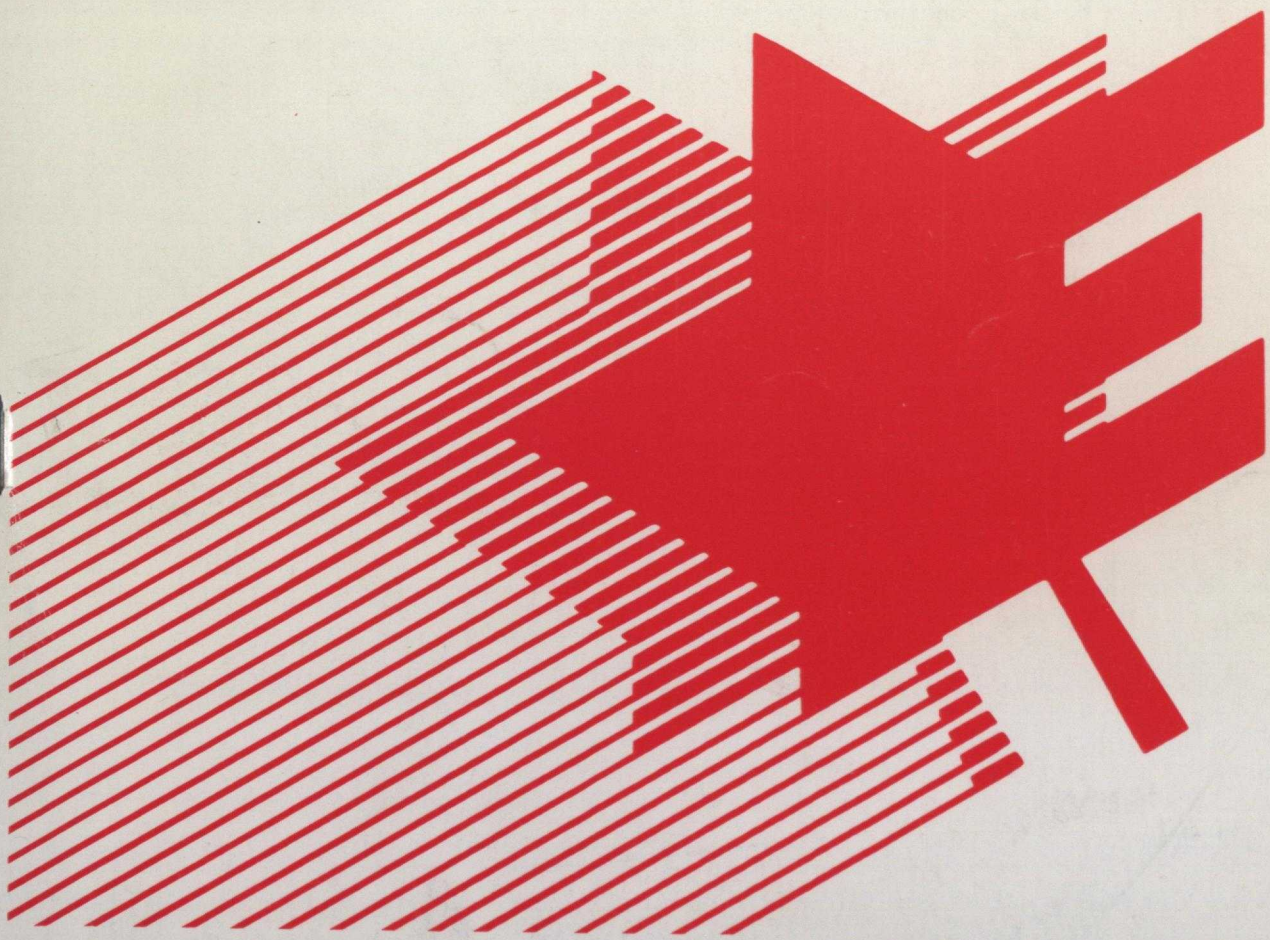
HiTEC '93



External Affairs and International Trade Canada

Affaires extérieures et Commerce extérieur Canada

Canada

HITEC '93

PROFILE BOOK

International Marketing Bureau

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ALGERIA

OVERVIEW

Algeria is undergoing a difficult transition from a managed economy, to a 'new' free market economy. A short term debt burden, as well as social and political unrest, makes the task of economic reform even more daunting to the government. A two year period of austerity has been introduced including import restrictions on a great many products, mostly those considered as luxury items.

These new restrictions have potentially serious implications for Canadian exporters of high tech equipment and services. In general, all imports of electronic equipment for mass consumption, such as personal computers for home use, or home entertainment equipment, are currently forbidden. In addition, all contracts exceeding U.S. $100,000 in value are subject to review by an ad hoc committee made up of cabinet ministers and the Prime Minister, which only meets every few months.

The market is also hampered by a lack of hard currency. As in most other sectors in Algeria, successful exporters must bring with them a financing package in order to have any chance of success. The Export Development Corporation (EDC) is currently negotiating a line of credit in excess of $100 million with the Banque Algérienne de Développement in order to facilitate export sales.

Despite these and other obstacles, Algeria remains a market with a great deal of potential. The current economic and political problems facing the country will make it a difficult country with which to do business, but those firms with the competence and the patience to pursue the market should continue to do well. Canadian companies enjoy a good reputation in Algeria, and Canadian technology is sought after. Our trading relationship with Algeria is such that Algeria has been one of our most important trading partners in the Arab world, with 1991 exports of Cdn $238 million.

Not all of the sub-sectors which are represented at HiTEC are viable sectors in Algeria. The primary sub-sectors of importance are:

TRANSPORTATION

Improving the transportation infrastructure of Algeria remains a government priority. The main priorities will be rail, urban transit, aerospace and port improvement. The government acknowledges that 1993-1994 will be difficult times in Algeria, with security concerns predominating. Economic development will assist the government in dealing with the social problems at the root of the current unrest. The next two years will see reduced spending as the government tries to reorganize and meet its debt obligations, but the sector will remain important to Canada.

Canada is a well respected partner in the Algerian transport sector, due in part to the similar problems facing the two countries, such as long distances and harsh, diverse climates. Canadian success at establishing such an advanced transportation network is admired by the Algerian industry. In the past, Canadian firms have provided aircraft overhaul services, locomotives, helicopters, trucks, and many other products and services.

The Algiers Subway project has been under discussion for a long time now. The Algerian government continues to insist that it will go ahead with the project, and are seeking foreign partners and foreign capital to proceed. This project will take a long time to come to fruition, if it ever does, but the enormous potential has kept several Canadian firms interested.

Financing, technology transfer and investment will remain very important factors in this sector. Training and improvement of existing infrastructure are among the top priorities and Canadian companies should expect to include such proposals in any contract negotiation. The Algerian government seeks to improve its own ability to produce necessary products and services and in the long term to reduce dependence on foreign technology and foreign products.

TELECOMMUNICATIONS

Many opportunities exist in the telecom sector in Algeria. Telecommunications hardware and software, as well as consulting services are among the more active sub-sectors. The Algerian PTT is planning to vastly expand its telecommunications network, with new public switching contracts expected to involve tens of thousands of new lines a year for the next five years. As well, areas such as spectrum management are being discussed by the PTT.

Northern Telecom has a local office and dominates the private switching market. Attempts are being made to enhance cooperation between the Algerian PTT and the Canadian Department of Communications (DOC) through visits and technical exchanges.

Given the vastness of the country and the sparseness of the population in the south, rural telephony is another area of interest to the Algerian government. HF systems and all of the related equipment will be needed to extend telecom services across the Sahara and to improve existing communications.

The Ministry of the Interior makes extensive use of microwave communications, particularly in the security services and this equipment is constantly being upgraded. Motorola and Siemens are the two primary suppliers of this type of equipment. The Algerian government also hopes to advance with its program of fibre optic installation and hopes to have approximately 2,000 kilometres of fibre optic lines laid by 1994.

Naturally, the Algerian program is quite ambitious and unlikely to proceed as planned due to a lack of financing. The government's priorities are the restoration of public order and an improvement of the health and housing situations. Despite this, telecommunications remains an important sector for the government, and Canadian firms would do well to keep Algeria in mind.

AEROSPACE

Canadian firms have been active in the aerospace sector in Algeria, selling products and services which range from helicopters to engine overhaul services. The government hopes to open more of its airports to international traffic and this will entail a need for improvements in infrastructure at those facilities.

The Algerian government has expressed an interest in updating radar systems, and in improving meteorological services through an introduction of satellite technologies. In addition, the potential exists to upgrade the major airports with Microwave Landing Systems, although this will probably be a long time in coming.

The national carrier, Air Algerie, is building a large maintenance base in Algiers which will require, upon completion, electronic equipment suitable for the maintenance of their fleet. Lab equipment and simulators have been mentioned as possible future purchases.

As with most other sectors, business in the aerospace market is restricted by financing. Grand schemes like the upgrading of rural airports will not likely go forward in the short term, but given the long lead time on such projects, Canadian companies should consider the long term possibilities.

DEFENCE AND SECURITY

The Algerian military approaches the embassy from time to time, interested in various technologies (for example: night vision equipment). These are generally 'shopping' requests and there are few solid projects at the moment. Given that the vast majority of the military's existing hardware is Soviet supplied, there are the obvious problems of compatibility.

There has been discussion recently of the possibility of purchasing new high tech security equipment for banks. Most Algerian banks do not have sophisticated security equipment and along with other aspects of bank reform, it has been suggested that the installation of such equipment as cameras and other similar measures may be a logical next step.

EGYPT

While not blessed like many of its North African and Gulf State neighbours with an over abundance of oil and therefore wealth, Egypt should nevertheless not be overlooked by Canadian companies looking to expand to new export markets.

Egypt has the largest population (55 million people) and second largest economy (after KSA) in the Middle East. Its total imports of US$ 13 billion make it one of the biggest markets in the total region. Additionally, its geographical location as the gateway to Africa and the Middle East contribute to its position as a logical stepping stone into that region.

Egypt's major imports in 1991 were transportation equipment, livestock, chemicals, wood and paper, and foodstuffs including cereals. Its major suppliers were the United States, Germany, Italy, France and Japan.

While Egypt's past debt problems temporarily make it a less than desirable risk for new financing by most private and Government lending institutions, one should not overlook the fact that it currently receives about US$ 4 billion in overall external assistance from foreign donors. Some US$ 2 billion of this comes from the USA including US$ 1.3 billion in foreign military sales credits. In addition to aid from bilateral donors, including Canada, institutions such as the World Bank, the Arab Fund for Economic and Social Development and the African Development Bank, just to name a few, extend various grants and soft loans to Egypt to undertake a vast gamut of projects of various types throughout the country.

The Egyptian private sector is increasingly active and imaginative and in 1991 managed to find the means to finance more then 35% of the total US$ 13 billion worth of imports. Recent Government initiatives aimed at liberalizing the financial market, including the establishment of a single exchange rate and the introduction of Treasury Bills, coupled with positive reversals in the country's balance of payments position and the budget deficit are providing some degree of encouragement to this private sector. The Government's plans to privatize numerous parastatals and public sector companies will offer some selective opportunities for private sector investment and may result in an active search to find foreign joint venture partners able to assist in the process of turning these concerns around.

Egypt's major exports in 1991 included cotton, petroleum, fruits and vegetables. The renewed calm in the area following the end of the Gulf crisis has seen a significant increase in Egypt's tourism receipts, its revenue from shipping in the Suez Canal and remittances from the numerous Egyptians who work or live abroad, particularly in the Persian Gulf States. Egypt's current account registered a surplus of US$ 1.4 billion in 1991, a dramatic reversal from a US$ 634 million deficit in 1990.

While existing Canadian exports total only some US$ 100 million, or less than 1% of the Egyptian import market, there is certainly plenty of room for Canadian penetration. With new developments, albeit selective, and upgrades in numerous sectors of Egypt's infrastructure, there are numerous niches to be found where Canadians can be successful. Indeed recent Canadian successes in such diverse areas as pollution control systems, butter sales, information and telecommunications systems development, cargo inspection services, and coal sales, point to Canada's ability to compete and compete well in the Egyptian market place. Numerous Canadian companies are appointing agents in Egypt, or establishing regional offices here to target both the domestic market and the surrounding markets of Africa, North Africa and the Middle East. Not only is this one of the easier markets to sell to, it is one of the easiest to comprehend. Egypt's commercial and political ties with other states coupled with its cheap and bountiful labour make it an ideal partner for joint ventures into numerous third markets. The Canada Arab Business Council (CABC) has long recognized this potential for strategic alliances with Egyptian partners and indeed has a formalized relationship with the Egyptian Businessmen's Association in order to foster and facilitate the marrying of its members and their strengths with Egyptian companies and their strengths.

There are as one can see or discover numerous opportunities in the Egyptian market for Canadian companies. It is our view that if one analyzes the various Egyptian government and private sector priorities and needs, and correspondingly takes into consideration Canadian strengths, that certain sectors stand out as offering perhaps some higher degree of potential opportunity. In this regard the post would list these sectors as follows:

1) energy, particularly electrical and to a lesser immediate extent, nuclear,
2) oil and gas equipment and services, including training,
3) environmental equipment and services,
4) agriculture and food stuffs.

The Power Generation and Transmission Equipment and Services Sector should offer increasing potential for Canadian suppliers over the next decade.

Egypt's present requirements for electricity are met by 40 interconnected power stations with a generating capacity of about 13,000 MW of which thermal steam accounts for 50%, combustion turbine, combined cycle 26%, and hydropower 24%. The transmission system consists of a unified grid totalling 7,400 kilometres of high and low voltage overhead lines which connect Upper Egypt and the High Dam Hydro Plant to the Delta area of Lower Egypt.

The Government's 5 year development plan forecasts investment of US $3 billion for the construction, rehabilitation and expansion of generation, transmission and distribution facilities. Several thermal generating power stations are currently being upgraded and or constructed in an effort to increase overall capacity by 800 MW per year until the

year 2000. Four hydropower generating projects are being developed and implemented currently. Some tenders have already been let and more will come for cable, insulators, conductors, fittings, towers, substations and transformers.

In addition to its own internal developments, Egypt is a major partner in three electrical grid projects. These include the Egypt Zaire Interconnect, the North Africa Network which will link up eventually to Europe through Spain, and the Europe/Islamic Countries grid linking Egypt, Jordan, Syria, Iraq and Turkey.

The Government of Egypt has placed a priority on reducing imports by increasing local manufacturing capability whenever possible. Indeed Bechtel Egypt and AECL Canada were commissioned to carry out a study to identify local companies capable of joint venturing with foreign partners to produce equipment for the nuclear industry, when and if nuclear power development becomes a reality.

ENVIRONMENTAL EQUIPMENT AND SERVICES

Because of the myriad of other priorities which it has had to address, the Government of Egypt is only now getting around to environmental concerns. While this makes it extremely difficult to pinpoint projects which are imminent or even in the planning stages, it creates an advantage for Canadian companies. The environment market in Egypt is now in the process of being shaped and defined. By being in on the ground floor Canadian companies can get an early jump on opportunities. The most difficult barrier is financial: Egypt cannot or most likely will not pay for environmental cleanup. Funding will have to come from bilateral or multilateral sources. In general countries or donors determine the sub-sectors they want to pursue. For example, water treatment has received the attention of Denmark, European Community (EC), Italy, U.K. and the U.S.A., while Denmark in conjunction with Germany and the World Bank is currently working on a project to reduce air pollution in the Helwan area, a suburb of Cairo.

The recently completed national environmental action plan focuses on the following specific areas: water resources management, land resources management, air pollution, solid wastes, marine and coastal resources, institutional issues, global heritage preservation, and generally raising the public's awareness of environmental issues. The action plan calls for investments of about US $300 to 500 million during phase 1 which could last up to five years. The highest priorities are those for strengthening environmental institutions and actions to rescue industrial pollution of water and air.

Many countries are already involved in environment protection projects. At the top of the list are Denmark, the European Community (EC), Italy, the U.K., the Netherlands, U.S.A., Finland, Germany, Japan and Switzerland. The World Bank and the UNDP are also playing leading roles in the institutional strengthening of the Egyptian Environmental Affairs Agency.

As for Canada's role so far, CIDA recently organized a Geographic Information System Seminar (GIS) in Cairo. This seminar was part of a pre-feasibility study to set up an Egyptian environmental Information System (EEIS). The study was conducted by Energy, Mines and Resources Canada. SNC, a Canadian consulting firm, is starting the second phase of the River Nile Development Project (RNDP), which encompasses a large environmental component, and is funded by CIDA.

To penetrate the market in Egypt companies can take one of many approaches: (1) through multilateral funds such as the World Bank, the UN, the ADB, etc; (2) through the CIDA environmental program in Egypt; (3) by selling equipment directly to the Egyptian government or to specific projects; (4) by appointing local agents to assist; (5) by cooperating with companies from other donor-countries. This latter action applies particularly well in cases of advanced technology unique to Canada and where a project will be financed bilaterally. At this stage, the Post sees opportunities in three areas: training, equipment, and consulting services.

The environmental master plan of Egypt is a unique document for a Middle East country. Historically, Egypt has exported its expertise to other Arab States. Any success that Canadian companies will have in Egypt could result in sales of know-how and equipment to other markets of the Middle East in conjunction with Egyptian partners. The relationship that Egypt has established with the other countries of the Middle East in sharing know-how and manpower cannot be over stressed.

DEFENCE

Opportunities in defence are extremely limited for Canadian exporters due to inability to compete with US$ 1.3 billion F.M.S. provided by USA and highly controlled access to military for info purposes. Egyptians do much sourcing through procurement office in the Embassy in Washington. Post will be pleased to recommend potential consultants (agents) and discuss approaches with potential exporters.

IRAN

AIR TRAFFIC CONTROL AND AIRPORT EQUIPMENT

Background - The Civilian Aviation Authority of Iran, under the Ministry of Roads and Transport, is responsible for all policy making issues, for the operation of all airports and for supervising the purchasing decisions of the airlines in Iran. There are currently 52 operational airports in the country of which 6 are international and 6 are exclusively used by the National Iranian Oil Company.

Iran is currently undertaking a renewal and expansion of its domestic airports system, and is planning the construction of the new Imam Khomeini International airport outside Tehran. Pre-qualified companies to complete the design for this were selected at the beginning of this year.

Iran is also building eight new airports and updating its radar and landing systems which would require a minimum investment of US $350 million in hard currencies. Given this level of activity, international competition especially from European airport equipment suppliers is especially strong. Therefore, Canadian companies wishing to enter this market for the first time must be represented by an effective agent with experience in this field.

Market Access and Restrictions - Some technologies in this area are restricted for export to Iran. Canadian companies should contact the Export Controls Division of External Affairs and International Trade Canada in Ottawa (fax: (613) 996-2387) to discuss any restrictions which may apply.

Financing - Iran is currently experiencing a shortage of foreign currency which has resulted in the country's banking system not being able to meet some of its short-term international debt obligations. This had made financing a sometimes difficult task for exporters worldwide. Canadian exporters should contact the regional office of the Export Development Corporation (EDC) to discuss insurance coverage possibilities. As well, a short-term line of credit, the majority of which is insured by EDC, carried through various banks in Canada including the Bank of Nova Scotia, ABN AMRO Bank and Barclay's Bank of Canada, has offered financing possibilities for Canada. Iran generally operates on a 360-day usance credit basis, requesting at times that this be extended to longer terms.

Trade Fairs and Missions - The Tehran International Trade Fair, a multi-sector trade fair attracting international exhibitors, is held from October 2-12 each year. This fair offers the best opportunity for companies new to this market to investigate sales potential in Iran, and to meet Iranian companies to discuss representation or other

arrangements. Canada will be present with its own pavilion in 1993 and exporters wishing to exhibit should book space early. The Africa and Middle East Trade Development Division of External Affairs and International Trade Canada in Ottawa (telephone (613) 993-7029) is the contact point for this trade fair.

TELECOMMUNICATIONS

Background - The Ministry of Post, Telegraph and Telephone (MPTT), and its affiliate, the Telecommunication Company of Iran (TCI), are the ultimate decision making authorities responsible for planning and operating the telecommunication network of the country. Private networks belonging to other state affiliated organizations are generally operated under the supervision of TCI.

Transition from the analogue to the digital system and wider introduction of satellite networks are the major aims of the country's telecommunication plan. Fibre optic systems will increasingly be used as junctions or for long distance connections.

US $2,400 million has been allocated in the Five Year Economic Development Plan (1990-1994) for the purchase of telecommunication equipment. Also, the equivalent of US $730 million has been set aside to cover the local costs of buildings, installations, etc. It is estimated that US $345 million was spent on telecommunication equipment in 1990 and this figure may rise to US $1,400 million in 1995. The market in 1991 reached US $483 million, with switching and transmission purchases accounting for more than half.

Competition and Canadian Presence - Competition from traditional suppliers from Germany, France and Japan is strong. Siemens is one of the co-founders of the Iranian Telecommunications Manufacturing Company (ITMC) established in 1961. Iran has a wide range of requirements for modernizing its telecommunication industry and is aware of the high standards of Canadian products. Iran is keen to find access to North American technology which has generally been denied since the early days of the 1979 Revolution, and is also anxious to diversify sources of supply.

SECONDARY INDUSTRY MACHINERY

Background - As a result of the reconstruction and development programmes following the end of the eight year Iran-Iraq war in 1989, Iran has become a very promising market for foreign suppliers of manufacturing machinery. Most of the manufacturing industry must be renovated if the country is going to meet the objectives set in its first Five Year Economic Development Plan (1990-94), including a GDP growth rate of 8.1 percent per annum. It is very difficult to guess the actual size of the market for manufacturing machinery since it covers a very wide range of products and reliable statistics on local production and imports are not available.

