

Business is soaring for Canada's aerospace sector. With 75,000 Canadians employed and revenues of \$21.8 billion, that's good news for Canada. With the post-9/11 doldrums behind it and promising signals including a globally buoyant aerospace sector, Canada's new defence spending and solid growth in business aviation, the future appears bright. **The question is, what will it take to keep Canada's momentum going?**



PHOTOS: SUPPLIED

Despite solid growth in the global aerospace industry, in which Canada ranks fourth worldwide after the U.S., UK and France, government and business leaders closest to Canada's aerospace industry say this is no time for Canada to rest on its laurels.

"Globally, this industry is back in growth mode," says Peter Boag, president of the Aerospace Industries Association of Canada (AIAC). "2005 was a record year for new commercial air transport orders, with Boeing and Airbus booking orders for some 2,000 aircraft. Canadians are significant players in the supply chains of these manufacturers."

Rich Gage, president and CEO of the Canadian Business Aviation Association, says Canada has also benefited from a strong resurgence in the business aircraft market with companies such as Bombardier and Pratt & Whitney Canada among those involved.

"The convergence of digital avionics, lightweight composites and small engine technologies are

enabling manufacturers to build smaller, incredibly capable aircraft for lower cost," he says. "These very light jets are creating a new potential market for air taxis, and making it more affordable for businesses to use business aviation to further their interests."

Yet, economic activity associated with Canada's aerospace sector extends far beyond commercial or business aviation. Across the country, companies are engaged in activities ranging from maintenance, repair and overhaul to space technologies, composite materials and much more. In fact, more than 45 per cent of the sprawling industry is located outside of the Montreal-Ottawa corridor, an area recognized among the world's top-three aerospace centres.

AIAC chair Donald Campbell, who is also executive vice president of simulation technologies and training provider CAE Inc., notes, "When people think of aerospace, they tend to look at the physical product. But the most important part is the brains that go into it. Many Canadian companies on the

leading edge of aerospace are in fact software companies."

Mr. Campbell agrees the future looks positive, but notes, "We're not sitting with rosy-eyed optimism, but with the right economic environment, this industry will continue to prosper."

Certain economic realities present challenges, notes EDC aerospace account executive Patrice Guindon. Among them is the strong Canadian dollar, which continues to make it more difficult than in the past for Canadian companies to compete internationally.

With most Canadian exports destined for the U.S., the continuing bankruptcy concerns of some American airlines and the high price of fuel also present some uncertainty amid an otherwise robust economic backdrop.

Despite these concerns, key opportunities for Canadian manufacturers loom large, perhaps few bigger than Canada's \$13-billion procurement of new military aircraft, purchases that will include 20-year maintenance contracts. While Canadian firms don't manufacture

military aircraft, there is significant potential for Canadian companies to reap the benefits of the industrial value created from such procurements.

"We must fully capture the potential by obligating the winning contractors to work with Canadian industry to develop high-value, sustainable economic activity in Canada related to aerospace," says Mr. Boag. "Canada needs to be very strategic about how we develop the industrial benefits side, especially the long-term service contracts."

U.S.-based Boeing, the world's largest aerospace company, is a frontrunner to supply four C-17 Globemaster III strategic airlift aircraft and 16 CH-47 Chinook heavy-lift helicopters to the Canadian Forces.

Boeing doesn't need any introductions to Canadian rules. Its roots in Canada go back nearly 100 years. Boeing employs more than 1,200 people in Winnipeg, Richmond (B.C.), Montreal and Ottawa, and deals with 200 Canadian aerospace suppliers across the country. The company's efforts to present Cana-

dian suppliers with opportunities linked to its potential Canadian military contracts are already well underway.

Leah Clark, Industry Canada director general, Aerospace, Defence and Marine, says, "We're working to maximize benefits to Canada to ensure these projects are high-quality and related to key areas of technology for our future. It's an opportunity to position Canada more strongly in the supply chains of these international companies."

Mr. Boag notes that, like Canada, most countries take an interventionist approach to establish and sustain their aerospace industries through investments, R&D support, preferred procurement practices and other mechanisms.

For example, Mr. Guindon says EDC plays a role similar to export credit agencies around the world.

"This industry is capital intensive. These companies require long-term financing that matches the lives of the assets," he says, noting EDC has 28 per cent (\$6.7 billion Cdn) of its total loan portfolio allo-

cated to Canada's aerospace sector.

Ms. Clark says Canada's supportive policies and actions have changed with the times over the years. "Now, we have to consider the future – the emergence of India, China, Latin America and Eastern Europe as competitors; new technologies; platform developments that come less frequently and other factors. Our role is multifaceted and evolving."

Like others, Mr. Campbell notes success requires commitment from both government and industry.

"Global leadership depends on innovation. Canadian companies must continue to invest heavily in innovation. In the face of rising competition, this industry needs an appropriate tax regime that will support and keep R&D in Canada."

Ms. Clark said, "We had an objective to be among the best in the world. We developed supportive mechanisms that got us there. Now, we must look at the current conditions – the challenges, risks and opportunities – and determine how we will address those." ■

Innovation the key to competitiveness

More supportive tax regime needed to keep R&D in Canada

Despite dwindling public sector support, Canadian aerospace companies have shown a determination to keep pace in the tough global marketplace. They have done so by continuing to make crucial investments in their R&D efforts.

"The aerospace private sector is maintaining an overall investment level of about \$1 billion per year in research and development," says

Ron Kane, AIAC vice president, Defence and Space. "That's despite the fact that public sector funding for R&D has been steadily eroding over the past decade."

A consistently healthy R&D budget is essential for staying on par, or ahead, in the world's very competitive aerospace race. In some of the sectors that make up this broad industry, Canadian companies are the leaders.

These include, for instance, regional aircraft, both jets and turboprops; full flight simulators used for training pilots and maintenance technicians; civil helicopters; aircraft engines; earth observation and remote sensing technology; satellite-based communications and large landing gear systems. Many commercial jet aircraft have

See **Innovation** AERO4

Affordable business jets take flight

Novel models allow greater access

With a new business jet costing anywhere from \$12 million to \$40 million US, the prospect of owning such a craft is prohibitive for some companies.

Fortunately, alternatives to full ownership have been developed to meet this growing demand, giving corporate brass a unique, airborne opportunity they might not otherwise have.

Fractional ownership is one option, and is offered by AirSprint Inc., which has offices in Calgary, Toronto and Montreal. With fractional ownership, up to eight owners have a stake in an aircraft – either a jet-powered Citation XLS or a turboprop Pilatus PC12. The refundable "buy-in" is \$1.5 million US for the XLS or \$450,000 US for the Pilatus. Fractional owners get a return on this equity whenever they

leave the fractional ownership plan, depending on the value of the aircraft at that time.

They then pay a combination of monthly and hourly fees, which vary according to each aircraft. The bottom line is that fractional owners will pay about \$150,000 Cdn per year for the Pilatus or \$450,000 Cdn for the XLS, for 100 hours of flying

See **Business** AERO6

INSIDE:

FUELLED BY INNOVATION

AIAC PRESIDENT and CEO PETER BOAG describes Canada's keys to continued aerospace success. AERO3

BUSINESS AVIATION

CBAA President and CEO RICH GAGE says today's business aircraft provide safe, secure and highly efficient transport. AERO7

INFRASTRUCTURE

A development centre in Calgary plus other facilities form critical parts of Canada's strategic advantage. AERO8



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The Aerospace Industries Association of Canada

"The Voice of Canada's Aerospace Industry"



Accelerate

Canadian Centre for Aerospace Development

On August 31, 2006, the Canadian Centre for Aerospace Development was established in southern Alberta. Working with industry, researchers, governments and educators from across the country, we're coordinating and promoting the nation's enormous potential and many competitive advantages in a distinct aerospace sector: general aviation aircraft certification.

