operating from Downsview for up to three years after the deal closes, with two optional one-year extension periods.

In parallel with this development, Bombardier announced it has entered into a letter of agreement with the Greater Toronto Airports Authority (GTAA) for a long-term lease of about 38 acres of property at Toronto Pearson International Airport.

Bombardier intends to open a new centre of excellence and final assembly plant for its Global business jets at Pearson.

"As part of Bombardier's five-year turnaround plan, we have been reviewing our facilities worldwide to ensure we have the most efficient and cost effective operations necessary to support our growth objectives," said Alain Bellemare, president and CEO of Bombardier Inc.

"Today, we only use about 10 per cent of a 370-acre site at Downsview and bear the entire cost of operating a 7,000-foot run-way. So, we are very pleased to have reached agreements with PSP Investments and the GTAA.

"Together, they allow us to monetize an underutilized asset, fur-ther streamline and optimize our business aircraft operations, and will support further economic development and job growth in the Greater Toronto area."

Bombardier's Downsview facility employs 3,500 people and is dedicated to the manufacture and assembly of the Q400 turboprop and Global business jets.

Downsview is also part of an aerospace hub that includes a new $78 million aerospace campus for Centennial College. The provin-cial and federal governments allocated $44.2 million toward that project in 2016.

Bombardier has been at Downsview since 1992, when it acquired a de Havilland operation from Boeing that had been on the property since 1928.

In 2004, Bombardier said it was "committed" to the Downsview aircraft plant, which at one point was Toronto's single largest industrial employer.

There was no immediate word on how Bombardier's Downsview workforce will be affected by the sale, which also raises questions about the future of the Q400 program.

With a backlog of 50 planes, the Q400 has about 25 per cent of global market share for the segment, sec-ond to European rival ATR, according to Reuters.

Bombardier also announced that nearly all regulatory approvals have been obtained for an agree-ment to cede control of its C Series program to Airbus.

Bombardier intends to continue operating from Downsview for up to three years after the deal closes, with two optional one-year extension periods. **Andy Cline Photo**

Air Georgian to launch training academy at Pearson

Ken Pole
Training News

Air Georgian Ltd., which carries close to two million passengers annually as an Air Canada Express partner with a fleet of 17 Bombardier CRJ 100/200s and 14 Beechcraft 1900D turboprops, unveiled plans May 8 for a new training academy initiative on the northwest fringe of Toronto Pearson International Airport.

John Tory, the company's vice-president for corporate development and government relations, told *Skies* the facility, now being designed in leased space a short distance from the company's main operations base at the Shell Aerocentre, will focus on recruitment and hiring as well as training in a suite of classrooms.

Scheduled to open in October, it will also house human resources and other support personnel.

"We are creating a space dedicated to learning, to employee development and fostering a learning culture that's adaptable," he said. "The people who will be there—instructors, students and the planners—will be able to ensure that our training not only exceeds regulatory requirements but also is meeting the needs of the students and, where applicable, driving regulatory change."

Air Georgian president and CEO Eric Edmondson said in the company's official announcement that Air Georgian was rolling out a welcome mat to "all of our industry colleagues to collaborate on ways to improve training techniques and develop best practices for pilots, maintenance personnel, cabin crew and ground staff . . . . The academy will not only satisfy our internal training needs, but it will serve as an anchor for research and development of advanced training techniques in Canadian aviation."

Students will be drawn mainly from Air Georgian's SOAR (Sharing Opportunities for Advancement and Reward) program, through which the company partners with other operators and flight schools across the country.

"Right now, the people we are considering students are licensed pilots who are looking to have a career at Air Georgian," said Tory. "However, we are interviewing people at all levels, including those who are freshly licensed, and possibly helping them through our SOAR program, to go and develop their careers and come back and join our flying environment."

It's a busy environment that encompasses some 62,000 flights annually through a capacity purchase agreement with Air Canada, providing regional service to 31 domestic and transborder destinations.

It clearly represents a significant but undisclosed investment by the privately-owned company in a bid to address the widely forecast pilot shortage looming over the industry.

Air Georgian emphasized that it is "committed to fostering an environment where regulators, unions, academics, flight attendants, maintenance engineers, and pilots can freely explore learning and teaching techniques, create new practices, collaborate with leaders in aviation, education, technology and innovation, while moving our industry forward with a focus on airline safety and operations."

The company said it believes strongly that aviation in Canada is a community.

"It is our responsibility to punch above our weight in solving the many complex issues relating to industry awareness, recruitment, skills development and career advancement."

Air Georgian has trained more than 6,000 pilots over the 24 years it has been in business, and is looking to build on that record.

Chief operating officer Julie Mailhot said in the official announcement that nearly one of every three Air Canada pilots spent "part of their journey" at Air Georgian.

Air Georgian operates aircraft, including this Bombardier CRJ, under the Air Canada Express banner.
Adam Tetzlaff Photo

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719.8 hours since new, Canadian Mod Package, Collins venue Media Center, GWX-3001 Collins Satellite Graphical Weather. Asking $4,750,000.

2009 Hawker 900XP | sn HA-82 | N479M

4,007.7 hours since new, AirCell ATG-5000 High Speed Internet, Engines and APU enrolled on MSP, Teflon Coating Completed in 2017, Asking $3,850,000.

2008 Hawker 4000 | sn RC-9 | N508CK

4,162.2 hour since new, Engines enrolled on ESP Gold, ATG-5000 High Speed Internet, Block Point Inspections / Load 20 Mod-Output Completed, Asking $3,500,000.

2007 Dassault Falcon 2000EX EASy | sn 104 | TC-DGN

4,394.5 hours since new, Engines and APU enrolled on 100% JSSI, EASA Certified, Fresh Pre-Buy completed at RUAG in Switzerland, Asking $9,495,000

2004 Hawker 800XP | sn 258657 | N417TM

8,985 hours since new, engines will be delivered on MSP, ATG-5000 Wifi. Asking $1,675,000.

2000 Hawker 800XP | sn 258482 | N808TM

12,690 hours since new, ATG-5000 Wifi, HBC Winglets. Asking $1,195,000.

2000 Hawker 800XP | sn 258474 | N833TM

11,814 hours since new, ATG-5000 Wifi, HBC Winglets. Asking $1,195,000.

1999 Hawker 800XP | sn 258409 | N409BH

4,578.4 hours since new, Engines and APU enrolled on MSP, Will be delivered with Fresh Paint, Aircell ST3100 SATCOM. Asking $1,695,000.

Industry, regulators seek balanced approach to urban air mobility

Chris Thatcher
Technology News

In the not too distant future of the 2030s, a "hyperloop" could be whisking passengers from Toronto to Montreal via Ottawa in under 40 minutes.

The technology, championed by Elon Musk of Tesla and SpaceX and already in the early stages of development, uses an electric propulsion system to move magnetically levitated pods through low-pressure tubes at a velocity approaching the speed of sound.

Well before then, however, Airbus, Bell, Boeing and Uber, among others, may be successfully ferrying passengers and cargo within cities in urban air taxis. Prototypes such as Airbus's single-passenger vertical takeoff and landing Vahana project have already completed test flights, and larger concept trials in Dallas and Los Angeles are planned by Uber for the early 2020s.

While urban air mobility projects may finally bring to fruition the vision prophesied by The Jetsons, there remain a number of critical issues that will have to be addressed before urban air transport takes flight over city streets.

Beyond the technical challenges of energy storage and management within the aircraft and sense and avoid in cluttered airspace, issues such as airworthiness standards, air traffic management, and supporting infrastructure must be resolved. And some fear air taxis will be ready long before the regulators.

The broad vision for urban air mobility is on a scale with automotive manufacturing, Thomas Prevot, director of airspace systems for Uber, told the Aerospace Innovation Forum in April, a biennial conference hosted by Aero Montreal and supported by the National Research Council of Canada. "We don't want this to be a little niche market. It's supposed to be transportation for everyone in the long run."

In a discussion with Michael Thacker, executive vice-president of technology and innovation for Bell, Prevot described a transportation system in which "vehicles are filled with as many passengers as possible and run at very high utilization factors and high throughput."

However, for the Federal Aviation Administration (FAA) or Transport Canada to certify the airworthiness of the airframe, electric hybrid propulsion system and remotely piloted operations, new regulations will have to be written.

Thacker noted that at present the FAA has no section, called a part, for vehicles that are both an airplane and a helicopter. "The only basis that has ever been formulated was one out of Part 21 for the [Leonardo] AW609, which took pieces of Part 25 and Part 27 and blended them together. I think you'll see something similar as an approach to try to build off of the revised Part 23 that the EASA [European Aviation Safety Agency], FAA and Transport have all been working towards, a simplified safety objectives-based set of rules that gives you a little bit more freedom in terms of means of compliance."

Since proposed aircraft seem to operate in a hover mode while others appear to transition quickly from vertical lift to winged flight, "the operations of each vehicle will somewhat drive their needs from a certification standpoint," he said.

The current air traffic control system likely would not be able to accommodate a sudden influx of flying taxis, said Prevot. "We know how saturated the airspace is already, and how busy air traffic controllers are at peak times. What we are trying to do is leverage the model that has been started within the small [unmanned systems] world … where we are trying to allow industry to provide some of the services that these aircraft will need, and to interoperate with each other for accommodating new entrants. We all realize safety is absolutely paramount, so we have to all collaborate."

He said companies, regulators such as the FAA, and even NASA are conducting research "to find the right balance" for scalable operations that won't negatively interfere with air traffic management, are more automated and do not require voice-based communications and control.

Infrastructure might be the most straightforward issue to resolve, Thacker said, noting the availability of existing spaces in cities such as the roofs of parking garages or other buildings for launch and recovery points.

"It's actually a relatively infrastructure-light opportunity relative to things like roads, trains or land-based systems, where you have to clear out houses [and] businesses, interrupt people's lives to be able to integrate it into a multi-modal system," he said.

As appealing as a flying car might be to some, both Prevot and Thacker underlined the need for public buy-in.

"Part of the challenge in terms of implementing this is making sure we are communicating with the cities and communities, because the public acceptance of having a lot more air traffic above the cities is one of the challenges we are going to have to overcome," said Thacker.

Despite the potential regulatory and safety roadblocks, Prevot said the burgeoning sector has been taking the right steps to introduce urban air mobility. "I'm really optimistic in all those areas," he said.

New regulations will need to be written before Transport Canada or the Federal Aviation Administration (FAA) can certify the airframe airworthiness, electric hybrid propulsion system and remotely piloted operational procedures for new urban air mobility vehicles. Shown here is Bell's new Urban Air Taxi concept demonstrator. **Bell Photo**

New DND program aims to tap into Canadian IDEaS

Chris Thatcher
Military News

If the next solution to revolutionize the Canadian Armed Forces (CAF) is sitting on your garage workbench, the Department of National Defence wants it.

In an effort to break beyond the traditional community of defence researchers and scientists, the department in April formally announced Innovation for Defence Excellence and Security (IDEaS), a program intended to challenge companies, academics and basement inventors to solve some of the military's most complex problems.

The concept was first proposed in the government's 2017 defence policy and comes with a $1.6 billion commitment over the next 20 years.

One of the objectives is to keep the CAF at the cutting edge of technology, said Defence Minister Harjit Sajjan during the IDEaS launch at the University of Calgary. "We need to enlist the ideas and enthusiasm of Canada's best and brightest minds."

And that means opening the process to a much wider audience than has traditionally been the case for defence projects, Eric Fournier, director general for science and technology at Defence Research and Development Canada, told the Aerospace Innovation Forum in Montreal a week later. "It is for everybody—big industry, small industry, not for profit, academia, the guy in his garage—everybody can participate in the various tools that we have."

The program consists of five means of generating ideas and solutions across all nine levels of technology readiness (TRL). They include competitive projects, in which participants are asked to respond to a range of priority challenges provided by the Army, Navy, Air Force, Special Operations Forces, health services, or the department. Rather than a lengthy procurement cycle, IDEaS will select the most promising within eight to 10 weeks once the call for proposals closes, provide up to $200,000 for six months of development, and then review and select a few projects to proceed to the next phase, with up to $1 million in available funding.

Other tools include open contests with a monetary prize and ongoing collaboration with the department for the company or person who can best resolve a posted challenge; innovation networks supported by significant funding intended to build capacity in Canada around areas of strategic interest such as advanced materials or autonomous systems; sandboxes where inventors can trial and demonstrate a capability directly to the military; and a process called innovation assessment and implementation for solutions at TRL 8 or 9 that the military can acquire and evaluate.

"We'll buy [a limited quantity] of your solution … and we'll give it to our operators," Fournier explained in an interview with *Skies*. "You get feedback about your almost-completed prototype and you can say Canada bought at least one of your products."

The sandbox challenge will be of particular interest to a defence and aerospace sector that has been clamouring for more technology demonstration opportunities directly with the military. Sandboxes are often an expensive proposition for small companies. Fournier said the IDEaS program would provide the trial space for free.

"If we need to rent 20 miles by 20 miles in Canada, put a needle in a haystack in the middle, we'll provide everything. You just come and show how you'll find the needle," he said. "You will not be paid for that, but it's free access." And a company demo would be exclusively with defence scientists and military personnel—no competitors—"to give you feedback."

BGen Michel Lalumiere, director general for Air Force development, had some guidance for companies proposing solutions for the Royal Canadian Air Force (RCAF).

While the RCAF is in the process of recapitalizing or upgrading a number of fleets and is incorporating more advanced remotely piloted and autonomous systems, along with their data management and fusion requirements, he reminded a Montreal audience that the Air Force is relatively small and spread across 14 Wings.

"It is always about people. And that should influence every new capability that you are thinking of moving forward," he said. "How challenging will it be for an Air Force of 18,000 people, 23 different trades, to bring this new capability in? If it's difficult, it's not going to work."

The RCAF has been promoting an internal innovation agenda. IDEaS would provide a further means to tackle complex problems such as cyber assurance, autonomy versus automated versus autonomous, big data, and the implications of artificial intelligence, he said.

IDEaS is informed in part by the hard-earned lessons of allies such as the U.S., U.K. and Australia, who have tried in recent years to engage more with their respective tech sectors. Developing networks that reach beyond the aerospace and defence community is key, Fournier said. And so is an agile procurement process that can contract solutions quickly.

The government has invested $320 million for the first five years of the program, and the first call for proposals was issued in late April and involved 16 challenges, from understanding post-traumatic stress disorder, to enhancing cognitive performance, lightweight ballistic protection, and making sense of the intelligence chatter.

RCAF change of command marks new era

LGen Al Meinzinger speaks to assembled guests during the RCAF change of command ceremony on May 4, 2018. **Cpl Alana Morin Photo**

A CH-135 Twin Huey and CH-146 Griffon pilot with four flying tours, Meinzinger has also served in a variety of senior staff roles. **Cpl Alana Morin Photo**

Chris Thatcher
Military News

Against a backdrop of a Douglas DC-3, a Bombardier Challenger 604, a Boeing CF-188B and a Boeing CH-113 Labrador, LGen Michael Hood passed command of the Royal Canadian Air Force (RCAF) to LGen Al Meinzinger on May 4, 2018.

The ceremony was conducted at the Canada Aviation and Space Museum in Ottawa and included an honour guard parade from 8 Wing Trenton, Ont., which Hood led from 2007 to 2009, and a Colour Party from 429 Tactical Airlift Squadron, the last squadron he commanded.

It also featured the central band of the Canadian Armed Forces (CAF) and the pipes and drums of 8 Wing. A planned fly-over of two CH-146 Griffon helicopters, two CF-188 Hornets and one CC-130J Hercules was cancelled due to poor weather.

The transfer of command from Hood, an air combat systems officer, to Meinzinger, a helicopter pilot, marked the first time the new RCAF colours were paraded since they were presented by the Governor General in September. The former colours were passed to the custody of the Toronto Maple Leafs in a ceremony in February.

The setting of historic Air Force and Canadian airframes was a fitting reminder of the importance of the RCAF legacy, a history both commanders referenced in remarks to an audience of several hundred personnel, families and dignitaries, including seven former commanders, three former Chiefs of the Defence Staff (CDS), and three former deputy commanders of NORAD.

The change of command is more than passing a torch, "it's poignant," said CDS Gen Jonathan Vance. "[It] marks the very cadence of life in the Armed Forces."

Hood assumed command of the RCAF in July 2015, culminating a 33-year career that included many years in a CC-130 Hercules as well as staff tours with the Governor General, the United States Air Force, and in senior positions with the CAF and RCAF.

He praised the "exceptional people" of the Air Force and their skill in operations. "You are inheriting a great team you helped build," he told Meinzinger.

Hood's one lament, he said, was the pace and lack of political agreement on vital procurement programs, in particular the replacement of the CF-188 Hornets.

"While I'm happy [the new] defence policy has a lot of great opportunity for the Air Force, and we have a vision moving forward for an open and transparent competition for the replacement of the fighter, I can tell you it is not happening fast enough," he said.

"And I am going to continue to

encourage, in my role as a civilian, the government to try and accelerate the acquisition of that replacement fighter."

Vance thanked Hood for his "sound and clear" advice on a number of complex files, including acquisition projects such as fighter jets and fixed-wing search and rescue aircraft, "ferocious advice" that was delivered in private and "honest execution delivered in public."

He also commended Hood for his efforts to instill a new generation of innovators within the RCAF by seeking out ideas from across the Air Force and seconding non-commissioned and junior officers to an entrepreneurial environment in a technology hub in Waterloo, Ont. "It speaks to your care for the future … of the RCAF," said Vance.

Meinzinger, who served as deputy commander of the RCAF for two years under Hood, also applauded the innovation agenda and said he would, "continue to focus on innovation as we look to the future."

A CH-135 Twin Huey and CH-146 Griffon pilot with four flying tours, Meinzinger has served in a variety of senior staff roles in the CAF, RCAF and NORAD, most recently as director of staff in the Strategic Joint Staff under Gen Vance.

He commanded the Joint Task Force Afghanistan air wing in Kandahar in 2011, overseeing air support to combat operations, and has led both the training and education systems as commanding officer of 403 Helicopter Operational Training Squadron in 2006 and later, in 2013, as commandant of the Royal Military College of Canada.

His experience taught him the importance of "flying in formation" and working "as one team," said Meinzinger. Born in Trenton and raised on the base, he said he was "indentured for life" and learned at an early age "what it means to be part of a military family."

His father, a chief warrant officer, served 36 years in the CAF.

Meinzinger said he intends to maintain the RCAF reputation for excellence in operations.

"Our ability to deliver air power effects in an integrated manner with precision, agility and professionalism is our true calling card."

But he also emphasized people as a personal priority at a time when the Air Force is wrestling with recruitment and, perhaps more challenging, retention.

"In my view, the RCAF can only be successful … if we have well-led, healthy, robust and inclusive squadrons and tactical units. I firmly believe that if we can get it right within our 39 flying units and 85 tactical units, our future will be all that brighter," he said, pledging that decisions would be made with the understanding that squadrons "remain the life blood of the RCAF."