Market Conditions and Opportunities - In order to succeed in penetrating the market, most foreign companies have local representatives to inform them of potential opportunities and provide after sales services. Also according to a recent Government decree, as from December 22, 1992, only foreign suppliers who have a local representative would be able to sell to Iran. While details of how this decree is going to be executed are not announced yet, it does indicate the importance that the Government attaches in working only with companies that are prepared to make a long term commitment to this market.

Iran has one of the strongest industrial infrastructures among the Middle Eastern countries, and the Government also encourages the local assembly/manufacturing of secondary industry machinery to encourage transfer of technology and know-how.

Trade Fairs and Missions - The First International Fair of Machine Tools will be held in Tehran in November 1993 and may be a good opportunity for interested Canadian companies to gauge market opportunities by participating.

ENVIRONMENTAL EQUIPMENT

Background - Environmental issues are not generally very high on the list of government priorities when compared to the standards of western countries. There are, however, growing signs that with the increasing pollution of Tehran and other major cities, some steps will have to be taken in future to control and improve the situation. The Environmental Protection Organization (EPO) is responsible for monitoring and controlling the level of pollution and factories.

Market Conditions - Market opportunities in the past were limited due to the shortage of foreign exchange. Lack of spare parts meant that most vehicles and factories worked in sub-optimum conditions, polluting the environment in the process.

After the war ended in 1989, Iran embarked on a massive reconstruction and development plan. The main aim of the Government has been to boost the level of local production to the furthest possible extent in order to improve general living conditions and find employment for the growing work force. More recently, Iran has been experiencing hard currency shortages which has seriously affected its development projects and imports.

It is generally believed that environmental issues will only gain the recognition that they deserve when the country has overcome its current economic problems and the population has been educated and been made aware of the dangers of pollution.

Companies interested to introduce their capabilities to EPO may contact the following: Dr. Manafi, Chairman and Managing Director, Environmental Protection Organization, 197 Najatallahi Avenue, Tehran, Tel: 49821/898177.

SECURITY PRODUCTS

Market Background - Iranian market for modern security products is in its initial stage of development and presently offers little sales opportunity to North American and European exporters of sophisticated equipment. Most security systems used in Iran are traditional and basic, e.g. preventive metal bars, barbed wires, guards etc. Imports of electronic warning devices is however growing and concentrated on simple systems of low price from Taiwan, Singapore and other South East Asian markets.

Market Segments and Opportunities

1) **Banks and security sensitive buildings:** High risk buildings use safes, heavy doors, bullet proof windows and sophisticated alarm systems. Most items in this category are imported and large international security system manufacturers, e.g. Chubb Security, are present in the market for the total system design and installation. This segment is the major area where Canadian exporters of security equipment and services have a chance of entering the market.

2) **Automobiles:** Import of foreign cars which was banned after the revolution of 1979 has recently become authorized and large numbers of new foreign cars are now in use. Buyers of these cars prefer to equip them with alarm systems resulting in emergence of a good market for such items.

COMPUTER HARDWARE AND SOFTWARE

Market Background - The computer hardware and software market in Iran offers good opportunities to companies with international export experience willing to devote the financial and personnel resources so often required to succeed in this part of the world. The sector itself is already heavily represented in Iran by most major European and North American computer software and hardware manufacturers, and competition (both in quality and pricing) is stiff.

Nevertheless, Iran's computer market has only recently started to expand, with new applications and hardware in demand in both public and private sectors. Iran's computer industry has remained largely undeveloped since the Revolution and an eight year war with Iraq, which limited the country's ability to import computing equipment. Today, all levels of industry recognize the possibilities which personal and main-frame computers hold in Iran's drive for industrial modernization and development.

Market Access and Restrictions - Whether a foreign company is a supplier of hardware or software, a local agent or representative (paid on a commission or other basis) is essential to ensure marketing success. Iranian companies wishing to import computers and computer-related products must be registered with the Informatics Council of Iran's Plan and Budget Organization. Most active companies are members of Iran's Chamber

of Commerce, Mining and Industry, but this does not imply authorization for importing any specific range of products. Exporters new to this market should therefore ensure that Iranian companies with whom they decide to associate have the appropriate government approval to import products.

Computer software suppliers should be aware that Farsi versions (not Arabic) are in demand in this market, and therefore should be specially tailored for use in Iran. Some specialized software applications are being developed in the country. It is important to note that as yet there is no copyright protection in Iran for software developers.

Market Competition - Most European and North American hardware and software manufacturers, and an increasing representation from the United States (Microsoft, Micro Express, Procom Technology, Optimex Computers, NCR, Bull, etc.) are already present in this market. Local manufacturing does take place, mainly in knock-down assembly of imported parts.

Trade Fairs and Missions - The next International trade fair for computers, electronics and telecommunications equipment will be held in February, 1994.

ISRAEL

ENVIRONMENTAL EQUIPMENT

Israel is an emerging market for environmental products and services. Israel's Ministry of Environment was created only in 1988. Prior to its establishment, there was little meaningful legislation in the area of environmental protection. However, it is now likely that much needed legislation will be enacted as the situation with regard to the environment has become intolerable and there are more and more pressure groups urging that new laws in this area be passed and that existing ones be enforced. In addition, there is a genuine will amongst key decision makers to enact tougher regulations on a wide range of environmentally related areas.

Water - Deterioration in water quality is now the most serious environmental problem in Israel. Drinking water provided by the two main aquifers show traces of chemical and microbial pollutants, salination, nitrates, heavy metals, fuels and toxic organic compounds.

Wastewater remains a serious problem. Sixty percent of treated wastewater is now used for irrigation. Plans are to utilize some eighty-five percent of Israel's total wastewater flow by the year 2000. As a first priority the Environment Ministry has called upon several municipal authorities to improve and expand their sewage treatment and disposal facilities. Opportunities in this field include providing technologies to ensure more effective recovery of wastewater and services to assist the authorities in better implementation of existing regulations.

Air Pollution - The main sources of air pollution are energy production, transportation and industry. Air pollution levels are monitored constantly. In the past two years, several power plants and refineries have been compelled to install scrubbers in their facilities. Israeli automobile owners are not presently required to use unleaded fuel, which has only recently become available. In addition to industrial scrubbers and filters, opportunities for pollution abatement technology and equipment exist, (e.g. emission reduction devices). Most industrial and commercial vehicles burn diesel fuel thus creating excessive exhaust fumes, especially in urban centres.

Hazardous Waste - There are plans to build an incineration plant for hazardous waste at the Ramat-Hovav hazardous waste site. However, plans have been delayed due to the upcoming privatization of the government company managing the site. It is expected that a decision will be taken early in 1993. Opportunities also exist for medical hazardous waste incinerators.

Solid Waste - Ninety-eight percent of Israel's solid waste is disposed of in sanitary landfills. There are over 100 of these landfills all over the country. Despite attempts to

minimize damage to the environment, these sites are becoming increasingly controversial as liquid seeps into the waterbed. Israel needs more effective disposal techniques and consulting services. Two large municipalities have recently issued tenders for Post Consumer Waste (PCW) incinerators.

Recycling - Very little recycling is being done at this stage as it is felt that recycling is not feasible in Israel. Once the Garbage Separation Law is passed, recycling of PCW will become economically viable. Opportunities exist for consulting services and recycling equipment (e.g. separators, shredders).

The cumulative three year export potential for Canadian products in this sector is valued at US$30 - 60 million. Most foreign companies bidding on local tenders are represented locally. Dealings with local government and/or municipal authorities is laborious and slow.

Opportunities exist for consulting services as the Israeli government needs assistance in the design and implementation of environmental legislation. In addition, many infrastructure projects have been budgeted for and many of these, in fields such as sewage treatment, port development, etc. will require environmental impact studies. Furthermore, the municipalities and local councils will increasingly be called upon to share the burden of water supply, sewage treatment, disposal of toxic wastes, etc. and they will require outside assistance as they do not, in most cases, have in-house capabilities.

Opportunities also exist in the area of technology transfer. Several large Israeli companies have recently decided to allocate resources for the development of so called environment friendly products and these companies have expressed interest in joint ventures and transfer of technology with Canadian partners.

Financing - Israel is not eligible for World Bank financing or African Development Bank financing. However, EDC is on cover and willing to finance qualifying projects. In the context of the current peace process, other sources of multilateral financing might become available for projects on a regional scale.

COMPUTER HARDWARE AND SOFTWARE

The local market for software is approximately $400M per year and is growing at 8% annually. Israeli software exports have increased from US$5 million to US$110 million in the seven years between 1984 and 1991, a twenty-two fold increase. Estimates for 1992 export figures call for sales of over US$135 million.

The defence sector, not surprisingly, continues to be a major consumer of software, especially in real time applications, avionics packages, communications systems, and command/control applications in each of these fields. In the commercial sector, most

Israeli enterprises have fully computerized their management infrastructure and many have on-line production control, CAD/CAM applications, office automation, and communication networks. In the education sector, it is noteworthy that as a result of collaboration between the private and public sectors, a wide range of educational software is in use throughout the country.

Due to the limitation of the local market's size and because of the relatively large investment required for software development, many Israeli software houses have become experts in packaging software as self-contained units which can be marketed/ sold by others. There is significant potential for cooperation via the following channels: marketing agreements with distributors and systems houses; out-sourcing, contract programming and joint projects with Israeli software houses; joint ventures with hardware/software companies in several potential venues, such as jointly-owned development centres or software package development under OEM agreements.

TELECOMMUNICATIONS & ELECTRONIC EQUIPMENT

In Israel, major investments are being made in infrastructure in order to modernize and improve the country's present communications/telecommunications systems and to provide new services for businesses and private consumers. There is a clear trend towards privatization of government owned corporations and towards opening up of monopolies to competition.

About US$1.8 billion is expected to be invested in the field of telecommunications over the next three years. There are major opportunities for Canadian suppliers since the Israeli government and business community view Canadian achievements in the field very favourably. The Israeli delegate to Intercomm '90 noted that prices for Canadian equipment are approximately 20% less expensive than similar equipment made in the U.S.A.

Under the terms of a 1985 agreement, almost all Canadian equipment with DOC approval is automatically approved after a very short waiting period (7 days). There are opportunities for the Canadian telecommunications industry in Israel in the following four fields: 1 - Transmission for VHF and UHF television systems (PAL standard), cable TV, AM medium and short-wave radio; 2 - Two-way radio and satellite communications; 3 - Telephony; 4 - Cellular mobile telephones.

Two-Way Radio and Satellite Communications - Two-way radios in Israel operate on the same systems and frequency allocations as in Canada and the U.S.A. The number of two-way radios has doubled every five years since they were introduced. Today there are about 310,000 two-way radios, cellular telephones and pagers, with an annual growth rate of 15% - 25% (1991 rate: 25%). Motorola Israel controls 80% of the market with the other 20% divided between European and Japanese companies. No Canadian companies are presently in the market, to the best of our knowledge.

There is a large and growing demand for satellite receiving stations, and for V-SAT's (Very Small Aperture Satellite) communications for data transmissions. Israel is a member of both Intelsat and Inmarsat and receives all DBS transmissions aimed at Europe, as well as those from the Intersputnik and Raduga Soviet satellite systems.

Telephony - At present, approximately 53% of Israel's phone system operates on digital exchanges. Telrad, an Israeli firm, makes 20% of the locally manufactured exchanges using Canadian technology. The other 80% of locally made exchanges are manufactured by Tadiran, using Belgian technology from Alcatel. The only telephone company in Israel at present (a monopoly) is Bezeq, which intends to invest heavily in telecommunications equipment. Bezeq's 1993-1997 5 year plan calls for an investment of NIS 8 billion (approximately US$ 3.3B), including a significant increase in the number of public telephones, infrastructure to accommodate up to 180,000 cellular phones, the laying of 66,000 km. of fibre optic cables, and much more. This plan may be compressed into a shorter time period (3 years) in order to accelerate investment in the telecommunications infrastructure. Bezeq's general policy is to purchase about 85% of its equipment from local sources and the rest from abroad.

Cellular Mobile Telephones - At present, the market for cellular mobile telephones, which grew by 51% last year, is a monopoly controlled by Bezeq and Motorola. However, it is likely that an international tender will be proferred in 1994 for other customer equipment and in 1997, for another supplier of systems.

Despite the country's small size, Israeli sales in telecommunications reached US$670M in 1991 and data communications sales reached US$150M in 1991. There is a great commitment to the industry as evidenced by the fact that approximately 70% of all R & D monies are invested in electronics. With its highly qualified labour force, Israel is well positioned for joint ventures with leading telecommunications companies. Israel also exports telecommunications equipment to several African countries and these are potentially an excellent market for Canada-Israel joint business ventures.

SECURITY PRODUCTS

Responding to Israeli special security needs, Israeli industry has developed a variety of high quality security products. Included are devices ranging from surveillance equipment, smart fences, through various types of metal, chemical and other detectors, personal protection equipment, identification systems, to physical security material.

The local market is estimated to be in the range of $50 M per year. Opportunities in marketing to the local market lies in those areas which Canadian companies have special expertise which is not available in Israel. Another area of opportunity exists in joint venture partnership with leading Israeli security products companies.

AIR TRAFFIC CONTROL AND AIRPORT REQUIREMENTS

The Israeli government plans to issue another international tender for a new airport north of Eilat, Israel's fast growing Red Sea resort city. The proposed facility is to be located 11 km north of the town and would be capable of handling all types of aircraft on a single runway. It will replace the existing facility which is on prime property in the center of town and can only handle small jet aircraft. At present, larger aircraft, operating primarily charter flights from Europe, have to land at an Israeli Air Force base 60 km to the north.

Earlier tenders for the airport were cancelled after the government ruled that the bids that were submitted were unsatisfactory.

JORDAN

(including Syria and Lebanon)

INTRODUCTION

The Middle East region as a whole has always offered enormous, if largely unexploited, potential for Canadian exporters. The three countries covered by the Embassy in Amman -- Jordan, Syria and Lebanon -- are relatively minor trading partners even in a regional context and are often therefore ignored by exporters. While there is no denying the apparently huge potential in several neighbouring countries, the opportunities in our territory nevertheless present promising markets for committed exporters. They have extremely similar import requirements, a population base of over 20 million and are, for the most part, competitive cash markets, comparable to others in the area. It stands to reason that Canada's success in exporting grains and forestry products to Saudi Arabia or oil equipment and livestock to Iran, can be matched elsewhere in the region.

OVERVIEW

The political and economic consequences of the Gulf War and its aftermath differed substantially in each of the three countries. These market disruptions all present new possibilities and should encourage interest in our territory. Exporters must, however, act quickly to consolidate representation and partners in order to capitalize on the wide-ranging opportunities for both goods and services.

Jordan, often said to have every characteristic of an oil economy except the oil, was the single-most effected country by the Gulf Crisis. While the aftershocks of the war will continue for the foreseeable future, the country is following well-defined restructuring programs based on IMF defined guidelines. Dire predictions of political instability and economic collapse failed to materialize, in part due to over one billion dollars in international aid and the cash injected by hundreds of thousands of returnees from Kuwait. Canada's aid program is also growing rapidly and helped boost exports to record levels in 1991 while exports in the first 9 months of 1992 had declined sharply to $4.4 million. The "overnight" increase in population will require an estimated Cdn $5.0 billion to alleviate, creating increased consumer demand and requirements for construction material and industrial equipment. Normalization in Iraq should eventually boost Jordanian fortunes as the Kingdom is a conduit for Baghdad's huge import requirements. Sectoral priorities for goods and services include telecommunications, agro-industry, mining, transport, industrial machinery and construction.

For Syria, the crisis came at a time when the economy was coming out of a prolonged slump, activated by large oil discoveries in the last 5 years. Arab aid of over Cdn $3

billion, notably from Kuwait and Saudi Arabia, due to Syria's role in the anti-Iraq coalition are currently used for large investments in industrial infrastructure. There are billions of dollars in current project tenders in areas as diverse as water and sewage facilities, turnkey steel, fertiliser and textile plants, an enormous telecommunications expansion and several electrical generation plants. Primarily an agrarian economy, the country of 15 million is becoming more heavily industrialized. An easing of restrictions on the long-stagnant private sector enactment of new investment laws, unleashed vigorous pent-up demand for western goods and services. There are, as a result, numerous smaller projects in virtually every sector as investors, both Syrian and foreign, scramble to capitalize on opportunities. The oil sector, where Canadian companies have been particularly successful, continues to boom with investments of over Cdn $1.5 billion in the past four years, offering enormous potential for goods and services exporters. Sectoral priorities for goods and services include agro-industry, mining, transport, industrial machinery, oil and gas and rural telecommunications.

Lebanon has just emerged from 15 years of civil strife and is now experiencing its longest period of peace in almost two decades. While the stability is still fragile, expectations are high that Lebanon, formerly one of Canada's major trading partners in the region, is poised for a rebound. Economic indicators are slowly turning positive led by significant growth in construction activity contributing to estimated real expansion of 15% in 1991. Anticipated western and Arab aid is now beginning to materialize, with agreements worth over Cdn $300 million, the majority of it untied, being signed in the past 10 months. The devastating effects of the war are in view everywhere in bullet-riddled and bomb-cratered Beirut. Should the stability endure, a rebuilding effort of massive proportions can be expected, costing billions of dollars, presenting a multitude of opportunities for exporters of goods and services. Sectoral priorities include agro-industry, telecommunications, grains transport, energy, health products and services, construction and advanced technology.

KUWAIT

The territory covered by Kuwait includes Bahrain, Kuwait, Oman, Qatar, and United Arab Emirates.

Background - In March 1991, following the conclusion of the Gulf conflict, firms from all over the globe descended on Kuwait to secure their "piece" of what was perceived to be a "huge pie," estimated at $100 billion. Lack of power, water, telephones, transportation and key public and private sector contacts complicated everyone's efforts. Despite these impediments, Canada responded.

While extensive damage existed, the initial grandiose claims about the extent of the "reconstruction" effort had been exaggerated. Substantial refurbishment rather than reconstruction, was required to return to Kuwait to some semblance of its former self. However, Canada has been very successful. It is still hard to pin down the actual costs of refurbishing the country, but a realistic estimate is that the immediate costs of reconstruction will approach US$ 5 billion, of which much has already been spent. Spending over the next five years is estimated to be in the range of US $ 15-20 billion.

Financing - In December 1991, Kuwait signed a syndicated loan with an international banking consortium, led by J.P. Morgan, for US $ 5.5 billion. These funds are expected to ease the shortfall in government account financing for 1992. To supplement the government's financial position and to provide flexibility in undertaking reconstruction projects, Memorandum of Understanding totalling over US$ 6 billion, have been signed with various governmental export credit agencies, including Canada's Export Development Corporation. A move for the establishment of a US$ 500 million line of credit to support the sale of Canadian goods and services to Kuwait has been signed between the Minister for International Trade, the Honourable Michael Wilson and the Ministry of Finance of Kuwait.

Tariffs and duties - Prior to the invasion, Kuwait imposed an across the board tariff of four percent on most imports. At the time of liberation, all tariffs were suspended. Kuwait reimposed the four percent tariff on March 31, 1992.

Agents - Although in the immediate post-liberation period, Kuwaiti regulations concerning representation were often suspended, a local agent or sponsor is now a must. In most cases, including all government contracts let through the Central Tenders Committee, a Kuwaiti agent or representative is required by law. In any case, local representation is essential for timely notification of major projects and tenders, and to maintain contact with Ministry officials and decision makers. Once contact with a potential agent has been made, periodic trips to Kuwait are advisable. The importance of direct contacts and personal relationships with Kuwaiti counterparts cannot be overemphasized. The selection of an agent is one of the most important decisions you will make in doing business in Kuwait. Foreign companies may not approach the CTC

directly in this process; rather, the foreign firm's Kuwaiti agent must deal with the CTC on the firm's behalf.

Registration of Consultants - Consulting firms should register with the Ministry of Planning. (As all previous records were burned, it is necessary for all interested consultants to register. The Middle East Trade Development Division of External Affairs has information on what this entails). This sector offers the most potential for Canadian firms as opportunities exist in all sectors for outside consulting assistance.

Investment/Joint Ventures - Though foreign investment in Kuwait is limited to a 49 percent share of any Kuwaiti company, joint ventures with Kuwaiti firms are nevertheless the best means for establishing a local manufacturing or service presence. Establishing a joint venture with a Kuwaiti company is often a successful approach to bidding on major projects and Kuwaiti private sector firms are often interested in joint ventures or licensing with firms that offer attractive technology or products. Profits in joint ventures are not necessarily distributed according to ownership percentage.

BAHRAIN - Attention has now turned to developing the services sector, light industry and tourism. A listing of the backlog of projects range from phase II of the airport expansion program (phase I was completed in October 1991); construction of a $185 million port and container terminal at southeast Hidd.

QATAR - Besides concentrating on petroleum sector opportunities, Canadian telecommunication firms, especially those with rural systems should consider promoting their capabilities in Qatar.

OMAN - The key areas to consider in Oman are oil, petroleum and rural telecommunications. Telecommunication systems for the major centres of the country are relatively sophisticated but the government now plans to ensure all its population, especially those in remote areas, are linked into the telecommunication system.

For assistance please contact:

1) Canadian Embassy, P.O. Box 25281, 13113 Safat, Kuwait, Tel: 965-256-3025, Fax:965-256-4167
2) Middle East Trade Development Division, External Affairs and International Trade Canada, 125 Sussex Drive, Ottawa, Ontario, Tel: 613-993-6847, Fax: 613-990-7431

AVIONICS, AVIATION GROUND SUPPORT AND AIRPORT RECONSTRUCTION

Kuwait International Airport was seriously damaged during the Gulf war. All of the airport's avionics equipment was destroyed or looted and several major structures will have to be rebuilt from scratch. The airport is currently running on post-war expedients,

including military radar not well adapted to civilian use. A Dutch firm, Narco, is currently consulting with the Directorate General of Civil Aviation, the Kuwaiti Government agency which manages the airport, to establish a "Master Plan" for the future of the airport.

