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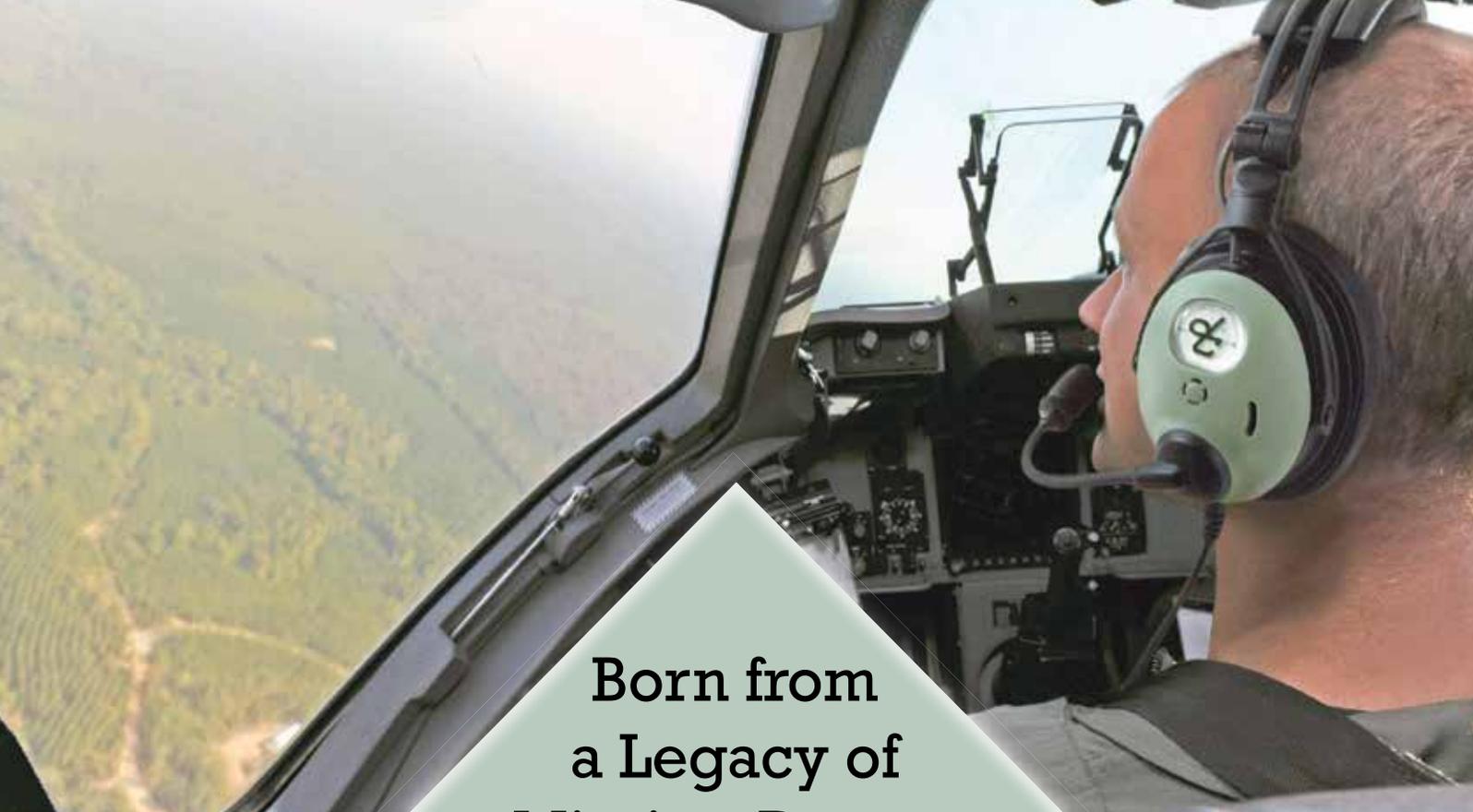
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IN THIS ISSUE

**DEC 2019/
JAN 2020**
VOLUME 9,
ISSUE 6

30



28

A PERFECT PAIRING

The largest Canadian-designed and -built jet aircraft is about to start work at Canada's largest airline.

By Frederick K. Larkin

30

MAX DISRUPTION

The three Canadian airlines operating the Boeing 737 Max have learned to be nimble, constantly adjusting schedules and business plans to accommodate the aircraft's worldwide grounding.

By Kenneth I. Swartz

+ IN EVERY ISSUE



From the Editor **6**



In the Jumpseat **8**



View from the Hill **10**



Focal Points **12**



ON THE COVER

Photographer Simon Blakesley is our **2019 Skies Photo Contest Grand Prize Winner!** He caught this Alkan Air Cessna 208 Caravan departing Schwatka Lake, Yukon, at sunrise on a beautiful golden morning.



Find this issue's bonus content at SKIESMAG.COM/ISSUES

38

A VERY TECHNICAL BUSINESS

Experienced pilots from around the globe descend on International Test Pilots School in London, Ont., to learn the specialized mechanics of flight testing.

By Robert Erdos



50

THIS SIMULATOR BURNS JET FUEL

Skies test pilot Rob Erdos flew the Pilatus PC-21 military trainer, discovering that it combines the best aspects of aircraft and simulator to deliver a unique training capability.

By Robert Erdos

124

DIGITAL BONUS | DARK HORSE

In a fighter procurement program that will be evaluated on capability, cost and economic return to Canada, Saab firmly believes it has a compelling offer to make.

By Chris Thatcher

60

2019 SKIES PHOTO CONTEST

Photographers, you came through for us once again. We're excited to present the winners of our 6th annual photo contest!

80 + SEE OUR BONUS HONOURABLE MENTIONS



130

DIGITAL BONUS | CULTIVATING ORGANIC GROWTH

True to its name, Spectrum Airways offers a broad range of flight training services – with the added bonus of an onsite approved maintenance organization, Kovachik Aircraft Services.

By Lisa Gordon

138

DIGITAL BONUS | AGFT: FROM THE GROUND UP

Aviation Ground Fueling Technologies' expertise and focus on the aviation sector have helped the company carve a name for itself within the industry.

By Robert Williamson



Briefing Room **14**



Marketplace **142**



In the Circuit **146**



Instrument IQ **147**



Faces of Flight **148**

WHAT'S ONLINE?

**DEC 2019/
JAN 2020**

VOLUME 9,
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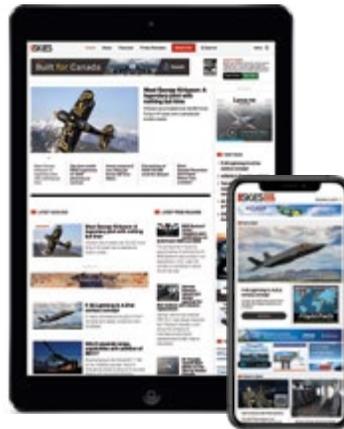
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SOCIAL SNAP



With pilot John Aitken at the controls, Supermarine Spitfire Mk XVI of Vintage Wings of Canada turns final for landing at Gatineau after an early autumn formation flight. Spitfire SL721 has since been sold and now resides in Belgium. **Peter Handley/Vintage Wings of Canada Photo**

Have a great photo to share? We want to see it! Post your amazing aviation photography to facebook.com/skiesmag or tag it with #skiesmag on Instagram for a chance to be featured here!

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COLUMN

From the Editor

BY LISA GORDON

Seeing is believing

I was at a tradeshow recently when someone asked me to describe what makes *Skies* different. After eight years of working on this magazine, several things sprang to mind:

- 1. We are invested.** At *Skies*, aviation is truly our passion. We don't work on any other magazines. This is all we do – every day. So, when our 60,000+ subscribers get their copy of the magazine, whether electronically or via Canada Post, they can be assured it was produced by a team that truly cares about this industry and our collective future.
- 2. We believe quality is still king.** We invest in our product by hiring top industry journalists, travelling to get the story, spending more on our photography and paper stock, and assembling a production “dream team” that knows how to hit a home run.
- 3. Reliability is our creed.** We deliver the news you need to know – on time, every business day. Some of you who get our *Skies Daily News* e-newsletter have told us you love being able to scan the day's top stories at a glance, clicking on what is pertinent to your business. And our print editions come out on time, every time – ensuring maximum shelf life for both editorial and advertising.
- 4. We value partnerships.** Whether you are one of our 200+ respected advertisers or a business contact sending us a news tip, we couldn't cover this industry without you.
- 5. We are proudly Canadian.** *Skies* was created to celebrate the accomplishments of Canadian aviation and aerospace. Together, we are an economic powerhouse: Aerospace alone contributed more than \$25 billion in GDP and 213,000 jobs to the Canadian economy in 2018. There is no shortage of innovative, engaging stories to tell and we are excited to share them!

I could have said all of these things at that tradeshow, but you know the old maxim: “Seeing is believing but feeling is the truth.” It's easier to just hand over a copy of the magazine and say we like to let our work speak for itself.

Along those same lines, our 2019 Skies Photo Contest features images from several awesome photographers whose work clearly speaks of their own passion for aviation.

A big congratulations goes to Simon Blakesley, who takes home our Grand Prize of \$750 as well as being featured on our cover! Whenever I need a northern aviation shot, Simon's photography folder is one of the first places I check. His work captures the special relationship between aviation and the North, where an aircraft is truly a lifeline to residents of isolated communities.

The first, second and third place winners in each of our three categories (General Aviation, Commercial and Military) take home \$500, \$250 and \$125 prizes, respectively. Turn to page 60 to see their fantastic work, and don't forget to check out our digital edition where we've included lots of honourable mentions.

Thank you to all the photographers who sent in more than 1,200 photos for our 6th annual photo contest. The judging process was no easy task. Of course, we'd also like to thank our contest sponsors who make it all possible: Columbia Aircraft Sales Inc.; Daher; FlightPath International; Innotech-Execaire; Levaero Aviation Group; Lockheed Martin Canada and Universal Avionics.

Along with all of those photos, we've also managed to squeeze in some top-notch editorial. Check out Ted Larkin's story on Air Canada and the Airbus A220; Ken Swartz's piece on the 737 Max and how Canadian operators are coping with its grounding; and a couple of epic adventures from test pilot Rob Erdos. We sent him to check out International Test Pilots School in London, Ont.; and then to Switzerland, where he got behind the controls of the Pilatus PC-21 military trainer, which made its North American debut at the Saskatchewan Air Show in July.

As we close off 2019, the *Skies* team would like to wish our readers a very Merry Christmas and blue skies for the New Year. Thank you for your support! 🇨🇦

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

“Our 2019 Skies Photo Contest features images from several awesome photographers whose work clearly speaks of their own passion for aviation.”



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COLUMN

In the Jumpseat

BY MIKE REYNO

Pursuing the shot

By the end of September, I had flown in well over 100 different aircraft types.

I have been fortunate to travel all over Canada (to some places that many people have never heard of) and have met hundreds of interesting folks with a story to tell.

And I've done all this with a camera in my hand.

What began for me as a childhood dream grew into a profession that is somewhat unique when you consider the available career fields. When most people think of aviation photography, they think of it as a hobby rather than a career. However, there are a few dozen aviation photographers around the world who have managed to turn their love for aviation and photography into a career. Still, the playing field is tiny when compared to other areas of photography.

For me, aviation photography was just the beginning of a career that morphed into becoming the co-owner and publisher (with my wife, Linda) of the largest aviation publishing company – six titles at last count – in Canada. It was all fuelled by a camera and a passion for aviation.

Publishing duties took over, and soon I wasn't able to do as many photo shoots. That's why I love the chance to get out of the office and up in the air for the odd photo flight to remain current, as I did for this issue when I flew with the International Test Pilots School in London, Ont.

But, most of the time, I only get to admire the aviation photography that appears on my screen, taken by some very talented photographers from across Canada. There are the "seasoned" veteran photographers, like Eric Dumigan and Heath Moffatt, whose images have graced the pages of *Skies* since the magazine started.

But there are some new up-and-comers, too, like Krystal Wilson who is starting to make a name for herself in the world of aviation photography. A talented young lady, Krystal had her first image published in *Skies* earlier this year. Her photo of the 2019 Canadian Armed Forces CF-18 Demo Hornet bathed in the glow of the aurora borealis in Cold Lake, Alta., was used on a poster that was given to tens of thousands of people at airshows across Canada. It was spectacular.

Admittedly, it is tough to make a career in the world of aviation photography. For the most part, people don't put much value

on aviation photos. Wedding photographers get paid more than aviation photographers! And that is despite the inherent risks that come with photographing airborne aircraft in close formation. I should know, as I was involved in a mid-air collision in 2001 at the end of an air-to-air photo shoot. It can be dangerous. But a good photographer will do what they can to mitigate risk.

How many times have you taxied out in a plane and saw someone standing on the other side of the runway, beyond the fence, with a camera in hand? They are there to get that one shot! Our magazines have been lucky to receive many of those shots.

But then, there are an incredible few that stand out from the rest. Accomplished photographer John Chung is a great example. He has a reputation for taking close-up photos of aircraft on final at Toronto's Pearson Airport. One of those pictures of an Air Canada Boeing 787 Dreamliner placed in this year's photo contest.

This edition of *Skies* is my favourite issue of the year because we get to highlight some of Canada's top aviation photographers and newcomers, too.

This year's Grand Prize recipient, Simon Blakesley, took the winning image of an Alkan Air Cessna 208 Caravan lifting off from Schwatka Lake, Yukon. He has developed a reputation for taking stunning photos of aircraft in

Canada's North, which have appeared in *Skies* in the past.

The voting process was particularly difficult for this year's photo contest. We received hundreds of images from all over Canada, but now the results are in! Turn to page 60 to check out this year's winners. The list includes a few familiar names and a few new ones, too.

You can visit skiesmag.com/issues to see all of the honourable mentions that we couldn't include in the print edition of *Skies*.

Thank you to all the die-hard aviation photographers who took the time to submit their photos for this year's contest. I continue to be amazed by the number of talented photographers that Canada has to offer. 🇨🇦

Mike Reyno is the co-owner and co-publisher of Kitchener, Ont.-based MHM Publishing, Canada's largest all-aviation publisher and industry news source.

“It's tough to make a career in the world of aviation photography. Wedding photographers get paid more than aviation photographers!”



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COLUMN

View from the Hill

BY KEN POLE

More low-hanging fruit: Picking off business aviation

As we transition into the year 2020, there's an evident lack of 2020 vision when it comes to business aviation. In fact, some ostensibly well-intentioned plans on both sides of the Atlantic are extremely short-sighted – at least for the time being.

On this side, I've previously written about bizav being targeted by a couple of Canada Revenue Agency tax proposals, which didn't seem to consider the broader implications of higher costs to the industry. Across the pond, a ban on fossil-fuelled corporate aircraft in British airspace is mooted by the Labour Party.

The fact that some politicians are buying into the latter is worrisome – especially if the idea found traction over here.

There's no shortage of bizav targets such as James Dyson, the inventor/entrepreneur who keeps coming up with new vacuum technologies to suck our wallets dry, and who has a Gulfstream G650. Formula One champion Lewis Hamilton has a Bombardier Challenger 605 (good for him!).

As for U.K. Labour, its case is built on a report by Common Wealth, a London think-tank that collaborated with A Free Ride, which investigates private jets' climate impact, and Green Gumption, an "independent sustainability agency."

Their report – *Jet, Set, Go: The case for electric-only UK private jet flights from 2025* – states, among other things, that private jet traffic between the U.K. and the rest of Europe in 2018 accounted for six per cent of all U.K. air traffic. "Climate crisis is driven by the wealthiest in our society," they said.

They also contend that putting pressure on those who use private jets and "tend to have access to private capital" would accelerate electric aviation development. "This would help create green jobs and cement U.K. industry leadership in electric flight."

Labour's transport frontman, Andy McDonald, used social media to reiterate that the wealthy do "profound damage to the climate and it's the rest of us who'll suffer the consequences." Hence, "a phase-out date for the use of fossil fuel private jets is a sensible proposal."

Nonsense, frankly. Energy generation, batteries and other technologies in aviation continue to evolve, but it'll take a major technological breakthrough for electric propulsion to be universally practicable.

It's destined for now to be a short-haul option; one being explored, again, on both sides of the Atlantic. As I write this, Harbour Air in B.C. is on the verge of a first flight by one of its de Havilland Canada DHC-2 Beavers, repowered with a 750-horsepower electric motor. Over in the U.K., the government recently

agreed to cover half the £18 million cost of converting a twin-engine Britten-Norman Islander to a hybrid system. Each project holds promise.

Still, overzealous critics target bizav, which accounts for two per cent of aviation's overall output – which in turn equates to a little over two per cent of global emissions.

Compare that with the cement industry's eight per cent! And Anthony Norejko, president of the Canadian Business Aviation Association (CBAA), told me that aviation's critics should "call us when the cruise ship industry gets its house in order."

He also said that as "low-cost carriers . . . nickel-and-dime every little aspect" in growing their market, their tendency to operate older aircraft means higher emissions. That begs the question of how many climate critics avail themselves of cheap travel.

"Aviation is the low-hanging fruit," Norejko agreed.

Commercial and business aviation continue to invest in efficiency. Composites, turbine technology and winglets, as well as satellite-based avionics for more efficient route planning, all have helped business aviation to reduce its environmental footprint by 40 per cent since about 1980. Sustainable fuels also are a positive trend.

It might be suggested that Canada will never take up U.K. Labour's idea. There's the fact that Prime Minister Justin Trudeau and the Liberals saw their 2015 majority reduced to a minority in

2019. They need the New Democratic Party and/or the Bloc Québécois to remain in power.

Before the 43rd Parliament began sitting Dec. 5, Trudeau met with NDP leader Jagmeet Singh.

"We have a number of shared priorities, things like fighting climate change," the PM said, quickly adding that economic growth is another common goal.

So, it's unlikely, given their parliamentary vulnerability, that the Liberals will emulate U.K. Labour. Neither the NDP (traditionally allied with our labour movement) nor the Bloc (aerospace is huge in Montreal) would support an idea which would mean inevitable job losses.

However, never say never in politics, given its practitioners' tendency to pander to the squeaky wheels among us. ❧

"As we transition into the year 2020, there's an evident lack of 2020 vision when it comes to business aviation."

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.

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COLUMN

Focal Points

BY TONY KERN

The infinite battle

There is an ongoing battle we all fight between who we are and who we are becoming. Oddly, most people don't even know they are in it – and are therefore losing.

It's not a battle we choose; it's a battle we are in. Whether we realize it or not, every experience we have shapes us in some way. Some for the better, some for the worse. Unexamined experience is lost opportunity at its best, and self-defeating retrograde of our abilities, discipline, professionalism, and even safety at the other end of the spectrum.

The purpose of this short column is to provide a wake-up call. So, let's get started with the first rule of battle.

Rule 1. *Know you are in the fight.* There is a story about a tired old Greek Stoic who is approached by his young student and asked, "What will cause the fall of Athens? Will it be ignorance, apathy, or isolation?" The tired old man looks up through wine-clouded eyes and replies, "I don't know. I don't care. Leave me alone." A clever tale, and one that could apply equally well to many of us in our industry. Perhaps even *specifically* in our industry. Here's why. Aviation has high standards, and we pride ourselves on "maintaining currency and proficiency to standards." But that belies the fact that human performance and ability is never static. Which leads us to Rule 2.

Rule 2. *You are either getting better, or you are getting worse.* Our performance is a lifelong dynamic event. No one really "maintains proficiency to standards." There may be a point of momentary stasis when we switch from worse to better or better to worse, but the point is that if you are not intentionally getting better, you are at risk of declining performance below the standards, even as you grow more experienced. In fact, unexamined experience is one of the leading causes of performance drift into bad habits, and sometimes even dangerous ones.

ENGAGING IN THE BATTLE

See Rule 1, then take stock of where you are. Take an hour of solitude to think through what you perceive to be your strengths and weaknesses. Make a list. Keep it with you. Then add to it over the next week or two. Now, you will have some idea where you are on the field of battle.

The next step is to begin to consciously address both sides of your performance. Bolster your strengths and have the courage to honestly admit and address your weaknesses. In Carlos Castaneda's book *Tales of Power*, he encounters a Yaqui Indian shaman who tells him: "The true warrior wakes up every morning and asks, 'Who is my enemy today?'"

It's a very nice metaphor for developing the life skill of proactively addressing our weaknesses. The infinite battle has one consistent objective, which is truly the condition of victory, which leads us to Rule 3.

Rule 3. *Stay in the fight.* The infinite battle is won or lost around a single word: persistence. Over time, we will learn what works for us and become increasingly more effective – we will get better at getting better. Somewhere along the way, the enemy of apathy will rear its head,

and tell us for the thousandth time that we are good enough. Don't let it. We win the infinite battle with Rule 3. Author and educator Sally Kempton tells us that, "It's hard to fight an enemy that has outposts in your head." Hard yes, but not impossible once these "inside enemies" are known and identified.

The infinite battle is more than a metaphor for human performance. We know this from the statistics that tell us the vast majority of on-duty and off-duty failures, accidents, and fatalities are the result of personal error.

It's time to take the fight personally – it's the only way we can win. You are already on the battlefield. Time to engage. 🚩

"The infinite battle is won or lost around a single word: persistence."

Tony Kern is one of the world's leading authorities on human factors in aviation. A former lieutenant colonel in the U.S. Air Force (USAF), he served as chief of the USAF Human Factors Steering Group and has authored eight books on professionalism inside and outside of aviation.



SKIES DAILY NEWS TOP 10

Here's a recap of our 10 most popular online stories since our last print edition was published.

