CANADA'S EXPORT STRATEGY

The International Trade Business Plan

1995/96

An Integrated Plan for Trade, Investment and Technology Development

The International Trade Business Plan is made up of an **Overview** highlighting Canada's international business development priorities, and a series of **Industry Sector Strategies**, which include lists of planned international activities. The following documents are available:

Overview

1. Advanced Manufacturing Technologies
2. Agriculture and Food Products
3. Aircraft and Parts
4. Automotive
5. Biotechnologies
6. Business, Professional and Educational Services
7. Chemicals, Plastics and Advanced Materials
8. Construction Products
9. Consumer Products
   - Apparel and Fur
   - Textiles
   - Footwear
   - Sporting Goods (including recreational watercraft)
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   - Residential Furniture
   - Business and Institutional Furniture
10. Cultural Industries
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12. Environmental Equipment and Services
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16. Medical and Health-Care Products and Services
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17. Minerals and Metals
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19. Power Equipment
20. Primary/Secondary Industrial Machinery
    - Mining, Forestry, Pulp and Paper
    - Agricultural Technology, Machinery and Equipment
    - Ocean and Marine Shipboard Technology
21. Rail and Bus Equipment
22. Space
23. Tourism

For information on how to receive the Overview, or additional Industry Sector Strategies, please call: **1-800-267-8376**

All monetary figures in this document are expressed in Canadian dollars unless otherwise indicated.

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Space

The space industry consists of companies and organizations that provide products, including hardware and software, that generally form part of larger space systems, such as satellites, space vehicles, ground stations for communicating information and/or controlling space assets, and launch vehicles, including expendable and reusable rockets and space planes. It also includes a range of service providers (such as geomatics and telecommunications firms) whose business activities depend on the use of space systems.

International Environment

In 1993, the world space industry activity was estimated at US$43 billion, dropping significantly (from US$55 billion in 1992) since the collapse of the Soviet Union. It is still highly concentrated in the United States (75 percent), Europe (14 percent) and Japan (5 percent).

Government defence and civil programs account for close to 90 percent of the global market. While the defence portion is difficult to estimate, it has decreased in recent years and is now considerably less than civil spending. Since the collapse of the Soviet Union, military spending on space has dropped dramatically; by some 30 percent in the United States and by over 90 percent in the former Soviet Union (FSU). For national security reasons, most governments try to procure space equipment from domestic firms, and use their space programs as vehicles for national industrial and scientific development.

Surveillance, command, control and communications via satellite have continued to rise in importance since the early 1980s, especially since the Gulf War. On the other hand, with the end of the Cold War, military spending in general has declined in many markets. As a result of rationalization, many marginally profitable firms are being taken over by larger, more diversified firms and several major mergers are anticipated (e.g. Lockheed/Martin Marieta). Defence space firms are looking to the civilian space arena and to strategic alliances to reduce research and development (R&D) costs and improve market access. While the FSU was not an active participant in the international space market, Russia has the interest and potential to become a major player.

The high cost of R&D has also contributed to the internationalization of major space programs, characterized by the establishment of new and stronger links between space companies in different markets or trading blocs. For example, the European Space Agency (ESA) is a key vehicle for co-operation in space projects for its 14 European members, and Canada, which has a unique relationship to the ESA as a closely co-operating state.

The U.S.-led International Space Station (ISS) is currently a co-operative effort among the ESA, Japan and Canada, and negotiations are under way to bring Russia into the partnership.

The use of space for commercial purposes is growing and evolving. Space-based communications comprise the most commercial space activity, relying on government support primarily for R&D and advanced technology development. Although there is a commercial market for remotely sensed data and the reception and processing equipment needed to acquire it, remote sensing does not yet generate sufficient returns to cover the cost of remote-sensing satellites, which are usually procured by governments.

Communications

Satellite communications are driven by the rapidly growing $600-billion annual demand for communications services, which include telephony, data transmission, cable and broadcast services. In 1992, commercial satellite systems operators and transponder brokers earned approximately

$4.4 billion from sales of satellite-based communications services, 34 percent of which was in the United States.

