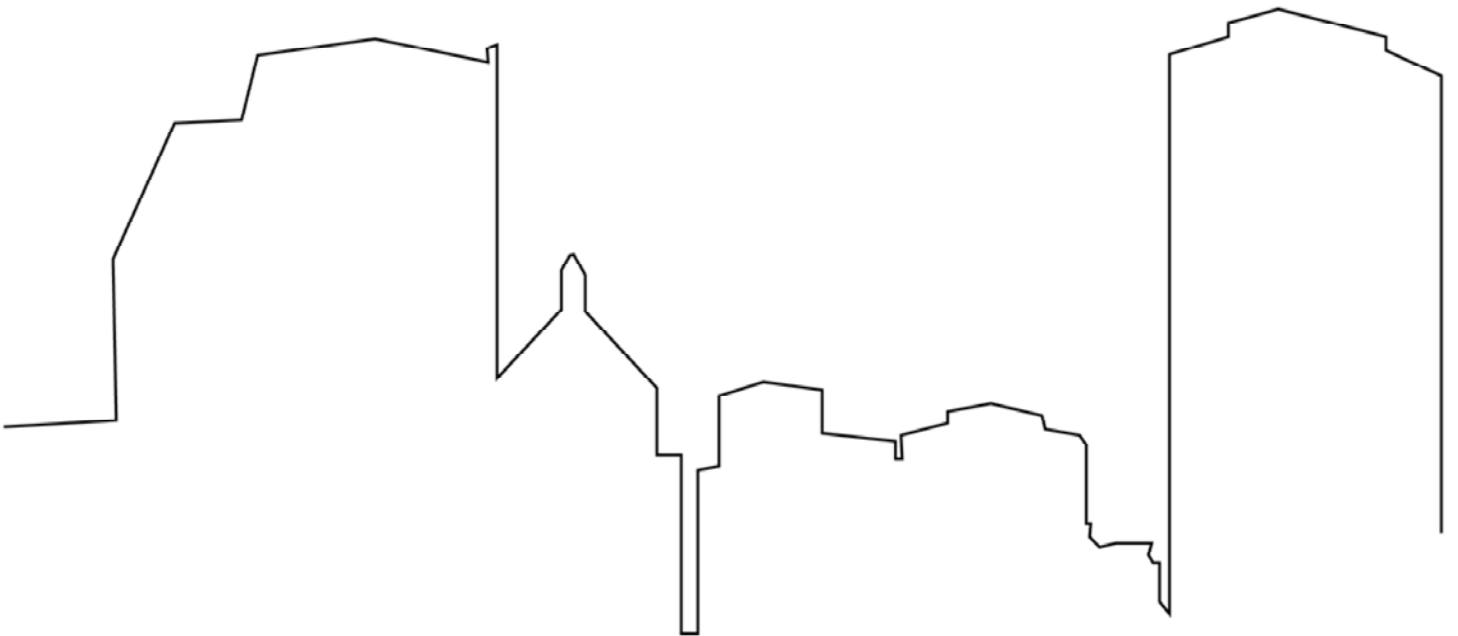


An effective | sectorial  
approach

## The Greater Montréal Aerospace Industry



( WE MAKE IT  
**HAPPEN** )



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## SUMMARY

### SIZE

The aerospace industry in the Greater Montréal represents:

- ◆ 39,800 jobs divided among 130 companies doing over 50% of their business in the aerospace sector<sup>1</sup>. In addition, there are more than 120 companies in Québec for whom the portion of business attributed to aerospace is between 30 and 50%<sup>2</sup>.
- ◆ More than 95% of aerospace jobs are within Québec
- ◆ \$10 billion worth of goods manufactured in 2000
- ◆ Over \$500 million<sup>3</sup> in annual R&D expenditures by businesses in 1998.

### STRUCTURE

The aerospace industry in the Montréal region is divided into three sub-sectors:

- ◆ Prime contractors and major repair and overhaul centres, representing 79% of total jobs divided amongst seven companies: Bombardier Aerospace, Pratt & Whitney Canada, CAE Inc., Air Canada (Technical Centre), Bell Helicopter Textron, Rolls-Royce Canada and Air Transat (Maintenance Centre).
- ◆ Equipment manufacturers, comprising 8% of jobs divided amongst the seven following companies: CMC Electronics<sup>4</sup>, EMS Technologies Canada, Honeywell Aerospace<sup>5</sup>, Héroux-Devtek, Lockheed Martin Canada, Messier-Dowty and Thales Avionics Canada<sup>6</sup>.
- ◆ Subcontractors and suppliers of special products and services, constituting a network of 107 establishments comprising 13% of total jobs, and offering such special services and products as machining, avionics, treatment of metals, composite materials, fasteners, tools, and interiors.

### WORLD LEADERSHIP

The Montréal region unites several world leaders in this industry:

- ◆ Bombardier Aerospace: 3<sup>rd</sup>-largest manufacturer in commercial aviation, after Boeing and Airbus.
- ◆ Pratt & Whitney Canada: world leader in turbofans, turboprop aircraft and low-power turboshaft engines.
- ◆ CAE: 80% of the world market for civil full flight simulators; 2<sup>nd</sup> largest independent provider of aviation training services, through its worldwide network of training centres.
- ◆ Bell Helicopter Textron: world leader in light and medium-weight commercial helicopters.
- ◆ Rolls-Royce Canada: world leader in maintenance and repair of a wide range of engines, including those of Bombardier's Global Express commercial aircraft and those of Boeing's Large carriers.

<sup>1</sup> Source: E&B DATA, 2001

<sup>2</sup> Sources: Ministère de l'Industrie et du Commerce, Investissement Québec

<sup>3</sup> Source: Estimate based on data from the Institut de la statistique du Québec (R&D intra-muros expenditures)

<sup>4</sup> Formerly Marconi Canada

<sup>5</sup> Merger between Honeywell and AlliedSignal in December 1999, became Honeywell International

<sup>6</sup> Formerly Sextant Avionique Canada

## SUMMARY

### RESEARCH AND DEVELOPMENT

This leadership is sustained by major investments in research and development. In all, over \$500 million was spent on R&D in the aerospace industry in the Montréal region in 1998. Thus, Pratt & Whitney Canada ranks second amongst Canadian private companies (all sectors combined) for the size of its R&D investments. Finally, Bombardier Aerospace has continued to certify a new aircraft design every year since 1992.

### INVESTMENTS

The dynamic nature of the aerospace industry in the Montréal region is obvious, as witnessed by the following examples of new facilities and expansions:

- ◆ Bombardier Aerospace is investing \$170 million at Mirabel for the construction of a new assembly plant for CRJ700 and CRJ900 regional transport jet airplanes which will create 1,700 jobs;
- ◆ CAE is investing \$118 million over three years (\$73 million in 2001) in Saint-Laurent to enlarge its main factory for the fabrication of flight simulators in order to expand its activities in the sector of training airline pilots and maintenance crews, and thus creating 400 jobs;
- ◆ Rolls-Royce Canada of the United Kingdom invested \$82 million in Montréal for the construction of an R&D facility - a testing centre for aircraft engines modified for industrial use - creating 200 jobs;
- ◆ The National Research Council of Canada (NRC) is investing \$53 million in Montréal to construct a Centre for Advanced Aerospace Fabrication Technologies at the Université de Montréal, near the École Polytechnique, and is creating 100 jobs;
- ◆ Air Canada is investing \$32 million to expand its Technical Centre in Dorval and create 200 jobs.
- ◆ Techspace Aero of Belgium is investing \$9.2 million to set up a new department of design and engineering in Montréal to design parts for aircraft engines and missiles, creating 35 jobs.

### WORK FORCE AND TRAINING

The Montréal region has approximately 6,600 engineers and scientists, 5,700 technicians, 19,500 operators and 8,000 administrators working in the aerospace industry. This sector, in co-operation with a network of teaching institutions in the Montréal region, has set up for itself an organization, the Centre for Aerospace Manpower Activities in Québec (CAMAQ), whose goal is to adapt the study programmes at secondary schools, colleges and universities to the needs of the market. For example, the Montréal region has the École des métiers de l'aérospatiale de Montréal (EMAM) and the National Institute of Aeronautics (ENA), which is the largest teaching institution for aerospace technology training. New programmes are regularly created to respond to the needs of the industry. For instance, a Masters of Aeronautical Engineering (M.Eng.) programme was created jointly by five Québec universities (Montréal, McGill, Concordia, Laval and Sherbrooke).

**INTERNATIONAL ORGANIZATIONS**

Numerous international organizations have set up their headquarters in Montréal, thus creating a particularly stimulating environment for the aerospace industry:

- ◆ International Civil Aviation Organization (ICAO)
- ◆ International Air Transport Association (IATA)
- ◆ International Federation of Air Traffic Controllers' Associations (IFATCA)
- ◆ Conseil international de formation aérospatiale (CIFA)





# 1 THE INDUSTRY

This section presents the aerospace industry in the Greater Montréal.

## 1.1 SIZE<sup>7</sup>

- ◆ The aerospace industry in the Montréal<sup>8</sup> region includes approximately 39 800 jobs divided among 130 establishments doing over 50% of their business in the aerospace sector<sup>9</sup>. Also, there are an additional 120 companies whose sales include 30 to 50%<sup>10</sup> that can be attributed to aerospace. Because of methodological differences, it is difficult to compare statistical data for the Montréal region and for Canada as a whole<sup>11</sup>.
- ◆ The value of aerospace industry activity in the Montréal region is estimated at \$10 billion dollars for the year 2000 and investments in R&D are estimated at over \$500 million.

## 1.2 STRUCTURE

Facilities in the Montréal region are divided into three sub-sectors:

### **Prime contractors and major repair and overhaul centres:**

- ◆ 7 companies (15 facilities) and 31,400 jobs
- ◆ Sectors of activity: aircrafts, helicopters, engines, flight simulators, maintenance and repair
- ◆ Principal employers: Bombardier Aerospace, Pratt & Whitney Canada, CAE Inc., Air Canada (Technical Centre), Bell Helicopter Textron, Rolls-Royce Canada and Air Transat (Maintenance Centre)

### **Equipment manufacturers:**

- ◆ 7 companies (8 facilities) and 3,300 jobs
- ◆ Sectors of activity: landing gear, avionics, satellite products, defence systems and systems integration.
- ◆ Principal employers: CMC Electronics (formerly Marconi Canada), EMS Technologies Canada, Honeywell Aerospace (formerly AlliedSignal Aerospace Canada), Héroux-Devtek, Lockheed Martin Canada, Messier-Dowty and Thales Avionics Canada (formerly Sextant Avionique Canada)

### **Subcontractors and suppliers of specialized products and services:**

- ◆ 107 companies and 5,100 jobs
- ◆ Sectors of activity (examples): fasteners, cutting tools, cabin interiors, machining, metal treatments, composite materials and electronic components.

<sup>7</sup> The data from E&B Data are based on a survey performed in April 2001 of all companies in the aerospace industry in the Montréal region. The total number of jobs in each company was counted to take in the number of employees whose main activity is related directly or indirectly to aerospace (e.g., at Rolls-Royce or CMC Electronics).

<sup>8</sup> Metropolitan Montréal census region; therefore, companies such as GE Canada in Bromont and Oerlikon in Saint-Jean-sur-Richelieu were not counted.

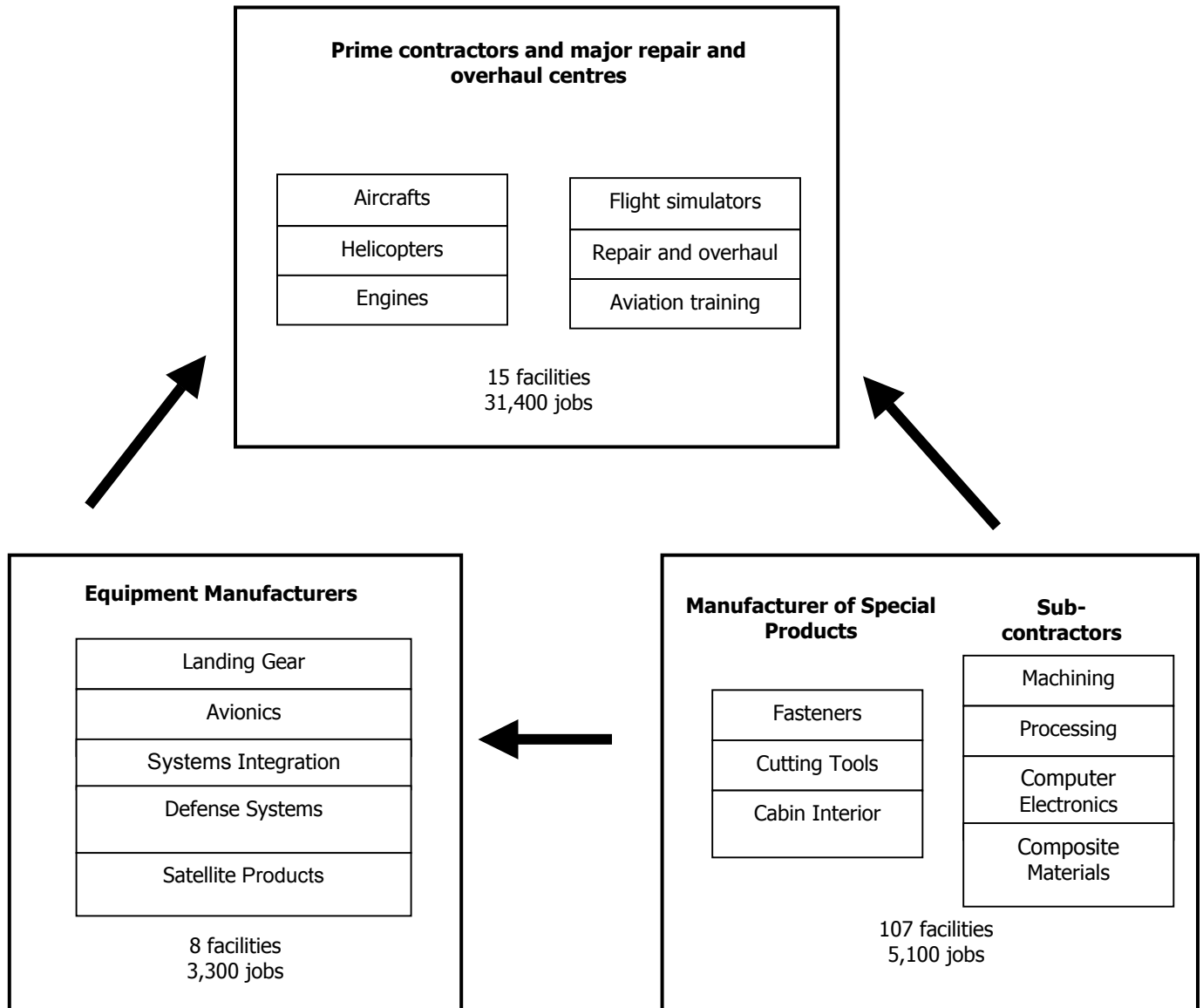
<sup>9</sup> Source: E&B Data, 2001

<sup>10</sup> Sources: Ministère de l'Industrie et du Commerce, Investissement-Québec

<sup>11</sup> In its Standard Industrial Classification Code SIC-3211 (Aircraft and Aircraft Parts Industry), Statistics Canada does not include businesses with operations such as design and manufacture of flight simulators (for example CAE), information systems and software for the aerospace industry, nor airlines which perform servicing and maintenance on their fleets. SIC-3211 includes "Establishments primarily engaged in manufacturing aircraft and aircraft assemblies, engines, equipment and parts. Establishments primarily engaged in aircraft repair".