1 AIRBUS SEEING 'MOMENTUM' ON A220
Airbus continues to produce the A220 at its plant in Mirabel, Que., despite opening a new line in Mobile, Ala. [▶ READ MORE](#)

2 AIRBUS EXEC OUTLINES A220 PROGRAM GOALS
Airbus Canada's CEO confirmed production targets and reiterated a need for cost-cutting at the AIAC Summit. [▶ READ MORE](#)

3 PILATUS UNVEILS THE PC-12 NGX
The latest model of Pilatus' popular single-engine turboprop features a new engine and avionics suite. [▶ READ MORE](#)

4 BRITISH AIRWAYS INTRODUCES A350
The carrier has deployed the Airbus A350-1000 on a transatlantic run, hoping to attract business travellers. [▶ READ MORE](#)

5 ERRATIC FLIGHT PATH
The plan to select Canada's next fighter has been complicated by politics and corporate marketing. [▶ READ MORE](#)

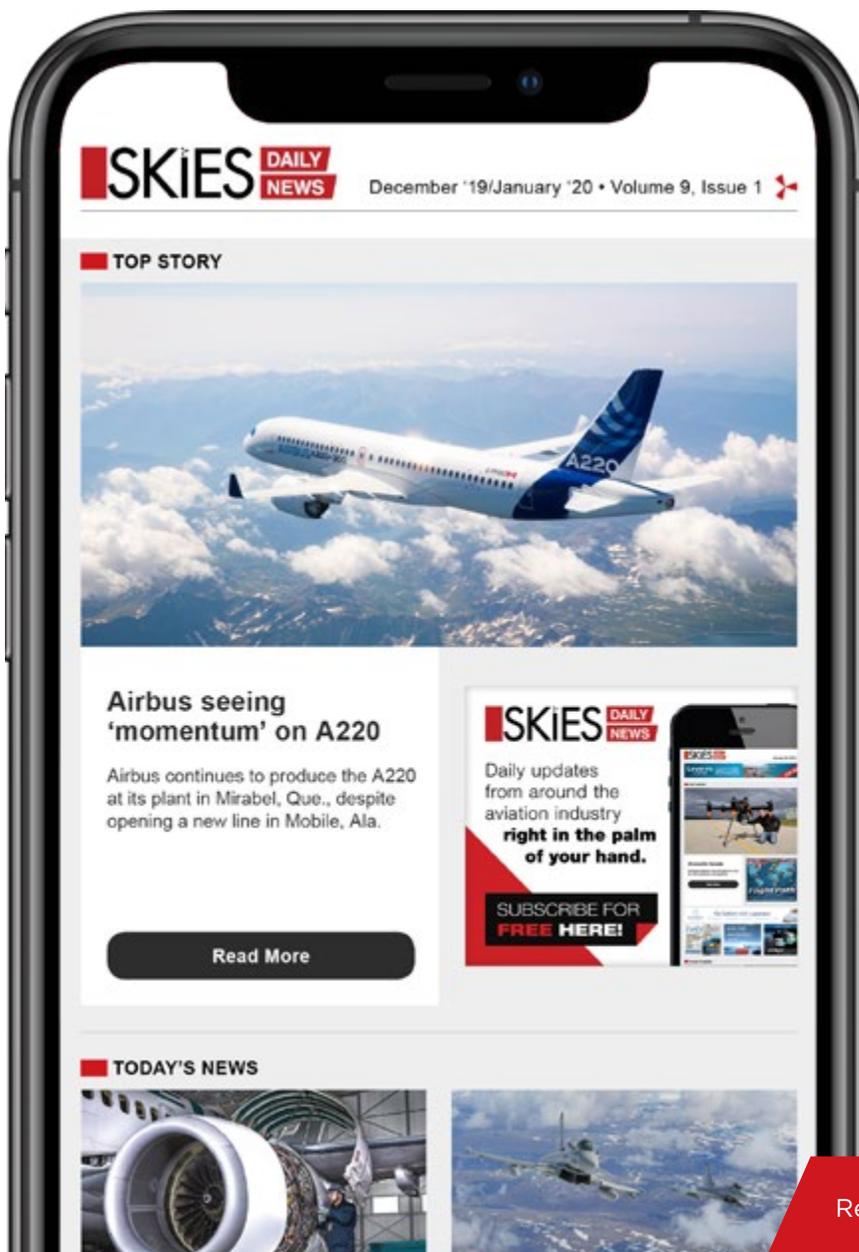
6 SNOWBIRD CRASH IN ATLANTA
A member of the Snowbirds was forced to eject before the team's appearance at the Atlanta Air Show. [▶ READ MORE](#)

7 TOP ACES WINS PIECE OF USAF ADVERSARY AIR TRAINING CONTRACT
The Canadian company was one of seven selected to participate in the U.S. Air Force Combat Air Force Contracted Air Support contract. [▶ READ MORE](#)

8 QUEEN LIZ: BEHIND THE SCENES ON BRITAIN'S NEWEST AIRCRAFT CARRIER
The Royal Navy prepares for the operational deployment of F-35B Lightning II fighter jets. [▶ READ MORE](#)

9 ALBERTA'S NATALIE ESSER BECOMES FIRST WOMAN TO QUALIFY AT HIGH SIERRA STOL DRAG RACES
Esser took home US\$2,000 in winnings for being fastest woman on course during the High Sierra Fly-in. [▶ READ MORE](#)

10 AVIONICS UPGRADE SLATED FOR ICONIC AERIAL FIREFIGHTERS
Viking Air is working on a state-of-the-art cockpit upgrade for the Canadair CL-215T and CL-415. [▶ READ MORE](#)



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ALSO

Launched

CAE, Jazz and Seneca announce training partnership

PLUS

Delayed?

CC-295 training manuals not yet ready; delivery is impacted

BRIEFING ROOM

AVIATION INDUSTRY NEWS



De Havilland contemplates stretched, shrunken Dash 8-400

OEM says it will perform market demand assessments to gauge operator needs, with new sales a priority.

► BRENT JANG | OEM NEWS

De Havilland Aircraft of Canada Ltd. is considering variations on a theme for its Dash 8-400 aircraft, gauging interest

for a shrunken version of the turboprop and pondering a stretched design.

"We've been starting initial discussions on possible variants of the aircraft," said Todd Young, De Havilland's chief

operating officer. "This would be a shorter aircraft in the range of 50 to 60 seats.

That would be a possible replacement to the original Dash 8-300, albeit based on a Dash 8-400 configuration."



In 2012, WestJet Airlines Ltd. chose the Bombardier Q400 for its regional Encore service. Bombardier produced the Q400 from 1997 until it sold the program to Longview Aviation Capital in mid-2019. The aircraft is now called the Dash 8-400 under the De Havilland Aircraft of Canada banner. **Eric Dumigan Photo**

During a phone interview, he said De Havilland is well positioned to prosper under the ownership of Victoria-based Longview Aviation Capital Corp., which acquired the Dash 8 program from Montreal-based Bombardier Inc., effective June 1, 2019.

“We’ve also started to look at the possibility of stretching the aircraft and making a 100-seat turboprop, though that is further away. But as part of the original design of the Dash 8-400, which I was part of, we had these two potential variants in mind,” said Young, the former general manager of the Q Series program at Bombardier.

De Havilland will be conducting market demand assessments for a shrunken version, including holding talks with prospective customers about potential changes to the Dash 8-400, formerly known as the Q400 under Bombardier.

“We’re starting to have the right discussions about what could be the future of this product platform,” said Young. He worked at Bombardier when WestJet Airlines Ltd. chose the Q400 over the French-Italian rival ATR 72-600 turboprop in 2012 for the Calgary-based airline’s regional Encore service.

WestJet’s workhorse continues to be Boeing 737s, but the smaller Q400s allow Encore to do short-haul flights to smaller markets considered uneconomical for the narrow-body 737s.

Bombardier produced the Q400 from 1997 until it sold the program to Longview in mid-2019.

Longview chairman David Curtis said his focus is on maintaining growth in Canadian aerospace.

“We are doing that by first ensuring that De Havilland’s existing customers and orders are addressed in a seamless fashion. And we are also seeking market opportunities around the world, leading to new Dash 8-400 sales,” he said in an email. “These aircraft have enormous versatility, and we believe there is a bright future.”

New sales are a priority at De Havilland, added Curtis, who is also president of a Longview division, Viking Air Ltd., which makes the Series 400 Twin Otter.

Young said 82 seats is the “sweet spot” for the existing Dash 8-400. That’s a higher capacity than the 78 seats considered to be the ideal number five years ago.

“We wake up every day and all we think about are Dash 8s,” he said. “That’s not a negative against Bombardier. Bombardier had a lot of things that they were focusing on. Now is a real good opportunity for us to look at our product lines and see where the markets are shifting and how we can adjust our products lines to suit the market demands for the future.”

Young also said De Havilland is marketing the existing fuselage structure to have a new 50-seat configuration with business class, premium and coach (with seat pitches of 38 inches, 36 inches and 32 inches, respectively).

Bombardier previously sold Q400s with as few as 58 seats and as many as 90 seats in the passenger configuration. Using a

cargo/passenger combination, the Q400 had 50 seats.

Young doesn’t have plans to revive manufacturing of the 100, 200 and 300 series of smaller Dash 8 planes, but believes the 400 has the potential to keep the Downsview assembly plant in Toronto busy for years to come.

De Havilland’s customer base exceeds 65 owners and operators of the Dash 8-400.

In a slide presentation, Young and his colleague, De Havilland sales vice-president Philippe Poutissou, summed up their marketing pitch for the Dash 8-400: “Turboprop economics with jet-like performance.”

In October, De Havilland announced that it signed a pact with the Tanzania government’s flight agency to acquire a Dash 8-400 in a 78-seat, two-lavatory configuration, marking the first firm deal for the aircraft under Longview’s ownership. The agency will lease the aircraft to the country’s flag carrier, Air Tanzania, whose slogan is “The Wings of Kilimanjaro.”

Air Tanzania chief executive officer Ladislaus Matindi said there are already three of the planes in service at the African carrier, which also ordered one other of the turboprops previously. When the latest firm deal is delivered, Air Tanzania will have five Dash 8-400s in its fleet.

“We are very satisfied with the Dash 8-400 aircraft’s low operating costs and reliable operations in our high-utilization environment,” said Matindi in a statement. ✦

CAE upgrades NFTC trainers

CAE has completed major upgrades to the CT-156 Harvard (T-6) and CT-155 Hawk flight training devices (FTDs) used as part of the NATO Flying Training in Canada (NFTC) program at 15 Wing Moose Jaw, Sask.

The upgrades were done on three CT-156 Harvard FTDs and one CT-155 Hawk FTD that are used extensively for ground-based training elements of the NFTC pilot training syllabus. CAE replaced computing hardware on the simulators, added new visual display systems, updated the instructor operator stations, and upgraded the image generators to the latest CAE Medallion series. CAE will now begin upgrading the CT-155 Hawk FTD located at 4 Wing Cold Lake, Alta., which is used as part of phase IV fighter lead-in training under the NFTC program.

The effectiveness of the upgraded CT-156 Harvard and CT-155 Hawk FTDs is already benefiting student pilots. The new visual systems provide more realism in the

synthetic environment and have enabled training tasks such as formation flying and tactical scenarios to be rehearsed in the simulators, thus enhancing the efficiency of performing these tasks during live flying training.

As the prime contractor for the NFTC program, CAE operates the NFTC base facilities, delivers the groundschool classroom and simulator training, and supports the live flying training on a fleet of Beechcraft T-6 (CT-156 Harvard) and BAE Systems Hawk (CT-155 Hawk) aircraft.

CAE operates the NFTC program out of 15 Wing Moose Jaw and 4 Wing Cold Lake, and the program is designed and delivered in co-operation with the Government of Canada to support pilot training for the Royal Canadian Air Force and allied militaries. The NFTC program combines basic, advanced and lead-in fighter training as part of the comprehensive military pilot training program. ✦

CAE has performed major upgrades on CT-156 Harvard (shown here) and CT-155 Hawk flight training devices used as part of the NATO Flying Training in Canada (NFTC) pilot training program. **CAE Photo**



Avmax acquires 2 new Viking Series 400 Twin Otters

The transaction marks Viking's first sale to a Canadian operator, although the aircraft will be working on contract in Africa.

◀ KEN POLE | OPERATOR NEWS

Having just taken delivery of the first two new Viking Air Ltd. Series 400 Twin Otters to be purchased by a Canadian operator, Calgary-based Avmax Group Inc. is wasting no time sending the aircraft on a marathon transatlantic ferry route via the Azores to the Republic of Chad in north-central Africa.

Beginning Jan. 1, under contract to the China National Petroleum Corp. (CNPC), the two new aircraft will transport CNPC personnel between the capital city of N'Djamena and operations in southern Chad. They will replace two legacy de Havilland DHC-6 Twin Otters.

Viking acquired the type certificate for the DHC-6 and six other de Havilland aircraft in 2006 and has since built well over 100 of the next-generation Twin Otters. They have been delivered into a global market where operators have long since come to appreciate the performance, reliability and capacity of the rugged high-wing turboprop with its short takeoff and landing capabilities. A total of 844 of the "legacy" models were delivered.

The Series 400 picks up where the de Havilland models left off, featuring upgraded Pratt & Whitney PT6A-34 turbines, a Honeywell Primus Apex digital avionics suite, and hundreds of other modifications that improve upon the originals.

Avmax has an extensive fleet that includes large jets (various Boeings and an all-first-class seating Airbus A340 which is leased out for executive charters) and an extensive inventory of Bombardier CRJs and de Havilland Dash 8 turboprops. The company unveiled its two newest acquisitions, serial numbers 978 and 981, at its Calgary International Airport facility on Nov. 26, just five days after they were flown in from Viking's delivery centre in Victoria, B.C.

"This multi-million-dollar deal is an excellent example of two Western Canadian companies reaching globally to strengthen aviation," Avmax chief executive officer Mark Maydaniuk said in a statement. "This deal was possible due to Avmax's strong collaborative relationships . . . local and worldwide, including China and Chad."

Robert Mauracher, Viking's executive vice-president for Sales and Marketing, added that he was "extremely pleased that a world-class Canadian company like Avmax,



David Curtis, president and CEO of Viking Air, left, and Professor He Qinghua, chairman of Avmax parent company Sunward, christened the aircraft for good luck. The two Twin Otters will soon be departing for contractual work in Chad. Avmax Photo

with their extensive aircraft portfolio and operational expertise, has selected the Twin Otter for their operational needs." He also pointed out that "more and more operators around the world are recognizing the unique capabilities and versatility of the Series 400."

Avmax chief commercial officer Al Young, who earned his commercial pilot's ticket while serving in the Royal Canadian Air Force as an engine technician on the Lockheed Martin CP-140 Aurora surveillance platform, told *Skies* that the two "legacy" aircraft in Chad were bought by Avmax from Canadian Helicopters in 2012.

He said the Chad contract has been "very good" for Avmax in that each aircraft has been logging approximately 600 hours annually, providing dedicated charter service on a fairly regular schedule.

"Our Chad operations originally started with Exxon and CNPC. We were operating two Dash 8s and two Twin Otters and while we're putting in the two new Twin Otters, we're also putting in two Dash 8s this year as well . . . out of our current fleet."

Fitted with long-range tanks, the Viking Series 400s will be flown to Chad by contract pilots from World Wide Ferry Inc., a company based in Strathmore, 50 kilometres east of Calgary. Mike Boettcher, technical director at Avmax's leasing operation, told *Skies* that World Wide Ferry has decades of experience in delivering Twin Otters.

The delivery will be on a southern great

circle route because these are what Young described as "warm weather" aircraft. "They're not equipped with de-icing and other such luxuries, so we didn't figure it would be a good idea to go across the top."

Asked why Avmax pilots wouldn't be doing the ferry run, he said they are still learning the new aircraft in two-pilot crews and the company also has other operations on the go. "The fact that they have thousands of hours of Twin Otter experience is mostly irrelevant. The 400 is a very different aircraft; it needs retraining to fly and it's different on the maintenance side too, taking about a week." The cockpit training is done at Viking, which has the only Series 400 simulator in the world.

The two "steam gauge" aircraft being replaced have been flown by "fairly high-time" Chadians and pilots from elsewhere in Africa as well as "basically all over the world," but Young said the current cadre doesn't include any Canadians.

Despite their vintage and high hours, the legacy Twin Otters have served Avmax and their previous users well in landlocked Chad's generally very hot and often dusty sub-Saharan operating environment. One, built in 1971, has 32,000 hours on the clock while the newer one, a 1977 model, has even more at 36,000.

When it was suggested that Avmax would like to see the new aircraft accumulate those kinds of hours before they're retired, Young agreed that, "We'd sure like to see that." ✦

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Jazz Approach: A powerful partnership

Three big names in Canadian aviation have partnered to create a new cadet training program that will put students on the fast track to a pilot career.

◉ LISA GORDON | TRAINING NEWS

A new made-in-Canada partnership is aiming to attract adult students to piloting careers, promising to transform them from industry newbie to a first officer at Canada's largest regional carrier in just 20 months.

Announced on Nov. 19 at the Air Transport Association of Canada (ATAC) conference and trade show in Montreal, Jazz Approach is Canada's first cadet pilot training program. Its architects include a trio of Canadian organizations – CAE, Jazz Aviation and Seneca – who have been collectively working on the program's development for some time.

Two things set Jazz Approach apart from any other cadet program currently offered in North America. First, students are issued a conditional letter of employment from Jazz Aviation upon acceptance into the program. Second, each student will conclude their training with a CAE type rating on the Bombardier CRJ200 regional jet.

"It's a new model for North America, really," said Capt Steve Linthwaite, vice-president of Flight Operations at Jazz. "It's common around the world to have these traditional cadet programs where people go from zero time to a type rating on a transport category airplane, but this is new in North America."

The screening process for the program will be robust. Potential students will be evaluated by CAE using the company's proven cadet screening assessment tool, and Jazz will also conduct interviews. The carrier will issue

a conditional offer of employment to each student upon acceptance into the program.

Unlike some other cadet pilot programs, there is no age cap for Jazz Approach applicants. Linthwaite said the airline is hoping to attract people looking for a career change as well as those who are just starting out.

"Maybe someone has always had a dream of being a pilot. This is about making an easy pathway for that person to fulfill their dream."

STRATEGIC COLLABORATION

In an interview at the show, CAE's vice-president of Public Affairs and Communications, H el ene Gagnon, said the Montreal-based simulation technology leader recognized a need for this type of accelerated training program in Canada.

"We wanted to be part of that solution," she said. "It's something we've had in mind for a long time. The collaboration here is a first – this three-way collaboration is a first for CAE. We worked closely with our partners; we trust each other and we work well together. This will create a new pipeline for Canadian pilots."

Gagnon said she hopes the Jazz Approach program will serve as a model for the establishment of other Canadian cadet programs through similar industry partnerships.

"Now that they see there is a new model we can do here in Canada, I think it will spark interest from others. But we want to make sure we partner with organizations that share the values of CAE, share the quality of CAE."

For CAE, Jazz Approach is the first cadet program where initial pilot training will be delivered by a provider other than a CAE training academy.

STARTING SMALL

Lynne McMullen, director of strategic partnerships at Seneca's School of Aviation, said the college is set to welcome its first cohort of six students in April 2020. A second group of the same size will begin in June. The idea is to start small, allowing for the three partners to fine tune the program along the way.

"At Seneca, we deliver a degree program with flight training associated with it," she said. "But we have not yet delivered a program that is strictly IATPL [integrated airline transport pilot licence] training tailored for cadets, for a specific airline."

"For us, it's exciting to have access to the vast experience CAE has with pilot training. They do this type of training for other countries and it's an opportunity for us to broaden our horizons in this partnership."

CAE, Jazz Aviation and Seneca signed a five-year partnership agreement to launch the new program, which is expected to incorporate the latest competency-based training strategies.

"A big part of our training program is scenario-based training and allowing students to progress at their own pace," said McMullen, who will be appointing two flight instructors to work with the first cohort of students.

She told *Skies* that Seneca has been working with Transport Canada to obtain authority to operate as an Approved Training Organization (ATO) as part of the regulator's pilot project. This certification would allow the college to develop cutting-edge competency-based training programs through alternate means of compliance, working with CAE along the way to tap into that company's expertise in simulation.

Linthwaite said scenario-based training has been identified as a crucial factor to student pilots' success.

He added that quality flight training is the differentiator that allows inexperienced candidates to transform into airline pilots in a short period of time. He referenced the military's proven success with this approach.

CAE, Jazz and Seneca also implied that efforts are well underway to establish student financing programs for successful candidates. The offer of employment that is built into the Jazz Approach program is expected to help candidates secure educational loans. ✦



Announcing the new Jazz Approach cadet program at the 2019 Air Transport Association of Canada conference were (L-R) Corey Sly, sales leader, North America, CAE; Steve Linthwaite, vice-president, Flight Operations, Jazz Aviation LP; and Lynne McMullen, director, Strategic Partnerships, Seneca. CAE Photo

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TSB: Industry collaboration, better education key to improving air taxi safety

► OLIVER JOHNSON | SAFETY NEWS

A collaborative effort will be required from all industry stakeholders to address the air taxi sector's accident and fatality rate, Transportation Safety Board of Canada (TSB) chair Kathy Fox told attendees at the Helicopter Association of Canada's annual convention.

Speaking during a presentation at the event, which was held Nov. 14 to 16 in Vancouver, B.C., Fox gave more detail on the TSB's recently released report "Raising the bar on safety: Reducing the risks associated with air taxi operations in Canada."

While commercial aviation has an improving safety record in Canada, aircraft operating in the air taxi segment still represent more than half of all the accidents and fatalities in Canadian commercial aviation.

Among a raft of issues the report identified and recommendations it makes, Fox highlighted the need for industry and the regulator to "raise the bar" for safety to level what she called an "uneven playing field" faced by operators.

During the TSB's investigation, she said it encountered operators who were going above and beyond regulations in terms of adopting safety-enhancing operating practices and measures, or installing new technology, and operators who were doing the bare minimum required.

"When it comes to competing against somebody who hasn't taken those extra steps, who's just doing the bare minimum to get by, they're at an uneven playing field, because they can't offer [a service] at the same price," said Fox.

"We think that by raising the bar for everyone, that will help to level that playing field."