The world civilian market for all types of satellite communications (satcom) space-based equipment is forecast at over $1.5 billion annually, declining slightly in the late 1990s, for an estimated total market (1994-2004) of approximately $16 billion. Excluding Russia, for which accurate numbers are not available, more than 80 geostationary communications satellites (comsats) are expected to be launched between June 1994 and the year 2000, representing a total market of approximately $8 billion. Roughly one third of this market remains to be captured under firm contracts. The U.S. market is expected to shrink to less than 20 percent of this, primarily in favour of Asia-Pacific markets. The Asia-Pacific region should dominate the rest of the world market outside of the U.S. and Europe, and is expected to represent 30 percent of the world demand between now and 2004.

The world annual civilian market for satcom ground-segment equipment, currently estimated at $3.35 billion, is expected to grow to over $5 billion by 1996 at an annual compound rate of 7 percent. This represents a total estimated world market of over $70 billion (1992-2004), or close to five times the space-based communications (satellite) equipment markets. The demand for TV receive only (TVRO) equipment represents the largest portion of the ground-segment market, with an additional 3 million to 5 million installations (over $4 billion) expected to be purchased in the next two years.

The military satellite communications (milsatcom) space and ground-segment market is approximately equal in size, but is heavily protected and dominated by the United States, with $1.3 billion budgeted for 1994. France's Syracuse on Telecom and the British Skynet 4 are the only other known milsatcom systems scheduled to be launched before the turn of the century. In addition, several Western countries are pursuing the development of other milsatcom systems for later launches, under co-operative international arrangements such as EUMILSAT, INMILSAT, and BIMILSAT.

Positive trends include rising demand for:

- space-based, mobile, personal communications and direct broadcast or direct-to-home satellite communications, including TVROs;
- Very Small Aperture Terminal (VSAT) networks in North America and in countries where the terrestrial telephony infrastructure does not exist;
- global coverage multisatellite networks such as Hughes' Spaceway.

Both the civilian and military markets for space segment equipment are dominated by the United States. As in the past decade, two thirds of the world's geostationary satellite systems (excluding those of the FSU) are expected to be supplied by three U.S. companies: Hughes, Lockheed/Martin and Space Systems Loral. Canada supplies less than 2 percent of the world market for civilian geostationary satellite systems.

Remote Sensing

Greater concern for the environment, and the need to obtain information over large areas in a cost-effective way, will strengthen the already rapid growth of geographic information. Geographic information systems (GIS), which combine a variety of data with maps and imagery, provide the bulk of such information products. The GIS market is estimated to be $13 billion per year between 1996-2000. Satellite-based remote sensing is increasingly able to service this market; in particular, the world market for value-added goods and services, based on satellite remote sensing, is estimated to be about $9 billion over the 1995-2000 period. Strong demand for geographic information systems and their products is in turn driving the demand for the platforms from which raw data are acquired.

Canada dominates the world market for a particular part of this market: satellite remote-sensing reception and processing systems.

The space segment of remote sensing consists of meteorological satellites, which had a fairly constant market of about $600 million per year between 1986 and 1992, and earth observation satellites, which had a market growth of $325 million to $800 million per year in the same period. Although space budgets are under pressure around the world, the importance of satellite data for understanding environmental problems continues to shield this portion of national budgets from significant cuts.

Even if the recent rapid growth of remote-sensing satellite systems slows, the stage has been set for considerable future activity in the ground segment and in the user community (hardware, software, processed data, education, consulting). The market will be strongest in equipment to receive data and in activities that add value to the data, such as services and equipment that convert data to usable information.

Space Infrastructure and Robotics

The International Space Station (ISS), led by the United States and involving Canada, Japan and the ESA, is an important infrastructural element for space science. It is closely controlled by participating governments through their space agencies, for reasons of national prestige. There are two levels of "competition" for space station work: direct contracts to national agencies, and contracts to prime contractors or their subcontractors. It is extremely difficult for Canadian companies to become direct contractors to foreign national agencies in the absence of a directly associated Canadian government agreement. Canada's share in the multibillion-dollar ISS program is about 2.5 percent, primarily for the construction of the Mobile Servicing System (MSS). Russia has been invited to become a partner in the ISS, and negotiations are under way; an agreement is expected to be signed early in 1995.