**1. THE INDUSTRY**

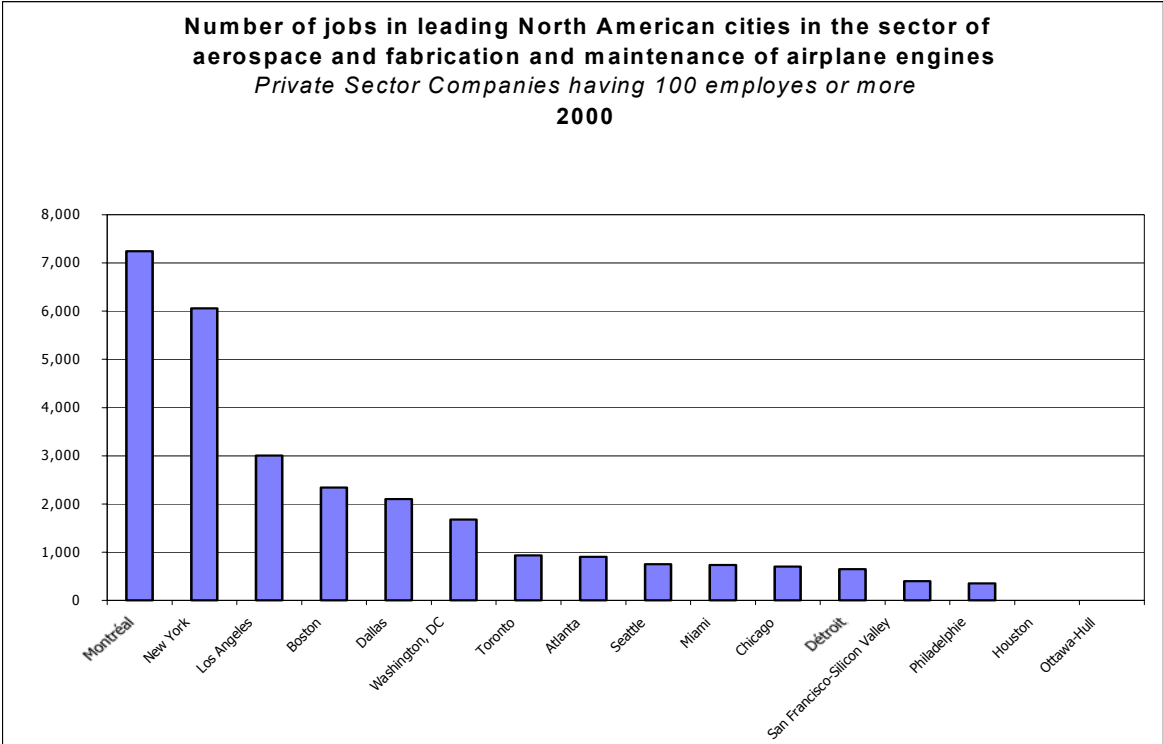
**Figure 1: Structure of the Montréal region Aerospace Industry**



**1.3 RANKING AMONG NORTH AMERICAN CITIES<sup>12</sup>**

Expertise in aircraft engines is one of the strong points of the aerospace industry in the Montréal region. Actually, Montréal is first among large North American cities for jobs in the manufacture and maintenance of aircraft engines, including only the jobs in the major companies and excluding the maintenance centres of airline companies. In addition to some 7,000 workers at Pratt & Whitney Canada, Rolls-Royce Canada and Honeywell, the aircraft engine business has over 4,000 more workers at Air Canada's Technical Centre as well GE Canada (located just outside the Greater Montréal). The ranking is presented below:

**Figure 2:**



Source: E&B DATA

<sup>12</sup> The data come from the E&B Data's databases, compiled by means of a telephone survey of 10,000 high technology firms, located in North American cities of 3 million inhabitants or more, which was conducted between October 1999 and May 2000 (Census Metropolitan Area in Canada; Consolidated Metropolitan Statistical Area, CMSA, in the U.S.). The Hull-Ottawa CMA was added to the analysis. Thus the activity and employment in establishments of 100 employees or more in an CMA were covered. The establishments were grouped according to their main activity (which may differ from that of the parent company) and not according to the market for which their products or services are destined.

## 1. THE INDUSTRY

### 1.4 FOREIGN PRESENCE

- ◆ 17.5% of the aerospace companies in the Montréal region are foreign-owned.
- ◆ They represent 10,307 jobs, forming 26% of jobs in the aerospace sector, divided amongst 23 facilities

**Table 1: Distribution of industries and jobs by country of origin**

Country	Companies	Jobs
United States	15	8,353
United Kingdom	2	1,595
France	4	344
Others	2	15
<b>Total</b>	<b>23</b>	<b>10,307</b>

Source: E&B DATA

## 2 THE INDUSTRY LEADERS

This section profiles the prime contractors and equipment manufacturers, as well as their activities in the Montréal region.

### **Bombardier Aerospace ([www.bombardier.com](http://www.bombardier.com))**

- ◆ Facilities: Saint-Laurent, Dorval and Mirabel
- ◆ Number of employees: 14,800
- ◆ Activities: Design and manufacture of aircrafts, systems and components for aviation companies.
- ◆ Main products: Canadair Regional Jet, Challenger and Global Express
- ◆ Comments:
  - 3rd-largest constructor of commercial aircraft in the world, after Boeing and Airbus.
  - 44% of the world market for regional airplanes.
  - 37% of the world market for commercial aircraft.
  - Orders on hand of \$23 billion for Bombardier Aerospace worldwide (Canadair, Montréal; de Havilland, Toronto; Learjet, U.S.; and Shorts, Northern Ireland).
  - Certification of a new aircraft every year from 1992 to 2000.

### **Pratt & Whitney Canada ([www.pwc.ca](http://www.pwc.ca))**

- ◆ Facilities: Longueuil and Saint-Hubert
- ◆ Number of employees: 5,510
  - Activities: Design, development, manufacture, marketing and technical support for turbofans, turboprop aircraft and turboshaft engines to meet the needs of the following markets: regional transport, commercial aviation, helicopters, utility aircraft, auxiliary power sources and industrial applications.
  - Main products: Turboprops and turboshaft engines (PT6), turboprops (PW100, PW150A), turboshaft engines (PW200), turbofans (PW300, PW500, JT15D) and auxiliary power sources (PW900)
- ◆ Comments:
  - World mandate for turbofans, turboprops and low-power turboshaft engines.
  - As of March 31, 2001, 802 airlines and 7,735 other customers in 183 countries used Pratt & Whitney Canada's engines. A total of 50,664 engines have been delivered.

### **CAE ([www.cae.com](http://www.cae.com))**

- ◆ Facility: Saint-Laurent
- ◆ Number of employees: 4,000
- ◆ Activities: Design and fabrication of flight simulation equipment for civil and military aviation and provider of integrated training solutions.
- ◆ Main products and aviation training services:
  - Civil full flight simulators and training: civil flight simulators for planes for almost all airlines and many business jets. Design and production of visual systems.
  - Military simulation and training: design and fabrication of military flight simulators for pursuit aircraft, helicopters, heavy transports and patrol planes. Design of visual systems and training systems. Production of flight simulators, tactical and complete mission simulators.
- ◆ Comments:
  - 80% of the world market for civil full flight simulators.
  - World's 2<sup>nd</sup> largest independent training service provider.
  - Employs more than 6,000 around the world.
  - Places among the ten Canadian companies investing the most in research and development.

## 2. THE INDUSTRY LEADERS

### **Air Canada – Technical Centre ([www.aircanada.ca](http://www.aircanada.ca))**

- ◆ Facility: Dorval
- ◆ Number of employees: 3,700
- ◆ Main activities and products: Repair and major overhaul of engines, auxiliary power units (APU), cells, components, as well as a range of supplementary services.

### **Bell Helicopter Textron ([www.belltextron.com](http://www.belltextron.com))**

- ◆ Facility: Mirabel
- ◆ Number of employees: 1,550
- ◆ Main activities and products: Assembly of commercial helicopters, models 430, 407, 230, 427, 212, 412, 206B, and 206L and after-sales service.
- ◆ Comments:
  - World mandate for assembly of light and medium-commercial helicopters.
  - Since 1986, the Mirabel plant has assembled more than 2,500 helicopters.

### **Rolls-Royce Canada ([www.rolls-royce.com](http://www.rolls-royce.com))**

- ◆ Facility: Lachine
- ◆ Number of employees: 1,500
- ◆ Main activities and products:
  - Repair and overhaul of a wide range of aircraft engines such as those driving Bombardier's Global Express business jets and the Gulfstream V, as well as Boeing's heavy transports.
- ◆ Comments:
  - World leader in maintenance and repair of a wide range of engines.
  - Sole Rolls-Royce R&D centre located outside the United Kingdom.

### **CMC Electronics ([www.cmcelectronics.ca](http://www.cmcelectronics.ca))**

- ◆ Facility: Saint-Laurent
- ◆ Number of employees: 1,070
- ◆ Activities: Design, manufacture, integration and support of high-technology electronic products, including avionics materials, satellite communication antennas for airships, specialized electronic components, military radios, space electronic materials, infrared cameras, medium-to-high quality global positioning systems (GPS) and maritime electronics.
- ◆ Main products:
  - Aeronautical communications: CMA-2102 (SATCOM High-Gain Antenna Subsystem), CMA-2200 (Intermediate-Gain SATCOM Antenna), a range of direct line-of-sight tactical radios.
  - Flight management systems.
- ◆ Comments:
  - R&D budget of \$28.5 million for 1999-2000
  - In April 2001, ONCAP L.P. (a Canadian company) completed its acquisition of BAE Systems Canada (formerly Marconi Canada), which has subsequently done business under its new name of CMC Electronics.

### **EMS Technologies Canada ([www.elmg.com](http://www.elmg.com))**

- ◆ Facility: Sainte-Anne-de-Bellevue
- ◆ Number of employees: 800
- ◆ Main activities and products:
  - Design and manufacture of communications satellite components.
  - Chosen by the Canadian Space Agency to create the first phase of the Radarsat-1 satellite teledetection system and to participate in the creation of some essential systems of Radarsat-2, as a subcontractor for MacDonald Dettwiler & Associates (British Columbia).
  - Designer and creator of TT&C communications systems (antennas), voice and video, for the International Space Station.
  - Designer and creator of all digital command units (computers and controls) for the Canadarm-2 and integrator of all its joints.
  - Designer and creator of the bidirectional Internet connection system via satellite DVB-RCS.
- ◆ Comments:
  - Orders of \$258 million for the year 2000.
  - R&D budget of approximately \$27 million for the year 2000.
  - Sainte-Anne-de-Bellevue facility bought in 1999 from Spar Aerospace, since then its activities have been carried out under the name of EMS Technologies Canada.

### **Héroux-Devtek ([www.herouxdevtek.com](http://www.herouxdevtek.com))**

- ◆ Facilities: Longueuil and Laval
- ◆ Number of employees: 550
- ◆ Main activities and products:
  - Design, updating, manufacture, repair and renovation of landing gear and jacks.
  - Fabrication of airplane engine parts, hydraulic actuators and hydraulic systems.
  - Surface treatment and machining workshop for aircraft structural parts.

### **Honeywell Aerospace ([www.honeywell.com](http://www.honeywell.com))**

- ◆ Facility: Saint-Laurent
- ◆ Number of employees: 410
- ◆ Activities: Design, sales and fabrication of high-technology electronic equipment for the military sector, as well as, products and services for the aerospace sector.
- ◆ Main products: Thermal camera systems, night-vision glasses, systems and control accessories for aircraft engines. Services include repair and overhaul, as well as full after-sales service and support for its products.
- ◆ Comments:
  - Orders of \$71 million U.S. for the year 2000.
  - Merger in December 1999 of AlliedSignal and Honeywell. Under the terms of the merger, AlliedSignal took the name of Honeywell International.

### **Air Transat – Maintenance Centre ([www.transat.com](http://www.transat.com))**

- ◆ Facility: Mirabel
- ◆ Number of employees: 310
- ◆ Main activities and products: Centre for repairs and major overhauls of airplane engines.

## 2. THE INDUSTRY LEADERS

### **Messier-Dowty ([www.messier-dowty.com](http://www.messier-dowty.com)) ([www.messierdowtymtl.com](http://www.messierdowtymtl.com))**

- ◆ Facility: Mirabel
- ◆ Number of employees: 220
- ◆ Main activities and products: Fabrication and assembly of major components of landing gear, mainly for Airbus models A-318, A-319, A-320, A-330, A-340-600.
- ◆ Comments: Messier-Dowty International holds 40% of the world market for landing systems, serves 600 airline companies and military organizations, and had attained \$652 million CAN in sales at the end of 1998.

### **Lockheed Martin Canada ([www.lmco.com](http://www.lmco.com))**

- ◆ Facility: Montréal
- ◆ Number of employees: 200
- ◆ Main activities and products:
  - Integration and management of complex electronic systems.
  - Software: systems for firing, mission planning, training, and instrument landings.
  - Integration of navigation control systems.
  - Surveillance and radar reconnaissance systems (SSAR) with which the Canadian Armed Forces' Aurora CP-140 aircraft are equipped.



### **3 INVESTMENT OVERVIEW**

This section presents examples of businesses that have recently installed themselves in the Montréal region, as well as a selection of expansions by aerospace companies already established in the Montréal region.