The TSB's investigation looked at the data from 2000 to 2014, during which there were 240 helicopter accidents in the air taxi sector,

and 35 of these were fatal. Unlike with fixed-wing aircraft in the segment, the TSB said there had been no clear decrease in the number of helicopter accidents over time.

From this data, the TSB identified 23 different accident types, nine of which were related to helicopters.

One of these — visual flight rules flight into instrument meteorological conditions resulting in loss of control or controlled flight into terrain — represented 12 per cent of all helicopter-related air taxi accidents, but resulted in the highest proportion of fatalities. Fox noted that, of all the accident types, it involved the most experienced pilots, with an average of 6,800 hours.

The TSB then conducted 125 interviews with operators to find out what they perceived to be their most significant risks, what they were doing to lessen them, and more they believed needs to be done.

From this information, the organization identified 19 safety themes, from infrastructure to fatigue, training, and regulatory oversight. The TSB talked to operators about how they were managing these safety issues, and identified best practices — which Fox encouraged operators to examine.

"What we learned really is that there are two key underlying factors. . . in all accidents that have happened during the study period," said Fox. "One is the acceptance of unsafe operating practices, and the second is inadequate management of operational hazards."

Unsafe practices, she said, included things like pushing the weather, taking off overweight, or not recording defects during a flight in a log.

Operational hazards included the level of operational control, crew pairing, the training an operator provides, or support the management provides personnel.

"We know that operators, by and large, are

striving to operate safely," said Fox. "But any operator can get caught with these two factors over time, unwittingly endorsing unsafe practices or not adequately managing operational risk. . . . What we're really talking about here is a slow incremental drift."

As a result of the investigation, the TSB has added four new recommendations to its 22 existing recommendations that apply to the air taxi sector.

The first is for the Department of Transport to collaborate with industry associations to develop strategies, education products and tools to help air taxi operators and clients eliminate the acceptance of unsafe practices.

The TSB also recommended that industry associations work to actively promote safety management systems and safety cultures among their members, and encourage operators to share data.

Third, the TSB recommended that the Department of Transport review gaps it found during its investigation, and update regulations and standards. For example, Fox said, there is no specialized training required by the regulator for pilots to operate in mountains, and the process that operators must go through in order to update technology in aircraft is arduous.

The final recommendation calls for the Department of Transport to require operators to collect and report hours flown and movement data by Canadian Aviation Regulation subpart and aircraft type.

Fox said it would take a collaborative effort from clients, passengers, crews, operators, Transport Canada and industry associations to address the underlying factors behind the air taxi sector's accident rate.

"Everybody has to work together in order to improve the safety of air taxi performance," she said. ✖



While safety is improving in Canada's commercial aviation sector, aircraft operating in the air taxi segment still represent more than half of the accidents and fatalities in Canadian commercial aviation. **Mike Reyno Photo**

COULSON AVIATION buys 5 Norwegian Hercs

Coulson Aviation (USA) Inc. has bought five C-130H transport planes from the Norwegian Defense Materiel Agency, which will be modified into firefighting aircraft like the one shown here. The formal takeover is planned for the end of this year/early 2020. In related news, Coulson was also selected by the United States Air Force to install its Retardant Aerial Delivery System (RADS)-XXL firefighting systems on seven C-130H Hercules aircraft that will fight fires in California.



Dan Megna Photo

BOMBARDIER GETS first SAF shipment

Avfuel has delivered 27,600 litres of sustainable aviation fuel (SAF) to Bombardier's Montreal facilities. This is the first step in the company's plan to secure long-term partnerships with fuel suppliers to deploy SAF to all of its facilities worldwide. "We stand behind our commitment to help promote the increased use of SAF throughout the industry," said David Coleal, president, Bombardier Aviation. "Today, we are proud to offer it for the first time at one of our Canadian facilities and it's only the beginning."



Avfuel Photo

DWAYNE CHARETTE discusses new role at Airbus Helicopters Canada

Now in his 17th year with Airbus Helicopters Canada (AHC), Dwayne Charette worked his way up to the position of chief operating officer before being appointed president in August. "It's a humbling experience to get the opportunity and responsibility to lead, and I'm appreciative," he said, crediting his predecessor Romain Trapp for establishing a solid focus on customer experience at AHC.



Airbus Photo

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Top Aces Corp. of Montreal has been awarded part of a US\$6.4 billion contract for providing adversary air services to the United States Air Force (USAF). The success is related to its experience providing similar services to the Royal Canadian Air Force. Here, a CF-188 Hornet and four Top Aces Alpha Jet aircraft fly near Fort Jefferson in Florida. **Cpl Pierre Habib Photo**

Top Aces lands share in USAF adversary air contract

The Montreal company will be the first commercial provider to acquire and configure the F-16 Falcon to replicate a wide range of threats.

CHRIS THATCHER | TRAINING NEWS

It's an old mantra among defence and aerospace companies: You first need success in your home country before you can export a capability or service internationally.

That certainly rings true for Top Aces. You can draw a straight line between the Royal Canadian Air Force (RCAF) Contracted Airborne Training Services (CATS) program and the announcement in October that Top Aces' Arizona-based unit was among seven companies awarded part of the United States Air Force's \$6.4 million Combat Air Force Contracted Air Support (CAFCAS) contract, said Paul Bouchard, president and chief executive officer of the Montreal-based company.

A pioneer of aggressor or "red" air training for militaries, Top Aces received

an indefinite-delivery/indefinite-quantity (IDIQ) contract that will allow it to compete with Air USA, Airborne Tactical Advantage Company, Blue Air Training, Coastal Defense, Draken International and Tactical Air Support for adversary air services at 12 USAF bases, including Nellis, Luke, Hollman, Langley, Eglin and Tyndall.

"Contractors will provide complete contracted air support services for realistic and challenging advanced adversary air threats and close air support threats," the Department of Defense (DoD) said in a statement. The contract is being run by the Air Combat Command's Acquisition Management and Integration Center at Joint Base Langley-Eustis in Virginia and runs until October 2024.

"Their intention is to stand up a contracted adversary service, almost like a unit, at all of the major air combat command bases

for training on a daily basis," explained Bouchard. "Once you have an IDIQ, you are then allowed to bid as a prime contractor at any or all of these operating locations, depending on what category of service you are positioned to provide."

Whether companies become the sole provider at a base or deliver services as part of a teaming arrangement where the demand for full spectrum training is exceptionally high remains to be seen. The USAF estimates the contract could involve between 30,000 and 40,000 hours of flying annually once the program is fully ramped up.

The award is a major breakthrough in the U.S. for Top Aces, which is also pursuing a U.S. Navy fighter services contract targeted for release in late 2019.

Top Aces launched the interim CATS program in the mid-2000s and has spent the past 15 years gaining experience

and investing in aircraft and advanced technology. In October 2017, under the banner of Discovery Air Defence, it retained the CATS program with a 10-year deal worth about \$480 million that includes options to extend the service to 2031 and the value to as much as \$1.4 billion.

Success to the south would not have been possible without the “industry leading” certification and airworthiness standards demanded by the RCAF and Transport Canada, said Bouchard.

“It is as close to a commercial equivalent certification standard as you will find in the world. With small exceptions, we are certified to the same standards as a commercial airliner or business jet. At the same time, we are fully audited and certified under the military airworthiness regime. The quality, airworthiness and safety requirements were very high from the beginning . . . That is where the USAF and other first-tier air forces want to go to.”

To meet the training requirements of next generation fighters such as the F-35 Lightning II and F-22 Raptor, Top Aces will be the first commercial provider to acquire and configure the F-16 Falcon to replicate a wide range of threats. The company has a binding contract with an undisclosed allied country to acquire 12 Block 15 A/B models.

“The F-16 really is our growth platform

for the future, especially for advanced adversary training,” explained Bouchard. “It is the most prolific adversary aircraft in the western world. It is the adversary aircraft of choice just because of its performance characteristics. It is a fourth generation aircraft, so from an aircraft architecture standpoint, it can be equipped and configured in so many different ways . . . And it is also scalable given there were more than 4,000 F-16s built. It is still a production aircraft. It has a lot of existing support in terms of sustainment.”

The F-16 was proposed as a possible addition to the Canadian program, and may still come into play once a replacement for the CF-188 Hornets is selected. The USAF contract, however, gave the company the green light to file an application with the U.S. State Department for acquisition and transfer of the frontline aircraft. Under the terms of the CAFCAS deal, Top Aces must have an initial 12 aircraft in service by October 2020, though Bouchard hopes to be ready sooner.

The fleet will be based at the F-16 Center of Excellence, near the company’s U.S. headquarters in Mesa, Ariz.

On Nov. 27, Top Aces announced it had secured \$100 million in financing for international expansion, allowing it to acquire new aircraft. ✂

KF AEROSPACE

opens massive new hangar at YHM



KF Aerospace Photo

On Nov. 19, KF Aerospace opened the doors to its first wide-body aircraft hangar at Hamilton International Airport (YHM). The 75,000-square-foot hangar was completed in less than eight months and is the centerpiece of KF’s \$40 million investment in Hamilton expansion projects that include new shop facilities and a state-of-the-art aviation campus for the Mohawk College Aerospace Training Hub. KF began hiring earlier this year in preparation for the hangar opening and has already welcomed an additional 60 staff. With 200 currently at the base, KF is planning to grow to over 400 staff in Hamilton by 2022. ✂

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First delivery of RCAF CC-295 could be delayed

Airbus will deliver 16 CC-295 aircraft to the RCAF to replace its fleet of de Havilland CC-115 Buffalo and Lockheed Martin CC-130 Hercules search and rescue aircraft. **Airbus Image**



CHRIS THATCHER | MILITARY NEWS

Complications with the technical manuals for the Royal Canadian Air Force (RCAF) CC-295 search and rescue (SAR) aircraft could delay delivery of the first plane. Manufacturer Airbus Defence and Space unveiled the first C295W (CC-295 is its Canadian designation) in its distinctive RCAF search and rescue paint scheme in mid-October at its production facility in Seville, Spain, and was anticipating hand-over by the end of the year.

While members of the SAR test and evaluation flight of 434 Operational Test and Evaluation Squadron have been in Seville since early fall to assess the aircraft and complete various flight and technical manuals, the Air Force has yet to accept the aircraft.

“There have been challenges in the completion of the required technical manuals, which are required for all aspects of safe aircraft operation — from flying to maintenance,” the RCAF and assistant deputy minister (materiel), of the military’s acquisition branch, said in a statement. “Technical manuals are a critical component when it comes to the safe operation of any fleet. The safety of our aviators is simply not something we are willing to compromise on. We continue to collaborate with Airbus, prioritizing the work required in order to deliver the new search and rescue aircraft safely and effectively.”

In a statement to CTV News, an Airbus spokesperson said, “Work on operational technical publications is under review to ensure these are tailored to the customer’s requirements and additional time is required.”

Airbus will deliver 16 of the twin-propeller CC-295 aircraft to replace the de Havilland CC-115 Buffalo and Lockheed Martin CC-130 Hercules used in a search and rescue role. Despite the delay, the RCAF is still expecting to bring the first aircraft to 19 Wing Comox, B.C., by April 2020.

“While it is not yet known if this will cause a delay in final delivery, we remain optimistic that the supplier can work towards an acceptable solution so that our on-site testing and evaluations can be done prior to flying the first aircraft to Canada next spring, as previously planned,” said a spokesperson.

In its statement to CTV, Airbus said it had been working “tirelessly to meet the demanding delivery milestones of the Canadian fixed-wing search and rescue [FWSAR] program and to date the company has successfully completed design, development, certification and manufacture of the aircraft, as well as the first stages establishing the program’s support operations in Canada.”

In addition to the first aircraft, six more CC-295s are in final assembly or completing flight test. Aircrew and maintainers with 418 Search and Rescue Operational Training Squadron, reactivated on July 11, 2019, began initial cadre training on the CC-295 at Airbus’ facility in Spain in September. The aircraft will operate from four main bases in Comox, Winnipeg, Man., Trenton, Ont., and Greenwood, N.S. ✦

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While the Snowbirds have returned to their home base at Moose Jaw, Sask., the team's 2020 schedule will certainly be delayed by the October crash in Atlanta. **Mike Reyno Photo**



Snowbirds aircraft back in Moose Jaw



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Ten CT-114 Tutor jets flown by the Canadian Forces Snowbirds returned home to Canada from Georgia on Nov. 27.

The Snowbirds have been on an operational pause since Snowbird 5 was forced to eject before a show at the Atlanta Speedway on Oct. 13.

The investigation had advanced enough that the Royal Canadian Air Force was confident the CT-114 Tutors parked at Falcon Field in Peachtree City, Ga., could be safely flown home to 15 Wing Moose Jaw in Saskatchewan. Another operational risk assessment will be conducted prior to resuming regular aerobatic training flights.

A preliminary report issued on Nov. 21 by the Directorate of Flight Safety indicates that Snowbird 5 – piloted by Capt Kevin Domon-Grenier – was performing a routine pre-show check while inverted. After rolling level and applying full power to rejoin the formation, the aircraft experienced a loss of thrust, lost altitude and was unable to recover engine power.

Domon-Grenier successfully ejected and sustained only minor injuries, although he later reported “anomalies with the ejection sequence.”

Once the fleet returns to full flying operations, there will be a better assessment of the impact on the Snowbirds’ schedule. At this point annual spring training in Comox, B.C., will be delayed at least a month. The full effect on the Snowbirds’ 2020 schedule was not clear at press time and the schedule had not yet been released. ✦

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CITATION TEAM CANADA

A Perfect PAIRING

The largest Canadian-designed and -built jet aircraft is about to start work at Canada's largest airline.

BY **FREDERICK K. LARKIN**

Since its first flight as Trans-Canada Air Lines on Sept. 1, 1937, Air Canada has operated aircraft that have been among the most advanced designs of their era. It was the first North American airline to introduce turbine-powered equipment (Vickers Viscount in December 1954), the first Canadian carrier to obtain a jetliner (Douglas DC-8 in February 1960), and the first Canadian airline to receive a jumbo jet (Boeing 747 in February 1971).

Now, in its 83rd year, Air Canada is adding another innovative model to its fleet.

On Feb. 27, 2016, Air Canada signed a letter of intent (LOI) to purchase 45 Airbus A220-300s (then named Bombardier CS300) and to hold 30 options. Based on the list price of US\$85 million, the value of the first 45 airplanes was approximately US\$3.8 billion. The LOI was finalized on June 28, 2016.

Some of the A220s will replace Air Canada's remaining fleet of Embraer E190s, with the remainder used for some route expansion. Air Canada had previously ordered Boeing 737 Max 8s to replace its Airbus A320s. The grounding of the Max on March 13, 2019 deferred the retirement of its A320s. The average age of the airline's 39 remaining A320s was approximately 26 years at Sept. 30, 2019.

With 18 Airbus A220-300s due to be in service by the end of 2020, Air Canada now expects to retire 19 A320s from its fleet during 2020. Only 14 of the 97-seat Embraer E190s remained in the fleet at the end of 2019.

THE NEW AIRPLANE'S ROLE

While the aging A320-200 and the new A220-300 are capable of carrying similar passenger loads, a key difference between the

two is range. The A220-300's ability to fly 33 per cent farther suggests that it will be an extremely valuable weapon in the ongoing battle for market share.

Skies discussed the addition of the new airplane with Mark Galardo, Air Canada's vice-president, Network Planning. Having been involved with the background research and route analysis that led to the decision to acquire the A220s, he is understandably keen on seeing the aircraft strategically deployed.

When asked what specific role the A220s will play for Air Canada, Galardo noted that they could be used to develop traffic on new long and thin city pairs; build frequency on key North American spokes into Air Canada's hubs at Toronto, Montreal and Vancouver; and provide an appropriate amount of capacity on seasonal routes.

With the A220-300, the airline intends to attract passengers that might otherwise travel within competitors' networks. This strategy is reflected in Air Canada's decision to launch the A220 aircraft into service on May 4, 2020, on two completely new routes: Toronto to San Jose, Calif.; and Montreal to Seattle, Wash.

OPERATIONAL EXPERIENCE

In order to appreciate how the A220-300 has performed, Skies approached the two airlines that have the largest number of the type in service.

SWISS INTERNATIONAL AIR LINES

Swiss was the A220's launch customer and currently operates nine A220-100s and 20 of the larger A220-300s. When Skies asked Swiss spokesperson Sonja Prassek how the operating cost of the A220-300 compared to its predecessor, she revealed that fuel consumption is 20 to 25 per cent lower compared to the Avro RJ100.

When asked about the type's role within the Swiss system, she said, "With this aircraft, we are able to operate on longer routes, as well as at operationally challenging airports with short and more complex approaches, such as London City or Florence."

AIRBUS A220-300 VS. A320-200

A220-300



LENGTH	WINGSPAN	HEIGHT	MAX. TAKEOFF WEIGHT	RANGE	CRUISE SPEED	SEAT CAPACITY
127' 38.7m	115'1" 35.1m	38'8" 11.8m	154,000 lbs 69.9 tonnes	3,200 _{nm} 3,680 _{sm} 5,920 _{km}	515 _{mph} 829 _{kph}	12J+125Y =137

A320-200

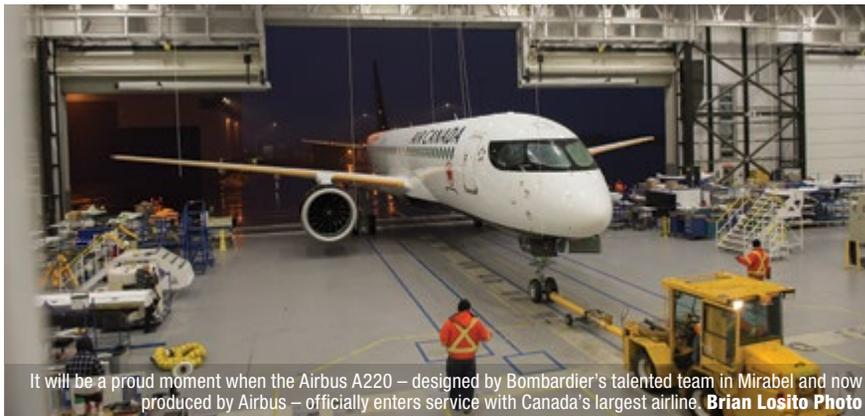
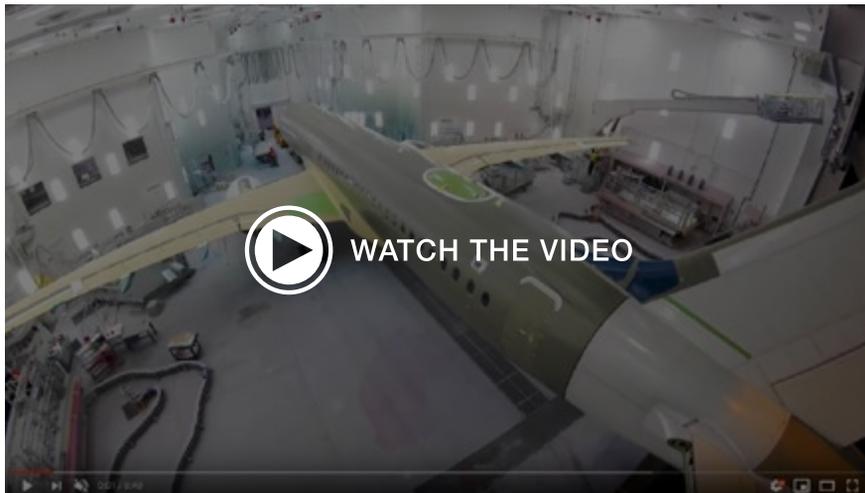


LENGTH	WINGSPAN	HEIGHT	MAX. TAKEOFF WEIGHT	RANGE	CRUISE SPEED	SEAT CAPACITY
123'3" 37.6m	111'10" 34.1m	38'7" 11.8m	162,000 lbs 73.5 tonnes	2,400 _{nm} 2,760 _{sm} 4,440 _{km}	520 _{mph} 837 _{kph}	14J+132Y =146

Source: Airbus and Air Canada



Since 1990, Air Canada says it has increased its fuel efficiency 44.5 per cent, with a three per cent average annual improvement over the last seven years. The addition of the Airbus A220 will assist the airline in making further improvements. **Air Canada Image**



It will be a proud moment when the Airbus A220 – designed by Bombardier’s talented team in Mirabel and now produced by Airbus – officially enters service with Canada’s largest airline. **Brian Losito Photo**



Each Air Canada pilot will undergo instruction in the classroom, the integrated procedures trainer and then finally in the A220-300 full flight simulator. **Brian Losito Photo**



In Economy class, Air Canada’s A220 fleet will offer 19-inch-wide seats and personal touchscreen TVs. **Air Canada Image**

AIR BALTIC

The Latvian carrier currently operates 20 A220-300s. Since November 2016, the type has carried over four million passengers on more than 40,000 flights. Daily utilization has been as high as 18 hours.

In May 2018, the company announced that it would standardize its fleet on the type and have as many as 80 units operating by the end of 2024.

Air Baltic spokesperson Ilva Priedniece told *Skies* that the aircraft flies short routes (Riga-Tallinn, 152NM, 0:50 block time) and long routes (Abu Dhabi-Riga, 2,360NM, 6:35 block time).

AMBER LIGHT

In October 2017, Air Baltic briefly grounded its seven A220-300s so that their Pratt & Whitney PW1500G engines could be inspected. More recently, Swiss experienced three in-flight engine shutdowns in July, September and October of 2019. After two days of inspections, all 29 of its A220s were back in business.

On Oct. 25, Transport Canada issued an emergency airworthiness directive ordering PW1500G engines to be limited to 94 per cent of maximum thrust while above 29,000 feet.

Delta Air Lines of Atlanta, Ga., has not had to remove any of its 27 A220-100s from service. Delta’s Morgan Durrant told *Skies*, “We are compliant with the directives from the U.S. FAA regarding the engine, which means we have been and will continue to meet or exceed inspection guidance.”

