





Surrounded by representatives from Brit Air, France and Bombardier, fourth from left, is Alain Huberdeau, Managing Director of Brit Air. On his right is Michael Graff, President of Bombardier Aerospace.

CRJ700 deliveries begin

First 70-seat regional jet to the market

FRENCH regional airline Brit Air has taken delivery of the first CRJ700 Series aircraft and is expected to inaugurate service with the aircraft in February, 2001. The CRJ700 is the first 70-seat regional jetliner to meet the requirement for additional capacity on many of the routes developed by the pioneering 50-seat CRJ100 and 200 Series aircraft, of which Brit Air operates 20.

The CRJ700 was awarded type certification by Transport Canada on December 22, 2000. Type Recommendation from Europe's Joint Airworthiness Authorities was received on January 26, 2001. Type Approval from the U.S. Federal Aviation Administration was expected before this issue of Regional Update went to press.

Brit Air was the launch customer for the CRJ700, with a firm order for four aircraft placed in February, 1997. It converted options on eight aircraft in July,

2000 to increase its firm orders for the type to 12 aircraft. Brit Air currently operates 20 of the 50-seat CRJ models.

"The exceptional economics of the CRJ have made it an invaluable asset to our fleet," said Xavier Leclercq, CEO of Brit Air. "We fully



In 1998, Xavier Leclercq's decision to commit to the CRJ700 program was a bold one. Considering the demand for 70-seat regional jets today, we are very pleased with that decision.

Alain Huberdeau, Managing Director Brit Air

expect that the new CRJ700 Series, with its additional seats, will deliver even greater efficiencies."

And CRJ700 operators will be getting a better aircraft than they signed for. Operating Weight Empty (OWE) is 120 pounds (54 kg) less than the published OWE, an

accomplishment of Bombardier Aerospace's aggressive program to save structural weight wherever possible. Take-off distance is 100 feet (30.5 m) less than advertised; maximum cruise speed at 35,000 feet (10 668 m) is Mach 0.825/476 knots rather than the predicted Mach 0.815/470 knots. Lower than expected drag has resulted in a payload increase of a hefty 4,000 lbs (1 841 kg) with a flaps 20° setting at take-off and 3,000 pounds (1 368 kg) with a flaps 10° take-off in climb gradient limited conditions.

"These numbers translate into the lightest 70-seat jet in the market," said Stephen A. Ridolfi, President of Bombardier Aerospace, Regional Aircraft. "The increased speed capability means greater operational flexibility and utility, while the increased payload capability means additional profit potential."

CRJ700 Firm Orders

American Eagle	25
Atlantic Southeast Airlines	12
Brit Air	12
Comair	20
Delta Connection	25
GECAS Leasing	25
Horizon Air	30
Lufthansa	20
Maersk Air	5
Total	174
Conditional orders and options	317

The CRJ700 Series full flight simulator at the Bombardier Aerospace Training Centre in Montreal received interim Level C certification in September, 2000. A second CRJ700 simulator is scheduled to become operational in March, 2001 at the Berlin-Schönefeld Lufthansa CityLine Simulator and Training Centre.

CRJ, Q Series find favour in Australia

They serve as airliners and special-mission aircraft

BOMBARDIER

Aerospace, Regional Aircraft products have been making steady inroads in Australia, both as regional airliners and special-mission aircraft. Twenty-eight Canadair Regional Jets and Q Series turboprops have been delivered to operators in the country as of January 15, 2001.

Ansett Australia/Kendell Airlines inaugurated regional jet service in Australia in 2000 and has taken delivery of nine of the 12 50-seat CRJ200 Series aircraft on firm order. Kendell's CRJ aircraft are complementing or supplementing larger Ansett aircraft on several routes in the southern part of the country while adding frequency. For example, prior to the arrival of the CRJ, Melbourne-

Hobart received three Boeing 737 services daily. Now it has 11 daily non-stops, with 10 of them provided by the CRJ.

All Qantas regional airlines operate Dash 8 or Dash 8 Q Series turboprops, the 37- to 39-seat Q100 and Q200 and 50- to 56-seat Q300. (Q Series aircraft, introduced in 1996, are equipped with the Noise and Vibration Suppression (NVS) system that substantially reduces passenger cabin noise and vibration.) Southern Australia Airlines, based at Mildura, has three Dash 8-100 aircraft for scheduled services in Victoria, Southern Australia, Australian Capital Territory and Tasmania. Eastern Australia Airlines, the Qantas regional in New South Wales, is an all-Dash 8 operator with 11 Series 100 aircraft, three Series 200 and one



National Jet Systems (photo), LADS Corporation and all Qantas regional aircraft operate Bombardier Aerospace Dash 8/Q Series aircraft, while Kendell Airlines inaugurated CRJ regional jet service in the country.