#### **Bombardier Aerospace**

- ◆ Investment: \$170 million
- ◆ Country of origin: Canada
- ◆ Sector: Prime contractor
- ◆ Location: Mirabel
- ◆ Year of completion of work: 2001
- ◆ Number of jobs created: 1,700
- ◆ Description: Construction of a new plant for final assembly of CRJ700 and CRJ900 regional transport jet aircraft

#### **CAE**

- ◆ Investment: \$118 million
- ◆ Country of origin: Canada
- ◆ Sector: Prime contractor
- ◆ Location: Saint-Laurent
- ◆ Number of jobs created: 400
- ◆ Description: Enlargement of main facility for fabrication of flight simulators in order to further develop its activities in the area of airline pilot and aircraft maintenance crew training.

#### **Rolls-Royce Canada**

- ◆ Investment: \$82 M
- ◆ Country of origin: United Kingdom
- ◆ Sector: Repair and overhaul of airplane engines
- ◆ Location: Lachine
- ◆ Year of completion of work: 2001
- ◆ Number of jobs created: 200
- ◆ Description: Construction of an R&D unit: a testing centre for airplane engines modified for industrial use

#### **NRCC Centre for Advanced Aerospace Manufacturing Technologies**

- ◆ Investment: \$53 million
- ◆ Country of origin: Canada
- ◆ Sector: R&D aimed at the improvement of technologies and manufacturing methods in aerospace.  
Location: Montréal
- ◆ Year of completion of work: 2002
- ◆ Number of jobs created: 100
- ◆ Description: Construction of the Centre des technologies de fabrication de pointe en aérospatiale at the Université de Montréal, near the École Polytechnique

### 3. INVESTMENT OVERVIEW

#### **Air Canada**

- ◆ Investment: \$32 million
- ◆ Country of origin: Canada
- ◆ Sector: Repair and overhaul of aircraft engines
- ◆ Location: Dorval
- ◆ Year of completion of work: 2000
- ◆ Number of jobs created: 200
- ◆ Description: Expansion of the Technical Centre. This project includes the enlargement of the hangar and modernization of maintenance facilities.

#### **Bombardier Aerospace**

- ◆ Investment: \$30 million
- ◆ Country of origin: Canada
- ◆ Sector: Prime contractor
- ◆ Location: Dorval
- ◆ Year of completion of work: 2000
- ◆ Number of jobs created: 250
- ◆ Description: Construction of a new hangar in Dorval, near the Montréal International Airports, to house activities related to the manufacture of model CRJ aircraft of the 700 and 200 series.

#### **NMF Canada**

- ◆ Investment: \$14.6 million
- ◆ Country of origin: Canada
- ◆ Sector: Subcontractors and suppliers of special products and services
- ◆ Location: Mirabel
- ◆ Number of jobs created: 90
- ◆ Description: Construction of a centre for the design and production of coverings for aircraft airfoils.

#### **Techspace Aero**

- ◆ Investment: \$9.2 million
- ◆ Country of origin: Belgium
- ◆ Sector: Research and development concerning design and production of equipment and subassemblies for aircraft and spacecraft engines
- ◆ Location: Montréal
- ◆ Number of jobs created: 35
- ◆ Description: New department of design and engineering in Montréal that will design engine parts for airplanes and missiles.

#### **CS Communications and Systems**

- ◆ Investment: not specified
- ◆ Country of origin: France
- ◆ Sector: Design of software destined for the aerospace industry, among others
- ◆ Location: Saint-Laurent
- ◆ Year of completion of work: 2000
- ◆ Number of jobs created: not specified
- ◆ Description: Opening of an office in Saint-Laurent

#### **CTP**

- ◆ Investment: not specified
- ◆ Country of origin: France
- ◆ Sector: Technical documentation
- ◆ Location: Saint-Laurent
- ◆ Year of completion of work: 2000
- ◆ Number of jobs created: not specified
- ◆ Description: Opening of an office in Saint-Laurent.

#### **Sonovision-Itep**

- ◆ Investment: not specified
- ◆ Country of origin: France
- ◆ Sector: Technical documentation, documentation engineering, maintenance management systems for the aerospace sector, among others.
- ◆ Location: Town of Mount Royal
- ◆ Year of completion of work: 2000
- ◆ Number of jobs created: not specified
- ◆ Description: Opening of an office in the Town of Mount Royal



## 4 WORK FORCE AND TRAINING

This section presents the pool of available manpower in the aerospace industry in the Greater Montréal in 2001; that is, the distribution of employment, training institutions, levels of remuneration, and the annual number of degrees awarded at the university level.

### 4.1 LABOUR POOL

#### Distribution of jobs by sector

♦ Prime contractors and major repair and overhaul centres:	31 400
♦ Equipment manufacturers:	3 300
♦ Subcontractors and suppliers of special products and services:	5 100
	-----
Total	39 800

#### Distribution of jobs by type<sup>13</sup>

♦ Engineers/scientists:	6 600
♦ Technicians:	5 700
♦ Operators:	9 500
♦ Administrators:	8 000
	-----
Total	39 800

**Table 2: Distribution of jobs by sub-sector and type<sup>13</sup>**

	Engineers/ scientists	Technicians	Operators	Administrators	Total
Prime contractors and major repair and overhaul centres	5 200	4 500	15 400	6 300	<b>31 400</b>
Equipment manufacturers	500	500	1 600	700	<b>3 300</b>
Subcontractors and suppliers of special products and services	900	700	2 500	1 000	<b>5 100</b>
<b>Total</b>	<b>6 600</b>	<b>5 700</b>	<b>19 500</b>	<b>8 000</b>	<b>39 800</b>

<sup>13</sup> Estimate based on provisional data for 2001 from the Centre for Aerospace Manpower Activities in Québec (CAMAQ), 1998

## 4. WORK FORCE AND TRAINING

### 4.2 UNIVERSITIES AND TRAINING PROGRAMS

This section presents all of the institutions offering aerospace-related training programmes at the university and pre-university levels. This industry, in co-operation with the network of teaching institutions in the Montréal region, has created a collaborative organization, the Centre for Aerospace Manpower activities in Québec (CAMAQ), whose objective is to adapt programmes at the secondary, college and university level to the needs of the local market. For instance, this centre has contributed to the establishment of several schools and programmes specializing in the aerospace industry.

#### 4.2.1 UNIVERSITY PROGRAMS

##### **Group comprising the Université de Montréal, McGill, Concordia, Laval and Sherbrooke**

- ♦ Joint masters in aerospace engineering (M.Eng.), in collaboration with businesses in the industry. Specialization options: Aeronautics and propulsion, Avionics and control, Structure and materials, Aerospace engineering.

##### **McGill University ([www.mcgill.ca](http://www.mcgill.ca))**

- ♦ Faculty of Engineering
  - Mechanical engineering B.Sc., M.Sc. & Ph.D.
  - Electrical engineering B.Sc., M.Sc. & Ph.D.
  - Computer engineering B.Sc., M.Sc. & Ph.D.
  - Metallurgical engineering B.Sc., M.Sc. & Ph.D.Note: The School of Computer Science at McGill has seven research laboratories, including Geometry and robotics.

##### **Concordia University ([www.concordia.ca](http://www.concordia.ca))**

- ♦ Faculty of Engineering and Computer Science
  - Electrical engineering B. Eng, MSc., M.Eng. & PhD.
  - Computer engineering B. Eng, MSc., M.Eng. & PhD.
  - Mechanical engineering B. Eng, MSc., M.Eng. & PhD.Note: New programme: Graduate Certificate in Software Systems for Mechanical and Aerospace Engineering

##### **École de technologie supérieure - affiliated with the Universities of Québec and Montréal ([www.etsmtl.ca](http://www.etsmtl.ca))**

- Mechanical engineering B.Sc., M.Sc.
  - Electrical engineering B.Sc., M.Sc.
  - Production automation engineering\* B.Sc., M.Sc.
  - Engineering Ph.D.
- \*with an option in aeronautics: Aerodynamics, Aero-elasticity, Aircraft construction, Dynamic stalling

##### **École Polytechnique - affiliated with the Université de Montréal ([www.polymtl.ca](http://www.polymtl.ca))**

- Mechanical engineering B.Sc., M.Sc. & Ph.D.
  - Electrical engineering B.Sc., M.Sc. & Ph.D.
  - Materials engineering B.Sc., M.Sc. & Ph.D.
- Note: Many concentrations offered, including: Avionics, Space technologies, Materials and Mechatronics

**4.2.2 INSTITUTIONS FOR TECHNICAL TRAINING AND SPECIALIZED TRADES****École nationale d'aérotechnique (ÉNA) - affiliated with Collège Edouard-Montpetit ([www.collegeem.qc.ca](http://www.collegeem.qc.ca))**

- ◆ College diplomas in aeronautical construction techniques, in aircraft maintenance techniques, and in avionics.
- ◆ CAD/CAM Centre (Computer-assisted design and manufacturing)  
Note: Houses the headquarters of the Conseil international de formation aérospatiale (CIFA, International Council for Aerospace Training) and the Centre technologique en aérospatiale (Aerospace Technology Centre; technology transfers and education-industry liaison).

**École des métiers de l'aérospatiale de Montréal (ÉMAM) ([www.csdm.qc.ca/emam](http://www.csdm.qc.ca/emam))**

- ◆ Diplomas of professional studies (DEP) in:
  - Assembly of cables and circuits
  - Mechanical assembly
  - Structural assembly
  - Machining techniques
- ◆ Attestations of professional specialization (ASP) in:
  - Tools
  - Machining with digitally-controlled machine tools

**École de formation professionnelle Pierre-Dupuy**

- ◆ Diploma of professional studies in the mechanics of aeronautical metalwork

**4.2.3 COLLEGE PROGRAMS****Cégep de Saint-Jérôme/Centre de matériaux composites de Saint-Jérôme ([www.cegep-st-jerome.qc.ca](http://www.cegep-st-jerome.qc.ca))**

- ◆ Techniques of transformation of composite materials
- ◆ Mechanical engineering technology
- ◆ Industrial electronics technology

**Cégep de Saint-Laurent ([www.cegep-st-laurent.qc.ca](http://www.cegep-st-laurent.qc.ca))**

- ◆ Mechanical engineering technology
- ◆ Electronic technology

**Cégep du Vieux-Montréal ([www.cvm.qc.ca](http://www.cvm.qc.ca))**

- ◆ Computer centre equipped with CATIA technology, a high-performance CAD/CAM system for the aerospace industry
- ◆ Industrial maintenance technology
- ◆ Mechanical engineering technology
  - Mechanical fabrication (FAO)
  - Mechanical design drawings (CAD/CAM)
- ◆ Electrical engineering technology
  - Industrial electronics
  - Instrumentation and automation

## 4. WORK FORCE AND TRAINING

### John Abbott College ([www.johnabbott.qc.ca](http://www.johnabbott.qc.ca))

- ♦ College diploma in aircraft maintenance techniques
- ♦ Programme in Aviation management: Management and training of pilots for commercial aviation.

### Dawson College ([www.dawsoncollege.qc.ca](http://www.dawsoncollege.qc.ca))

- ♦ Mechanical engineering technology: Automation option (Design and Computer-assisted design; Robotics, Digital controls and Computer-assisted manufacturing)
- ♦ Industrial design

## 4.3 COMPENSATION

The following table presents an estimate of the levels of compensation in the aerospace industry in the Montréal region. Real salaries may vary in relation to the specialty, training (post-secondary/professional, DEC, bachelor or masters degree) and market conditions. These levels are estimated on the salary scales for new employees without experience.

**Table 3: Remuneration Levels**

**Average starting salaries (without experience)  
- Estimated**

<b>Engineers/scientists</b>	45 000 \$ to 50 000 \$/ yr
<b>Technicians</b>	32 000 \$ to 37 000 \$/ yr
<b>Operators /assemblers /installers</b>	28 000 \$ to 32 000 \$/ yr

Source: E&B DATA

## 4.4 DEGREES AWARDED

In the Montréal region, over 870 university degrees are awarded each year within programmes related to the aerospace industry. The distribution by discipline is shown below.

**Table 4: Degrees awarded by universities in aerospace (1999-2000)**

<b>Discipline</b>	<b>Bachelor</b>	<b>Masters</b>	<b>Doctorate</b>	<b>Total</b>
Physical sciences	76	16	25	<b>117</b>
Aerospace, aeronautical and astronautical engineering	15	13	----	<b>28</b>
Mechanical engineering	400	82	25	<b>507</b>
Industrial and administrative engineering	167	24	----	<b>191</b>
Physical engineering	18	8	1	<b>27</b>
<b>Total</b>	<b>676</b>	<b>143</b>	<b>51</b>	<b>870</b>

SOURCE : MINISTÈRE DE L'ÉDUCATION DU QUÉBEC



**4.5 UNIVERSITY ENROLMENTS**

More than 4,500 students are enrolled in universities in the Montréal region in programmes related to the aerospace industry. The distribution by discipline is shown below.