Projects and purchases will include:

- construction of a new administrative centre and headquarters for government-owned Kuwait Airways Corporation (KAC). The construction contract is expected to be awarded in February.

- building and supply of a new Communications Centre, with a VHF ground to air communications system. According to the Directorate General of Civil Aviation, this will be a priority after completion of the master plan.

- long range, final approach, and secondary radar elements and support systems.

- possible re-establishment of KAC's aircraft maintenance facility. Before the invasion, it was one of the most sophisticated such facilities in the Middle East. KAC may rebuild this centre. If so, this would create major opportunities for contractors, suppliers of all types of aircraft maintenance equipment, and maintenance service providers.

- purchase of avionics, spare parts for electronics, aircraft parts and engines, and limited amounts of ground equipment.

ENVIRONMENT, WATER AND SANITATION

Environment - Damage to the environment as a result of the gulf war was great, but not as devastating as had originally been feared. The main source of concern, pollution from the oil well fires, has been eliminated. The government-owned Kuwait Institute for Scientific Research (KISR) is currently conducting several studies on behalf of the government, including: air pollution concentration, environmental impact, coastal damage, and health effects. The most important upcoming environmental restoration project is the onshore oil spill clean-up project. At this time the Kuwait Oil Company is handling this project on its own.

Water is primarily provided by six desalination plants, related to power generation plants.

The **sanitary sewage system** will eventually need major refurbishment. In the meantime a number of smaller contracts are being let. Even before the invasion of Kuwait, the country's sanitary sewage system was inadequate, and a lack of maintenance during the war exacerbated sewage problems. The Ministry of Public works has recently proceeded with several sizable contracts, including a replacement of the collection system, worth

some $13 million, and a round of operations and maintenance contracts to be let in March.

COMPUTERS

During the occupation, Iraqis looted Kuwait's supply of computer hardware, software and peripherals. Liberation brought with it a tremendous need to resupply the university, various ministries, businesses and other institutions. While "emergency phase" restocking is over, significant computer requirements remain to be met. Kuwait is continuing to make purchasing decisions largely based on price. Western firms with competitive pricing have been very successful in this post-liberation market.

Computer training programs for everything from word processing and data entry to systems management and design will be key factors in coping with Kuwait's changing demographics.

There are ample opportunities to supply Kuwait with PC's, main frames, and mini computers. However, you should be aware that this market is extremely competitive. Although Kuwaitis continue to buy lower priced PC's from the Far East, they are beginning to recognize qualitative differences in computer products.

Even though a strong demand in Kuwait exists for computer software, especially Arabic language programs, there is at present no protection for intellectual property rights and pirating is a common problem.

TELECOMMUNICATIONS

Kuwait's telecommunications infrastructure sustained major damage during the Gulf war. The Ministry of Communications has worked very closely with a number of western companies in restoring emergency service and in helping to replace permanent infrastructure.

The Ministry of Communications is now focusing on replacement of its permanent earth stations, the installation of new lines and switching gear, and restoration and improvement of customer services. As soon as service is completely restored, the Ministry of Communications plans to privatize its telecommunications services. The Kuwait Institute of Scientific Research (KISR), the government-owned research facility, is currently undertaking a study of the form privatization will take.

Upcoming Ministry of Communications projects include:

- 2 standard A and I standard B earth stations at Doha, worth approximately $35 million. The Ministry is currently preparing tender documents, and the tender should appear in January.

- switch gear for 150,000 new lines. The switch gear will pass through between 4 and 6 areas. The total value of this project may be as much as $20 to $30 million.

- new billing system. Bids have already been submitted for a main frame and computer services for customer billing (the original tender was reduced in scope because of budget constraints).

- cables and other equipment. The Ministry of Communications' stocks of equipment and spare parts were entirely looted or destroyed during the war. The Ministry is currently replenishing its stores. For example, the Ministry will be buying $13 million worth of cable (though probably from low cost Saudi or Indian suppliers) in the near future.

- telecommunications services. Although budget constraints limit the degree to which all of the Ministry of Communications' telecom service goals can be met at once. The Ministry will design a number of service packages in the near future, including: improved customer service systems, increased frequencies, and new management and maintenance systems.

MOROCCO

TRANSPORTATION (Airport and Air Traffic Control Equipment)

Airport and air traffic control equipment appears to be the transportation area with the greatest number of trade opportunities in high technology products (details follow).

The aerospace industry is practically nonexistent in Morocco, and with the exception of some pieces of equipment such as sonar, radar, sounders and other navigational aids, the shipping industry has only a marginal commercial interest. The aeronautical industry has only one airline (Royal Air Maroc), with a fleet of about 30 aircraft. Eventually it will afford opportunities for aircraft maintenance and repair equipment, and for flight simulators.

Overview - Morocco has 17 airports, 11 of them open to international flights. Commercial air traffic consists of about 70,000 flights transporting five million passengers. The ONDA, the facility which manages these airports, has begun an extensive modernisation program covering the period 1993-97.

Size of the Market - C$190 million for the 1993-97 program, of which $45 million will be devoted to airline equipment.

Products and Services for which Market Opportunities Exist

1) Navigational Equipment
2) Beacon and Radio Beacon Equipment
3) Telecommunications Equipment
4) Radar Equipment and Antennae
5) Broadcasting and Reception Sectors
6) Maintenance Equipment
7) Training

Main Suppliers - France

Financing/Projects - About C$100 million will be available from the ADB to finance the above projects. The first tender calls should be made early this year.

Activities Planned - Site inspections are planned in the context of these tender calls.

ELECTRONICS SECTOR

Market Overview - The Moroccan electronics market is still quite weak, and growth prospects are also limited. Significantly, Morocco already has some production capacity in this sector, in cooperation with foreign companies, and much of its production is destined for export. However, there are market possibilities for the following products: electronic components, home appliances, generator sets, transformers, converters, electro-magnetic devices, generators, electro-thermic equipment, measurement equipment, integrated circuits, electronic security equipment.

Main Suppliers - Germany, France, UK, Italy, Spain, USA.

Projects/Financing - There are no activities being financed by the international organizations in this sector. However, it does lend itself to partnerships.

The World Bank has given Morocco a loan of $100 million for the second phase of the telecommunications development project (expansion of the network, promotion of private investment). This project should start early this year.

Planned Activities - Plans to participate in SITEB 1993 (EDP, Telecommunications and Office Equipment Show) in Casablanca; Moroccan managers have been invited to participate in TEMIC (Telecommunications Executive Management Institute of Canada) and Intercom in 1993; Proposal for Moroccan private sector Telecom/EDP mission to Canada in 1993.

DATA PROCESSING SECTOR

Market Overview - The EDP market is undergoing tremendous expansion in both equipment and services. In 1991, the growth rate was 22 percent. This expansion has affected both the public and private sectors.

Market Size - Products and services represent an annual market of about $200 million.

Promising Products and Services

Products - Micro-Computers; Peripherals; Data Processing Accessories.

Services - Data processing services (access to data bases, facilities management, network and inter-network services, shared treatment for EDP services; Manufacturing of software; Consultative services (project management, master plans, diagnosis, EDP audit); Computerization of banks and insurance companies.

Main Competitive Suppliers - France, Germany, USA, Japan, Sweden.

Projects/Financing - Mainly World Bank funding for EDP projects (for example, Ministry of Transport EDP master plan, computerization of Finance Department).

Activities Planned - Plans to participate in SITEB (EDP, telecommunications and office equipment fair), Casablanca, April 1993; Invitation to Moroccan managers to attend Montreal Data Processing Fair (SIM); Proposal to have Moroccan private sector EDP-telecommunications mission to Canada in 1994.

SAUDI ARABIA

AEROSPACE

Saudi Arabia holds tremendous potential for Canadian aerospace firms that are willing to spend the time and effort necessary to pursue the many commercial opportunities in this market. Any decision to pursue contract work in the Kingdom should be made with full knowledge of the following:

(1) U.S.A., British and French firms are well connected to the various local military and civilian aircraft organizations, (2) An on-the-ground presence in the form of an agent or representative is crucial to succeed in the market, (3) There is a move towards increased Saudi involvement (ie, Saudization) and, (4) It generally takes some time to conclude contract agreements in this country.

The Saudi Land, Navy and Air Forces all possess substantial aircraft inventories. Following the Gulf Crisis, the USAF left a total of 24 F-15C/D jet fighters for the Saudi Air Force bringing total F-15C/D strength to 93.

The national airline, Saudia, now comprises a fleet of more than 100 aircraft, most of which are the modern wide-bodied type including the Boeing series of 707's, 737's and 747's (100's, 200's, 300's, SP's); Airbus A300-600's and Lockheed L1011 TriStars. The fleet also includes Beechcraft A-100's, Cessna Citation, Grumann Gulfstreams (G-II's, G-III's, G-IV's) and Piper aircraft. The airline serves more than 70 international and domestic destinations, operating 300 flights daily from Saudi Airports. Saudia reportedly spends approximately C$8 million annually on the maintenance of its fleet.

Saudia has now announced its intention to purchase eight fifty-seater aircraft. Saudia also plans to purchase new aircraft in the 100 to 150, the 200 to 250 and the 250-plus seat classes. In total, Saudia expects to buy some 68 new aircraft in this fleet modernization programme. Saudia generally operates its own maintenance facilities although, in certain instances, work may be contracted to foreign (including Joint Venture) firms.

Aircraft Maintenance - Maintenance of both civilian and military aircraft in Saudi Arabia is generally performed by the initial supplier either solely or as Joint Venture (JV) with a Saudi partner. One industry expert maintains that a good way to ensure initial O&M work in the Kingdom is to first sell a new line of aircraft. In recent years, however, there has been a growing tendency to submit new contracts to public tender. The first ever Canadian firm commissioned for aircraft maintenance work for the Saudi military is Air Canada which, in 1992, was awarded the overhaul and maintenance contract for the RSAF AWACS CFM56 aircraft engines. Work on these engines takes place at Air Canada's Mirabel facilities.

In coming years, maintenance of larger aircraft (both military and civilian) can be expected to come increasingly under the Al-Salam hanger facility now under construction at the Riyadh airport. Plans call for the eventual construction of 9 hangers. Each hanger will have the capacity to handle up to three 747s at one time. The first three hangers are due to be completed by the fall of 1993.

Opportunities for new entrants - Canadian firms interested in pursuing contract work in the Saudi aerospace sector will find opportunities in various areas including:

Aircraft purchases: It is anticipated that there may soon be a requirement for new aircraft to perform coastal surveillance/border control activities in the Kingdom. As was noted above, Saudia is currently assessing bids for some 68 new commercial aircraft to handle various passenger requirements. The RSAF has identified small aircraft requirements for various applications. There is a continuing demand by the private sector (individuals and corporations) for medium to long-haul aircraft.

Aircraft Maintenance: A new opportunity in aircraft maintenance may emerge with the RSNF when the Aerospatiale O&M contract expires shortly. A maintenance contract for 72 F-5's is due to go to tender in early 1993. A Cdn$ 100 - 125 million support contract for the C-130's is expected to be announced in 1993.

Air traffic control: Navigational aides at RSAF airport facilities were installed in the mid-1970's and are now considered to be archaic and in need of updating. A total of five RSAF air bases will require ATC upgrading in the near future. An upcoming ATC tender is expected to be announced soon for the civilian Al Jouf airport facility. Bids are now being reviewed for a major upgrade project at the Al Karj facility. Canadian firms could well be considered for subcontract work on these projects. The firm LNS is already involved in ATC work in the Kingdom.

Training of RSAF Pilots: BAe has been training Saudi pilots for the past 20 or so years. Many of the teachers hired by BAe are Canadian. As a result, Canada now has an excellent reputation in the pilot training field and opportunities for an expanded Canadian role could well emerge in the near future. The BAe programme begins with piston driven Cessna 172's and then moves on to basic jet training with Strike Master and PC-9 aircraft. Advanced training courses are in place for helicopters (Black Hawks), jet fighters (Hawks) and transport aircraft C-130's.

Training of Saudia Airline Pilots: Primary training is currently carried out at the Saudia Flight Training Academy in Jeddah. Secondary and tertiary training take place in the United States. Saudia may now be considering expanding and upgrading its flight training program. This would involve a requirement for instructors along with additional training aircraft and the construction of housing and training facilities.

Airport Construction Opportunities: The Saudis have already announced plans to

construct up to 10 frontier utility airfields along the eastern and southern border of the Kingdom. Requirements include a runway system sufficient to handle Hercules aircraft, runway lighting, generating plants, air traffic control towers and corresponding equipment. The prime contractor, announced earlier this year, is a local firm (Al-Mabani).

Flight Simulators: Both the RSAF and Saudia Airlines have identified requirements for flight simulators.

Munition Supplies: Requirements do exist for certain products, for example, of the air-to-ground and air-to-air variety.

While US, British and French firms will likely remain the major contenders for aerospace contracts in the Kingdom, public tenders will continue to be issued more frequently and competitive bids assessed. Given Canada's strong and growing reputation in this sector, Canadian aerospace firms would be well positioned to pursue emerging contract opportunities.

Creating a presence in the Saudi market - In order to establish sales in this market, firms must be willing to create an on-the-ground presence. This is usually done by seeking a local representative. The representative must be knowledgeable about the Saudi aerospace sector, have access to key personnel at different levels in the various purchasing bodies and be willing to energetically pursue the client's business interests in the Kingdom. There is nothing more important than selecting an effective agent. New entrants should also be aware of the growing Saudi preference for joint venture operations. Other determining factors in contract selection include compatibility of equipment and the ability to provide after-sales service.

TELECOMMUNICATIONS

In 1992, the Saudi Ministry of Posts, Telegraph and Telephones announced its intention to proceed with the first phase of a planned one million-plus telephone line expansion project valued at US$ 2-3 billion. This will double the capacity of the Kingdom's existing telephone system. There is tremendous potential for Canadian companies engaged in this sector.

Firms considering Saudi Arabia as a potential market should be aware of the following: 1) Canada enjoys an outstanding reputation in the Saudi Arabia for state-of-the-art telecommunications equipment and expertise, 2) an on-the-ground presence in the form of an agent or representative is crucial to succeed in the market, 3) there is a move towards increased Saudi involvement (ie, Saudization) in all industries. Overall investment in the sector during the current Five-Year plan has been projected to total as much as US$ 6.5 billion.

Opportunities for new entrants - The one million-plus new lines of the current expansion project represent the single largest increase of the Kingdoms telecommunications system. Phase one of the project, comprising 190,000 new lines, has recently been awarded to the German firm Siemans. The RFQ for the 500,000 line second phase of the project is expected to be released sometime within the January/February, 1993 timeframe. The seven firms involved in the first phase will all be invited by the Saudis to bid on the phase two project.

Even with this major expansion project, which will effectively double existing telecommunications capacity in Saudi Arabia, it is estimated that the resulting upgraded and expanded system will represent only about 30% - 40% of the overall demand requirements of the Kingdoms 17 million or so inhabitants. The potential for further expansion will be significant.

The first two ARABSAT satellites (ie, 1A and 1B) were launched in 1985. However, it was another 3 - 4 years before earth stations in the Arab world were running at full capacity. By 1991, the demand for ARABSAT equalled capacity. In mid-1992, the third and last of the first generation series, 1C, was launched.

The contract for the second generation series of satellites was awarded to Hughes International in October, 1992 for US $258 million. One point that helped Hughes win the contract over rivals British Aerospace and Aerospatiale was the $40 million line of credit contained in its offer. The satellites are scheduled to be launched in the second half of 1995.

With demand exceeding capacity and the second generation not scheduled to enter into service for another 3 years, ARABSAT is now looking for other satellites (potentially Canadian) whose owners would be willing to move into the ARABSAT orbit. ARABSAT would market the capacity of these satellites and share the profit with the foreign owners. In terms of revenue potential, the Saudis anticipate about US$ 1 million per channel and over US$ 2 million per KU.

In addition to the expansion of line capacity, there is a wide range of other opportunities for Canadian telecommunications firms: the microwave system, the telex system, PBX, mobile telephones, pagers, spectrum management, air traffic control, earth stations, and expertise in digitalization and in network planning and management. There is additional potential for firms involved in coaxial cable and fibre optics. Detailed information on these projects will be available at HiTEC '93.

DEFENCE AND SECURITY FORCES

As a result of the Gulf Crisis, the government is now in the process of reassessing the country's strategic military needs with a view to increasing the number of personnel as well as expanding existing hardware inventories. Until such time as the government

decides on a new direction for the defence and security forces, most major new purchases (such as tanks, multiple launch rocket systems, fighting vehicles) will likely be delayed. Nevertheless, as reflected in the 1992 national budget, Saudi Arabia continues to be a viable market for defence products.

Military Sales Potential - In spite of the lower-than-expected direct allocation for military spending, it is widely believed that funds may be made available for additional purchases. This is based on the following: First, about Cdn $17 billion of budget money that has not been allocated to any specific area. Second, money hat has been allocated for defence comes nowhere near the funding needed for the "big ticket" items that the government has indicated it would like to purchase (eg, new aircraft and tanks).

It should be noted that Canada was the fourth largest Western allied contributor during the Gulf Crisis (the other major Western allied countries being the US, Britain and France). This contribution, coupled with the fact that we are the only one of these countries not to seek financial repayment for our efforts, has served to strengthen the already favourable impression the Saudis have of Canada and Canadians.

COMPUTERS

The Computer market has evolved tremendously over the last 5-6 year period. For many years, large companies and the Government were the only users for many considerations including high cost, lack of knowledge and experience of the computer systems and their compatibility with the type of work in specific areas.

Times have changed: the use of computer software systems is now part of school programs, the population has acquired a high level of sophistication through their contacts with western companies; by reading on the subject; by visiting business and technology shows. More PCs are sold than before because of the increased use of the computer as an extension of the work done in the offices. More laptops and notebooks are sold for the same reason, and also because they are portable and take less place at home or the office for the same characteristics and capabilities as the full size model.

Another item that contributed to this evolution is the competition generated by a lucrative market. Ten years ago, companies and other users contracted big names in the computer industry such as IBM, Apple, Olivetti etc. The introduction in this market of the IBM, compatible "clones" assembled in Taiwan, Korea or India started a price war amongst dealers to preserve a market share or gain a new one by leveraging a smaller profit on their volume sales. This means that, even though more hardware is sold, the profit margin is thinner. The same situation applies to the software market. Pirating is practised on an extensive scale and is hitting ready made programs such as DOS, WORDPERFECT, LOTUS, and WINDOWS. While copyright is protected by a royal decree, the enforcement leaves much to be desired and pirates are profiting from selling software at a fraction of the original prices.

TUNISIA

Tunisia, with an area of 164,000 square kilometers is equal to half the area of the province of Newfoundland (371,690 km). As the southern part of the country is arid, all economic activities are concentrated, with the exception of oil and gas fields, in the north and along the coastline.

For international institutions such as IBRD and the IMF, Tunisia is considered a middle-income country with an average income of $1600 US in 1991. The population is estimated at 8.3 million people. Agriculture still represents one third of national assets and remains very vulnerable to annual rainfall. The most important crude materials in Tunisia are oil, gas and phosphate.

With a GDP growth estimated at 5.5 percent in 1992, compared to 6.5 percent in 1990, the Tunisian economy slowly resumes its growth levels registered before the Gulf War. The 5.5 percent GDP growth registered in 1992 reflects the good performance of the agricultural, textile and equipment sectors which contributed significantly to economic stabilization. In general, the country's industrialization is continuing in the context of liberalization, with the objective of reducing its dependence on petroleum resources. The major challenge for the coming year for Tunisia will be to enhance its economic relations with a more integrated European market and also with those more open to the Eastern European market.

Commercial prospects for Canada

The current level of Canadian exports to Tunisia is based on sulphur sales. In 1991, our exports totalled $58.9 million of which 68 percent was sulphur. Other major Canadian exports in Tunisia are newsprint, asbestos, aluminum, industrial machinery, telecommunications, medical equipment and engineering and consultants services.

Despite some purely commercial successes in terms of financing in 1991 and 1992, the major constraint for Canadian exporters in this market is still the absence of significant concessional financing. As a consequence, several Canadian firms have lost promising contracts to European competition, not because of the quality of the costs being too high, but due to the absence of attractive financing. Multilateral financing institutions, such as the World Bank and the African Development Bank, traditionally offer limited opportunities in Tunisia.

In this context, commercial niches are less numerous for Canadian exporters in Tunisia. The following sectors represent the best opportunities: telecommunications, petrol and gas, transport equipment, engineering and consultants services, crude materials and pollution control equipment.

TELECOMMUNICATIONS

The telecommunications sector in Tunisia received $500 million in investment during the VII year plan (87-91). In the region, the situation in the communications sector in Tunisia is comparable to those prevailing in other North African countries. A recent study made by PTTs showed that Tunisia ranked at the bottom among twelve countries able to compete with Tunisia on its external market. During the Seventh plan just completed, Tunisia connected 113,000 lines compared with the 203,000 initially expected. The level of subscribers in December 1991 was 330,000 compared with the 420,000 planned. The telephone density now reaches 4.02 lines per 100 people, rather than 5 lines per 100 people initially expected.