Series 300. At Brisbane, Sunstate Airlines has six 100/Q200 Series and one Q300 to serve its route along the east coast of Australia. Skipper's Aviation, based in Perth, uses a Dash 8-100 to serve some of its destinations.

LADS (Laser Airborne Depth Sounding) Corp. of Sydney has won contracts worldwide to probe the depths of the oceans with the laser system aboard its Q200.

From bases at Darwin, Broome and Cairns, National Jet Systems subsidiary Surveillance Australia operates five Q200 "Coastwatch"

Maritime Patrol Aircraft equipped with sophisticated radar, infra red, low-light-level television, cameras and other equipment to keep unwanted intruders from Australia's coastlines.

"We are proud of the contribution that our products have made to successful airline and special mission operations in Australia," said Walter Galloway, Vice-president Sales, Asia/Pacific at Bombardier Aerospace, Regional Aircraft.

"We anticipate playing an even greater role in the future."

Happy is he who, like Ulysses...

The profession of test pilot at Bombardier Aerospace has a number of sides to it. Flight testing makes up the greater part of what we do. However, it sometimes happens that we deliver aircraft to airlines that have entrusted Bombardier with an order for one or more units. Our company is successful on all five continents and as a consequence, the Flight Operations Department regularly organizes convoys that sometimes go to the most distant parts of the planet.

Recently, Gerry Martinsen and myself were responsible for delivering a Dash-8 202LR (S/N 551) to National Jet. This entailed a journey which began in Toronto's Pearson Airport and ended in Cairns (Queensland, Australia).

Once more, we were able to verify the remarkable reliability of this aircraft. Our route took us across the Atlantic in a single stage (Gander to Shannon (Ireland). More impressive still, we then went from Shannon to Muscat (Oman) in the same day, with a stopover in Crete. Two days later, we flew from Muscat to Kuala Lumpur (Malaysia) with a single stopover in the Maldives!

At the airport in Male (Maldives), we parked the aircraft near another Dash-8 200 operated by Air Maldives. At that moment, the Indian Ocean was vibrating to the colours of Bombardier! We then repeated the experience in Malaysia, when we stopped alongside a Dash-7, still in good condition despite its advanced age!

At each stage, the aircraft attracted attention. It has to be said that the different equipment installed on board for the Australian Customs made the aircraft difficult to miss. Once in the air however, the situation became reversed: the range of this equipment meant that nobody, either flying or on the ground, could pass by unnoticed. The precision of the images from both the radar and the camera was astounding.

After a last stopover in Bali, we arrived in Cairns in the afternoon of the seventh day of our trip. A flyover at low altitude of the National Jet hangars and another aircraft of the same type, delivered several weeks earlier, marked the end of a very intense and enriching mission.

—Jean-Christophe Lamy

Test Pilot, Bombardier Aerospace Regional Aircraft

CRJ700, Q400 embark on world demo tour

Bombardier Aerospace's CRJ700 Series regional jet and Q400 high-speed turboprop will begin an around-the-world demonstration tour following their appearance at the Australian International Air Show at Melbourne, Australia from February 13 to 18, 2001.

The journey of the 70-seat CRJ700, SN10004, and 60-68-seat Q400, SN 4004, will see them conduct demonstration flights for airline executives in Australia, Papua New Guinea, Singapore, Malaysia, Thailand, Taiwan, Japan, Korea, People's Republic of China, India, and several countries in the Middle East and Europe. The aircraft will return to Canada for a short time before leaving again for the Paris Air Show from June 17 to 24.



Q400 shines on Asia-Pacific demo tour

The trip was marked by flawless performance

THE world's most advanced turboprop airliner paraded its outstanding capabilities to airline executives during an Asian demonstration tour in the fall of 2000. The 360-knot Q400 flew westward around the globe during its 1½-month journey.

Serial number 4004, the fourth Q400 to be built, contains a number of seating layouts, ranging from luxurious leather seats at 32-inch (81.3 cm) pitch used by SAS Commuter to a high density layout at 30-inch (76.2 cm) pitch.

Departing Bombardier Aerospace, Regional Aircraft headquarters at Downsview, Ontario on October 23, the Q400 headed west across Canada and north to Fairbanks, Alaska. A crossing of the Bering Straits was followed by a flight down the east coast of Russia, via Anadyr, Petropavlovsk and Khabarovsk, before arrival in Beijing, People's Republic of China.