**Table 5: University enrolment in aerospace (1999-2000)**

<b>Discipline</b>	<b>Bachelor</b>	<b>Masters</b>	<b>Doctorate</b>	<b>Total</b>
Physical sciences	324	90	111	<b>525</b>
Aerospace, aeronautical and astronautical engineering	16	57	-----	<b>73</b>
Mechanical engineering	2 352	239	92	<b>2 683</b>
Industrial and administrative engineering	850	200	-----	<b>1 050</b>
Physical engineering	155	19	18	<b>192</b>
<b>Total</b>	<b>3 697</b>	<b>605</b>	<b>221</b>	<b>4 523</b>

Source: Ministère de l'Éducation du Québec



## 5 RESEARCH AND DEVELOPMENT

The Montréal region has, in addition to the R&D centres within companies, many public and parapublic research centres working directly or indirectly in the aerospace industry. They are presented here in descending order by number of personnel:

### Canadian Space Agency

- ◆ Affiliations Government of Canada
- ◆ City: Saint-Hubert
- ◆ Expertise: Coordination of all elements of the Canadian space programme and administration of five sectors:
  - Space systems, which comprise Canada's contribution to the International Space Station
  - Space operations, which group the David Florida Laboratory -testing centre for spacecraft engines- and RADARSAT, the first Canadian observation satellite in the world, launched in 1995
  - Bureau of Canadian Astronauts
  - Space sciences
  - Space technologies, which also involve Canada's participation in programmes of the European Space Agency
- ◆ Ressources:
  - Federal public servants: 450
  - Contract workers: 250
  - Students: 75 (on average)
  - Total: 775
  - Note: The majority of the staff work at the Centre spatial John H. Chapman, the headquarters of the Agency located in Saint-Hubert. The Agency also has offices in Ottawa (Space sciences, David Florida Laboratory, Liaison Office), Washington, Houston and Paris
- ◆ Internet site: [www.space.gc.ca](http://www.space.gc.ca)

### Institut des matériaux industriels (IMI)

- ◆ Affiliation: National Research Council of Canada
- ◆ City: Boucherville
- ◆ Partners: Close co-operation amongst the industry, universities and the government, thanks to the creation of interest groups or technology groups, of consortia and joint research projects
- ◆ Ressources:
  - Research: 130
  - Administration: 25
  - Total: 155
- ◆ Expertise: The Institute implements R&D projects targeting the development of computer simulation models and experimental techniques for the validation and optimization of processes; the development and technological updating of processes involving metals, polymers, ceramics and their composites; and development and utilization of process control systems such as optical and ultrasonic sensors
- ◆ Internet site: [www.imi.nrc.ca](http://www.imi.nrc.ca)

## 5. RESEARCH DEVELOPMENT

### **Centre de recherche appliquée sur les polypères (CRASP)**

- ◆ Affiliation: École polytechnique de Montréal
- ◆ City: Montréal
- ◆ Industrial partners: Aerospace, Camoplast, ELF Atochem, IBM, IRSST, Northern Telecom, Shell, 3M, Ford, Matra, SNECMA, ACM Composites, Beauce Composites, Pultrusion Technique
- ◆ Expertise: Research in the field of organic matrix composites, plastics, alloys, and polymers in general
- ◆ Ressources:
  - Professors and researchers: 20
  - Graduate students: 63
  - Postdoctoral interns: 8
  - Research agents: 13
  - Total: 104
- ◆ Internet site: [www.polymtl.ca/udr19.htm](http://www.polymtl.ca/udr19.htm)

### **Centre de recherche en calcul appliqué (CERCA)**

- ◆ Affiliation: Université Concordia, Université McGill, École Polytechnique, Université de Montréal et Ministère de l'Industrie et du Commerce
- ◆ City: Montréal
- ◆ Industrial partners: Bombardier Aerospace, Service de l'environnement atmosphérique (Environnement Canada), GE Canada, Hydro-Québec (Groupe Production), NATCOM
- ◆ Expertise: Study of complex physical systems by means of mathematical modeling, intensive calculations, digital simulations and scientific visualization, in the following fields:
- ◆ Industrial Mechanics, Environmental forecasting, Pharmaceutical chemistry, Industrial geophysics, Scientific visualization, Astrophysics and High-performance calculations
- ◆ Ressources:
  - Researchers: 80
  - Administration: 4
  - Others: 11
  - Total: 95
- ◆ Internet site: [www.cerca.umontreal.ca](http://www.cerca.umontreal.ca)

### **POLY-GRAMES (Centre for advanced research in microwaves and space electronics)**

- ◆ Affiliation: École Polytechnique
- ◆ City: Montréal
- ◆ Industrial partners: EMS Technologies Canada, Hydro-Québec, Advantech and NSI
- ◆ Ressources:
  - Professors and researchers: 7
  - Graduate students: 55
  - Postdoctoral interns: 4
  - Research agents: 5
  - Total: 71
- ◆ Expertise: The Centre is interested in, amongst other things, the field of microwaves for space and mobile communications (updating of digital methods and design of passive and active integrated components in centimetric and millimetric bands).
- ◆ Internet site: [www.polymtl.ca/udr16.htm](http://www.polymtl.ca/udr16.htm)

**CONCAVE (Centre de recherche sur la conception de véhicules assistés par ordinateur/  
Concordia Centre for Advanced Vehicle Engineering)**

- ◆ Affiliation: Concordia University
- ◆ City: Montréal
- ◆ Industrial partners: Héroux-Devtek, Pratt & Whitney Canada
- ◆ Ressources:
  - Researchers: 27
  - Students: 20
  - Total: 47
- ◆ Expertise: The Centre's mission is to effect technology transfers towards industries working in the field of transportation; to develop secure and efficient transportation systems through basic and applied research; to develop user-friendly software for expert systems for analysis, design and testing of vehicular systems and sub-systems.
- ◆ Internet site: [www.me.concordia.ca/research/concave/index.html](http://www.me.concordia.ca/research/concave/index.html)

**Groupe d'analyse des composants mécaniques (GACM)**

- ◆ Affiliation: École Polytechnique
- ◆ Ville: Montréal
- ◆ Industrial partners: Pratt & Whitney Canada, Bombardier/Canadair, Hydro-Québec, Howmedica, PWRC, GORE, Flexitallic, DuPont, Marine & Petroleum, Techmir
- ◆ Spécialisation: Analysis of the performance of mechanical components, as well as testing such components to determine their lifespan in service.
- ◆ Ressources:
  - Professors and researchers: 11
  - Students: 24
  - Research agents: 3
  - Total: 38
- ◆ Internet site: [www.polymtl.ca/udr02.htm](http://www.polymtl.ca/udr02.htm)

**C<sup>2</sup>M<sup>2</sup> (Centre de caractérisation microscopique des matériaux)**

- ◆ Affiliation: École Polytechnique
- ◆ City: Montréal
- ◆ Industrial partners: Alcan, Oerlikon Aérospatiale, Domfer, Précitech, Noranda
- ◆ Ressources:
  - Professors and researchers: 18
  - Graduate students: 13
  - Research agents: 4
  - Total: 35
- ◆ Expertise: Research into the engineering of materials to develop generic technologies and resolve problems of technique and of material quality. Its areas of expertise are the following: composite materials with metallic matrices; the metallurgy of powders; galvanized zinc and alloy claddings; and the development of new methods of microscopic characterization.
- ◆ Internet site: [www.polymtl.ca/udr14.htm](http://www.polymtl.ca/udr14.htm)

## 5. RESEARCH DEVELOPMENT

### **Groupe de recherche en mathématiques de l'ingénierie assistée par ordinateur (GRMIAO)**

- ◆ Affiliation: École polytechnique de Montréal
- ◆ City: Montréal
- ◆ Industrial partners: Hydro-Québec, GEC-Alstom, GE Canada, Centre des technologies du gaz naturel, Bombardier/Canadair, CANMET, Toshiba, BMA.
- ◆ Expertise: GRMIAO is involved with the application of digital simulations to industrial flows for:
  - Analysis and performance of hydraulic turbines (viscous and turbulent flows in 2D and 3D)
  - Calculation of external flows for aircraft aerodynamics
  - Simulation of the interaction between electrical arcs and compressible flows for the design of high-voltage circuit breakers
  - Prediction of pollutant formation in industrial natural gas burners
  - Scientific visualization
  - Generation within networks
- ◆ Ressources:
  - Professors and researchers: 6
  - Graduate students: 21
  - Postdoctoral interns: 3
  - Research agents: 3
  - Total: 33
- ◆ Internet site: [www.polymtl.ca/udr15.htm](http://www.polymtl.ca/udr15.htm)

### **Centre des matériaux composites de Saint-Jérôme (CMC)**

- ◆ Affiliation: Cégep de Saint-Jérôme
- ◆ City: Saint-Jérôme
- ◆ Ressources: 30 personnes
- ◆ Partners: Several domestic and international partners, including the Centre de recherche industriel du Québec (CRIQ), the École Polytechnique, the Centre de recherche des fabrications industrielles of Belgium and the Institut des matériaux composites of France (IMC)
- ◆ Expertise: The CMC is a centre for technology transfer in the composite materials sector and offers computer-assisted design and fabrication (CAD/CAM), financing and technology transfers, custom training and testing services.
- ◆ Internet site: [www.citenet.net/cmc](http://www.citenet.net/cmc)

**Chaire en aéronautique J.A. Bombardier**

- ◆ Affiliation: École Polytechnique
- ◆ City: Montréal
- ◆ Industrial partner: Bombardier/Canadair
- ◆ Ressources:
  - Professors and researchers: 1
  - Graduate students: 6
  - Postdoctoral interns: 2
  - Research agents: 1
  - Total: 10
- ◆ Expertise Research activities centre on the area of aeronautics; that is, investigating the effects of ice on airplane wings, the stability and transition of the stratum at the limits of its compression, and wind energy. The Chair has developed, along with Bombardier/Canadair, several codes to predict the accumulation of ice on airplane components, which are used in updating the designs of new types of airplanes such as the Regional Jet and Global Express.
- ◆ Internet site: [www.polymtl.ca/udr05.htm](http://www.polymtl.ca/udr05.htm)

**Concordia Research Centre for Composite Materials (CONCOM)**

- ◆ Affiliation: Concordia University
- ◆ City: Montréal
- ◆ Industrial partners: Bell Helicopter Textron Canada, CMC Electronics, CIL Canada, Circocraft, Comptank Corporation, CPF Dualam, Dow Chemical Canada, FRE Composites, Les Transports Provost, Noranda CNR Division, Pratt & Whitney Canada, EMS Technologies, Troy Manufacturing
- ◆ Expertise: Transformation, fabrication, repair of composites, CAD and non-destructive testing of composite structures
- ◆ Ressources: 13
- ◆ Internet site: [www.me.concordia.ca/research/concom.html](http://www.me.concordia.ca/research/concom.html)

**Centre technologique en aérospatiale (CTA)**

- ◆ Affiliation: École nationale d'aérotechnique, Collège Édouard-Montpetit
- ◆ City: Saint-Hubert
- ◆ Industrial Partners: Ministère de l'Industrie et du Commerce du Québec, Ministère de l'Éducation du Québec
- ◆ Specialization: The primary mission of the centre consists in supporting businesses (particularly, small and medium-sized businesses) working in the aerospace sector, as much in the development of new technologies as by participating in the implementation of projects.
- ◆ Expertise: Studies and needs analyses, Aeronautical techniques, CATIA technologies, Computer-assisted drawing (CAD), Computer-assisted manufacturing (CAM) and Computer-assisted design (CAD).
- ◆ Ressources:
  - Research: 8
  - Administration: 5
  - Total: 13
- ◆ Internet site: [www.collegeem.qc.ca/ena/cta/menu.htm](http://www.collegeem.qc.ca/ena/cta/menu.htm)





## **6 SUPPORT TO INDUSTRY**

This section presents the various forms of support of which companies in the aerospace industry may avail themselves. This support may take the form of fiscal measures and public and private financial assistance. Also, there are several institutions offering risk capital to businesses in this industry, amongst which are the Caisse de dépôt et placement du Québec (CDPQ), Capital d'Amérique, Sofinov, the Société générale de financement du Québec (SGF), the Fonds de solidarité des travailleurs du Québec (FTQ) and Aérocapital (subsidiary of GTI Capital).

### **6.1 VENTURE CAPITAL**

Fiscal measures may take the form of support to employment, to investment or to R&D.

#### **6.1.1 ENCOURAGEMENT OF INVESTMENT**

- ◆ Tax holiday for major investment projects  
A company which implements a major investment project can benefit for a period of ten years from an exemption from corporate income tax, tax on capital and the employer contribution to health services (Fonds des services de santé, FSS). Three types of projects may qualify under the heading of "major investment projects":
  - Investment of at least \$300 million in the case of a modernization or expansion
  - Investment of at least \$300 million in the case of a new facility, which will result in a growth of at least \$4 million in total salaries
  - Investment entailing a growth in total salaries of at least \$15 millionThe investment project must be implemented in the primary sector, in the manufacturing sector, or in the tertiary engine sector, excluding placement offices and accounting services.
  
- ◆ Accelerated amortization and tax holiday on capital  
The Québec government allows companies a deduction for accelerated amortization of 125% of the capital cost of eligible new goods used in Québec for their manufacturing or transformation activities, and of the capital cost of computer equipment including operating system software. This rate of amortization also applies to the capital cost of intangible goods such as patents, licences and permits acquired within the framework of technology transfer. In addition, the capital cost of these eligible goods is deductible from the calculation of capital spent for the purposes of the tax on capital in the current year, as well as in the subsequent year. In both cases (accelerated amortization and tax holiday on capital), the goods must be acquired before March 31, 2005. After that date, the rate of amortization will be reduced to 100%.
  
- ◆ Tax holiday for new companies  
The Québec government allows new companies with paid capital under \$15 million an exemption from tax on revenue, from tax on capital, and from employer contributions to health services (Fonds des services de santé, FSS) for a period of 5 years. The exemptions will meet the following criteria on an annual basis:
  - First \$200,000 million of taxable revenue exempted from corporate income tax
  - First \$3 million of paid capital exempted from the tax on capital
  - First \$700,000 of contributions to the Fonds des services de santé forgiven

## 6. SUPPORT TO INDUSTRY

### 6.1.2 ENCOURAGEMENT OF R&D

- ◆ Deduction for all eligible R&D expenses  
The governments of Canada and Québec allow the deduction of current and capital expenditures in the current year or later.
- ◆ Basic income tax credit of 20%  
The government of Canada allows a basic income tax credit of 20% of eligible R&D expenses, a credit that may be refundable for small businesses and may attain up to 35% of the first \$2 million spent.
- ◆ Refundable income tax credit of 20% on salaries  
The Québec government allows a refundable income tax credit of 20% of salaries paid out for R&D activities. For small businesses, this credit is increased to 40% for the first \$2 million spent for R&D salaries.
- ◆ Refundable income tax credit of 40%  
The Québec government allows a refundable income tax credit of 40% on 80% (an effective rate of 32%) for a business of any size on all eligible expenses for R&D done in Québec by an accredited research centre (university, hospital, public research centre) or within the scope of a precompetitive research project. Companies that are members of a research consortium may also benefit from this income tax credit.
- ◆ Financial aid at reduced rate of interest  
Small and medium-sized businesses that will have increased their investments in R&D as compared to the average of their R&D expenditures in the three previous years may take advantage of an additional tax credit on the increase of their expenses. Thus, small and medium-sized businesses may benefit from an income tax credit of 40% on the total of their expenses and an additional 15% on the increase in their R&D expenditures.
- ◆ Tax holiday for foreign researchers  
Foreign researchers and other experts may benefit from a five-year tax holiday from provincial income tax on personal revenues if they establish themselves in Québec in order to participate in R&D activities within a company. This tax holiday also applies to foreign postdoctoral interns who enter into an employment contract with eligible universities and research centres.