Development forecast for telecoms during the VIII Year Plan (1992-1996)

Installation of 460,000 subscribers' equipment, connection of 339,000 new subscribers for a total in 1996 of 669,000 Tunisia subscribers with a density of 7.4 main line per 100 people by 1996.

These objectives will require investments estimated at $1.26 billion, with $350 million dedicated to existing projects. New telecommunications projects will include public switching equipment - $373 million, transmission systems - $145 million, subscriber lines - $292 million. In addition, $100 million will be allocated to projects to be specified early in 1993. Sectors offering the best opportunities for Canada are: rural telephones, cable TV equipment and services, public and private switching, paging and radio-telephone system, microwave transmission links and spectrum management.

OIL AND GAS

Oil and gas reserves dominate Tunisia's energy resource base. Gas reserves with 80 million toe are more than double those of oil which are only 36 million toe. Oil reserves are enough to last about eight years at the current production rate of 4.6 million toe per year.

After ten years of decline, Tunisia's oil industry is finally on the rebound. Output is increasing, new discoveries are encouraging and there are plans to expand exploration in the coming years. The challenge ahead is to uncover substantial hydrocarbon resources, in using new techniques and rethinking drilling strategy. With energy consumption increasing by 5 to 6 percent a year, Tunisia is pushing the development of natural gas resources as an alternative to oil for domestic use, including electricity generation. At the present time, Tunisia's gas reserves are meeting less than 10% of primary energy requirements.

In this regard, two main projects are currently underway: the Miskar gas field and the World Bank project for the transmission and distribution system linking the north with

the south. The Miskar gas field, offshore Tunisia in the Gulf of Gabes, is to be developed by British Gas. The total cost of Miskar's development will be approximately US $630 million over a three year period. The development of the field will initially involve installing two offshore platforms linked by a 26 inch diameter pipeline to an offshore gas processing plant. Buying operations for supply of equipment and services will be concentrated at British Gas International based in Houston, Texas. The STEG project financed by the World Bank in the gas sector as mentioned previously is estimated at $100 million. Although this project is already underway towards completion, some opportunities still exist for Canadian firms in the technical assistance area. The products and services for which there is good potential are: vertical and horizontal drilling; pipeline maintenance and inspection equipment; process trains and equipment for oil and gas production; specialized equipment for oil fields and drilling operations and instrumentation, remote sensing, and data analysis.

TRANSPORT EQUIPMENT AND INDUSTRIAL MACHINERY

In 1991 and 1992, the transport equipment and industrial machinery sector represented our second largest export sector in Tunisia after sulphur. Our sales were mainly based on graders and industrial loaders, aircraft engines, spare parts for locomotives and diesel engines.

If we consider recent purchases by Tunisia in the urban transport and airline sectors, the best commercial prospects for Canada are: railways (long distance) with SNCFT's intention to buy 15 new diesel locomotives; construction and maintenance road equipment (graders) and mining pit equipment such as industrial loaders and specialized trucks. In the aviation sector, possibilities exist in the fields of civilian and military helicopters, aircraft engines and business aircraft. Otherwise, Canadian firms will probably be able to consolidate their position in the short term for spare parts for diesel engines used for locomotives and industrial machinery etc. With the future development of a new freeport in Zarzis, Tunisia will also have to improve its port handling equipment.

ENVIRONMENT

With the recent creation of an Environment Ministry, Tunisia has demonstrated its increasing interest in pollution control (air, water), especially in the Gabes area, which has been severely polluted for years by the phosphate industry. In this sector opportunities exist for sales of specialized equipment and services. This sector will benefit in the coming years from financing from World Bank and ADB and also financing from some European countries (i.e. Sweden, Germany etc.).

EUROPE

BELGIUM

OVERVIEW

Belgium is an open and dynamic market for advanced technology and defence products. Since 1988, total imports of machinery, electrical, electronic and transportation equipment and defence products have increased by some 30% to $48.3 billion. Around 80% of these imports originate in EC and EFTA countries. Canadian exports of advanced technology and defence products increased in the same period by 33% to $119 million. Canada has had particular success in the telecommunications, aerospace and railway equipment sectors.

When developing a European strategy, Canadian firms should take into account the fact that Belgium is an open market with few import restrictions, and a unique source of strategic venture partners. The following reviews the opportunities in the Belgian hi-tech market, providing for each sector (1) A Market Profile (2) Best Market Prospects together with Trade and Investment Promotion Activities.

DEFENCE PRODUCTS

The Belgian government has started reorganizing its armed forces (concentrating on rapid deployment and surveillance) and rationalizing defence expenditures. Future expenditures are likely to be concentrated on tank modernization; the continued purchase of Agusta helicopters; an automated system for military communication; the air traffic control program; the C-130 modernization; the F-16 mid-life upgrade; a vehicle replacement program; the tri-partite minesweeper program, and; a possible frigate upgrade.

The focus on improved communications and information systems as well as on modernization of equipment and repair and overhaul should offer good opportunities for Canadian companies. Given current rationalization in the Belgian industry, it is an ideal time for Canadian companies wishing to establish a presence in Europe to look for strategic venture partners. A defence products mission will be organized in April 1993, where exporters will have the opportunity to present their capabilities and examine market possibilities and meet with Belgian industrial counterparts. A briefing on NATO procurement will also be organized for mission members.

SECURITY EQUIPMENT AND SERVICES

The Belgian market was estimated to be around US $358 million in 1990 and is expected to grow at an annual rate of 5% throughout the 1990s. The many international organizations and multi-national corporations in Brussels have an ongoing need for

security equipment and services. Given that only a small percentage of the home and automobile market is equipped and that insurance companies are increasingly willing to cover only adequately equipped homes, significant growth is expected in this market segment. Security services (installation, monitoring, intervention) are provided mainly by foreign companies. Domestic supply accounts for around 27% of the equipment market, with the remaining (US $360 million) being imported. The U.S.A. has 38% market share, Germany 25%, France 19% and Switzerland, 10%.

The market for sophisticated, reliable products and services is considered the most promising. There is also a more limited market for non-professional low priced products, sold mainly through do-it-yourself distribution outlets and mail order catalogues. The post has proposed that a NEXOS mission and an incoming Belgian buyers' mission be organized in 1993-94. Canadian exporters might consider visiting the trade fairs Secura (Brussels, March 1993) and Top Security Expo (Antwerp, April 1993).

AEROSPACE, AIR TRAFFIC CONTROL (ATC) AND AIRPORT EQUIPMENT

The Belgian aerospace industry, active in civil aviation (Airbus), space programs (ESA), defence aviation and general maintenance and repair, has a turnover of $1 billion. Imports are $1.46 billion; exports, $1.04 billion. The market outlook for the aerospace sector is considered fair to good given trends toward air transport deregulation in Europe and anticipated participation in the Hermes space shuttle; the Airbus A350; the FLA (Future Large Aircraft), and the F-16 Mid-Life Upgrade.

Belgium is modernizing its ATC facilities. Upcoming projects include replacement of the ATC tower, radar simulation equipment and Doppler/VORS navigation aids. As for airport equipment, the new terminal at Zaventem airport in Brussels is going to be completed in 1993, at which time the old terminal will be closed for total reconstruction.

Good market prospects include sub-contracting on Belgian participation in European civil aerospace and space programs; sale of regional aircraft; repair and overhaul work; radar and tower simulation equipment, aeronautic telecommunications, data communications and advanced software. The post has proposed an incoming buyers' mission in 1993 composed of ATC equipment and simulation experts from Eurocontrol (European Organization for the Safety of Air Navigation) and the Belgian civil aviation authority.

TELECOMMUNICATIONS

The market is open and offers excellent investment/joint venture opportunities in the area of value-added telecom services. Although competition is strong with Alcatel-Bell, Siemens-Atea, Philips, AT&T, Ascom-Hassler and Ericsson being well established in the market, there is still room for new market entrants. The total telecom equipment market is estimated in 1993 at $1137 million, broken down into public switching

equipment ($271M), transmission equipment ($224M), terminals ($216M), private switching equipment ($147M), data communications ($113M), and mobile communications ($57M).

There are good market opportunities for PABX, GSM (cellular telephones), satellite communications and X.25 and other relay products. The post intends to have an information booth at the telecommunications fair TMAB in May 1993 at which time an Investment Canada seminar on the Canadian telecommunications sector will be held. An in-depth market study on the Belgian telecom market is available to any interested parties.

INFORMATICS - COMPUTER HARDWARE AND SOFTWARE

Belgium has a very competitive and open market for computer hardware and software. The local industry is composed of SME's and the sector is dominated by imports, with the USA having a 40% market share, Japan 25%, the Netherlands 10%, Germany 5% and France 5%. The PC market is one of the fastest growing hardware segments. As for software, some 38% of the market is customized, developed by small local software houses. Standard software is mainly imported with systems software and utilities accounting for 32% of the market; applications (eg. word processing) software for 37%, and; specialized application software (eg. data base management) for 31% of the market.

Best sales prospects are for advanced software, simulation software, GIS, system engineering and integration and niche hardware products. The post has requested funding for info booths at the trade fairs CAD/CAM (October 1993) and Software Automation (March 1994). Investment prospecting activities in the advanced software sector will be continued in 1993/94.

ENVIRONMENTAL EQUIPMENT

Massive public sector (roughly $8 billion) and private sector investments are being made in Belgium to bring public infrastructure and industry up to the level of new European environmental standards.

There are good opportunities for technology and equipment in the water treatment, toxic waste treatment and solid waste treatment and disposal sectors. An in-depth market study is currently being completed. The post has requested funding for an incoming mission and info booth at IFEST (the Belgian environmental equipment fair). Various investment prospecting activities (toxic waste, industrial waste water sectors) will continue in 1993.

BRITAIN

DEFENCE PRODUCTS & SERVICES

Britain is NATO's second largest defence spender with an annual budget of nearly $50 billion. About $18 billion is allocated to defence equipment expenditure during 1992/93. About 7.5% of that is imported, mostly from other NATO and Western European countries. UK defence expenditure is expected to decline only marginally in real terms over the next few years. In some sub-sectors, e.g. simulators and training devices, expenditure will grow.

Under the MoD's "Options for Change" statement, the Government has committed itself to "smaller forces, better equipped...with a higher proportion of modern equipment." Current UKMOD procurement continues to stress value for money. Competition remains a key theme. In 1991/92, nearly 80% by value of contracts were placed by competition or priced by reference to market forces, up from 50% in 1988/89.

The signing of the contract between the Canadian government and EH Industries Ltd. for the purchase of 50 EH101 helicopters marked the beginning of a stepped increase in the bilateral trade in defence goods between Canada and the United Kingdom. While most opportunities arising from the related Industrial Regional Benefits program had been nailed down by the time of the signing of the contract, some opportunities still exist to work with the sub-contractors to the main European principals, Westlands in the UK and Agusta in Italy.

In November, the UK Minister of State for Defence Procurement launched the "Defence Market Testing Initiative", aimed at exposing to outside competition in-house operations which are currently costing £1.2 billion (Cdn $2.3 billion). While trade opportunities are limited, they are strongest for management consultancies, data processing, insurance and engineering. Activities which will be market tested in all services include light and heavy engineering, facilities management, information technology (software support), storage depots, education and training, and maintenance of equipment.

COMPUTER HARDWARE & SOFTWARE

The main opportunities for Canadian suppliers are in the fields of specialist software and hardware. The Post has been especially active in the software area, both in seeking distributors and also strategic partnerships. A report, commissioned from Ovum in 1991, describes the UK software market in some detail. Copies are available through the Post in London.

The UK has been at the forefront of developing standards for software quality, with its *TickIt* scheme based on ISO 9000 principles. Already Sweden has adopted the same

scheme and other countries are showing considerable interest. Software suppliers should be aware of this scheme and the fact that it will become a compulsory requirement for software suppliers in the UK over the next few years. Details are available from the Post in London.

TELECOMMUNICATIONS

Radical changes in the UK telecom market have occurred during the past ten years, to the extent that it is the most liberalized market in Europe, if not the world. These changes are slowly being echoed throughout Europe, making the UK the ideal test-bed for new products and services. A unique feature of the UK is the ability of cable television operators to offer advanced telephony services to their subscribers, an area of major growth and opportunity which Canadian companies are actively pursuing.

However, competition is very intense because of the openness of the market and UK/European technical standards tend to be very different from those in North America. To succeed companies need to make a commitment to the UK market and be prepared to modify their products. Strategic alliances can be an excellent way to enter the market. A detailed report on the UK, French, German and Italian telecom markets has been commissioned from Ovum of the UK and is available from the Post in London.

AIR TRAFFIC CONTROL AND AIRPORT EQUIPMENT

In March 1992, transport ministers from the 28 member states of the European Civil Aviation Conference (ECAC) approved the *European Air Traffic Control Harmonization and Integration Programme* (EATCHIP). This $4.5 billion program is part of a package of measures to improve traffic flow in Europe's airways. The first phase to the end of 1993, will include a review of all methods available for the improvement of ATC at every ECAC airport, and their integration within the en-route system.

The UK Civil Aviation Authority is in the middle of a £750 million ($1.5 billion) *Investing for Growth* capital program to modernize and expand UK air traffic service. There are over 150 projects worth £100,000 or more, plus many smaller ones. Although this program has had to be stretched out, due to government borrowing constraints, the rate of capital expenditure continues to increase. Projects include improvements to the communications, navigation and surveillance infrastructure, improved distance measuring equipment, an improved air/ground voice communications system, and a new radar program for Scotland.

In May 1992, the BAA, the privatized former British Airports Authority, unveiled plans for its new proposals for a fifth terminal at Heathrow Airport. Current capacity at Heathrow is 42 million passengers a year. In 2016, with a fully operational Terminal 5, it would be able to handle 80 million passengers a year.

SECURITY

With the IRA difficulties, London bombings and other terrorist attacks, the UK has become a significant market and source for anti-terrorist equipment. The opening of European borders as a result of the Single Market will make the task of preventing terrorism more difficult and will require more sophisticated technologies to respond to the threat within a democratic society.

The UK Police market is expanding due to increases in manpower and the growing complexity of equipment. The market is worth about $300-400 million. This breaks down into communications equipment (45%), vehicles (25%), scientific and photographic equipment (15%), and other (15%). Nearly all the equipment is purchased direct by individual Police Forces, of which there are 52, not counting the specialized police.

The UK market for commercial security equipment is worth approximately $Cdn 2 billion a year. Turnover has kept up reasonably well during the recession. Future growth areas are likely to be those employing the latest technology - CCTV, access control, integrated systems etc., which make up around 30% of the total (the remainder being alarms, locks, grilles, safes and similar equipment). The UK is the largest market in Europe for access control, second largest (behind Germany) for integrated systems and is at the forefront of the EC in security technology. Canadian companies wishing to enter the market will need to offer something new technologically, and, although it is possible to set up a subsidiary, the most appropriate approach may be to work through a distributor.

AEROSPACE

With £12.5 billion ($25 billion) in sales, the UK is the second largest aerospace manufacturer in the world. Two-thirds of sales are exported. Between 1985-90, output rose 7 percent a year, while exports climbed 11 percent a year. For commercial airliners, growth was substantially boosted in Europe by the increasing market penetration of the airbus. In the nineties, growth has been throttled back, given the downturn in both civil and defence sectors. Some 10 percent of the commercial fleet is idle following a 2 percent decline in world passenger traffic in 1991. Doubts have arisen to what follow-up there will be to the Saudi Arabia/British Aerospace multi-billion pound sterling deal of the eighties. Despite uncertainty for most of 1992, the European Fighter Aircraft (EFA) project is to go ahead, following a decision in December 1992 by the UK, Germany, Italy, and Spain.

By and large, Canadian companies have not been involved supplying UK military aircraft. However, some Canadian companies have done good business supplying the BAe corporate jet, the BAe regional turboprop, and through BAE, the airbus.

SPACE

One hundred and sixty million pounds was spent in 1991/92 in the UK on civil space projects with at least as much again going on military developments. Of the £160 million **civil** space budget, 60% went to the European Space Agency (ESA) for European

funded projects and 40% to national programs notably £15 million to universities and research centres for research related to astronomy and instrumentation for non-international ESA science missions, and £40 million for earth observation. It should be noted that the UK commitment to ESA is expressed in ECU and could entail a cut in the national civil space budget for 1993 to compensate for recent devaluation of the pound.

Most commercial activities fall under earth observation (EO), the most active UK players being Matra-Marconi, Bae, EEV and SIRA. Major activities focus primarily on software and include: 1) handling and processing of EO data received from an Earth Observation Data Centre; 2) several programs related to ESA activities here again with particular emphasis on EO-related activities; and, 3) research and development of EO instruments notably advanced SARs and an optical mapping instrument. The best opportunities for Canadian companies in earth observation lie in joint research with UK companies or third country cooperation in Central and Eastern Europe.

Satellite production, a traditional field of competence in the UK, has been concentrated increasingly in the hands of Matra-Marconi, a French and UK joint venture. Matra-Marconi is proving an active bidder for satellite contracts opening up opportunities for Canadian sub-components or partnerships.

As do other European countries, the United Kingdom has its own program for developing **military** satellite communications. The UK is considering the potential for developing such a system collaboratively with France and other Europeans in a program which could involve Canada.

PACKAGING MATERIALS AND EQUIPMENT

The UK packaging industry generates $18 billion of business each year. Like many industrial sectors packaging has been affected by the current economic downturn in the UK. In addition to the difficult business conditions of the last few years, the packaging industry has undergone considerable structural change in the UK. Large industry groups have been formed to take advantage of the benefits of size, while others have disintegrated.

The demand for packaging products has fluctuated widely with the main focus of production on plastics packaging, corrugated fibreboard cases, folding cartons and metal containers. Combined, these account for $12 billion of sales. Other important sectors are labels, glass containers and laminates. Sectors in decline or with limited growth potential are paper bags/sacs, cellulose film, metal closures and aluminium foil. With many different packaging media available (plastic, board, wood, paper, metal, foil, laminate) there is considerable opportunity for packaging companies to develop new products for the packaging industry. Despite the turmoil of the last few years some sectors have shown increased demand (food and drink), however, white goods packaging

and much industrial packaging have reported reduced demand. UK packaging companies have been slower than their European competitors to reinvest in new technology and adapt to new packaging systems.

The environmental impact of packaging materials is a major issue facing the industry. Germany has already introduced regulations on the use and disposal of certain packaging products. It is likely that other European countries will move in this direction as well, sooner rather than later.

The main opportunities for Canadian companies are in the areas of quality packaging materials and equipment for niche markets and unique applications. Issues such as price, quality and reliable delivery are reasons for some buyers to continue to import packaging materials.

PLASTICS MATERIALS AND EQUIPMENT

The UK is a major centre for the development of plastics products and has been instrumental in introducing new applications for plastics materials in the packaging and engineering sectors. Plastics used for packaging materials amount to $ 5 billion of business each year. The plastics industry (products and equipment) has a sales value of $14 billion.

Opportunities exist in the areas of niche products in plastics material production and ancillary equipment. Recycling, repair and reconditioning of plastics products and plastic components is still an expensive and technical process. With increasing awareness of products' environmental impact manufacturers are becoming more aware of the extended life of plastics, their environmental impact and the opportunities for re-use.

ENVIRONMENTAL EQUIPMENT

The environmental sector has suffered less than many in the current UK recession, principally because tighter regulations imposed on industry by government have resulted in greater expenditure on environmental goods and services. For example, the market in industrial waste-water-treatment equipment is valued at $Cdn 140 million and is expected to grow by 15% a year until 1995, and domestic water and sewage treatment sales are estimated to be worth $Cdn 350 million.

The increased environmental controls can mean business for Canadian companies, and there are no significant trade barriers affecting Canadian goods. Duty on environmental equipment is generally in the range of 4-6%, and although compliance with the relevant British Standard (or ISO equivalent) is sometimes advisable from a marketing point of view, it is not mandatory. The only legal requirements affecting environmental products

are those applying to all goods: that they should be fit for the purpose for which they are designed and sold, of merchantable quality, and safe in use (although electrical equipment must comply with electro-magnetic-compatibility regulations).

UK organizations have considerable expertise in the following areas: water treatment; monitoring instrumentation; oil-spill clean-up; environmental consultancy; waste management; contaminated-site clean-up; and biotechnology. Nevertheless, there are niches in these sectors where Canadian firms can find markets - for instance, UV water-treatment is still uncommon, there is always room for new developments in biotechnology and site remediation, and specialist consultants with genuine expertise will be positively received. Novel recycling technology is also likely to be met with interest. The UK is relatively poorly served in incineration technology and general air-pollution control. As Britain's government has determined that a greater proportion of waste will be burned, companies with equipment for limiting the resulting environmental impact should have good prospects.

Since the privatization of the UK water industry in 1989 the newly-constituted companies have been active in seeking new technology in water treatment and have formed several joint-ventures and other partnerships formed in related areas such as solid-waste management.

ELECTRONIC EQUIPMENT

The UK market for electronic equipment is as sophisticated as any in the world. The domestic industry is reasonably strong, but both consumer and commercial users are more than happy to buy products from other countries if they fulfil their needs - thus Canadians should face no resistance due to "not-made-here" attitudes. The other side of this openness is that the market is competitive, and "me-too" products will find sales difficult to achieve; however, those which genuinely offer something unique are likely to do well if given adequate commitment and support by the Canadian manufacturer and his UK representative.

The recession has hit the electronics industry, and some sectors worse than others. The market for power supplies, for example, previously worth $Cdn 150 million, has dropped by about 10-15% in the last two years. This has forced some rationalization of operations, and several take-overs/mergers have occurred. For Canadian suppliers this is good in that there are fewer competitors, although those that are left will usually be the best.