After a visit to Shanghai, the aircraft appeared at the China Air Show, held from November 5 to 12 at Zhuhai Airport in Guangdong Province. There, it was displayed alongside a CRJ200 in the colors of Shandong Airlines, based in Jin'an in eastern China. The show

also coincided with the delivery of the first of three Q400s to Hainan of Haikou.

Following the show, 4004 crossed the East China Sea to make landfall on Okinawa, in the far south of the Japanese archipelago. This was the first port of call in a week of intensive pilot and passenger demonstrations throughout the country.

From Japan, the aircraft flew to Taipei, Taiwan. This was followed by a series of short hops that saw the Q400 fly south and west with visits to the Philippines, Malaysia, Sabah, Brunei and Indonesia. After a brief stopover, the tour resumed with demonstrations in Nepal and India.

Airline executives who sampled the aircraft complimented the "big aircraft" feel of the Q400 cabin and were especially impressed by the large amount of underseat stowage space for carry-on baggage. The underseat area on the Q400 is larger than that of the Boeing 737. While passengers seated at the very rear of the cabin did not notice much difference in

sound and vibration levels than that in other Dash 8 aircraft, passengers seated in rows immediately for and aft of the wing were vocal in their praise of the Q400's Noise and Vibration Suppression (NVS) system.

Airline pilots who rode in the jump seat told Bombardier pilots

Bombardier Aerospace, Regional Aircraft. "It is becoming increasingly clear that the aircraft's speed, comfort and exceptional economics give it a significant competitive edge over any other aircraft in its class."

Leaving New Delhi December 7, the Q400 made its return ferry flight to Toronto, transiting via Oman, Bahrain, Egypt, Malta, England, Iceland and Greenland, reaching Goose Bay and Downsview on December 11.

The tour conducted 42 demonstration flights carrying 1,437 passengers, all of whom were impressed with the Q400's superb performance and the quiet cabin provided by the Noise and Vibration Suppression (NVS) system.

The aircraft also proved its reliability, with no cancellations caused by mechanical problems, even though the aircraft operated from Arctic to Equatorial conditions. In addition, there were 37 ferry flights; in total, 19 countries were visited. Total flight time was 138.7 hours, and the aircraft covered 33,476 nm (62 098 km).



that the sharpness, quality and color definition of the Sextant Avionique electronic flight instruments were better than similar displays in Boeing's 747-400 and 777.

"The almost unanimous positive response to the Q400 by the passengers carried on the demonstration flights is very encouraging," said Steven A. Ridolfi, President of

Top photo: the Q400 was painted in Augsburg Airways Team Lufthansa livery. Inset: armed forces members from Brunei

CRJ200: broadening Kendell's horizons

Jet operations benefit customers and employees

50-SEAT CRJ200 regional jets are allowing Australia's Kendell Airlines to fulfil its mandate to provide an efficient and seamless integration with the mainline operations of Ansett Australia. At the same time, the smaller seating capacity of the CRJ compared to Ansett's Boeing 737 and Airbus A320 aircraft permits increased frequencies on many routes.

"The ability to increase frequency in some markets is an important competitive initiative," said Bruce Byron, Kendell's Executive General Manager, Operations. "Historically, particularly in Tasmania, there has been a need to spread the available seats over a greater proportion of the day. With the CRJ, Kendell Airlines has satisfied that requirement."

Prior to the arrival of the CRJ in mid-2000, Melbourne-Hobart was served by three B737 daily round trips. Now there are 11 daily frequencies, with 10 flown by the CRJ.

By February, 2001, Kendell will have nine CRJ aircraft in service of its firm order for 12. Kendell holds options for an additional 12 jets.

"The greatest benefit from the CRJ is that we have been able to offer our customers the speed associated with jet aircraft travel and frequency of service on selected routes," said Mr. Byron. "This has enabled our operation to become



more integrated with the mainline Ansett operation. At the end of the day, our customers are offered a more seamless service.

"The majority of passengers are more than satisfied with the overall service," he added. "Those passengers – mainly business passengers – who have been accustomed to a larger cabin size acknowledge that a more frequent service more than makes up for that aspect."

At the end of January, 2001, Kendell's CRJ's were flying Melbourne-Hobart, Melbourne-Launceston, Canberra-Adelaide, Canberra-Brisbane, Brisbane-Rockhampton and Sydney-Hobart. Soon to be added are Melbourne-

Canberra and Brisbane-Mackay. Ranging from 246 to 561 nm (483 to 1 038 km) the routes were all new to Kendell, having been transferred from Ansett.

Mr. Byron offered some insights on the introduction of jet aircraft into what was previously an all-turboprop fleet.