**Table 6: Net cost of \$100<sup>14</sup> in eligible R&D salaries in Québec - 2001 - Manufacturing sector**

Tax credit	SME		Large Business	
	R&D done within company	R&D done by an accredited research centre	R&D done within company	R&D done by an accredited research centre
	Tax Credit 40%	Tax Credit 40%	Tax Credit 20%	Tax Credit 40%
Québec financial incentives <sup>15</sup>	\$26	\$39	\$17	\$40
Federal financial incentives <sup>16</sup>	\$35	<b>\$30</b>	<b>\$34</b>	<b>\$26</b>
Net Costs for enterprises <sup>17</sup>	\$39	\$31	\$49	\$34

Source : Investissement-Québec, 2001

<sup>14</sup> 50% in salaries, 40% in current expenses and 10% in equipment

<sup>15</sup> The federal income tax credit is taxable in Québec in the year following that in which it was claimed. For the purposes of the example, the credit was included in the revenue for the same year in which it was claimed

<sup>16</sup> The federal income tax credit on investment becomes taxable federally in the year following that in which it was claimed. For the purposes of the example, the credit was included in the revenue for the same year in which it was claimed

<sup>17</sup> Includes the income tax credits and the tax savings resulting from the deduction from revenues

## **6. SUPPORT TO INDUSTRY**

### **6.1.3 MONTRÉAL INTERNATIONAL TRADE ZONE AT MIRABEL**

Following the 1999-2000 budget, the Québec government created the Montréal International Trade Zone at Mirabel. This is situated on part of the site of the Mirabel airport. The new International Trade Zone seeks to attract to its site businesses working in the areas of international logistics, aircraft maintenance and repair, complementary education in the field of aviation, and light conversions. The assistance programme, applicable until 2010, will be offered to eligible companies which will locate themselves in the International Trade Zone and will include the following aspects:

Aid to investment: a refundable tax credit of 25% for the acquisition or rental of eligible equipment and the construction of a strategic building in the Zone

- ◆ Aid to operations: an exemption from tax on corporate revenue, tax on capital, and contributions to the Fonds des services de santé (FSS); a refundable tax credit for the salaries of eligible employees, with the exception of those in manufacturing companies; and a refundable tax credit for the fees of customs brokers which will be of 40% until December 31, 2001, 30% from January 1, 2002 to December 31, 2004, and of 20% from January 1, 2005 to December 31, 2010, within the limit of a maximum amount per employee or per company; a loan guarantee and a holiday from interest for the financing of payments of refundable taxes
- ◆ An exemption from personal income tax for a period of five years for foreign specialists
- ◆ Assistance to companies wishing to operate in a free-trade zone environment
- ◆ Assistance in recruiting and training from Emploi-Québec
- ◆ A refund of up to 50% of the costs of a feasibility or profitability study

## **6.2 GOVERNMENT FINANCIAL ASSISTANCE**

This section presents the main government financial aid programmes from which aerospace businesses can benefit. The information presented below details these programmes as of April 2001.

### **6.2.1 IMPROVEMENT OF SKILLS IN SCIENCE AND TECHNOLOGY PROGRAMME**

#### **(PROGRAMME D'AMÉLIORATION DES COMPÉTENCES EN SCIENCE EN TECHNOLOGIE, PACST)**

- ◆ Objectives/characteristics:
  - Assistance programme for companies conducting activities to train and integrate new employees. The training must include a theoretical component (lasting at least one month) and a company internship (for a minimum of six months)
  - The candidate is paid throughout the training period
  - The candidate must have a university degree or college diploma
  
- ◆ Types of financial aid:
  - 40% of eligible expenses
  - The maximum aid awarded to a company may reach \$12,000 per person hired
  
- ◆ Minimum investment:
  - To be eligible to the programme, the company must plan to train and hire a minimum number of employees:
    - 5 to 49 employees = 5 candidates
    - 50 to 749 employees = 10% of the company's total number of employees
    - 750 employees and more = 75 candidates
  
- ◆ Eligible Costs
  - Salaries of trainers, purchase price of courses, tuition or registration
  - Cost of teaching materials
  - Travel expenses for foreign trainers
  - Salaries paid to new employees for a minimum period of 7 consecutive months
  
- ◆ Programme administrator:
  - Ministère de l'Industrie et du Commerce  
710, place d'Youville, 5<sup>e</sup> étage, Québec, (Québec), G1R 4Y4  
Tel.: (418) 691-8021, Fax: (418) 643-6669  
Internet site: [www.mic.gouv.qc.ca](http://www.mic.gouv.qc.ca)

## 6. SUPPORT TO INDUSTRY

### 6.2.2 FUNDS FOR GROWTH OF PRIVATE INVESTMENT AND RESURGENCE OF EMPLOYMENT (FONDS POUR L'ACCROISSEMENT DE L'INVESTISSEMENT PRIVÉ AND LA RELANCE DE L'EMPLOI, FAIRE)

- ◆ Objectives/characteristics:
  - The programme seeks to encourage companies to implement investment projects that will give rise to significant economic effects.
  
- ◆ Types of financial assistance:
  - Coverage of 50% of the cost of feasibility studies for obtaining world rights (maximum of \$100,000)
  - A guarantee of reimbursement of at most 70% of net losses relating to a loan, margin of credit, letter of credit, lease, lease-to-own or any other financial commitment granted by a financial institution; such financial commitment not to exceed 75% of the cost of a project
  - Depending on the project, the contribution will be refundable, non-refundable or eligible for a conditional refund
  - The maximum period of financial intervention is 10 years
  
- ◆ Conditions/eligible expenses
  - Projects including an investment of at least \$10 million over a 36-month period for companies already established in Québec, or
  - Projects creating at least 100 jobs over 36 months for companies already established in Québec, or
  - Projects creating at least 50 jobs over 24 months for companies working in the fields of multimedia, call centres, transaction processing centres, or value-added distribution, or
  - Projects related to a new installation, including an investment of at least \$2 million and creating 50 jobs over 24 months, or
  - Projects including a purchasing credit of at least \$1 million for the purchase of goods and services destined for export, or
  - Projects for performance of a feasibility study for a subsidiary established in Québec seeking to obtain a worldwide mandate.
  - Implementation of the project must begin no later than six months after the date of authorization of financial aid.
  
- ◆ Programme administrator
  - Investissement-Québec  
393, rue Saint-Jacques, Bureau 500, Montréal (Québec), H2Y 1N9  
Tel.: 1 (800) 461-2433, or (514) 873-4375, Fax: (514) 873-5786  
Internet site: [www.invest-quebec.com](http://www.invest-quebec.com)

**6.2.3 SMALL-TO-MEDIUM BUSINESS GUARANTEE PROGRAMME (PROGRAMME GARANTIE PME)**

- ◆ Objectives/characteristics
  - Loan guarantee programme for any business planning the following activities: start-up, significant expansion or modernization, or implementation of an export or innovation project (R&D, design or marketing)
  
- ◆ Types of financial assistance:
  - Maximum amount of loan: 75% of project costs including the required operating funds (financing for premises)
  - Loan guarantee for a maximum period of 10 years
  - Minimum guarantee awarded: \$50,000
  - Maximum amount of guarantee: \$500,000
  - Fees for guarantee: 1 - 2.25% on balance of loan, payable annually
  - Maximum percentage of guarantee of reimbursement of net losses determines according to project type:
    - Innovation = 80 %
    - Export = 80 %
    - Start-up, expansion = 70 %
    - Consolidation or alliance = 70 %
  
- ◆ Conditions/criteria for eligibility
  - Fewer than 100 employees
  - Sales volume under \$10 million
  - Potential for export development
  
- ◆ Programme administrator
  - Investissement-Québec  
393, rue Saint-Jacques, Bureau 500, Montréal (Québec), H2Y 1N9  
Tel.: 1 (800) 461-2433, or (514) 873-4375, Fax: (514) 873-5786  
Internet site: [www.invest-quebec.com](http://www.invest-quebec.com)

## 6. SUPPORT TO INDUSTRY

### 6.2.4 "DÉCLIC PME" PROGRAMME

- ◆ Objectives/characteristics
  - Loan guarantee programme aimed at all companies planning a start-up. All sectors of activity are eligible, including services to the following businesses: computer services, software services or other services with high value added relating to information technology, except for services to individuals.
- ◆ Types of financial assistance
  - Guarantee of loan reimbursement of no more than 80% of the net loss
  - Maximum amount of guarantee: \$100,000 (for a loan of &125,000)
  - Programme may not be combined with another Québec government programme
- ◆ Conditions/criteria for eligibility
  - Projects must be implemented in Québec
  - Creation of a business or exploitation for fewer than 3 years with sales under \$1 million
  - Creation of two or three new jobs
  - Minimum investment of 20% for any start-up business. A part (10%) of the investment may be made by a regional development organization. Under certain conditions, investment in equipment may be replaced by an investment in cash
- ◆ Eligible costs
  - Cost of purchase of goods related to the operation of the business
  - Start-up funds
  - Cost of final updating of products
  - Costs of marketing recently developed products
  - Expense for operating funds during the year following authorization of the request
- ◆ Programme administrator
  - Investissement-Québec  
393, rue Saint-Jacques, Bureau 500, Montréal (Québec), H2Y 1N9  
Tel.: 1 (800) 461-2433, or (514) 873-4375, Fax: (514) 873-5786  
Internet site: [www.invest-quebec.com](http://www.invest-quebec.com)



**6.2.5 INDUSTRIAL RESEARCH ASSISTANCE PROGRAMME (PARI)**

- ◆ Objectives/characteristics
  - Programme to assist small and medium-sized Canadian companies to design new technological products, processes or services or to improve them, with shared-cost financing. This programme also includes a section for pre-marketing assistance, which more specifically targets projects that have reached this stage in the sectors of assistive environmental technologies, or aerospace and defence.
  
- ◆ Types of assistance
  - The financing varies according to the size and complexity of projects:
    - Small projects: 40 - 50% of eligible costs, for a maximum of \$150,000, varying with the purpose of the project and the province
    - Large projects: 40 - 50% of eligible costs, for a maximum of \$350,000, varying with the purpose of the project and the province
  - Assistance to marketing: maximum contribution of 33% of eligible costs,
  - Pre-marketing assistance: eligible costs, not to exceed \$1.5 million
  
- ◆ Conditions/criteria for eligibility
  - Under 500 employees
  - Potential to improve capacity for innovation
  
- ◆ Eligible costs
  - Eligible costs include:
    - Feasibility studies
    - Strategic planning of technologies
    - Technical analysis
    - Access to technology and resources in Canada and abroad
  - Under the heading of marketing assistance, eligible costs cover:
    - Costs of labour, materials and equipment
    - Administrative costs
    - Costs for purchasing specialized materials
  
- ◆ Programme administrator:
  - Conseil national de recherches du Canada (CNRC)  
75, boul. de Mortagne, Bureau P-101  
Boucherville, QC J4B 6Y4  
Tel.:(450) 641-5300, Fax: (450) 641.5301  
Internet site: [www.nrc.ca](http://www.nrc.ca)

## 6. SUPPORT TO INDUSTRY

### 6.2.6 TECHNOLOGICAL PARTNERSHIP CANADA (TPC)

- ◆ Objectives/characteristics
  - Fund investing in technologies that support R&D and innovation in various domains of high technology. In aerospace and defence (including projects for conversion of defence industries), technologies related to the following are targeted:
    - Advanced avionics and electronics systems
    - Aircraft engines and engine components
    - Aircraft materials, structures, components and systems
    - Software and simulators
    - Systems and components for the space industry, including communications technologies
  - Projects eligible for PTC investments must target:
    - Development in advance of competition
    - Industrial research
    - Studies
- ◆ Types of financial assistance:
  - Underwrites a portion of eligible cost to a maximum of 25-30% (exceptionally 50%). The TPC's investments are conditionally repayable.
- ◆ Eligible expenses:
  - Labour costs
  - Costs of materials and equipment
  - Costs of specialized materials
  - Other costs directly related to the project
- ◆ Programme administrator:
  - Industrie Canada/Partenariat technologique Canada bb  
300, rue Slater, 10<sup>ème</sup> étage, Ottawa (Ontario), K1A 0C8  
Tel.: 1 (800) 266-7531, Fax: (613) 954-9117  
Internet site: [www.strategis.ic.gc.ca](http://www.strategis.ic.gc.ca)

#### Note

In 2001, Technological Partnership Canada set up two pilot projects destined specifically for small and medium-sized businesses working in the aerospace and defence sectors:

- Programme for development of markets for aerospace and defence suppliers
- Programme for collaboration for technological development

These programmes are described in the following pages

**6.2.7 PROGRAMME FOR DEVELOPMENT OF MARKETS FOR AEROSPACE AND DEFENCE SUPPLIERS (UNDER TPC)**

- ◆ Objectives/characteristics
  - Programme helping small and medium-sized businesses develop and integrate international-calibre practices and technologies in trade and manufacturing. This initiative supports the following categories of activity:
    - Quality Management systems
    - Advanced manufacturing systems
    - Planning and process systems
    - Robotic cells and systems
    - Studies in the transfer of technical data
    - Purchase of equipment essential to the implementation of project activities
- ◆ Types of financial assistance
  - Total amount of eligible costs not exceeding \$2 million
  - Financing of 40-50% of eligible cost
- ◆ Conditions for eligibility
  - At least 33% of total revenues for the previous year must come from sales to the aerospace or defence industry
  - Sales volume under \$20 million per year or less than 100 employees
- ◆ Eligible costs
  - Costs of direct labour and direct materials related to the work of the project
  - General expenses (65% of the costs of direct labour or a rate determined by Public Works and Governmental Services Canada)
  - Salaries of consultants and subcontractors necessary to the completion of the work
  - Costs of materials and software necessary for the implementation of a particular system.
  - Costs of software and site licences, according to need
  - Costs of studies performed
- ◆ Programme administrator
  - Partenariat technologique Canada  
300, rue Slater, 10ème étage, Ottawa, ON K1A 0C8  
Tel.: 1 (800) 266-7531, Fax: (613) 954-9117  
Internet site: [www.strategis.ic.gc.ca](http://www.strategis.ic.gc.ca)

## 6. SUPPORT TO INDUSTRY

### 6.2.8 PROGRAMME FOR COLLABORATION FOR TECHNOLOGICAL DEVELOPMENT (UNDER TPC)

- ◆ Objectives/characteristics
  - Programme to encourage R&D projects with multiple partners, destined for Canadian aerospace and defence suppliers. Programme of a partnership between the Bureau of Collaboration for Technological Development, composed of the Canadian Association of Aerospace Industries (Association des industries aérospatiales du Canada, AIAC), the National Research Council of Canada (NRCC) and of Technological Partnership Canada (PTC).
- ◆ Types of financial assistance
  - Underwriting of 50% of the costs of financing, with a maximum of \$1 million per project
- ◆ Conditions of eligibility
  - Collaboration between the partners in the first stages of R&D, which will include a significant element of innovation and allow the members of the team to increase their technological abilities
  - Eligible teams must include at least two Canadian aerospace and defence companies, of which one must be a small or medium-sized business. One of the Canadian companies must be the project's leader. University researchers, government laboratories and other public organizations may also be partners in the project. Eligible fields are the following:
    - Design technologies
    - Environmental technologies
    - Maintenance, repair and renovation technologies
    - Manufacturing technologies
    - Materials and construction technologies
    - Systems technologies
    - Visualization technologies
- ◆ Programme administrator:
  - Partenariat technologique Canada  
300, rue Slater, 10<sup>ème</sup> étage, Ottawa, ON K1A 0C8  
Tel.: 1 (800) 266-7531, Fax: (613) 954-9117  
Internet site: [www.strategis.ic.gc.ca](http://www.strategis.ic.gc.ca)

**6.2.9 IDEE - PME PROGRAMME**

- ◆ Objectives/characteristics
  - The programme seeks to allow small and medium-sized businesses (200 employees or fewer), or groups of same, to implement projects for innovation or RDD (Research, Development and Design), or other projects related to the marketing of products, services or technologies derived from the RDD work
  
- ◆ Types of financial assistance
  - Contributions, repayable or not, or subsidies:
    - Contributions must not exceed 50% of authorized costs
    - Subsidies may reach 100% of costs
  
- ◆ Eligible costs
  - All costs related to:
    - Manpower;
    - Professional services;
    - Equipment rentals;
    - Demonstration or upgrading of a process;
    - Organization of an exhibition, colloquium or seminar.
  