Our national centre has already recruited an innovative aircraft manufacturer. Aircraft Investor Resources (AIR) of Las Vegas will move its completion and certified manufacturing facilities for Epic AIR to the Springbank Airport near Calgary beginning in 2007. About the same time, we'll start construction there of a new certification centre specializing in aircraft using carbon composite materials.

We're accelerating attention, investment and opportunities in Canadian aerospace. To learn more about the Canadian Centre for Aerospace Development, and what we can do together, contact us at:

403.735.1249 or CCAD@yyc.com



Canadian military spending a boon to aerospace sector

Canada's recently announced increase in defence spending not only represents a boon to our national security capabilities, but also a huge opportunity for Canada's aerospace industry. The question that remains, will the Canadian government ensure Canadians get their share of industrial benefits?

Earlier this year, the federal government announced plans to acquire four new strategic lift aircraft, 17 new tactical lift aircraft and 16 medium/heavy lift helicopters for an estimated total cost of \$13 billion to \$14 billion, deals that would include 20-year, in-service repair and maintenance contracts.

The catch is Canadian aerospace companies don't make these kinds of military aircraft. As a result, Canada's new aircraft will be purchased from foreign companies such as Boeing. With an intention of ensuring that Canadian aerospace companies benefit both directly and indirectly from such huge public procurement, however, Canadian policy requires foreign vendors to provide opportunities for Canadian companies.

For its part, U.S. aerospace giant Boeing, which already employs 1,200 people across Canada, appears prepared to not only deliver the goods, but also the industrial benefits to Canada.

"A key part of the C-17 and CH-47 acquisitions is the value that these procurements bring to the ongoing transformation of the Canadian Forces and the positive economic impact to Canada," says Al DeQuetteville, Boeing vice president, Canada. "Boeing is fully committed to

meeting the Government of Canada's Industrial Regional Benefits requirements and to investing an equal amount in this country for every dollar the government spends on procurements that Boeing will be awarded.

"We look forward to making the C-17 and CH-47 programs a success story for the Canadian Forces, for the Canadian aerospace industry and for Boeing."

Boeing recently spent two days in Quebec, where it discussed opportunities linked with its potential procurement contract with 90 aerospace companies and presented its case to more than 200 industry and government officials at an event hosted by the Association Québécoise de l'Aérospatiale in Montreal. This event was the third of four such Boeing Canadian Industry regional meetings held in Halifax and Calgary since September. The previous two were in Halifax and Calgary, and the fourth will take place in Toronto early in November.

The long-term benefits derived from such military spending impact aerospace companies in communities coast to coast. For example, Abbotsford, B.C.-based Cascade Aerospace Inc. is currently using its aircraft maintenance expertise to keep Canada's 32 multi-purpose CC-130 Hercules aircraft mission-ready, and is eager to be part of the service and maintenance of the newly acquired aircraft.

A year after becoming the prime contractor in the \$423.4-million contract to maintain the Hercules fleet, Cascade is ready to compete for future maintenance work on the

new military aircraft, a growing part of its business says Cascade Aerospace president David Schellenberg.

"The new procurements are going to mean more opportunity," said Mr. Schellenberg. "The Department of National Defence has never had a procurement on this scale before and for the support providers, it's a once-in-a-lifetime opportunity. I think we have to properly set up the support to achieve Canada's objectives. That's where we see the opportunity for Cascade in the future."

L-3 Communications Canada, currently supplying products and support for Canada's fleet of F-18s, CP-140s and maritime helicopters, also expects to supply products and perform in-service support for one or more of Canada's new aircraft. L-3 currently has relationships with major manufacturers that will allow the company to participate in indirect offset programs associated with the acquisitions said L-3 Communications, Canada vice president, president and COO Anthony Caputo.

He said a strategic approach to the procurements, one that recognizes the standing and capabilities of existing Canadian companies, would benefit Canadians across the country working on the new planes.

"This is a monumental event in Canadian defence industrial terms," said Mr. Caputo.

"It needs to be done in a way that will support and promote the existing industry. That can be done through collaboration between government and industry. AIAC, and in particular its Defence Committee that I chair, has initiated that kind of contact and exchange."



PHOTO: SUPPLIED

Canada's new military aircraft will be purchased from foreign companies such as Boeing. As part of the deal, however, Canadian policy requires foreign vendors to provide opportunities for Canadian aerospace companies. In addition to chances for them to become more involved in the supply chains of global aerospace manufacturers, Canadian companies may also benefit by securing 20-year maintenance contracts for Canada's new aircraft.

Military spend a once-in-a-generation opportunity

The Canadian Forces' procurement of \$13 billion in new aircraft represents a once-in-a-generation opportunity for the industry to deepen its involvement in Canadian defence capabilities, which presently represents about \$4.4 billion or 20 per cent of Canadian aerospace revenues.

The new procurements are also a chance for Canada's aerospace industry to secure long-lasting, high-value industrial benefits through 20-year maintenance contracts, says AIAC vice president, defence and space Ron Kane.

"This magnitude of defence spending in aerospace is the largest aggregate spending for military aerospace that we have ever seen at one time, said Mr. Kane.

"We want to encourage the government that the \$13 billion of spending not only meets the military's requirements



PHOTO: SUPPLIED

for the best equipment in the shortest possible time, but that it is also leveraged to benefit the domestic aerospace industry."

Direct benefits include contracting Canadian aerospace companies to supply components and service the new aircraft. Indirect benefits include giving Canadian companies and workers opportunities to participate in new programs and activities with selected multinational manufacturers, allowing technology transfer through exposure to new manufacturing techniques and cutting edge materials.

The AIAC is also calling on government to require 100 per cent of in-service support of the new aircraft is performed by existing Canadian-based companies. This measure intends to both strengthen Canada's foreign and defence policy sovereignty and maximize Canada's return on taxpayer investment.

HIGH FLYERS



Iain Christie, PhD Physics Director of Business Development and Research and Development, Neptec Design Group Ltd.

Dr. Iain Christie says being inside the NASA family during history-making events has been fascinating.

"In the aerospace industry – which is so connected to changing politics, technical advances and a changing business climate – you can suddenly be dealing with a very different reality," he says.

Moving to a new job within Neptec Design Group every two to three years, Iain has helped

develop the Space Vision System for use on space shuttle missions and has worked extensively with both NASA and the Johnson Space Center. "We would test the SVS while the astronauts were asleep. At one point... suddenly you could see the Earth rotating by and I thought, 'I'm giving commands to a camera that is on the space shuttle looking back at me,'" he says.

He developed the Laser Camera System, for use on orbiter missions, and is now working with NASA on Tridar, a technology that will allow for the automated docking of the space shuttle.

Canadian aerospace fuelled by innovation

PETER BOAG
President and CEO of the Aerospace Industries Association of Canada



Canadians proudly count themselves among the best and the brightest on the planet in the design, engineering and delivery of aerospace products and services to customers around the world and beyond. Still, our reputation as a creator and innovator of some of the world's leading space-age technologies hasn't materialized overnight, nor has it come about by accident. The key to our success is innovation.

Canada's world-leading technologies

Canada's space engineering prowess helped put NASA's shuttle program back in space with Canadarm and the Space Vision System – both critical tools in the assembly of the International Space Station. Canadian companies are world-class leaders in the design and production of regional and business aircraft, helicopters, small turbine engines, landing gear, avionics and advanced composite materials used increasingly in the production of aircraft of all sorts. We produce state-of-the-art

simulation systems used to train pilots all over the world, as well as deliver highly specialized maintenance and overhaul services. We develop Earth observation technologies, along with advanced communications satellites and environmental monitoring space technologies. Our companies are integral elements of a dynamic, intensely competitive, worldwide network of aerospace suppliers and partners. They employ a highly skilled workforce of more than 75,000 men and women – the very life-blood of the industry. These are the men and women who drive innovation, fuelling our success as the world's fourth largest aerospace player behind the United

States, the United Kingdom, and France. That's no small feat for a nation of 32 million people.