All manufacturers of electrical equipment for sale in the European Community should be aware of the regulations regarding electro-magnetic compatibility (EMC) - this applies both to items which may cause electro-magnetic disturbance and to those which may be affected by it. Certain goods (e.g. active implantable medical devices) have their own specific EMC rules, but the majority are covered by the EMC Directive. This is a

European legislative document which came into force on 1st January 1992, although there is a transitional period until 31st December 1995 during which time manufacturers have the option of complying with member states' individual regulations instead.

MARINE TECHNOLOGY

The UK is internationally recognized as being a centre of expertise in marine technology, and is the headquarters of such bodies as the International Maritime Organisation and the Oil Spill Response Centre. Because of the concentration of interest in the marine environment, it offers good opportunities for specialist Canadian companies to sell their equipment and services for use not only in Britain but also elsewhere in Europe and further afield, through partnerships and through supply to projects coordinated in the UK.

Several Canadian firms are active in the market, some with straight-forward distribution arrangements and others in various forms of strategic alliance. There are some large domestic players, but the majority of the industry is represented by smaller concerns concentrating on specific technology or distributing to particular users. Many of these companies are willing to consider distribution/agency agreements provided that there is no conflict with their own products.

CZECH AND SLOVAK REPUBLICS

There is strong market potential in the republics and Canadian firms are enjoying increased success here. Exports in the first 9 months of 1992 were $64 million compared to total exports of approximately $15 million in each of the two previous years. Although marketing channels are still evolving, new private firms now play a key role in most sectors (eg. computer hardware/software), as opposed to large foreign trade organizations which formerly handled all imports and exports. Success in this market will likely require early visits by Canadian companies, given importance which Czechoslovaks and Slovaks attach to personal links and need for visibility to compete with strong German and Austrian presence in market. Although some opportunities may not be immediate given present low level of demand across all sectors of Czechoslovak economy, the time to establish contacts is certainly now. Service sector firms should consider establishing a permanent presence in the CSR in order to improve the quality of market intelligence. Although in many markets this would be a costly step, at the present time in the Czech and Slovak Republics it can be undertaken at relatively little cost. The Czech and Slovak Republics also pursue a very liberal import policy, under which no import permits are required and enterprises have unlimited access to foreign exchange.

COMPUTING/SOFTWARE

This will continue to be a significant area of growth, as Ministries and enterprises further introduce automation and modern info systems. Opportunities appear strong for Canadian producers of "niche" software or computer related materials suitable for Czech or Slovak markets. In addition, the need to extend or improve the use of EDP (for public as well as financial services) creates a requirement for specialized software. Larger Canadian software or systems integration firms who are able to situate experienced personnel in territory (ideally Czech or Slovak speaking) should do well, if they move quickly to take advantage of emerging opportunities in CSR. The major trade fair in the CSR for computer hardware/software is Invex BRNO, held in October of each year. Various opportunities also exist in the geomatics sector, particularly given the high quality of Canadian products. A substantial remote sensing/GIS project supported by a task force on assistance to central and Eastern Europe will provide an important reference point for Canadian technologies, which Canadian firms can take advantage of through active marketing. Opportunities exist for advanced information gathering software, (particularly as CSR users become increasingly aware of limitations of some of Arcinfo and integraph programs presently being purchased). In addition, strong potential exists for processing third country data within the CSR, given that skilled Czech and Slovak professionals are paid well below Canadian levels.

TELECOMMUNICATIONS

Modernization of their outdated telecommunications infrastructure is a priority of Czech and Slovak governments and is one of the areas targeted for World Bank and EBRD funding. The present CSR telephone network consists of approximately 2.5 million lines. There are plans to expand this to 5.5 million lines by the year 2000 through a digital overlay network, involving the installation of an additional 3.1 million lines as well as the replacement of 50% of current lines at an estimated cost of US $5 billion. More specifically, current EBRD programs for Slovakia call for funding of 28 local and primary digital remote exchanges with total capacity of 313,200 lines, 184,200 kilometre-pairs of copper cable wiring, multiplexors and cabling of 15,000 kms of optical fibre, PCM (pulse mode modulation) and equipment for digitalization of coaxial and long distance cables. In the Czech Republic, the program calls for 96 local and primary digital remote exchanges with total capacity of 378,301 lines, 668,000 km pairs of copper cable wiring, multiplexors and cabling of 42,110 km of optical fibre, PCM and equipment for digitalization of coaxial and long distance cables. Joint venture arrangements are in place with Bell Atlantic and U.S. West to establish data packet switching networks and a cellular telephone system. In addition, Alcatel and Siemens have been selected to provide approximately 60% of switching and transmission hardware for provision of digital overlay network. Opportunities may exist for Canadian suppliers of peripheral equipment for data packet switching networks.

AIR TRAFFIC CONTROL AND AIRPORT EQUIPMENT

The Czech Republic is currently in the process of upgrading its air traffic control equipment and related airport electronic systems. It is expected that over a longer timeframe, Slovakia will also undertake such equipment upgrading. A consortium led by a Canadian company has been selected for development of the Prague-Ruzyne Airport which should present opportunities for Canadian suppliers of airport related equipment.

SECURITY PRODUCTS

Security products represent an emerging market in the CSR, with electronic security systems likely to be an area of particularly high growth over upcoming years. One Canadian firm has already had success in exporting Canadian alarm systems for industrial, commercial and residential applications.

ELECTRONIC EQUIPMENT

The instrumentation/process controls sector offers increasing opportunities as CSR companies introduce more advanced industrial technologies and processes. Apart from possible export opportunities of instrumentation/process control products in a wide range of industrial sectors, Canadian firms could find opportunities for possible joint ventures or technology transfer as commercial electronics firms become privatized and seek to

become internationally competitive. Czech and Slovak firms recognize foreign partners as important sources of capital, modern technology and management techniques. Partnership arrangements can take the form of joint ventures, marketing, manufacturing and technology transfer arrangements.

ENVIRONMENTAL EQUIPMENT

Both the Czech Republic and Slovakia have extensive needs for environmental products and services, although expenditures in this sector will be limited by economic constraints facing the two governments. Approximately $410 million was allocated for environmental expenditures in 1991 with funding from domestic sources unlikely to increase significantly over the near term given competing demands for public sector expenditures. However, funding from multilateral sources (e.g. World Bank) should also be important in financing environmental work. Although identification of Czech and Slovak environmental priorities is difficult, the following areas will likely be of key importance: reduction of air pollution in the most severely polluted areas (eg. Northern Bohemia) including installation of flue-gas desulphurization equipment on the worst polluting facilities, reduction of major industrial sources of water pollution, including mandatory treatment of industrial wastes, control of ongoing toxic waste production, improving safety management practices of nuclear reactors and development of system for storage of spent fuel, development of monitoring systems focused on compliance to environmental standards and measurement of toxic chemicals and food contamination. It should be kept in mind that the CSR has considerable engineering and manufacturing capability in this area. However, Canadian firms with innovative, leading-edge technologies will find excellent potential in market. EnviBRNO is the major trade fair for environmental goods and services.

SECONDARY INDUSTRY MACHINERY

The CSR machinery industry is large and diverse, but not always state of the art. Again, Czech or Slovak firms are in search of joint-venture partners and could provide interesting strategic partnering opportunities for Canadian firms particularly given Czechoslovak strengths in research. A recent visit by the President of the Machinery Association Manufacturers of Canada identified packaging machinery as an area of strong potential for Canadian companies. Post anticipates a mission in this sector for 1993, possibly during BRNO fair in mid September which is this territory's most important engineering/industrial products event.

AEROSPACE

The CSR has a significant and successful aerospace industry. The firm Aero manufactures the LET 410, LET 610 (35-seat commuter aircraft), and L39 military training jet. As Aero seeks western markets for its products, opportunities could arise for Canadian component suppliers.

DEFENCE PRODUCTS AND SERVICES/ARMAMENTS

There is strong interest in converting many aspects of the CSR defence industry from defence to civilian production. Foreign participation in such a conversion is certainly welcomed, although interest has been limited to date. Canadian defence electronics firms with a "dual-use" orientation may find joint venture opportunities here.

DENMARK

KEY ECONOMIC INDICATORS

Canadian Exports to Denmark 1991: Cdn $160 million
Danish Exports to Canada 1992: Cdn $240 million

Economic outlook for 1993: Mixed. Positive balance of payments, low inflation, high industry productivity - stagnating production output, high/increasing unemployment.

Government: Minority coalition (Conservative - 18 December 1990).

ADVANCED TECHNOLOGY/INFORMATICS

COMPUTER HARDWARE

- In an overall European context, Denmark is one of the smaller PC markets. Overall, the number of PCs in Denmark is estimated at 700,000 and this is expected to increase to 1 million by 1995.

- Hardware vendors, including dealers, are under pressure due to declining prices and deterioration of the traditional distribution channels (Hi-Fi stores, supermarkets, photo shops, etc).

- LAN sales have experienced solid growth rates in recent years. 40% of Danish PCs are networked.

- There is also a market here for PC add-on/enhancement products, communications products, voice response, LAN cards, fax, teleconferencing, emulation, imaging and graphics boards. Furthermore, there is increasing awareness of the need for data security software and hardware (UPS, Tape Back Up, RAID etc).

SOFTWARE

The Overall Danish software market in 1992 is estimated at approximately Cdn $660 million and is expected to grow to Cdn $800 million in 1993. Packaged PC software accounts for approximately Cdn $150 million of the total Danish software market. Annual projected sales growth rates are approximately 80% to 90%.

In very rough terms, there is a market in Denmark for practically all types of software **other than** accounting/ administrative software and to a certain degree, 4GL products. 90% of the installed Danish PC base runs on DOS, OS/2 only 3%, and Apple Macintosh 2%. UNIX on PCs accounts for approximately 2%.

There is good market potential for: Communications software; Applications under Windows; DTP software (DOS and Apple); Graphics software; Utility/systems improvement software; GIS software; Technical software; Imaging software; UNIX is popular in Denmark, both in the private and business sectors.

DATA AND TELECOMMUNICATIONS

Danes are aware of Canada's strong sector capabilities in telecommunications and datacommunications and there is a definite positive attitude towards Canadian products and services. The telecommunications sector will continue to grow in the coming years as Danes complete digitalization of the telephone network and introduce ISDN. Deregulation on the equipment side has taken place and complete deregulation of the datacommunications services occurred on 1st January 1993.

The Danish telecommunications industry is significant by international standards in some niche areas and the main product categories are: cellular equipment, radio (mainly marine), fibre optic cables and telephone switching equipment.

Some expected growth areas are: ISDN bridging and routing products; Cordless voice and datacommunications (DECT); 2MBIT Datacommunication: substantial demand from Danish industry to lease 2MBIT lines; X.25: Denmark has a public X.25 service but users remain few (due to lack of aggressive marketing). As integration with EEC progresses, we foresee increased usage of X.25; Cellular: Two new additional cellular services were introduced in 1992 based on the GSM standard. One service is privately operated and the other operated by the Danish Government Telecom Agency; Increased sales of PABXs and datacommunications equipment is expected; Increased sales of voice response systems is expected; With the deregulation of public telephone network and data communication services, there will be increased demand from new service vendors for intelligent routing and billing systems; EDI (Electronic Data Interchange) and VANS (Value Added Network Services); Replacement of radio and TV broadcasting equipment.

The key players are TeleDanmark, a Government owned holding company controlling Telecom Denmark A/S (previously the Danish Post and Telegraph) and the four telephone companies: KTAS (Copenhagen Telephone Company), JTAS (Jutland Telephone Company), FT (Funen Telephone Company) and Tele Sonderjylland (Southern Jutland Telephone Company).

Where the five telecom utilities have had a tendency to compete with each other, both in terms of products and services, Telecom Denmark is now in the process of rationalizing and restructuring the telecom utilities in order to create a more unified identity. As a result, a large portion of equipment procurement will become more centralized. There are alternative distribution channels for telephone related equipment and software

products in Denmark. Several private chains are competing with the telephone companies in selling subscriber equipment and services.

At present there is extensive interest in telephone automation products, ie voice response systems, automatic attendants, teleconferencing products, etc.

CABLE SYSTEM

Introduction of a national Synchronous Digital Hierachy (SDH) transmission system is expected in 1992/93.

Telecom Denmark is heavily involved in sea cable communications projects and is a participant in the CANTAT 3 project which will connect Canada and USA to Denmark and Central Europe. Denmark already has a cable connection to Russia and may become a central coupling point for communications between North America and Eastern Europe.

ENVIRONMENTAL TECHNOLOGIES

The Danish authorities place a very high priority on conserving (improving) the environment. Consequently, a number of major environmental programs have been approved and are underway; for instance, the water quality improvement program (valued at approximately Cdn $3 billion). Furthermore, the Government places high priority on cleaner energy and major investments are expected in the power utility sector (gas) in the years to come. Denmark's own environmental technology industry, (including consulting engineering companies), is strong and has enjoyed success not only in Denmark but also in third country markets. They are keen to expand these markets. International suppliers interested in pursuing opportunities in Europe, (and of late Eastern Europe), are therefore encouraged to establish joint ventures/strategic alliances with Danish suppliers in this sector.

OTHER ELECTRONICS

Canadian companies with specialized electronic products are encouraged to contact the Embassy in Copenhagen for an assessment of their specific product.

DEFENCE

Budget

Overall budget: Approximately Cdn $2.7 billion
Procurement portion of budget: Approximately Cdn $425 million.
Offset: Normally 100% (administered by the Ministry of Industry in communication with the Confederation of Danish Industries).

IEPG Member: Yes

Possible upcoming projects

Air Force: F-16 Fighter upgrade (1993); Microwave Landing System (1996); Ammo/weapons for fighters (AMRAAM) (1994/96); Anti-radiation missiles (1996); Hawk missile system upgrade (1995/96); Mobile radar installation modification (1995); Gulfstream aircraft midlife upgrade (1996).

Army: Ammunition heavy calibre (1994); NBC supplies (1994); TOW missiles (1995); Small Arms (M75) (1994); Drone/RPV/ Artillery Target Detection System (1995/96); Night combat equipment (1996); Personal protection equipment (masks, eye protection etc.) (1996); Ammunition for Field Artillery (1999); Signalling equipment (1998).

Navy: The bulk of Navy spending over the next few years will be related to completing "Stanflex" and fisheries inspection vessel programs. "Stanflex" is a unique Danish/Scandinavian vessel concept with emphasis on a high level of multirole flexibility. Vessel design is modular allowing for rapid replacement of task related modules. For instance, ASW module can be replaced by mine sweeper module, etc. Danish Navy will be equipped with 16 Stanflex vessels.

New modules for Stanflex include MCM modules, ASMD and ASW modules (1994/96) plus 3 VDS systems (1998).

Other Navy Projects include: ASMD missile system for Corvette vessels (1992/97); Sea Sparrow missiles (1993); Replacement submarines (1996); Sea Gnat launchers and charges (1998); Fisheries Inspection vessels midlife upgrade (1994); Electro-optical equipment for coastal installation (1995).

STRATEGIC PARTNERING

Danish industry is generally characterized by small to medium enterprises which excel in niche-oriented products. Significant potential exists for Canadian suppliers of equipment and services to establish strategic partnering arrangements with Danish companies, for the EC Internal and Nordic markets and, in the future, Eastern Europe and the USSR.

FRANCE

COMPUTERS

In 1990, the computer hardware market in France totalled 85 billion FF, an increase of 9% over 1989. The market is expected to grow to 115 billion FF in 1994. The total number of computers in use in France during 1990 was over 114,000 units.

Operating Systems - The most striking recent innovation in computer operating systems is the introduction of Unix which has the flexibility ("portage") to be used with different operating systems. Nonetheless, Unix will not mean the elimination of operating systems specific to one manufacturer or one line of computers: MVS and VM at IBM or VMS at Digital, for example. In the micro-computer domain, it is likely that MS-DOS and OS/2 will continue to coexist and dominate a large share of the market.

SOFTWARE AND SERVICES

Software remains the most thriving computer market. Growth of over 20% is expected through 1992 prompted by the prospects of increased demand from the single European market. The fastest growing sector is software designed for specific operations (e.g., management, electronic data interchange). This software represents a third of the total market for software and related services.

The software and services market in France (software includes packages) is dominated by two key groups: hardware manufacturers, and companies providing only software applications and service known as SSII (Sociétés de Services et d'Ingénierie en Informatique).

TELECOMMUNICATIONS

The telecommunications industry is highly protected in almost every country in the world, and France is no exception. While almost all of the major international players are active in the market including ITT, ATT, Siemens, Philips, Ericsson and Northern Telecom, they are all affiliated with French companies.

With the current rewriting of the rules of the game, France Telecom, in addition to taking on a new role as a corporate body, owned by, but operating at arm's length from the state, has had its monopoly limited, and is competing in several areas with private firms. Spurred on by the EC green paper on telecommunications, France has separated the regulatory arm (the DRG) from the service provider (FT), provided new ground rules for private companies to enter the game (provision of value-added services such as data-base access), support services such as private networks and provision of data communications services, and radio-based telecommunications such as cellular phones.

Private firms can compete in each of these areas - but their participation is governed by different rules in each case.

Perhaps most important in these changes is that FT now finds that 15% of its income comes from competitive markets - up from basically nothing in 1987. Some Canadian companies have found that this need to compete has opened doors. FT, to strengthen its competitive position is more willing to consider buying clearly superior products regardless of their origin.

Any equipment that can be connected to the public telephone network in France, as well as anything using the radio waves, must be type approved by the Direction de la Réglementation Générale, with the actual testing being done by the CNET. Type approval can often be obtained more quickly if the exporter works in close collaboration with a French or EC partner, particularly if the partner is adding significant value to the product. Details on standards can be obtained from the Canadian Standards Council.

An EC directive that passed first reading in the fall of 1990, would require that each EC country accept the certification of telephone equipment accorded in any other EC country. This would benefit Canadian companies who find the certification of equipment easier to obtain in the UK or Germany as such certification would enable them to export their product throughout the EC. It should be noted, that the directive has not passed final reading, and it would not, in any case, come into effect until mid or late 1993.

ENVIRONMENT

The environmental market in France offers considerable potential for expansion. The growth of expenditures in this sector is likely to stimulate demand for products and services. National spending for the environment in France was over 77,9 billion FF ($15.6 billion) in 1991. "Domestic environment production" which can be defined as all activities carried out in the environmental area (water, air, noise, waste, ecology, recycling, insulation, etc.) accounted for 111,4 billion FF ($22.3 billion) in 1991, 1.7% of GDP. The percentage of companies forecasting investments aimed principally at environmental protection continues to increase: from 13% in 1989 to 19% in 1991.

The budget of the Ministry of the Environment was increased by 14.8% in 1992 from 1991, to a total of 1,459 million FF ($291 million). This spectacular jump demonstrates, for the third consecutive year, the government's commitment to the environment, as budget doubled from 1989 to 1992. Included in the policy are the fundamental programs such as protection of natural sites, water supply management and prevention of major risks.

The creation in 1990 of a National Plan for the Environment which outlined the government's policy for the next 10 years is an indication of the scope of the efforts in this area. One of the main objectives in the Plan is to reinforce international

cooperation against types of pollution which can only be combatted on a worldwide scale, such as to stabilize the level of carbon dioxide emissions and to eliminate the use of products which destroy the ozone layer. Finally, the Plan strongly advocates increased application of the "polluter fee principle" for wastes.

Cooperation between France and Canada - In 1991, Canada and France signed a Memorandum of Understanding for the purpose of increasing scientific cooperation between the two countries in the environmental area. This accord foresees the promotion of scientific and technical cooperation, notably in the following areas: management of major rivers and lakes, aquatic contamination, remote sensing, treatment of domestic and industrial waste water, management of wastes and contaminated soils, and meteorology. This accord calls for the exchange of personnel and scientific and technical information in a range of areas, including: policies and regulations, research, surveillance, training and communications.

Market potential - Canada has an excellent reputation in the French environmental sector and our companies could certainly take advantage of the opportunities available. Recycling activities and waste processing appear to be the most dynamic sectors in France. The market for incineration equipment is experiencing solid growth as a result of stricter standards on air pollution, representing a total of 1,938 million FF ($388 million) in 1991, up 10% from 1990.

With regard to the recycling of cellulose fibre, used glass and plastics, the growth in processing by tonnage was 2.5%, 8% and 10% respectively in 1991. In the area of water supply and sewage treatment, France's medium term needs are substantial. There is often an urgent need to upgrade systems, thus offering good business development prospects. It is only in the area of air pollution reduction (installation of air cleaning equipment and filters) that business is clearly stagnating.

Canada has acquired a good reputation in the area of environmental technologies and practices (e.g. treatment of industrial wastes, rehabilitation of polluted sites), and there are good prospects for entering this market. As the source of demand is often the public sector where procurement procedures are very complex, it is generally desirable for a foreign company to plan for a local relationship by putting emphasis on strategic alliances of various forms (joint venture, exchange agreements, technology exchanges, licences, co-production, etc.).

DEFENCE AND AEROSPACE

In spite of pressure due to the current slowdown in activity, this industry remains one of the largest in the Western world. The sector is characterized by its concentration (the 10 largest companies generate $20 billion, 75% of the industry's sales), and its specialization (the aeronautics and electronics industries produce 54% and 26% respectively of defence

sales). It is important to note that military and civilian activity are closely related, particularly in the aerospace and electronics industry.

Cooperation: How to enter this market - Due to the weakness of the traditional French markets, both domestic and international, and the ever-increasing costs of major civilian and military programmes, French companies are now searching actively for joint partnerships. This is particularly true within the European Community, where numerous civilian and military projects are being undertaken and negotiated. In the defence market, the General Delegation for Armament is the government body responsible for identifying French equipment requirements and making purchases for the French armed forces. Several Canadian companies have already signed supply contracts with this organization. Both the private and the public procurement process is very complex, and precise rules must be followed by anyone interested in this market. A detailed study of the procedure and its regulations is currently underway and is available at the Embassy.