- ◆ Programme administrator:
  - Développement Économique Canada  
800, square Victoria, Bureau 3800, CP 247, Montréal (Québec), H4Z 1E8  
Tel.: (514) 283-2500, Fax: (514) 496-8310  
Internet site: [www.dec-ced.gc.ca](http://www.dec-ced.gc.ca)

## **6. SUPPORT TO INDUSTRY**

### **6.2.10 MICRO-BUSINESS PROGRAMME**

- ◆ Objectives/characteristics
  - This programme is intended to support small, innovative businesses in the start-up stage or at the beginning of their growth, and offers them a follow-up and personalized management support for two years.
  
- ◆ Types of financial assistance
  - Term financing up to:
    - \$50,000 for established companies
    - \$25,000 for new companies
  
- ◆ Programme administrator
  - Banque de Développement du Canada  
5, place Ville Marie, Bureau 12525, Montréal (Québec), H3B 2G2  
Tel.: (514) 496-7966, Fax: (514) 496-7974  
Internet site: [www.bdc.ca](http://www.bdc.ca)

**6.2.11 CANADA SMALL BUSINESS FINANCING PROGRAMME (PROGRAMME DE FINANCEMENT DES PETITES ENTREPRISES DU CANADA, FPEC)**

- ◆ Objectives/characteristics
  - Loan guarantee programme delivered by financial institutions across Canada, with the goal of allowing small businesses to more easily obtain term loans serving to finance the purchase or improvement of real estate destined for the expansion of their operations or the creation of a new business. Administered by virtue of the Canadian Law on the Financing of Small Businesses, the programme is a joint initiative of the Government of Canada and private-sector lenders.
- ◆ Types of financial assistance
  - Financing of up to 90% of the costs relating to assets, including taxes and non-refundable rights
- ◆ Conditions of eligibility
  - Small businesses starting up or already established in Canada.
  - Small businesses whose gross receipts do not exceed \$5 million for the fiscal year in the course of which they ask for a loan
- ◆ Eligible costs:
  - Purchase or improvement of real estate or buildings
  - Purchase of leasehold improvements or improvements to rented premises.
  - Purchase or improvement of the new or used material necessary to the operation of commercial enterprises.
- ◆ Ineligible costs:
  - Purchase of shares or any other form of participation in a business
  - Financing of operations (inventories, client accounts, etc.)
  - Financing of expenses or borrower commitments previously financed by a term loan.
  - Purchase of real estate for resale
  - Purchase or improvements of real estate for purposes of rental or sub-leasing (except for businesses in the sectors of hotels, health care and mini-storage)
- ◆ Programme administrator
  - Industry Canada - Administration of loans to small businesses  
8th floor, East Tower  
235 Queen Street  
Ottawa, ON K1A 0H5  
Tel.: (613) 954-5540, Fax: (613) 952-0290  
Internet site: <http://strategis.ic.gc.ca/lfpec>





**APPENDIX A**  
**LIST OF ESTABLISHMENTS IN GREATER MONTRÉAL**



**LIST OF ESTABLISHMENTS IN GREATER MONTRÉAL**

<b>Prime contractors and major repair and overhaul centres</b>	<b>Jobs</b>	<b>City</b>	<b>Details by facility</b>
Bombardier Aerospace	14 800	Saint-Laurent	5800
		Dorval	4200
		Dorval	2100
		Dorval	1300
		Mirabel	1200
		Saint-Laurent	200
Pratt & Whitney Canada	5 510	Longueuil	3800
		Longueuil	170
		Saint-Hubert	790
		Longueuil	750
CAE	4 000	Saint-Laurent	
Air Canada (Technical Centre)	3 700	Dorval	
Bell Helicopter Textron	1 550	Mirabel	
Rolls-Royce Canada	1 500	Lachine	
Air Transat (Maintenance Centre)	310	Mirabel	
<b>Total Prime contractors and major repair and overhaul centres</b>	<b>31 370</b>		

<b>Equipment manufacturers</b>	<b>Jobs</b>	<b>City</b>	<b>Details by facility</b>
CMC Electronics (ex. Marconi Canada)	1070	Saint-Laurent	
EMS Technologies Canada	800	Saint-Anne-de-Bellevue	
Héroux-Devtek (Landing Gear Division)	550	Longueuil	430
		Laval	120
Honeywell Aerospace (ex. AlliedSignal Aerospace)	410	Saint-Laurent	
Messier Dowty	220	Mirabel	
Lockheed Martin Canada	200	Montréal	
Thales Avionique Canada (ex. Sextant Avionique Canada)	90	Saint-Laurent	
<b>Total Equipment manufacturers</b>	<b>3 340</b>		

## LIST OF ESTABLISHMENTS IN GREATER MONTRÉAL

<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City</b>	<b>Details by facility</b>
Innotech Exequire	300	Dorval	
NMF Canada	280	Mirabel	
GFI	250	Pointe-Claire	
Avcorp Industries	150	Laval	
Shellcast Foundries	140	Montréal-Nord	
Marquez Transtech	125	Montréal	
Entreprise de Soudures Aérospatiales	120	Blainville	
Arell	105	Anjou	
Alphacasting	100	Saint-Laurent	
Claro Précision	100	Saint-Léonard	
CPS Industries	100	Pointe-Claire	
Harrington	100	Lachine	
Industries Aérospatiales Mecair	100	Pointe-Claire	
Systèmes Accessair	100	Sainte-Catherine	
Vestshell	100	Montréal-Nord	
TRW	95	Montréal	
CP Tech	93	Saint-Laurent	
Aero Machining	90	Montréal-Nord	
Performance L.T.	90	Laval	
Industries UDT	85	Montréal	
MagChem / Magnus Canada	75	Boucherville	
Placage Tecnickrome	75	Montréal	
Corporation d'Usinage Métro	70	Montréal	
CVDS	70	Dollard-des-Ormeaux	
Luminescent Systems Canada	68	Dorval	
Technimeca International	65	Saint-Laurent	
Pega Precision	63	Montréal	
Sermatech Canada	63	Dorval	
Aviation Lemex	60	Saint-Hubert	
GSM Production	60	Saint-Laurent	
Industries Leesta	60	Pointe-Claire	
Metcor	60	Saint-Eustache	
Pyrogenesis	60	Montréal	
Elimetal	58	Saint-Laurent	
Eastern Aerocast	55	Lachine	
Abipa Canada	50	Laval	
Airborne	50	Saint-Léonard	

**LIST OF ESTABLISHMENTS IN GREATER MONTRÉAL**

<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City</b>	<b>Details by facility</b>
Industries Guérette	50	Longueuil	
Nitrex Metal Technologies	50	Saint-Laurent	
TQF Technologies	50	Saint-Laurent	
Anodisation Verdun	49	Verdun	
JE Lortie	45	Montréal	
Corporation Tribospec	40	LaSalle	
Société d'Outilsage MR	39	Saint-Laurent	
Les Industries CAT	38	Montréal	
Sider Tech	38	Longueuil	
Profab	37	Laval	
Tektrend International	36	Dollard-des-Ormeaux	
Aerotech Tubetronics	35	Laval	
Deburex Aviation	32	Lavaltrie	
Alta Précision	30	Anjou	
Avianor	30	Dorval	
CEL Aérospatiale	30	Longueuil	
Optimus	30	Saint-Lambert	
Team	30	Saint-Laurent	
Techniprodec	30	Montréal	
MG Lonic	28	Dorval	
Usinage Netur	28	Saint-Hubert	
Air Data	25	Ville Mont-Royal	
Aluminium Foundry and Pattern	25	Dorval	
Breschbul	25	Saint-Hubert	
DMG (Usinage Mécanique)	25	Montréal-Nord	
Teco Précision	25	Saint-Laurent	
Vac Aero International	25	Saint-Laurent	
Les Industries de Placage Lego	24	Saint-Léonard	
LNS Systems	24	Saint-Laurent	
OBDS On-Board Data Systems	24	Mirabel	
Industries Patenaude	22	Laval	
Amphitech International	20	Laval	
DP Digital Precision	20	Laval	
Gentner	20	Saint-Léonard	
Mirabel Aéro Service	20	Dorval	
Elisen Technologies	18	Montréal	
Produits Automatiques Micron	17	Laval	

## LIST OF ESTABLISHMENTS IN GREATER MONTRÉAL

<b>Subcontractors and suppliers of special products and services</b>	<b>Jobs</b>	<b>City</b>	<b>Details by facility</b>
Micro Craft Canada	16	Dorval	
Aeronef Instruments	15	Dorval	
Modèlerie Dorval	15	Saint-Laurent	
Airnav Électronique	12	Dorval	
Amphenol Air LB North America	12	Dollard-des-Ormeaux	
Apex Précision	12	Vaudreuil	
Atelier d'usinage FJ	12	Baie-d'Urfé	
Aviatron	12	Hudson	
Liebherr Aerospace Canada	12	Saint-Laurent	
Pôle Air Aviation	12	Lachine	
Aérosystème International	10	Saint-Laurent	
MDS Aero Support Corporation	10	Saint-Laurent	
Noorduyn Norseman	10	Saint-Laurent	
Progressive	10	Anjou	
Repoussage de Métal Américain (AMS)	10	Laval	
Saint-Just Aviation	10	Mirabel	
Mécanique Industrielle B Courteau	9	Varenes	
Nav-Aids	9	Saint-Laurent	
APS Aviation	8	Montréal	
Avtech Corporation	8	Saint-Hubert	
Outilsage Guerette	8	Mirabel	
RMR Tooling Industries	8	Saint-Laurent	
Air Data Structure	7	Saint-Laurent	
Usinage Aerospec	7	Laval	
Polvige Technologies	6	Dorval	
Apex Aerospace	5	Dorval	
Norprecision	5	Montréal-Nord	
Eurocopter Canada	4	Dorval	
Genitest	4	Montréal	
Marinvent	4	Saint-Bruno	
Académie de l'Aviation	3	Mascouche	
Bruel & Kjaer Canada	3	Pointe-Claire	
Dubé Normand Aviation	3	Sainte-Anne-des-Plaines	
<b>Total Subcontractors and suppliers of special products and services</b>	<b>5110</b>		

## **APPENDIX B**

### **PROFILE OF THE MAJOR CORPORATIONS <sup>18</sup>**

Bombardier Aerospace  
Pratt & Whitney Canada  
CAE  
Bell Helicopter Textron  
Rolls-Royce Canada  
CMC Electronics  
EMS Technologies Canada  
Héroux-Devtek  
Honeywell Aerospace  
Messier-Dowty  
Lockheed Martin Canada

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<sup>18</sup> The information shown here is based on published data and, where possible, has been confirmed with the companies.





## PROFILE OF THE MAJOR CORPORATIONS

### Bombardier Aerospace

www.bombardier.com

Industry sector: Prime contractor – Aircraft manufacturing

Ownership: Bombardier Inc. (Canada)

Stock Exchange (TSE): BBD\_pb, BBDa, BBDb

Products/Services World Wide	<ul style="list-style-type: none"> <li>• Design and manufacturing of aircraft (regional transport, business aircraft and amphibian airplanes), systems and components for aircraft manufacturers.</li> <li>• Bombardier Aerospace is an integrated international organization that has its' own complete design and manufacturing installations, such as Canadair and de Havilland in Canada, Learjet in the United States and Shorts in the United Kingdom.</li> </ul>
Exclusive products developed in the Montréal region	<ul style="list-style-type: none"> <li>• Business aircraft: Bombardier's Global Express, Challenger 604 and the Canadair Corporate Special Edition Jetliner.</li> <li>• Regional aircraft: Canadair's Regional Jet (CRJ).</li> <li>• Amphibian airplanes: Canadair's multi-mission CL-415, CL-215 and CL-415.</li> </ul>
Locations and employees in the Montréal region	<ul style="list-style-type: none"> <li>• Saint-Laurent: Plant: 5,800 employees Training centre: 200 employees</li> <li>• Dorval: Plant: 4,200 employees Finishing centre: 1,300 employees Bombardier Aerospace administrative centre: 2,100 employees</li> <li>• Mirabel: Defence services – 1,200 employees</li> </ul> <p>Total: 14,800 employees, 6 locations</p>
Orders for the Montréal region	\$23 billion CDN as of January 31, 2001 for Bombardier Aerospace World.
R&D activities in the Montréal region	Certification of a new aircraft every year between 1992 and 2000.
Customer base	Air Dolomiti, Air Nippon, American Eagle Airlines, Atlantic Coast Airlines Holdings, Atlantic Southeast Airlines, Brit Air/Air France, Japanese Civil Aviation Board (JCAB), Cathay Pacific Airways, China Yunnan Airlines, Comair, TAG Aerospace Group, Japan Airlines, Lufthansa, Maersk Air, Mesa Air Group, Northwest Airlines, Quantas Airlines, Shandong Airlines, Shanghai Airlines, SkyWest Airlines
Comments	<ul style="list-style-type: none"> <li>• The world's third largest manufacturer of commercial aircraft, after Boeing and Airbus, with a 44% share of the world's regional aircraft market and 37% of the business aircraft market</li> <li>• Regional transport and business jet aircraft, including support services, represent 96 % of total sales. Amphibian airplanes, pods, cell components and defence services constitute the remaining 4%.</li> </ul>

## PROFILE OF THE MAJOR CORPORATIONS

Recent developments in the Montréal region

### **Bombardier Sets a New Record With 370 Airplanes Delivered**

MONTRÉAL (QC), Canada, February 26, 2001 – Bombardier announced today that the number of aircraft delivered for the fiscal year ending January 31, 2001 reached a new peak with 370 units, compared to 292 units the previous year. This 27% increase in deliveries over the previous year is greater than the projected growth of 20%, or 350 aircraft, which had been announced at the beginning of the 2000-2001 fiscal year by Bombardier Aerospace. The increase occurred in the regional aircraft sector, with 157 aircraft delivered. In the business aircraft sector, 203 units were delivered, compared to 183 for the same period of the previous year. Furthermore, 10 Canadair 415 amphibian airplanes were delivered during the 2000-2001 fiscal year, compared to five in the preceding year. Bombardier Aerospace ended its fiscal year with firm orders totalling 574 regional aircraft, compared to 435 on January 31, 2000.