Meinzinger, right, said he plans to keep the RCAF's focus squarely on innovation. The new commander was born in Trenton and raised on the base. **Cpl Alana Morin Photo**

RCAF, NRC assess Hornet sniper pod placement

Chris Thatcher
Military News

In a two-by-three metre wind tunnel at the National Research Council of Canada's (NRC's) aerospace research centre in Ottawa, aerospace engineers gathered data for the Royal Canadian Air Force (RCAF) to validate the placement of the sniper pod on the centreline station of the CF-188 Hornet.

"For this configuration, we are running at close to takeoff and landing speeds to simulate the takeoff and landing of the F-18, about 100 metres per second or almost 200 knots," explained Melissa Richardson, an aerodynamics research officer and the project manager for the testing process, as wind whipped over the inverted nose landing gear and sniper pod.

The CF-188 fighter jet has carried a certified sniper pod on the left side of the fuselage, below the engine intake, since the aircraft were upgraded in the early 2000s. But lessons from recent operations over Libya in 2011 and Iraq and Syria between October 2014 and March 2016 convinced pilots they would have a better view of possible targets with the centreline placement.

"We found a lot of our missions revolved around looking at the ground, monitoring areas of interest and targets for missions that are four to five hours long," said Capt Tom Lawrence, a CF-188 pilot and the project officer for fighter weapons and equipment.

"When [pilots] are manoeuvring their aircraft, there is a chance of the aircraft actually masking the targeting pod. Putting [it] on the centre of the aircraft allows a larger field of regard."

Rather than bank left to maintain focus on a target, the new placement should ensure an uninterrupted view of the ground or target aircraft, "taking that frustration out of the pilot's mind," he said. "They can just focus on the imagery and the task at hand."

Lawrence said it could also make it easier for pilots to employ weapons and assess battle damage effects.

The purpose of the wind tunnel tests is to measure the aerodynamics created by the nose landing gear on the sniper pod mounted behind it at times when it is most exposed to turbulence, said Richardson. Among concerns before the tests began were the effect of significant vibration on the pod and the possibility of debris being kicked up by the wheels and striking its protective glass shield.

"[We need to] make sure the aircraft is safe to operate with the sniper pod on this new location. That means it can take off and land without excessive vibration, that the loads are still within acceptable limits," explained Capt David Demel of the RCAF's Technical Airworthiness Authority.

"This is the goal of the current wind tunnel test, to confirm that before we move to the flight test phase in Cold Lake in the September time frame."

A second high-speed equivalent test conducted by the NRC is planned at the agency's high-speed trisonic wind tunnel, using a six per cent scale model, that will include ensuring engine intake airflow is not affected. Test pilots with the Operational Test and Evaluation Unit in Cold Lake will then recertify operational airworthiness of the sniper pod in its new placement.

While the testing facilities are being provided by the NRC, the vibration data is being gathered and analyzed by Bombardier, which has provided some of the instrumentation. The sniper pod and landing gear were installed in the wind tunnel by L-3 MAS, which will have the task of mounting the pods in the new location on the entire CF-188 fleet—including the 18 F/A-18 Hornets the government is negotiating to buy from the Royal Australian Air Force—once approved.

"We're all collaborating on the project as it goes through each phase, from technical airworthiness to operational airworthiness," said Lawrence.

The CF-188 fighter jet carries a certified sniper pod on the left side of the fuselage, below the engine intake. But lessons from the field indicate a centreline placement would provide pilots with a better view of potential targets. **Mike Reyno Photo**

Give Hope Wings exceeds fundraising goals for Hope Air

Ben Forrest
General Aviation News

About an hour before they were scheduled to land a homebuilt Vans RV-6 kit plane in Oregon on March 6, 2018, pilot Dave McElroy and first officer Terry Grover sat in the cockpit and weighed the implications of a complete electrical failure.

All radios in the aircraft failed, including the intercom system, along with the other electronic instruments that had guided McElroy and two other Canadian pilots on Give Hope Wings, an epic circumnavigation of Central and South America that raised more than $517,000 for charity.

They landed safely in the coastal city of North Bend, de-cowled the aircraft, and confirmed the cause: A failed alternator. It took a couple of days to have it overhauled, delaying their return to McElroy's home airport in Kelowna, B.C.

But that was the only major glitch in a 66-day adventure that saw McElroy, along with pilots Russ Airey of Windsor, Ont., and Harold Fast of Spiritwood, Sask., fly about 39,000 kilometres to raise money for Hope Air, a charity that provides free flights to health care for patients in need.

"Apart from that, zero issues," said McElroy, a seasoned pilot with more than 3,600 hours in 29 different aircraft.

"We did two oil changes en route, and when I got home to Kelowna I did a complete annual and 100-hour inspection, and the aircraft was in great shape.

"Even after all that, it was in great shape."

Airey, who made the journey in his Vans RV9A with Fast as his co-pilot, was in charge of maintenance for Give Hope Wings, and he doesn't hesitate to brag about the reliability of both aircraft.

"The only thing I took out of my toolkit was a screwdriver that someone had to tighten up a couple of screws on their wheel pants or something like that," he said.

Give Hope Wings far exceeded expectations as a fundraiser, easily hurdling its initial goal of raising $400,000 before the flying even started.

Money is still coming in, but the journey will fund at least 2,000 flights to medical appointments through Hope Air, a national charity that uses airlines and general aviation pilots to serve patients across the country.

"I think all three of us would share the sentiment that it was one of the best, if not the best, experiences of our lifetimes," said McElroy, who also circumnavigated the globe in a Piper Comanche in 2014.

"It was absolutely fabulous."

McElroy, Airey and Fast set out from Kelowna International Airport on Jan. 2, 2018, with the goal of raising both money and awareness for Hope Air, as well as raising awareness of general aviation and inspiring young people.

Nine additional co-pilots joined them for various legs of the journey, which had stops in Rio de Janeiro, Brazil; Ushuaia, Argentina; Santiago, Chile; and Panama City, among other places.

Highlights included flying with aerobatic demonstration teams in Chile and Brazil, as well as the relationships they formed with other pilots in the general aviation community.

"We've made a host of life-long friends, because the GA [general aviation] community just absolutely encircled us and adopted us," said McElroy. "They helped us so much."

The flying itself wasn't difficult. McElroy, Airey and Fast divided it into 88 manageable legs that ranged from five minutes to just under four hours.

But getting off the ground was sometimes a challenge, given the red tape and extra paperwork required in some countries.

"They're a lot more bureaucratic than what we're used to in Canada or the States; however, once we were flying, then it loosened up a lot," said Fast, another seasoned pilot and co-founder of the pig genetics company Fast Genetics.

None of the pilots have plans to embark on another trip as ambitious as this, but McElroy and Fast will be on the speaking circuit this summer, sharing stories from their journey and continuing to raise money for Give Hope Wings.

They'll also be providing the Give Hope Wings brand to Hope Air, in case the organization wants to use it for future fundraisers.

As they speak about the journey in the months ahead, a key goal will be showing young people what's possible when they dream big.

"All three of us subscribe to the belief that the biggest impediment on many, many, many young lives is not their circumstances; it's their inability to imagine a bigger life for themselves," said McElroy.

"A dream written down with a date becomes a goal; broken down into steps becomes a plan; backed by action, becomes reality.

"But it's got to start with a dream."

Give Hope Wings was the trip of a lifetime, with many highlights. It was also a hugely successful fundraiser for Hope Air, a charity that provides flights to healthcare for patients who can't afford them. **Give Hope Wings Photo**

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ATAC, HAC call for "pause" in regulatory process

Helicopter operators are among those who will suffer under the current proposed changes to Canada's flight and duty time regulations, says the Helicopter Association of Canada. **Heath Moffatt Photo**

The Air Transport Association of Canada (ATAC) and the Helicopter Association of Canada (HAC) are asking Transport Minister Marc Garneau to review his proposed changes in flight and duty time regulations to consider aviation sector differences.

"We are inviting the minister to pause and sit with industry before implementing changes that would have disastrous consequences on commercial aviation in Canada," said John McKenna, ATAC president and CEO.

"None of industry's concerns voiced over the past eight years have yet to result in an iota of change in the proposed regulations. This is unacceptable and goes against the mandate given by the Prime Minister to engage in 'constructive dialogue with Canadians … stakeholders, including business … and identifying ways to find solutions and avoid escalating conflicts unnecessarily.' "

Industry believes the minister has Gazetted the most important regulatory changes to occur in aviation for the past decade.

ATAC and HAC say these changes will cause prices to go up for all Canadians, put smaller carriers out of business, and will seriously threaten service to Indigenous, northern, and remote regions of Canada—hurting those who depend the most on aviation as a lifeline.

This will inevitably lead to serious job losses in the regions.

To make matters worse, a recent government-funded study indicates that the proposed set of regulations will require 26 per cent more pilots to offer the current level of service—this at a time when industry is already grappling with a serious pilot shortage.

Fred Jones, HAC president and CEO, said: "This set of proposed regulations doesn't take into account the many different sectors in Canadian aviation.

"The Canadian Aviation Regulations were conceived with these different types of operations in mind, so why now impose a one-size-fits-all set of rules? Both the USA and Europe have excluded vast sectors of the industry from their new flight and duty time regulations, for now—including regional carriers, cargo, medevac, and the helicopter industry—until they can prepare regulatory solutions that fit different types of commercial operations."

McKenna added that the associations are not asking the minister to scrap plans to modernize flight and duty time regulations.

"We are simply asking him to pause, to work with all stakeholders to draft a revised set of regulations that will not threaten our competitiveness and will minimize the impact on Canadians everywhere.

"Let's put our heads together to make this work while protecting the best interests of Canadians."

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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◀ LEFT: Photographer **Derek Heyes** captured this Boeing EA-18G Growler zooming through Rainbow Canyon (known to fighter pilots as Star Wars Canyon), near Death Valley National Park in California. The U.S. Air Force and Navy commonly use the canyon for low-level fighter training.

▼ BELOW: **Eric Dumigan** caught two birds in one frame with this photo: an Ornge Leonardo AW-139 air ambulance helicopter and an Air Canada Express Bombardier Q400.

▼ BOTTOM: An Air Canada Boeing 777 flies over a Petro Canada gas station on approach to Toronto Pearson International Airport.
Adam Tetzlaff Photo

LABOUR SHORTAGE IN FOCUS

The Canadian Council for Aviation & Aerospace has released a new study that quantifies and confirms a significant labour shortage across the industry.

BY BEN FORREST

A new study from the Canadian Council for Aviation & Aerospace (CCAA) confirms what most in the industry have known for years: A significant labour shortage is on the horizon, and a cohesive mitigation strategy is needed.

The study, released April 20, 2018, indicates a need to hire 55,000 new workers by 2025 to keep pace with projected industry growth, and to replace workers who are retiring or leaving the workforce for other reasons.

This represents more than one third of the existing workforce of 154,000 today, a daunting challenge for the industry.

"Due to the skilled labour shortage, companies otherwise well positioned for growth are unable to plan for development that the market is actually calling for," said Leslie Hogan, CCAA project manager, in an interview with *Skies*. "It is stifling potential for the economy to grow."

While Boeing and CAE have both released projections for the global pilot shortage, the CCAA study focuses exclusively on the Canadian market, and the various subsectors of the industry.

The report projects Canada will need an additional 7,300 pilots and 5,300 new aircraft mechanics by 2025. It quantifies hiring needs for a range of other professions such as avionics, air traffic control, machinists, and managers.

It also looks at "skills shortages," a term that refers to additional skills needed by graduates or the existing workforce in response to new technologies and business needs.

"To address these issues and to ensure that the aviation and aerospace industry in Canada continues to thrive, a multi-faceted national strategy is required," the study notes.

"Absent such a strategy, we see growth coalescing around larger companies in the short term, at the expense of small- and medium-sized businesses. In the longer term, if we do not have sufficient workers with the right skills, the entire industry will suffer."

The study also looks at labour supply—the current and projected number of graduates from Canadian college and university programs.

Only a quarter of the needed workers—about 14,000—will be domestic graduates. Industry must find 41,000 additional workers from other industries, and from outside Canada.

According to the study, most developed nations have similar, or even greater projected shortages of qualified workers.

"Just as Canada may look overseas to meet the needs of its labour shortages, other countries seek to attract Canadian

As industry stares down a significant labour shortage that threatens to stifle economic growth, the Canadian Council for Aviation & Aerospace is calling for immediate action towards the creation of a national labour market strategy.
Matthew Fansher Photo

The growth of Canadian aviation and aerospace will be hampered by a lack of available personnel, according to the CCAA. **Mike Reyno Photo**

More than one third of the existing workforce will need to be replaced by 2025. **Mike Reyno Photo**

Flying schools are already feeling the pinch as instructor pilots are lured away by larger operators. **Mike Reyno Photo**

Only one quarter of the needed workers, or about 14,000, will be domestic graduates. To keep operations running smoothly, industry must find 41,000 additional workers from other industries and from outside Canada. **Eric Dumigan Photo**

talent to address their own shortfalls," the study notes.

"With many other industries also experiencing labour shortages, we are all competing for graduates."

CCAA has been conducting labour market information (LMI) studies for many years. Data collection is seen as a diagnostic tool that will help CCAA and its partners develop concrete solutions. This most recent study was conducted over a span of four years.

"Everything we do at CCAA starts with labour market information and we will continue to conduct such studies in order to provide industry, educators and government with the data necessary to make informed decisions," said Theresa Davis-Woodhouse, director of project management and accreditation for the CCAA.

The CCAA labour market report provides data the organization hopes will enable industry to develop a comprehensive national labour market strategy.

With industry support, CCAA said it is coordinating the work, "because it's hard

for any one company or region to do on its own."

Appealing to young Canadians is a key part of the national strategy, along with recruiting under-represented groups such as women and indigenous peoples.

Women make up only 30 per cent of aviation and aerospace workers, and indigenous peoples make up only three per cent, according to the study. Only seven per cent of pilots and six per cent of mechanics in Canada are female.

"We need outreach programs to make students aware of the exciting career paths that are available in our industry, and to make sure they understand what courses they need to take for the wide variety of careers available," said Davis-Woodhouse.

Education also plays a critical role in the national strategy, creating new ways of learning and ensuring what is being taught reflects industry needs.

The federal government selected the CCAA to lead a student work integrated learning program (SWILP) for the aviation and aerospace industries. The program provides wage subsidies to employers who hire students in order to provide them with hands-on training.

CCAA is also working with a consortium of companies and colleges to develop a program that will combine the skills of maintenance technicians with those of avionics technicians and interior technicians, as well as business skills and soft skills.

The program will deliver "multi-disciplinary technicians" to meet a demand for workers with broader skill sets.

"We've had really great support from industry for this work, and industry has asked for similar programs combining other trades," said Davis-Woodhouse

"On behalf of the industry, we wish to acknowledge and thank the federal government for funding this study through the Sector Initiatives Program," said Robert Donald, executive director of the CCAA.

"Without their support, the study would not have been possible."

BEN FORREST

Ben Forrest is editor of *Insight Magazine* and assistant editor of *Skies, Vertical, Vertical 911* and *RCAF Today*. He is a graduate of Western University's Master of Arts in Journalism program.

All sectors of the industry will be hit by the impending shortage of qualified workers. The CCAA hopes its labour market report will enable industry to develop a comprehensive national labour market strategy soon. **Mike Reyno Photo**

UNCOMMON DENOMIN

AirSprint introduced fractional aircraft ownership to Canada 18 years ago. Now, it's a North American leader.

BY BEN FORREST

ATOR

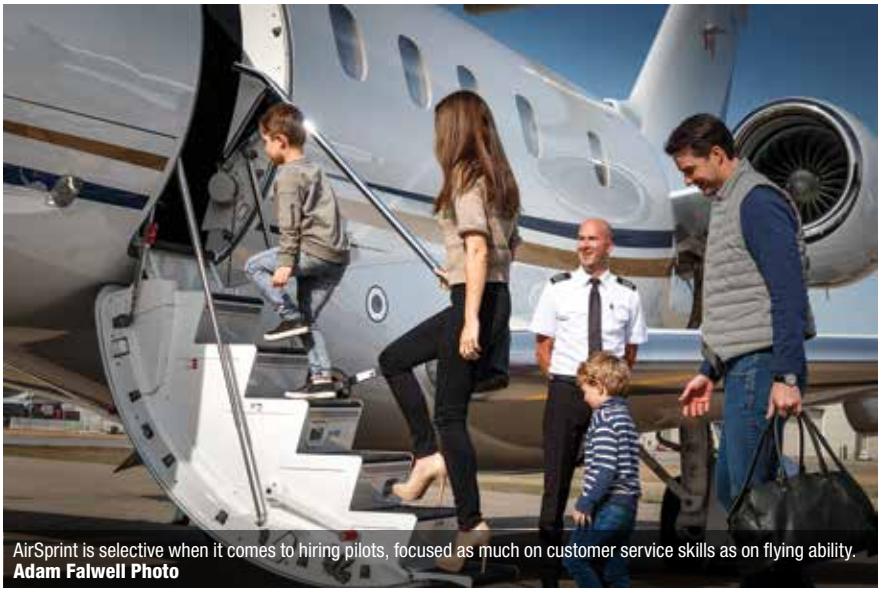
DOWNLOAD WALLPAPER

AirSprint operates a fleet of 12 aircraft, including Embraer Legacy 450, Cessna Citation CJ2+ and Cessna Citation CJ3+ business jets.
Adam Fallwell Photo

AirSprint caters to successful Canadians, but also brings the benefits of private aviation to exponentially more people through the fractional model. **Adriana Bernal Photo**

AirSprint maintenance director Chris Foley and his staff have helped keep the company's aircraft availability rate at 93.25 per cent so far in 2018. **Adriana Bernal Photo**

AirSprint president and COO James Elian started with the company as a first officer on the Pilatus PC-12 in 2001, and quickly rose through the ranks. **AirSprint Photo**



AirSprint is selective when it comes to hiring pilots, focused as much on customer service skills as on flying ability. **Adam Falwell Photo**

"IN A SECTOR WHERE SOME BELIEVED NO CANADIAN COMPANY COULD SURVIVE, AIRSPRINT HAS BEEN A RUNAWAY SUCCESS."

AirSprint founder Judson Macor met Phil Dewsnap when they were law students at the University of Alberta in the late 1990s, both seasoned pilots and united in their desire to launch an aviation company of their own.

Dewsnap was a year behind Macor in school, and when he graduated he called his friend to see if he was still interested. He was, and they worked together to carve out a new niche in the Canadian market, launching AirSprint as the country's first fractional ownership company in 2000.

At the time, conventional wisdom held that fractional ownership couldn't work in Canada to the extent it had in the United States. Canada had a different regulatory environment and the country's sparse population, with only a handful of major centres spread out over a vast landscape, simply didn't lend itself well to the fractional model.

Canadians tended to fly north-south or stay close to home during the punishing winters, rather than city-hop or take ambitious trips from east to west. It simply couldn't work, the naysayers said. But AirSprint proved them wrong.

What began as a two-person startup with a single Pilatus PC-12 aircraft is now one of the most successful fractional ownership companies in North America, discretely carrying high-profile and high-net-worth clients in a fleet of 12 Embraer Legacy 450 and Cessna Citation CJ2+ and CJ3+ business jets.