Leaders in R&D

According to the latest data, Canada's total annual aerospace revenues exceeded \$21.7 billion in 2005. Yearly R&D investment amounted to more than \$1.1 billion, placing three aerospace companies among the top 10 R&D investors in Canada. More than 84 per cent of total production was destined for export markets, with \$13.7 billion worth of output shipped to the U.S., \$2.6 billion to Europe, \$0.7 billion and growing to China, and \$1.3 billion to the rest of the world. In an independent report published recently in the U.K., Canada is described as "conspicuously successful" in nurturing a robust domestic aerospace industry with relatively limited government assistance. Despite fierce competition, ours is an impressive track record by any standard of measure.

Still, we wrestle with Canadians' perception that aerospace is an industry sector living off the public dole. Nothing could be further from the truth. While federal government

R&D support of the industry has been shrinking – falling from more than \$600 million in the early 1990s to roughly \$200 million today – Canada's aerospace industry has more than doubled in size and contributed \$35 billion to Canada's trade surplus over the same period. The return on investment for taxpayers has been significant – innovative products and services that contribute significantly to the economic well-being, security and overall quality of life of Canadians throughout the country, and thousands of high-quality, knowledge jobs in communities in every province. The success of Canadian aerospace demonstrates how the right mix of government policies and programs can deliver real benefit to Canadians. The challenge going forward is to find ways that taxpayers can achieve an appreciably greater return on their investment – to reshape this successful government-industry partnership so that it effectively responds to the changing dynamics of the global marketplace. Moreover, the industry must and will do a better job of explaining itself. We see our success as a win-win proposition for everyone – aerospace companies,



PHOTO: JMS

Aerospace, which is Canada's leading knowledge-based industry, employs more than 75,000 people coast to coast.

investors, government and taxpayers alike.

Aerospace eyes a clear, blue horizon

We excel in creating niche markets for our products and services, and have proven our ability to respond quickly and efficiently to global market shifts. In essence, Canadian aerospace has stuck to doing what it does best, concentrating on those areas where we can become major global players. This has enabled us to bring new technologies and applications to the marketplace more quickly than our competitors, giving

rise to a significant world market share in several areas. According to the Conference Board of Canada's June 2006 industry forecast, business prospects for Canadian aerospace manufacturers look promising. We have considerable expertise in new technologies and are ideally positioned to produce the next generation of aerospace materials and capture those markets that will need them. With a greater commitment to R&D investment by the industry in partnership with government, Canada is poised to build on our reputation as an influential player on the world's industrial stage.

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Stéphane Blais *Systems Engineer, Project Manager and Pilot, Marinvent Corporation*

Stéphane Blais always dreamed of being a test pilot. At Marinvent Corporation, he is flying high, indeed.

Prior to joining Marinvent, Stéphane worked as a pilot, and later as an engineer with Pratt & Whitney Canada, where his accomplishments included revolutionizing Pratt's turboprop engine reliability.

"Before, I did pure engineering and pure flying. But at Marinvent, I do both and manage projects. It's

very fulfilling," he says.

Among the most dynamic Marinvent projects he's seen yet was his management in 2003 of NASA's pre-commercial Synthetic Vision Systems (SVS) flight trials. Today, SVS is an emerging technology available for commercial aviation that enables pilots to "see" in otherwise low- to zero-visibility situations.

Not only did Stéphane help design and custom

fit Marinvent's aircraft with NASA's technology for the test flights, he also flew the plane alongside his boss, iconic aerospace innovator John Maris, who acted as a safety pilot. "The people at NASA said that they'd never seen an outsourced test program as efficient as ours," says Mr. Blais.

Supportive R&D tax policy key

Innovation from AERO1

Canadian-made landing gear, and Canadian landing gear systems and engines have been incorporated on the upcoming Airbus A380.

One such Canadian high-tech trendsetter is CAE Inc. of Montreal, provider of simulation and modelling technologies, as well as integrated training services to the civil aviation industry and defence forces around the globe. "We have one of the largest groups of aerospace software professionals with engineering degrees in Canada, and we are the global leader in our market," says president and CEO Robert E. Brown.

The company has developed simulators and training devices for all types of commercial, business and military aircraft, including the Airbus A380, the Embraer 170/190 series of regional jets and most military helicopters.

Increasingly volatile and competitive market conditions have encouraged the company to diversify its product line. CAE's revenue is now equally spread across the civil and military markets, and its

revenue is also derived 50/50 between training and equipment sales. CAE has maintained an R&D investment level of over 10 per cent of revenues annually," says Mr. Brown. "We know this level of research investment is necessary to remain globally competitive."

R&D investments by Canadian aerospace companies will get even more challenging in 2007, given the imminent review of a federal funding mechanism. December 31, 2006, will mark the end of the Technology Partnerships Canada program, which has co-invested millions of dollars with Canadian aerospace firms to advance their development projects and assure their innovation leadership.

The Technology Partnerships Canada Program has helped fuel Canada's world-class reputation in aerospace, said Ron Kane. "Without support through programs like TPC, the business case for investment in aerospace innovation in Canada is substantially weakened."

Companies such as Pratt & Whitney Canada need to continue to make the substantial investments necessary to retain their rank as world-beating aircraft engine

designers and manufacturers.

"Pratt & Whitney Canada is the number one R&D investor in the Canadian aerospace sector," says

John Saabas, executive vice president, Pratt & Whitney Canada. "We have invested over \$2 billion over the past five years, and we must

continue to invest heavily in R&D." Pratt & Whitney Canada's design and production of more than 50 new engines over the last decade is

"an unmatched record."

But Pratt & Whitney Canada faces the same challenge as every other Canadian aerospace corporation, in that it must compete against international aerospace companies that have access to substantial government support funds.

"Pressures coming from international competition are increasing, and our competitors are strongly supported by their respective governments, most notably through support to R&D programs," says Mr. Saabas.

Ron Kane agrees. "Global competition for aerospace investment is fierce – foreign governments use a variety of policy tools and programs to attract this investment," he said.

The aerospace industry requires a long-view outlook to make product design decisions, especially since the time from product concept to market introduction is so long. As such, "the Canadian government's support through programs such as Technology Partnerships Canada is essential," says Mr. Saabas. "With it, companies like ours can make long-term plans." ■



Pratt & Whitney Canada president Alain M. Bellemare proudly shows a product of P&WC innovation – the PW600 engine, which now holds a market-leading position for a new class of business aircraft known as Very Light Jets (VLJs).

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Nadia Bhuiyan, PhD Mechanical Engineering Assistant Professor, Department of Mechanical and Industrial Engineering, Concordia University

Was it a family calling or research opportunities that drew Nadia Bhuiyan to aerospace? The answer is debatable.

Hailing from an "aerospace family" (her father, brothers and husband all work in the sector), Nadia is an assistant professor of Mechanical and Industrial Engineering at Concordia University. "I'm passionate about teaching," she says. "I feel privileged to men-

tor students."

Outside of her classroom, Nadia works as the associate director of the Concordia Institute for Aerospace and Design Innovation (CIADI).

She says her work on the Consortium for Research and Innovation in Aerospace in Quebec project is particularly interesting. In one job, she is providing software quality assurance for a Dynamic

Test Bed for Flight Management System at CMC Electronics. She is also on a team helping Pratt & Whitney Canada efficiently scale its PW600 engine production to meet rising demand.

This modern woman has another side – super mom. "My biggest passion right now," she admits, "is my son, Gabriel, who is now six months old." Perhaps another Bhuiyan engineer in the making?

Supplier to the world Closer than you think

Know-how remains a competitive advantage, for now

Since the day it got its wings, Canada's aerospace industry has depended on strong customer-supplier relationships for many of the parts and sub-systems that have made it soar. Now, those relationships have revved into fully integrated global supply chains that have transformed suppliers into vital partners, from specification through to final delivery.