By virtue of an intergovernmental agreement, the primary ISS market for each partner is essentially its own contribution to the project. There are a number of other identifiable markets, including maintenance and further enhancements of the existing MSS, spinoff opportunities into other space robotics markets, and diffusion of technology into other markets, especially the terrestrial market.

Terrestrial market opportunities are substantial. Nuclear waste handling has been specifically identified as a near-term, $20-billion market, with more to follow. Other terrestrial markets are also developing, especially in the resource-harvesting area, where hazardous or difficult conditions attract the use of robotics. While identification of these markets is softer, they are likely to develop over the next decade and should be worth hundreds of millions of dollars per year.

Space market opportunities will also be great, and will be developed as we prepare to explore and exploit the solar system further. However, these markets will only become apparent well past the turn of the century.

Space Science

A measure of market size for space science is the amount that governments are prepared to spend in support of such activities. Space science is driven by scientists' continuing need for broad-based knowledge, often unfettered by near-term economic considerations. Industrial development and commercial interests also need knowledge derived from space science. However, revenue-generating commercial activities resulting from space science programs take longer to develop, and are more difficult to predict and compute than those generated by the other major space segments. Annual spending on space science by the United States, the ESA and Japan runs at approximately $3 billion, with Canada spending about $25 million per year. Programs are invariably sponsored by governments, and market opportunities exist for the provision of specialized equipment.

Canadian Position

In 1993, Canada's space industry employed an estimated 4000 people and generated sales of over $650 million. Seven companies had space-related annual revenues in excess of $15 million, and accounted for over 85 percent of total industry sales. Spar Aerospace represents over half of total industry sales and employment. The majority of companies in the space industry are Canadian-owned.

The Canadian space industry is comparable to that of most other industrialized countries in terms of per capita sales and employment. However, it exports a larger proportion of its total production than any other major space-faring country. Exports have grown from about $10 million in 1977 (17 percent of sales) to an estimated $270 million in 1993 (40 percent of sales).

Canadian companies focus on technology and market niches, with specialized areas of expertise. Examples include:

- COM DEV's multiplexers/switches;
- SED/Calian's telemetry, tracking and control equipment;
- MPR Teltech's ground station network technology;
- MPB Technologies' expertise and unique capabilities in space photonics;
- Canadian Marconi Company's and CAL Corporation's mobile satellite terminals;
- MacDonald, Dettwiler and Associates' (MDA) earth-receiving facilities;
- Intera's aerial radar mapping;
- Telesat's engineering, spacecraft procurement management and launch operations expertise;
- CAE's space simulation capabilities.

As a result of their niche strategies, many Canadian companies dominate the world market for the products or services they provide.

Spar Aerospace, as the prime contractor for the Canadian space program, has developed systems integration skills and payload capability. As well, Spar produces and exports satellite subsystems such as antennas and electronic systems. It is also pursuing new opportunities in small satellites and remote-sensing instruments.

Over 150 Canadian companies currently sell some space-related products and/or services. More of these companies, particularly in the remote-sensing, value-added area, are expected to enter the international market.

In communications, the challenge for the industry is how to exploit the space and ground segments of fixed satellite-based, overseas telephony markets, and how to market both hardware (space and ground) and service segments of the new global mobile networks. Canada's lead role in developing the Mobile Communications Satellite (MSAT) has positioned industry to pursue the rapidly growing market in mobile satellite communications products and services.

Market opportunities in the remote-sensing area are related to ground equipment, software and value-added services for both radar and optical data. Canadian firms are already established world leaders in ground-station and processing-system design. In fact, MDA has provided systems for 80 percent of the installed base of remote-sensing reception facilities worldwide. In the area of value-added products and services, Canadian companies also play a leading role, currently supplying about 10 percent of the world market, with sales of approximately $85 million in 1993. Sales are expected to increase to $240 million by 1998.