"At the beginning, it was a hard sell," said James Elian, the company's president and chief operating officer.

"It took a couple of months to get going with our first few clients. But once they experienced our service and understood our unique offering, word spread quickly, and a rapid expansion followed. Word of mouth was powerful and important in the early days."

In the mid-2000s, AirSprint was listed among Canada's fastest-growing companies, and the fleet added as many as five aircraft per year at its peak.

Aviation data provider ARGUS International listed AirSprint as the No. 6 fractional ownership company on the continent for 2017, thanks in part to a 23.5 per cent jump in its total flight hours over the previous year.

In a sector where some believed no Canadian company could survive, AirSprint has been a runaway success. A pair of ambitious entrepreneurs who bonded over their love of aviation found the industry foothold they were looking for.

All it took was a bit of contrarian thinking, rare business savvy, and the ability to see opportunity where others saw folly.

RENEWING THE FLEET

About six years ago, AirSprint began replacing its 13 Pilatus PC-12 single-engine turboprops with six Cessna Citation CJ2+ and two CJ3+ business jets.

A need to renew the fleet was a major consideration—some of the PC-12s were nearly 10 years old. But light jet technology had also come a long way, and the cost of operation had decreased significantly, said Elian.

"We found that the cost per trip was only seven per cent higher, yet the time savings was closer to 35 per cent," he said.

The advancement of light jet technology prompted AirSprint to upgrade to an all-jet fleet. "We found that the cost per trip was only seven per cent higher, yet the time savings was closer to 35 per cent," said company president James Elian.
AirSprint Photo

"In the end, the cost of the aircraft worked out to be about 20 per cent more than the PC-12, but our fractional owners were willing to pay that, due to the benefit of significantly reduced trip times, twin-engine jet reliability, and increased comfort due to the higher flying altitudes."

In 2016, the company also began replacing its eight Cessna Citation Excel and XLS aircraft with top-of-the-line Embraer Legacy 450s. At press time, AirSprint had five Legacy 450s in its fleet, with one more scheduled to arrive in late summer.

"It was really about offering our fractional owners an increased level of service," said Elian. "With the Legacy 450 we can now offer non-stop travel anywhere in Canada and the U.S., and we have also introduced new regions such as Hawaii and Europe."

The Legacy 450 flies 10 per cent faster than the XLS, and its fly-by-wire flight controls result in a "level of comfort and safety that is unmatched for the segment," he added.

"From a cost perspective, many trips are actually less expensive for our fractional owners than the Citation XLS due to the increased speed and the ability to eliminate fuel stops."

Choosing the right aircraft went a long way to ensuring 2017 was one of the company's most successful years to date, attracting more than 30 new clients to the ownership group.

"Existing fractional owners and new fractional owners really appreciated the speed, the range, and the comfort of the Legacy," said Elian.

MODEL FOR SUCCESS

AirSprint is devoted to putting the benefits of private jet ownership within reach of exponentially more people, using the fractional ownership model.

Clients buy a share of an aircraft with a one-time capital cost of at least $190,000 for a one-32nd share of a Citation CJ aircraft.

"That's the price of an expensive luxury car," said Elian. "But it is within reach of many Canadians. You really don't have to be that big a business to be a customer of AirSprint. Private aviation is a powerful business tool and at this price the return on investment is much easier to see."

Based on the size of the share they own, clients receive a correlating number of hours to fly each year, paying an additional hourly fee only when they are on board the aircraft. Access is guaranteed with as little as eight hours' notice, anywhere in North America.

An additional annual fee covers maintenance, pilot wages, insurance and a support structure that helps ensure the aircraft remain in the best possible condition.

If a customer sought to buy an entire Legacy 450 aircraft from the OEM, it would cost about $18 million; with AirSprint, shares start at about $550,000 for access to

25 hours of occupied flying per year.

Clients can list their share of the aircraft for sale at any time, recouping the initial capital cost, minus depreciation.

AirSprint keeps its client list confidential, but Elian noted it includes a "fairly even split" between high-net-worth individuals and corporations. Clients are also located right across the country, from Vancouver Island to the Maritimes.

"Many of Canada's most successful individuals and corporations are clients of AirSprint, including some who are very well known to Canadians," said Elian.

Among the company's celebrity clients is Calgary entrepreneur and philanthropist Brett Wilson, formerly of the CBC television series *Dragons' Den* and part owner of the NHL's Nashville Predators.

Wilson and a friend jointly have a one-quarter share in a Legacy 450, and Wilson used the aircraft to attend Predators playoff games in Nashville last season.

"To me, the economics can be compelling. You have to value your time," said Wilson in an interview with *Skies* last year.

"The problems that I've had with AirSprint have been tiny and the solutions have been instant," he added. "They've saved my bacon a few times. The fractional concept works well for me."

PROACTIVE MAINTENANCE

AirSprint has an aircraft availability rate of 93.25 per cent so far in 2018, an enviable mark that exceeds the company target of 91 per cent.

This figure includes both scheduled maintenance and aircraft-on-ground (AOG) events, and it is significantly better than the company's previous fleet.

"But we're comparing a 10-year-old fleet to a fleet that consists of airplanes no older than five years," said Chris Foley, director of maintenance for AirSprint.

AirSprint attains a high availability rate by following the manufacturer's maintenance program, along with a Transport Canada-approved maintenance regimen that was developed in-house.

"With all that, we take additional steps, like doing daily inspections," said Foley. "We do monthly condition inspections … we start identifying problem areas, and then we'll try to resolve these issues on a regular interval before it's something that either puts an aircraft down or impacts the customer's experience."

AirSprint has extremely high standards for all aspects of its business, and maintenance is no exception.

"We set the bar extremely high," said Foley. "Our goal in the maintenance department is to ensure the aircraft are always maintained to the highest level, ensuring safety and reliability, and ensuring a great customer experience."

AirSprint has 18 employees in its maintenance department, stationed at a primary maintenance base in Calgary, Alta., and a secondary base at Toronto Pearson International Airport.

"We do things right," said Foley. "It doesn't matter what it takes or how much it costs."

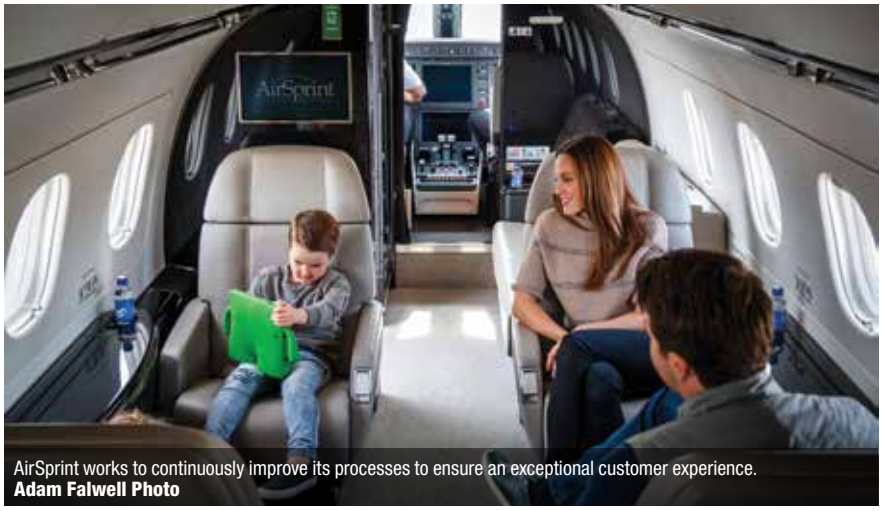
CLIENT-FOCUSED CULTURE

AirSprint goes to significant lengths to create an exceptional experience for clients and for its employees.

Its hiring process for pilots is extremely selective, focused as much on customer service skills as on flying ability. And once employees join the AirSprint family, the hope is they'll stay.

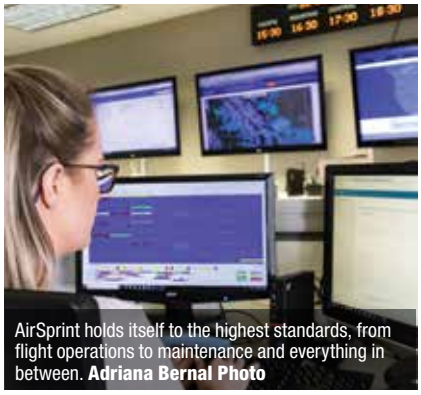
"My goal overall has been to really make AirSprint a true alternative to an airline for aviation professionals," said Elian, who joined the company in 2001 as a first officer on the PC-12. "AirSprint has been very successful over the years due

AirSprint is Canada's first and largest fractional ownership provider. The Embraer Legacy 450, shown here, has proven to be a valuable member of the company's fleet. **Blake Cook Photo**



AirSprint works to continuously improve its processes to ensure an exceptional customer experience. **Adam Falwell Photo**

Fractional ownership ensures paradise is never more than a few hours away. **Alain Duzant Photo**



AirSprint holds itself to the highest standards, from flight operations to maintenance and everything in between. **Adriana Bernal Photo**

to the quality and dedication of our talented staff. I really couldn't ask for a better team."

He said many non-airline jobs in Canada necessitate a compromise between job security, safety and quality of life.

"And so I set out, a number of years ago, to truly make this a career alternative to the airlines for people. It's really kind of formed the approach that we take every day with the team."

With that goal in mind, AirSprint offers its pilots time off through an online preferential bidding system focused on equity rather than seniority.

"It takes a look at all the time off requests and optimizes to maximize the overall happiness for the entire group," he said.

"If someone doesn't get what they want one month, it kind of gives them bonus points … so that they'll probably get what they want the following month."

Pilots interact directly with fractional owners, and the job offers the opportunity to fly to a different place virtually every day.

"And there's job security," said Elian. "AirSprint is a profitable company, and [it has] significantly better job security compared to a lot of corporate operators, where a new CEO can come in and the airplane could be gone a couple of months later."

AirSprint has 115 total employees, with a head office in Calgary and secondary bases in Toronto and Montreal. The company also plans to set up additional pilot bases in Ottawa, Winnipeg, Saskatoon, Edmonton, Vancouver and Victoria, B.C., among others.

"That way, people can live where they want to live and still work with us," said Elian.

It's a formula that works for Essam Hassan, a Montreal-based Legacy 450 pilot who joined AirSprint about eight years ago.

"They listen to their own pilots," said Hassan. "They listen to their own people, and they're always striving to improve things.

"Every month, every week, every year, there's always new developments in making our life easier and making our work better and safer.

"And because of that, there's no reason for me to look somewhere else."

NEXT STEPS

As AirSprint moves forward, it remains focused on six core values that have guided its success so far: Safety, service, people, integrity, humility and community.

Ultimately, the company sees fractional ownership as a way of helping successful Canadians optimize their time, do business more effectively, and capture as many can't-miss life moments as possible.

"We really believe in the fractional ownership model," said Elian.

"We're proud to be Canada's first and largest fractional provider, and we plan to continue growing fractional ownership in Canada."

LAN

DOWNLOAD WALLPAPER

One of just two flying Lancaster bombers in the world, C-GVRA resides at the Canadian Warplane Heritage Museum in Hamilton, Ont. The aircraft is a flying memorial to the Bomber Command crews of the Second World War, and is officially named the "Mynarski Memorial Lancaster." Here, its port side carries special markings honouring the 75th anniversary of the famous RAF 617 Squadron Dambuster raid. Wing Commander Guy Gibson's aircraft, AJ-G, had two Canadians on board when he led the daring mission in May 1943. **Mike Reyno Photo**

THE LEGENDARY LANCASTER

C-GVRA, or "Vera", is the last remaining airworthy Canadian-built Avro Lancaster, and one of only two left flying in the world. *Skies* visited the Canadian Warplane Heritage Museum to find out what it takes to fly and maintain the rare bomber.

BY LISA GORDON

Over the years, the museum has temporarily changed the Lancaster markings. In June of 2014, it was transformed into VR-R, KB772, "Ropey." The eye-catching shark teeth painted on the engine nacelles were popular with visitors, photographers and the media alike. **Eric Dumigan Photo**

Canadian Warplane Heritage Museum president and CEO, Dave Rohrer, has been flying the Lancaster for almost a decade. "We think about what we're doing, and the privilege and the honour and responsibility," he said. **Mike Reyno Photo**

The museum has employed some creative fundraising over the years in order to stay alive. Its evening "run-ups" are always popular. Here, the Lancaster's four Packard Merlin V-12 piston engines roar on the tarmac outside the museum. **Eric Dumigan Photo**

At 73, Vera's retirement is hopefully a long way off. For now—and as long as it's financially and physically possible—she's still a working girl.

"Vera," of course, is the affectionate nickname for the Canadian Warplane Heritage Museum's (CWHM's) Avro Lancaster Mk. X, registration C-GVRA.

A total of 7,377 of the heavy bombers were built in Britain and Canada during the Second World War.

With its impressive manoeuvrability and payload, the Lancaster is remembered for its role in the bombing of the Ruhr Dams in 1943, and the sinking of the German battleship *Tirpitz*, as well as for successfully deploying the "Grand Slam" bomb on U-boat facilities. It was without doubt the most successful Allied heavy bomber of the war.

Vera is the last remaining airworthy Canadian-built Lancaster, rolling off the Victory Aircraft assembly line in Malton, Ont., as RCAF FM213, in April 1945. Canada built 430 of the bombers to support the war effort, turning out one aircraft per day at peak production.

Now, Vera is one of only two airworthy Lancasters in the world. [The other is PA474, a British-built Lancaster operated by the Battle of Britain Memorial Flight (BBMF) at RAF Coningsby in Lincolnshire, England.]

The Canadian "Lanc" resides at the CWHM, located at the John C. Munro Hamilton International Airport in Mount Hope, Ont. She is dedicated to the memory of P/O Andrew Mynarski, a Canadian recipient of the Victoria Cross, and is in fact formally named the "Mynarski Memorial Lancaster."

But, far from a leisurely life on display, Vera must stay busy to earn her keep.

Without any regular government or corporate support, the museum's staff has resorted to some creative fundraising efforts that—when taken together—have always managed to fund the facility's $5.5 million annual operating budget and support its collection of 45 historically significant aircraft.

"It's up to us to create those revenues," said Dave Rohrer, president and CEO of the museum. "We are Canada's flying museum, and I say that in the sense that we're the largest flying museum in Canada, but there are a lot of other things we do to make that possible."

On any given weekday, as many as 150 schoolchildren attend special classes at the hangar, and others sleep under the wings of the Lancaster with their Cadet, Girl Guide or Boy Scout troops. The CWHM operates a successful café with a Red Seal chef, along with a catering business that handles as many as 40 onsite wedding receptions and other corporate events every year.

Other funds are raised through ticketed guest speakers (one recent event was a talk by author Ted Barris, who wrote the soon-to-be-released book *Dam Busters* about Canadian airmen and their role in that famous wartime mission), as well as special industry functions such as the 2017 Air Commodore Birchall Leadership Award dinner held in honour of former astronaut Chris Hadfield.

The museum also hosts other events such as an annual Flyfest on Father's Day weekend, Vintage Wheels & Wings shows, themed dances, and its renowned Remembrance Day ceremony.

For the second year in a row, the CWHM is also partnering with the Rotary Club of Brantford to host the free Community Charity Airshow in Brantford, Ont. This year, the Lancaster will fly with another rare bird, the B-29 Superfortress known as "Fifi," which will make its only Canadian airshow appearance in Brantford on Aug. 29, 2018.

The CWHM crew is very busy, indeed.

And, just like Vera herself—who logs about 50 hours in the air each year—retirement is the last thing on the minds of the select group of pilots and maintainers who keep the much-loved heavy bomber in the air.

VERA AT WORK

In wartime, the Lancaster carried a crew of seven: the pilot, flight engineer, navigator, wireless operator, bomb aimer/front gunner, mid-upper gunner and rear gunner.

Nowadays, when Vera takes to the skies, she's usually flying with a crew of four,

In the summer of 2014, the museum flew its Lancaster on an epic transatlantic journey to England. There, it flew alongside the only other airworthy Lancaster in the world, which is operated by the RAF's Battle of Britain Memorial Flight. The pair of bombers performed for cheering crowds, many of them veterans. **Eric Dumigan Photo**

which includes two pilots, a crew chief, and a fourth crew member who looks after the passengers.

Although time has stood still for England's BBMF Lancaster, its Canadian cousin has been stripped and reconfigured to include four passenger seats on the port side.

"Their airplane is equipped just like it was in World War II," explained the museum's chief pilot, Leon Evans. "The turrets are hanging there, radio panels and transmitters, the navigating table, even a flare-mounted gun in the fuselage. Ours has been stripped—but this airplane has to earn money, and the Queen is very generous to the BBMF. This one is a working girl."

The British Lanc isn't available for public flights, making the Hamilton museum the only place in the world where enthusiasts can actually fly in a Lancaster.

At a cost of $3,500 for one hour, plus the cost of a $125 museum membership, Lanc lovers everywhere can hear the roar of four Merlin engines and experience the thrill of flying in the legendary heavy bomber.

About half of the museum's rides are sold to passengers from the U.K., Australia and New Zealand. About one third of riders are from the U.K. alone, following the Canadian Lancaster's successful 2014 English tour.

Local flights are generally sold to people who live within a couple hours' drive of Hamilton, although many come from the vicinity of Nanton, Alta., home to the Bomber Command Museum of Canada.

AN EXCLUSIVE CLUB

If Vera is travelling away from her home base in Hamilton, her entourage will generally include a crew of eight, with two pilots, two crew chiefs and four maintenance personnel.

In total, six CWHM pilots are qualified to fly the Lancaster: Dave Rohrer, Leon Evans, Andy Dobson, Sten Palbom, Bill Craig and John McClenaghan.

Together with three of their colleagues at the BBMF in England, they form a very exclusive club.

As one of only nine pilots in the world qualified to fly the Lancaster, Rohrer, 67, put it like this: "When I checked out on the airplane, my wife asked me, 'What do you think? How does it feel?' I told her I thought we had joined a more exclusive club than the [space] shuttle pilots!"

Both Rohrer and Evans have been flying the rare bomber for almost a decade. Like all CWHM pilots, they started from the bottom, first flying the museum's North America Harvard Mk. IV and eventually working their way up the taildragger ladder to the twin-engine Beech 18, the Douglas C-47 Dakota, and then finally the Lancaster.

When it comes to succession planning, museum management is extremely selective about who will join the exclusive Lancaster pilots' club. The job is about much more than simply flying the plane.

"We look at the younger pilots and if it's someone who will eventually be on the Lancaster, we identify that fairly early," explained Rohrer.