Delta expects to be operating 95 A220s by mid-2023.

FINAL THOUGHTS

Air Canada is proud to have played a role in the success of a Canadian airliner program that, for a period of time, had a questionable future.

As its Mark Galardo noted, “We believe our order helped secure the program and built momentum to future orders of the aircraft.”

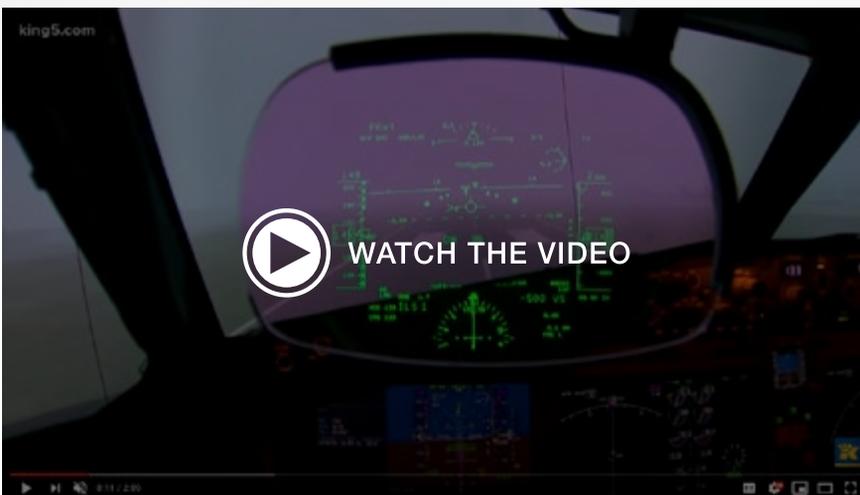
With its improved fuel efficiency, reduced carbon footprint, quieter engines and more comfortable cabin, the A220-300 is expected to be well received by Air Canada’s customers, employees and shareholders.

Air Canada’s ultimate blessing of the A220 was provided by its president and chief executive officer. When *Skies* asked Calin Rovinescu to comment on the new type, he responded, “The game-changing A220, built in Canada, will open up a multitude of new routes for us – where we either did not previously have the range with other narrowbodies or could not justify a widebody. We are super excited to introduce it.” 🇨🇦



Frederick K. Larkin | Licensed to fly before he could drive, Ted Larkin has closely followed the airline, business aviation and aerospace industries for more than 50 years. During nearly three decades in the investment business, he advised institutional investors in North America, Europe and Asia on their holdings in aviation-related corporations.

DISRUPTION



The grounding of the Boeing 737 Max has turned out to be one of the most disruptive events in Canadian airline history from a regulatory, business and passenger perspective.

The crash of two brand-new Boeing 737 Max 8 passenger jets five months apart in Indonesia and Ethiopia killed a total of 346 passengers and crew.

On Oct. 29, 2018, Lion Air Flight 610, a B737 Max 8, crashed shortly after takeoff in Jakarta, Indonesia. Then on March 10, 2019, Ethiopian Airlines Flight 302, also a B737 Max 8, crashed shortly after takeoff in Addis Ababa, Ethiopia.

Three days later on March 13, Canadian Transport Minister Marc Garneau ordered the grounding of 41 Boeing 737 Max 8s in service

The three Canadian airlines operating the Boeing 737 Max have learned to be nimble, constantly adjusting schedules and business plans to accommodate the aircraft's worldwide grounding.

BY KENNETH I. SWARTZ



When flights resume, WestJet will return to its normal aircraft delivery schedule, taking delivery of four new Max 8s in 2020, including two that should have arrived in 2019. **Adrian Edwards Photo**

with three Canadian airlines – Air Canada (24 aircraft), WestJet (13) and Sunwing (4) – and banned any 737 Max aircraft from arriving, departing or overflying Canadian airspace.

Hours later, U.S. President Donald Trump grounded all Max 8 and Max 9 aircraft in service in the U.S., which idled a total of 385 jets.

Over the past five years, the airline industry has had a remarkably good safety record, but the two 737 Max accidents raised serious questions about Boeing's safety culture and the U.S. Federal Aviation Administration's (FAA's) oversight.

The accidents triggered investigations by two independent watchdogs, a specially formed panel and committees in both chambers of the U.S. Congress.

When Stephen Dickson was sworn in as the new FAA administrator in Washington,

D.C., in August, he made clear that the safety of the 737 Max was a top priority.

"I want to again be clear: FAA is a safety-driven organization and safety is my highest priority," said Dickson in his swearing-in remarks. "This plane will not fly in commercial service until I am completely assured that it is safe to do so."

Major U.S. airlines like American, Southwest and United have pulled the 737 Max from their flight schedules through March 2020; by that point, the fleet will have spent at least a year on the ground.

MAX FAMILY

The Boeing 737 Max family — including the Max 7, Max 8, Max 9 and now Max 10 (debuted on Nov. 22, 2019) — is the fourth generation of the Boeing 737 which first flew on April 9, 1967.

The new family was born when record high fuel prices drove Airbus to update the A320 family with the launch of the A320neo (for New Engine Option) in December 2010. It incorporated more fuel-efficient CFM International LEAP-1A or Pratt & Whitney PW1000G turbofans.

Boeing held back as the A320neo gained sales, then jumped into the re-engine game when it selected the CFM LEAP-1B engine to power the Boeing 737 Max, which was announced in August 2011 and launched by Southwest Airlines with an order for 150 aircraft.

DESIGN CHANGES

The LEAP-1B was a larger engine than the CFM56-7B turbofan on the Boeing 737 NG, and could not be mounted in the same position under the wing.

The 737 Max 8 has been removed from the Air Canada winter schedule through at least Feb. 14, 2020.

Brian Losito/Air Canada Photo



“Air Canada trained 400 pilots to fly its 24 737 Max 8s; they have been grounded, but maintain their currency with a visit to a full flight simulator every six months.”

Boeing engineers solved this problem by extending the 737 Max nose gear leg eight inches and moving the LEAP-1B forward and upward relative to the leading edge of the wing to increase ground clearance.

Other design changes included advanced technology winglets, aft body aerodynamic improvements, and fly-by-wire spoilers that resulted in increased fuel efficiency, increased range, and a reduced noise profile.

The Max models burn 14 per cent less fuel than a similar-sized 737 NG model and have greater range to serve more distant city pairs.

The launch of the 737 Max was hugely successful, with Boeing holding orders for around 5,000 of the new jets by late 2019.

Southwest Airlines took delivery of the very first 737 Max 8 in May 2017 and Air Canada and WestJet received their first Max 8 jets at the end of 2017.

LION AIR FLIGHT 610

Alarm bells rang across the aviation industry when Lion Air Flight 610 crashed into the Java Sea just 12 minutes after takeoff.

On Nov. 6, 2018, Boeing issued an Operations Manual Bulletin (OMB) to 737 Max customers, explaining that during manual flight a malfunction in the angle of attack (AOA) indicator could generate erroneous readings. This incorrect data could cause a new automated system on the aircraft to push the nose down using the ele-

vator trim system, which if unchecked could result in an aggressive dive into terrain.

The next day, the FAA issued an Emergency Airworthiness Directive (AD) echoing Boeing's warnings, and outlining the corrective action to be taken in such an event.

This was the first time 737 Max pilots learned that Boeing had introduced a function called the Maneuvering Characteristics Augmentation System (MCAS) as an extension of the existing speed trim system, to improve aircraft handling characteristics at elevated angles of attack. It was designed to counteract an “upward pitching moment” generated by the LEAP-1B engine nacelles at high angles of attack.

The MCAS was introduced in order to make the Boeing 737 Max's handling characteristics so similar to the NG versions that no simulator training was needed for a pilot transitioning between the NG and the Max.

ETHIOPIAN AIRLINES FLIGHT 302

Following its November OMB, Boeing began developing a software update for the MCAS with the goal of receiving FAA approval by the spring of 2019.

Then, Ethiopian Airlines Flight 302 crashed seven minutes after takeoff in March, prompting China and other regulatory authorities to start banning the 737 Max from their skies.

The preliminary accident investigation

revealed that Flight 302's pilots knew about the MCAS, but even when they followed the prescribed emergency procedures, they couldn't save the aircraft.

The accidents raised very serious questions about Boeing's internal Functional Hazard Assessment (FHA) of the MCAS and why the FAA didn't ground the 737 Max fleet after the Lion Air crash.

GROUNDING

Airlines had just a few hours to comply when regulators ordered the grounding of the 737 Max, which was operating around 8,500 flights a week.

China grounded about 100 Max aircraft operated by domestic airlines and the U.S. grounded 72 aircraft flown by American, Southwest and United.

Thousands of flights were cancelled and hundreds of thousands of passengers had to be rebooked on other planes. Leases were extended on older aircraft scheduled to be retired, additional aircraft were leased, and growth plans tied to new Max deliveries were postponed.

PRODUCTION CONTINUES

Boeing cut 737 production at its Renton, Wash., plant from 52 to 42 aircraft a month, but could only deliver the 737 NG models, including P-8 Poseidon military aircraft based on the 737-800 NG.

This decision kept 10,000 workers



employed at the plant and thousands more at its 900 suppliers, but this was a very expensive undertaking since Boeing only receives final payment on delivery.

By early December 2019, there were more than 350 new aircraft stored at Boeing Field, Paine Field and Grant County International Airport in Washington State, as well as Kelly Field near San Antonio, Texas. These included 16 new 737 Max 8s for Canada (12 for Air Canada, two for WestJet and two for Sunwing).

ACCIDENT INVESTIGATION

The 737-8 was certified as a derivative of the 737-800 NG under the FAA's Changed Product Rule, which required Boeing to demonstrate compliance with Amendment 25-136 for significant areas of change.

The Indonesia accident report published in October 2019 explained that when Boeing developed the MCAS, its FHA process classified two hazards associated with "uncommanded MCAS" activation as "major."

Since the hazards associated with an "uncommanded MCAS" event were not classified as "hazardous" or "catastrophic," Boeing did not have to more rigorously analyze those failure conditions using its Failure Modes and Effects Analysis (FMEA) and Fault Tree Analysis (FTA).

However, in both 737 Max accidents, a single failure – a miscalibrated or damaged

AOA sensor – initiated a fatal chain of events because there was no redundant system.

The use of FMEA would have been able to identify single-point and latent failures in the MCAS design that contributed to the accidents.

The Indonesia accident report also found that Boeing's assumptions on flight crew initial response time, and the time it took for them to recognize and react to flight control failures, were very different from their actual behaviour when the MCAS activated.

Other reports published by the U.S. National Transportation Safety Board and the Joint Authorities Technical Review (JATR) team were highly critical of the FAA certification of the 737 Max. Questions were raised about the amount of certification activities delegated by the FAA to Boeing's Aviation Safety Oversight Office; how the technical documentation Boeing submitted to the FAA for the MCAS certification was inadequate, fragmented and incomplete; and how "human factors" testing did not go far enough.

BOEING TAKES ACTION

Boeing began redesigning the MCAS shortly after the Lion Air crash.

The software was updated so that the MCAS would receive data inputs from two angle of attack sensors instead of one. Other changes included a limit on the number of times the MCAS could activate and a limit on the amount of downward force the MCAS could apply when

a pilot was flying the aircraft manually.

Pilots will now be able to override MCAS at any time. In addition, when the Max returns to service, all production aircraft will have an activated and operable AOA disagree alert and an optional angle of attack indicator. Boeing said the AOA disagree alert will be available for activation on previously delivered aircraft.

In early August 2019, *Seattle Times* reporter Dominic Gates revealed that the FAA had discovered a potential flaw in the 737 Max flight control system during simulation tests in June that "spurred Boeing to make a fundamental software-design change."

Gates reported that, "Boeing is changing the Max's automated flight control system software so that it will take input from both flight control computers at once instead of using only one on each flight. That might seem simple and obvious, but in the architecture that has been in place on the 737 for decades, the automated systems take input from only one computer on a flight, switching to use the other computer on the next flight."

This means the flight control system will now take input from both of the airplane's flight computers, eliminating the risk of a fault in a single flight computer triggering an MCAS failure even if the two AOA sensors were functioning normally.

Boeing hasn't released many details of the redesign to the media, but said its "robust MCAS software update" includes "three additional layers of protection" and provides "additional updates to the flight control computer software for further redundancy and safety."

MAX PROGRESS REPORT

On Nov. 11, Boeing published a progress report that stated, "... Boeing continues to target FAA certification of the Max flight control software updates during this quarter. Based on this schedule, it is possible that the resumption of Max deliveries to airline customers could begin in December, after certification, when the FAA issues an Airworthiness Directive rescinding the grounding order."

The positive news raised Boeing stock prices by 12 per cent, but it triggered a renewed tug-of-war with the U.S. regulator.

The next day, the FAA's Dickson made it clear that the agency would not be a slave to Boeing's timeline when he spoke to the Washington Aero Club.

"I've said this before but will continue to repeat it: The FAA's return-to-service decision for the Max will be based solely on *our* assessment of the sufficiency of Boeing's proposed software updates *and* pilot training that addresses the known issues for grounding the aircraft. We are not delegating anything. When we finally take the decision to return this aircraft to service, it will be the most scrutinized aircraft in history. It will also be one of the safest machines to ever take to the sky. I am not going to sign off on this aircraft until I fly it myself and am

satisfied that I would put my own family on it without a second thought.”

Then the FAA went a step further and took control of the 737 Max delivery process when it announced that it will, “retain authority to issue airworthiness certificates and export certificates of airworthiness for all 737 Max airplanes ... (until) ... at a minimum, Boeing has fully functional quality control and verification processes in place; delivery processes are similarly functional and stable; and Boeing’s 737 Max compliance, design, and production processes meet all regulatory standards and conditions for delegation and ensure the safety of the public.”

This put the FAA in firm control of when Boeing could deliver new 737 Max jets to airline customers and receive critical final payments.

Tasks still on the FAA’s “to do” list in late November included completing a critical review of Max design changes and associated training; human factors testing of the upgrades to the MCAS software; final simulator flight; Joint Operation Evaluation Board simulator rides for line pilots; and completion of the FAA Flight Standards Board’s report on the MCAS (which has to go out for public comment), as well as co-ordinating the rescinding of the Airworthiness Directive for the 737 Max with international regulators.

NORTH OF THE BORDER

In August 2013, WestJet announced a \$6.3 billion order (at list prices) for 65 737 Max jets and then Air Canada followed in December with a \$6.5 billion order for 61 737 Max aircraft.

WestJet initially ordered 25 Max 7s and 40 Max 8s, but later converted its order to 22 Max 7s, 20 Max 8s and 12 Max 10s.

Air Canada revised its order to 50 Max 8s

and 12 Max 9s. Two Max 8s were delivered in 2017, 16 in 2018, and six in 2019 before the grounding.

Sunwing received the first of four 737 Max 8s from Air Lease Corporation in May 2018, with the latest touching down in Toronto days before the grounding.

When Lion Air Flight 610 crashed a year ago, Transport Canada immediately adopted the FAA’s AD which affected Air Canada, WestJet and Sunwing. Within 24 hours of issuance of the Emergency AD for B737 Max operators, a common approach and solution had been established.

“Transport Canada shares Air Canada, WestJet and Sunwing’s common interest in aviation safety. As such, our greatest concern was the swift dissemination of appropriate and accurate information to flight crews to enable them to apply proper procedures if such a similar event were to reoccur,” said Transport Canada in a written statement to *Skies* last December.

A WestJet spokesperson at the time said that, similar to other operators, WestJet had not been aware of the MCAS system and its operating characteristics before Boeing issued its OMB in November 2018. “Once aware, we took swift and decisive action, working with Transport Canada and the two other operators of the Max aircraft in Canada on a rapid revision to our aircraft flight manual, quick reference checklist, and to supplement our training with MCAS system information.”

Approximately 360 pilots at the three airlines, flying a total of 29 737 Max aircraft, were affected by the AD in mid-November 2018.

When the Canadian fleet was grounded on March 13, 2019, the 737 Max 8 represented 24 out of 400 aircraft in the Air Canada fleet (including Rouge and Air Canada Express); 13 out of 175 aircraft at WestJet and four out

of about 40 aircraft at Sunwing. The groundings were welcomed by flight attendants and pilots, who preferred a response that erred on the side of caution.

As the grounding dragged on, each airline made long-term plans to idle their aircraft. Seventeen Air Canada Max 8s are currently stored in the desert at Pinal Airpark in Marana, Ariz.; five are in Windsor and two are in Montreal. WestJet’s Max 8s are parked in Vancouver (2), Calgary (6), Edmonton (2), Hamilton (1) and Kelowna (2), and Sunwing’s four Max 8s are in an active storage program at Mirabel.

WestJet explained to *Skies* that its 737 Max aircraft “continue to receive regular scheduled maintenance checks, the engines are run every seven days, and they are occasionally flown, with permission from Transport Canada, to maintenance facilities in Canada.”

BUSINESS IMPACT

Canadian airlines purchased 737 Max fleets to replace inefficient jets and drive future growth.

The Air Canada business plan called for 36 737 Max 8s by the summer of 2019, but due to “the grounding” and postponed deliveries it was left with 24 per cent fewer narrow-body jets than planned, “which exacted a toll from a financial, route, product, and I would say a human resource perspective,” said Air Canada president and CEO Calin Rovinescu.

“However, I’m confident that if regulators unground the aircraft near-term, our ongoing transformation will quickly regain its former trajectory,” he added.

Air Canada was able to cover about 95 per cent of its planned summer flying through a series of mitigation measures, including schedule changes, temporary route suspensions and sourcing alternative aircraft.



In total, over 3,000 Sunwing flights were affected this past summer. In most instances, all routes were maintained but some frequency was reduced. **Patrick Cardinal Photo**

The Max 8 has been removed from the winter schedule through at least Feb. 14, 2020, and probably longer. While the aircraft have been sitting, the airline has installed dual Head Up Displays (HUDs) and WiFi on many planes.

Air Canada extended the leases of E190s and A320s, and Rouge and Air Canada Express (ACE) have also been covering some 737 Max routes.

Two Airbus A330s were wet leased from Qatar Airways last summer to link Montreal with Paris and Barcelona. This winter, the airline has wet leased two Omni Air International 767-200s to link Vancouver with Hawaii and Phoenix, and two Air Transat A330-200s to serve sun destinations from Montreal. Max 8 routes between Atlantic Canada and the U.K. were suspended.

Air Canada trained 400 pilots to fly its 24 737 Max 8s; they have been grounded, but maintain their currency with a visit to a full flight simulator every six months. Air Canada has the only airline-owned Max simulator in North America.

Once the grounding is lifted, Air Canada expects to take delivery of 26 additional Max 8s in 2020, including 12 completed by Boeing but never delivered in 2019, but “this is not an overnight process.”

To fill those cockpits, Air Canada needs to hire 350 more pilots, but hiring and training has to be carefully paced since most will be hired under “flow-through” agreements with ACE partners Jazz Aviation and Sky Regional, who will have to backfill a lot of pilots’ seats.

WestJet told *Skies* that the Boeing Max 8 made up about seven per cent of its fleet of 160 aircraft. “By adjusting some of our leases, utilizing the brand new 787 Dreamliner with 320 seats and adjusting the planned installations on some of our premium seats, we have been able to maintain about 98 per cent of our planned departures,” wrote an airline spokesperson.

“In addition to several changes to either flight times or substituting larger aircraft with fewer frequencies, we did have to make some difficult decisions to temporarily suspend a small number of routes where no alternative aircraft were available.

“These included one of our new routes between Halifax and Paris for the summer and the Max flying from Alberta to Hawaii this winter. From a flight perspective, the Max is a great aircraft as it is extremely fuel efficient and therefore offers a longer range than our 737 aircraft. Without the Max, we do not have aircraft available to offer this type of mid-range route,” added WestJet.

WestJet 737 Max pilots have maintained currency on the 737 NG, which safely operates 400 daily departures. When flights resume, WestJet will return to its normal aircraft delivery schedule, taking delivery of four new Max 8s in 2020, including two that should have arrived in 2019.

Normally, WestJet’s network team creates around two schedules a year (summer and winter), but uncertainty regarding the return of the 737 Max has caused the airline to update its schedule eight times since March 13, which has been a huge team effort.

Sunwing had four Boeing 737 Max 8

aircraft with two pending delivery at the time of the grounding.

“Since the grounding of the Boeing 737 Max 8, our senior executive team at the airline has been working closely with Transport Canada, Boeing and the other airlines that operate this aircraft type on the necessary steps for re-entry,” said Rachel Goldrick, Sunwing’s senior corporate communications manager.

The airline’s Max 8 pilots have remained current operating the 737 NG and were employed during the summer flying 737-800 aircraft. Since the summer is Sunwing’s low season and staffing levels normally



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decrease, the airline didn't have to furlough any of its pilots.

"In total, over 3,000 flights were affected during the summer period. In most instances all our routes were maintained, but with reduced frequency in some cases. We did have to suspend flying to Camaguey in Cuba and Puerto Vallarta, Mexico from Toronto for the summer season, but routes are operating again now."

In other instances, Sunwing contracted flight services through third-party carriers to help customers maintain their summer travel plans.

Sunwing has removed the 737 Max 8 from its schedule until May 2020.

RETURN TO SERVICE

The return to service date of the 737 Max is a moving target.

A key question will be how closely international aviation authorities such as Transport Canada and EASA will follow the FAA's first steps.

Transport Canada said its final decision on returning the 737 Max to service will be based on its continuing independent review and validation of Boeing 737 Max 8 changes, while working closely with other regulators.

Once the fix has been certified by the FAA, "Transport Canada will validate the changes by conducting its own rigorous, risk-based

review and will evaluate the impact on training requirements through the Joint Operational Evaluation Board (JOEB)," said the agency in a written response to *Skies*.

The JOEB is typically composed of regulatory personnel from the FAA, EASA and Transport Canada. The goal is to provide national aviation authorities with a harmonized basis for approval of pilot type rating training courses, differences training, proficiency checks, and currency requirements.