Although all remote-sensing data is currently provided by satellites belonging to other countries, Canada will operate its own remote-sensing satellite in 1995, when RADARSAT is launched. RADARSAT data will be internationally marketed exclusively by RADARSAT International of Richmond, B.C., which is negotiating reception agreements with ground-station operators, usually government-funded national facilities. This will be complemented by a concerted effort to promote global awareness and sales of RADARSAT data and related Canadian goods and services. Canada is

already a world leader in the reception, analysis and interpretation of radar data, and RADARSAT will be the world's first operational satellite providing radar remote-sensing data.

Canadian expertise in natural-resource management, environmental monitoring, mapping and remote sensing can be a valuable tool to increase sales of related products and services. The world market for value-added goods and services associated with satellite remote sensing is estimated to be about $1.8 billion annually, and is growing at 10 percent to 15 percent per year. Canadian value-added companies that can demonstrate their superiority in using radar data and integrating it with other sources of remote-sensing data will be poised to capture an increasing share of the market for geographically based information, which is used worldwide for natural-resource and environmental management.

Export opportunities for Canadian companies on the ISS are limited to subcontracts to foreign companies. In space robotics, which is closely associated with Canadian involvement in the ISS, Canada has developed some unique capabilities. Markets are emerging for the handling of contaminated waste, which requires specialized hardware and software systems. While space robotics hardware is not appropriate for terrestrial applications, the merging of space software with existing terrestrial hardware could place Canada in an advantageous position. The United States represents a near-term market (some $20 billion over 20 years), but similar requirements will eventually emerge in Eastern Europe. Although many opportunities will likely emerge in space for space robotics, such as satellite servicing, market size is unquantifiable and at least 10 years away.

National preferences dominate space science activities. Canadian government participation in foreign programs is usually required to obtain work for Canadian companies. Bristol Aerospace is an exception, exporting 95 percent of its sounding rockets for space science experiments, mainly to the United States.

The small size of the domestic market tends to place the Canadian space industry at a disadvantage in marketing high-volume products where cost is the critical factor. Nonetheless, some Canadian space firms are world competitors. The biggest obstacle to Canada's continuing success in space-hardware manufacturing is a shortage of capital to undertake large, multibillion-dollar activities, such as the new global mobile satcom projects, coupled with the corresponding large size of the participating companies.

Canadian firms have options in marketing in this competitive environment. Increasingly, space companies worldwide are using strategic alliances, teaming arrangements and joint ventures to gain access to markets, technologies and the financial resources required to undertake large projects. Canadian companies should consider wider use of such arrangements to compete in a world space market dominated by a few giants.

Canada's strengths lie in system and component design and integration; knowledge-intensive as opposed to mass-produced hardware; and complete information and/or communications solutions.

Critical factors for continued export success include:

- the formation of international alliances/ partnerships (often requiring government-to-government agreements);
- innovative, government-supported export financing;
- stable, continuing government investment in the development of emerging new technologies.

Strategic Direction

Industry-government consultations have determined that key marketing priorities will include:

- satellite communications, particularly prepositioning for the developing mobile

market, while exploiting fixed satellite-based, overseas telephony markets;

- remote sensing, specifically co-ordinating Canadian efforts to sell RADARSAT data, image-processing systems and software, and value-added products and services;
- ground-segment equipment, in both communications and remote sensing;
- small satellites, assessment of the market for small satellites, suggested as a possible major growth area in the coming decade;
- space robotics as an enabling technology for widespread application to environmental clean-up and hazardous-waste handling, defence, medicine and education.

The Interdepartmental Working Group on International Trade in Space Products was created in 1993 to provide greater co-ordination of export-marketing activities among federal government departments, with provincial governments, and between government and industry. All interested federal departments and agencies and Canadian space companies are encouraged to participate in the Working Group. Provincial interests are represented by the Atlantic Canada Opportunities Agency (ACOA), the Federal Office of Regional Development-Quebec (FORDQ), the Western Diversification Office (WDO), and the Ontario government.