In addition to the requirement for a product with distinctive comparative advantages (i.e. new technology, superior quality, competitive price), continual and personal contact is essential to succeed in France. For this reason, substantial financial resources are generally required and interested companies must be prepared to devote the necessary time. As France already produces and exports highly sophisticated products and equipment, its foremost interest abroad is to identify high technology products or services. Penetrating the French market often requires a foreign company to associate itself with local suppliers through exchange agreements, joint development, co-manufacturing, or other forms of strategic alliances.

MECHANICAL ENGINEERING INDUSTRIES

The euphoria of the 1988-1990 period with its annual 6% growth in volume is definitely over. For this industry in France, 1991 saw a harsh reversal, with a drop in volume of 4.5%. The decrease was 2% in value, with sales of 317 billion FF ($64.3 billion).

In addition, this sector was directly hit by the halt in industrial investment, thus losing 13,000 jobs last year, for a total work force of 532,000. The major difficulties are due to the slowdown of the domestic market, down 7%, and the outlook for 1992 remains grim.

Equipment manufacturing and metal works are the two principal sectors suffering from the recession, but manufacturers of public works, textile and printing, and farm equipment, and sub-contracting have all had a particularly bad year. However, the precision equipment industry managed to stay out of trouble, gaining close to 4%. Equipment for oil and gas has also experienced a relative recovery, and the tunnelling sector is fully booming.

The mechanical engineering industry is represented on the Stock Market by the following companies: Alsthom, CMB Packaging, Legris, Essilor, Strafor Facom, Dynaction, Jeumont Industrie, Merlin Gerin.

The machine tool sector, composed of small and medium businesses (PMI), and generating total sales of close to 70 million FF ($14 million) with a total workforce of less than 10,000 workers, has seen its production decrease by 15% in 1991. Despite apparent purchases worth 12 billion FF ($2.4 billion - 6th largest in the world), domestic production is valued only at 8 billion FF ($1.7 billion).

This industry has nevertheless weathered the recession better than the competition, due to its restructuring over the past several years, from which European size companies have emerged. This race for competitive size was won by the Brisard group which now earns half of its sales of 3 billion FF ($600 million) in machine tools. In the area of special equipment where the big names are Citroen Industrie, Renault Automation and Polymatic, partnerships of manufacturers are multiplying.

Foreign trade and industrial investments - The increased competitiveness of a large proportion of the 7,000 companies active in this industry generated a rise in exports of 2% to 144 billion FF ($29 billion) in 1991. As imports amounted to 155 billion FF ($31,4 billion), the trade deficit was brought down to less than 11 billion FF, with a rate of coverage of 93%.

In addition, it is important to know that industrial subsidiaries of American, Japanese, and German multinationals currently account for 20% of sales, 25% of capital, and 30% of export sales.

In the area of public works and handling-lifting equipment, the French companies Legris, Fayat and Manitou are at even keel with giants such as Caterpillar or Case IH (Tenneco Group). Legris Industries has bought Century II, an American company specializing in lifting equipment. Lovat Tunnel Equipment of Ontario will supply two tunnel drills to Campenon Bernard/GTM, the local company in charge of excavating for a new Paris metro and rapid transit line.

Finally, the difficult machine tools sector, where exports represent approximately 40% of total sales, has also regressed by 14.5% in 1991. In this industry, France is one seventh the size of Germany, and one third the size of Italy. Cooperation between France and Canada in this field is limited: Renault Automation with Valiant Machine & Tool for transfer lines, and Henri Line Machine Outil Ltee, a company of French origin, for gantry milling machines.

GERMANY

DEFENCE PRODUCTS AND SERVICES

Reduction of the defence budget continues to be a high priority for the German government. On 15 December 1992, the German Ministry of Defence unveiled its 10-year plan for 1994. The organization and equipment plans indicate a shift toward flexibility and mobility as forces are structured for crisis reaction commitment to NATO and anticipated missions within its UN commitment. Following are highlights of the approved procurement plans:

Armed Forces Equipment Projects - Light transport helicopter NH 90; Clothing and personnel equipment; Modern training and simulation technology.

Army Equipment Projects - Support helicopter; Weapons and equipment for light forces; Armoured transport vehicles; Light RECCE vehicle, armoured; Combat improved LEO 2; Self propelled 155mm Howitzers; Light army air defence systems; Battle training centre.

Airforce Equipment Projects - Stars or LAPAS aircraft for strategic reconnaissance with first aircraft operational (1997); Eurofighter 2000 to replace F-4F and MIG 29 (1996); National component of NATO air defence (1995); NATO identification system (1999); Modernize avionics of C-160 Transall (1994); Modify 4 B707 aircraft to cargo/aerial refuelling (1995); NH 90 to replace UH 1-D (2003); Modernize Tornado aircraft (avionics, flir, GPS) and acquire recce pods (1994); Modular stand-off weapon (1996); Improve Patriot capability for ABM defence (1995); Tactical air defence system to replace Hawk (2000); Acquire first lot of AMRAM (1995); Acquire second lot of AMRAM (1999).

Naval Equipment Projects - Ten 332 class mine hunters (1993); Six 404 class and four 123 frigates (1994); Commence construction of 124 class frigates in cooperation with Netherlands (1996); Commence construction of four 212 class submarines first lot (1997); another six in (2006); Update maritime patrol aircraft Breguet Atlantique (1996); Acquire new MPA 2000 (2005); 38 NH 90 helicopters (2003).

Canadian companies interested in these projects should consider establishing a joint venture or strategic alliance with a German partner. The German Ministry of Defence in cooperation with External Affairs and International Trade Canada will sponsor a mission of Canadian defence and aerospace firms to Germany in May 1993 specifically designed to foster these alliances.

AEROSPACE

Germany is one of Canada's most important markets for aerospace products. Canadair's Challenger and Regional Jet are enjoying great success as is Bell Helicopter Canada with its 412, 206 and 230 helicopters. Pratt & Whitney Canada and CAE Electronics have formed important joint ventures in the Berlin area and a number of component manufacturers are positioned to receive contracts from BMW Rolls-Royce for its new BR 700 series of aircraft engine. Despite these achievements, however, Germany is likely to be a more difficult place to do business in this sector over the next few years.

Dwindling international orders, a recession in the economy, a strong Deutsche Mark and severe cuts in defence spending are causing severe difficulty in the aerospace industry. As a result, there is a move toward retrenchment in an industry that is dominated by one company, DASA. In making procurement decisions German firms look first in house, second in Germany and third in Europe (largely because of the European nature of the industry).

Canadian companies have enjoyed success by offering unique niche technologies to Germany and by forming joint ventures and strategic alliances. External Affairs and International Trade Canada will be sponsoring an aerospace and defence mission to Germany in May of this year to assist Canadian companies in introducing themselves to the market and identify potential partners.

The major aerospace exhibition in Germany is ILA scheduled for 30 May to 6 June 1994 in Berlin.

SPACE RELATED EQUIPMENT

Germany is Europe's second largest space power. The Ministry of Science and Technology (BMFT) 1993 budget for space related activities is DM 1.8 billion representing 19% of the ministry's total budget. Of this amount, DM 1.23 billion is allocated to ESA and DM 586 million is set aside for national projects.

The present emphasis of Germany's space programs is on microgravity experimentation. Major private sector space-related activities include Spacelab D mission, DFS-Kopernikus, communications satellites, and participation in a number of cooperative space astronomy projects. Germany also has a direct broadcasting satellite, TV-SAT.

In April 1992, Germany announced an expanded relationship with the Commonwealth of Independent States designed to offset its mounting deficit problems with ESA. It is now linked with CIS in some 55 space projects, including the recent German-Russian mission to the MIR space station and an unmanned mission to Mars in 1994 and 1996.

Canadian firms can best penetrate this market through joint ventures and strategic alliances with German firms.

AIRPORT EQUIPMENT

Major expansion projects are under way at nearly all German international airports, notably Frankfurt, which is investing DM 1 billion per year through 1995. Cologne and Düsseldorf are adding runways, while Hamburg, Nürnberg and Stuttgart are building or upgrading terminals. National airports at Münster-Osnabrück, Paderborn and Bremen also have terminal expansion plans as a result of fast growing regional aviation. The most important current airport project in eastern Germany is the renovation, upgrading and expansion of Berlin-Schönefeld with costs estimated at DM 300 million. A new airport located south of Berlin is also in the planning stage and is expected to be completed by 2005. Upgrading projects are also a priority at all other airports in the five new states. The German Airport Operators Association (ADV) estimates that overall expansion outlays at German airports will be a minimum of DM 18 billion through the year 2000.

While overall planning and coordination of airports is under the administration of the German Ministry of Transport, each major German airport is a quasi-independent operating company organized in a public or limited liability company structure. The Federal Air Traffic Control Agency has overall responsibility for airport security. Funds for air traffic control and navigation communication equipment are therefore provided from federal budgets. Luggage and passenger safety equipment etc. is purchased and serviced by the individual state governments and operated by the airport authorities.

Major trade shows:

InterAirport	21-24 September 1993	Frankfurt
ILA	30 May - 5 June 1994	Berlin

SECURITY PRODUCTS

The German market for security equipment, the largest in Europe, is estimated at up to $3.2 billion, split approximately 60/40 between mechanical and electronic sectors. Security services, including monitor and alarm systems operating via telecommunications networks, add up to $1.5 billion. Steady growth is predicted through the 1990s. By value, sales of intruder and fire alarm equipment predominate in the electronic sectors, although higher growth rates are predicted for access and video control installations. Europe-wide, the German electrical/electronic association forecasts a globalization of the market, increased company mergers, and a growing systems' orientation at the expense of direct retail sales. Because of the heterogeneous nature of the sector, import figures for specific products can only be estimated. Some sectors, e.g. firm alarms, are dominated by foreign (European) suppliers. However, in general, direct off-the shelf

sales of imported products are small. There are select opportunities for export of both systems and components for Canadian manufacturers willing to work with German installers and suppliers or to establish locally. With the exceptions noted above, there is a well developed structure of German manufacturers and consultants, both large and small, within which Canadian companies can seek to establish a business relationship.

Adherence to German industrial norms and technical standards, although not mandatory, facilitates market entry. German voltage/frequency (220 V, 50Hz) and safety standards apply for electrical equipment. In addition, approval of equipment and installation firms by the Association of German Property Insurers enables reduced insurance premium rates, thus constituting an incentive to use goods and services certified in this way.

Major trade show:

Security '94	11-14 October 1994	Essen

ENVIRONMENTAL EQUIPMENT

While it is difficult to accurately estimate the total size of the German market for environmental equipment, given the fact that it covers a wide range of industries, it is safe to say that total annual requirements run into several billions of dollars per year. The industrial site clean-up and renovation of industries in the New Länder alone will require massive expenditure. Tough new recycling regulations are creating a demand for innovative approaches to the problems of collection, transportation, sorting and processing of waste products. We see opportunities for Canadian companies with specialized technologies in such areas as: ultrafiltration systems, anaerobic reactors/filters, metal salt recovery, treatment of organic waste, "oil from sludge" technology and UV disinfection systems. The best approach to the market for many of these Canadian companies would be through some sort of partnership or alliance with a German firm capable of integrating the Canadian products and expertise in complete packages. This approach could also have the advantage of accessing third country markets in Eastern Europe where German firms are well established and well connected. There are three key trade shows in the environmental sector in Germany. These are:

IFAT (waste water and waste disposal)	11-15 May 1993	München
Entsorga (waste management, Essen sewage treatment)	7-10 Sept. 1994	
Envitec (waste treatment, recycling etc.)	May 1995	Düsseldorf

SECONDARY INDUSTRIAL MACHINERY

While Germany itself is one of the world's leading producers of machinery, the market is open to foreign competitors and there exist market niche opportunities for Canadian companies with world-class technologies. Some of these are: plastics processing,

packaging, labelling, printing and book binding.

The key trade shows in these areas are:

K (plastics and rubber)	October 1995	Düsseldorf
Interpack (packaging machinery/materials)	6-12 May 1993	Düsseldorf
DRUPA (printing)	1995	Düsseldorf

ELECTRICAL/ELECTRONICS PRODUCTS

The electrical and electronics industry in Germany is one of the most important in the national economy, accounting for approximately 12% of total manufacturing turn-over and 15% of employment. Total turn-over surpassed the DM200 billion point and employment registered more than 1 million.

Growth in the industry started to decline in the last quarter of 1991 and has generally fallen victim to the lower economic growth seen in most industries in Germany during 1992. There have been some notable exceptions such as products used in the telecommunications sector where continued improvements by the Deutsche Bundespost Telekom has sustained the industry. The same has happened in data technology and consumer electronics, although the latter is now showing signs of weakening.

Japan and the USA are the most important foreign competitors in Germany. The USA is known for its technologically advanced products, while the Far East has penetrated the German market with lower priced products.

Canadian (as well as other foreign firms) will face tough competition in Germany, particularly in the Single Market. Exporters and their distributors will have to work more closely together to raise their (joint) investment in marketing and technical support. They will have to develop long-term strategies that will include long-term contracts (3 years minimum) and Pan-Europe pricing policies. Larger firms should look at the broader European market, while smaller firms would do better to concentrate on niche or regional markets.

The general market in Germany is good. Customers are open to foreign products; import duties are low (4-9% range), and there are no regulatory nor commercial impediments to business. Electronic components must satisfy certain safety, industrial and/or technical standards. These are available through the publishers for the VDE (Association of German Electrical Engineers), the publishers for the DIN (Deutscher Industrie Normenausschuss), the Standards Council of Canada, and the TÜV Rheinland office in Toronto.

There are two important trade shows in Germany; the Hannover Industry show held annually in April; and Electronica, held every 2 years in Munich. The next Electronica will be in 1994.

The Consulate General in Munich has prepared a detailed report on this sector that can be obtained from External Affairs and International Trade Canada, Western Europe Trade, Investment and Technology Division. Telephone (613) 996-3774.

COMPUTER PRODUCTS

Germany is the third largest computer products (software and hardware) market in the world and is in first place in Europe with almost 25% of the total European market. As the country with the highest GDP and the highest GDP per capita in the European Commission, and with an advanced industrial base, Germany offers significant potential for a wide range of computer products with business, industrial and consumer applications. Germany imports as much as 70% of its software (much of it from the USA), and therefore has developed a high degree of receptiveness to foreign products. As costs of industrial production rise in Germany, companies are looking for computer applications to lower costs, improve competitiveness and increase productivity.

The 1991 hardware and software market in Germany was estimated to be Cdn $35 billion and is expected to be $39 billion in 1992 and $42 billion in 1993. Canadian companies have a small but growing share of this market. When figures are in for 1992, we expect to see sales of $120 million. Canadian companies have earned a reputation as suppliers of both hardware and software of advanced design, functionality and consumer acceptance. Canadian firms interested in the German market must be prepared to work closely with their German representatives to provide local product support. In order to be accepted, products new to Germany should have a proven track record in the US market. This is important to German users as it proves that the products have received and passed the grade in the bench-mark US market. Small companies or those without a broad base of sales in North America will find the German market difficult and expensive (money and time) to enter.

Products with particular potential are: document management; system integration; telecommunications and interface software; CAD/CAM systems; networking products (LAN and WAN); PC add-on products and a wide range of peripheral equipment. However, this is not an all-inclusive list. Companies with internationally recognizable products should seriously consider the German market.

Trade shows are an important feature in the marketing of computer products in Germany and are a key way to promote to distributors and end-users. The largest of these is CeBIT, held annually in March in Hannover. Each year over 4000 exhibitors display their products and technologies to 500,000+ visitors. External Affairs and International Trade Canada is there with approximately 40 Canadian companies. In

1994 Canada will have added exposure as the Partner Country. There are smaller, specialized shows in Munich, Frankfurt, Stuttgart and Cologne.

TELECOMMUNICATIONS

As a recent independent study on the European telecommunications sector concluded, "... all else being equal, Canadian suppliers would be best advised to target initially the national markets of Germany and (to a lesser extent) the UK".

Since 1990, the telecommunications market in Germany has changed dramatically. This transformation has been brought about by the movement towards privatization of the Deutsche Bundespost-Telekom (DBP-T), a (wholly) state owned utility, the general liberalization and opening of the telecommunications industry in Germany, the standardization of the telecommunications regulations in the EC, and the comparatively backward (technologically) state of the German telecommunications system in Germany.

In 1993, the market for telecom equipment in Germany (in Canadian dollars) is expected to be $7.6 billion, and the end-user equipment market $4.2 billion. Already Europe's largest market, growth will continue for the next five years for the following reasons:

1. The extent of digitalization is unusually low (less than 20% of subscriber lines are digital). The DBP-T's conversion to digital switching and transmission equipment will result also in an expansion in the market for end-user digital voice and data equipment;

2. The liberalization of telecommunications services will provide rapid growth in the market for private networking equipment;

3. The DBP-T is committed to a substantial ($4.5 billion p.a.) investment program in the former East German Länder.

Canada generally is viewed in Germany as being one of the world's leaders in telecommunications equipment and services. Companies such as Northern Telecom, Mitel, and Newbridge have made significant penetration into a market that previously was difficult for a non-German company to enter. New Canadian firms must appreciate that there is still some residual preference for German products, particularly at the DBP-T level. Foreign firms must have local partners and must have a capability and willingness to work in the German language with local customers and end-users.

The certification process has been simplified and will become even easier in the future with the appointment of private testing facilities, including some located in North America. Companies should discuss early with the appropriate officials the certification process. The Consulate General in Munich can assist.

Because of the recent and rapid changes in the industry in Germany, the distribution network is not as sophisticated nor specialized as one would expect in a country such as Germany. Nevertheless, the vacuum is being filled quickly by companies previously in telecommunications who see new opportunities developing from the changes and growth. They appear to be keenly interested in acquiring new products and are open to those from abroad.

As in other sectors, Canadian companies interested in the German market should have the most up-to-date technologies, and products that have been proven in other export markets, particularly the USA. They must be committed in time, money and the support of senior management. CeBIT is the major annual trade show in the world for the telecommunications sector and all companies serious about the European market attend it in March in Hannover.

GREECE

DEFENCE

Although a small country, with a total population of about 10 million, Greece has historically dedicated a substantial percentage of its resources to defence. In 1991 the country dedicated 5.6% of its GDP to defence purposes, higher than that of any other NATO member. In 1992, about $3.1 billion of the national budget was allocated for defence, approximately 22% of that was for equipment purchases.

The country receives a substantial amount of NATO-cascaded equipment on FMS or other soft-credit terms. Greece has a relatively limited defence industrial capability, composed of about 70 firms, which are mainly involved in the production of machined parts for repair and overhaul purposes. Few systems are produced domestically, with the exception of some APCs (Leonidas type) and some naval vessels. The country possesses one aircraft R&O facility which supports all of the Armed Force's airframes. Greece is also capable of small arms and rocket/cannon manufacture.

Greece is in the process of implementing major upgrades to its defence inventory. Modernization of the 4 existing German Type 209 submarines is planned, including advanced fire-controls, electronics and engines, as is the acquisition of new fast patrol boats. The Air Force is planning replacement of the existing HU-17B Albatross fleet and is interested in the acquisition of new, small transport aircraft. The Army wants to modernize the Chinook fleet of helicopters and is planning improvements to the M48 main battle tank. Plans exist to acquire MRLS systems, C3, EW systems and tank simulators.

Each service arm of the Armed Forces does its own procurement via public tender and bids are subject to technical and financial evaluations. All major acquisitions are referred to the Minister and/or P.M. for final approval, making the procurement process less transparent than that with which most Canadian companies may be familiar. Several financial restraints force procurement authorities to place a high premium on price and financing. Canadian companies successful in this market have been so because of (i) an innovative product, with little competition, (ii) ability to supply under FMS or some other soft-credit system, or (iii) cooperation with some other prime contractor. Best opportunities exist in aerospace and vehicle components, ASW systems, mine countermeasures, NBC equipment, and communications and radar/EW equipment. Canadian firms must designate competent local representation for this market.

TELECOMMUNICATIONS

Greece is in the process of modernizing its telecommunications services, an evolution which is long overdue. Although there are a large number of telephone lines (4.5 million, or roughly 45 for every 100 residents), the quality of service is the lowest within the EEC. This has been caused by a lack of investment in new telecommunications infrastructure, and improper maintenance of existing equipment. The vast majority (86-88%) of the lines are switched by analogue/mechanical technology 20-40 years old,

causing many failures. The country has only in the last two years introduced paging services and data packet switching, and only in 1992 awarded two licenses for the operation of cellular telephony, making it the last EC country to do so.

Until now, OTE, the Greek Telecommunications Authority, has maintained a monopoly for telecommunications services. Procurement practices have been restrictive, resulting in excessive equipment costs and poor performance. This situation is now recognized as constituting a significant drag on the competitiveness of the country. An EC-sponsored and funded study has estimated that to bring Greece's telecommunications up to EC standards, an annual investment on the order of $600 m to $1b will be required until the year 2000. As a first effort, the government is undertaking a $750m "crash" program for Athens. Planning also calls for the entire country to be converted to digital switch by the year 2002. The government also intends to privatize 30% of OTE.

Opportunities in the market include digital switching systems, cellular and paging equipment, telephone hands, and customer accounting/service management software.

COMPUTER HARDWARE/SOFTWARE

The expenditure on computers does not exceed 0.5% of the country's GNP, an amount which is 5-10 times lower than that of its other EC partners. Despite this, the average sum invested by a single Greek industry in informatics has risen from CAD $60,000 in 1986 to CAD $206,250 in 1992.