"Prior to the introduction of the CRJ, we operated traditional regional routes with turboprop aircraft based on separate hubs," he said. "With the introduction of the CRJ the style of operation needed to change. We did not want to operate two different airlines – jet and turboprop – with different procedures or standards. Thus, one of the greatest challenges was to build an integrated

jet/turboprop operation that satisfied the regulatory standards required of a high-capacity operator.

"This was necessary for our customers as part of our plan to integrate the service with Ansett mainline, but also provided benefits for our employees. Kendell employees now have more scope for advancement within a large organization and technical staff have the opportunity to operate a wider range of equipment including state-of-the-art aircraft."

He said the operational and safety benefits of this integrated approach are particularly important.

"Kendell has a compliance and safety approach second to none," he said. "Improvements in operational management have included a centralized approach to daily network control, a new centralized maintenance control system, and a flying operations training system that utilizes simulators for all aircraft types in our fleet."

And how is the CRJ performing for Kendell?

"It is about as expected, with no major issues at this stage," Mr. Byron said. "However, there have been some issues that relate to our extreme distance from the manufacturer and other major CRJ operators. We're encouraging Bombardier Aerospace to allocate additional resources to our unique requirements."





The first CRJ900 is assembled at Bombardier's plant in Mirabel, near Montreal.

CRJ900 set for flight

86-seater due for service entry early in 2003

THE first of two CRJ900 Series flight test aircraft is ready to make its first flight on schedule in the first quarter of 2001. The aircraft was assembled by inserting two fuselage plugs measuring 90 inches (2.29 m) and 62 inches (1.57 m) into CRJ700 serial number 10001. This instrumented vehicle will be used to explore the flight envelope.

Aircraft number two will be the first all-new CRJ900, SN 15001, in production configuration for systems validation, baggage compartment certification and function and reliability testing. It is scheduled for its first flight in the second quarter of 2001.

Both aircraft will be ferried to the Bombardier Aerospace Flight Test Center at Wichita, Kansas for the approximately 13-month flight test program. Transport Canada type certification is scheduled for the fourth quarter of 2002 with deliveries beginning in the first quarter of 2003.

SN 15002, with a generic 90-seat airline interior, will be used solely for passenger evacuation testing late in 2001 and will later be converted into a customer aircraft.

Formally launched at the Farnborough Air Show in June, 2000 the 86-seat CRJ900 has received 10 firm orders plus 20 options from GE Capital Aviation Services. Brit

Air has placed a conditional order for eight, while Air Nostrum and Tyrolean Airways have signed Letters of Agreement for eight and 12, respectively, for a program total of 58 CRJ900 Series aircraft.

All of these customers operate or have ordered the 50-seat CRJ100/200 and 70-seat CRJ700 Series regional jets. The 86-seat CRJ900 will give them additional capacity as well as common crew qualification, common maintenance and training procedures, common spares, common ground support equipment and common after-sales support.

Bombardier Aerospace, Regional Aircraft believes that this kind of family commonality can result in enormous cost savings – as much as \$153.05 million over a 15-year period based on a sample fleet of 30 CRJ aircraft versus a mixed fleet of 50-seat CRJ aircraft and other 70- and 86-seaters. The \$153.05 million is comprised of savings in flight crew and training costs (\$81.63 million), spares savings (\$14.72 million), maintenance savings (\$51.71 million) and miscellaneous savings (\$4.99 million).

"In addition to the multi-million-dollar cost advantage over mixed fleets, the CRJ900 will offer

regional airlines unbeatable operational flexibility, and its exceptional operating economics will set the standard for this category of aircraft," said Steven A. Ridolfi, President of Bombardier Aerospace, Regional Aircraft.

The standard version of the CRJ900 has a maximum take-off weight of 80,500 pounds (36 514 kg) while the extended range CRJ900ER has a maximum take-off weight of 82,500 pounds (37



...the CRJ900 will offer regional airlines unbeatable operational flexibility...

Steven A. Ridolfi, President
Bombardier Aerospace Regional Aircraft

421 kg). A "European Version" of 36 995 kg maximum take-off weight is available to minimize weight-related charges in European airspace.

Maximum cruise speed is Mach 0.81 or 476 knots (35,000 feet, ISA, 95% MTOW) while normal cruise speed is Mach 0.78 or 447 knots at 37,000 feet. ER version range with 86 passengers in a North American environment is 1,720 nm (3 183

km) and 1,442 nm (2 668 km) in a European environment.