"As soon as the board has finished its work, we will apply its training adjustment recommendations for the return to service of the 737 Max 8 in Canada," said Transport Canada.

In April, the Canadian regulator was invited to join the JATR team tasked with conducting a comprehensive technical review of the 737 Max flight control system. This gave Canadian technical experts an in-depth understanding of what went wrong. The agency has been analyzing the recommendations in the JATR report, published in October.

"Canadians can be assured that Transport Canada will not lift the current flight restriction of the Boeing 737 Max 8 aircraft until it is fully satisfied that all concerns have been addressed by the manufacturer and the U.S. Federal Aviation Administration, and enhanced flight crew procedures and training are in place," said the regulator.

"It would be premature to speculate when the department will be in a position to approve the return to service of the Boeing 737 Max 8 aircraft in Canada."

All three Canadian 737 Max operators continue to be fully engaged with Boeing, Transport Canada and other regulators to understand how and when to safely reintroduce the Max.

WestJet said that before any passengers are flown, its 13 Max 8s will have the newly certified software installed and will undergo an evaluation flight. Pilots will also take any additional training that Transport Canada mandates.

WestJet also said it will be transparent in communicating which aircraft its guests have booked on, so they will always know if it's a Max flight.

"Regardless of when the aircraft are approved to return to service, WestJet will provide nothing less than 100 per cent assurance to our guests and WestJetters that all processes, procedures and decisions will be made with safety at the forefront," concluded the airline. ✈

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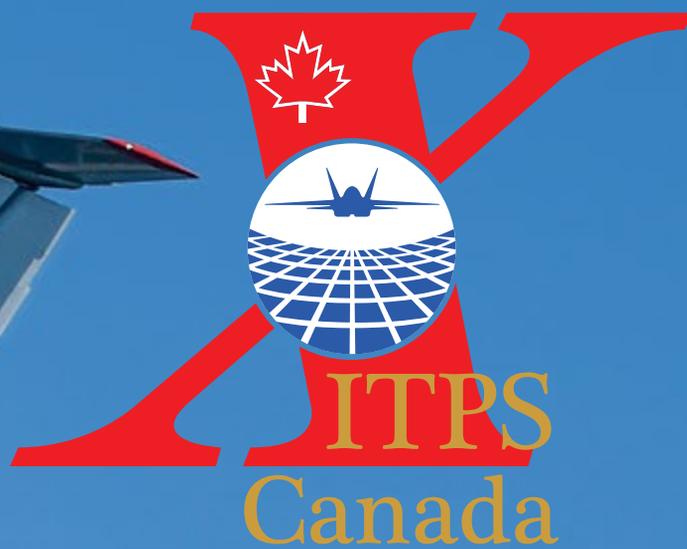
A very **TECHNICAL** business

Experienced pilots from around the globe descend on International Test Pilots School in London, Ont., to learn the specialized mechanics of flight testing.

BY ROBERT ERDOS
PHOTOS BY MIKE REYNO



International Test Pilots School operates a diverse fleet of military fighters, training jets, light airplanes and helicopters – 10 types in all.





ITPS clearly intends to make London, Ont., its home, having invested in new hangars and classroom facilities. **ITPS Photo**



The vision behind ITPS is its founder and CEO, Giorgio Clementi.



The author takes a turn as student, learning a few things from ITPS' instrumented BO-105 helicopter.

The instructor pilots at the International Test Pilots School (ITPS) say some interesting things around the water cooler.

Jason Paquin had his hands on emergency ejection handles three times during his flying career. Each ended well, he reported, with a shrug and a smile.

Fred Hauviller experienced an uncontrollable rotor underspeed while testing an experimental helicopter. He was lucky that day.

Adam Lowes recalled how his helicopter's flight control system malfunctioned during takeoff from a ship. He landed safely back onboard.

These things happen in the risky business of flight testing.

THERE IS A TEST PILOT SCHOOL IN LONDON, ONT.?

Welcome to the International Test Pilots School, based in London, Ont.

Walking into the hangar reveals a scene that will warm the heart of anyone with jet fuel coursing through their veins. A diverse

fleet of military fighters, training jets, light airplanes, and helicopters – 10 types in all – sits under the looming wingspan of an enormous 1950s-vintage Grumman Albatross flying boat.

There is a studious air to the place. Whiteboards are decorated with algebra. Teams of students huddle over computers;





The author's first impression was that, "Walking into the hangar reveals a scene that will warm the heart of anyone with jet fuel coursing through their veins."

textbooks arrayed for reference. Periodically, conversation levels rise over the sound of the school's jets starting on the ramp outside. A casual perusal of flight suit badges reveals students from nearly everywhere: South Korea, China, Indonesia, Turkey, Spain, Germany, France, the U.K. and Italy.

The students are all experienced aviators, but ITPS seeks to teach them a new technical specialty: flight testing. Once they graduate, these new test pilots and flight test engineers (FTEs) will join teams of aeronautical engineers around the globe who design and build new aircraft and systems. Their jobs will

entail testing those engineers' bright ideas without killing themselves in the process.

Most people, aviators included, have little familiarity with the technical business of flight testing. People have heard of test pilots; a term that brings to mind vague notions involving silk scarves and goggles, but it's not like that.

Test pilot school is akin to aeronautical graduate school. ITPS graduates' new skill set will enable them to assess whether a new aircraft type meets its mission objectives, whether it conforms to certification requirements, whether its systems are reliable, and to document its performance capabilities in charts and graphs. Ultimately, flight testing is a process of demonstrating what a design



Getting hands-on experience in new aircraft types — here, the L-29 trainer — is a pleasant part of the ITPS experience.



ITPS is just an unusual schoolhouse where some lectures are delivered in flight.

is safely capable of doing, and whether it meets its design requirements. In practice, the flying is technically demanding, intellectually challenging and often more than a bit risky.

Perhaps the best way to appreciate an ITPS student's experience is to ride along on a training flight as an observer. Better still, to be engaged as a participant.

FLYING WITH A STUDENT

Raik Gabler is a civilian student-FTE, sponsored by the German Technical and Airworthiness Center for Aircraft, called WTD 61. Gabler was tasked to assess the handling qualities of the school's instrumented MBB BO-105 helicopter as part of the Stability and Control portion of the course.

As his test pilot for the mission, I would serve as his teammate in gathering data as prescribed on his voluminous test cards. Adam Lowes was instructor and pilot-in-command, but his main role was to watch

critically as Gabler and I went to work.

We met at 10 a.m. to brief an afternoon sortie. Lowes expected Gabler to take charge of the mission, including the pre-flight briefing in which we reviewed the flight test manoeuvres, airspace, weather, fuel requirements, and aircraft limitations, amidst myriad other details.

The two-hour briefing put to rest the "silk scarf and goggles" image of test flying. It is a painstaking and fastidious business. There is an aphorism in flight testing that one "plans the flight, and flies the plan." Gabler admitted that he went to sleep at about 1 a.m. the previous night, but he had a good plan.

It was a good plan "on paper," so to speak. Low ceilings and gusty turbulence-inducing winds created havoc almost immediately. Gabler needed to scramble, deleting some tests and shuffling the test cards to take best advantage of the suboptimal conditions. Despite temptation,

Gabler "flew the plan," never deviating from the limitations detailed in the briefing.

After a busy 90 minutes aloft, having performed tests with yawn-inducing names like, "lateral-directional dynamic stability," Gabler was armed with ample data which, in the course of further late-night work, would become some very beguiling graphs.

For my part, I quizzed Gabler constantly – a bad habit – to assess the depth of his comprehension of the data's practical meaning, finding that he balanced technical rigour with nascent diagnostic skills and real-world knowledge. I was impressed.

TAKING STOCK OF THE FLEET

Choosing aircraft for test pilot training is a particular challenge. Ideally, the school's aircraft should be different enough to engage the student; mildly challenging to fly, but not enough to pose undue risks. It should stimulate the skills needed to fly operational military

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BELOW: ITPS is working on a fifth generation cockpit for the Hawker Hunter.



BELOW: The school recently unveiled its new flight test simulator.



COLUMN BELOW: With a diverse fleet of aircraft and a high tempo of operations, ITPS' technicians face a daunting challenge.



The Grumman HU-16 Albatross twin-engine amphibious aircraft is a great example of a design that still has a lot to offer modern aviators. **Eric Dumigan Photo**



types, yet must be comparatively cost-effective.

ITPS' aircraft fleet is changing so fast that it's hard to keep up. At the time of writing, the school owned three Aero L-29 Delfin and five Aero L-39 Albatros jet trainers, three Hawker Hunter fighters, one Beechcraft B-60 Duke, one IAR 823 and one Cirrus SR-22 piston trainers, and an amphibious multi-engine Grumman HU-16 Albatross. Helicopters included a Bell 206 and the instrumented twin-engine MBB BO-105. A search is ongoing for an instrumented multi-engine helicopter with modern systems such as an automatic flight control system.

The photos accompanying this article were shot during two formation flights; one jet, one helicopter. The jet formation consisted

of ITPS instructors Steve Milligan flying an L-39, Jason Paquin in an L-29, and Stephane Logette flying the Cirrus SR-22 camera ship. I was thrilled to ride along with Paquin to familiarize myself with the L-29.

A legacy of the Cold War, the L-29 was originally a Czech military trainer. Why an L-29? An objective of test pilot school training is gaining "adaptability," a term that is best defined as the breadth of a pilot's overall flying experience. Modern aviation tends toward specialization, with pilots gaining thousands of hours doing virtually the same things in the same aircraft type, and calling the result "experience." Adaptability, however, comes from flying different aircraft, featuring various design features and possessing diverse

handling qualities. Test pilot school training seeks to diversify a pilot's frame of reference by exposing them to numerous aircraft types.

The salient properties of the L-29 are simplicity, robustness, and its quaint "Czechisms," such as push-button undercarriage, hand-operated pneumatic brakes and a sluggish ol' engine. Economical, robust and plentiful-as-borscht, I thought the L-29 was perfect!

MANAGING GROWTH

There was a time when flight test training was the sole preserve of the military. Test pilots and flight test engineers were almost exclusively drawn from the ranks of those who attended "Edwards," "Pax River," or "Boscombe Down,"



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Stephane Loette flies the Cirrus SR-22 camera plane.



The L-29 trainer offers an educational and economical jet experience.



The instrumented twin-engine BO-105 helicopter is a staple in the rotary-wing syllabus.



Fred Hauviller demonstrates an eye-opening vortex-ring state to the author.



The L-39 jet is the other workhorse of the fixed-wing syllabus. **Eric Dumigan Photo**



Jason Paquin readies for his next test flight in the L-29.

to name the most well-known of the handful of traditional military test pilot schools.

The course offerings understandably addressed the needs of the military. ITPS is among the few civilian institutions to buck the trend.

Traditionally, the test pilot school course was one year long. In 2017, the European Union Aviation Safety Agency (EASA) imposed licensing standards upon the civilian flight test community, and the coming accreditation of the test pilot school syllabi changed the various schools' offerings.

ITPS offers a "Flight Test Graduate Course" (a 50-week program with 110 hours of flying on 20 types), typically for military students and those engaged in envelope-expansion testing, and a more cost-effective "Flight Test Diploma Course" (a 24-week short course comprising 55 hours in 15 types). In 2019, the school expects to graduate 16 test pilots and 23 flight test engineers.

With students and staff coming from around the globe, ITPS has a distinctly international flavour. Instruction is conducted in English, and language proficiency can be a challenge for some students. Similarly, while an undergraduate degree in physical science or engineering is a recommended prerequisite, some students arrive without a technical education. ITPS offers a five-week pre-course academic and language-proficiency syllabus for those in need.

LEARNING SURVIVAL SKILLS

As an academic institution, ITPS not only teaches flight testing, but is engaged with the industry in the development of the professional skill set. The school hosts an annual flight test seminar that hears presentations by flight testers from around the globe.

The professional experience of its expanding cadre of alumni provides a constant stream of feedback, and ITPS instructors engage in continuous refinement of the technical state-of-the-art. A good example was my flight with ITPS instructor-pilot and head of training Fred Hauviller demonstrating recovery from vortex ring state (VRS).

VRS is a rare but dangerous flight regime where a helicopter in a steep powered descent begins to recirculate its own rotor wake, resulting in an uncontrollable descent. The standard recovery technique – reduce power, lower the nose and wait! – is effective, but consumes a lot of altitude; not an ideal response to an already uncontrollable descent. Hauviller, an ex-French Army test pilot, researched an alternative recovery technique, called the Vuichard Recovery Method, which had the potential to effect recovery with minimal altitude loss. He demonstrated it in the BO-105.

From a safe altitude, Hauviller had me slow to a near-hover, allow a rate of descent to develop, and try to arrest it with power. The result was an eye-opening vertical descent with the helicopter shaking under full power

“Test pilot school training seeks to diversify a pilot’s frame of reference by exposing them to numerous aircraft types.”

like a wet dog. It was evident how this condition could lead the unwary to disaster.

Standard recovery techniques were effective, but typically consumed at least 800 feet of altitude. Using the Vuichard Method – simultaneous right pedal and cyclic to sidestep from the recirculating vortex – we were free of the nasty vortex within roughly 200 feet.

The VRS demonstration was thrilling, but that misses the point. Having never experienced such acute vortex ring characteristics, I was unprepared with the appropriate skills to recognize and recover.

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“Modern aircraft are safe and reliable to an extent that is a credit to the industry, but most test pilots can affirm that they didn’t start out that way.”

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The BO-105 could have killed me. However, if I were to experience such symptoms again, perhaps while flight testing some future helicopter prototype, I would recover confidently and survive to fly another day. Such is the value of flight test training.

GIORGIO'S VISION

ITPS' rise in the flight test community is a credit to the entire team, but central to the story is the vision of its founder, Giorgio Clementi. Clementi joined ITPS in 1991 as an FTE instructor and acquired the business in 1996. Over the coming years, the school would make its home in Woodford and Coventry in the U.K., then briefly in Cold Lake, Alta., before coming home in 2005 to its current base at London.

For a time, ITPS operated modestly as a “virtual” school, hosting specialty flight testing courses such as avionics systems flight test programs and the first-ever test pilot course presented in Canada in 2004. In those lean days, facilities were leased, and staff consisted of Clementi’s extensive network of contacts, but the clients kept coming. ITPS’ focus on pragmatic, bespoke training was a winning formula.

By 2012, its transformation to a bricks-and-mortar school was complete. In addition to its 39 full-time employees and 17 aircraft, at the time of my visit the finishing touches were being put on a 10,000-square-foot office facility to complement its existing 27,000-square-foot hangar.

The completed school will have capacity for up to 48 students in residence. Growth is evident wherever one looks, whether in the acquisition of a CF-188 Hornet cockpit training device, the recently-installed flight test telemetry system, or the purchase of a Rutan Long-EZ aircraft for use as a dedicated training platform for unmanned aerial system (UAS) testing.

Modern aircraft are safe and reliable to an extent that is a credit to the industry, but most test pilots can affirm that they didn’t start out that way. Test flights of new designs fresh off the drawing board are still fraught with risk and inevitably a few surprises. The gestation process from prototype to operational aircraft depends upon a specialized engineering skill set; an amalgam of operational flying experience and engineering diagnostic skills. ■

Disclaimer: At the time of writing, the author had been peripherally involved with ITPS as a consultant.

Robert Erdos is a contributing editor for *Skies* magazine. He is a graduate of the U.S. Naval Test Pilot School and a retired professional test pilot. Also an aviation enthusiast, his spare time activities include displaying vintage airplanes and flying his RV-6 kitplane.

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THIS SIMULATOR **BURNS JET FUEL**

► BY ROBERT ERDOS

Skies test pilot Rob Erdos flew the Pilatus PC-21 military trainer, discovering that it combines the best aspects of aircraft and simulator to deliver a unique training capability.





With its PC-21 military trainer, Pilatus has blended in-air and in-simulator experiences, creating a form of high fidelity, in-flight simulation. **Pilatus Photo**

The dogfight was over in seconds. Our radar painted a bogey closing on us from about 20 miles. Selecting the radar to “Track” mode, a tone in our helmets confirmed that a radar-guided missile had locked on the target, and with a squeeze of the trigger we dispatched a lethal message about virtue and democracy. Splash one bad guy.

There was something unusual about our air combat victory: there was no bogey, no radar, and no missile. The entire engagement was an elaborate airborne simulation. It was all in a day’s work for the PC-21; Pilatus’ latest concept in pilot training.

Pilatus Aircraft Limited invited *Skies* to

its factory in Stans, Switzerland, to experience something new and innovative in military pilot training. At first, the experience was, frankly, a bit boggling. Would we be flying or were we simulating? Well, both.

Modern technology allows training to be conducted on the ground in simulators, often to a high degree of fidelity but, as any pilot knows, simulators have their limitations, particularly in the realm of dynamic manoeuvring.

With the PC-21, Pilatus has blended the in-air and in-the-box experiences, creating a form of high fidelity, in-flight simulation. It’s a capability that is a game changer in the complex and expensive business of military pilot training.

WHAT’S NEW IN FLIGHT TRAINING?

Pilatus lists the PC-21’s design objectives as increased performance, enhanced maintainability, lower operating costs and added capability.

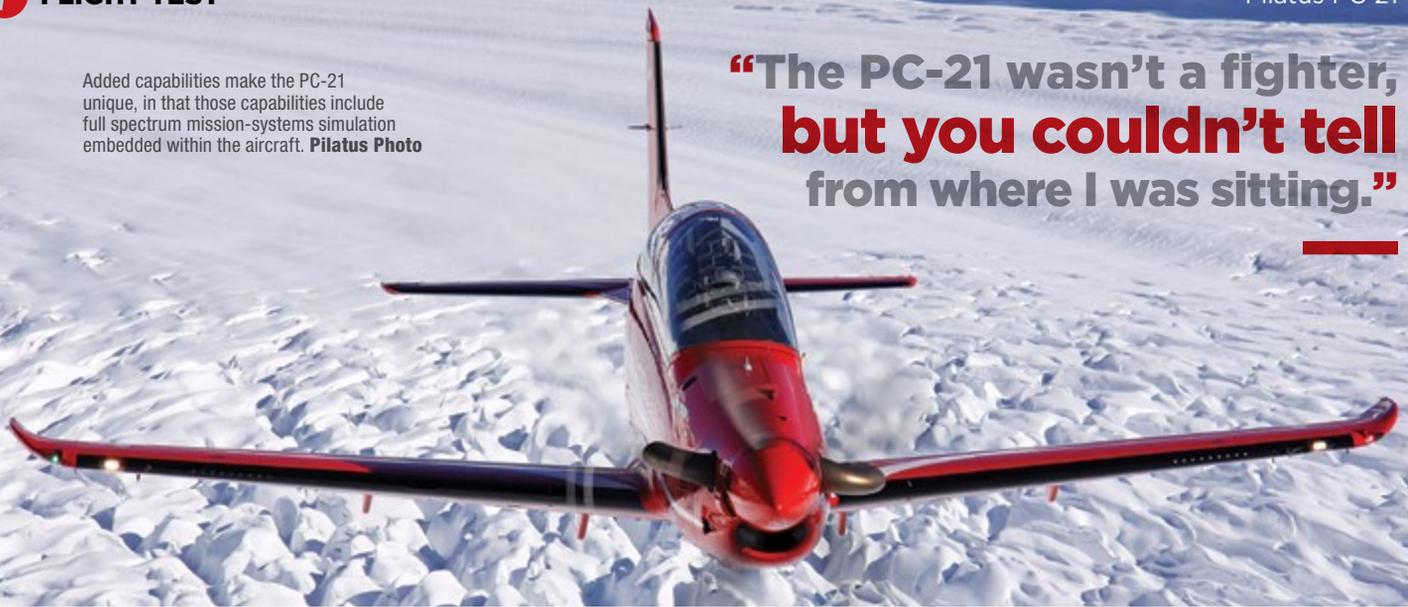
While it scores points on all counts, the “added capabilities” are at the heart of what makes the PC-21 unique, in that those capabilities include full-spectrum mission-systems simulation embedded within the aircraft.

As combat aircraft become more sophisticated, they become easier to *fly*; however, increased complexity of the sensors, weapons, countermeasures and tactics make them similarly harder to *fight*. Introducing tactical systems and



Added capabilities make the PC-21 unique, in that those capabilities include full spectrum mission-systems simulation embedded within the aircraft. **Pilatus Photo**

“The PC-21 wasn’t a fighter, but you couldn’t tell from where I was sitting.”



The comfortable, functional cockpit emulates many of the systems on an F/A-18 fighter. **Pilatus Photo**



Pilatus test pilot Matthew Hartkop familiarized the author with the cockpit. **Debbie Erdos Photo**

procedures early in the training makes sense. The collateral benefit of doing so in a turboprop PC-21 versus an operational combat aircraft also makes economic sense.

Pilatus touts the PC-21 as a trainer that can take an *ab initio* pilot from their first flying lesson through fighter lead-in training. To say I was skeptical is an understatement. In my experience, a trainer that is easy enough for a new student to fly would be ill-suited for advanced air combat training. Similarly, an aircraft with sufficient performance and systems to credibly perform air combat would be too “hot” for a student. Military budget managers might eschew operating multiple types, but no single type would suffice.

Pilatus was eager to prove otherwise. Two sorties were scheduled for my visit. For the first, I would ostensibly be an *ab initio* student. My plan was simply to strap-in and fly the PC-21, reasoning that a good trainer should be sufficiently conventional and forgiving that it shouldn’t present any obstacles to a trained pilot. Admittedly, I learned to fly in an analog environment several decades ago, but that shouldn’t be an impediment, right?

My PC-21 training began in the simulator, a fixed-base device which rep-

licates the aircraft with sufficient fidelity to habituate me to normal procedures, systems and basic handling. An hour in the “box” left me feeling ready to strap in and find the important levers and switches – provided that I had adult supervision. I would fly my first sortie with Pilatus’ experimental test pilot Matthew “Fish” Hartkop, an ex-U.S. Navy F/A-18 pilot.