### **The Inaugural Flight of the CRJ900 Reinforces Bombardier's Leadership in the Regional Aircraft Market**

MONTRÉAL (QC), Canada, February 21, 2001 – The brand-new jet from Bombardier Aerospace, the CRJ900, made its inaugural flight from Montréal International Airport (Mirabel). According to the crew, "the first flight of this 86-seat prototype was impeccable". Joining the ranks of the 50-seat CRJ100 and CRJ200 and the 70-seat CRJ700, the CRJ900 is the newest addition to Bombardier's twinjet regional transport line. A slightly longer version of the CRJ700, this aircraft was subject to the same crew qualification procedures that apply to the crews of other Bombardier CRJ craft.

### **Bombardier Aerospace Will Build an Aircraft Assembly Plant in Mirabel**

MONTRÉAL (QC), Canada, August 11, 2000 – Bombardier Aerospace announced today that it will invest approximately \$170 million to build a plant for the final assembly of its 90-seat CRJ900 twinjet regional aircraft, which will be located at Mirabel Airport. The 70-seat CRJ700, whose main features are identical to the CRJ900 series, will also be assembled in Mirabel. The construction of this new plant in Montréal's international commercial zone, at Mirabel, will commence in September and be completed by spring 2001. The work force at Mirabel will reach approximately 1,700 by 2003.

**PROFILE OF THE MAJOR CORPORATIONS**

**Pratt & Whitney Canada**

www.pwc.ca

Industry Sector: Prime contractor – Manufacturing of gas turbines  
 Ownership: United Technologies Corporation (United States)  
 Stock exchange (NYSE): UTX

Products/Services World Wide	Design, development, manufacturing, merchandizing and technical support of turbofans, turboprop engines and turbo shaft engines to meet the requirements of the following markets: regional transport, business aviation, helicopters, utility aviation, auxiliary power units and industrial applications.
Exclusive products developed in the Montréal region	<ul style="list-style-type: none"> <li>• PT6: Business aircraft market, regional transport, test-driving/training, helicopters, as well as utility and agricultural airplanes</li> <li>• JT15D: Business aircraft market and training aircraft</li> <li>• PW100: Regional transport turboprop engine market (30 to 70 seats)</li> <li>• PW150A: Regional transport turboprop engine market (60 to 80 seats)</li> <li>• PW200: Light and medium-size helicopter market</li> <li>• PW300: Business jet and small regional jet markets for intercontinental and transcontinental connections</li> <li>• PW500: Business aircraft up to medium-size craft for intercontinental service</li> <li>• PW900: Auxiliary power units (GAP) – PW901A</li> </ul>
Locations and employees in the Montréal region	<ul style="list-style-type: none"> <li>• 3 locations in Longueuil: 4,720 employees</li> <li>• 1 location in Saint-Hubert (overhaul and training centre): 790 employees</li> <li>• Total: 5,510 employees, 4 locations</li> </ul>
Annual budget for R&D in the Montréal region	14% of total sales, \$331 million in 2000 (world wide)
Customer base	Augusta, Bell Helicopter Textron, Bombardier Aerospace, Cessna Aircraft, Dassault, EADS (ATR, SOCATA, CASA), Embraer, Fairchild Dornier, Piper, Raytheon
Comments	<ul style="list-style-type: none"> <li>• World mandate for turbofans, turboprops and low-power turboshaft engines.</li> <li>• As of March 31, 2001: 802 airline companies and 7,735 operators throughout 183 countries use motors made by Pratt &amp; Whitney Canada. In total, 50,664 motors have been delivered.</li> </ul>

## PROFILE OF THE MAJOR CORPORATIONS

Recent developments in the Montréal region

### **Pratt & Whitney Canada Completes the First Run of Its ATFI, a Revolutionary Geared Turbofan**

LONGUEUIL (QC) Canada, April 5, 2001 – Pratt & Whitney Canada Corp. (P&WC) has successfully completed the first run of its revolutionary geared turbofan engine demonstrator, the Advanced Technology Fan Integrator (ATFI), designed for the regional airline and corporate jet markets. The company is considering the launch of an in-flight trial program aboard the ATFI in the year to come. The success of this program will open the way for the PW800. The new-generation advanced technology of the turbo-charged turbojet offers a thrust bracket between 44.5 and 84.5 kN (10,000 – 19,000 lb.). The PW800 can be introduced within 36 months of the official launch of the program, thereby completing Pratt & Whitney's product portfolio. This model is positioned between the PW300 unit, for small regional transport jets and business aircraft, and the PW6000, designed for the 100-seat-plus market.

### **Pratt & Whitney Canada Develops a New PT6 Motor for Huey Helicopters**

**Anaheim (CA), U.S.A., February 12, 2001** – Pratt & Whitney Canada Corp. (P&WC) announces the development of a PT6C-67D engine for the UH-1 Huey Helicopter. The new engine will significantly enhance the aircraft's performance and availability while reducing its operating costs – at a very competitive price. The PT6C-67 series engines are part of the large PT6 family. P&WC expects to obtain an Engine Type Certificate (TC) for the new Electronic Engine Control (EEC) equipped PT6C-67D engine from Transport Canada in October 2001, and also obtain a helicopter Supplementary Type Certificate (STC) from the U.S. Federal Aviation Administration (FAA) in the first quarter of 2002.

## PROFILE OF THE MAJOR CORPORATIONS

**CAE**

www.cae.com

Industry Sector: Prime contractor – Flight simulators

Ownership: CAE Inc.

Stock Exchange (TSE-Toronto): CAE

Products/Services World Wide	<ul style="list-style-type: none"> <li>• Design, manufacturing and updating of flight simulation equipment for military and civil aviation use and in-flight training units.</li> <li>• Rental of simulators on an hourly basis and turnkey training solutions as well as Web-based training.</li> </ul>
Exclusive products developed in the Montréal region	<ul style="list-style-type: none"> <li>• Training and civil full flight simulations: civil flight simulators for almost the entire in-line aircraft sector and many business jets. Design and production of visual systems.</li> <li>• Training and military simulations: design and manufacturing of military-fighter flight simulators, helicopters, heavy transport and patrol planes. Design of visual systems and training systems. Manufacturing of flight simulators – tactical and complete missions.</li> </ul>
Locations and employees in the Montréal region	Saint-Laurent: 4,000 employees
R&D activities for the Montréal region	<ul style="list-style-type: none"> <li>• Ranked among the top 10 Canadian companies in terms of research and development.</li> <li>• The Saint-Laurent plant reinvests between 15 and 20% of its sales in research and development.</li> </ul>
Customer base	Agusta, Air Canada, Air China, All Nippon Airways, American Airlines, Bell Helicopter Textron, Boeing, British Airways, Continental Express, Delta Airlines, EDESUR, EHI, Embraer, Finnair, GEC Marine Tarrow Shipbuilders, KLM, Lockheed Martin, Royal Air Force, Schreiner Aviation Training, Singapore Airlines, US Airways, Westland
Comments	<ul style="list-style-type: none"> <li>• 80% of the world market for civil full flights simulators.</li> <li>• 2<sup>nd</sup> largest independent provider of aviation training services, through its worldwide network of training centres.</li> </ul>

## PROFILE OF THE MAJOR CORPORATIONS

Recent developments in the Montréal region

### **Major Aerospace Investment: Québec Government Contributes to the Expansion of CAE and the Training of CAE Employees**

MONTRÉAL (QC), Canada, May 15, 2001- Québec's Premier, Mr. Bernard Landry, the Minister of Labour and Manpower, Mr. Jean Rochon, and the President and Chief Executive Officer of CAE, Mr. Derek H. Burney, announced an expansion project for its main plant located in Saint-Laurent. The first phase is evaluated at \$73 million, and could total \$118 million over three years. Some \$92.7 million will be allotted for training and employee development.

The financial participation of the Québec government, through Emploi-Québec, is comprised of a \$15.3 million contribution over four years toward the training of 400 new employees and retraining of the company's 4,000 current employees. With respect to the expansion of corporate facilities, Investissement Québec will loan CAE a refundable amount of \$10.3 million over three years to complete the work.

## PROFILE OF THE MAJOR CORPORATIONS

### **Bell Helicopter Textron**

www.bellhelicopter.textron.com

Industry Activity: Prime contractor – Manufacturing of helicopters, mainly in the commercial sector

Ownership: Textron (USA)

Stock Exchange (NYSE): TXT

Products/Services World Wide	Helicopter design and assembly, mainly in the commercial sector, and after-sales service.
Exclusive products developed in the Montréal region	<ul style="list-style-type: none"> <li>• Assembly of commercial helicopter models: 430, 407, 230, 427, 212, 412, 206B, 206L, and after-sales service.</li> <li>• Specialized analysis system, design and manufacturing of structures and composite materials, design by final-element method, oscillation analysis, rotor dynamic analysis, flight trials.</li> </ul>
Locations and employees in the Montréal region	Mirabel: 1,550 employees as of March 31, 2001
Orders for the Montréal region	\$700 million CDN for 2000
Customer base	American Department of Defense (which buys commercial helicopters for training purposes), petroleum operations, police forces, medical evacuations, etc.
Comments	<ul style="list-style-type: none"> <li>• World mandate for assembly of light and medium-weight commercial helicopters.</li> <li>• Since 1986, the Mirabel plant has assembled more than 2,500 helicopters.</li> </ul>

## PROFILE OF THE MAJOR CORPORATIONS

### Rolls-Royce Canada

www.rolls-royce.com

Industry sector: Prime contractor – Repair and overhaul of gas turbines  
 Ownership: Rolls-Royce plc (United Kingdom)

Products/Services World Wide	<ul style="list-style-type: none"> <li>• Repair and overhaul of aircraft gas turbines (airline, business and military aircraft)</li> <li>• Precision machine shop for spare parts</li> <li>• Installation of aircraft motor spare parts</li> </ul>
Exclusive products developed in the Montréal region	<p>Aircraft motors</p> <ul style="list-style-type: none"> <li>• AE3007 (Embraer ERJ145/135, Cessna Citation X)</li> <li>• RB211 (Lockheed 1011, Boeing 757)</li> <li>• Tay (Fokker 100, Boeing 727QF, Gulfstream IV)</li> <li>• BR710 (Gulfstream V, Bombardier Global Express)</li> <li>• BR715 (Boeing 717)</li> <li>• Spey (Fokker 28, Gulfstream III/II, BAC1-11)</li> <li>• Adour (USN Bae/Boeing T-45A Goshawk)</li> </ul>
Locations and employees in the Montréal region	Lachine: 1,500 employees
Customer base	Bombardier, British Aerospace, Continental Express, Embraer, Excel Air Service, US Airways, UPS, Western Jet
Comments	<ul style="list-style-type: none"> <li>• World leader in maintenance and repair of a wide range of engines.</li> <li>• Sole Rolls-Royce R&amp;D centre located outside the United Kingdom.</li> <li>• Centre of excellence for the corporate aerospace market.</li> </ul>



Recent developments in the Montréal region	<p><b>Canada Invests \$53 Million in R&amp;D to Promote Cleaner, More Efficient Energy</b></p> <p>LACHINE (QC), Canada, July 5, 2000 – On behalf of Mr. John Manley, Minister of Industry, Mr. Pierre Pettigrew, Minister for International Trade, announced today that the federal government's Technology Partnerships Canada (TPC) program will invest \$53.3 million in Rolls-Royce Industries Canada Inc. for research and development of advanced industrial gas turbine technology. This investment from the TPC, to be paid back through royalties from Rolls-Royce Canada's energy unit, will contribute to a \$160 million increase in the company's R&amp;D spending. The investment will also make it possible, for both Canada and Rolls-Royce, to sustain a long-term mandate for the manufacturing of Trent industrial gas turbines that will be used for various applications such as energy production and gas pipeline compression.</p> <p><b>Rolls-Royce Deutschland Signs a Technical Assistance Agreement with Rolls-Royce Canada for BR 715 jet engines</b></p> <p>RESTON (VA), U.S.A., June 14, 1999 – Rolls-Royce Canada Limited and Rolls-Royce Deutschland have signed a 10-year agreement under which the Rolls-Royce facility in Montréal will provide complete repair and overhaul services for BR 715 jet engines made by Dahlewitz, a German-based manufacturer. The agreement designates the Rolls-Royce Canada facility as the primary North American repair and overhaul facility for the engines, which power the Boeing 717 aircraft.</p>
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## PROFILE OF THE MAJOR CORPORATIONS

**CMC Electronics**  
**(Formerly BAE System Canada and Marconi Canada)**

www.cmcelectronics.ca

Industry sector: Equipment Manufacturer – Design, manufacturing, integration and support for electronic and aircraft equipment

Ownership: Major shareholder – ONCAP L.P.