"It's very interconnected today," says Dale Hunt, AIAC vice-president of supplier development. "The speed, intensity and methods of doing business are constantly evolving. The drive is to build aircraft faster, lighter, more fuel-efficient and at lower cost. A key element is advanced supply chain management, which is now the norm within the Canadian industry."

As worldwide competition has intensified, original equipment manufacturers (OEMs) and traditional large suppliers have taken time and costs out of their processes, and reduced risks, by farming out design, development and production of components and major sub-assemblies that go into final products.

Says Mr. Hunt, "It's been to the OEMs' advantage to mitigate supplier performance concerns by offering them life-of-program contracts in exchange for stringent quality standards, product reliability and on-time delivery, all crucial to winning orders."

Proof that this approach is working is borne out by the statistics. The Canadian aerospace industry booked \$22 billion in sales in 2005, more than double its 1990 level. About 85 per cent was offshore, making aerospace systems Canada's leading advanced technology export.

The industry's supply chain stretches through more than 400 firms and employs more than 80,000 Canadians coast to coast. It also extends beyond our borders to feed international projects such as the double-deck Airbus A380 and Boeing 787 Dreamliner and military aircraft such as the Lockheed Martin Joint Strike Fighter. The latter has generated 250 Canadian contracts worth more than \$300 million, with more to come.

"What's carrying us to these heights is innovation throughout the supply chain," says John Koumoundouros, president of Mississauga-based Aviya Technologies,



PHOTO: SUPPLIED

Commercial aircraft worldwide rely on Canadian-made components including landing gear.

which provides software, hardware and systems engineering solutions for commercial and military aviation. "Cost is a prime motivator, but it's our emphasis on new technologies, new engineering and new production methods – including supply chain management – that has done it."

Mr. Koumoundouros says this explains why low-labour-cost nations such as China, India and Russia have not knocked Canadian manufacturers out of the global market. He adds, "We've got experience and innovation, which they need. And we're able to use those strengths to create the local offsets needed to win orders in those countries. They aren't threats, they're opportunities because they're new markets with an emerging taste for increased air travel."

That Canadian supply chain partners have the savvy and strength to do this, says Mr. Koumoundouros, is demonstrated by the multinational companies that have located their global aerospace operations here in preference to other countries. A prime example is Honeywell, which has been awarded major international contracts on projects for Boeing, Lockheed Martin and Sikorsky. Today, Honeywell is a key contributor to the Airbus A380 platform.

"Canada has a reputation for its centres of supplier excellence and that's vital to us," says Pam Parsons, Honeywell's Toronto site sourcing leader. "If we're going to win orders for performance-critical systems, then we need strong partners working with us to deliver the required excellence at all levels. It's been beneficial to develop those partnerships, and it's a key factor in keeping us competitive." ■

Technologies for space touch everyday lives

Canadians can point proudly to landmark contributions made to astronomy and space exploration through Canada's participation in space shuttle missions, international space station construction and satellites, but Canada's aerospace industry is also adept at applying satellite technology in ways that contribute to Canadians' everyday quality of life.

Richmond, B.C.-based MacDonald, Dettwiler and Associates Ltd. (MDA), perhaps known best for its satellite images of Earth, is providing a broad spectrum of information products for customers such as the insurance industry to assess flood risk or farmers to monitor the condition of crops.

Recently, MDA created ice-sensing radar technology for the Radarsat 2 satellite, a partnership between MDA and the Canadian government due to be launched next year. Canada is a world leader in using space-derived data to forecast ice break-up and monitor icebergs for shipping, says MDA executive vice president David Caddey.

MDA is also applying vision technology it developed for the International Space Station robotic arm to Earth-based uses in areas as diverse as mining and medicine, he said.

"For example, people are finding some interesting uses of it to develop three-dimensional images of the inside of mines," said Mr. Caddey of MDA's robotic vision technology.

"As well, we are using our space technology in medicine. We are just finishing building a prototype of a device for doing brain surgery. It turns out a robot is steadier and more precise. Surgeons can get to the 2-millimetre accuracy in removing brain tumours; our robots can assist the surgeon in doing it to less than a millimetre."

Also bringing the benefits of space technology to Canadians in their day-to-day lives, Cambridge, Ontario-based COM DEV International builds custom-engineered equipment used in 80 per cent of commercial satellites ever built.

COM DEV equipment for Earth observation, atmospheric research and space exploration allows satellites to assist in agricultural and resource management, provide disaster monitoring and Search and Rescue services, look at weather, assist in navigation,

monitor climate change and explore the universe more deeply and accurately than before, says COM DEV CEO John Keating.

He said COM DEV's communication satellite technology is also providing broadband Internet access for distance education and

healthcare to rural communities in Asia and also here in Canada with equipment it built for the Anik 2 satellite.

"An element of Anik 2 was funded by the Canadian government quite deliberately to provide equality of access for all Canadians.

So, school boards, hospitals and libraries and school kids who are outside of the metropolitan areas of Canada can get the same advantages of broadband connectivity that the rest of us get when we are doing our homework or running a business," said Mr. Keating. ■



PHOTO: MDA

Canadian contributions to space include technologies for space exploration such as the Canadarm as well as leadership in satellite systems that provide a host of services for people everywhere.



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HIGH FLYERS



Paul Fulford Program Manager of Development Programs, MacDonald, Dettwiler and Associates

Paul Fulford is perhaps best known for his work building the “fingers” of the Canadarm. Nick-named “Dexter,” the fingers consist of two arms that simulate the capabilities of an astronaut.

Educated as a mechanical engineer, he chose the aerospace industry because of its multidisciplinary nature and his attraction to space exploration. “There are always interesting technical challenges, and cre-

ating ideas that have reasonable costs is one of the greatest challenges,” Paul says.

He worked on a Mars Feasibility Study for the Canadian Space Agency, looking at everything from how to include other countries to what speed of rocket to use.

Paul’s Mars Rover concept is a solar-powered rover for lunar mining of products including water

and fuel, and he has developed drilling and processing technology for taking samples. “I work with some brilliant minds in the aerospace sector – NASA, CSA and MDA. Working together to solve problems successfully is very satisfying,” he says.

He is now developing an Alpha Particle X-Ray Spectrometer for the 2009 Mars Science Laboratory Mission.

Business aviation advances

It’s no secret that Canada’s aerospace companies have earned their stripes many times over as world leaders in specific sectors of the industry. The obvious examples include the Canadarm and the near mythical Avro Arrow.

But there are equally noteworthy examples of Canadian aerospace achievements that are not confined to a museum or book. In fact, these may well in some way touch the flying experience of every commercial and private jet passenger.

Take for example the Enhanced Vision System (EVS) developed by CMC Electronics Inc. of Montreal. This technology uses infrared cameras mounted on the nose and tail of an aircraft to “see” through low-lying clouds or fog, and give pilots the added vision they need for landing in adverse weather conditions or at night.

“We are the world leaders in this technology,” says CMC president and CEO Jean-Pierre Mortreux, who notes that the Bombardier Global Express and Global 5000 aircraft were the “early adopters” of the EVS, when the first deliveries were made in 2005. Since then, buy-

ers have included Dassault and Pilatus, among others. “We have sold more than was anticipated in the first year of production,” said Mr. Mortreux. “It is a testament to the major safety advantages offered by the system.”

While many of us may never get the chance to fly in a corporate jet, the knowledge that sleek and powerful executive aircraft made in Canada carry many of the world’s business leaders is a point of pride nonetheless. It is Bombardier Business Aircraft that wave the Maple Leaf in this rarefied field, and does so with a world-beating roster of business jets that includes the iconic Learjet.

The newest in that series is the Learjet 60 XR, which retains the combination of value and high-speed performance of the Learjet 60, but adds one of the most advanced cockpits on the market today, together with a stand-up cabin redesigned for style, comfort and functionality.

The Bombardier Learjet 60 XR has the lowest fuel burn in its category, and delivers outstanding climb capabilities and transcontinental range from its fuel-efficient engines,

says the company. The aircraft’s performance is impressive; it cruises at 863 km/hr and can reach an altitude of 51,000 feet (15,545 m).