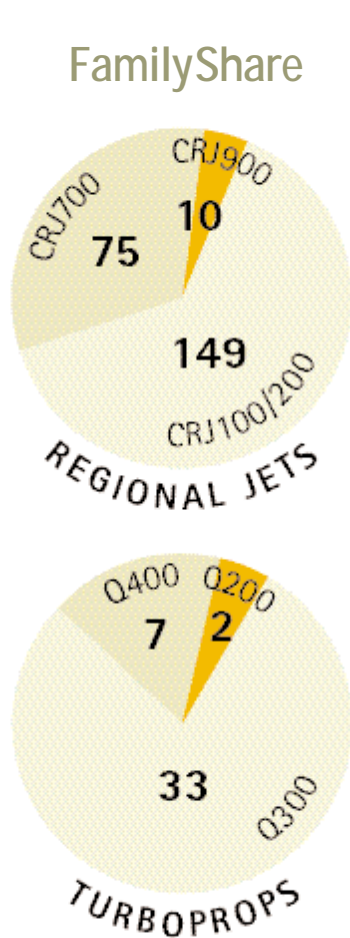
The CRJ900 is powered by two General Electric CF34-8C5 engines of 14,500 pounds (64.5 kN) thrust, scheduled for certification in the 2nd quarter of 2002. The -8C5 is a growth version of the -8C1 engine in the 70-seat CRJ700 and features wide spares and line replaceable unit commonality with the -8C1. The CRJ900 will feature common left/right engine nacelles, fan and core cowl doors, nose cowl and thrust reversers – more examples of significantly reduced spare parts requirements.

Compared to the CRJ700, the CRJ900 has a strengthened main landing gear with upgraded wheels and brakes, an additional aft service door, two more overwing exits, strengthened wing, increased volume in the underfloor baggage compartment with an additional underfloor baggage door, and a third seat rail to provide 2+1 seating.

The standard aircraft has 86 seats at 31-inch (78.8 cm) pitch. However, various seating capacities are available, including business or club class seating at 34-inch (86.7 cm) pitch. There is also a wide range of galley configurations, enabling hot meal service.

Bombardier marked record sales in 2000

234 CRJ regional jets and 42 Q Series turboprops



CALENDAR year 2000

Bombardier Aerospace, Regional Aircraft and added eight new customers to the company's roster. The sale of 276 aircraft – 234 RJ200/700/900 regional jets and 2 Q200/300/400 turboprops – was 2 more units, or about 14%, over the 1999 sales total.

The 234 CRJ orders came from a blend of new and repeat customers and included 149 50-seat RJ100/200, 75 70-passenger CRJ700 and 10 86-seat CRJ900 aircraft.

Bombardier took a 62% share of the turboprop market with sales of 42 of the 68 units sold around the world. Sales were comprised of 37 37-seat Q200, 33 50-passenger Q300 and seven 70-seat Q400 aircraft.

Overall, Bombardier regional aircraft garnered a 42% revenue share of the 20- to 90-seat market

in 2000, while capturing 37% of the 757 units sold worldwide.

134 Deliveries

Bombardier Aerospace, Regional Aircraft deliveries in 2000 numbered 134 – 35 Q Series turboprops and 99 CRJ regional jets. First deliveries were made to new customers in Japan and China in the Asia/Pacific region. In 1999, Bombardier delivered 107 aircraft – 25 turboprops and 82 regional jets.

Orderbook Exceeds 2,600 Aircraft

At the end of 2000, Bombardier's regional aircraft orderbook had increased to 2,631 aircraft delivered, on firm order backlog and optioned, compared to 1,847 a year earlier. CRJ orders stood at 947 firm, with 460 delivered and 487 on backlog. There were also conditional orders and options for 941. Q Series firm orders reached 661 – 571 delivered and 90 on backlog – plus 82 conditional orders and options.

It was a very good year

Sales 2000	
CRJ Series	234
Q Series	42
Deliveries 2000	
CRJ Series	99
Q Series	35
Q Series Order Book Dec 31/00	
Ordered	661
Delivered	571
Backlog	90
Conditional orders and options	82
CRJ Series Order book Dec 31/00	
Ordered	947
Delivered	460
Backlog	487
Conditional orders and options	941

SkyWest CRJ deal could reach 128 aircraft

U.S. carrier planning expanded United Express operations



CRJ100 and 200 Series regional jets cemented their position as the most successful regional airliner program in history with the announcement in January, 2001 that SkyWest Airlines of Utah plans to acquire up to 128 Series 200 aircraft.

The transaction includes 35 firm orders, 29 conditional orders and 64 options. It increases SkyWest's commitment to 248 CRJs comprised of 100 firm orders, 29 conditional orders and 119 options, with 15 of the firm-ordered aircraft currently in revenue service.

"The aircraft covered in this announcement will provide SkyWest with the ability to expand our planned United Express operations," said Jerry Atkins, President and CEO of SkyWest Airlines. *"With the CRJ as the core of our fleet, we are able to realize significant savings in flight and maintenance training, spare parts provisioning and economy of operation."*

The 29 conditional orders are subject to an extension of the current SkyWest and United operational agreement and

the orders are expected to be firmed up sometime in 2002.