Based on their estimates of market growth, Canadian prospects, access considerations and market size, a group of the largest Canadian space companies suggested a market emphasis as follows: The industry group felt that the United States, Europe and Japan, as the largest, most diverse, and most technologically advanced markets, continue to be of primary importance. Additional effort beyond historical levels, is however unnecessary at this juncture. Three new growth areas were identified as requiring extra marketing effort and government attention: China, Russia/Eastern Europe, and the Pacific Rim countries (the Republic of Korea, Thailand, Singapore, Taiwan, Indonesia, Malaysia, Viet Nam and Hong Kong). Other regions of lesser, though important, market interest are Mexico and Latin America, and the Middle East. Regardless, expanded involvement with national space authorities in all countries remains a priority.

A better comprehension of the United States as both the dominant supplier and market for space products and services is an important component in the normal development of a space-market strategy for Canada. Development of such a market strategy is a priority for the Canadian space community, in particular the Working Group, for the next year. As a first step in the development of this strategy, the Department of Foreign Affairs and International Trade (DFAIT) is funding a study of the U.S. space market.

Government activities dominate space markets worldwide. This suggests a strong role for the Canadian government in assisting industry with market development and trade promotion, in particular with foreign governments. Broad-based trade promotion activities abroad can be carried out under a "Team Canada" umbrella, with the Canadian Space Agency (CSA) as team captain, supported by other departments such as DFAIT and Industry Canada (IC).

To maximize the impact of limited public and private resources, Canadian involvement in trade fairs and missions in the space sector will be focussed and organized with careful selection of a small number of high-profile promotion activities directed at specific markets with specific objectives. Small- and medium-sized enterprises (SMEs) will be consulted and encouraged to become involved. The Canadian Space Industry Capabilities Guide will be updated as an information source and a promotional tool.

In addition to these broad-based promotion initiatives, the Government, in particular the CSA, IC and DFAIT, along with the DFAIT network of trade missions abroad, can provide a valuable service to individual firms in their pursuit of specific overseas contracts. The CSA, for example, through its co-operation with other

space agencies, has access to valuable market intelligence as well as key decision makers in the international government space community.

The Working Group will ensure that detailed information is provided to the Canadian space community regarding the services provided by the Government, such as international contracting assistance through the Canadian Commercial Corporation (CCC) and export financing through the Export Development Corporation (EDC).

A key priority of the Working Group for the coming year will be the identification, collection and dissemination of intelligence about priority markets. This includes broad-based but specific activities such as:

- production of information on national space and technology development programs;
- publication of a list of key decision-making contacts in national space and space-related agencies, public and private space firms and research laboratories;
- identification of sources of general or specific market research and intelligence on target countries.

In addition to the collection and dissemination of general intelligence, mechanisms must be improved for accessing and delivering more detailed, comprehensive and timely intelligence required by space firms for specific projects or procurements.

Another key priority activity starting next year will involve a series of public and private initiatives in support of space-based remote-sensing market development. In the wake of the 1995 launch of RADARSAT, RADARSAT International will undertake a major worldwide promotional effort to sell data and sign reception agreements. Canadian space- and ground-based RADARSAT suppliers will want to use the profile of the launch to promote their products. Canadian value-added companies will be encouraged to participate in the market-promotion and market-development activities to gain early advantage in overseas radar-based remote-sensing markets. RADARSAT is an important government initiative, and its operational and commercial success will be a key theme over the next few years.