"It takes more than good hands and feet to be a pilot at the museum. You have to have a sense of purpose, a sense of stewardship, a sense of engaging the public

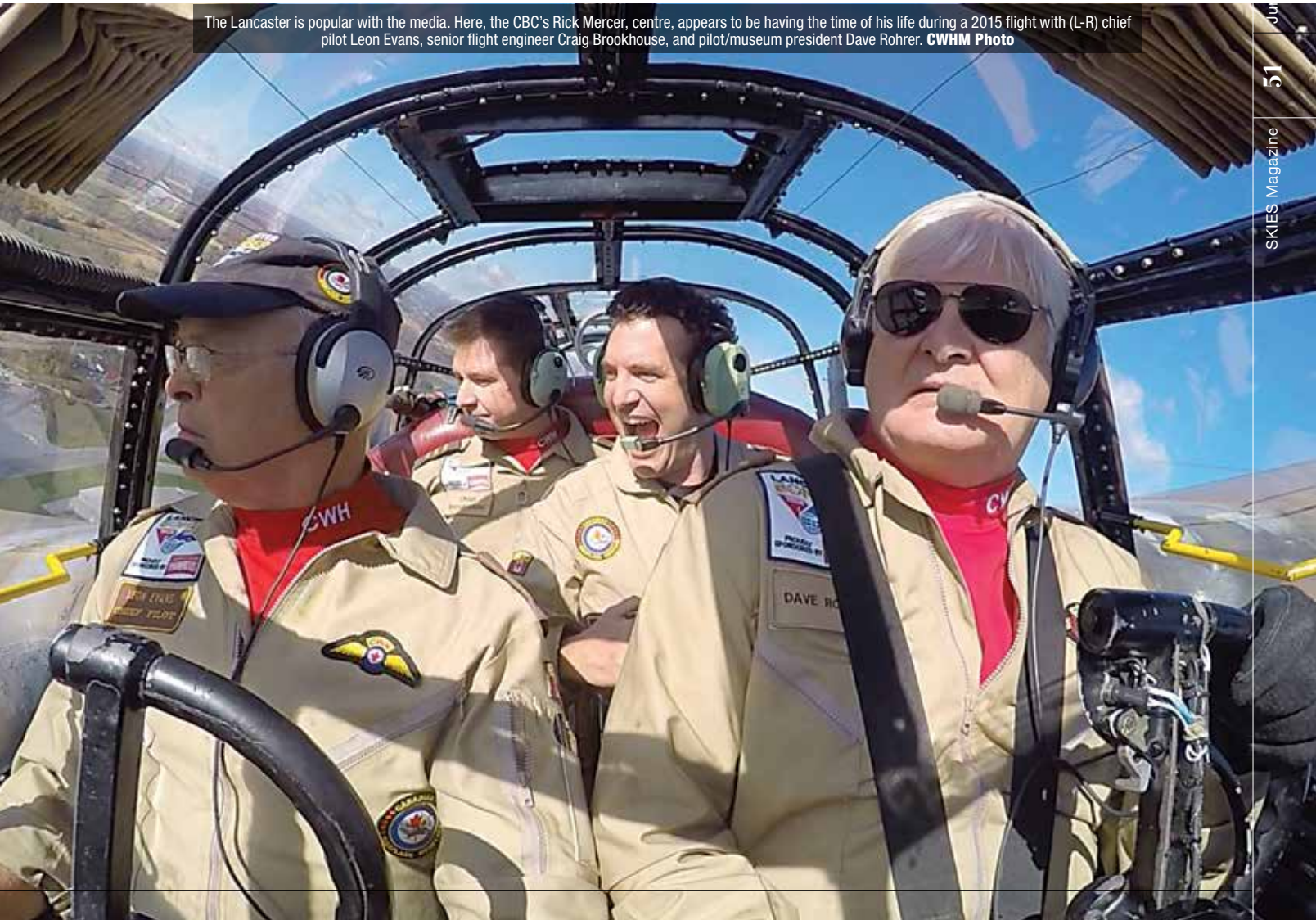
The museum operates the Lancaster with two pilots; in wartime, there was only one. **Eric Dumigan Photo**

The Lancaster's 50 hours of annual flying easily translate into 1,000 man hours of regular maintenance. **Eric Dumigan Photo**

Engineers with Lancaster experience are rare, so the museum invests a great deal of time and effort to "train up" the right people. **Eric Dumigan Photo**

A Merlin engine overhaul costs approximately US$150,000, and the museum has done five of them in the last 10 years. **Eric Dumigan Photo**

The Lancaster is popular with the media. Here, the CBC's Rick Mercer, centre, appears to be having the time of his life during a 2015 flight with (L-R) chief pilot Leon Evans, senior flight engineer Craig Brookhouse, and pilot/museum president Dave Rohrer. **CWHM Photo**



The B-29 Superfortress known as "Fifi" will fly at the Brantford Community Charity Airshow on Aug. 29, 2018. It will be the aircraft's only Canadian airshow appearance. The event is organized by the Canadian Warplane Heritage Museum and will feature warbird, military and civilian acts. **Eric Dumigan Photo**

and making sure it's an enjoyable experience for them. At the end of the day, we're in the entertainment business—we educate and entertain, and we make history fly."

Some of the museum's pilots have been flying Vera for close to 30 years, and each one cherishes the special opportunity they've been given.

"We don't take it lightly," said Rohrer. "We think about what we're doing, and the privilege and the honour and responsibility. That word 'stewardship' is a big thing. It's almost like a life's goal we've prepared for all our lives, almost unknowingly."

Rohrer, who joined the Royal Canadian Air Force (RCAF) out of high school, served actively on a number of different aircraft and tactical helicopters until 1986, and then on reserve until 1993. After a stint at the Canadian Aviation Safety Board (precursor to the Transportation Safety Board of Canada) as the Ontario regional manager, he moved to Transport Canada, where he became regional director of aircraft services for Ontario region. When he retired in 2005, he moved from volunteering at the museum into the president and CEO's office. In addition to actively flying several of the museum's aircraft, he logs thousands of hours a year flying what he calls the "mahogany bomber"–a.k.a. his desk.

Chief pilot Leon Evans, 72, first became interested in warbirds while flying Harvards in Tillsonburg, Ont. He started volunteering at CWHM in 2000 and hasn't looked back since.

A senior captain and training pilot with Air Canada for almost 34 years, Evans has accumulated more than 22,000 hours flying aircraft as modern as the Airbus A340 and as old as the Fleet Model 21.

"We didn't expect we'd be where we are today, flying these airplanes now," Evans told *Skies*. "Dave and I flew the C-47 yesterday, the D-Day bird. These are all airplanes the Canadian Armed Forces have flown, and many are dedicated to those who served. I'm so lucky to be here."

As the dedicated training pilot for the Lancaster, Evans oversees initial and recurrent training for all pilots on the bomber.

Newcomers to the airframe must complete an initial 16-hour groundschool at CWHM, followed by a minimum of five hours of flight training.

An RCAF CT-155 Hawk with 419 Tactical Fighter Training Squadron sports a camouflage pattern in celebration of the squadron's 75th anniversary in 2016. Originally a bomber unit, 419's training jet honoured the Wellington Bomber flown by Wing Commander John "Moose" Fulton, the first commanding officer of the unit in 1941. **Eric Dumigan Photo**

Once qualified, an annual one-hour recurrent training flight is required as well as a competency check every second year.

Pilots will often log countless hours just sitting in the cockpit, reviewing procedures and scenarios with a check pilot.

So, just how does the Lancaster perform?

"It's a heavy airplane," said Evans. "It has a little bit of assistance with the servo tabs that help take some of the weight off the elevators and ailerons. But at the end of a couple of days, your upper legs feel like you've been doing squats with a barbell! You really have to kick in the rudder. If you turn the yoke and just use your aileron, you're not going anywhere."

But he added that the bomber is surprisingly responsive, especially in landing configuration, without any nasty habits in the stall.

Rohrer agreed, adding: "When I went to the Lanc, I was a bit apprehensive about how it would handle. There are stories about it in crosswinds, but I was amazed because it was more manoeuvrable than I thought it would be.

"The thing I'll never forget is the first time I put the power up for takeoff and those four Merlins came to life. The sound is unbelievable."

The Lancaster performs best on a grass strip, landing into the wind. Crosswinds from the left do present a challenge, but as Evans put it, "We can manhandle it."

Regardless, both pilots realize their preparedness is a luxury that didn't exist in wartime.

"When you think about the experience and the challenge those boys had, there's no comparison," said Rohrer.

The CWHM doesn't fly the aircraft at typical wartime loads of up to 67,000 pounds. A typical flight will see the Lancaster take off between 42,000 and 46,000 pounds, enabling it to easily cruise along at 170 knots, its four big Packard Merlin V-12 piston engines burning a whopping 1,000 litres of avgas per hour.

[Fuel is one of the museum's biggest expenses. In 2017, it spent $225,000 on avgas.]

When they're flying the Lancaster, the fact that it's one of two airworthy examples in the world is always top of mind for the CWHM crew. Everyone must be on their A game, dedicated to safeguarding the priceless aircraft.

"We're here at the right time in the right place, with the right skills and background," said Rohrer. "We can identify the risks and we know when not to take a risk. We know aviation is dynamic and things can happen, but we

know this airplane intimately and we know ourselves."

He said practising effective crew resource management is critical at the museum—any crew member knows they must speak up with any concern, no matter how small.

"And we have an AMO [aircraft maintenance organization] that does tremendous work, so we have a lot of confidence in the airplane and its maintenance."

KEEPING VERA IN THE AIR

Flying season at CWHM runs from May 1 to Nov. 11 for most airplanes.

Following Remembrance Day, the museum begins its winter maintenance program. While Evans' team reviews manuals and checklists to make any necessary revisions, chief engineer Jim Van Dyk musters the troops for a long season of inspections.

With just five staff—including an office clerk, two licensed aircraft maintenance engineers (AMEs), and two apprentices—Van Dyk relies heavily on 60 to 80 volunteers who come in at least once a week.

Overall, the museum as a whole realizes about 65,000 volunteer hours a year.

"Everybody comes from a different

"At the end of a couple of days, your upper legs feel like you've been doing squats with a barbell," said the museum's chief pilot, Leon Evans, about the Lancaster's stiff rudder. **Eric Dumigan Photo**

"AT THE END OF THE DAY, WE'RE IN THE ENTERTAINMENT BUSINESS—WE EDUCATE AND ENTERTAIN, AND WE MAKE HISTORY FLY."

background and we try to fill in the gaps," the chief engineer told *Skies,* adding that it's a daunting task for anyone to learn all the systems on the museum's 18 airworthy aircraft.

"To find engineers experienced on a Lancaster is extremely rare, so typically we've managed to take people who were volunteers and then worked them through. Other times, we've taken AMEs and trained them on type. Typically, it involves a lot of hands-on work."

Van Dyk figures the Lancaster's 50 hours of annual flying easily translate into 1,000 man hours of regular maintenance, not including important tasks that come up during flying season.

That doesn't include the hours spent searching "the Lancaster network" for scarce parts.

Recently, CWHM had a major windfall when Van Dyk located some brand new Lancaster propeller blades in a Florida warehouse, mislabelled as Corsair props.

Along the same lines, the aircraft on display at 14 Wing Greenwood, N.S., proved to be the bearer of recently overhauled props.

"We did a swap with some similar propeller blades from another airplane that I managed to scrounge," said Van Dyk. "We put the unserviceable blades on the display plane and we got all 12 blades in exchange."

It's not cheap to keep Vera in the air. A Merlin engine overhaul costs approximately US$150,000, and the museum has done five of them in the last 10 years.

A propeller can be serviced for about $15,000, with one going in for overhaul about every two years, based on a 50-hour flying season.

As for tires, Dunlop still has the Lancaster moulds and recently produced a special batch that was shared by CWHM and the BBMF in England.

"We can keep ancillary costs down quite low, partly because we keep a lot of spares on hand," added Van Dyk. "Many times, we can use our machine shop to reproduce simple parts. Also, parts are sometimes interchangeable between airplanes."

The rest of the time, the museum works its contacts to scrounge, trade and share parts for not just the Lancaster, but the rest of its flying fleet.

A LANC'S LIFESPAN

No one knows how long the museum will be able to keep Vera in the air, because the life expectancy of a Lancaster airframe was never determined.

In the end, it will come down to how much structural fatigue the metal can safely endure.

"That's why when we go into maintenance on Nov. 12, we do a lot more maintenance than we have to, and we go through the airplane every year with non-destructive testing (NDT) specialists," said Rohrer.

It helps that Vera is an unpressurized vessel and that she saw no combat service in the war due to her production date. Van Dyk surmised she carried survival equipment rather than bombs in her post-war maritime reconnaissance role, where she served with the RCAF on Canada's East Coast and retired from duty in 1963.

The aircraft was then displayed outside the Royal Canadian Legion in Goderich, Ont., before it was acquired by CWHM in 1977 and painstakingly restored to airworthy condition. It officially took to the air again on Sept. 24, 1988. Since then, Rohrer estimates the museum has put about 1,800 hours on the airframe.

Today, Van Dyk and his crew keep a close eye on Vera's health.

"It's very hard to say when small cracks will appear," he said. "If we had any sign of things cracking or shifting, or hardware coming loose, we would have to make a decision at that time.

"I would hope we have several years left. I don't think 10 is a bad guess, going the way we are. But it is very hard to say when a 73-year-old airplane is going to give out. We're very happy they were so well built in the first place."

Rohrer said that even after the Lancaster is grounded, it will likely still continue to operate, not unlike "Just Jane," Avro Lancaster NX611, which is based at the Lincolnshire Aviation Heritage Centre at historic RAF East Kirkby airfield in England.

Jane's engines are run periodically and taxi rides are sold. Proceeds help support the centre, which is dedicated to educating visitors about the sacrifices made by Bomber Command.

"Somewhere down the road, we'll be in that situation," admitted Rohrer. "That's another reason we limit the flying hours every year, to stretch out the airplane's life.

"When is that day? It's really hard to say. I certainly hope it's not on my watch. I don't think it will be. But, I can't imagine a 100-year-old Lanc flying, either."

HONOUR AND PRIVILEGE

That concept of stewardship Rohrer mentioned is shared by everyone in the museum. From its 25 mostly volunteer pilots to its 23 full-time staff, everyone considers themselves privileged to work with a collection of rare aircraft that embodies Canada's flying heritage.

There's no doubt the Lancaster is the centrepiece of that collection.

"It's a tremendous opportunity and I think I've done everything I can to help the museum continue with this airplane for a very long time," said Van Dyk. "I do realize it's the opportunity of a lifetime that I've been given."

From the pilot side, Rohrer and Evans say that although many aviators volunteer to fly the Lanc, it's worth waiting for the right person.

"We're looking for someone with a servant's heart," concluded Rohrer. "When we find them, it's a special person."

He pointed out that of the 120,000 or so who joined Bomber Command, 55,573 did not survive their tour. Of those, 10,659 were young Canadians in the prime of their lives—an unbelievable sacrifice for a country populated by only 11 million people at the time.

"When we fly, we fly to represent that history and that sacrifice, that service, and to keep that memory alive … that's why it's an honour."

LISA GORDON

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

DOWNLOAD WALLPAPER

Each winter, the Lancaster undergoes extensive testing to check for signs of structural fatigue. "It's very hard to say when small cracks will appear," said chief engineer Jim Van Dyk. **Eric Dumigan Photo**

"NO ONE KNOWS HOW LONG THE MUSEUM WILL BE ABLE TO KEEP VERA IN THE AIR, BECAUSE THE LIFE EXPECTANCY OF A LANCASTER WAS NEVER DETERMINED."

The Aircraft Services Directorate and the Canadian Coast Guard faced a monumental challenge putting 15 Bell 429 light twin helicopters (background) into service in just nine months. The agency also ordered seven Bell 412 EPI helicopters (foreground) to handle medium lift requirements. **Mike Reyno Photo**

ADAPTING FOR THE Mission

Transport Canada's Aircraft Services Directorate is a multi-faceted operation that has provided diverse aviation-related services to government departments for more than eight decades.

BY LISA GORDON

Few people may know that a Dash 8-100 aircraft played a critical role during the manhunt for Justin Bourque, the 24-year-old man convicted of shooting and killing three RCMP officers and wounding two others in Moncton, N.B., during the summer of 2014.

The aircraft is operated by Transport Canada's Aircraft Services Directorate (ASD), an 82-year-old entity mandated to provide a variety of aviation services to a number of different government departments. With its fleet of fixed- and rotary-wing aircraft, the ASD logs about 15,000 hours per year flying a plethora of aerial missions where adaptability is the name of the game.

The Dash 8, which is based in Moncton to perform maritime patrols on behalf of the National Aerial Surveillance Program (NASP), is normally on the lookout for polluters, illegal fishing and even marine wildlife.

But on the night of June 5, 2014, it was pressed into service for a vastly different mission—this one over land in search of a man who later pleaded guilty to three of the highest-profile law enforcement murders in Canadian history.

"We launched the Dash 8 out of Moncton, turned the lights out, kept the flaps down for a shallow angle of bank, and brought an RCMP officer along on board," explained Steve Buckles, director of flight operations for Transport Canada's ASD. "They found him [Bourque] with an infrared camera and coordinated his capture with the Mounties on the ground before anyone else got hurt."

The dramatic arrest at 12:10 a.m. on June 6 is just one example of a successful ASD mission. With its headquarters at Ottawa's Macdonald-Cartier International Airport and 14 additional bases located from Vancouver, B.C., to St. John's, N.L., the directorate's 325 staff members perform an endless variety of important tasks.

Founded in 1936 by then Transport Minister C. D. Howe (who was also the architect of Trans-Canada Air Lines), Aircraft Services is a directorate within the Safety and Security Group at Transport

Three aircraft (two Dash 8-100s such as this one plus a Dash 7 IR) cover Canada's coastline, which at 243,042 kilometres is the longest in the world and borders three oceans. **Michael Durning Photo**

The Dash 7 IR (ice reconnaissance) aircraft is the only one of its kind, featuring bubble windows on the top and sides, as well as cutting edge surveillance equipment. It was recently painted a bright red to match the Dash 8s in the National Aerial Surveillance Program fleet. **Brian Tattuinee Photo**

Steve Buckles is planning to retire shortly from his role as director of flight operations for Transport Canada's ASD, following almost 32 years with the organization. **Peter Handley Photo**

Canada. The Group develops regulations and national standards that promote safety and security in the aviation, marine, rail and road transportation modes.

CHANGING WITH THE TIMES

Operating with a commercial Air Operator Certificate under the *Canadian Aviation Regulations*, the ASD's mission has changed over the years as surely as its fleet has evolved from the Waco Biplanes of 1936 to new Bell 412EPI helicopters, which first entered service with the Canadian Coast Guard in 2016.

Today, the ASD's fleet includes 40 aircraft: six Cessna Citation C550s, five Beechcraft King Air C90As, two Dash 8s, one Dash 7 IR (a one-of-a-kind ice reconnaissance variant), three Bell 407 and one Bell 206B helicopters operated for civil aviation business, and the Coast Guard helicopter fleet of 15 Bell 429s and seven Bell 412EPIs.

"We have a number of different business lines," said Buckles. "For example, of our 325 people, 97 are Transport Canada employees but dedicated to the Coast Guard operation."

The ASD works hand-in-hand with the Coast Guard. For example, when it was time to procure new helicopters, the agency stood up a team that included ASD members as subject matter experts.