Under the terms of the agreement, some of the CRJ200 aircraft will be in 40- and 44-seat configuration.

The SkyWest transaction brought the CRJ100/200 orderbook to 798 aircraft as of January 15, 2001, with 460 delivered and a backlog of 338. Options and conditional orders for those models represent another 615 aircraft, for an overall total of 1,413 units.

SkyWest Airlines was the first airline to commit to the CRJ program with a Letter of Intent signed prior to formal program launch in 1989, and put its first aircraft into service in March, 1994 from its hub at Salt Lake City, Utah.

"SkyWest had the vision and understanding to commit to the then-unknown regional jet concept," said Steven A. Ridolfi, President of Bombardier Aerospace, Regional Aircraft. *"We are proud that SkyWest's confidence in Bombardier and our products has endured and grown since those early days."*

Dash 8/Q Series milestone

Bombardier turboprops rack up 10 million flight hours

TEN million hours. That's 1,141 years, 13,704 months, 59,384 weeks or 416,830 days. It's also how long Bombardier Aerospace's Dash 8 turboprops have spent in the air, flying something like 4.3 billion km in the process.

Dash 8s and their successors, the Q Series, have carried an estimated 294 million passengers. In all, 74 customers in 57 countries operate Dash 8s. The airplane's day begins at Vanuatu, across the International Date Line in the South Pacific, with Air Vanuatu's first flight in the morning. Dash 8 flights continue across all time zones until Aloha Island Air's last flight of the day touches down in Honolulu.

The high number of flying hours and an unparalleled low accident rate are the legacy of a team of engineers at de Havilland Aircraft – taken over by Bombardier in 1992 – who, in the late 1970s sat down to design a new airplane for regional airlines. After studying various configurations and passenger capacities, they settled on what became the Dash 8 and the program was officially launched in September, 1980, with orders in hand for about 55 airplanes. That was more advance orders than de Havilland had ever received for an airplane still in its early stages.

The Dash 8 wasn't just a new airplane; it was a new-new airplane with technological advances never before seen on this class of airliner. The use of composite materials such as kevlar, rather than aluminum, in some flight control surfaces was a new approach then. The automatic pilot was digital, rather than analog. Computer-driven digital flight displays as opposed to electro-mechanical dials and gauges) were in the cockpit. Above all, the engines were new. Pratt & Whitney Canada had been chosen to supply a new turbine engine and developed the PW100 of 1,800 shp. Pratt & Whitney has since delivered more than 4,500 of these engines which have become a best-selling series of 26 variants ranging from 1,800 to 2,880 shp.

The first revenue flight with a Dash 8 was made on December 19, 1984 by norOntair, the Ontario government-owned airline, between Sudbury and North Bay, Ontario. Other flights by other airlines soon followed.

The original Dash 8 Series 100 had a maximum capacity of 39 passengers. Now there are several models available. The Q Series 200 retains the dimensions



and seating capacity of the Series 100, but has more powerful Pratt & Whitney engines to deliver better performance under high altitude, hot weather conditions. With that better performance comes increased payload (read revenue) for the operator. The Series 100 was stretched into the Series 300, with a

The Dash 8 wasn't just a new airplane; it was a new-new airplane with technological advances never before seen on this class of airliner.

maximum passenger capacity of 56. The latest Dash 8, the Q Series 400, entered airline service early in 2000. It seats a maximum of 78 passengers and is the fastest turboprop aircraft in the sky, with cruising speeds as high as 360 knots (665 km/h).

The economic benefit to an airline of having a fleet of common aircraft with various seating capacities is significant. A common fleet allows the operator to reduce his spare parts inventory, ground support equipment and, more importantly, crew expenses because the same pool of pilots can fly all models. The wide range of seating capacities also allows the airline operator to match aircraft capacity to passenger demand.

All Dash 8s produced since 1996 are

called "Q" aircraft. A Noise and Vibration Suppression (NVS) system, developed jointly by Bombardier Aerospace and Ultra Electronics of Cambridge, England, uses sophisticated dampers, microphones and computers to cancel out the noise and vibration caused by the propellers beating against the fuselage. This system gives the passenger cabin of Q Series aircraft the low noise and vibration levels associated with pure-jet aircraft. Under some circumstances, Q Series aircraft are quieter inside than jets. The "Q" designation has become quite a marketing tool for the airlines, too; Tyrolean Airways of Innsbruck, Austria has "The Sounds of Silence" painted on its Q Series aircraft.