The driving force of many such planes is owing to engine maker Pratt & Whitney Canada. Among its achievements, the company is advancing engine technology of Very Light Jets (VLJs), with its new PW600 series of turbofan jet motors.

In fact, P&WC has established a global market leadership position in the market for VLJs, aircraft that may one day be widely employed as “jet taxis.” These would provide the on-demand benefit of point-to-point travel, in a way that regular taxis do. Such jets will be able to provide these services within defined regions of about 300 to 500 miles in radius, using secondary airports around major urban centres.

“We see a requirement for a fleet of over 3,000 aircraft to cover about 20 regions of service around the U.S.,” says Andrew Tanner, vice president, Business Aviation, Pratt & Whitney Canada. The goal is to provide these flights at a cost that will be competitive with current total trip costs – possibly on a “shared ride” basis. ■

A new advantage

Business from AERO1

time over that year. This includes fuel and various tariffs, such as landing fees, airports fees, NAV CANADA fees, etc. Availability of an aircraft is guaranteed with at least eight hours’ notice to AirSprint’s fractional owners.

The fractional ownership alternative is clearly an appealing one for customers of AirSprint. The company imported the concept from the U.S. six years ago, starting with one airplane, and has since expanded its fleet to 15 aircraft. “Our revenues are 30 to 40 per cent this year over last, and we will likely add another three aircraft by the end of 2006,” said AirSprint founder and CEO Judson Macor, who was recently named a 2006 Ernst & Young Entrepreneur of the Year. “We’ve been fortunate to be profitable each year since starting up.”

Fractional ownership has also been welcomed by Canadian aerospace manufacturers. Since the first fractional ownership model emerged in the mid 1980s, this segment of business aviation has accounted for a steadily growing

share of business aircraft purchases, and the sales of Canadian firms such as Bombardier and Pratt & Whitney Canada.

Business is also good for companies whose income model is based on the chartering of corporate aircraft. One such company is Execaire, a division of IMP, whose head office is in Montreal. Execaire houses and maintains a fleet of privately owned business planes, which have been registered for commercial usage and then made available for third party charters.

The Execaire fleet numbers 24 at present, and the demand for chartering these aircraft is consistently strong, says the company. This option has proven very popular with the aircraft owners, because the charter fees are applied directly to the reduction of their operating costs. “All of our owners participate in a charter plan for their aircraft,” says Anne Dinwoodie, the director of charter sales.

To what degree they participate is entirely their choice. For instance, an owner may use aircraft for 300 to 400 hours per year, and Execaire will charter the aircraft out for another 200 hours per year. The average

usage time for a given corporate aircraft is between 500 and 700 hours per year. Aircraft in the fleet include everything from the turboprop Pilatus and King Air 350 to the Bombardier Global Express, Challenger 604 and Cessna Citation 10.

Both the chartering and fractional ownership options open the door to the world of corporate flight, which many clients may have assumed was out of reach. “Our biggest source of customers is people who say they didn’t know that we existed, or that this could be so easy,” said Mr. Macor.

Executive turboprop aircraft, like the Pilatus, offer the advantage of lower purchase and operating costs than their jet counterparts. And while they have less range and velocity, they are more frugal on fuel consumption and offer the ability to land on shorter, more remote runways.

Both speed and range play to the strong points of a jet, which can cover great distances rapidly. These Ferraris of the airborne world can fly at 500-plus m.p.h and can reach 45,000 to 50,000 feet in altitude, where they are above some of the winds that commercial jets must face. Here, on this exclusive road in the sky, up to nine passengers can hold a meeting in a whisper-quiet setting, using tables that fold into the wall of the aircraft. Or, they can just relax and enjoy the ride. ■

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Technician, Assembly & Test
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BOMBARDIER



Brian Stone Director of Operations, Honeywell Canada

Brian Stone attributes his pursuit of an aerospace career to two key factors: his father's influence, and inspiring artifacts he discovered as a security guard at airplane engine manufacturer Orenda. Flash-forward and today Brian's work at Honeywell Canada is helping make history.

"My father supervised operations at Orenda for 37 years. I worked there part-time while studying

engineering at Ryerson," says Brian, who notes Orenda's library of aerospace history fascinated him. As an engineer, he later worked on Orenda engines for Canadian military aircraft including Tutors, CF5s and Snowbirds.

Since starting at Honeywell in 2001 as a repair and overhaul engineer, Brian has risen to wear multiple hats that today include his key involvement in

Honeywell's supply of secondary power distribution systems for the historic Airbus A380.

"I was on one of the first test aircraft in Toulouse. It tied it altogether for me. We're not just building a power system, we're part of something much bigger."

Beyond work, Brian devotes himself to his young family and playing on Honeywell's hockey team.

Business aviation is how business gets done

RICH GAGE
President, Canadian Business Aviation Association



In 1920, Imperial Oil acquired two aircraft for use in exploration and personnel transport to Northern Canada – that was the beginning of business aviation in Canada. Since then, the industry has grown to become a mature, innovative and integral part of corporate Canada, the transportation infrastructure and the nation's economy.

Using a diverse range of aircraft sizes and types, business aircraft today provide safe, secure and highly efficient transport for: executives, management and sales teams, group travel, just-in-time and emergency parts delivery – and Hope Air with a seat for a needy child or adult requiring specialized medical attention in locations coast to coast. Business aviation complements scheduled airline operations and fully addresses the need for time management, scheduling flexibility, and passenger comfort and convenience. A business aircraft enables firms to manage and maintain a competitive edge in the market place and is one reason d'être for how business gets done. In addition, it is

also a significant contributor to Canada's economy through direct and indirect employment for flight operations, manufacturing, sales, service, support, maintenance and repair activities.

As a vital element of air transportation, business aviation has a fully integrated infrastructure to manage its operational, maintenance and support needs. Furthermore, Canada has a progressive regulatory structure that recognizes the safety and efficiency values of business aviation through an adaptable regulatory system. In all respects, this gives the Canadian business aviation community a sound footing

and predictability for its ongoing growth and development.

The Canadian Business Aviation Association (CBAA) is the voice for Canadian business aviation at all levels. First incorporated in 1962, the CBAA now has a dual role of advocacy and regulatory stewardship, and speaks for more than 400 companies and organizations that operate over 500 business aircraft. The CBAA has access and links to a comprehensive network of regional, national and international fora through local chapters, the International Business Aviation Council (IBAC) and bilaterally with the National Business Aviation Association (NBAA) in Washington. CBAA fully supports and promotes business aviation wherever Canadian owners and operators do business.

The CBAA provides an essential service and support network to both its members and the greater aviation community. Particularly relevant to the CBAA is its ongoing work to ensure that aviation remains a safe, dependable, efficient and credible form of transportation not only within Canada, but around the world. The association's key interests, both at home and internationally, are: the

constraints on airports and airspace; security in the post-September 2001 era; regulatory harmonization and the ongoing trend to transfer responsibilities from government to industry; and national and international environmental issues relating to aircraft noise and emissions.

The CBAA holds an annual convention and trade show that provides a key opportunity for members, associates and prospective new entrants to experience and appreciate the business aviation culture. It is a great opportunity to do business, network with the community leaders and be informed about business aviation.

Business aviation globally is undergoing sustained expansion. Canada – with the second-largest national business aviation fleet – is experiencing growth at a rate that exceeds 10 per cent annually. Of particular interest is the emergence of new entry level aircraft. These aircraft – referred to as light jets or very light jets – are a result of the convergence of digital avionics, lightweight and durable composite materials and small engine technology. This convergence is allowing the development of small, highly capa-



PHOTO: BOMBARDIER

Business aircraft such as Bombardier's Global Express enable key personnel to work efficiently even during long-distance flights.

ble and efficient aircraft to enter the market at an increasingly affordable cost, allowing a progressive number of organizations, companies and individuals to take advantage of business aviation's core values. Furthermore, substantive work is underway in the United States to develop regional air taxi systems using this category of aircraft. Although this is a highly speculative endeavour, it may be a parallel to

the low-cost carrier that has changed, and continues to change, the airline industry business model.