Products/Services World Wide	Design, manufacturing, integration and support for advanced technology electronic products, including: aircraft hardware, aircraft satellite communication antennas, specialized electronic components, military radios, space-borne electronic hardware, infrared cameras, Global positioning systems (GPS) – medium- and high-end and maritime electronic hardware.
Exclusive products developed in the Montréal region	<ul style="list-style-type: none"> <li>• Aerospace communications: CMA-2102 (SATCOM High-Gain Antenna Subsystems), CMA-2200 (Intermediate-Gain SATCOM Antennas), portfolio of Direct Visibility Tactical Radios.</li> <li>• Flight management systems</li> </ul>
Locations and employees in the Montréal region	Saint-Laurent: 1,070 employees
Annual budget for R&D in the Montréal region	28.5 million CDN for 1999-2000
Customer base	Air France, ALM 1997 Airline, American Airlines, AOM (France), American Army, Cogent Defence Systems (a Nortel Networks company), Continental Airlines, Gulf Air, Honeywell International, Hong Kong Dragon Airlines, Huneed Technologies, Saudi Arabian Airlines
Comments	In April 2001, ONCAP L.P. (a Canadian company) completed its acquisition of BAE Systems Canada (formerly Marconi Canada), which has subsequently done business under its new name of CMC Electronics.

## PROFILE OF THE MAJOR CORPORATIONS

### EMS Technologies Canada

www.ems-t.com

Industry Sector: Equipment Manufacturer – Design and manufacturing of communications and remote sensing products, as well as, advanced terrestrial communications systems.

Ownership: EMS Technologies, Inc. (U.S.A.) (formerly known as Electromagnetic Sciences, Inc.)

Stock Exchange (NASDAQ): ELMG

Products/Services World Wide	Development, design, manufacturing, assembling, integration, sub-system and satellite component trials, and new products for network satellites
Exclusive products developed in the Montréal region	<ul style="list-style-type: none"> <li>• Chosen by the Canadian Space Agency to develop the first phase of the Radarsat remote sensing satellite, a contract worth more than \$440 million</li> <li>• Participated in the completion of certain essential systems of the Radarsat-2; subcontracted by MacDonald Dettwiler &amp; Associates (British Columbia).</li> <li>• Designer and builder of the TT&amp;C Communications systems (antennas), audio and video systems for the International Space Station</li> <li>• Designer and builder of all digital control units (computers and control units) and integrator of all “hinges” for the Canadarm2</li> <li>• Designer and builder of the bi-directional connection system for the Internet via satellite DVB-RCS</li> </ul>
Locations and employees in the Montréal region	Sainte-Anne-de-Bellevue: more than 800 employees
Orders for the Montréal region	\$258 million CDN for 2000
Annual budget for R&D in the Montréal region	Approximately \$27 million for 2000
Customer base	Canadian Space Agency, Alcatel, Astrium, Boeing, CAST, ESA, Lockheed Martin, MacDonald Dettwiler, MD Robotics, NASA, SES, Telesat, TRW
Comments	In 1999, purchased the satellite product unit division of Spar Aerospace Space Systems, located in Sainte-Anne-de-Bellevue

## PROFILE OF THE MAJOR CORPORATIONS

Recent developments in the Montréal region

### **EMS Technologies Wins Contract to Supply Spares for Robotic Workstation**

MONTRÉAL (QC), Canada, September 22, 2000 – EMS Technologies has won a firm fixed price contract from MD Robotics in Brampton, Ontario, valued in excess of CDN\$4M to supply one flight Display & Control Panel (DCP) and one flight Control Electronics Unit (CEU) for the Robotic Workstation. The Robotic Workstation is the interface between the astronauts on board the International Space Station (ISS) and Canada's new generation robotics, the Mobile Servicing System. The DCP is the principal device that translates the commands received from the two hand controllers (operated by the astronauts). The CEU unit includes a central processing unit and a variety of digital and analog interface units, including video interfaces.

### **EMS Technologies, Amphitech International Sign Memorandum of Agreement To Develop First Commercial Radar Obstacle Awareness System**

MONTRÉAL (QC), Canada, July 25, 2000 – EMS Technologies and Amphitech International Inc., of Montréal, Canada, have signed a Memorandum of Agreement for the design, manufacture and test of a Ka-band radar antenna and gyro-stabilized platform sub-system for a new helicopter Obstacle Awareness System (OASys RADAR). Announced today at the Farborough International 2000 Aerospace Show, the system is the first commercial OASys RADAR system that permits helicopter pilots, flying at low altitude, to see obstacles as small as power transmission lines and towers from distances of up to two kilometres, even in the most difficult day and night weather conditions (fog, haze, smoke, snow and light rain). This innovative product significantly increases flight safety, particularly for helicopters used in emergency medical services, search and rescue, law enforcement, fire fighting, and civil inner-city shuttles.

## PROFILE OF THE MAJOR CORPORATIONS

### Héroux – Devtek

www.herouxdevtek.com

Industry Sector: Equipment manufacturer – Design, manufacturing and repair of landing gear, and the manufacturing of aircraft structural parts

Ownership: Gilles Labbé, President and Chief Executive Officer; America Capital CDPQ; The Municipal Retirees Organization of Ontario

Stock Exchange (TSE): HRX

Products/Services World Wide	<ul style="list-style-type: none"> <li>• Design, overhaul, manufacturing, repair and refurbishing of landing gear and jacks</li> <li>• Manufacturing of aircraft motor components, hydraulic actuators and hydraulic systems</li> <li>• Surface treatments and precision machine shop</li> </ul>
Locations and employees in the Montréal region	<ul style="list-style-type: none"> <li>• Longueuil (head office and plants, landing gear division): 430 employees</li> <li>• Laval (plant, landing gear division): 120 employees</li> </ul> <p>Total: 550 employees, 2 locations</p>
Customer Base	American Air Force, Bell Helicopter, Boeing, Bombardier, Certified Aircraft, GE Aircraft Engines, GE Power Systems, Goodrich, Lockheed Martin, American Marines, Northrop Grumman and Messier Dowty, Snecma
Comments	<ul style="list-style-type: none"> <li>• Héroux-Devtek derives 90% of its sales from outside Canada, mainly in the United-States.</li> <li>• Purchased the Metro Machining Corporation and CAT Industries for its Aero Structural Division: 100 employees</li> </ul>
Recent developments	<p><b>Technological Partnership: Canada Invests in a Third R&amp;D Project Supporting a Canadian-American Initiative in the Aerospace Sector</b></p> <p>LONGUEUIL (QC), Canada, September 15, 2000 – Technology Partnerships Canada (TPC) consents to a \$1.21 million refundable investment for the research and development of “high priority technology” for the aerospace industry. This investment from the TPC will allow Héroux-Devtek Inc. of Longueuil, Québec to participate in a joint project between Canada and the United-States that will scope out and debug a replacement solution for the hard chromium plating used in landing gear.</p>

## PROFILE OF THE MAJOR CORPORATIONS

### Honeywell Aerospace

www.honeywell.com

www.sac.honeywell.com

Industry Sector: Equipment Manufacturer – Motors

Ownership: Honeywell International

Stock Exchange (NYSE): HON

Products/Services World Wide	<p>Diversified technology and manufacturing company that offers some of the following products and services:</p> <ul style="list-style-type: none"> <li>• Aerospace products and services</li> <li>• Building, residential and industrial premises surveillance technology</li> <li>• Automotive products</li> <li>• Energy production systems</li> <li>• Electronic material</li> </ul> <p>Operates under the four following divisions: "Aerospace Solutions", "Automation and Asset Management", "Performance Materials" and "Power and Transportation Products".</p>
Exclusive products developed in the Montréal region	Design, marketing and manufacturing of advanced electronic equipment for the military and of products and services in the aerospace sector. These products include control systems and accessories for aircraft motors, thermal camera systems and night vision glasses. The services include repair, as well as after-sale service and product support.
Locations and employees in the Montréal region	Saint-Laurent: 410 employees
Orders for the Montréal region	\$71 million US
Client Base	BAE Systems Canada
Comments	Merger between AlliedSignal and Honeywell on December 1, 1999. Following this merger, AlliedSignal was renamed Honeywell International.

## PROFILE OF THE MAJOR CORPORATIONS

### Messier-Dowty

[www.messier-dowty.com](http://www.messier-dowty.com)

Industry Sector: Equipment Manufacturer – manufacturing of landing gear

Ownership: Member Company of the French group – SNECMA

Stock Exchange: Private

Products/Services World Wide	<ul style="list-style-type: none"><li>• Design, manufacturing and landing gear support.</li><li>• Manufacturing and assembling of major components for landing gear, primarily for the Airbus A318, A319, A320, A330, A340-600.</li></ul>
Locations and employees in the Montréal region	Mirabel: 220 employees
Customer base	Airbus
World market share and exports	<ul style="list-style-type: none"><li>• 40% of the world market for landing systems</li><li>• Serves 600 airline and military companies</li></ul>
Comments	Two plant expansions in 1997 and 1998.

## PROFILE OF THE MAJOR CORPORATIONS

### Lockheed Martin Canada

[www.lockheedmartin.com/canada](http://www.lockheedmartin.com/canada)

Industry Sector: Equipment Manufacturer – integration of electronic systems

Ownership: Lockheed Martin (USA)

Stock Exchange (NYSE): LMT

Products/Services World Wide	<ul style="list-style-type: none"> <li>• Integration and program management of complex electronic systems</li> <li>• Software: fire control systems, mission planning, instrument landing</li> <li>• Integration of flight deck systems</li> </ul> <p>Surveillance systems for radar reconnaissance (SSAR) which are on the Aurora CP-140 aircrafts of the Canadian Armed Forces</p>
Locations and employees in the Montréal region	Montréal: 200 employees
Comments	Training with EMS Technologies Canada, former division of Spar Aerospace in Sainte-Anne-de-Bellevue, and Radarsat International, a corporate space and technology partnership for channelling the development of the Remote Sensing Industry. This initiative allows Canada to remain the leader in the creation and distribution of Remote Sensing data.



**APPENDIX C**  
**CANADIAN AND INTERNATIONAL AEROSPACE**  
**ASSOCIATIONS AND ORGANIZATIONS**



## **GROUPS AND ASSOCIATIONS**

- ◆ Aerospace Industries Association of Canada (AIAC)  
60 Queen Street, Suite 1200  
Ottawa, Ontario K1P 5Y7  
Telephone: (613) 232-4297  
Fax: (613) 232-1142  
E-mail: [info@aiac.ca](mailto:info@aiac.ca)  
Internet site: [www.aiac.ca](http://www.aiac.ca)
  
- ◆ International Air Transport Association (IATA)  
800 Place Victoria, P.O. Box 113  
Montréal, Québec H4Z 1M1  
Telephone: (514) 874-0202  
Fax: (514) 874-9632  
Internet site: [www.iata.org](http://www.iata.org)
  
- ◆ Association québécoise de l'aérospatiale (AQA)  
5300, rue Chauveau  
Montréal, Québec H1N 3V7  
Telephone: (514) 596-2388  
Fax: (514) 596-3388  
E-mail: [info@aq.ca](mailto:info@aq.ca)  
Internet site: [www.aqa.ca](http://www.aqa.ca)
  
- ◆ Centre d'adaptation de la main-d'oeuvre aérospatiale au Québec (CAMAQ)  
5300, rue Chauveau  
Montréal, Québec H1N 3V7  
Telephone: 514-596-3311  
Fax: 514-596-3388  
E-mail: [info@camaq.org](mailto:info@camaq.org)  
Internet site: [www.camaq.org](http://www.camaq.org)
  
- ◆ Conseil international de formation aérospatiale (CIFA)  
(École nationale d'aérotechnique)  
5555, Place de la Savane  
Saint-Hubert, Québec J3Y 5K2  
Telephone: (450) 678-3560  
Fax: (450) 678-3240  
Internet site: [www.collegeem.qc.ca/ena/cifa/cifmenu.htm](http://www.collegeem.qc.ca/ena/cifa/cifmenu.htm)

## CANADIAN AND INTERNATIONAL AEROSPACE ASSOCIATIONS AND ORGANIZATIONS

- ◆ International Federation of Air Traffic Controllers Associations (IFATCA)  
1255 University Street, Suite 408  
Montréal, Québec H3B 3B6  
Telephone: (514) 866-7040  
Fax: (514) 666-7612
- ◆ International Civil Aviation Organization (ICAO)  
999 University Street  
Montréal, Québec H3C 5H7  
Telephone: (514) 954-8219  
Fax: (514) 954-6077  
E-mail: [icaohq@icao.int](mailto:icaohq@icao.int)  
Internet site: [www.icao.int](http://www.icao.int)
- ◆ Airline Telecommunications and Information Services (SITA)  
770 Sherbrooke Street West  
Suite 2100  
Montréal, Québec H3A 1G1  
Telephone: (514) 844-4343  
Fax: (514) 982-3590  
E-mail: [info@sita.int](mailto:info@sita.int)  
Internet site: [www.sita.int](http://www.sita.int)

## RESEARCH CENTRES

- ◆ Institute of Air and Space Law  
Affiliation: McGill University  
Location: Montréal  
Resources: 45 people  
Expertise: This institute is mainly interested in higher-level law studies (Masters & Doctorate) and research with regard to aerial and spatial law.  
Internet site: [www.iasl.mcgill.ca](http://www.iasl.mcgill.ca)
- ◆ Aerospace Medical Research Unit  
Affiliation: McGill University  
Location: Montréal  
Resources: 9 people  
Expertise: The members of this group concentrate on neuropsychological research, most of which deals with the performance of human beings in an aerospace environment and adapting to weightlessness, postural control, and buccal-ocular systems.  
Internet site: <http://landru.medcor.mcgill.ca/amru.html>

**CANADIAN AND INTERNATIONAL AEROSPACE  
ASSOCIATIONS AND ORGANIZATIONS**

- ◆ Centre for Research on Transportation (CRT)  
Université de Montréal  
Pavillon André-Aisenstadt  
2920, Chemin de la Tour, Suite 3520  
Montréal, Québec H3T 1J4  
Telephone: (514) 343-7575  
Fax: (514) 343-7121  
E-mail: [crt@crt.umontreal.ca](mailto:crt@crt.umontreal.ca)  
Internet site: [www.crt.umontreal.ca](http://www.crt.umontreal.ca).CRT
  - Affiliations: Université de Montréal (École des Hautes Études Commerciales and École Polytechnique)
  - Industrial Partners: Air Canada, Air France
  - Resources: 129 people
  - Expertise: This centre is interested in all methods of transportation. It specializes in design and development of quantitative models and methods, computer systems, as well as in the study of economic policies and issues concerning transport safety regulations.

**OTHERS**

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Fax: (613) 562-1784  
E-mail: [info@spacejobs.com](mailto:info@spacejobs.com)  
Internet site: [www.spacejobs.com](http://www.spacejobs.com)