

# BOMBARDIER

## BACKGROUNDER

### SPECIALIZED AIRCRAFT SOLUTIONS

**Background:** Bombardier has the longest track record and the widest range of experience of any special mission aircraft provider. The company's rich heritage of developing aircraft for governments, armed forces, and specialized commercial operators stretches back more than 40 years and tens of thousands of flight hours.

Bombardier has designed, built and delivered well over 300 special mission aircraft for customers worldwide since January 1965, when a Learjet 23 was quickly reconfigured from a standard corporate interior and flew a medical evacuation mission. Today, the *Learjet*, *Challenger*, and *Global* business jets and Q-Series turboprop airliners provide a full spectrum of special mission capabilities that can meet most current requirements. With the largest fleet of special mission aircraft in corporate aviation, each member of Bombardier's comprehensive business jet and commercial aircraft family is firmly established in-service with special mission operators. For future mission concepts, Bombardier continues to develop new Specialized Aircraft Solutions to maintain its market leading status.

**Status:** Bombardier aircraft undertake such a wide range of roles and missions; specifically, the company's Specialized Aircraft Solutions unit has identified several trends for current and future mission areas.

#### **Airborne C4ISR**

Any mission requiring surveillance, monitoring, intelligence gathering, airborne coordination or simply national presence falls under the heading of C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance). Bombardier aircraft are already well established in these roles, particularly in the increasingly sophisticated air to ground surveillance environment, including overland and maritime domains.

The ASTOR program for Britain's Royal Air Force (RAF) underlines the credentials of the *Global Express* as a superior C4ISR platform for air to ground surveillance.

As part of a team led by Raytheon Systems, Bombardier won the UK's ASTOR competition in 1999, supplying five *Global Express* aircraft for the program. Bombardier was responsible for all simulation and modeling of the airframe modifications as well as a 300-hour flight test program. The fifth and final aircraft was delivered to Raytheon Systems in January 2004 for systems integration. The ASTOR platform, - known as the Sentinel R.Mk 1 -- is equipped with a Raytheon dual-mode SAR/MTI radar, mission management systems, MILSATCOM,

and the latest in communications and data link equipment. The Sentinel R.Mk 1 is the only dedicated NATO C4ISR aircraft in operation outside the United States.

The success of the ASTOR program has led to the *Global Express* being considered as a candidate platform for other C4ISR requirements worldwide.

Key customer nations for Bombardier's surveillance and patrol aircraft include the UK (*Global Express*), Korea (*Challenger 604*), Australia (*Dash 8/Q-Series*), Denmark (*Challenger 604*), Sweden (*Q-Series*) and the US (*Q-Series*). The US Department of Homeland Security has acquired *Dash 8* aircraft for the counter-narcotics/border surveillance missions.

### **Aircrew Training**

Bombardier aircraft are currently deployed for training, evaluation and mission readiness procedures with a host of government and military operators. Specialized functions extend beyond training for aircrews (pilots, navigators etc.) to include threat simulation, electronic warfare and airborne target presentations to train air defense systems operators on land, at sea and in the air.

Some well-established operators include L-3 Flight International (US), Phoenix Air (US), SAAB-Nyge Aero (Sweden), Pel-Air Aviation (Australia) and the United Arab Emirates Navy. As well, Singapore Airlines operate *Learjet 45* aircraft for advanced pilot and flight crew training.

Bombardier's experience and comprehensive product line makes it a strong contender for future military flight crew training requirements around the world.

### **Executive Transport and Logistic Support**

Bombardier aircraft transport high priority passengers and essential cargo for air forces worldwide. The United States Air Force alone has an extensive fleet of C-21A (*Learjet 35A*) aircraft that undertake operational support airlift missions around the clock and across the globe.

Other nations that call on Bombardier aircraft for head of state, ministerial, government and senior military transportation include Australia, Canada, Germany, Czech Republic, Denmark, Malaysia, and the US Coast Guard. As more nations become integrated with long standing allied organizations, they turn to Bombardier aircraft as a reliable and highly supportable means of transportation. The Government of Germany has recently selected the *Global 5000* as it's replacement platform for VIP transportation.

### **Search and Rescue, Disaster Response**

Bombardier aircraft undertake life-saving missions for a range of operators, including air forces and agencies in Australia, Canada, Japan, Switzerland and the US. Bombardier

aircraft can operate not only in the traditional sea-going search and rescue (SAR) role, but also in providing capability to civil authorities in disaster relief scenarios.

Several aircraft/capabilities options are available to support rescue, recovery and restoration work following hurricanes, flooding or other natural disasters including Bombardier's 415 amphibious aircraft. Additionally, there are emerging requirements for supporting potential weapons of mass destruction (WMD) events in several countries worldwide.

Bombardier aircraft already have a long history of air ambulance and Medevac flying. The *Challenger 604* has emerged as a preferred aircraft for air ambulance missions. REGA, Swiss Air-Ambulance Ltd. has been operating a fleet of three Bombardier *Challenger 604* aircraft for air ambulance operations since January 2003. Based in Zurich, the aircraft are equipped with two intensive care stations and the latest specialist life support equipment. The Government of Quebec operate two Challenger 601 aircraft. One of these aircraft is used exclusively in a Medevac role and has accumulated close to 30,000 flight hours and 35,000 landings over a twenty year period. Bombardier has also sold *Learjet 60 XR* Medevac aircraft into Saudi Arabia.

#### **Flight Testing, Airways Calibration, Research & Development**

Bombardier aircraft are in use for airborne test and trials work with several aerospace corporations and other centers of excellence for technology development. The FAA operate a Global 5000 as an airborne research laboratory for testing a variety of state of the art equipment related to communications and navigation systems. Other customers include industry leaders such as NASA and Northrop Grumman.

The US Federal Aviation Administration (FAA) operate an all-Bombardier fleet led by four *Challenger* aircraft (a *Challenger 604* and three *Challenger 601-3R* jets) and six *Learjet 60* aircraft. As a joint organization with the USAF Combat Flight Inspection detachment, the FAA *Challenger* aircraft have supported allied nations in certifying airfields for military operations from Kabul to Baghdad to Uzbekistan.

Additionally, another world-renowned civil aviation organization, Japan's Civil Aviation Bureau (JCAB), operate two *Global Express* ultra-long range jets and one *Q-Series* airliner for flight inspection missions.

**Future Concepts:** Bombardier continues to expand the capability range of its aircraft to undertake new and emerging specialized missions.

In anticipation of future aircrew training requirements, Bombardier and our industry partners have developed, tested, and fielded the Joint Aircrew Mission Adaptive Training System (JAMATS) that will bring unmatched flexibility and capability to the *Learjet 60*. Through the use of an integrated synthetic mission system, JAMATS provides a transformational training

environment with net centric compatibility that will prepare aircrews for the demanding real world missions of today and in the future.

Bombardier continues to improve upon our existing and high performing ISR aircraft solutions by evaluating upgrades to current systems as required by specific missions. An example includes programs such as the *Q-Series* Maritime Patrol Aircraft where Bombardier has supported airframe, avionics, and mission system improvements solely for the benefit of special mission customers.

Another area of future interest is the development of unmanned aerial systems using existing Bombardier aircraft modified to conduct autonomous missions such as electronic attack, reconnaissance/surveillance or to serve as launch platforms for other smaller remotely piloted craft.

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