Business aviation is indelibly connected to helping advance Canada's competitive advantage globally. A strong business aviation demand acts as a catalyst to the aerospace sector, providing ongoing investment, job creation and an expanding Canadian market. In short, business aviation is good for Canada. ■

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Skyward

HIGH FLYERS



Todd Macuda, PhD Neuroscience Research Officer, Flight Mechanics and Avionics, Institute for Aerospace Research, National Research Council Canada

Dr. Todd Macuda's work with Night Vision Goggles is nothing short of a sci-fi thriller, with very interesting applications to real life.

As a member of a team of flight test experts including psychologists, neuroscientists, test pilots and engineers, Todd studies how NVGs impact visual perception and flight performance during helicopter night landings and low-level night flight.

"Flying at night in the back country of Northern Ontario with NVGs while looking at a controlled burn has got to be one of the most interesting research experiences I have had," he says of the collaborative project with the Ontario Ministry of Natural Resources looking at the use of NVGs in forest fire suppression.

Todd's research in aeromedicine and the med-

ical/physiological factors contributing to flight involves a recent NRC initiative to monitor a pilot's physiological state during flight. His international team is measuring pilot brain activity in a helicopter. "The thrust of this program is to develop neural monitoring equipment to be used in a cockpit and look at a pilot's cognitive state as he flies," he says.

Calgary development centre a boon for industry

Focus on certification of aerospace composite materials

Alberta has staked a strong claim to a share of the growing market for aircraft development and certification by announcing plans for a national aerospace centre.

Under the umbrella of the Canadian Centre for Aerospace Development (CCAD), a wholly owned subsidiary of the Calgary Airport Authority, the project includes the Canadian Centre for Aircraft Certification (CCAC) at Springbank Airport near Calgary.

Myrna Dubé, president and CEO of CCAD, says aerospace provides an opportunity to further diversify Alberta's economy and take advantage of the demand for aircraft testing, evaluation and certification in the United States.

The demand is driven by a growing number of manufacturers of high-performance and lightweight aircraft – called very light jets (VLJs)

– carrying three to seven passengers and costing \$1 million to \$3 million.

Several manufacturers including Eclipse, Honda, Adam, Cessna, Excel-Jet, Epic AIR, Diamond, Avocet and Safire are racing to bring VLJs to market. One of the obstacles is certification, a rigorous and often costly process to test and ensure aircraft safety and reliability.

"The Federal Aviation Administration certifies aircraft in the U.S., but is experiencing high demand and some backlog," says Ms. Dubé. "We will work with Transport Canada Civil Aviation to make the CCAC a Transport Canada-accredited centre of excellence for testing, evaluating and engineering for general aviation aircraft. Transport Canada works with the FAA so that its certification is recognized in the U.S.," she says.

The CCAC's primary function will be to provide streamlined and

cost-effective testing and evaluation services for general aviation aircraft, specializing in aircraft made from carbon composite materials. Construction of the 50,000-square-foot facility will begin next spring and is scheduled to be completed by October 2007.

The CCAD has already attracted Aircraft Investor Resources (AIR) of Las Vegas as an anchor tenant. AIR founded Epic AIR, LLC in 2003 to design and manufacture five- to seven-seat aircraft including VLJs.

Epic AIR will move its completion and certified manufacturing facilities to Springbank Airport next year and expects to invest between \$125 million and \$150 million in Alberta in over the next two to four years.

Epic AIR CEO Rick Schrameck says his company expects to create "several hundred" jobs in Calgary. "Our experience working with the Calgary Airport Authority and

Transport Canada has been very positive, and we are confident that this is the right location for our endeavour. The concept of a single facility – a one-stop shop – for certification makes a lot of sense and is very attractive to us."

Clint Dunford, Minister of Alberta Economic Development, says the growing market in aerospace is a business opportunity for all of Canada. "Alberta has taken the initiative, and it is time now to establish a focal point for all Canadians for the advancement of this growing industry."

Merlin Preuss, director general, Civil Aviation at Transport Canada in Ottawa, says CCAD has a good opportunity to build a global niche business certifying general aviation aircraft that use composite materials. He believes the initiative has "tremendous potential" because the people involved are knowledgeable and seem to have assessed their market accurately.



PHOTO: NRC

Centres of excellence such as the NRC Aerospace Manufacturing Technology Centre provide critical infrastructure that reports industrial research, development and commercialization efforts. Located on the campus of the Université de Montréal, the AMTC is one of five laboratories operated by the NRC Institute for Aerospace Research.

Avionics certification centre would fill a big gap in Canada's aerospace sector

The growing international demand for the certification of new aircraft electronic systems – called avionics – and the training of personnel to test and certify them, is an opportunity for Canada to establish a world-class facility to provide these services, says Montréal businessman and test pilot John Maris.

Mr. Maris believes he is well positioned to spearhead the establishment of what he envisages as a Flight Test Centre of Excellence (FTCE).

He and his wife Julia co-founded Marinvent Corporation in 1983 as a Canadian research and development firm specializing in aerospace human factors, systems engineering and flight testing. The FTCE would capitalize on Marinvent's core competencies and reputation.

"FTCE would use the same business and technical models that we have successfully applied in our

company over the last 10 years," says Mr. Maris.

There are few facilities in the world that combine avionics certification and training tailored to the requirements of Transport Canada and the U.S. Federal Aviation Administration (FAA). As a result, says Mr. Maris, some aerospace companies face long and costly delays in certification due to the shortage of suitable test platforms and trained personnel.

"The global aerospace industry is so competitive and price sensitive that no one can afford delays in getting new aircraft to market. The challenges facing the new Airbus A380 program clearly highlight the importance of this activity and the very serious financial consequences of certification delays," he says.

He sees St-Hubert Airport at Longueuil near Montréal as a potential site for an FTCE, and while Marinvent is ready to invest

approximately \$10 million in the project, Mr. Maris says partnering with other investors and getting support from different levels of government would help create the critical mass necessary to attract global attention.

"This needs to be a national-level resource where we have the top engineers and scientists, the best available equipment, the most advanced training and groundbreaking research. The whole will be more than the sum of its parts," he says.

"An FTCE with an avionics focus would reinforce Canada's position as a leader in aerospace technology and provide considerable economic benefits to the country as a whole," says Mr. Maris.

Sue Dabrowski, director general of the Quebec Aerospace Association, has spent several years campaigning for the type of facility that Mr. Maris wants to establish.

"We estimate that Quebec is losing approximately \$10 million annually due to our inability to meet the demand for certification. And with nearly 60 per cent of the country's aerospace industry located in Quebec and employing about 40,000 people, it doesn't make sense for our region to be losing out in that way," she says.

Ms. Dabrowski believes that an FTCE similar to the one Mr. Maris is contemplating would attract significant new business to Quebec. The

facility could provide an ideal location under one roof for many of Canada's Design Approval Representatives (DARs), who are licensed

by Transport Canada to test and certify aircraft.