TEACHING THE FUNDAMENTALS

Strapping into the Martin-Baker ejection seat – survival kit, leg restraints, oxygen hose, G-suit, communications, harnesses – puts one in a tactical frame of mind.

The cockpit layout roughly emulates an F-18, with a heads-up display, three reconfigurable 6x8-inch portrait-style displays and a fighter-style up-front control panel as the interface for avionics and simulated weapons systems. The stick and throttle emulate a fighter’s hands-on-throttle-and-stick (HOTAS) design. The cockpit layout was snug and utilitarian.

Hartkop talked me through the start-up of the digitally controlled engine, and we were ready to taxi in about three minutes.

The mechanical nosewheel steering was tight

and responsive, with only a touch of brake required to regulate speed. The field of view from the front seat through the single-piece canopy was expansive, and I was beginning to think that the PC-21 was no big deal.

Then I opened the throttle. To tame propeller torque, full throttle is scheduled to deliver “just” 1080 HP below 80 knots indicated airspeed (KIAS), increasing to its rated 1600 HP above 200 KIAS. Initial acceleration was brisk behind 1080 HP, and remained strong as we cleaned up landing gear and flaps and accelerated to the scheduled 190 KIAS climb speed, where we were rewarded by a spectacular 3,900 foot-per-minute initial climb rate.

In addition to taming the natural directional instability of a propeller, the speed-scheduled power limits gave the PC-21 the characteristic long slow push of a pure jet, allowing me, as Hartkop put it, to “quickly forget about the propeller.”

Aerobatics are a productive way to get acquainted with a new airplane. Flying in the highly segmented Swiss airspace was a bit like learning to swim in a bathtub! Most of our aerobatics seemed to occur out of necessity as we bounced off the corners of the tiny country, but I was in pilot heaven.



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With 1,600 horsepower, the PC-21 has better power loading than a Second World War Mustang fighter. **Pilatus Photo**



FRIENDLY HANDLING

I found the simple, reversible, mechanical flight controls – with hydraulically-boosted ailerons augmented by roll spoilers – to be light, crisp and predictable. The published maximum roll rate of 200 degrees per second is sufficient to replicate tactical manoeuvring.

Wind-up turns to for ‘g’ displayed a well-balanced stick-force gradient estimated at 10 pounds per ‘g.’ Overall, the control harmony and response of the PC-21 were delightful throughout the flight envelope.

Cruising in slow flight at 95 KIAS in the landing configuration, I did some crisp roll attitude capture tasks, expecting to need copious rudder co-ordination, but the PC-21 rewarded me with cleanly decoupled roll response. The published stalling speed of 81 KIAS makes the PC-21 a fairly hot single-engine airplane, but the stall characteristics in both the clean and landing configuration were entirely benign, with a distinct pitch break at the stall, retaining full lateral control throughout.

Having marvelled at how “unpropeller-like” the airplane was at low speed, Hartkop suggested a similar demonstration at high speed. We shoved the throttle forward, unleashing all 1600 HP as I accelerated at low level up a Swiss alpine valley. I saw 294 KIAS, which equates to an impressive 323 knots true airspeed. With 1,200 pounds usable fuel onboard, low level fuel flow averages 700 pounds per hour. At higher altitudes, Hartkop uses 300 to 400 pounds per hour as a fuel flow rule of thumb.

Retaining a turboprop powerplant is a decision driven by economy, yet the expectation is that students will graduate to fly high-performance tactical jets. That is, the propeller is a training distraction that is ideally transparent to the budding jet pilot.

In an effort to mask its effects, the PC-21 features a sophisticated computerized rudder trim aid device (TAD) that moves the rudder trim tab based on inputs of airspeed, engine torque, angle of attack, and load factor. The trim aid device kept the aircraft co-ordinated as we accelerated, as evidenced by a slow migration of the rudder pedals underfoot, but pilot workload to co-ordinate that big propeller was effectively nil.

Something else I wouldn’t have noticed unless Hartkop mentioned it: the ride. It was like ruffled velvet. The sky around us was a roiling mess of torn cumulus, so I could see that the conditions were turbulent, but the PC-21’s high wing loading gave us a ride that could only be described as “jet-like.”

We returned via a vectored-ILS at the nearby Swiss Air Force base at Emmen, before returning to work the airfield at Stans. Equipped with a glass cockpit, autopilot, dual civil-certified flight management systems, dual inertial reference units, dual GPS and instrument landing system (ILS) receivers, the PC-21 is very well equipped for instrument flight training.

Hartkop let me loose in the circuit, and with his prompting I did a suitable job with several touch-and-go landings, a closed pattern, a flapless approach, and a practice forced landing.

My experiment was to simply strap into the PC-21 and safely take it flying, figuring



Ground simulation facilities are a core part of the overall PC-21 training system. **Pilatus Photo**



Celebrations after the author’s successful first flight. **Debbie Erdos Photo**

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AEROSPACE

those first impressions would reveal any quirks awaiting the new trainee. After about 90 minutes in the front seat of the PC-21, my growing confidence with the aircraft was ample proof of its merits as a trainer.

MEET THE PC-21

Pilatus has been building airplanes since 1939, and is perhaps best known today for the success of its PC-12 single-engine turboprop design. However, it has long been a key player

in the military training market with its PC-7 and PC-9 designs, of which over 800 have been delivered, as well as licensed variants of the PC-9, called the T-6 Texan/Harvard II.

The PC-21 is an entirely new design, although by this point a mature one, having first flown in July 2002. As a trainer, the PC-21 seems exceptionally well equipped, including a heads-up display (HUD), airbrakes, health and usage monitoring system (HUMS), single-point refuelling, cockpit pressurization,

onboard oxygen generating system (OBOGS) and anti-skid brakes. Pilatus claims that the turn-around between flights can be performed in 12 minutes by a single technician.

The aircraft features a single digitally-controlled 1,600 horsepower (HP) Pratt & Whitney Canada PT6A-68B engine that drives a five-blade graphite propeller. For reference, that's a better pounds-per-horsepower ratio (power loading) than a Second World War P-51 Mustang, so rather satisfying performance might be anticipated. It's maximum operating speed (Vmo) is 370 KIAS (0.72 Mach).

PLANNING FOR COMBAT

Our second mission was to demonstrate the PC-21's simulated tactical capabilities in a composite air-to-air and air-to-ground mission. I flew with Pilatus test pilot Reto "Obi" Obrist.

Mission planning requires downloading topographic and tactical data to a removable hard drive, called a "brick." Alternatively, an instructor in either seat in the PC-21 can enhance the scenario by assuming a degree of real-time control of the threat aircraft. It also records DATA for post-flight playback, along with HUD video, cockpit audio, and a reconstruction of all the players in the three-dimensional battle space.

"FOX THREE"

I rode the back seat as Obrist demonstrated how quickly he could make the PC-21 emulate a multi-mission fighter. Using the instructor's pages on the MFD, he "loaded" imaginary missiles onto imaginary rails on our very real aluminum wings, adding a few notional free-fall bombs and some virtual chaff and flares until we were virtually bristling with simulated firepower.

We launched in a two-ship formation of PC-21s, with Hartkop departing first in the "threat" aircraft. Our aircraft split to a distance of about 30 miles and then turned toward each other. Hartkop's aircraft was continually visible on the multi-function display, based on real-time high-bandwidth datalink. Obrist obligingly explained that he had selected a "six bar scan" on the F/A-18 radar emulation. I was quickly recalling that I don't understand fighter pilot talk, but the HUD symbology indicated that a weapon had locked onto Hartkop's aircraft at a range of 16 miles, allowing Obrist to squeeze the trigger.

"Fox 3," he called on the radio, indicating a radar-guided missile shot. Hartkop was dead, sort of, until Obrist "reset" him for the next engagement.

We did four air-to-air engagements. Our first engagement was simply a missile shot, but it let me experience the basic functionality of the F/A-18's AN/APG-73 radar and its associated weapons systems in a very realistic setting. The training scenarios proceeded incrementally.

We set up for another engagement, but this time Hartkop seemed inclined to shoot back. The warning tone of his missile



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Aerobatics are a productive way to get acquainted with a new airplane. Overall, the author found the PC-21's control harmony and response "delightful throughout the flight envelope." **Pilatus Photo**



trying to lock onto our aircraft sent us into a defensive manoeuvre with some additional radar work to widen the sector scan to obtain a weapons lock. Things were getting interesting. On the next, a simulated missile was launched against us, requiring Obrist to employ the radar countermeasures. We survived.

Obrist made no claims about the fidelity of the radar or weapons simulations. The performance and behaviour of the tactical systems relies upon unclassified commercial models of weapons and sensors that Pilatus has integrated into the aircraft.

Exact realism isn't the objective, however. Rather, the goal is effective training. The purpose of the tactical scenarios is to teach the pilot to *behave* appropriately and to do so in a setting where their judgment, timing and skills are critical to the outcome. The only thing missing from complete realism were live warheads.

Interestingly, some simulation models have been modified to enhance training effectiveness. For example, Hartkop explained that in the interest of improved training, the onboard dynamic model of the air-to-air missiles needed to be slowed down to give realistic time-of-flight between turboprop trainers engaging at slower speeds and shorter distances than actual fighter aircraft.

BOMBS WITHOUT THE BOOM

There is a lovely lakeside town south of Stans that needed a bit of friendly bombing, so we split our formation, set the radar to Ground Mode, and set course for the target.

I was impressed by the air-to-air radar simulation capability, but utterly gobsmacked when Obrist selected the air-to-ground mode. The synthetic radar display depicted a pseudo-photographic image of the terrain ahead.

Let's take a moment to appreciate what we were seeing: In the absence of an actual radar, the radar return was simulated; meaning that the software "knew" the shape and texture of the local terrain, "knew" the characteristics of an AN/APG-73 radar beam, including all the fancy features and modes such as Doppler beam sharpening, "knew" where the radar beam was in space, and calculated what the reflected radar image should look like under those conditions. Impressive!

Our navigation system put a waypoint near the target, allowing Obrist to visually identify and update the target designator during our low-level ingress to the target. The HUD guided us through a pop-up manoeuvre to the continually computed release point (CCRP), where it simulated release of the weapon. The PC-21 can simulate – and even score – gun, rocket or bomb delivery.

TAKING SIMULATION AIRBORNE

The PC-21 wasn't a fighter, but you couldn't tell from where I was sitting. Taking stock of the experience, the PC-21 isn't an airplane and it isn't a simulator, but rather combines the best aspects of both to provide a unique training capability.

It can't deliver a weapon, but if the need ever arises the PC-21 can teach you how. **✘**

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GRAND

GRAND PRIZE WINNER | Simon Blakesley



An Alkan Air Ltd. Cessna 208 Caravan demonstrates the power of the Texas Turbines Conversions engine upgrade as it makes a sunrise departure from Schwatka Lake, Yukon.

◀ **Simon Blakesley** is an aviation photographer living in Whitehorse, Yukon. A former Royal Canadian Air Force aircraft technician, Simon continually strives to combine his love of aviation and photography with the Yukon's stunning scenery.



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2019 SKIES

PHOTO CONTEST

It's time for our favourite issue of the year! We're excited to share the results of our 6th annual Skies Photo Contest, which attracted close to 1,200 entries across three categories – General Aviation, Commercial and Military – submitted by talented photographers across the country.

This year's entries showcased the full scope of Canadian aviation, from single-engine training airplanes to giant Royal Canadian Air Force transport aircraft.

The Skies Photo Contest was open to both amateur and professional Canadian photographers over the age of 18. Once the contest closed on Nov. 1, the *Skies* team had the difficult task of narrowing down the entries in each category.

Then, we called in our seven contest sponsors. Representatives from Columbia Aircraft Sales Inc., Daher, FlightPath International, Innotech-Exeaire, Levaero Aviation Group, Lockheed Martin Canada and Universal Avionics voted for their favourite photos in each category, as did MHM Publishing staff.

As you'll see on the cover and here on this spread, our 2019 Grand Prize goes to photographer Simon Blakesley. Congrats, Simon!

The first, second and third place winners in each of the three categories appear on the following pages. While it's impossible to print all of the incredible photos we received, we hope you enjoy the winning entries. For a selection of honourable mentions, please see our digital edition at www.skiesmag.com/issues/.

The *Skies* team thanks all photographers for their submissions. Of course, we also recognize and thank our contest sponsors for supporting the 6th annual Skies Photo Contest. **✈**

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The CL-415 was part of the Aero Gatineau-Ottawa airshow in September 2019. The day was overcast with sunny breaks and the aircrew opted to do two drops due to the crowd being so spread out. This shot was the first drop, and was taken using a Nikon D500 coupled to a Sigma 150-600mm lens at 240 mm, ISO 125, F 11 at 1/320 sec.

◀ **Andre Laviolette** is a retired RCAF member and AME who has been working on warbirds for Vintech Aero at Vintage Wings of Canada for the last 12 years. He has spent most of his adult life around aircraft and has loved dabbling in photography since the mid-1980s.



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Québec

C-GQBF



Dave Hewitt displays the "Canadian Queen," his 1952 ex-Royal Canadian Air Force Beechcraft Expeditor 3NM (s/n 1552), over Toronto during the Canadian International Air Show. Equipped with an airshow smoke system, Hewitt displays the vintage transport at several events across Canada and the United States.

◀ **Eric Dumigan** is a photographer based in Southwestern Ontario who specializes in aviation photography. His family photo collection dates back three generations.



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ROYAL CANADIAN AIR FORCE





The carrier-based F4U Corsair stretches its wings during a night run up at Thunder Over Michigan.

◀ **Joe Letourneau** is a private pilot, radio control aircraft enthusiast, engineer, entrepreneur and experienced photographer from Brantford, Ont. He has been shooting airshows internationally for over 20 years and photographing everything else since an early age.



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21



An Air Canada Boeing 787-9 Dreamliner arrives at Calgary from London Heathrow during a lovely fall afternoon. This happens to be one of my favourite shots in recent times due to the rear perspective before touchdown.

◀ **Rinat Haque** says he is the kind of avgeek that has jet engine sounds playing in his room while he sleeps. As an aviation photographer, his goal is to capture the beauties of the skies from different perspectives.



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SECOND



I have been chasing this one for a while. I used a photography/celestial app to pinpoint the full harvest moonrise and then determined spotting locations that would line up the fairly quick moonrise with the 3° glide path of this Boeing 787 Dreamliner, on approach to runway 24R at Los Angeles International Airport. Shot in October 2019.

◀ **Maciej "Match" Hatta** is a Prairie-based RCAF pilot with 3,000 hours on military jet aircraft, including fighter, Snowbirds and instructor tours on the CF-188, CT-114 and CT-155. In his spare time, he strives to inspire future aviation generations with his creative passion for aviation video and photography.



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An Air Canada Boeing 787 Dreamliner on final for Toronto Pearson, highlighting the iconic Air Canada roundel on both the belly and the distinctive chevrons nacelle. Reflected on the engine are Airport Road, a popular locale for spotters, and the aircraft itself.



John Chung is an aerospace engineer from Toronto, whose passion for flight was nurtured from childhood with the support of his family. When not designing airplanes or spacecraft, John expresses his love for them through his hobbies of photography and scale modelling. John believes the soul of a subject is in the details, which he strives to encapsulate in his work.



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Two CT-155 Hawks from 419 Tactical Fighter Training Squadron pose while breaking formation after completing tactical exercises. This photo was shot during a training mission while on winter deployment to Naval Air Facility El Centro, Calif., in October 2018.

Maciej “Match” Hatta is a Prairie-based RCAF pilot with 3,000 hours on military jet aircraft, including fighter, Snowbirds and instructor tours on the CF-188, CT-114 and CT-155. In his spare time, he strives to inspire future aviation generations with his creative passion for aviation video and photography.

Editor's note: Maciej has asked Skies Magazine to donate the prize money associated with this winning photo to Soldier On, a Canadian Armed Forces Transition Group program that supports veterans and serving members to adapt and overcome permanent physical or mental health injury or illness.



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The Royal Air Force Red Arrows perform at the Aero Gatineau-Ottawa airshow on a beautiful August afternoon. This image holds a special place in my heart as my father and I solidified making fourth-generation avgeeks out of my two teenage boys!

◀ **Julie Sturrock** is a Montreal-based third generation aviation aficionado who spends much of her summer vacation days at airshows. In her spare time, she can be found along the runways of YUL or YYZ, and she always carves some plane spotting time into her travels.



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THIRD



As the day ends for most people, it is just beginning for the crew of this RCAF CC-177 Globemaster III. They can be seen here on final for a touch-and-go in Trenton.

◀ **Galen Burrows** lives in Trenton, Ont., where he works as a paramedic and holds a commercial pilot's licence. He enjoys aviation and landscape photography in his free time.



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HONOURABLE MENTIONS



Keith Ewenson Photo





Thomas Cousins Photo





Simon Blakesley Photo





Adam Tetzlaff Photo





Jean-Phillipe Richard Photo





Andrew Dougall Photo





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D A R K

In a fighter procurement program that will be evaluated on capability, cost and economic return to Canada, Saab firmly believes it has a compelling offer to make.

BY CHRIS THATCHER | PHOTOS COURTESY OF SAAB



If you have been following the convoluted process of replacing Canada's aging fleet of CF-188 fighter jets, the continued presence of the Saab Gripen E might seem puzzling in a competition that has seen both Dassault Aviation and Airbus Defence and Space withdraw their entrants.

The Gripen has been mocked as too small by some critics and less capable than the Lockheed Martin F-35 Lightning II or Boeing F/A-18E/F Super Hornet, the

remaining competitors, by others. It's also, perhaps ironically given the many concerns raised about the F-35, the only fighter still in development and not yet operational.

But to dismiss the single-engine Gripen E as merely a longshot might be a mistake. Because in a project that will be evaluated on capability, cost and economic return to Canada, Saab firmly believes it has a compelling offer to make.

Some of the reasons for that belief became evident when *Skies* recently toured Saab's pro-

duction facilities in Linköping, Sweden, and visited air wings and operational bases where the Gripen C is deployed by the Swedish Air Force and NATO customers to monitor and interdict Russian aircraft skirting, and at times breaching, domestic airspace.

The Gripen was purpose-built for Swedish national defence, but its missions of quick reaction alert (QRA) defensive counter-air along Sweden's borders and offensive roles during, for example, NATO's Operation Unified Protector over Libya in 2011, would

HORSE



Two of Saab's three flying Gripen E test aircraft, 39-9 and 39-10. The test program of four aircraft has accumulated over 150 hours.

look familiar to any Canadian CF-188 Hornet pilot. So, too, would the modest defence budget with which it was procured.

And in a Canadian defence procurement system where access to intellectual property (IP) is deemed essential to long-term in-service support and technology upgrades, Saab has demonstrated an approach to foreign sales that can include the wholesale transfer of IP to sustain the aircraft and a commitment to share and invest the knowledge behind that IP with indigenous industry.

To appreciate the strengths of the Gripen, it helps to understand the origins of Saab. An abbreviation for Swedish Aircraft Company, the business is the direct result of an agreement with the Swedish government over 80 years ago to start an aircraft manufacturing company with the sole purpose of being able “to protect Sweden’s borders and people,” explained Jerker Ahlqvist, deputy head of Business Area Aeronautics.

Vastly outnumbered by Russian fighter jets and strategic bombers that reside in

Kaliningrad, a short distance from its southern border, Sweden has relied on tactical superiority to achieve combat effectiveness, deploying some of the first datalinks and electronic warfare systems in its fighters, starting with the Saab 35 Draken and more recently the 37 Viggen. That combination of aircraft combat performance, pilot tactics, cost and availability were all baked into the JAS 39 Gripen, said Ahlqvist.

“It is not something you can start to think of once you have designed your fighter.



It needs to be part of the design criteria from the beginning,” he said.

And that philosophy has carried over into the Gripen E, what Ahlqvist called “an even smarter” system of integrated systems. The fighter has two customers at present—Sweden will begin with 60 and Brazil is acquiring 36, eight in the twin-seat F variant—but the aircraft is a contender in at least three fighter replacement competitions globally.

However, unlike the F-16s, F-18s, F-35s and other jets it is up against, the Gripen E is not yet in service. The test program of four aircraft has accumulated over 150 hours, a majority of those in 2019, achieved 9Gs, broken the Gripen speed record in level flight, validated new flight control software, sensors and electronic warfare systems, conducted a test flight with a new electronic attack jammer pod, flown with the MBDA Meteor beyond-visual-range air-to-air missile, and fired the short-range IRIS-T air-to-air missile. Brazil accepted its first flight test aircraft in September and expects to take delivery of its first operational aircraft in 2021.

INVESTING IN SUPERIOR TECHNOLOGY

The enhanced capability of the Gripen E furthers a combat DNA intended to meet an operating environment the Swedish Air Force regards as cluttered, contested, connected, constrained and congested with advanced fighters and air defence systems.

“The Russian QRA behaviour has been changing in the last three to four years. There is more aggressive flying,” explained Col Anders Persson, commander Air Staff.

Russian Sukhoi Su-35, 34 and 27 fighters have frequently flown to within 10 metres of Swedish aircraft in the past 24 months and, in what he said was “a signal to us” earlier this year, a Russian signals intelligence (SIGINT) aircraft escorted by two fighters flew inside Swedish airspace for a minute. “That had never happened before in Swedish airspace. A fighter, yes, a SIGINT, yes, but never a SIGINT escorted.”

A Swedish defence white paper in May concluded Russian capability and activity, in par-

ticular electronic warfare (EW), will continue to increase, necessitating investment in superior technology and tactics. “You are superior in technology if you use the technology in the right way,” Persson emphasized.

As with its predecessors, the Gripen E aims to detect and disrupt threats earlier in the kill chain through an improved avionics system that fuses data from an Active Electronically-Scanned Array (AESA) radar system on a washplate, a passive infrared search and track (IRST) sensor, a tailored datalink and an enhanced EW system, explained Jonas Hjelm, senior vice-president and head of Business Area Aeronautics.