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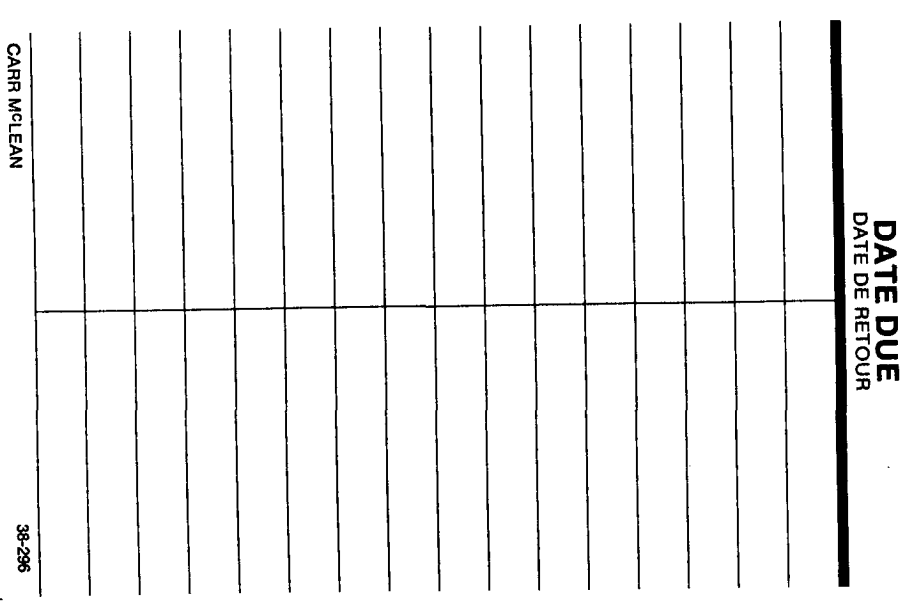
Space

Activity	Date	Location	Dept.	Contact
Asia-Pacific South				
Asian Aerospace '96: Info Booth	Feb-96	Singapore	DFAIT	613-996-5824
East Asia				
Outgoing Industry Mission	Jul-95	China	CSA	514-926-4364
Multiple Markets				
International Mobile Satcom Conference & Exposition	Jun-95	Ottawa	IC	613-954-3977
Airshow Canada	09-Aug-95	Abbotsford	IC	613-954-3748
Radarsat Promotional Tour	Oct-95	Various	IC	613-954-3166
United States				
U.S. Space Market Newsletter	Apr-95	Washington	DFAIT	613-944-9481
U.S. Space Market Study	Jun-95	Washington	DFAIT	613-944-9481
Military Satellite Mission	Oct-95	Los Angeles	IC	613-952-3977
Western Europe				
Space Industry Mission	May-95	Canada	CSA	514-926-4364
Paris Air Show: National Stand	Jun-95	Paris	DFAIT	613-996-3607
Industry Mission from Italy	Aug-95	Canada	DFAIT	613-995-9766
World Telecommunications Exhibition - National Stand	Oct-95	Geneva	DFAIT	613-995-6435



Note: Dates and locations are subject to change.

Acronyms and Initialisms Used in The International Trade Business Plan

(This list does not include sector-specific references)

ACOA	Atlantic Canada Opportunities Agency
AG Can	Agriculture and Agri-Food Canada
ASEAN	Association of Southeast Asian Nations
BBS	electronic bulletin board system
BOSS	Business Opportunities Sourcing System
CCC	Canadian Commercial Corporation
CIDA	Canadian International Development Agency
CIS	Commonwealth of Independent States
CSA	Canadian Standards Association
DFAIT	Department of Foreign Affairs and International Trade
DFO	Department of Fisheries and Oceans
DND	Department of National Defence
EC	Environment Canada
EDC	Export Development Corporation
EU	European Union
FITT	Forum for International Trade Training
FORDQ	Federal Office of Regional Development - Quebec
FSU	former Soviet Union
FTA	Canada-U.S. Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GNP	gross national product
HRDC	Human Resources Development Canada
IC	Industry Canada
IDRC	International Development Research Centre
IFI	international financial institution
ISO	International Standards Organization
ITBP	International Trade Business Plan
ITC	International Trade Centre
MAPAQ	Ministry of Agriculture, Fisheries and Food of Quebec
MDB	multilateral development bank
NAFTA	North American Free Trade Agreement
NATO	North Atlantic Treaty Organization
NRC	National Research Council
NRCan	Natural Resources Canada
NRCan-CFS	Natural Resources Canada - Canadian Forest Service
OECD	Organization for Economic Co-operation and Development
PEMD	Program for Export Marketing Development
R&D	research and development
SMEs	small- and medium-sized enterprises
UNEP	United Nations Environmental Program
WED	Western Economic Diversification
WTO	World Trade Organization