"It doesn't really matter whether the facility is run privately or by

government, or as a partnership between the two. What's important is that it be established as soon as possible," she says.

get on board



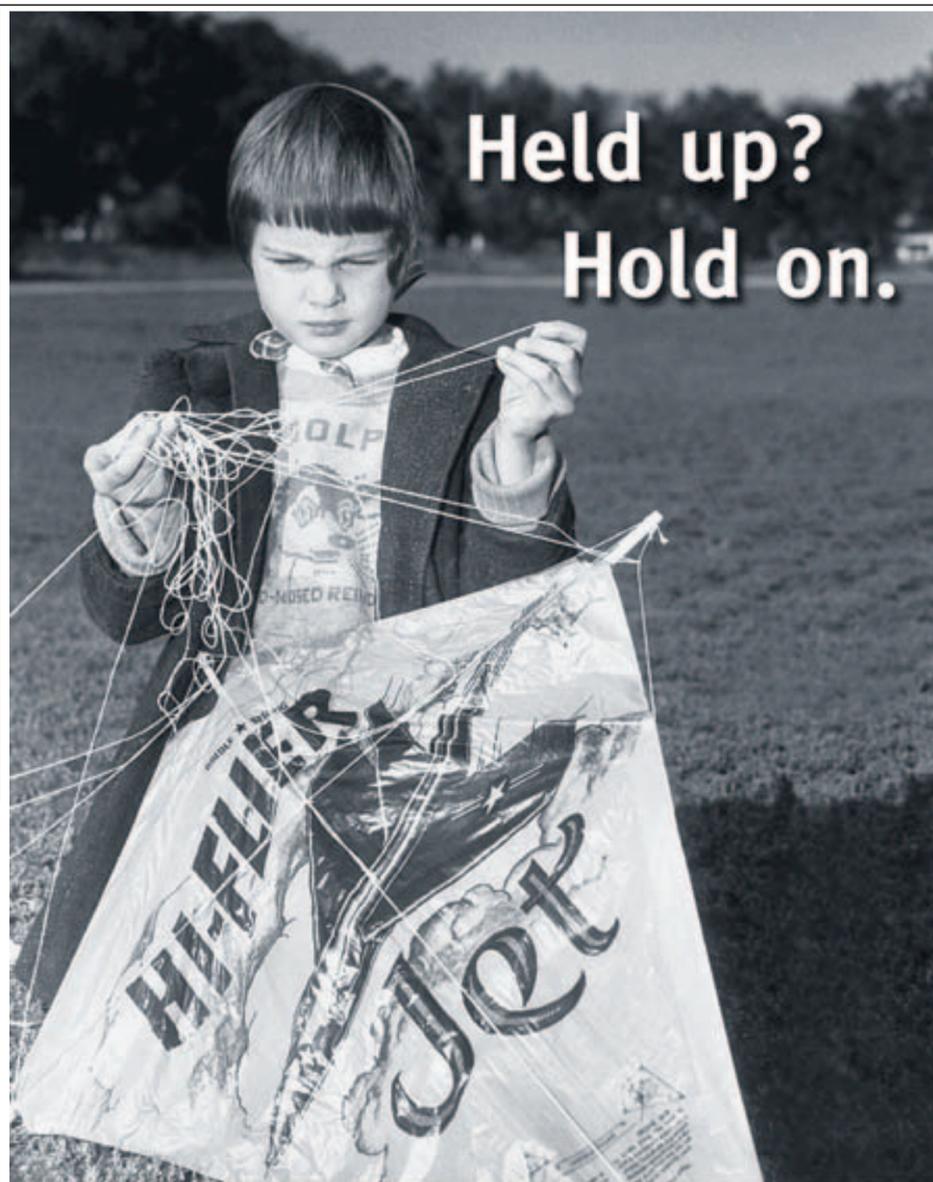
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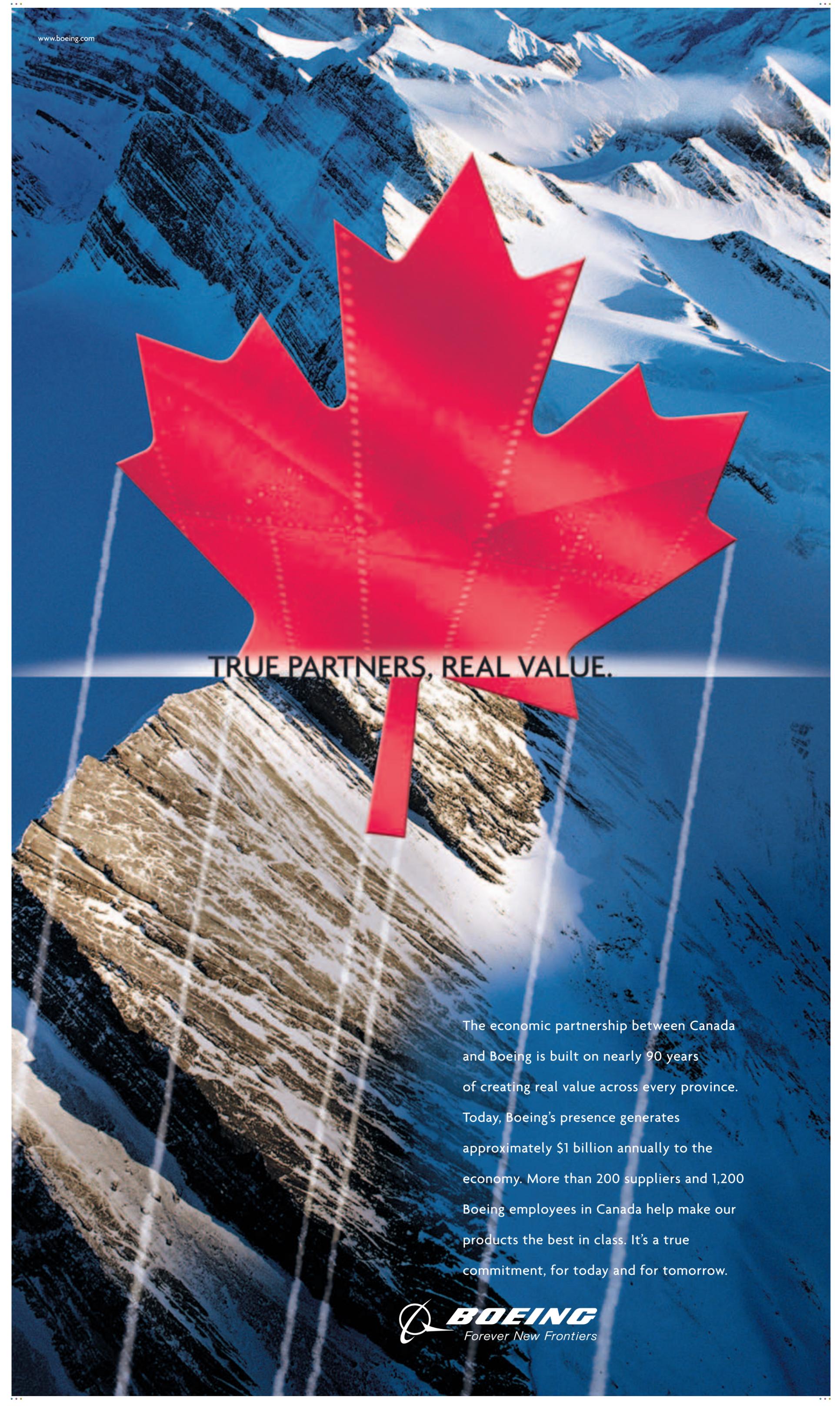
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Skyward

HIGH FLYERS



Robert Bradley Software Engineer, Aviya Technologies Inc.

Robert Bradley is a recent graduate of Engineering Science at the University of Western Ontario, but he's already had his hand in the development of the Cessna Citation Mustang engine controller.

"The plane's not even out yet and people are already calling it the Ferrari of business jets," he says.

During his computer engineering education,

Robert took many courses closely associated with the aerospace industry. "I thought it was very cool because aerospace is always pushing the envelope of technology," he says. "There's no compromising — everything has to work."

As team lead for the testing of the Cessna Citation Mustang, Robert says they are in the final stages of testing and upgrading. "Our team is responsible

for ensuring that our clients' designs work. They provide the designs, and we analyze the software and hardware to make sure that no matter what happens, it will always work in any condition."

Robert has also been involved in the testing of the landing gear and steering control unit for the Falcon FX.