Most of the 560-odd Dash 8s in the world (659 have been sold, so there's a backlog of about 100 unfilled orders) are hard-working regional airliners earning a profit for their owners. The airplanes are up and down a lot; average Dash 8 flight time is 50 minutes over a 200-nm (370-km) sector. The dispatch reliability is more than 99%.

The Dash 8 is so flexible and adaptable that it fills many other roles. Dash 8s train navigators for the Canadian Forces. Canadian and Norwegian authorities use Dash 8s to monitor airways navigation aids and runway instrument landing systems. In Colombia, a BPX Colombia Dash 8 ferries oil exploration crews and equipment

The Q200 Dash 8, above, is the successor to the Dash 8, inset, first flown commercially by norOntair on December 19, 1984.

between Bogota and exploration sites in the interior. Dash 8s in Australia conduct coastal surveillance for Australian Customs, and serve as the platform for laser depth-sounding of the ocean. Saudi Aramco in Saudi Arabia has a do-everything Dash 8 that is converted between all-passenger, all-cargo, passenger-cargo or medical evacuation configurations as required. The U.S. Air Force has a Dash 8 to patrol and monitor a missile test range in the Gulf of Mexico.

The Dash 8 set a milestone when it became the first turboprop aircraft to be approved for a head-up guidance system, or HGS. This gives the airplane the ability to land when the cloud ceiling is only 158 feet (15 m) above the runway and the visibility is only 700 feet (213 m). Airlines installing this equipment gain a strong competitive edge by being able to operate in weather conditions that keep other aircraft on the ground.

"The Dash 8 family's successful longevity is directly due to its operating economics and its rugged reliability," said Steven A. Ridolfi, president of Bombardier Aerospace, Regional Aircraft *"We have continuously upgraded the aircraft as new technologies such as NVS have become available, and we are confident of selling many more Q Series aircraft in the years ahead."*

Customer support: the opportunities are great

And customer satisfaction leads to customer loyalty

SUCCESS in servicing a product after it has been sold is crucial to future sales of the product. A customer who is happy with a company's after sales support is more likely to return with more orders.

"We certainly recognize the importance of customer loyalty, but we also recognize that our customer support may not be perfect," said Chris Beaton, Vice-president, Customer Support at Bombardier Aerospace, Regional Aircraft.

As a result, about 18 months ago Customer Support began in-depth surveys of operators of both CRJ regional jets and Q Series turboprops, asking them to rate the company's support. The resulting "scorecard" registered 3.5 out of a possible seven.

"It is because of the scorecard that we have invested considerable resources in the technical publications and spare parts operations groups, the two greatest areas of customer concern," said Mr. Beaton.

In a way, the "3.5 - somewhat satisfied" score is a penalty for success.

"We are delivering more aircraft of more models and the challenge is to keep pace with this growth," said Mr. Beaton. "The airlines that operate our aircraft are growing just as fast, and so are their expectations for support. We have to deliver and the scorecard will help us do that. Although many of our customers who also operate competitor air-

craft say we offer better support, that isn't good enough."

Mr. Beaton and his staff of about 700 experts are responsible for spares, technical publications, customer training, customer service and supplier liaison, and field support. Each month Mr. Beaton chairs the Customer Board, a new initiative consisting of senior regional aircraft management, sometimes with customer participation. These meetings review major areas of customer dissatisfaction.

Customer Support has several actions being implemented this year. Beta testing of on-line ordering of spare parts is underway with the co-operation of a core group of operators and the system should be on-line worldwide by mid-2001. Technical publications are being moved from paper to high-quality web-enabled Digital with hyper-linking. The Technical Help Desk has been allocated additional resources to allow it to provide more efficient service to more customers. Bombardier also plans to be more aggressive in expanding the role of customer training.

"We also recognize that while many aspects of Customer Support are fleet wide, operators have individual needs," Mr. Beaton continued. "An operator in the tropics obviously faces different circumstances than an operator in the Arctic. They don't require more service, they require



Chris Beaton is Regional Aircraft's Vice-president, Customer Support.

'differentiated' service and we have to provide that."

Bombardier realized early in 2000 that its support could be structured better to address its customers' requirements and reorganized support into three separate units under the umbrella of Support and Services: Mr. Beaton's Customer Support, In-service Engineering under Vice-president David Schenck and Aircraft Services & Business Systems

under Vice-president Jeff Mihalic.

"Customer satisfaction with the operational reliability of our products is paramount to our future," said Steven A. Ridolfi, President of Bombardier Aerospace, Regional Aircraft in announcing the new structure. "We believe that all aspects of support and services are key to improving our performance and that this issue deserves dedicated senior management focus."



Different operators face different conditions and Customer Support must provide "differentiated" service.