"It was a joint effort," said Buckles. "The folks here who would be involved with those aircraft were very engaged in the development of the paperwork ahead of time and the assessment of the criteria we were establishing, as well as development of the statement of work and the selection of the aircraft."

He said it was a monumental challenge to put 15 Bell 429s into service in just nine months and take out an equivalent number of MBB BO 105 helicopters.

"We were really crunched for time and the change in technology from the 105s to the 429s [presented] a whole new set of challenges we had never faced before."

Aside from its Coast Guard affiliation, the ASD does a lot of work with the Civil Aviation branch of Transport Canada and the Transportation Safety Board (TSB).

"There are a number of aviation inspectors

who are pilots and part of our mandate is to provide them with airframes and the training to support them as pilots," commented Buckles. "They use the aircraft to maintain their own qualifications, but also to move around the country to conduct inspections in the King Airs and Citations, as well as the Bell 407s and the Bell 206B."

To support these government departments, the ASD operates a large training centre at the Ottawa airport, which includes classrooms, instructor space and simulator bays. Citation training is supported by a Level D simulator and a Level C sim complements the King Air program.

The training centre is now being expanded from 21,387 square feet (1,987 square metres) to 34,153 square feet (3,173 square metres) to add two classrooms, for a total of eight, and to make room for a third device—a brand new, state-of-the-art Coast Guard simulator that is currently being built by CAE in Montreal.

The Level D device—which will be used to support both the Bell 429 and the 412EPI—will feature a roll-on/roll-off interchangeable cockpit design. When one cockpit is being used inside the simulator, the other will sit on the mezzanine at a docking station that will allow it to be used as the equivalent of as a Level 5 flight training device.

"It will be quite unique," said Buckles. "We'll have one motion system, one visual system and one instructor operating system, but we'll have two cockpits, one for the 429 and one for the 412."

Weighing 33,000 pounds with a 12-foot visual display (versus six-foot displays in the ASD's existing fixed-wing sims), the new helicopter simulator will be suitable for the full range of Canadian Coast Guard flight activities, with extremely high resolution visuals to support training in mountaintop, Arctic, Canadian Coast Guard icebreaker and remote coastal locations.

A bubble door and enhanced visual capability is being included to allow emergency procedures training during vertical reference sling load operations as well as a view of what the pilot would see in the cargo mirror.

"CAE will tell you it's the most sophisticated sim in the world. It's taking over two years to build it. The instructor operating system we're developing with them will become their new standard moving forward for all simulators."

Buckles said the ASD is set to take delivery of the new simulator this fall and will put it into service early next year. "There is a lot of work to do to make sure it's right. We won't accept delivery here until it passes all qualification tests in the plant."

ASD's Technical Services Branch performs all first, second and third-line maintenance for RCAF 412 Transport Squadron's four CC-144 Challenger aircraft. **Peter Handley Photo**


Five Beechcraft King Air C90A aircraft help support Transport Canada inspectors as they move around the country. The ASD operates a Level C simulator to augment training on this aircraft. **Peter Handley Photo**

The ASD's technical services branch is an Approved Maintenance Organization and an Approved Engineering Organization that offers design and fabrication capabilities. **Peter Handley Photo**

The rate of oil spills in Canadian waters has dropped significantly as a result of patrols conducted by the National Aerial Surveillance Program. Here, a Dash 8 flies over a cargo ship. **ASD Photo**

Onboard surveillance equipment is operated by members of a Maritime Aerial Surveillance Team (MART). **ASD Photo**

"ASIDE FROM ITS COAST GUARD AFFILIATION, THE ASD DOES A LOT OF WORK WITH THE CIVIL AVIATION BRANCH OF TRANSPORT CANADA AND THE TRANSPORTATION SAFETY BOARD."

EYE IN THE SKY

Transport Canada's ASD is also responsible for supporting the longstanding National Aerial Surveillance Program (NASP), which has roots going back to the 1960s.

The main function of the NASP is to keep watch over Canadian waters to deter and detect illegal maritime activities, including polluting and unregulated fishing.

In the early years of the program, a Cessna 337 aircraft patrolled the Great Lakes. Today, three aircraft (two Dash 8-100s and the Dash 7 IR) cover Canada's coastline, which at 243,042 kilometres is the longest in the world and borders three oceans.

[If required, the NASP will contract private aircraft from St. John's, N.L.-based PAL Airlines to supplement patrols.]

Painted bright red and emblazoned with the word "Surveillance," Buckles said the three NASP aircraft serve as a powerful deterrent to illegal activity because "Big Brother is watching."

In fact, the rate of oil spills has dropped significantly as a result of aerial surveillance. Since the 1990s, Transport Canada has tripled the NASP patrol hours and the total volume of all combined oil spills dropped from 17,816 litres in 1992-93 to 3,796 litres in 2017-18.

Like all ASD aircraft, the NASP fleet can multi-task with the best of them.

While deployed on patrols, the aircraft also monitor shipping routes, ice conditions and marine security, providing important information to other government departments including the Marine Safety and Security Program, Fisheries and Oceans Canada, Environment and Climate Change Canada and the Canadian Coast Guard, among others.

Each aircraft carries a Maritime Aerial Reconnaissance Team (MART), which is tasked with operating the onboard equipment.

Buckles said the fleet offers tremendous surveillance capability powered by the Swedish MSS 6000 Airborne Maritime Surveillance System. That system manages the data acquired by an extensive range of sensors, including a powerful Wescam MX-15 camera, infrared and video system, side-looking airborne radar (SLAR), an infrared/ultraviolet (IR/UV) line scanner and airborne AIS (automatic identification system for ships).

"The Dash 7 IR we have is the only one of its kind in the world. It's based in Ottawa, but normally operates in the Arctic, primarily from Iqaluit, during the Arctic shipping season [July to October]."

With its bubble windows on the top and sides, and cutting edge surveillance equipment, the Dash 7 has the ability to geo-reference data and stream it live through satellites, or record it onboard to be downloaded after a flight.

When *Skies* spoke to Buckles in mid-April, the Dash 7 was departing for the East Coast, where it would be involved in the Northern Right Whale survey before working its way up the coast towards Iqaluit.

The other aircraft in the NASP program consist of a Dash 8-100 based in Vancouver for West Coast patrol, and another Dash 8-100 in Moncton. If any of them spot a problem, their mission is to collect data on the activity, record the location, talk with the ship by radio if possible, and report back to the appropriate regulatory authorities who handle enforcement.

Following the Deepwater Horizon oil spill in April 2010, the worst in American history, NASP's Moncton-based Dash 8 spent 11 weeks in the Gulf of Mexico.

The aircraft conducted aerial surveys from an altitude of between 8,000 and 10,000 feet, cataloguing the oil spill to provide critical data to the operations

The ASD operates a large training centre at the Ottawa airport, which includes classrooms, instructor space and simulator bays. **Peter Handley Photo**

A Level D simulator supports the department's Cessna Citation C550 training. **Peter Handley Photo**


The ASD believes simulation is key to keeping up with technology, while at the same time keeping a lid on costs. **Peter Handley Photo**


The ASD headquarters in Ottawa is currently being expanded to make room for the new CAE-built Bell 429/412 EPI Coast Guard helicopter simulator. **Peter Handley Photo**

centre that was managing the clean-up.

"The aircraft turned pink in the sun, it was so hot," said Buckles. "The Americans didn't have any technology like that at the time. They were really happy with that service."

DEFENCE CONNECTION

In addition to the Coast Guard, Transport Canada Civil Aviation and the NASP, the ASD has connections to the Department of National Defence (DND).

"This building was originally built in the 1960s to house the Transport Canada Exec Flight, which provided the VIP flight for the Prime Minister, the Governor General, members of Cabinet and visiting dignitaries," said Buckles.

The responsibilities were transferred to DND in the mid-90s and now ASD's Technical Services Branch performs all first, second and third-line maintenance for Royal Canadian Air Force (RCAF) 412 Transport Squadron, which is located onsite in Ottawa.

With four CC-144 Challenger aircraft, the squadron not only provides VIP transportation, but has also been tasked with bringing wounded veterans home from Afghanistan, repatriating imprisoned Mississauga pastor Hyeon Soo Lim from North Korea in August 2017, and inserting Canada's elite Joint Task Force 2 into hot spots around the world.

The ASD also has a contract to perform 600-hour inspections on six to nine RCAF CH-146 Griffon helicopters each year, while it also houses and maintains the Cessna 206 belonging to the Ottawa Police Service. In Moncton, the RCMP's flight department is located on the ASD premises, with Transport Canada providing transportation support to the national police service if needed.

The ASD's technical services branch is an Approved Maintenance Organization (AMO) and an Approved Engineering Organization that handles aircraft modifications through its design and fabrication capabilities in the main Ottawa hangar.

The engineering part of the organization can sign off on changes to aeronautical product type design, modification design and repair design for aircraft owned by Transport Canada, as well as engineering approval services to 412 Squadron and other clients.

Other functions of the ASD include the flight operations department, overseen by Buckles, which handles all aircraft operations and related contracts, as well as initial and recurrent pilot training programs. In addition, the Directorate has a proactive

The Canadian Coast Guard operation may be vulnerable to proposed amendments to Canada's flight and duty time regulations, said ASD director of flight operations Steve Buckles. **Mike Reyno Photo**

Safety Management System, with the chief of safety services reporting directly to the director general, John Madower.

A BRIGHT FUTURE

As he begins to contemplate his own retirement later this year after almost 32 years with the organization, Buckles remains enthusiastic about what he called the directorate's bright future.

In addition to new initiatives coming down the pike with DND, the ASD is planning to construct a large hangar and staff living quarters in Iqaluit. Land has been identified, and a site survey is targeted for next year.

Along with Transport Canada Civil Aviation, the ASD is working on a proof of concept for a remotely piloted aerial surveillance vehicle.

"We have a contract with the University of Alaska for a small drone called the Sea Hunter," said Buckles. "It's a twin-engine, 17-foot-wingspan aircraft that runs on diesel and flies at 110 knots with eight hours of endurance. We are trialing it in the test area in Alma, Que. We have also done some successful work off the back of a Coast Guard ship with a different platform."

Buckles came to Ottawa in 1988 from Prince Rupert, B.C., where he had been flying the Coast Guard's Sikorsky S-61 helicopter, to work on the Polar 8 icebreaker project. It was scuttled in 1990, but apparently the idea has surfaced again.

"A design has been developed and the Coast Guard is deciding whether it wants to build this ship," he said. "If they do, it will take us to a whole new level of operating helicopters in the Arctic. It's an active consideration but still several years out.

"It's a big investment, but Canada's Arctic is precious. It needs protection, especially with the huge increase in private and commercial vessels up there in recent years. Having a government resource that can live year-round up

there is very positive, I think. Not only for scientific research, but to enhance SAR capability and for protection of the environment."

In the meantime, although the implementation of the Coast Guard's new helicopter fleet continues (with the new simulator yet to come), there are no current plans to acquire additional aircraft of any type.

"I'm always hopeful that we'll see some fleet renewal, but I won't suggest there will be anything anytime soon," said Buckles. "We're well positioned here now. If we're going to see an increase, I'd like to see it in the aerial surveillance program, but there is nothing underway now."

FOCUS ON EFFICIENCY

The ASD must stay abreast of aviation technology if it hopes to remain effective.

"We need to keep up with technology but also keep up with costs," said Buckles. "We have an obligation to ensure the operation we run is efficient."

Along those lines, simulation is seen as a way to keep a lid on expenses while increasing capability.

Besides the simulators in Ottawa, the organization has invested in desktop Garmin G1000 trainers for its regional offices in order to help keep King Air flying time down. Similarly, the directorate's Citations were upgraded about 10 years ago with the Rockwell Collins Pro Line 21 integrated avionics suite, and desktop training systems are used where those aircraft are located.

Another area of interest is flight data management. The ASD is examining its options now that some of its aircraft are capable of downloading maintenance and performance data. And the Flight Operations branch is instituting a Quality Assurance program to monitor its activities.

"We're not looking for Cadillacs here, but for aircraft we can operate effectively and efficiently for long periods of time," emphasized Buckles. "We keep most of our aircraft for 20 to 30 years."

A potential cloud on the horizon is the growing North American pilot and maintenance engineer shortage. For now, the ASD has managed to attract good people who stay in their jobs for a long time. But Buckles knows that eventually, the directorate will feel the pinch.

That's why the ASD has identified key roles where succession planning is especially important.

"Where knowledge transfer is critical, we must have overlap. We have been doing that in several key roles in the organization—mentoring and transferring knowledge and trying to think ahead. We practice anticipatory staffing as much as possible."

The Aircraft Services Directorate has weathered a lot of change since it was founded more than eight decades ago.

Change is a constant in this business, and Transport Canada's proposed amendments to Canadian flight and duty time regulations could mean yet another hurdle to jump, particularly for the Coast Guard operation.

"[The changes] won't apply to CARs 702 operations, which is the NASP. We're still analyzing the changes, but the biggest impact will be on the Coast Guard—we are still evaluating how it might affect the operation."

Regardless, Buckles is enthusiastic not only about the ASD's past, but most importantly its future.

"We've managed to bring together a great team," he concluded. "I firmly believe we borrow places from the future, and I want to give this back in better shape than when I got it."

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CITATION TEAM CANADA

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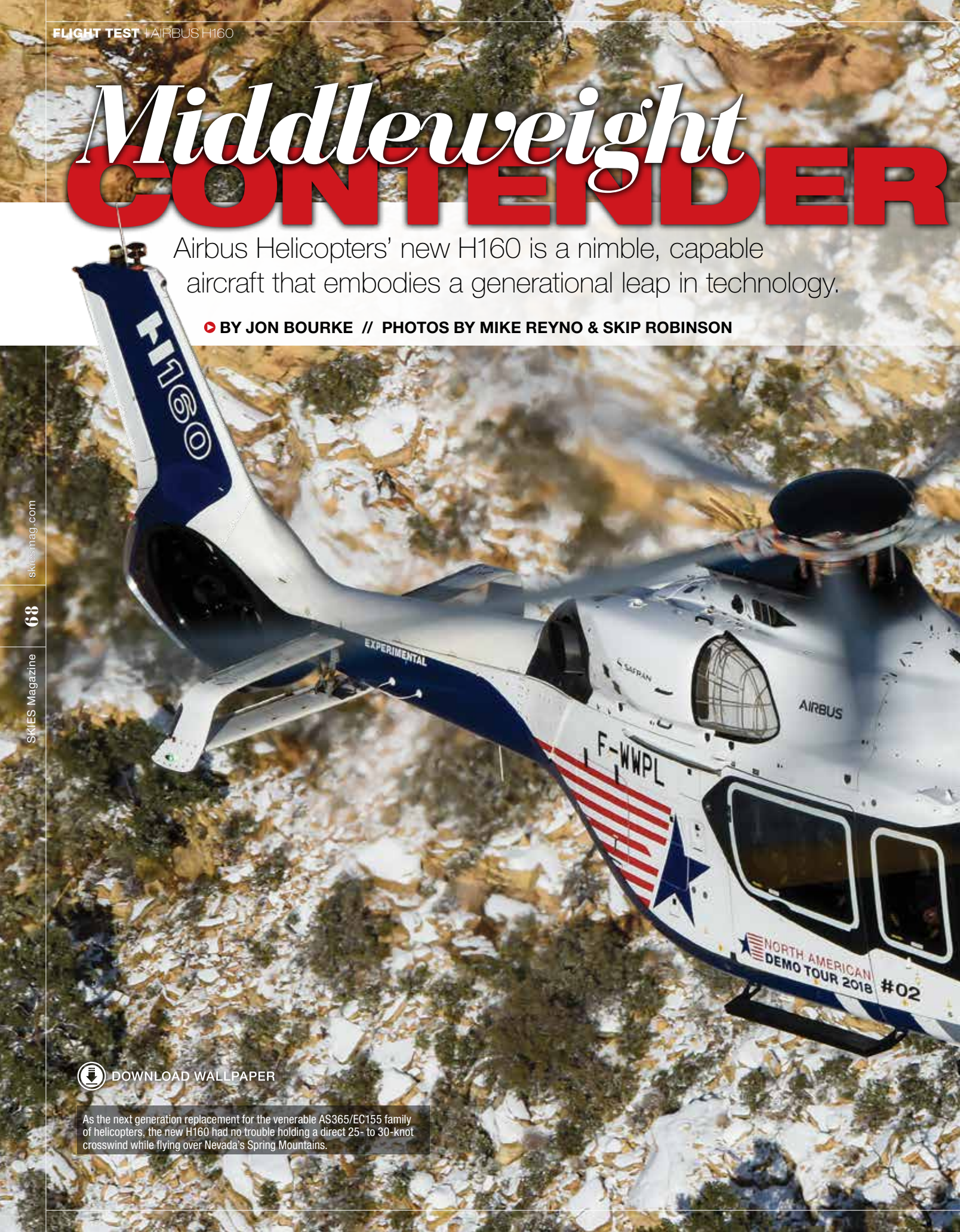
Airbus Helicopters' new H160 is a nimble, capable aircraft that embodies a generational leap in technology.

BY JON BOURKE // PHOTOS BY MIKE REYNO & SKIP ROBINSON



DOWNLOAD WALLPAPER

As the next generation replacement for the venerable AS365/EC155 family of helicopters, the new H160 had no trouble holding a direct 25- to 30-knot crosswind while flying over Nevada's Spring Mountains.

I was beginning to think this wasn't going to happen. Our camera ship was stuck a 15-minute flight away at the Henderson (Nevada) Executive Airport, engulfed in a winter snow shower that had brought visibility below one mile.

"This is Vegas!" I thought. "Where the hell did this come from? Isn't it supposed to be sunny and warm here in the winter?" Normally, yes … but a strong Pacific trough had moved in the day before, and was now pouring cold moisture over Mount Charleston and the foothills west of Las Vegas. Our very limited opportunity seemed to be slipping away.

Airbus Helicopters had offered us a chance for a demo flight and photo shoot with the H160—the next-generation replacement for the venerable AS365/EC155 family of helicopters—out of the North Las Vegas Airport (KVGT) on Feb. 23. The aircraft was scheduled to fly into the Las Vegas Convention Center for HAI Heli-Expo 2018 early the next morning, and there wasn't going to be any wiggle room for rescheduling.

Test pilot Olivier Gensse and chief engineer Laurent Maruejols had been on a precise timeline since arriving in the U.S. with the second H160 prototype, F-WWPL. We were scheduled to do a briefing at KVGT at 2 p.m. before departing for the flight evaluation and photo shoot in Red Rock Canyon, but the weather was having none of that. Not only was our primary photographer, *Skies* publisher Mike Reyno, stuck with the camera ship in Henderson, but cloud cover was spoiling the light, and the wind in the mountains where we planned to fly was gusting 25 to 35 knots alee.

Finally, a little before 3 p.m., Reyno called to say there was a break in the weather and they would be there shortly. I would get a chance to fly the H160 after all.

STYLISH AND FUNCTIONAL

I had arrived at KVGT early, along with *Skies* photographer Skip Robinson, who would be riding along with me in the H160 to take in-cockpit and other shots as the flight progressed. Not only did we want to make sure we weren't late, I was hoping to get more saturation time with this new, intriguing aircraft. There are enough novel things about the H160 that I needed to explore them not just in the formal flight test, but in the kind of informal hangar atmosphere where detailed techno-speak flows more freely.