Local hardware production is very small (it covers less than 6% of the local market) and consists mainly of assembly of PCs. Most major suppliers are now trying to "Hellenize" their software (i.e. convert it to Greek language characters). This means that much software (65.3%) now has Greek value-added content.

Greece's lack of production makes it totally dependent on large multinationals which compete energetically for sales. There are over 700 local companies that are involved with the representation of these firms. Given that the total market is small, sales competition is very stiff. After-sales service is generally very poor.

Canadian firms wishing to penetrate the market must seek an alliance with a strong local partner. Although competition in this sector is intense, opportunities exist for Canadian companies. Most promising are niche markets for specialty computer hardware and software in the areas of personal publishing and graphics.

CIVIL AVIATION

The civil aviation market is in the process of undergoing a substantial transformation, as a result of the country's integration into the EC. This is taking place in both the development of the country's airport and air traffic management infrastructure, and in the provision of air transport services.

Management of airport development issues is undertaken by the Greek Civil Aviation Authority (YPA). There are 42 civilian airports in the country, five of which handle over 1m passengers per year, the most important of which is Athens. The facilities of Athens are clearly outmoded and overburdened. The government has thus planned to build a new facility at Spata. This new airport, which is to be built by a private developer on a BOOT basis, will in theory be in operation within 4 years of contract award. This project will create opportunities in a wide range of products.

Within the Athens Flight Information Region (FIR), traffic varies considerably according to the season and the time of day. The country has only "approach" radars at its five main airports, which are capable of identifying aircraft within a 20 km radius. There are no civilian "en route" radars. The remaining 37 airports in the country operation on an IFR basis. Greece is in the process of upgrading its air traffic management system but further plans for ATC improvement are on hold pending completion of the Spata airport project.

Domestic air transport is the monopoly of the state-owned national carrier Olympic and this situation is expected to change as a result of the imposition of EC rules.

Both Olympic and EAV (The Hellenic Aerospace Industry) procure a wide range of aerospace and airline equipment. In each case, tendering procedures are used. It is strongly recommended that any Canadian firm interested in the civil aerospace markets in Greece engage the services of a competent agent.

SECURITY EQUIPMENT

Although Greece has one of the lowest crime rates in the EEC, security is becoming an increasing concern. Reliable statistics are difficult to find, but it is estimated that revenues of security services firms have increased over the last 5 years at an annual rate of 30-50%.

The main segments of the market here in Greece are: (i) private, (ii) industrial, (iii) government non-military and (iv) government military. The segment that has demonstrated the greatest growth has been the first category, private. 20-25% of all motor vehicles incorporate some type of anti-theft or anti-tamper device. This reflects the relatively high level of "car crime" (i.e. theft of radio or contents, or the vehicle itself) seen in Europe in general.

In each of the remaining market segments there is generally a greater reliance on human intervention, i.e. security personnel, rather than electronic or some other means of securing property. These persons are usually not well equipped, due in part to lack of budgetary resources, and a lack of coherence in assessments of security requirements.

The government's military requirements are more rigorously defined, but even here the emphasis is on human detection and deterrence. Some military installations, especially airfields, in the capital region, in Crete and in Thessaloniki employ perimeter monitoring systems, but almost all others outside of these areas have no advanced security control.

Potential requirements for both military and non-military government users include: perimeter and access control equipment, bomb disposal and detection systems, and airport security devices. Also in the longer run is a plan to introduce more sophisticated, temper resistant and machine readable identification cards and passports. All government acquisitions are made through a tendering process, which normally involves evaluation by both technical and financial committees. Whether one sells to government buyers or to private sector suppliers, alliance with a competent agent or representative is strongly recommended.

ENVIRONMENTAL EQUIPMENT

The environmental sector is one more sector which finds Greece far behind its EEC partners. The air quality of Athens, is rated by most measures to be one of the worst in the world, and water quality is very poor. Solid and toxic/hazardous waste creation has burgeoned, and as tourism is a major component of GNP, all these problems are poised to create not only immediate health risks, but long-term economic problems.

Greece produces 3.5 million tons of solid waste annually or 17.5 million cubic meters, with an increasing trend of 1% annually. The average Greek produces 310 kg. of garbage per year (the average amount per EEC resident is 300 kg per year). There are 5,000 landfills throughout the country which are insufficient to handle the output. 572,000 tons of toxic waste are produced annually and 2.5 tons of hospital waste per day is produced of which 4,885 kg is infectious waste, which is transported out the country.

Greece is also well behind the EEC norm in terms of recycling. It is estimated that only 20% of paper is recycled, 15% of glass and 26% of aluminium. Collection of garbage is the responsibility of each municipality, and only a few of them encourage separation of garbage at source, and there are no facilities to separate garbage on a more industrial scale. Any recycling done is done by the municipalities, small entrepreneurs and some industry. In the Athens region there are two units for the recycling of aluminum.

The Greek government is lacking in terms of the policy-making, organization, management and supervision that are required to take decisions and implement measures. Such environmental legislation as Greece does possess has been handed down from the EEC and thanks to such EEC directives and financing, some investments and projects have been started, including the construction of a major biological waste treatment plant for Athens and Thessaloniki.

One of the basic problems is the lack of public awareness of the need not to litter, to recycle and conserve. There is a basic need in Greece for virtually every form of environmental technology. For most product areas the level of competition is low. It should be noted, however, that most funds for projects in this sector are made available through the European Community which may, in some circumstances, bias the purchasing decisions of the Greek authorities in favour of European suppliers. If Canadian companies are to succeed, they will likely do so in areas where they have particularly unique product capabilities, and/or competitive pricing. They will also require strong local representation.

ITALY

BACKGROUND

While recent results for the advanced technology sector in Italy have been mixed, significant opportunities continue to exist and very much correspond to known Canadian capabilities in this dynamic sector. Italy offers outstanding long term potential for Canadian high technology products and considerable scope for strategic alliances and other forms of industrial cooperation. The Italian software and services industry continues to grow, and telecommunications and space activities, sustained by massive government investment, continues to post strong gains. With fiscal and structural problems hindering Italy's international competitiveness, the Italian manufacturing sector is constantly seeking productivity improvements through the use of the most sophisticated technologies. Planned restructuring of the Italian forces offers the promise of increased investment in high technology equipment. Industrial offsets from the EH 101 Helicopter Program offers good long term prospects for the Canadian aerospace industry..

Canadian Consulate General in Milan - The northern regions of Italy from Florence north to the boarders of Switzerland, France and Austria is the heart of industrial manufacturing and the private sector in the country, including: advanced technology, automotive, electronics/instrument and process controls, informatics and automation, environment, instrumentation, advanced materials and semiconductors, and medical devices.

The tens of thousands of small and medium sized companies here are responsible for over three quarters of Italy's economic output and have primarily been responsible for the major economic turnaround of the 1980's. These firms have a dynamic entrepreneurial spirit and a pragmatic and innovative approach to upgrading process technologies and production improvements to meet international competition. The Milan territory is the headquarters of the advanced technology industry associations and is the location for all this sector's trade fair activity in the country. The territory is responsible for the aerospace and defence sector production of Agusta, Breda, Oto Melara, Fiat, Fiar and for the telecommunication production of Italtel, IBM, Alcatel, Pirelli, etc.

Canadian Embassy in Rome - Rome is the seat of government and the national focal point for key aspects of aerospace, defence and telecommunications with regard to government purchasing and policies. Rome is the centre of Italy's large public sector which accounts for 30% of total industrial production and 66% of all R&D.

The territory is the headquarters of aerospace, defence and telecommunications industry associations, the Ministries of Defence, Industry, Transportation, Health, and Post and Telecommunications; the Italian Space Agency, and state holdings i.e. Radio/TV broadcasting and telecom monopoly carriers (SIP, Italcable, Telespazio etc.). Rome is also the focal point for Italian participation in EEC R&D projects i.e. Brite, Esprit, Race, Eureka etc.

Opportunities - Italy - Italy offers significant opportunities for the Canadian advanced technology and defence industries. While both posts in Rome and Milan can provide comprehensive analysis of the sub-sectors within the advanced technology sector, Canadian companies are urged to direct their inquiries keeping in mind that Milan concentrates on manufacturing, distribution, and private production. The post in Rome covers public sector activities and interests as well as policy and access questions. Furthermore, Rome coordinates both posts' strategy vis-à-vis aerospace, defence and telecommunications while Milan takes the lead in information technologies, electronics, environment, instrumentation, automation and other advanced technology subsectors such as medical.

ENVIRONMENTAL EQUIPMENT

In spite of a late start vis-à-vis other EEC countries, the environmental industry in Italy has been growing apace since the mid-Eighties. Important results have already been achieved in furthering collaborative projects between Canadian and Italian private and public corporations. A Memorandum of Understanding was signed in November 1990 between the Canadian water research centres in Burlington, Ontario and Halifax, Nova Scotia and the Italian Emilia-Romagna regional government. Milan Post led a 21-delegate Italian environmental mission to Canada in October 1992 to explore opportunities of collaboration on projects in Canada, Italy and Third Countries, with particular reference to Eastern Europe. Mission members participated in a workshop attended by 140 Canadian industry representatives. Three large Canadian environmental groups have since effected large direct investments in Italy, and many export sales, distribution and licensing agreements are under negotiation. The Italian environmental market offers great business opportunities for the introduction of Canadian products, systems and technologies. It has been estimated that in the industrial waste sector alone, investments of the order of Cdn $100 billion will be required between now and the year 2010. Other areas of great potential interest and scope for the Canadian environmental industry are waste water treatment, air pollution abatement, marine technologies, coastal protection and forestry management.

A trade fair and mission worth considering is SEP Pollution in Padua (March 94).

AEROSPACE

The principal firms in the Italian aerospace industry are Alenia S.p.A., Agusta S.p.A., Aeronautica Macchi S.p.A., FiatAvio S.p.A. and Piaggio S.p.A. Alenia, Agusta and Aermacchi are all owned by the Italian government. FiatAvio is, of course, a member of the Fiat Group, while Piaggio is an independent private firm. The vast majority of the Italian aerospace industry is state owned and dominated by the fixed wing manufacturer Alenia and Agusta in the rotary wing sector. Both of these firms work in close cooperation with the other major European aerospace firms on large projects such as Alenia's participation in the European fighter and Agusta's involvement with Westland in the EH101 program. The Canadian government's purchase of 50 of these helicopters will create many opportunities for Canadian firms as Agusta and its local suppliers attempt to fulfil their offset obligations. Milan is actively working with Agusta and its

local subcontractors to identify areas in which Canadian firms can participate in this project. Any firms which have been unsuccessful in the past in selling in Italy due to possible political reasons should now reinvestigate the market as there is political pressure on Agusta and its subcontractors to buy Canadian. Additional opportunities may emerge from the revamped European Fighter program (EFA), a $45 billion joint venture between the United Kingdom, Germany, Spain and Italy. The new program, renamed Eurofighter 2000 is designed to produce a lighter, less costly aircraft than previously envisaged. An initial investment decision for the production phase is due in Spring 1993 and the first aircraft are expected in service in 2000.

SPACE PRODUCTS

The Italian Space Agency recently manifested strong interest in an accord with Canada and a joint working group has been instituted between the two countries to identify specific projects for cooperation in the following areas: earth observation, telecommunications, space science and telerobotics. While remaining fully committed to ESA and to participation in ESA programs, Italy has recently increased its efforts to join in non-EEC space activity through bilateral space agency agreements targeted at specific projects. A principal example of this is the AST (Italian Space Agency) - NASA collaboration for the Saturn reconnaissance mission, CASSINI; the logistic aspects of the Freedom Space Station; the TSS (Tethered Satellite System); and the X-SAR radar program. Other bilateral agreements are with Holland for the SAX astrophysics program on high energy X band propagation; with Russia for Astelit, the Telespazio/Italcable telecom satellite system; and with Germany for X-SAR.

TELECOMMUNICATIONS

Investment in the upgrade and modernization of the Italian Telecom sector remains high. Growth continued in 1991 at 10.6% down from 12.3% in 1990. Niches in which Canadian companies can successfully penetrate this market include: network control; trouble shooting and optimization software; fibre optic components; instrumentation for network control; ISDN equipment and hardware/software for value added telecom service. In particular, opportunities for alliances with Italian companies are very promising for firms seeking a presence in the Italian market.

SIP, the national telephone company is investing more than Cdn $43 billion in the next five years to achieve 66% deregulation of the Italian network. Also, the Italian telecom sector is undergoing a process of unification and rationalization in preparation for the step by step EEC liberalization of a wide range of telecom products and services.

Trade fairs in FY 1993-94 worthy of consideration are SMAU (Milan in October) and SIOA (Bologna in April).

SOFTWARE

There is a growing demand in Italy for software products in particular. Recent market research on behalf of the Canadian government demonstrates excellent opportunities for

sales and joint ventures in niche areas such as CASE, CAE, CAD/CAM and specialized and technical software applications are growing steadily.

The increasing popularity of UNIX and ICON-based graphic user interfaces as well as funded government R&D programs in broad band communications (ISDN) and multimediality are sparking interest in 4th generation languages, object oriented programming and x-windows CASE software testing/control applications. In banding and finance, investment is ongoing in electronic fund transfer and distributed information-client/server applications in wide area networks. In retail distribution, POS systems are beginning to appear in larger outlets.

The Italian public administration sectors are beginning to make concerted efforts at synchronizing and harmonizing the automation of government services. Currently, a big push is being made towards the optimization of red-tape bureaucratic processes in which Italy is seriously behind. Projects are at various stages of development for the computerization of large data archives and the interconnection between databanks of various government archives and agencies. The concern over the huge public deficit and over controlling the underground economy have resulted in efforts to develop a national informatics strategy aimed at standardizing the citizen-government bureaucracy relationship around the social security number as in the US. Large government software companies have been formed within the major state holding groups to implement these strategies as well as to continue on parallel projects for the automation of territorial management, of the electoral process, of education, health care, etc. Trade fairs in FY 1993-94 worthy of consideration are SMAU in Milan (October '93), ICOGRAPHICS in Milan (March '94) and CQS in Milan (March '94).

DEFENCE PRODUCTS

Italy has introduced a new ten year defence model which will result in major institutional reforms, including reduction in manpower and reduced investment in new equipment. Italy's central position in the Mediterranean and its ties to North America and the Middle East will continue to be emphasized. At the same time, new global realities require the maintenance of a flexible military instrument with a high level of technological capability and the integration of all military branches. The new model anticipates a reduction of 40% from the ten year budget introduced in 1991. Nevertheless, with annual increments combined with inflation, expenditure is actually expected to increase by $16.4 billion over the period. While the amount allocated for investment in 1993 is projected to decline significantly, the brunt of the cuts falls on investment in new equipment. In 1993, expenditures will be Cdn $3.4511 billion, a decline of 16.4% over 1992. Expenditures on R&D will increase by 1.3% to Cdn $344.4 million. This includes support for international cooperation programs. However, in the short term, opportunities for Canadian companies will be limited by budget cuts and the reorganization of Italy's defence structure.

SECURITY

Public concern over increased crime rates and Mafia related terrorism in Southern Italy have turned security products into a growth industry. The growth rate of Italian demand for law and order enforcement equipment in 1991 was approximately 14%. This trend should continue in the next three years in almost all product segments. Imports account for approximately 30% of market share. Law and order enforcement equipment must comply with official technical standards issued by the Italian Technical Standards Institute.

Enforcement equipment is sold to Italian government police forces through specialized distributors and manufacturers by direct sales and bidding on public tenders. Most products are price sensitive. In order to penetrate the market effectively, Canadian exporters should focus on products with high technological content. Companies should supply complete systems, underlying the importance of software and electronics rather than low value-added hardware. Joint venture agreements may be explored with Italian partners. With distributors, intensive training and after sales service is important.

ELECTRONIC EQUIPMENT/INSTRUMENTATION

Canadian companies can be successful in niche areas such as the instrumentation and processing control subsectors, including image processing systems, artificial vision systems, knowledge based systems for machine-tools, CAE for electronic circuit engineering and testing, and non destructive testing equipment. Good opportunities exist within this subsector for Canadian companies to supply sophisticated instrumentation to Italian industrial machinery manufacturers who are successfully competing with Japanese and German producers.

A trade fair worthy of consideration is BIAS in Milan (November 93).

INVESTMENT, TECHNOLOGY TRANSFER, JOINT VENTURES

There are numerous opportunities for investment, technology transfers, joint-venture and other forms of partnering between Canadian and Italian firms in a variety of sectors. These include plastic machinery such as recycling, food processing and packaging; automation equipment and robotics; flexible manufacturing systems, and selective environmental equipment and services, amongst others. In most of these areas, hundreds of small and medium sized Italian companies have developed equipment which is often among the best in the world. Machinery is more often than not partly custom designed to suit individual users and often are based on the most advanced state of the art technologies resulting from the ingenuity and innovativeness of small manufacturing firms' owners. Other high tech subsectors with good potential for industrial cooperation activities include advanced materials (for application in electronics), software-based products and expert systems, integrated systems involving opto electronics sub-systems and production equipment and plastic parts for the automotive sector.

NATO

GENERAL OVERVIEW

The security situation continues to change worldwide and despite continuing trouble spots such as the former Yugoslavia, the perceived need for a large defence structure is declining. Virtually all European allies have announced deep cuts to the budgets and personnel of their armed forces. Not only does this affect the national procurement plans of nations, but it also has a trickle-down effect on what nations are willing to fund through multinational organizations such as NATO.

Traditionally, projects within the NATO sphere have been funded through civil or military budgets, or through the Common Infrastructure programme. This latter scheme has had a successful history of improving defence infrastructure in the allied nations. The focus has been on airfields, pipelines, air defence systems, communications systems, jetties and the like. From FY 1993, due to reduced funding from the United States, the scope of this programme will be drastically reduced. The contribution of each nation will also be reduced. As a result, the availability of funding for "new start" projects will be severely limited. However, there are indications that communications and air defence related projects will continue to be assigned priority status by the major NATO commanders.

NATO PROCUREMENT OFFICES

NATO Maintenance and Supply Agency, L-8302 Capellen, Luxembourg. NAMSA exists to support a variety of weapons systems on behalf of nations. Bulk procurement is also contemplated. The main market tends to be of the spare part variety but other lucrative business is available. It is suggested that firms register on the NAMSA source list.

NATO Communications and Information Systems Agency, 8 rue de Geneve, 1140 Brussels. NACISA is the recognized NATO agency for projects dealing with the CIS, ranging from ISDN telephone networks to satellite communications. NACISA also handles contracting for the NATO Integrated Communications System. A business plan is published which will be available for consultation during HiTEC.

NATO ACCS Management Agency, 8 rue de Geneve, 1140 Brussels. NACMA has been established to implement the air command and control system project, a huge alliance-wide air defence system. The early years of the acquisition plan foresee a focus on software development. Two industrial consortia have been established and it is recommended that interested firms contact them so that opportunities for Canadian involvement can be established. Details will be available at HiTEC.

NATO AEW&C Programme Management Agency, Akerstraat 7, 6445 CL Brunsuum, Netherlands. NAPMA runs the NATO AWACS programme from a non-operational standpoint. There is a large industrial participation programme in place in order to steer business to firms from contributing nations. The industrial consortium in place is called IAMCO and Canada is represented by Spar Aerospace. The IB focal point in Ottawa is Mr. Bill Prowse at the NDHQ Directorate of International Armaments Cooperation. Tel: 613-992-6810 or 992-0882.

SHAPE Technical Centre, PO Box 174, NL-2501 CD The Hague, Netherlands. The STC is the major research centre for the Supreme Allied Commander Europe. Its scientists conduct a number of battlefield studies, operational analysis, communications research etc. From time to time, the Centre requires outside consultancy assistance.

AFCEA Trade Show. In October of each year, the Armed Forces Communications and Electronics Association has a small trade show in conjunction with its autumn conference. Some firms may wish to consider a stand at this exposition as an entree to the NATO-wide CIS environment.

CONCLUSION

This brief report is meant as a general overview. A more complete report will be available at HiTEC for interested firms. While budgets will never again be as well funded as they were during the Cold War period, there continue to be opportunities within NATO for Canadian firms in communications technologies. Competition from European firms will continue to be fierce, but Canadians have had some success in penetrating this market, often in partnership with European companies.

NETHERLANDS

COMPUTER HARDWARE AND SOFTWARE

The total Dutch market for computer hardware, software and services in 1991 is estimated at between Dfl. 17 and 18 billion ($12.4 to 13.1 billion), representing an increase of some 6% over 1990. Sales of software and services, estimated at Dfl. 10 billion ($7.3 billion), represented over 50% of the total. In the area of computer hardware, as in other markets, the larger mini-computers are being replaced by increasingly powerful PCs. Many Dutch companies now work with a multiplicity of either stand-alone or networked PCs. There are good opportunities for PC-related hardware, mainly peripherals and add-ons, particularly in relation to the increasing use of PCs in data communications, i.e. LAN and WAN products. Many brands of IBM-compatible PCs are already on the market. Sales of laptops made a relatively slow start in The Netherlands, perhaps because of the high degree of personal PC ownership, but are now growing.

Both hardware and software sales have been decreasing in recent years. While the computing sector as a whole is still enjoying growth of some 6% a year, sales in 1992 are expected to be some 4% above those in 1991 and growth rates in 1993/1994 are expected to level off further to between 1 and 3% p.a.