CRJ, Q Series deliveries

70 aircraft were delivered to 21 operators in the last six months of 2000

THE first Q400 delivery to a North American operator went to Horizon Air, which has placed firm orders for 15 of the quiet, high-speed turboprop airliners. Other Q400 aircraft were delivered to SAS Commuter, which took five to boost its fleet total to 11 of the 28 ordered; Hainan Airlines, two of the three on order, and Tyrolean Airways, two additional aircraft, giving it four of the six on order.


Other Q Series deliveries: National Jet Systems took both of the Q200 aircraft it ordered; British European Airways accepted the fourth Q300 of its order for four; Palestinian Airlines took the second of the two on firm order; two of three Q300s ordered by Qantas were delivered, as were two to Tyrolean to round out its firm order for seven.

Comair led CRJ customers with the acceptance of 10 aircraft, giving it 106 of the 110 on order. Atlantic Coast Airlines took nine CRJ200s, giving the carrier 37 of the 69 on order. Northwest Airlines added six more CRJ aircraft to its fleet and had nine of the 54 ordered. Other U.S. carriers accepting CRJ aircraft were Midway with one, raising the fleet total to 23 and a backlog of three; Atlantic Southeast Airlines, five aircraft giving it 41 of the 45 on order. The 7th and 8th of nine ordered aircraft were delivered to Air Wisconsin; and SkyWest Airlines accepted four aircraft to raise its fleet total to 15. An additional 50 are to be delivered.

Elsewhere, Cimber Air accepted the two CRJ200 jets it ordered, while Kendell Airlines took the 8th from its order for 12. Lufthansa, which has

orders for 45 50-seat regional jets, received three to increase the fleet to 43. The third of four jets ordered by British European Airways was delivered, as were the first two of five taken by Shandong Airlines. Maersk Air took delivery of two aircraft, giving it 10 of the 11 on order, Shanghai Airlines took two of the ordered three, while Japan Air Lines (J-AIR) received the first of four.

CRJ700, CRJ200, Q400, Q200 are at Avalon



Bombardier Aerospace, Regional Aircraft will display the newest members of its regional airliner family, the 70-seat CRJ700 Series regional jet and 68- to 78-seat Q400 high-speed turboprop, at the Australian International Air Show. Surveillance Australia, a subsidiary of National Jet Systems of Adelaide, will display one of its Q200 "Coastwatch" Maritime Patrol Aircraft and Kendell will present one of its CRJ200 airliners. The show is from February 13 to 18 at Avalon Airport in Melbourne. Regional Aircraft will be located at Bombardier Aerospace chalet, No. 9.

Q Series Dash 8 Facts and Figures

Sales (January 15, 2001)	Delivered	Backlog	Total
Series 100	298	1	299
Series 200	89	5	94
Series 300	166	34	200
Series 400	20	48	68
Program total	573	88	661

Q Series Dash 8 Fleet Statistics

Aircraft in service	546 (at Nov 30, 2000)
Average flight time	50 mins. (at Sept 30, 2000)
Average annual utilization (hours/cycles)	2,221/2,654 (at Sept 30, 2000)
Highest annual utilization (hours/cycles)	2,914/5,013 (at Sept 30, 2000)
Fleet total hours	10,064,352 (at Nov 30, 2000)
Fleet total cycles	12,194,681 (at Nov 30, 2000)
Dispatch reliability	98.9% (12 mos. to Sept 2000)
Schedule completion rate	99.0% (12 mos. to Sept 2000)

Q400 Statistics (to Nov. 30, 2000)

Aircraft in service	16
Average flight time	44 mins.
Average annual utilization (hours/cycles)	1,570/2,163
Fleet total hours	8,787
Fleet total cycles	11,809

CRJ Series Facts and Figures

Sales (January 15, 2001)	Delivered	Backlog	Total
Series 100	231	5	236
Series 200	219	330	549
Series 700	0	174	174
Series 900	0	10	10
Corporate variants	13	0	13
Program total	463	519	982

CRJ Series Fleet Statistics

Aircraft in service	447 (at Nov. 30, 2000)
Average flight time	1.1 hrs. (at Nov. 30, 2000)
Average annual utilization (hours/cycles)	2,433/2,173 (at Nov. 30, 2000)
Highest annual utilization (hours/cycles)	3,958/3,273 (at Nov. 30, 2000)
Fleet total hours*	3,166,770 (at Nov. 30, 2000)
Fleet total cycles*	2,822,068 (at Nov. 30, 2000)
Dispatch reliability	98.2% (12 mos. to Oct. 2000)
Schedule completion rate	99.1% (12 mos. To Oct. 2000)

*Does not include corporate/business operators
Utilization based on schedule data

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