As part of the test program, Saab is trialing what it calls Multi-Functional System EW, part of its Arexis family of airborne EW systems, that incorporates ultra-wide-band digital receivers, gallium nitride (GaN) AESA transmitters, digital radio frequency memory (DRFM) devices, precision direction finding and localization, and stealth-enabled countermeasure systems. The onboard signals and data processing are



Gripen E test aircraft 39-8 carries the MBDA Meteor beyond-visual-range air-to-air missile.

further enhanced by artificial intelligence and machine learning algorithms.

The result is far better situational awareness in the cockpit. Ahlqvist described an OODA (observe, orient, decide, act) loop informed by an electronic support measures system in which the pilot is “quicker to see, quicker to understand, quicker to decide, quicker to act and quicker to adapt. With all the sensors on board, with the data analysis on board ... the aircraft will suggest what he should do, so he will be quicker to act.”

Through datalinks, which Saab has been developing and employing for over 30 years, “a couple of Gripens can do magic just because of the way the datalink is used,” he said.

While the debate about stealth may feature prominently in the Canadian competition, Saab sees no long-term value in building for short-term stealth. “If you build an airframe with a stealthy design, there are other things you can’t do with that aircraft,” observed Ahlqvist. “We have created another way by, for instance, putting in a very capable electronic warfare system that can make the aircraft invisible.”

“Stealth is much more than the radar cross section,” added Patrick Palmer, executive vice-president and head of Marketing and Sales for Saab Canada. “That is a perishable commodity as technology evolves. Ten years from now, the technology in terms of radar capability will be far more advanced than it is today. What this allows us to do is provide that upgradability, to be forever responding to whatever those new threats are.”

Instead, the goal for the Gripen is to be a “true multi-function aircraft in all aspects,” said Persson. As adversaries advance anti-access/area denial weapon systems and their own stealth capabilities, EW and datalinks for passive sensing and silent networking are an operational necessity to share target information between aircraft. “As soon as we take off, the jamming [from Russia] starts,” he said.

Those onboard systems are “a huge difference maker” for the multi-function Gripen E, said Mikael Olsson, Saab’s chief test pilot. “It is purposely designed for what you see around Sweden (such as the Russian S-400 anti-aircraft system in Kaliningrad). That is what it is designed to counter.”

Saab is “building the aircraft around the pilot,” observed BGen Csaba Ugrik, commander of Hungary’s recent Baltic NATO air policing mission in Lithuania, of the systems and human-machine interface

“The vision was program in the morning, fly in the afternoon.”

The Gripen E was designed to counter the threats of Russian aircraft and anti-aircraft systems near Sweden’s borders, said Saab’s chief test pilot Mikael Olsson.





in the cockpit. Based at Šiauliai Air Base, Hungary served as lead nation for a three-month rotation from May through August, operating five JAS 39 Gripen C and D aircraft, augmented by Spanish F-18s and United Kingdom Eurofighter Typhoons at Ämari Air Base in Estonia.

Over that time, the Hungarians conducted more than 400 sorties, over 40 of which were actual (Alpha) scrambles in response to Russian Tupolov, Antonov and Sukhoi transports, bombers and fighters, including the Tupolev Tu-142 maritime reconnaissance and anti-submarine warfare aircraft, transiting to Kaliningrad or flying over the Baltic Sea. "If they don't want to see us too close to the aircraft, they are doing manoeuvres," he noted.

Consequently, the Gripen Link 16 datalink was critical to ensuring situational awareness. "If you are running the APU here and you turn on the Link 16, you will have the information already on the ground, and you can move the maps and see what is going on 300 kilometres away... and you can prepare for the fight," he said. "That is a good advantage of the aircraft."

Capt David Szentiendrei, a graduate of the NATO Flying Training in Canada program in 2012, said the Gripen worked well with non-NATO fighters and excelled at maintaining and sharing situational information fused from its sensor suite.

Both Airbus and Dassault withdrew from the Canadian fighter competition citing, in part, their concerns about the NORAD

security requirements and the need for Two Eyes (United States and Canada) interoperability. Though Sweden is not a member of NATO, Saab has designed the Gripen to meet Sweden's requirement to be fully interoperable with NATO, and in particular with the U.S., working on same or similar datalinks. "We have our own mission planning but the data format transfers into the NATO system," said Persson.

With the technology behind onboard sensor systems poised to change almost as rapidly as the applications in a smartphone, Saab has attempted to "future proof" the Gripen by designing the avionics "in such a way where the software is more or less hardware independent," said Ahlqvist. "The threat environment changes quickly and you will need to make



Brazil accepted the first of its flight test aircraft in September 2019 and expects to take delivery of its first operational aircraft in 2021.



The Gripen E tests its ability to jettison a drop tank.



changes in a much faster way than you have done in the past. Gripen E allows for that.”

By separating the hardware layer from the software layer, and the flight critical applications from the mission critical or tactical, “we are ready for novel algorithms like artificial intelligence in the future,” explained Johan Segertoft of Saab, noting that even in the development phase of the E model, multiple software changes were required because computing power improved during that span.

“This is a major problem in a fighter jet,” he observed, adding that the exponential increases in computing power make it difficult to predict how technology will be affected. “Computer power translates to tactical power...[T]he key is how you harness the evolution of computing power.”



A Gripen E fires off the short range IRIS-T air-to-air guided missile.



Rather than invest specifically in stealth, Saab has developed sensors and electronic warfare capabilities to make the Gripen E difficult to detect.

The separation of church and state also means that every change no longer requires re-testing and certification. “The vision was, program in the morning, fly in the afternoon,” he added. “You can code once and deploy everywhere. We can now do a change in a matter of days.”

KNOWLEDGE TRANSFER

From the outset, Saab built the Gripen E with international customers in mind. And it has demonstrated a willingness to transfer technology in a manner that might seem unusual to some. Besides Sweden, four countries currently operate the Gripen C — South Africa, Czech Republic, Hungary and Thailand (the U.K. Empire Test Pilots’ School also uses the platform). But as the first foreign customer for the Gripen E, Brazil provides an interesting case study on how that technology and knowledge transfer could work.

“One of the aspects that makes us unique is our willingness and ability to share technology,” said Mikael Franzén, vice-president and head of the Gripen Brazil business unit. “We understand the importance of national industry and national independence.”

Saab has recognized IP without knowledge has limited value. Under a “train the trainer” model over a 10-year period, 350 professionals from local partner companies and the Brazilian Air Force will receive theoretical and on-the-job training in Sweden for anywhere from six months to two years. Already, over 190 Brazilians have completed their technology transfer program and are now working on teams in the Gripen Design and Development Network.

The offer to Canada would be similar, said Palmer. “This illustrates what the realm of the possible is. In the case of Brazil, they had a very specific focus in terms of what they wanted to accomplish from a [technology transfer] perspective ... [We] will be completely responsive to the RFP. We have been working with suppliers and partners in Canada for the last 24 months or so, and we will have a very attractive proposition.”

He acknowledged that one of the strengths of the current CF-188 sustainment program was early engagement with Canadian industry and access to IP. “Our vision is to have companies and capability early in the process so that you don’t have this huge wall at the end where you are not able to get over it.”

Whether that willingness to transfer critical IP negates any of the concerns raised by the NORAD security requirements remains to be seen. But Palmer said Two Eyes interoperability is not a technical issue, but rather a process and procedure challenge. “We see it more as where is that data going, what is it touching, who has access to it, and how is that controlled.”

No discussion of fighter jets would be complete without an attempt to pin down costs. Comparing price tags is problematic

“If there is a feature Saab hopes might intrigue Canadians, it’s the Gripen’s ability to operate in Arctic conditions.”

because different companies and countries often use different metrics to define unit flyaway costs, cost per flight hour and long-term sustainment. Saab officials were coy about an exact number, but the sale of 36 Gripen E/F aircraft to Brazil, including related systems, support and equipment, was valued at around US\$4.5 billion.

“I think it is a fact that we are the most cost-efficient solution,” said Eddy De La Motte, vice-president and head of the Gripen E/F business unit. “That goes both for acquisition and flight hour costs.”

If there is a feature Saab hopes might intrigue Canadians, it’s the Gripen’s ability to operate in Arctic conditions. Sweden’s most northern air base is above the Arctic Circle, so the Gripen “was designed from the beginning to cope with very cold conditions and to be operated with no hangars in open airfields, short takeoff and landing on ordinary roads, even in winter time,” said Ahlqvist.

It’s an operating concept that has been in place since the country first introduced fighter jets. In fact, the Gripen can operate from an 800-metre road that is just 17 metres wide, and can be refuelled, rearmed and checked in under 10 minutes by a team of five conscript soldiers and a technician. More impressive, with just a few more personnel, a small team can replace an engine in one hour in the same frigid conditions.

And it is something that the Swedish air force regularly trains. “Every time we have an exercise, we [operate] on dispersed basing,” assured Persson. 🇸🇪



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

Cultivating ORGANIC GROWTH

True to its name, Spectrum Airways offers a broad range of flight training services – with the added bonus of an onsite approved maintenance organization, Kovachik Aircraft Services.

► BY LISA GORDON | PHOTOS BY DAWSON HAGENS

Spectrum Airways has recently recorded a steady increase in enrollments. In 2018, it accepted 33 new students in the first three months of the year. In the same time period this year, the school enrolled 79 new students.

Tucked away in the countryside near Milton, Ont., is busy Burlington Airpark (CZBA), a privately-operated airport founded by Vic Kovachik in 1962.

Kovachik, an aircraft maintenance engineer (AME) who was working at Orenda Engines Limited in nearby Milton, Ont., bought a 144-acre parcel of land on Bell School Line and built a runway and a hangar.

As the saying goes, once it was built, they started coming.

Small aircraft would fly into the approved maintenance organization (AMO) for service. By 1967, Kovachik Aircraft Services was so busy that its founder quit his day job and hired an apprentice to help him out.

That apprentice, Vern Stutt, would go on

to serve Kovachik Aircraft Services for half a century, retiring just two years ago in 2017. As the company's first full-time employee, he saw a lot of change through his five decades at CZBA.

ALL IN THE FAMILY

From the moment it was founded, Burlington Airpark has been a family affair. Founder Vic Kovachik passed the reins along to son Paul; he in turn ceded the managerial role to his son, Chris, who is the current president.

Over the past 57 years, change has left its mark on the airfield.

The AMO grew steadily. The year 1982 was a big one for Burlington Airpark, as the runway – which was originally on the northwest side of the airport near the

maintenance facility – was moved to the present-day location of Runway 14/32.

That same year, Kovachik Aircraft Services took over the small flying school that had been operating at the airfield. It was rebranded Spectrum Airways and managed by Paul Kovachik, also an AME and a private pilot.

Today, Kovachik Aircraft Services is a busy AMO, operating from 40,000 square feet of total hangar space at CZBA, which includes two maintenance buildings plus a hangar for the Spectrum Airways aircraft it maintains.

Burlington Airpark itself is home to 150 hangars that house a variety of private and commercial operators. Traffic at the airfield is steady and includes medevac flights, charters and flight school activity.



Spectrum operates a fleet of 13 aircraft, including three Cessna 152s, five Cessna 172s, four Piper PA-28 Warriors, and a twin-engine Piper PA-34 Seneca. Last year, the combined fleet flew a total of 14,000 hours.



RUNNING AT CAPACITY

From its early days as a “mom and pop” recreational flying school, Spectrum Airways has cultivated careful, measured growth. Today, it employs 16 flight instructors and operates a fleet of 13 aircraft, including three Cessna 152s, five Cessna 172s, four Piper PA-28 Warriors, and a twin-engine Piper PA-34 Seneca. Last year, the combined fleet flew a total of 14,000 hours.

Seven years ago, Spectrum also purchased a Redbird FMX1000 “full motion experience” simulator, which can be configured for three kinds of aircraft: a Cessna 172R, a Piper Seneca II, and a Beech Baron with Garmin G1000 glass cockpit. The device has been approved by Transport Canada for use during instrument proficiency checks (IPCs).

Lastly, the school offers a Precision Flight Controls Cirrus II desktop trainer that is used for instrument procedure practice.

Spectrum’s 3,000 square feet of office space includes a 22-seat groundschool classroom that is full each time a new class begins.

General manager John Gioseffi said Spectrum offers everything from recreational pilot permit training to commercial pilot licence, multi-engine instrument, VFR over-the-top, night ratings and instructor ratings.

Currently, the school is training about 90 active commercial students, with a total of 930 customers in its online booking system, which includes recreational renters.

As a registered private career college and a designated learning institution with Immigration Canada, Spectrum also attracts

a fair number of foreign students.

“We have about 25 active foreign students, and that number is growing every day,” said John Gioseffi. “We are a designated learning institution, so we are one of the flight schools that is able to accept foreign students.”

Most of those students come from India, China, the U.K., Nigeria and the Caribbean. Currently, Spectrum trains them on an *ad hoc* basis, meaning there are no structured intakes for foreign students.

The school’s rural location and the lack of public transit do pose some logistical challenges, although the school has made local homestay arrangements. But still, students keep coming.

“It’s tough to pre-plan foreign classes as



“We’re like a farm team – we know people are going to move on. So, we want to provide them with **a good environment where they want to be,** and keep them as long as possible.”



Currently, the school is training about 90 active commercial students, with a total of 930 customers in its online booking system, which includes recreational renters.

a smaller organization,” admitted Chris Kovachik, president and owner. “We are already at capacity as far as airplanes and students go.”

In 2018, Spectrum enrolled 33 new students in the first three months of the year. In the same time period this year, the school accepted 79 new students. Increasingly, more of them are women.

Chief pilot and chief flight instructor Dennis Simo said that despite its significant growth, the school has managed to avoid implementing a waiting list – so far.

“One of the reports from the 2018 ATAC [Air Transport Association of Canada annual conference] was how many flight schools have waiting lists and how long those lists are,” he told *Skies*. “One of the worries of the

waiting list concept to me is that there will be a lot of potentially good students buried somewhere deep inside that list. They might get frustrated and go somewhere else.”

Kovachik agreed that the focus is on keeping good students engaged.

“We’re trying to avoid a waiting list and have other ways to vet the students,” he commented. “We want to keep the people who are engaged and active, but vet out the ones who are not committed. So, we’re moving away from mom and pop to a more professional orientation.”

FIELDING THE FARM TEAM

Spectrum Airways has a vested interest in encouraging the best students. The school typically hires about 60 per cent of its instruc-

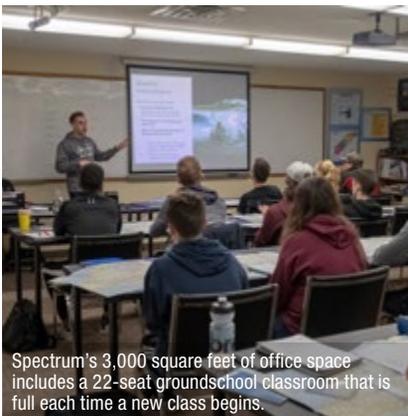
tor rating graduates. In today’s tight labour market where flight instructors are scarce, “growing your own” helps schools survive.

“As an organization, we’re not just looking at them as customers,” said Kovachik. “We’re looking at them as potential employees as well. Four years ago, we decided that instead of doing an outside hire, we would do our best to hire the people we’re bringing through. They come on as ramp and desk staff, and then through as instructors. Some are even bonded for 22 months; in exchange for the bond we cover the costs of the instructor rating.”

Sometimes, an older person looking for a career change is the best candidate for an instructor rating, and Spectrum hones in on those individuals.



Behind the scenes in the maintenance department at Burlington Airpark. Owner and AME Chris Kovachik recently expanded by purchasing Lawrence Aero in Parry Sound. He is considering establishing a school there, too.



Spectrum's 3,000 square feet of office space includes a 22-seat ground school classroom that is full each time a new class begins.

“We’re trying to get people to do this as a second career,” said Simo, who has been flying out of CZBA since 1984. “We are targeting older people who have retired from other sectors. They enjoy flying and love to teach.”

While Class IV instructors are still trickling through the pipeline, Class I and II instructors are a rare breed these days – but you can’t run a flight school without one.

“Our hope with these career instructors is that they will over time move up to higher classes,” continued Simo. “It’s important to have them because they can supervise the Class IVs.”

While it’s difficult to find and keep good flight instructors – who these days are enticed away by larger operators – Kovachik said it’s also exciting because the industry is moving faster than ever.

“New people are coming through the door. We just have to find a way to manage that turnover. We’re like a farm team – we know people are going to move on. So, we want to provide them with a good environment where they want to be, and keep them as long as possible.”

It’s the same over at the AMO, where Kovachik Aircraft Services is also feeling the pinch of a tight labour market.

“I’m an AME; the pilot shortage doesn’t even touch the pending AME shortage,” said Kovachik. “You’re not seeing the grads come

out of the schools any more. We have to pay more for AMEs to come in; then our rates have to go up.”

Like the flying school, the maintenance operation aims to grow its own apprentices. Kovachik admits he’s learned how important it is to keep good people happy.

“You have to be proactive with that now.”

It’s hard for smaller operations to compete with the airlines, so both the flying school and the maintenance shop have had to be creative.

“We offer flexible shift hours in addition to money. Our maintenance department is busy. If you like a challenge, we can offer that,” said Kovachik.

Simo added that Spectrum’s professional yet casual environment is appealing and staff enjoy coming to work.

BEARING THE BURDEN

Ultimately, said Kovachik, the federal government recognizes the pilot and AME shortage and needs to do something about it.

“We’re not looking for a handout, but everyone needs to get on the same page.”

Simo agreed, adding that if flight training were on par with every other type of educational process, it would be helpful.

“A small flight school isn’t the big presence; aviation doesn’t have that same sort of public attachment as being a doctor, lawyer or engineer,” he said.



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With limited staffing resources, Spectrum feels the weight of the regulatory burden it must bear. Not only must it comply with Transport Canada regulations, but it also needs to jump through significant hoops to maintain its status as a private career college.

“You need to do a lot of paperwork. When you’re one person in a small business trying to do all that, it’s really difficult,” said Gioseffi.

It’s an added requirement that translates into higher fees for customers, added Kovachik.

“When people ask why we have to raise rates, that’s why. We pay \$30,000 a year in accounting fees. There are follow-on effects, too.”

Aside from regulations, the booming training market has presented other hurdles. New training aircraft are expensive and good used options are scarce. Recently, Spectrum bought one that needs work and tasked Kovachik Aircraft Services with bringing it up to par.

“All the flight schools say they can’t keep up with domestic demand,” Gioseffi stated. “We need airplanes, instructors, AMEs.

We can’t get airplanes because the prices are astronomical; so, as a small business, how do you afford to purchase that airplane? You look to leasing, but then you’re cutting into your margins. We need to get the banks on board to provide funding. There’s a lot that needs to change.”

PLANNING FOR THE FUTURE

Spectrum Airways and Kovachik Aircraft Services will always subscribe to the steady growth plan that has served them well.

“We grow organically at a measured pace,” said Simo. “The big problem here is the ability to react quickly. You can’t just get more instructors, more airplanes all of a sudden. Even this office – we sometimes need more space.”

With the demand for maintenance services increasing, Chris Kovachik seized the opportunity for expansion in 2018, when he purchased Lawrence Aero at the Parry Sound Area Municipal Airport (CNK4). The new satellite base offers full maintenance services for land- and water-based aircraft.

Over the summer months, any Spectrum Airways aircraft that needs major repairs will have the work done at the 7,000-square-foot Parry Sound facility.

Down the road, Kovachik – who has already moved his family to Muskoka and commutes back to Burlington as needed – hasn’t ruled out establishing a school up north.

“We’re exploring the options,” he said.

“Can we move? The municipality is much more supportive. It opens the doors to take on maybe more international students and house them, etc.”

Gioseffi said Spectrum is not losing sight of international markets.

“Aviation is affected by recessions and

the financial outlook of the country,” he commented. “If that turns, the international markets seem to provide a steady influx of students. One of the things we can look at is moving to an integrated program, and offering that with a college tie-up.”

Meanwhile, the school is trying to tap into the domestic market by educating local high school students and guidance counsellors about aviation careers.

“My personal peeve is we haven’t done enough to encourage the local domestic market,” said Simo. “I think there is a lot of untapped capacity out there. This is an industry that has a real cool factor to it, but nobody talks about it.”

Simo, who originally dreamed of becoming an airline pilot, said that in hindsight, flight training is more rewarding.

“This job is never the same,” he said.

“Every day is different. I live seven minutes up the road from here, and the one thing I’ve noticed is that ever since I’ve gotten involved in aviation, I’ve never needed an alarm clock. I’ve never slept in for anything involving aviation.

“Facilitating peoples’ dreams is very cool.”



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

A large, modern hangar with a grey metal exterior and a dark roof. The hangar has a sign that reads "KOVACHIK Aircraft Services Ltd." in white letters on a dark background. In front of the hangar, two small, white and blue aircraft are parked on a gravel surface. The aircraft on the left has the registration "SKOV" and the aircraft on the right has "C-FGMM". A person is standing near the aircraft on the right, and a red tractor is visible in the background on the right side. The sky is clear and blue.

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AGFT provides a full range of fuel farm services, including maintenance and inspections after installation.

AGFT: From the ground



Aviation Ground Fueling Technologies' expertise and focus on the aviation sector have helped the company carve a name for itself within the industry.

► **BY ROBERT WILLIAMSON**
PHOTOS COURTESY OF AGFT



From coast to coast, aviation fueling is a key component in the chain of flight operations, and it's important that those responsible for a successful operation are specialists in their field. Aviation Ground Fueling Technologies (AGFT) is just that – an industry specialist with a strict focus on aviation.

With three offices spread across Canada – in Delta, B.C.; Edmonton, Alta.; and Cambridge, Ont. – and plenty of mobile employees, the company is well suited to

meet the needs of any location looking to either install or continually maintain a fuel farm system.