The airport manager drove us to the rented hangar where Airbus's technical and engineering staff were holed up with the aircraft. At the rear of the hangar, in a dingy work room that appeared to have once served as a battery reconditioning station, an old steel table served as the workspace for a number of engineers and technicians, with their laptops and other modern tools of the trade piled on top.

These were the flight test and development team members assigned to the H160 project, who had been travelling different parts of the globe expanding the envelope of the aircraft in the harshest of conditions—from cold to hot, low to high—wherever those conditions could be had.

Slightly embarrassed with the accommodations my country was leasing to them, I asked, "Are you OK here?" They collectively brushed it off as no big deal; they had seen plenty worse.

Gensse and I slipped right into conversation like pilots do when talking about the things they are most passionate about: common experiences and acquaintances; been-there, seen-that's; the failures and successes of new and old technologies. I could have spent another week talking to him, but then we got the call about the break in the weather.

Half an hour later, the photo crew was gathered around the table with the Airbus team to brief the aerial shoot, which would start with a pass through downtown Las Vegas. By the time we were ready to go, it was 4:30 p.m., and the only sunlight visible was beyond the high overcast, peeking through the mountains somewhere to the west as the sun lowered to the horizon.

Getting into the cockpit was easy through very large, automotive-style doors, which felt solid and were easy to use thanks to handles similar in design to those used on most cars. The devil is in the details, they say, and Airbus seems to have put a great deal of effort into making this new airframe devilishly functional.

One of those details is a visual indicator on each door, visible from both inside and outside at a good distance, which shows red when the door is open or not fully latched, and solid green when it is secure. A quick glance over the shoulder from the cockpit allows pilots to confirm whether the doors are latched and ready for lift-off. The cabin window design also provides a wide area of visibility from the cockpit to check outside surroundings easily.

The starting sequence was similar to that of the older EC155 that my company operates, with a few notable differences. In the H160, there is no manual autopilot test (it's completely automated, including the cyclic centering function) and no fuel boost/transfer switch management or tests (as the fuel system is also fully automatic and transparent to the pilot). And two separate batteries allow the two Safran Arrano engines to be started simultaneously, if the need arises.

For flight test, the aircraft had been outfitted with a non-standard cabin interior: a lightweight fabric blanket with Velcro attachments, to accommodate easy access to

The H160's slow-flight deck angle offered plenty of visibility while cruising over the Las Vegas Strip.

all of the test and measurement equipment placed throughout the airframe. With both engines running and main rotor RPM at 100 per cent, the cockpit noise level was low enough to talk comfortably without headsets, thanks in part to the quieter Blue Edge main rotor blades and the design of the transmission and all-composite airframe. Gensse said the decibel level in the production aircraft with standard interior will be lower still.

Immediately, as I began taxiing out to where the photo ship was waiting for us, I noticed how much more stable the H160 felt on the wheels compared to the 155. We were rolling with a calculated gross weight of around 12,200 pounds (5,535 kilograms), just 300 pounds (135 kilograms) shy of the maximum takeoff weight of 12,500 pounds (5,670 kilograms) that Airbus is targeting for initial certification. Airbus said it also plans to have a supplemental type certificate at entry into service for an extended gross weight of 13,338 pounds (6,050 kilograms), with some limitations that are not expected to impact most customers.

Gensse had briefed me on the design and function of the Safran electric brake system before the flight, so I was eager to try it out. Up to that point, the only electric brake system I had used was the emergency brake system on my own car, so I was somewhat skeptical about giving up the feel and control of the old hydraulic brake system in favour of pure electric.

I'm a believer now. Not only were the brakes more easily actuated than the old-style hydraulic brakes in the 155, the feel and power was linear, precise and controllable. The pedals in the H160 have also been redesigned to make it easier to toe the brakes without having to slide your feet up, which makes braking while taxiing a simple and seamless task—something that could come in handy in tight places like platform and shipboard helidecks.

As a bonus, the carbon-matrix rotor disc pack and electric calipers also lighten and simplify the brake system. Though the aircraft we were in had not yet been equipped with it, the production landing gear system on the H160 will be all-electric as well, simplifying and lightening the system by eliminating hydraulic reservoirs, lines and actuators. Gensse said the cycle time for the landing gear system, from fully up to down and locked, will be four to six seconds.

I'm all for these types of improvements. Earlier in my conversation with Gensse and Maruejols, they used the term "spirit" a lot. With the H160, Airbus aims to make real-world advancements in simplifying systems not only for the obvious benefits of cost and weight savings, but also to streamline manufacturing processes for quality control and efficiency, enhance reliability and reduce pilot workload. So the "spirit" of the H160 is really an inclusive package of many forward-looking improvements.

SMOOTH CONTROL

Once we were in position and ready to go, the camera ship took off and headed southeast for the Las Vegas Strip. I lifted into an eight-foot hover, scanned the first limit indicator (FLI) on the Helionix avionics suite, and pulled enough power to keep pace with the Airbus H125. Not even near a max continuous limit, the aircraft felt light and solid, easily manoeuvrable.

As we got close to the photo ship, Gensse took over the controls to tuck in close and low on the H125's left aft side. As Gensse remained visually glued to the camera ship, I assumed radio duties and kept a lookout for traffic and obstructions. With Reyno directing us using hand signals and relayed radio commands as he shot through a special camera window, we slow-cruised southward

The second Airbus H160 prototype flies near the Red Rock Canyon area west of Las Vegas in late February.

Between the visibility and the ease with which it handles, the H160 seems much smaller from the cockpit, writes flight test pilot Jon Bourke (left).

down the Strip until abeam McCarran International Airport. Then we made a coordinated right turn westward toward the Red Rock Canyon area and the only direct sunlight around.

Red Rock Canyon itself was still in shadow, so we continued west up into the higher snow-covered hills of the Spring Mountains, where the sun had just broached the westernmost edge of the overcast. Quick plan changes and adapting to the conditions allowed us to capture still shots and video with the aircraft contrasting against the dusted boulders and trees in the high country, and the sun striking us at a dramatic, low angle. The dark overcast behind us made the photos pop.

The wind coming across the ridge to the northwest of us remained at 25 knots with gusts to 30, and being on the lee side of the main range made for some not-so-smooth conditions in which to work. By the time we reached the first location in the Spring Mountains, our gross weight was down to around 11,800 pounds (5,350 kilograms), and we were hovering stationary while Reyno worked the angles around us in the photo ship. The pressure altitude was 6,700 feet, and the temperature 2 C (35 F).

During some of this time, Gensse wanted to demonstrate the capabilities of the four-axis auto flight system to make pedal turns, and perform slow climbs and descents per Reyno's instructions. The auto-flight system handled all of the commands and held headings/altitudes well during the gusts and downdrafts. I was able to select a display page of engine parameters and watch the margins. Most of the time in the hover, our power setting showed a comfortable margin available with the occasional use of a time-limited range, as we held a direct 25-knot gusty crosswind.

I was impressed by the authority of the new Fenestron tail rotor, which has a canted design to deliver an additional 176 pounds (80 kilograms) of lifting ability. Gensse said it is the most powerful Fenestron yet produced, and its performance actually exceeded design expectations. He said it has been tested to 50 knots of crosswind at gross weight.

Eventually, the sun crept low enough that Red Rock Canyon began to get good light, so we headed back east and concluded the photo shoot there. It was now "my" time with the H160, and I headed to a nearby landing zone (LZ) on a flat ridge that I had visited during a previous HAI Heli-Expo demo flight. As I began my eye-level recon, I saw that a windsock had been added to the site, and it looked quite suitable for a landing.

Slopes and unprepared surfaces present a challenge to pilots when the exact placement of the gear is critical to keep from setting down on unforgiving objects and causing damage. But the visibility from the H160's pilot seats takes most of the guesswork out of picking the right spot, and the smooth control response makes it easy to put it there and hold it, even under the windy conditions we had. Being able to so clearly see detail below your feet and out to the sides without having to contort yourself in the seat is uncommon in a helicopter of this weight class.

We dropped Robinson off at the LZ, and I did some "sporty" manoeuvres to get into good positions for his shots. This is where I got to really feel out the control margins and responsiveness of the main rotor and Fenestron. Low airspeed manoeuvring using pedal, slips and skids to a hover, crosswind pedal turns: easy. No special technique, no surprises. Those kinds of manoeuvres would have had the stability augmentation system (SAS) and auto-pilot kicking off line in the EC155, but the H160 took it all in stride.

After receiving the thumbs-up signal from Robinson, I landed back at the spot where we let him out; he boarded, took his seat and belted in. We were ready to head back to KVGT. By now it was getting late, so I asked Gensse if we could use the remainder of our time to do some pattern work, including single-engine landings and SAS failures.

Gensse agreed, so while en route to the airport, in addition to demonstrating the auto-flight unusual attitude recovery mode, we went over the procedure for single-engine training mode.

The bi-plane horizontal stabilizer design reduces the exposed surface area in the rotor downwash. Airbus says this adds another 110 pounds of useful load and a flatter hover attitude.

Canting the Fenestron on the H160 adds 176 pounds of additional useful load, according to Airbus.

Airbus's quiet Blue Edge main rotor blades are among the new technology on the H160.

Training mode is fairly straightforward: you don't need to select any engine to "fail," since the aircraft doesn't respond any differently whether the right or left engine is failed. With the training mode selected, power limits are recreated on the display, calculating available single-engine power. No engines are rolled back or reduced, so there is no re-engagement of freewheeling sprag clutches between training mode and operating mode that could do damage to drivetrain components.

Once in the pattern at KVGT for Runway 30R, Gensse let me fly with SAS off to a landing and then demonstrated a unique feature of the new auto-flight system: auto-land from a CAT A takeoff profile before the takeoff decision point (TDP). That sounds like a handful, but it wasn't. With the autopilot engaged, we initiated a vertical takeoff profile and simulated an engine failure before reaching the TDP in the profile. The system took the aircraft back down to the runway using "simulated" available power with no manual intervention.

If we had selected the failure after the TDP, the system would have flown the profile for continued takeoff to safe single-engine speed (Vsse), with the only difference being

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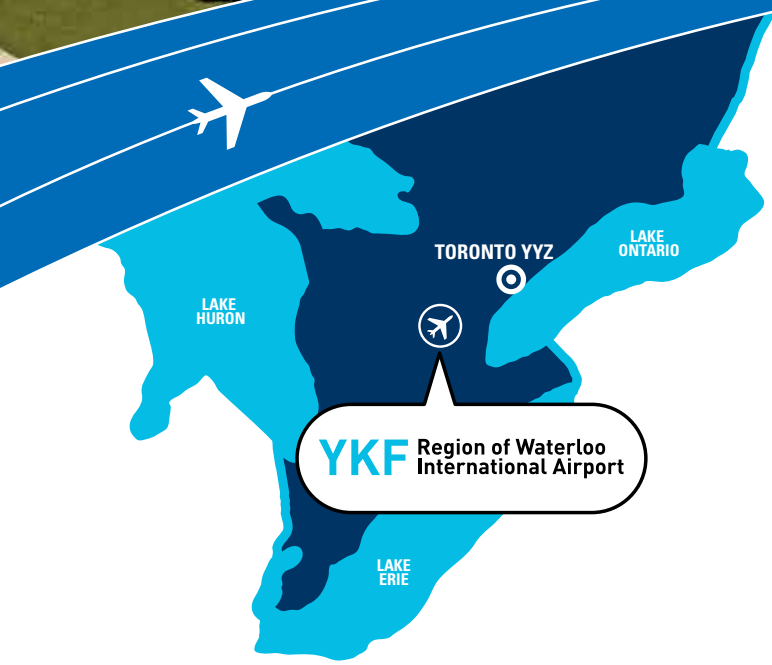

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This photo and below: The Safran Arrano uses two centrifugal compressor stages without any bleed valves. To maintain optimum combustion temperatures, flow is instead controlled through a variable inlet guide vane system.

Orange cabling installed on F-WWPL's Spheriflex rotorhead gathers in-flight data from an array of strain gauges, accelerometers, and other measurement sensors.

The second H160 prototype has been used to experiment with different angles for the bi-plane horizontal stabilizer, but it will have a fixed position in the production aircraft.

that the pilot needs to tell the system with the press of a button when the aircraft is at the TDP, in order for the autopilot to determine what course of action to take.

Another pattern and another demonstration on downwind: full authority digital engine control (FADEC) authority over rotor RPM. With a quick upward pull of the collective, followed by a sharp thrust downward, the RPM held steady. I'm glad Gensse did this one, not me; I could only envision myself making such radical control movements in some kind of certification test flight, or in a crazy life-or-death manoeuvre to avoid another aircraft. Nonetheless, the H160 shrugged it off as no big deal: no exceedances or out-of-limits indications.

After readjusting my seat belt, I performed a rolling landing from a single-engine approach, although I didn't need to; the aircraft had enough simulated single-engine power for the whole series of patterns. Oh, and those electric brakes? To demonstrate their safety benefit, Gensse told me to keep

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the speed up on landing, then grabbed the parking brake knob and set it to "on." In the EC155, I would be purchasing new main tires at this point, but in the H160, the system firmly applied the brakes to bring the aircraft to a rapid stop without the slightest squeal of rubber, as if it had an anti-lock braking system! Cool.

A TRUE LEAP IN TECHNOLOGY

My time was up, and the sun was beginning to set behind the Spring Mountains. I requested an air taxi over to the ramp near Airbus's rented hangar, accelerated to 80 knots, levelled at 100 feet, then did a controlled quick-stop to a slight roll-on landing. Gensse laughed and said there was no such thing as an "air taxi" in Europe; such things aren't recognized by air traffic control there. "Oh?" I said. "You are missing out on some good practice, then. Too bad ..."

We completed a simplified checklist for shutdown. As the main rotor blades came to a stop, I was reminded by the sight of the five highly contoured Blue Edge blades that we had been flying with a lot of new technology—all designed to make the H160 stronger, lighter, quieter, faster and more efficient than any previous helicopter in its weight class.

The main rotor blades alone allow the H160 to maintain the 170-knot sea-level never-exceed speed up to 5,000 feet pressure altitude, and the new Safran Arrano engines claim to burn 10 to 15 per cent less fuel for the equivalent horsepower output of similar engines in the same class (1,110 to 1,300 shaft horsepower). According to Airbus, that will give the H160 an advantage over competing aircraft, such as the Leonardo AW139.

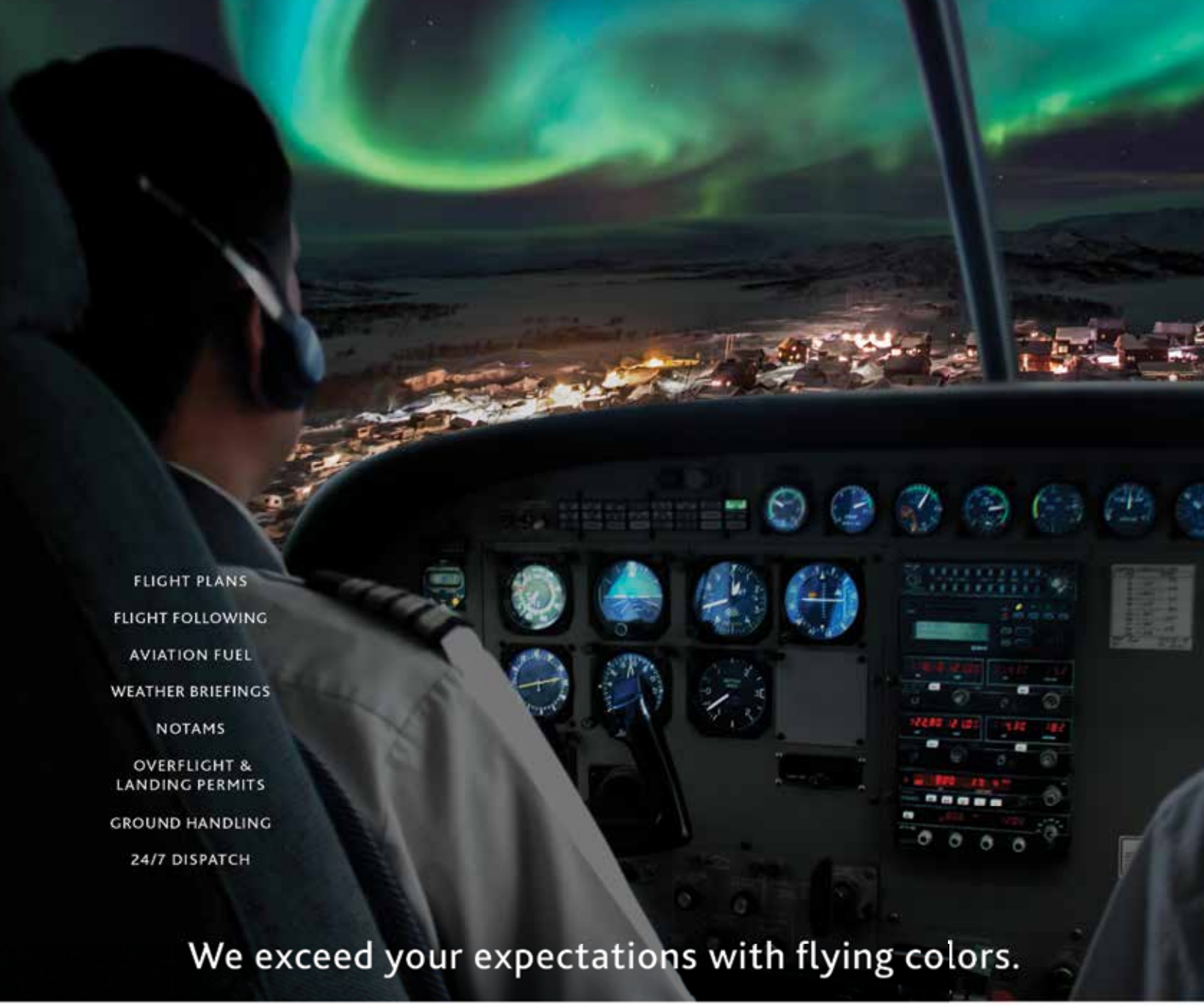
Behind the controls of the H160, I didn't get the feeling that I was flying such a large aircraft. Between the visibility and the ease with which it handles, it seems much smaller from the cockpit. In comparing it to the aircraft it was designed to replace, the EC155/AS365, I have to say that its new technology represents a much greater overall improvement than in past model upgrades.

From the two hours I got to spend in the cockpit of this new, "clean-sheet" aircraft, I'm impressed. If the claims of reduced acquisition and operating costs prove to be true, Airbus will have a real contender in the medium weight class of aircraft for the offshore, search and rescue, emergency medical services, and corporate charter markets. Time will tell.

JON BOURKE

Jon Bourke is the director of quality assurance and quality control for Atlanta, Ga.-based Helicopter Express. He has served as chief pilot (parts 135/133/137), company instructor, and check airman for three different companies, in addition to owning his own helicopter company.