From tarmac to deep space

Canadian aerospace sector spans an array of capabilities, products and services



Aviation Infrastructure

ATC radars and information systems
Airport equipment
Ground support equipment



Complete Aircraft

Regional aircraft
Business jets
Helicopters
Training aircraft
Special purpose aircraft



Civil and Military Aircraft, Engine and System in-Service Support

Fleet management
Engineering support
Maintenance repair and overhaul
Modifications and upgrades



Avionics and Electronics Systems

Cockpit systems integration
Aircraft flight management systems
Display systems
Enhanced vision systems
Communications systems
Satcom antenna
Mission computing and processing systems
C4ISR systems and components



Space

Communications satellites
Earth observation satellites
Small science satellites
Satellite components
Space robotics
Space vision systems



Training Equipment and Services

Flight simulators
Maintenance simulation systems
ATC simulation systems
Training services



Aircraft Engines and Components

Aircraft Systems, Structures and Components

Landing gear
Environmental control systems
Metal and composite structures and components
Specialized products and services



Canadian aerospace by the numbers

Annual Revenues \$21.8 billion

Rank: 4th in the world after the U.S., UK and France.

Annual Trade Surplus \$3.5 billion

The only Canadian advanced technology sector with a consistent trade surplus.

Direct Contribution to GDP 1.85%

Compares favourably to other industrial sectors such as agriculture, forestry, mining, electrical and electronics.

A higher percentage contribution than in most other 'aerospace nations.'

Annual Exports \$18.5 billion

A significantly higher percentage of exports than any other aerospace nation.

Firms 500+

A pan-Canadian industry with firms in every region of the country.

Employees 75,000

Scientists and Engineers 12,000
Technicians and Technologists 20,000

Average Annual Salary \$60,000

Significantly higher than the overall manufacturing average.

Sales by Geographic Market

United States	\$14.0 billion
Canada	\$3.3 billion
Europe	\$2.8 billion
Asia	\$1.1 billion

July 2006 (source: 2005 Annual AIAC industry survey)

Sales by Market Segment

Commercial Aviation	\$17.3 billion
Defence and Security	\$3.9 billion
Space	\$0.6 billion
Rest of World	\$0.6 billion

CAE Global Academy to train pilots from start through to career readiness

Canadian aerospace giant CAE, a world leader in training, flight simulation and modelling technologies, has deepened its worldwide reach even further through its recent introduction of the CAE Global Academy, a training alliance intended to address the global shortage of pilots. CAE Global Academy is a network of flight training organizations offering candidates training for a commercial pilot's licence and a clear path, via the CAE training network, to continue to a specific type-rating and ultimate career as an airline pilot.

"There is a worldwide shortage of airline pilots, which is expected to

become more acute over the next two decades," said Jeff Roberts, CAE's group president, Civil Training and Services and Innovation. "With the global jet fleet expected to almost double in the next 20 years, industry sources estimate demand for new pilots at up to 18,000 annually," he explained.

The Global Academy is starting with three flight training organizations — International Airline Training Academy (IATA) in Tucson, Arizona; HM Aerospace (HMA) in Langkawi, Malaysia; and Academia Aeronáutica de Évora (AAE) in Evora, Portugal.

CAE expects to expand into var-

ious locations around the world, particularly in areas experiencing a pilot shortage, such as China, India, Southeast Asia, the Middle East and Western Europe. According to Cameron Doerksen, an analyst at Versant Partners, "This is a good venture for CAE. There is a severe shortage of pilots in Asia, and the Global Academy is a natural extension of what CAE is already in."

Mr. Roberts agreed. "People learn by doing. Our Global Academy will use our capabilities in simulation, modelling and training to give qualified candidates a high level of expertise in only 12 months. Ours is a very efficient pilot training

process designed to improve their opportunities for a career as an airline pilot."

Currently, the alliance partners — IATA, HMA and AAE — can graduate and license over 600 pilots annually. These pilots graduate with a commercial pilot's licence, then proceed to type-rating qualification at one of CAE's 20 training centres worldwide. Over the next two years, other flight training organizations will be added to the Global Academy with the goal of producing more than 2,000 type-rated pilots annually.

Flight training organizations joining the alliance will continue to

offer the traditional training, known as "ab-initio" training, while CAE provides type-rating qualification through its global training network. In the future, CAE will utilize the academy to introduce a standardized Multi-Crew Pilot License (MPL) curriculum and course software supported by flight training devices.

One organization already taking advantage of CAE's training capabilities is Ryanair, the largest low-cost airline in Europe. According to Peter Bellow, general manager of Flight Operations, "Ryanair has had a very successful partnership with CAE for three years now. They train

pilots to our specifications; about 180 this year, and up to 400 next year."

In addition to training new pilot candidates, CAE offers transition training to existing pilots. "Pilots like to fly big, sophisticated airplanes. We make it possible for someone who is, for example, a first officer on a regional jet in Canada, to become a first officer and eventually a captain of a jet in another country. We make career progression possible for pilots," Mr. Roberts added. CAE's training facilities are a valuable source of pilots for airlines, and leverage CAE's extensive airline relationships. ■

BCIT opens campus at Vancouver airport

New school among world's best for aviation and aerospace training

When the British Columbia Institute of Technology moves into a new \$65-million campus at Vancouver International Airport (YVR) next fall, it will confirm its status as one of the premier aviation and aerospace schools in the world. Thanks to support from a blue-ribbon array of industry and other partners, BCIT is able to position graduates for smooth landings in the public sector as well as the private sector.

Lane Trotter, dean of the BCIT School of Transportation, noted in an interview that BCIT had its first intake of aeronautics students in 1957. The school has since grown steadily, doubling its faculty to more

than 450 full-time equivalents from about 225 since Mr. Trotter came aboard in 1998.

Its current campus occupies 125,000 square feet of leased space adjacent to the YVR south terminal. The new campus will be 300,000 square feet, including a hangar to accommodate large jets used for maintenance training.

Maintenance, repair and overhaul had been BCIT's core until about 2001, when it began augmenting curriculum to meet the increasingly specialized needs of aviation. "We are now the largest aerospace school in the country," Mr. Trotter said, adding that BCIT works co-operatively with other

polytechnical schools across the country and in the U.S.

In addition to a full range of flight training offered through a long-term partnership with Pacific Flying Club, BCIT has Transport Canada-certified courses in airport and flight operations, aircraft maintenance and type-certification, engines and avionics. It is also discussing an air traffic services course with NAV CANADA and, in partnership with Lufthansa, has had its maintenance and avionics programs certified by the European Aviation Safety Agency.

"We were the second international school EASA certified," Mr. Trotter noted. "We wanted to be the

first, but Aviation Australia, with which we're developing a relationship, beat us to the punch!"

Mr. Trotter can claim, however, that BCIT received the highest level of EASA certification ever issued, which he says is testament to the school's results, including its 90 per cent job placement rate. "There's always room for improvement, but we have a great team; my aerospace instructors are all industry people."

Also, because of its size, BCIT can run an airline-style quality assurance program with auditors and support staff who ensure that everything on campus meets standards. "In a sense, Transport Canada treats us as if we were a carrier," Mr. Trotter, who regards this as "an honour," notes, "It does require a lot of work." ■

Where do many NATO pilots train? Moose Jaw, naturally.

Saskatchewan's skies are known for more than being big, blue and wide-open; they are also valuable airspace used to train military pilots and instructors from nearly a dozen countries. Today, at 15 Wing in Moose Jaw, Canada continues a tradition of allied pilot training that dates back to World War I.

NATO Flying Training in Canada (NFTC) began in December 1994 as an unsolicited proposal from a consortium led by the Defence Systems Division of Montreal-based Bombardier Inc. Recognizing that international participation meant it could train Canadian Forces pilots at a lower cost and on more modern aircraft, the Department of National Defence (DND) signed a 20-year contract in December 1997.

Signing the deal enabled Bombardier and its partners to continue a Canadian tradition that began in 1917 with a British Royal Flying Corps program based in Toronto.

At 15 Wing in Moose Jaw, NFTC trains pilots in two-seat turboprop aircraft. From there, pilots go on to fighter, transport or helicopter training at other DND bases on the Prairies.