Along with installation, the company offers any fuel farm component susceptible to operational wear such as nozzles, hoses or filter cartridges. Pair this with the company's expertise and the result is “a full life-cycle solution service provider in design, engineering, turnkey fabrication, commissioning, maintenance and inspections to keep systems fully operational,”

Kelsey Smart, AGFT's marketing communications manager, told *Skies*.

Since its inception in 2011, AGFT has seen exponential growth built on the back of the team's expertise and a focus that offers a “precise understanding of the industry, allowing it to deliver solutions specific to the unique and changing needs of the customer,” said Smart.

In the past five years, AGFT has grown from a little over 100 customers to 438 total customers in 2018 – a 29 per cent



The system AGFT installed for Chartright Air Group at the Region of Waterloo International Airport included two 60,000 litre tanks and a defuel tank.



An AGFT employee conducts a control valve repair for one of the company's fuel farms.



Shown here are the control and metering components of a transloading system installed by AGFT.

increase over the span. This growth is a direct result of the company's focus on and knowledge of aviation, according to AGFT's general manager, Ted Chow.

"We specialize in aviation, and that's what the difference is," he explained. "We're a one-stop shop for aviation ground fuelling products."

AGFT's offerings include services, parts and system-based solutions to "enhance customer facility projects and day-to-day operations," as Smart put it.

After recognizing the need for a company with a specialization in aviation fuel systems and parts, AGFT was born. The relationships the company has developed through the years have garnered partnerships with industry-leading suppliers that include ContiTech, Facet and Eaton. These relationships have allowed the company to diversify, improve product quality, and expand its distribution network to a national level.

Getting to this point, AGFT had to be flexible – due to the team's knowledge and experi-

ence in the aviation industry it is able to offer custom solutions "relative to market conditions and operational excellence, along with application and regulatory requirements," said Smart.

"What differentiates us from our competitors is that we are a knowledge-based company," she continued. "Our expertise has contributed to steadily improve our performance and journey to earning a reputation for upstanding services and products."

The team's expertise has allowed the company to work with customers to develop ground fuelling support services that include system maintenance, VK [visual and leak] testing, and metre proving, along with ground support equipment (GSE) maintenance out of its Calgary and Edmonton locations.

"It's really all about the people," Chow said, echoing the thought. "I think we have [well over] 50 years of experience in this organization."

The people Chow is referring to are Ron Szepesy, who manages fuel system building

operations, repairs or anything technical, and who has been in the business for three decades; Vic Kadar, AGFT's manager of Eastern Operations, who has been in the business for over 35 years and previously ran his own filtration service company; and Steve Peitz, a supervisor who has been in the aviation fuel sector for 15 years.

That team's know-how has afforded AGFT the ability to be fluid and flexible, to get creative with projects that require it.

"Every system is customized and engineered to the customer's needs," said Szepesy. "We can build a fuel system for any flow rate that is needed. We try not to sell the customer any more than they need, but we want to make sure they get what they want."

"All of our projects are unique, and all have different solutions. What is important is that we have the experience to show the customer what will work and what their options are when we design a project from scratch and go over every detail with the customer until they are satisfied," he continued.



AGFT's know-how led the company to develop services that include system maintenance, VK testing and metre proving, along with ground support equipment maintenance out of its Calgary and Edmonton locations.

“Since its inception in 2011, **AGFT has seen exponential growth** attributed to its expertise and precise understanding of the industry.”



AGFT supplies any fuel farm component susceptible to operational wear such as nozzles, hoses or filter cartridges.

A project AGFT completed in 2016 was a transloading system designed for a client to include the capabilities of dispensing fuel into a truck or directly into aircraft. A challenge that arose with the project was that the fuel tank needed to be large enough to maximize fuel delivery capabilities by receiving full loads, which in turn would reduce transport costs due to split orders, yet remain mobile. The AGFT team was able to come up with a system that is compact enough to be moved via a flat-deck trailer, yet large enough to hold the fuel required to avoid split orders and higher costs.

Added Szepeszy: “The previous system had a filter that was underperforming in flow rate for what they needed. AGFT was able to improve the system by sourcing, designing and installing a larger pump and filter vessel to allow for the increased flow rates through an aviation certified filtration vessel.”

When Chartright Air Group expanded its aircraft management operations to include a fixed-base operation (FBO) at Region of

Waterloo International Airport in Ontario, AGFT was contracted to design a fuel system for the new facility.

“This fuel system was one of the larger systems that AGFT has constructed at a Tier 2 airport,” said Smart. “The project scope included two 60,000 litre tanks for Jet A fuel storage, a defuelling system and engineering of a secondary containment for stringent environmental requirements due to the proximity of the Grand River.”

The project was a success, and due to AGFT's ingenuity, Chartright is able to provide Jet A to commercial customers at Waterloo as well as a defuelling system for an aircraft maintenance, repair and overhaul facility located at the airport.

Moving into the future, as in the past, AGFT's knowledge and fluidity, along with its dedication to the aviation industry, can help grow the company's foothold within it. Chow believes the room for growth within Canada is exponential, and that AGFT is well positioned to take advantage of that.

“I see opportunities left and right for us,” he explained. “There's been a big void. There are all these airports in Canada. Every community wants airports because of access and because they think it's a community driver . . . So, all these airports need upgrades and capital expenditures to keep them going, right? So now the provinces are looking at how we support that.”

Chow estimated there are around 7,000 private airstrips, helipads, and small airports in Canada today – and each one presents an opportunity for AGFT to display its expertise and creativity within the ground fuelling market. 🇨🇦



aviation developed from his father's passion for the industry.

Robert Williamson is a junior editor at *Skies*. After working in broadcast, he joined MHM Publishing to pursue a lifelong dream of writing and editing for a print magazine. His interest in

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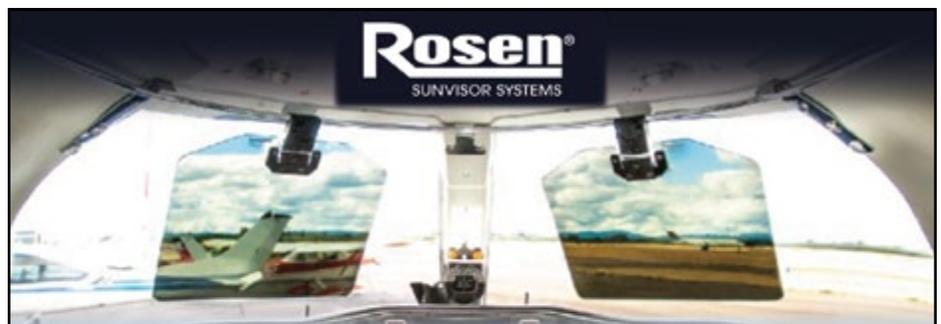
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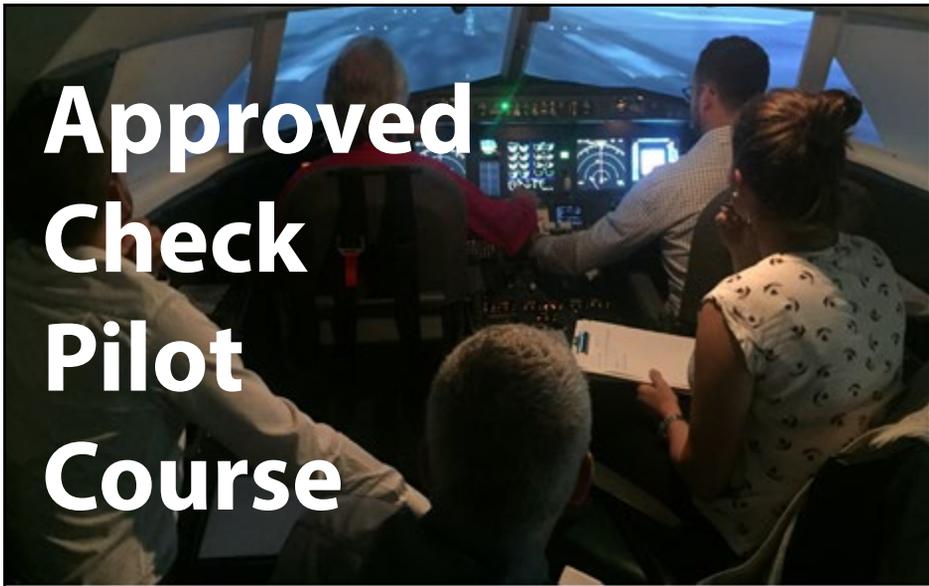
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In the Circuit

WINNIPEG INTERNATIONAL AIRPORT (CYWG) | BY ROBERT WILLIAMSON

Working with its community

For the past 23 years, tucked away on the grounds of the Winnipeg James Armstrong Richardson International Airport (CYWG), a garden staffed by airport employees has provided local food distribution charities with over 65,000 pounds of vegetables. All of it has been grown right there on the airport campus.

“It’s a fairly large garden and we tend to it all summer long,” Barry Rempel, president and CEO of the Winnipeg Airports Authority (WAA) told *Skies*. “We donate those vegetables, primarily root vegetables, to Winnipeg Harvest, which is a food bank in town ... for those that probably don’t use the airport a lot, but they’re part of our community.”

The project, along with Rempel’s sentiment, is a reflection of the airport’s mission statement that begins with the words “with our community.”

Since the WAA took over responsibility for the airport from the federal government in 1997, its mission has been to give back to Winnipeggers.

At the time, the airport’s total economic impact equalled \$384 million and around 7,000 community-wide jobs, according to Rempel. Since then, the WAA has drastically increased those figures.

“We now have \$3.4 billion in economic impact and are now supporting over 17,000 jobs,” explained Rempel. “You know, that’s a fairly significant shift. To do that, we went back to our mission statement and started working on very specific projects.”

One such endeavour involved StandardAero, one of the world’s largest aviation maintenance, repair and overhaul (MRO) facilities, with a location at Winnipeg International. In the early 2000s, the company was looking to get into the maintenance of larger aircraft engines — specifically the CFM International CFM56. At the time, WestJet was servicing its CFM56 engines at various locations in the United States. After what Rempel described as “many happy coincidences,” WestJet turned to StandardAero in Winnipeg, thus developing a job-creating relationship that is still intact today.

“Because of that relationship, General Electric came to the table and today we have the largest engine test and research facility in Canada, right on our airfield,” he explained. “That’s how we’ve been able to leverage relationships and our land in a way that has really benefited the community, because now we have a very high tech facility, [and] lots of good paying engineering jobs, both at StandardAero as well as at the General Electric facility.”

That relationship continues to prove fruitful; Rempel explained that General Electric’s presence on the airport campus also plays into Winnipeg’s extensive cargo network.

“We want to make sure that the cargo carriers that are serving here are able to meet General Electric’s needs, whether it’s for an engine or whether it’s for a valve or whatever it happens to be. And it’s been through those sorts of building relationships, both with the carriers and potential tenants, that we’ve really been able to create basically 600 new jobs per year on the airport,” he explained.

With over 4,000 cargo flights every year, and more than 1,100 semi-trucks moving through the airport’s cargo areas, it’s easy to see how that side of the business factors into most of the WAA’s operations.

“Cargo operations are doing incredibly well,” continued Rempel. “Most of what we operate in and out of Winnipeg has nothing to do with the regular passenger carrier network. Vancouver or Toronto gets a lot of freight based on belly-hold capacity. We’re almost an exclusively



WAA Photo

dedicated freighter operation and primarily all overnight because in large measure, the way people have changed their shopping habits — a lot more online — has really been a good base for solid growth of our overnight network here.”

A large part of that success is due to the airport’s location, smack dab in the middle of the country, and Rempel explained that, “it’s an easy place to have airplanes come in, exchange freight, and then head back out to other destinations.”

As the cargo ops have grown through the years, the WAA has had to expand to accommodate operators. The airport has incorporated a number of updates to its cargo facilities, and is planning to move forward with a new multi-tenant air cargo logistics facility, set to open in 2023/2024. The new centre will include a certified cold chain for meat handling, as well as pharmaceutical and nutraceutical handling capabilities. WAA has already secured agreements with a number of future occupants.

This expansion isn’t limited to the cargo side. In 2018, Winnipeg International welcomed 4.5 million passengers, marking the fifth consecutive year of growth in this area and making it the seventh busiest in Canada for passenger movements. As it stands, the airport is equipped to handle five million passengers per year, and according to Rempel, these numbers have been a major area of focus for the WAA moving into the future.

“We really need to be thinking about what our future looks like,” he commented. “We’re sitting, right now, about four full years ahead of where we thought we’d be in terms of traffic growth when the terminal was built [in 2011].”

This has led the WAA to launch studies measuring the airport’s master plan against the actual amount of movement it sees. One study is focusing on cargo movements, another on the passenger terminal, and yet another on parking and ground transportation.

“That’s really all part of what we’re looking at, all of which is in continuing our business transformation plans that we’ve put out,” said Rempel. “So, by using technology [and] having the right people in the right place, we’re making sure that we’re not at any point ever constricting the flow of passengers or cargo, and are meeting carrier and passenger cargo, and people’s needs.”

Winnipeg International’s commitment to accommodating people’s needs has been a driving factor in its growth since the WAA took over. The airport’s mission statement, “With our community, we provide excellent airport services and facilities in a fiscally prudent manner,” seemingly holds serious weight throughout airport operations — a point made clear by that quaint, well-tended garden that grows food for local charities. ■



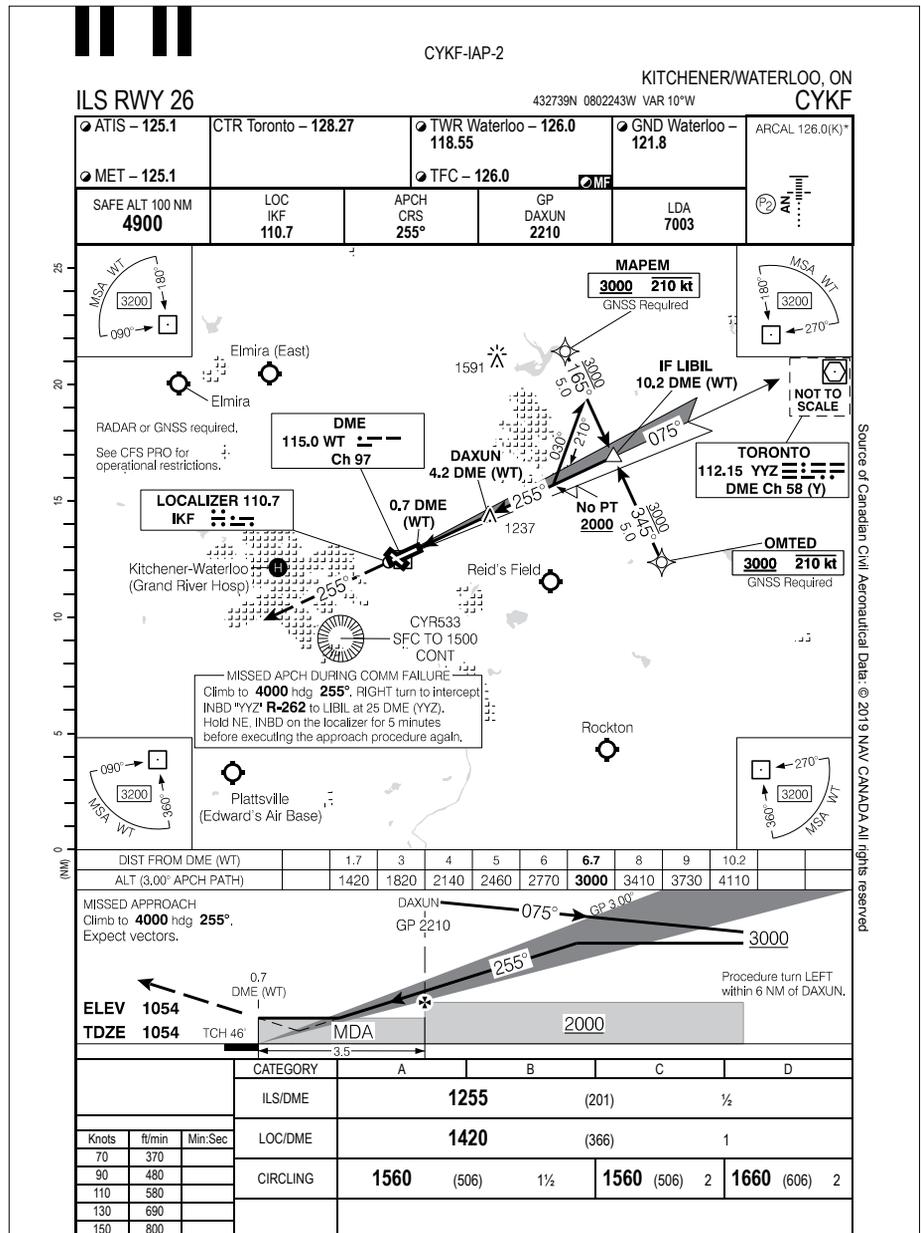
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5. Why is there no timing to the missed approach point indicated on this approach?
6. If not GPS equipped, how would you identify the FAF?



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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.

CHART NOT TO BE USED FOR NAVIGATION PURPOSES

Faces of Flight

BY LISA GORDON

Meet Capt. Judy Cameron, Air Canada's first female pilot



In the summer of 1973, Judy Cameron was a University of British Columbia arts student who rode a motorcycle and “loved to go fast.”

With no fixed career goal in mind, the 19-year-old took a job administering a Transport Canada survey to pilots of small aircraft. While working, she ran into someone from high school who was finishing his flight instructor rating, and he invited her to go flying.

Despite being terrified, she was also exhilarated as she

experienced a stall, a spin and even the old “see a pencil float from the back to the front” weightlessness trick.

By the time she landed from her first flight, Cameron’s future career path was lit up like a runway in front of her.

“I wanted to find out how to do this,” she told *Skies*. “I heard Selkirk College in Castlegar was the place to train. So, I got on my motorcycle and drove eight hours to the college.”

Luckily, the head of the aviation department was a motorcycle fan and he admitted Cameron to the program, advising her to get her Grade 12 math credit before school began that fall.

She struggled with the hard reality of how to finance her training. As the daughter of a single mother – who Cameron said was her role model – she had few financial resources but “all the support in the world” when it came to pursuing her dream of flying.

“I’m not even sure why I tackled this career,” reflected Cameron during a recent interview. “I had no money. I had to sell my motorcycle; I had student loans and bursaries. I didn’t have a Plan B.”

When she got to college that fall, she was shocked to find that Grade 12 math didn’t put her on par with the other students – all of them men and most with physics courses under their belts.

“It was two rather tough years. I was the only girl with a whole group of guys. They weren’t intentionally cruel, but no one really studied with me. But I hung in there and I graduated. I tell girls now, make sure you take the prerequisites!”

After school, Cameron worked for a few small aviation operations, including B.C. Forest Products and Air West.

Her big break came in the spring of 1976, when she heard about a job opening at Bayview Air Service, a scheduled operator in Slave Lake, Alta. She flew to Edmonton, where Bayview picked her up for an interview.

“I met the chief pilot and he took a big chance on me,” recalled Cameron, who was 21 at the time. “He was quite eccentric and he hired me.”

It was at Bayview that Cameron earned her first officer endorsement on the Douglas DC-3 – just four months before the company went bankrupt.

Her next stop was Gateway Aviation, which sent her to Inuvik, N.W.T., as a DC-3 first officer. The northern flying experience was gold for Cameron. She subsequently moved back to Edmonton to fly Gateway’s Hawker Siddeley HS 748 turboprop.

Her experience attracted Air Canada’s attention in 1978. With just under 2,000 hours in her logbook, Cameron brought a photo to her interview that showed her rolling fuel drums along the ground up north. “See how badly I want this job?” she told recruiters.

Cameron was hired as Air Canada’s first female pilot and began as a second officer on the Boeing 727 at the age of 23.

“There was an awful lot of pressure,” she said. “I knew there were a few female pilots being hired in the U.S., but the three months of training at Air Canada was incredibly stressful.”

So why does she think Air Canada hired her?

“Because I was 5’7” – there was a height requirement back in the day,” laughed Cameron. “And also, because I had DC-3 time, which was considered heavy time back then!”

After 37 years at Air Canada, Cameron says she had “the best career in the world,” retiring as a Boeing 777 captain in 2015.

In the early years, she remembers a male captain commenting, “I’ve never flown with a female pilot before.”

“Neither have I,” she told him.

In 2015, Cameron was honoured as the recipient of the Flight Operations/Maintenance Award presented by the Northern Lights Aero Foundation (NLAF). When she learned more about the not-for-profit organization, which encourages young women to embark on aviation and aerospace careers, Cameron realized this was her chance to give back.

She began volunteering with NLAF in 2016, and today directs its fundraising efforts.

“The work is so important. Female pilots still represent only five or six per cent of airline pilots worldwide, and women still don’t consider it as a career . . . There is the misconception you can’t have a family,” continued Cameron, who has two daughters.

She especially loves spreading the word and educating young women about careers in aviation. Last year, she travelled to seven events to promote NLAF and its work.

In September 2019, Air Canada announced it was establishing the Captain Judy Cameron Scholarship, committing to award \$20,000 per year for three years.

“The biggest honour of my life was having that scholarship at Air Canada named after me,” said Cameron, who recently renewed her private pilot licence. “We want to help women who may not be able to afford their flight training or their aircraft maintenance engineer training.”

Applications are being accepted for this year’s scholarships until Dec. 31, 2019 at www.northernlightsaerofoundation.com.

“I never thought of myself as a pioneer; I just discovered flying and absolutely loved it and wanted to pursue it wholeheartedly,” concluded Cameron. “My single mother slept on the sofa in our one-bedroom apartment. We lacked material things, but she was incredibly strong and encouraged me to follow my dreams.

“This scholarship will help other women who might be held back for financial reasons.” ❦



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