Low airspeed manoeuvring using pedal, slips and skids to a hover, crosswind pedal turns: easy. The H160 requires no special technique and offers no surprises, writes Bourke.



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2018 CF-18 demonstration pilot, Capt Stefan 'Porcelain' Porteous, rolls the demo jet to show off this year's paint scheme in honour of the 60th anniversary of the bi-national NORAD alliance. At the same time, two Hornets from 401 Tactical Fighter Squadron split, showing off their NORAD-type armament load of air-air missiles and sniper pods.

CELEBRATING AN Alliance

The 2018 Demonstration Hornet pays tribute to the 60th anniversary of the North American Aerospace Defense Command (NORAD).

BY CHRIS THATCHER // PHOTOS BY MIKE REYNO

Team public affairs officer Capt Jenn Howell is also the team's announcer during the Hornet demonstration. **Heath Moffatt Photo**

Porteous performs a walk-around of his jet before a practice in Comox, B.C. **Heath Moffatt Photo**

Without the technicians, Porteous would not be able to perform his dynamic airshow routines. Four technicians from 3 Wing and four from 4 Wing are assigned to the team. **Heath Moffatt Photo**

This year's CF-18 Demonstration Hornet design was created by Capt Jeff Chester, under the mentorship of Jim Belliveau, who is renowned for designing many of the commemorative paint schemes of previous Demonstration Hornets and other RCAF aircraft.

A Hornet pilot since 2014, Capt Stefan Porteous is assigned to 433 Squadron based in Bagotville, Que. **Heath Moffatt Photo**

The Demo Hornet design was inspired by the NORAD slogan, "We have the watch." The jet honours all those who have served in NORAD since the partnership began in 1958.

"THE FINAL PAINT SCHEME CAPTURES ELEMENTS OF SWEEPING RADAR AND THE NORTHERN LIGHTS, IN THE BRILLIANT COLOURS OF BOTH CANADIAN AND U.S. FLAGS."

Like two kids on Christmas morning, Capt Stefan "Porcelain" Porteous and Reserve Captain Jeff Chester exuded nervous energy as they waited for the hangar doors of the Aerospace Engineering Test Establishment at 4 Wing Cold Lake, Alta., to open.

The Royal Canadian Air Force (RCAF) fighter pilot and paint scheme designer of the 2018 CF-18 Demonstration Hornet had been intimately involved in the design process, but neither had seen the final paint job. And the anticipation was getting to them.

"Wow … oh wow," said Porteous when the giant doors finally rolled back to reveal a brilliant blue, white and red Hornet in the sun of the sub-zero early April morning. Though he'd had opportunities to see the jet as it was being painted, "I didn't peek," he said moments later. "I think the contrasts are going to look incredible airborne."

"I'm impressed," said Chester as he stepped down after viewing the design from the wing. "I saw it about a month ago and helped do some of the masking. It's actually way better than I thought when we finalized the design. It has surpassed what I was hoping for."

Together with the Canadian Forces Snowbirds of 431 Air Demonstration Squadron, the CF-18 Demo Hornet team serves as ambassadors for the Forces and a visible symbol of the skill, teamwork and professionalism of those in uniform. Beginning in early May in Trenton, N.J., the Hornet will perform an aerobatic demonstration at more than 25 airshows across Canada and the United States, as well as in the United Kingdom at RNAS Yeovilton and at the Royal International Air Tattoo at RAF Fairford.

Consequently, the theme for the Hornet paint scheme is an important decision for the RCAF. BGen Sean Boyle, the deputy commander of 1 Canadian Air Division, admitted several major events were on the table, including the 100th anniversaries of the Royal Air Force and 401 Tactical Fighter Squadron, but in the end the

Members of the 2018 CF-18 Demonstration Team, ready to enjoy a busy airshow season. **Heath Moffatt Photo**

60th anniversary of the North American Aerospace Defense Command (NORAD) "just made sense."

The unique NORAD paint scheme "will allow us to speak with Canadians and Americans across North America about the importance of the NORAD mission and its successes," he said.

The paint scheme went through numerous design changes before a final version was approved, capturing elements across the wings of a sweeping radar and the Northern Lights in the colours of both national flags.

"I just think that's brilliant," said Boyle, who observed the selection process for the demonstration team, the pilot and the theme. "[It] fuses the Canadian and American piece on the jet."

All told, the design and painting of the Hornet took hundreds of hours, he added. While that might lead some to question the value of so much effort and taking an operational jet out of service for almost a year, he said the demo jet provides an "immeasurable" public relations benefit to the Forces and RCAF.

A radar control operator who has spent much of his career immersed in the bi-national command, Boyle believes the commemorative Hornet can serve as a reminder to both Canadian and American airshow audiences "that [NORAD] really is

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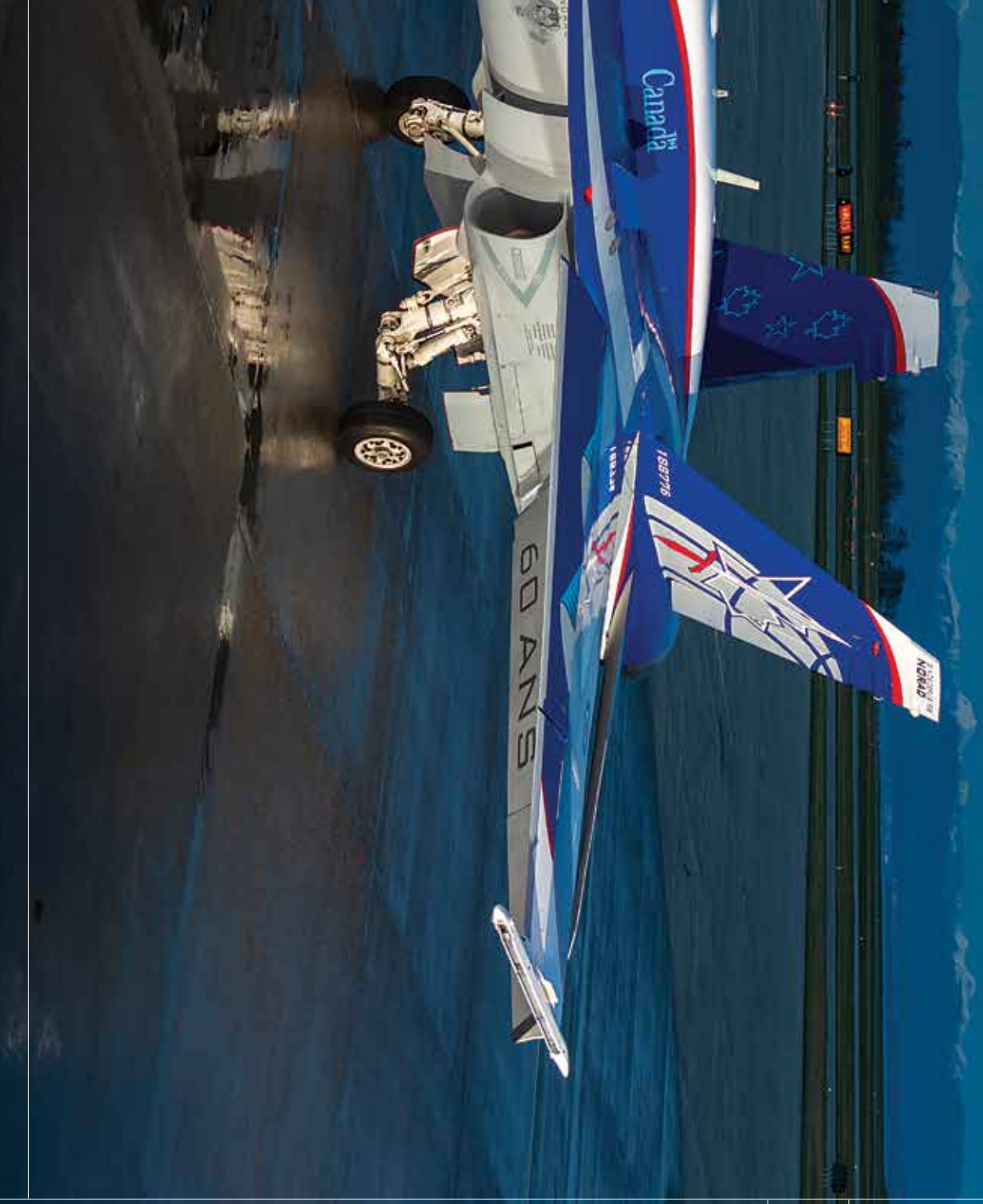
The CF-18 Demo Hornet team is an ambassador for the Forces and a visible symbol of the skill, teamwork, and professionalism of those in uniform. Consequently, the theme for the Hornet paint scheme is an important annual decision for the RCAF.
Heath Moffatt Photo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CF-188 HORNET AT A GLANCE

The CF-188 Hornet, or CF-18 as it is popularly known, is a multipurpose, high-performance twin-engine fighter that can handle both air-to-air and air-to-ground combat. Because of its power, speed, and target tracking capabilities, the CF-188 has had great success in many military operations in Canada and around the world.

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ENGINE THRUST: Standard: 4,850 kg (10,700 lbs.) Afterburner: 7,290 kg (16,000 lbs.)

RANGE: 3,700 km

MAXIMUM SPEED: Mach 1.8

POWER: 2 General Electric F404 low bypass turbofan engines

WEIGHT 10,455 kg

CREW/CAPACITY: 1 pilot **(CF-188A)** | 2 pilots **(CF-188B)**

the longest standing defence agreement on the planet."

Though the two countries had been cooperating for a decade on mutual air defence in response to the threat posed by Soviet long-range aviation, the exchange of notes on May 12, 1958, formalized a unique bi-national command structure that has yet to be replicated by any other defence alliance.

Command is shared by both countries. At NORAD headquarters in Colorado Springs, Colo., the commander has been an American military officer while the deputy commander is a Canadian. In the regional commands such as Canadian NORAD Region (CANR) located at 1 Canadian Air Division in Winnipeg, command is under the host country, but the deputy commander is from the other nation.

Part of the responsibility of CANR is to provide combat-ready aircraft and aircrews to defend and maintain the sovereignty of North American airspace, a quick reaction force rotated among the RCAF's tactical fighter squadrons and equipped with the CF-188 Hornet.

"This aircraft and its stunning paint job will no doubt serve as a fitting reminder that 24/7, 365 days a year, there are Canadian and American service members ready to respond to any situation at a moment's notice," said Porteous during his formal remarks to a largely Air Force audience as the airshow jet was unveiled.

Born and raised in Comox, B.C., Porteous said he applied for the role when the opportunity arose, but "kind of forgot about it" while the selection process was underway. Much like the reveal of the jet itself, he was thrilled when he learned he'd been chosen.

"I'm very excited and motivated, and looking forward to flying," he said as he walked around the freshly painted jet for the first time.

Porteous is a member of 433 Tactical Fighter Squadron at 3 Wing Bagotville, Que., with over 600 hours on the Hornet since receiving his wings in 2013. He said safety would be his top priority during the

While the design and painting of the Demo Hornet took hundreds of hours, it provides an "immeasurable" public relations benefit to the Canadian Armed Forces and the RCAF.

The Demo Hornet will perform at 26 airshows throughout North America and the U.K. during the 2018 season.
Heath Moffatt Photo

airshows, but with so many cameras and smartphones focused on the jet, it would also be a special "opportunity to demo the capabilities of the RCAF."

Chester admitted he went through 65 different drawings "in my basement" before achieving the final concept. The inspiration came from the NORAD crest and logo, "We have the watch," as well as the red, white and blue colours from both national flags. He originally began with a rock ptarmigan wing and feathers across the wingspan of the jet. But with each drawing, that bird concept gradually morphed to include elements of the Northern Lights and a radar sweep. The brilliant colours were chosen to be eye-catching on the ground and in the air.

"I hope this design can be a badge of honour for all those men and women who stand on the watch ... in NORAD," he said.

The design was created under the mentorship of Jim Belliveau, renowned for designing many of the commemorative paint schemes of previous Demo Hornets and other RCAF aircraft.

Belliveau, who was recently recognized by the International Council of Air Shows with its Platinum Pinnacle Award for his many designs, had high praise for both Chester and the paint and support team of Cpl Philip Knaus, Cpl Daniel Jacobs, Cpl Matthew Recollet, Avr Gabriel Fortier, Sgt Fred Lanouette, MCpl Darin Adams, MCpl Dale Perry, MCpl Philip Wells, Cpl Tanya Campbell, Cpl Maxime Robichaud and Cpl Felix Gendron-Bourgoin.

"It was a joy to be the bridge between Jeff's incredible talent and their incredible talent," he said.

CHRIS THATCHER

Chris Thatcher is an aerospace, defence and technology writer and a regular contributor to *Skies*.

DOWNLOAD WALLPAPER

The RCAF operates 14 CH-149 Cormorants, a variant of the Leonardo AW 101, as part of its search and rescue fleet. The helicopters are based in Gander, N.L., Greenwood, N.S., and Comox, B.C. **Mike Reyno Photo**

CANADA MOVING TOWARD CORMORANT *mid-life upgrade*

After weighing options, the federal government intends to move forward with a mid-life upgrade of its CH-149 helicopter fleet.

BY CHRIS THATCHER

Airbus Helicopters was prepared to offer Canada its H225, part of the Super Puma family, which is in service with multiple search and rescue providers. **Anthony Pecchi Photo**

The federal government intends to move forward with a plan to extend the life of the CH-149 Cormorant helicopter fleet to at least 2040, according to Public Services and Procurement Canada.

The department on May 24 posted a letter of notification (LoN) outlining its intent to conduct a sole-source negotiation with Leonardo, formerly AgustaWestland, to replace, modify or upgrade current and projected obsolete systems on the Royal Canadian Air Force (RCAF) search and rescue (SAR) aircraft, a variant of the AW101.

"The CH-149 has proven to be an excellent search and rescue asset for the [RCAF]. The fleet has been outstanding in covering the required range and providing the cabin capacity necessary to successfully deliver search and rescue in a country the size of Canada, often flying in very harsh environments which include demanding icing conditions," the Department of National Defence (DND) said in the letter.

The Air Force has been analyzing options for the Cormorant Mid-Life Upgrade (CMLU) project for several years, but recently secured funding and project approvals as part of the Canadian government's defence policy released in June 2017.

As part of the analysis, the RCAF surveyed other manufacturers to gauge whether an alternative helicopter might be better than the 16-year-old Cormorants, which have experienced significant issues with component obsolescence in recent years.

Two other helicopter manufacturers, Sikorsky and Airbus, were requesting an open competition, arguing their SAR helicopters could provide the same service more effectively and efficiently.

In opting to proceed with a non-competitive process with Leonardo, DND said in the notification letter to industry that the project team had "conducted a market survey and an options analysis which determined that the Cormorant is the only solution to meet the rotary-wing search and rescue capability requirements."

The analysis found that, "based on projected flying rates, the CH-149 will remain a viable [SAR] asset until at least 2040," and augmenting it with a different make or model of helicopter could, among other concerns, increase pressures on RCAF aircrew flight training.

The department also noted that a CAE-designed and built commercial off-the-shelf (COTS) flight simulator is already available and certified for use and could immediately meet the project's training requirements.

It added that any potential solution would need "to maximize the use of [COTS] aircraft and subsystems that have already been certified in accordance with airworthiness regulations."

Leonardo has proposed an upgrade program based on the Norwegian AW101-612 All-Weather Search and Rescue Helicopter (NAWSARH) model, which entered service in December 2017.

That would involve upgrading the Cormorants with new cockpit displays, avionics, digital automatic flight control system, aircraft management system, electro-optical surveillance system, an obstacle

proximity LiDAR system, weather radar, a new 3,000-horsepower CT7-8E engine, and mobile phone detection technology that would allow an onboard system to identify and track a mobile phone within a 25-mile (40-kilometre) range.

"Based on current information, Leonardo is the sole worldwide provider of AW101 aircraft and exclusively holds the necessary level of intellectual property to conduct a project of this scope," reads the LoN.

A spokesperson for Leonardo said the company would not be commenting at this time.

The RCAF would like to see the Cormorant fleet equipped with enhanced aircraft flight management, communications, navigation and safety systems to meet current and pending airspace regulatory requirements. As well, better SAR sensor capability and communication systems to improve interoperability with other SAR assets, such as the newly acquired fixed-wing Airbus CC-295 aircraft, and with the three Joint Rescue Coordination Centres and civilian agencies like the Civil Air Search and Rescue Association, are on the wish list.

The plan also calls for more effective aircrew training with the acquisition of a dedicated flight simulator and associated training aids, something that was highlighted in the defence policy.

Lastly, DND said in the LoN that it would proceed with a plan to "augment" the current fleet of 14 Cormorants by as many as seven and return the Cormorant capability to a fourth main operating base in Trenton, Ont.

> "LEONARDO HAS PROPOSED MODERNIZING THE CORMORANT FLEET BASED ON THE NORWEGIAN ALL-WEATHER SEARCH AND RESCUE HELICOPTER (NAWSARH) PROGRAM."

The department acquired nine VH-71 aircraft (variants of the AW101 that do not have valid airworthiness certificates) from the U.S. government in 2011 for $164 million, when the U.S. presidential fleet replacement program was cancelled for being too costly. Leonardo had been proposing to convert seven of those airframes to the same standard as the Norwegian model.

"This augmentation will allow the [RCAF] to re-establish a rotary-wing search and rescue presence at Canadian Forces Base Trenton and will provide additional support to all of Canada's [SAR] regions," the department said.

The RCAF currently operates 14 CH-149 Cormorants from three bases in Gander, N.L., Greenwood, N.S., and Comox, B.C., and augments that with five yellow-painted smaller CH-146 Griffon helicopters from Trenton.

COMPETITIVE ADVANTAGE

The LoN is undoubtedly a setback for both Sikorsky, a division of Lockheed Martin, and Airbus. In recent defence industry forums, the RCAF had indicated it was assessing "all options to address the current and future operational requirements for the Cormorant fleet," and looking for input from other potential suppliers to meet the CMLU mandate.

Although the Air Force had yet to release a statement of requirements for the project, both manufacturers believed they could provide competitive offers.

In an interview with *Skies* in mid-April 2018 Raffi Fattal, Sikorsky's regional sales director for the United States and Canada, acknowledged that the primary option on the table was an upgrade to the existing Cormorant fleet, but said "we also understood that other options were

The Cormorants first entered service with the RCAF in 2002, and today average more than 5,000 flight hours per airframe. **Mike Reyno Photo**

being looked at: replacement aircraft, new aircraft of another type, augmentation to the existing fleet, or a mix thereof."

"We looked at this understanding that the defence department has put out a mandate where they are looking really hard at efficiencies and commonality going forward," said Glenn Copeland, business development director for Lockheed Martin Canada's rotary and mission systems. "Knowing that they have challenges with existing cost structures associated with the EH-101 … we saw a very good opportunity."

Sikorsky planned to offer the S-92 in a SAR configuration, an off-the-shelf platform currently used by Ireland, the United Kingdom and other SAR providers.

"The S-92 is the 'go to' SAR helicopter, operating in the harshest environments around the world," said Fattal. "The S-92 platform is reliable and robust—it's a workhorse. In Canada, S-92s have flown over 100,000 hours since 2006 and demonstrated the endurance and range requirements needed to operate effectively in Canada's large maritime and interior areas. It's conducting missions … in the North Sea area [for UK SAR] over long distances, harsh environments, and low visibility, so the aircraft has proven itself in that regard."

Airbus, on the other hand, was proposing the H225, part of the Super Puma family in service with multiple search and rescue providers. Airbus calls the helicopter "a reference in SAR operations" due in part to a quick takeoff sequence of less than five minutes, all-weather capability, and extra long-range with auxiliary fuel tanks.

"We strongly believe it is premature to rule out all other non-Cormorant based options and hope we will have the opportunity to offer alternatives," said Mark Conroe, director of government and military sales for Airbus Helicopters Canada in an emailed response to *Skies* on May 1.

In particular, both companies touted their availability rate and operating costs.

The global S-92 fleet claims an availability rate consistently above 95 per cent, said Fattal. And performance data from UK SAR health and usage monitoring systems shows a rate of between 98 and 99 per cent.

"With a SAR mission, that is a paramount requirement, to have that aircraft ready to go when it is needed … with no delay. It has exceeded in that regard," he said.

Airbus didn't provide a rate, but Conroe said the H225 has the lowest operating costs in its class, and a useful load that is "at or near the best in its class."

The CH-149 has been an expensive aircraft to operate, and while changes in recent years have significantly improved lifecycle costs, both Airbus and Sikorsky said they could achieve around 50 per cent savings.

Conroe said data analyzed by a third party, Conklin and deDecker, show the operating costs per flight hour for the H225 "are approximately 32 per cent less than those for a commercial variant of the Cormorant."

Moreover, information obtained from Public Accounts of Canada found the total variable operating costs for 2015 for the

The CH-149 Cormorant wil be upgraded to the same standard as the new Norwegian Air Force AW101. **Greg Caygill Photo**

Cormorant to be $6,650 per flight hour, "reported costs [that] exceed projected costs for the H225 during the same year by over 50 per cent," he said.

The same information revealed that for the years 2013 to 2016, "the average contract cost for the CH-149 in-service support contract was $185 million, rising to $300 million in 2016. We can provide aircraft, services, and a simulator below those rates moving forward, with a modern helicopter operating more efficiently than the current fleet and with higher operational availability," said Conroe.

Based on third-party analysis of UK SAR data, Sikorsky also claimed to be "at least 50 per cent of the cost per hour to operate the S-92 compared to the incumbent," said Fattal.

Both companies suggested that, based on their availability rates, they could meet the RCAF's high operational tempo with similar or even fewer SAR helicopters per base than the Air Force has today.

Airbus and Sikorsky were also hoping to find savings by leveraging the relationships they have today with the RCAF. Airbus won the fixed-wing search and rescue competition in 2016 with the CC-295 and, together with CAE and a joint venture with PAL Aerospace called AirPro, will build, maintain and deliver the courses for a SAR training centre in Comox.

Sikorsky had offered its S-92 helicopter in search and rescue configuration to upgraded Cormorants. The aircraft is currently used by Ireland, the United Kingdom, and other SAR providers. **Sikorsky Photo**

Sikorsky is delivering the CH-148 Cyclone, a militarized variant of the S-92 that will reach initial operating capability deployed on Royal Canadian Navy frigates later this year. Compatibility with a new SAR aircraft could allow for common aircrew and technician training and improve fleet management.

SURPRISE MOVE

While the RCAF had said it would consider all options to improve SAR capability, the decision to proceed with the Cormorant as the preferred SAR solution should not come as a big surprise.

In an interview with *Skies* in April, BGen Michel Lalumiere, director general for Air Force Development, indicated the RCAF would be cautious about adopting another platform. He emphasized the demand for people the RCAF currently faces, and noted that as new and upgraded platforms, from fighter jets to tactical and maritime helicopters, to remotely piloted aircraft, come online, the transition from old to new aircraft can be difficult to manage.

"The people aspect is a huge challenge, especially if it's on high readiness. SAR is on high readiness," he said. Furthermore, the Air Force would be hesitant to accept "a very long and very tough transition for the 25 to 30 operational crews that I have doing the [SAR] business today."

Lalumiere also said that although other manufacturers might claim better performance metrics, the Air Force knows the costs and capability of the current fleet and has a well-established relationship with Leonardo and its in-service support partner, IMP Aerospace, on the program.

In an interview last May, John Ponsonby, managing director for Leonardo Helicopters, acknowledged RCAF concerns about lifecycle costs and said the company has "committed to a significant program of cost reduction and we have delivered a significant percentage of cost reduction already."

At the April industry outlook, an Air Force official described the first stages of a new sustainment business cases analysis on the CH-149.

She said it builds on an earlier "optimization review" in which the two companies "proposed a new approach to materiel support and component repair and overhaul services" that included "a savings target."

To date, "innovation and efficiency resulted in an overachievement of savings and a reduced cost of ownership" that has not compromised fleet availability.

While CMLU negotiations will now likely be for a sole-source arrangement, the department could initiate a competition for future in-service support (ISS). The letter of notification said DND, Public Services and Procurement Canada, and Innovation, Science and Economic Development Canada would complete a sustainment business case analysis to "inform options for future [ISS], including the option to compete future support."

The CMLU project is still in what the military calls the options analysis phase and a schedule for the project has not been set. The letter of notification is intended to inform industry of the proposed process and does not commit the government to a non-competitive contract.

Companies have until June 7 to respond to the letter.


YHM Photo

On the RISE

YHM Photo

John C. Munro Hamilton International Airport was the fastest-growing airport in the country last year, and it shows no signs of slowing down.

BY BEN FORREST

The passing of John C. Munro, a long-time Liberal MP and cabinet minister from Hamilton, Ont., was a national news story in the summer of 2003, prompting coverage in *The Globe and Mail* and many other publications across the country.

Munro was remembered as a tireless worker, a political scrapper, and a "pit bull" who fought for the rights of the underdog. He was one of the most prominent politicians Hamilton has produced, a name that will not be soon forgotten.

"He was the feistiest, most stubborn person I knew in public life," said former Hamilton mayor Bob Morrow in a *Toronto Star* obituary.

"He used those qualities to do a lot for the city. I don't think we will ever meet his equal of scaring up funds for Hamilton."

John C. Munro Hamilton International Airport (CYHM), Canada's largest overnight express cargo airport and its fastest-growing airport by passenger volume in 2017, is among the most prominent examples of Munro's legacy.

Built in 1940 as an Air Force training station, the airport transitioned into a public facility after the Second World War. Many politicians hoped it would become a regional transportation hub.

Munro was instrumental in bringing that dream to fruition, securing a $55 million federal investment to expand and develop the airport's existing facilities in the early 1980s. In April 1998, city council acknowledged Munro's efforts by naming the airport after him.

Today, CYHM is one of Canadian aviation's biggest success stories.

With the arrival of low-cost carrier Flair Airlines (formerly NewLeaf Travel Co.), and expanded service from Air Canada and WestJet, passenger volumes jumped 80 per cent in 2017 to a total of 599,146.

"Because of the low fares, you now have people that are travelling that would potentially not have travelled before," said Cathie Puckering, airport president and CEO.

"And what we're seeing is that demographic is changing, it's different, with Millennials, young families with children.

"You also have the opportunity of people travelling more frequently now because that fare is very attractive to them."

Ultra-low-cost carriers (ULCCs) often target smaller, secondary markets like Hamilton, and they figure to play a large role in any continued growth in 2018 and beyond.

Canada Jetlines announced last year it intends to make Hamilton its primary base, and Swoop, WestJet's entry into the ULCC market, also plans to offer flights to and from the city.

"As a secondary airport, our cost structure is lower," said Puckering. "We also provide ease of access. For the airlines and for the passengers, it's easier to get to, it's easier to operate in, it's easier for aircraft to turn around.

"So it's a quicker experience, which translates into cost savings or affordable travel for anyone. And that's strategically important for the success of a low-cost carrier, where they're able to minimize their costs by utilizing an airport such as us."

Hamilton saw 11,735 aircraft movements in 2017, and cargo volume jumped by 14 per cent to 499,211,000 kilograms in total landed billable weight.

"Our 24/7 operation provides a strategic advantage over other airports," said Puckering. "We're able to connect Canada, from a hardware perspective, overnight, with no restrictions on the timing."

With increases in online shopping and e-commerce, the demand for cargo continues to grow, and the future looks bright.

"Lower operating costs translate into financial savings, which is very attractive to them," said Puckering, referring to cargo carriers.

"They look at Hamilton as being the airport of choice for them to continue to grow their operations. We would expect at a minimum, on an annual basis, at least organic growth."

Hamilton invested nearly $5 million in airport upgrades last year, including runway, taxiway and roadway resurfacing; a new covered and heated international walkway; refurbished retail facilities, and the purchase of new snow clearing equipment.

"Our investment strategy has always been to align our spending to what the air carriers and the passengers and our cargo partners need," said Puckering.

"Our role in Hamilton is, we are an economic engine. We drive employment, we drive growth, we generate jobs, we increase taxation, and we are an area that Hamilton has designated for employment growth with adjacent lands around the airport.

"It all comes down to the economic impact and the direct and indirect jobs, and all the other ancillary benefits that are derived from that."

As the airport moves forward, there is a fair measure of excitement. Passenger volumes in 2018 are trending upward at a pace similar to last year, and additional ULCCs could push them even higher.

"We just want to continue building on the momentum and the successes that we saw last year," said Puckering.

"We're committed to delivering an easy and a convenient experience for all of our customers, whether they be passenger or cargo, and enabling the movement of goods and people through our region and beyond."

SKIESMAG.COM

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@proifr.com.

Sharpen your IFR skills

Test your instrument flight rules (IFR) proficiency and sharpen your piloting skills with this exclusive *Skies* feature!

Examine the following approach plate and take your best shot at the accompanying questions—answers can be found at **www.skiesmag.com/iq**.

KITCHENER WATERLOO (CYKF) RNAV GNSS RWY 08 APPROACH

1. Which approach offers the best chance of achieving the required visual reference for landing at CYKF?

2. My GPS is not WAAS-equipped. May I fly the LPV approach?

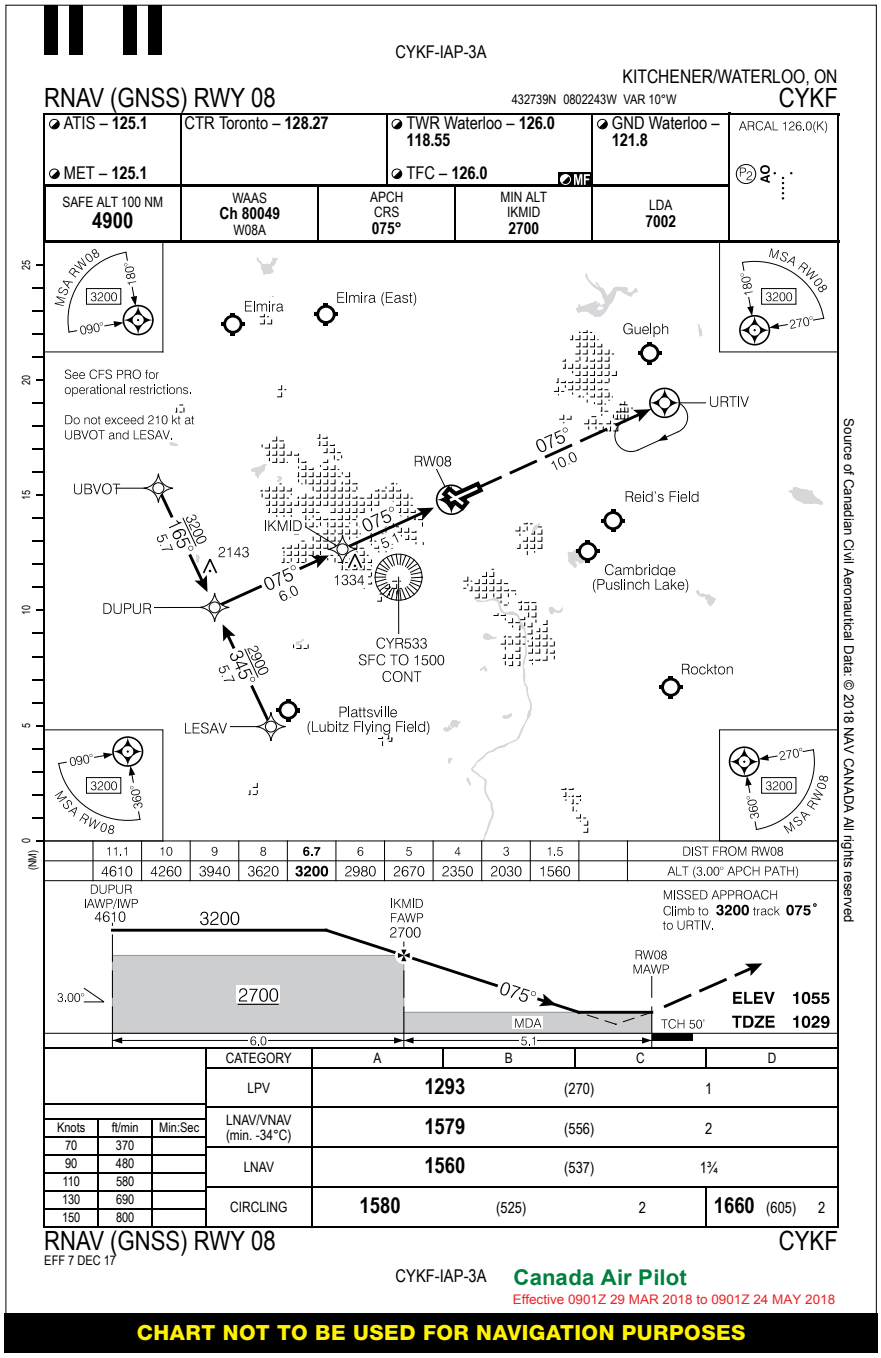
3. Which waypoints within the procedure are fly-over waypoints?

4. If doing the LNAV procedure, what minimum ceiling and visibility are needed to establish the required visual reference when landing on RWY 08?

5. If flying the LNAV approach via a CDFA (continuous descent final approach) from 3,200 feet ASL, when should the descent be initiated?

6. Relative to the above, what would be the sink rate requirement if your groundspeed on the approach is 100 knots?

7. What would be your course of action upon arrival over the clearance limit, without further clearance in the event of a missed approach?



Column

FACES OF FLIGHT
BY LISA GORDON

Pete Loeffler Photo

Meet **Cristalle Fairbank**

Air Spray's first female heavy air tanker captain

Sometimes a chance encounter is all it takes to put your life on a completely different path.

When Cristalle Fairbank was a linguistics student at Simon Fraser University, she worked a seasonal job tree planting in the B.C. interior, where exposure to helicopters sparked her interest in aviation.

The experience led her to consider a career in forestry and aviation, but with the high cost of helicopter training, she elected to pursue her fixed-wing private pilot's licence in 2004 at High Alpine Aviation in Castlegar, B.C.

While she was training, Fairbank took a line crew job at the airport. She was primarily responsible for fuelling Air Spray's heavy Lockheed L-188 Electra air tankers and fire suppression aircraft.

"I continually requested ride-alongs, but was denied. Perhaps I'm stubborn," Fairbank, now 39, told *Skies*. "It seemed to be the perfect job. You could fly an airplane intimately—there's no auto pilot, you are close to the environment, and ultimately, you have purpose."

Her experience in Castlegar prompted her to go "all in" by securing loans and moving to Victoria, where she fast tracked her commercial licence in 2005 at the Victoria Flying Club. That was followed by an instrument rating at Pro IFR, located at the Boundary Bay Airport, in Delta, B.C.

"When I finished flight training, there was little to no movement for employment in the aviation industry. I moved out to Winnipeg and worked as a cargo person and dispatcher at Perimeter Aviation."

In her seven years at Perimeter, Fairbank logged hundreds of hours flying medevacs on the Fairchild Metro.

She got her big break in 2012, when she was hired by Air Spray as an Alberta-based bird dog captain in the Turbo Commander 690.

"It was amazing. There was quite a steep learning curve because I went from flying mostly IFR from A to B, to a completely different and dynamic environment," she said.

"The first fire that I bird-dogged was a grass fire that had taken off and was heading towards a farmhouse. It was gusting 35 knots and there were several tankers stacked overhead. It was busy. The bird dog crew consists of the pilot and air attack officer, and as a team they are responsible for coordinating all the aircraft working on a fire."

> "I LOVE THIS TYPE OF FLYING—WE HAND FLY EVERYTHING. THE JOB IS UNPREDICTABLE; WE TRAVEL AND GET TO SEE SOME AMAZING PARTS OF THE PROVINCE."

Her two seasons in the bird dog role reinforced a lot of important skills: how to stay focused on the task at hand, how to multi-task with the radios, and how to communicate and maintain a heightened situational awareness in a demanding environment.

In 2015, Air Spray offered her a first officer job on the Electra, the big four-engine air tanker capable of cruising at 330 knots while carrying 3,000 U.S. gallons of fire retardant.

Fairbank and her spouse, Rob, along with their son, Richie, have spent the past five summers in various tanker bases throughout Alberta and B.C., where pilots stand by to respond to a fire at a moment's notice.

Flying the Electra is every bit as exciting as she dreamed it would be during her days fuelling the aircraft in Castlegar.

"I love this type of flying—we hand fly everything. The job is unpredictable; we travel and get to see some amazing parts of the province."

The late 1950s-era, turbine-powered Electras have been modified from their original passenger and cargo configuration to suit aerial fire suppression.

"They are state-of-the-art technology for 1959," she said. "We operate without pressurization, the whole interior has been stripped out and an exterior retardant tank is mounted to the belly."

For someone who says she "bounced around not always knowing what direction to take," Fairbank is thrilled to have landed at Air Spray.

With about 500 hours on the Electra and 4,500 hours total, she was recently promoted as Air Spray's first female heavy air tanker captain.

The 2018 season is her qualifying season, so she will be co-captaining—swapping legs with a company training captain while building up her experience level.

"This is where I wanted to be, and I'm happy to be here. I am always learning, being challenged, and it's always evolving. With new technology coming in at some point, there will be a new fleet of tankers and I'd like to be a part of that, too."

While dedication and talent have taken her far, she readily credits a great support network as a critical factor influencing the success of her career.

Rob and Richie, now four years old, have managed to travel with Fairbank for most of every summer fire season.

"We are fortunate that we've been able to make it work so far," she said. "We take it year by year."

As Air Spray's only female pilot, Fairbank would love to see more women in the aerial firefighting industry.

"Stick with it, if it's what you want to do. Dreams are attainable. I've had a lot of great mentors who helped me get here, both male and female."

And even though part of her wishes she'd pursued aviation earlier in life, Fairbank is thankful she didn't take just any job.

"Keep looking for what you really want to do—don't settle. It's been quite the adventure getting here and I'm looking forward to what is ahead."