Most software on the Dutch market is imported, mainly form the USA, although the domestic industry is growing. In view of different accounting procedures from North America, domestic suppliers are particularly strong in the standard business package sector. Use of UNIX is growing rapidly, which augurs well for overseas suppliers of UNIX-based software and hardware. Market opportunities exist in specialized (technical) software (e.g. graphics and CAD/CAM, desktop publishing, expert systems). Documentary Information Systems (DIS), including optical data storage, and Electronic Data Interchange (EDI), are two important growth areas, as are communications-related PC software and add-on products (e.g. LAN/WAN products, voice related systems).

The Netherlands is considered one of the most mature markets in Europe for Geographic Information Systems (GIS). There is substantial capability in this area with the local industry and, while this can sometimes be an impediment for overseas GIS suppliers, it means that there are good opportunities in The Netherlands for identifying strategic partners. The geographic and demographic differences between The Netherlands and Canada have resulted in different emphases in GIS expertise; while Canada leads the field in hard- and software for mapping large areas, The Netherlands excels in computer models for environmental monitoring and physical planning, for example, so that technologies developed in The Netherlands may usefully complement those developed by Canadian companies. Many Dutch universities are active in GIS research and the University of Utrecht is the largest GIS research centre in Europe.

The Netherlands Centre for Expertise in GIS (NexpRI), aims to support and promote the use of GIS. It has an extensive databank on institutions with a major interest in geographic information handling, on GIS projects and sources of GIS expertise.

INSTRUMENTATION

Annual sales of instrumentation are estimated at some Dfl. 6 billion ($4.4 billion). The rate of growth, while still a healthy 7% p.a., has levelled off somewhat over the past three years (in 1989, the growth rate was 9% p.a.). During the course of the 80's, sales in this sector doubled, as did the number of members of the influential instrumentation trade and industry association, "Het Instrument". Increased sales are mainly evident in industrial automation (around 10% annual growth) and laboratory instrumentation (8%). The growth rate for instrumentation for the medical sector is currently around 5%. The sector is characterized by a mixture of manufacturers, traders and, increasingly, combinations thereof. Imported equipment accounts for some 70% of total sales, Japan, USA, Germany and Switzerland being key sources of supply. An increasing number of trading companies are starting to manufacture or assemble at least part of their range. Some 6,000 foreign manufacturers are represented on the Dutch market. In spite of a technologically sophisticated, competitive market, good opportunities exist for suppliers of high quality instrumentation, particularly for industrial automation and process control applications, industrial electronics and (industrial) laboratory use. Increasing environmental concerns indicate a promising market for environmental monitoring instruments. The increasingly export minded local companies, often combining manufacture of their own products with import, distribution and sometimes assembly of foreign-produced instruments, can represent good opportunities for strategic partnerships and other commercial alliances for markets additional to The Netherlands itself.

There are good opportunities in this growth sector, particularly for instrumentation and process control equipment for application in industrial automation systems and industrial laboratories.

TELECOM/DATACOM

In light of the increasing convergence between the computing sector and telecom/datacom, it becomes increasing difficult to separate the sectors from one another. EDI and LAN/WAN hardware/software, for example, are growth areas which overlap both sectors. Generally, the Dutch telecom sector is felt to offer excellent potential for outside suppliers, following deregulation of The Netherlands PTT in 1989. The market is estimated at between $US 1.2 and 1.4 billion. Dutch industrial strength in this area is focused on a relatively small group of larger manufacturers, including Philips, which are members of the "Netelcom" association. Products from many foreign manufacturers are on the market. There are no particular barriers to Canadian products, although many telecom products need to undergo conformance testing to ensure compliance with local technical requirements. Canadian telecom/datacom

manufacturers have been successful in supplying voice mail systems (to the Dutch PTT), fax switching equipment and taxi dispatch systems; others are actively pursuing opportunities in data acquisition and control systems. EDI, mobile datacom equipment and ISDN-related systems are growth areas. A Canadian information booth has been proposed for the key telecom/datacom trade fair in The Netherlands "EuroComNet" (Amsterdam, December 1993).

ENVIRONMENTAL TECHNOLOGY

Recent information supplied by the Federation of Netherlands Industry (VNO) indicated current environmental expenditures by industry are around Dfl. 3.25 billion (Cdn. $2.37 billion). Bearing in mind these expenditures include such items as environmental taxes and overheads and at the same time considering expenditures by the public sector, a ballpark figure of some US $2.5 billion (Cdn $3.4 billion) does not seem unrealistic.

The level of expertise in environmental technology is high in The Netherlands. Notable strengths are in wastewater treatment, solid remediation and to a lesser extent, solid waste treatment and recycling. This means the Dutch are selective when it comes to sourcing of equipment/services. High quality, competitive pricing and innovative technology are essentials. Particularly in services and complete environmental projects, Canadian companies must compete with well known and large local firms using high quality technology.

The local expertise does offer good opportunities for Canadian companies for finding partners, for developing the Dutch and other European markets and the high level of demand in the market can represent good pros for Canadian suppliers of high quality, innovative equipment or technologies. Some items with good prospects include flue-gas desulphurization equipment, particulate emission collectors, gas chromatography, NOx and SO2 analyzers, flue-gas monitors/samples, reverse osmosis equipment, biological processing systems and (solid) waste recycling equipment.

A federally funded mission of some 15 Canadian companies, supported by an information booth, visited "Aquatech 92", the key water treatment technology fair in September 1992. A mission, has been proposed in conjunction with "Ecotech 93", a fair focusing mainly on solid waste treatment and recycling (Utrecht, December 1993).

SECURITY EQUIPMENT

The Netherlands market for security equipment is in a growth mode, in light of soaring urban crime rates and increased privatization of traditional police tasks. Particularly in electronic alarm and surveillance systems (including intruder detection), there are good prospects for competitive and high quality equipment. Computer security and protection of network communications systems is of growing importance, particularly in the light of increased use of EDI (electronic data interchange). There are no particular barriers to overseas products entering the Netherlands market and many overseas manufacturers are represented in the market. Local expertise focuses mainly on system integration rather than manufacture of equipment.

A federally-funded trade mission has been proposed in conjunction with the key local trade event, "Security 93" (Utrecht, October 1993).

ELECTRONIC EQUIPMENT

Following are some projections for the market in 1993 (in million of US dollars)

Data processing equipment	4,899
Office equipment (other)	368
Instrumentation and process control	3,600
Medical & industrial	475
Communications & military	793
Telecom	1,237
Consumer	1,163
Components (active)	903
Components (passive)	580
Components (audio)	442
Total	14,460

Manufacture in telecom equipment is focused on relatively few, larger local firms; much equipment is imported. Main industry strengths are in high value electro-medical equipment, some office equipment and military electronics.

A federally-funded "Nexos" mission has been proposed in conjunction with the main electronics trade fair in The Netherlands "Electronics 93 Amsterdam" (Amsterdam, April 1993).

AEROSPACE

The Netherlands' aerospace industry is a concentrated national enterprise, centered around the commercial aircraft manufacturer, Fokker. The German company DASA is in the process of purchasing a 51% stake in the Dutch company. Fokker has produced more than 1300 short-to-medium haul commercial airliners in the past three decades, initially the F-27 and F-28 and more recently the F-50 project and the F-100 fanjet. One of the partners in the Fokker 100 program is Bombardier Shorts (wings), and a major subcontractor of the Fokker 50 program is Pratt & Whitney Canada (engines). Menasco Aerospace has also been a long-time supplier to Fokker of flight control systems. Initial indications are that Fokker may in future specialize in passenger jets in the 100-130 passenger range. Since 1978, Fokker has been a European co-producer of the F-16 fighter aircraft for the Royal Netherlands and the Royal Norwegian Air Forces. The Netherlands Agency for Aerospace Programs coordinates research and development project funding for the Dutch aerospace industry, and the Netherlands Aerospace Group (NAG) is the industry association which is responsible for international promotion.

SPAIN

Market Opportunties

- Helicopters for Spanish Police Forces
- Engineering support project for Spanish Air Force F-18 aircraft
- Upgrading programme of Spanish F-5B aircraft
- Fuel Tanks for Spanish F-18 aircraft
- Trisonic wind tunnel and upgrading of existing tunnels at INTA, Spanish National Aerospace Institute
- Repair and maintenance programme for the GE 404 engines of the Spanish F-18 aircraft
- Arresting gear and hangar doors for Spanish navy frigates and carriers being built by Bazan in Spain
- Life Support Systems for Spanish Navy Helicopters and Armed Forces vehicles
- Software project for manuals of Spanish Air Forces F-18 fleet
- Computer equipment for Spanish Armed Forces
- TACAN Systems for military applications
- Air traffic control and airport equipment. This is another sector of interest, due to the planned expansion of the Madrid-Barajas airport
- Security Products - Explosive detection systems for Spanish civil aviation authorities and airports.
- Intrusion detection systems
- Telecommunications - Satellite TV broadcasting in Spain and the launch of the HISPASAT Spanish Communicatons Satellite
- Domestic receiving equipment and small diameter disc antennas
- Radio paging equipment
- Mobile Telephone Systems
- The law on cable TV will take a little longer to be approved, but when this takes place in the near future there will also be some possibilities for Canadian suppliers in this sector
- Data transmission systems for the Spanish telephone network is another sector of interest where companies such as Northern Telecom and Memotec are already experiencing some success
- Trade Fairs. The mission has requested to participate in Tecnova, a high technology trade fair to take place in Madrid in May 1993 with an info booth, and at SIMO '93 for computer hardware and software and office equipment in Madrid in November. Another possibility is to participate at SICUR '94, in March 1994 covering security equipment
- Environmental equipment. We have recently noted an interest in recycling process equipment, following the recent success of recovery technologies in Spain.

SWEDEN

GENERAL BACKGROUND

Geographical Data: Population 8.5 million
Area: 187,900 sq. miles (486,661 sq. km), including territorial waters
Length from North to South: 978 miles (1,574 km)
Greatest Width: 310 miles (500 km)
Total Length of Coastline: 1,680 miles (2,700 km)
Territorial Limit: 12 nautical miles
Land Frontiers: Swedish-Norwegian border 1,025 miles (1,650 km), Swedish-Finnish border 335 miles (539 km).

Swedish Industry: Mining and manufacturing employ nearly 1 million of Sweden's labour force of 4.4 million. Private companies account for 85% of industrial employment, national government (the State) less than 10% and producer or consumer co-operatives 5%. More than 40% of the people in the industrial labour force work for one of the country's 20 largest companies. Engineering, the largest sector of Swedish industry, accounts for more than 45% of industrial production and about 50% of Sweden's merchandise exports.

DEFENCE

Security Policy: Sweden has elected to be non-aligned and has not fought a war for nearly two centuries. In the event of hostilities, Sweden would be neutral. By guaranteeing that no foreign powers can gain military access to Swedish territory, Sweden aims to contribute towards security and detente in the Nordic area. This policy can only be credible by Sweden demonstrating its capacity to defend itself; hence Sweden has a strong, integrated defence system, based on the resources of the entire community. Sweden has applied for membership in the European Community (EC) and this basic security policy will remain in place at least for the short/medium term. Some modifications in the country's defence posture may eventually be made, but it is too early to say what these might be.

Total Defence: In order to be able to mobilize the whole community to resist threats and attack, Sweden has a so called Total Defence System, the military and civilian parts of which are mutually supportive. The aim is for this system to be so strong that the advantages to be gained by an attacker would not be worth the necessary loss of time and resources.

Expenditure: Every five years following comprehensive studies by a parliamentary committee on defence the Swedish Parliament passes a resolution on the aims and financing of the total defence system. On September 23, 1992 the defence budget was set at about CAD $7 billion with an annual growth rate of approximately 0.75% for the

years 1993-1997. 90% of this goes to military defence. Total defence accounts for an estimated 2.8% of GDP. A list of planned Army, Navy and Air Force deliveries and orders for budget year 1992/93 is available from the Commercial Division of the Canadian Embassy, Stockholm.

THE DEFENCE INDUSTRY

Sweden's defence industry is structured to contribute towards the credibility of the country's neutrality policy, by enabling the Swedish defence establishment to equip itself without risk of political commitment. 85% of the Swedish defence contracts is placed with Swedish suppliers, who in turn make foreign purchases for about 33% of the value of orders received. Together with the 15% awarded directly to foreign prime contractors, a total of about 37% of Sweden's defence budget is spent on imported equipment and services. Leading foreign suppliers at this writing are France, Norway and the U.K.

Current developmental projects include a new armoured combat vehicle, the BILL anti-tank missile system, STYX (anti-tank) smart mortar system, a night version of the RBS 70 anti-aircraft missile, a new Västergötland generation of Sterling engine submarines, land-to-sea and air-to-sea versions of Naval Missile 15, the 39 Gripen aircraft, and new base and combat control systems for the Air Force. A new main battle tank (Leopard 2, Abrams or Leclerc) will be purchased in 1994.

MARKETING IN SWEDEN

A Swedish representative is essential to selling defence equipment in Sweden and information on suitable candidates is available from the Commercial Division of the Canadian Embassy. Background information on military operational requirements is not normally available to foreigners and in addition to attending bid openings and pursuing commercial aspects of the military procurement process, a local representative with Swedish security clearance can provide invaluable guidance, without of course, divulging classified details to their foreign principal(s).

As noted above, Sweden places considerable importance on being able to assume (armed) neutrality in the event of a major European conflict. As a corollary of this, the country's military inventory must be locally maintainable, and many of its major systems have been designed and built by Sweden's 12 major prime contractors.

These prime contractors are naturally interested in maximizing their in-house development work and Canadian companies negotiating with Swedish companies would be well advised to involve their Swedish representative/consultant in such discussions to ensure a good balance between prime contractor desire and prime customer (FMV) = Swedish Defence Material Administration) demands.

The list of foreign firms represented or having branch offices in Sweden is a virtual "Who's Who" of the world's high technology industries. Furthermore, there is a high positive correlation between companies who don't win contracts and those without representation. Those phenomena underline the importance of the role played by local representatives on the Swedish market.

NON-DEFENCE

The typical Swedish company is heavily dependent on trade for its continued prosperity and Sweden total exports of goods and services account for about 35% of GDP. Sweden's exports, to a greater extent than most members of the OECD, mainly to Western Europe and North America. More than half of Swedish merchandise exports goes to five countries: The Federal Republic of Germany (FRG), the United Kingdom (UK), the United States (US), Norway and Denmark. Sweden's exports also differ somewhat from those of other OECD countries in that a large proportion consists of forest products and other basic industrial goods.

Sweden buys most of its foreign goods from Europe and North America, with the FRG and the UK alone accounting for about 25% of merchandise imports. Imports of machinery and equipment account for about 20% of the total. In recent years the overall volume of imports has climbed rapidly. Japanese cars have shown a particularly sharp rise in popularity and now account for nearly 30% of foreign-made passenger vehicles sold in Sweden.

Industrial and R&D co-operation with other European countries has intensified in recent years. In 1988, Parliament approved a government bill establishing guidelines for Sweden's policy with regard to European economic integration, especially the reforms that the EC plans to implement by 1992. The goal of this policy is to strengthen Sweden's role in European economic co-operation and an application from Sweden to join the EC has been made. EC membership is expected to be granted as early as the fall of 1993.

INDUSTRIAL INVESTMENT

During the 1980's, Swedish industry has shown a strong innovative spirit. This applies to relatively new sectors such as industrial robots, computers and biotechnology as well as more traditional specialties such as telecommunications, aviation, high-voltage technology and paper production. R&D efforts over the past decade include Volvo's industrial environment projects, Saab-Scania's commuter airliner (the Saab 340), Ericsson's AXE digital telephone exchanges and mobile telephone systems, numerous development projects at Swedish pharmaceutical and biotechnology firms, research in semiconductors at ABB Hafo and Rifa, Siemens-Elema's advanced medical hardware and Mölnlyke's new paper and plastic-based hospital products.

SELLING TO SWEDEN

As with defence products, a Swedish representative is normally required, e.g., a commission agent, importer/distributor or wholesaler. Swedish companies avoid buying through export agents. Quotations should be made on International Chamber of Commerce (INCO) terms.

TURKEY

TELECOMMUNICATIONS

Turkey's telecommunications system provides many opportunities for Canadian companies in the 1990s. Turkey's long-distance telecommunications network contains coaxial and fibre-optic cables and complementary systems, satellite earth stations, open wire carrier systems, and radio-linked systems. Until 1983 Northern Telecom, through its Turkish manufacturing joint venture NETAS, supplied almost 80 percent of telephone exchanges and lines. Since 1983 several European companies have also established local manufacturing facilities, including ALCATEL and Siemens. The Turkish Government has given priority to telecommunications sector development since 1984. Turkey is a signatory of the MOU for GSM (Pan European Digital Cellular Mobile Radiotelephone System).

All Turkish telecommunications systems are state-owned and operated by the national PTT. The PTT also provides Video Conference Systems, Teletext, Information Display Pager (IDP), Pre-paid Cardphones, Data Communication Services, Dial-up Modem Service, Data Network with Circuit Switching, Packet Switching Data Network (TURPAK), Teleinform via TV network (Teletext), New Teleinform Networks Data Communications System via teleinform terminals in different languages and at different protocols (CETP profile 1-2-3), Facsimile Communication, and Telex.

The PTT is planning to include in its network the following systems in the next five years: VAN (Value Added Network); colour fax system; special data communication services via satellites; ISDN; remote reading of water, electricity, and gas meters over telephone lines; VSAT (very small aperture terminals, 1500 units); No. 7 coding system.

Spectrum Monitoring Project: Turkish Radio Telecommunications Department (TGM) is expected to open a tender in 1993 to procure software and hardware for a nation-wide Spectrum Monitoring/Management System.

The Turkish telecommunications sector meets its requirements through domestic and/or international tenders. The PTT prepares its annual procurement plans and seeks approval and budget allocation from the State Planning Organization. Potential suppliers should introduce themselves in advance to PTT and be registered. The PTT asks bidders to submit with their price proposals a bid bond of 3-6 percent of the total FOB price and the successful bidder is always asked for a performance bond of 6-10 percent of the contracted price. It is possible to make unsolicited offers for telecommunications equipment to the PTT, and PTT also welcomes product introduction briefings by suppliers. Canadian companies in telecommunications should work through a local agent in the Turkish market.

DEFENCE

With one of the largest armies in Europe and a modern industrial policy designed to create an indigenous defence industry, Turkey's defence products market provides many opportunities for Canadian companies prepared to investigate technology transfer, joint ventures and other cooperation. The Armed Forces are partially integrated at senior headquarters level, with the Army as the predominant service. The Ministry of National Defence, the Turkish General Staff (TGS) and the headquarters of the four services (land, air, naval, gendarmerie) are all located in Ankara.

In 1985, a new agency was established to promote an indigenous defence industry, known as the Undersecretariat of Defence Industry (SSM). SSM directly reports to the Minister of National Defence and is responsible for administration and disbursement of special industry funds. In fiscal 1992, the defence share of the overall national budget was 13.48 percent or US $4,305 million. The defence budget in 1992 was 4.8% of Turkey's GNP and per capita defence expenditure is about US $65.

The U.S. has long been Turkey's primary foreign source for defence equipment. Other major suppliers are Germany, Britain, France, Italy, Canada, and the Netherlands.

Defence Projects under Evaluation - Low Level Air Defence System; 35 mm Gun Fire Control System; Mine Hunters; Coastal Patrol Boats.

Procurement Mechanism of Turkish Armed Forces - All Armed Forces requirements are determined by the TGS, following input from the services. Annual procurement plans are either implemented by the foreign or domestic procurement department of the Ministry of National Defence (MND) or by the logistics divisions of the services. MND and all military organizations must by law call tenders for procurement. Potential suppliers of defence equipment should be registered with the foreign procurement department of the MND and with the logistics divisions. This ensures direct and early notification of tenders to registered companies.

In MND tenders it is quite common that the bidders may be asked to apply discounts to their bids. In some high value procurements the bidders may be asked to offer "best and final prices" more than once. MND procurement regulations governing acceptance of the equipment delivered are very strict. In some MND tenders bidders are asked for a bid bond of 6% of the total FOB price and the contractor is always asked for a performance bond of 6-10% of contract price.

It is possible to make an unsolicited offer for defence equipment for programs which are not included in the current procurement schedule. If the end user of the proposed system is known, the proposal can be delivered to the Plans and Principles Department

of the relevant service. If the end user is not known, then the unsolicited proposal can be submitted to the Policy and Plans Divisions (PPD) of the TGS. Following evaluation, the equipment may be included in the next fiscal year's procurement. The supplier should mount promotional activity to ensure that the technical specifications are written around its equipment. Canadian companies active in the defence field in Turkey should work through a local agent in order to follow procurement programs closely.

ENVIRONMENTAL EQUIPMENT AND SERVICES

Turkey is a rapidly industrializing country which has regarded environmental deterioration as the cost of development. Lacking the necessary technology and resources in past years, the public and private sectors gave minimal consideration to environmental protection resulting in high levels of air and water pollution, particularly in urban areas. New legislation and public concern, however, have forced industry to be more sensitive to environmental issues. A growing market has developed for industrial and urban waste disposal and treatment systems, domestic water purification appliances, flue gas desulphurization equipment, biodegradable packaging, energy efficient heating and insulation materials, all of which offer export opportunities for Canadians.

ELECTRONICS SECTOR

The Turkish electronics industry depends on imports to meet production input requirements, such as printed circuit boards and microwave circuits. Production of consumer electronics has shown rapid growth since 1990. Some 1.5 million Turkish colour TVs are now exported annually. Electronic telecommunication equipment production increased substantially in 1991-92, and the export sales volume of such products was US $30 million in 1992. Local production of electronics telecom components can today only meet 25-30 percent of the requirements of the domestic manufacturing industry.

In the Turkish market there is potential for sales by Canadian suppliers of the following end products or their electronic components (figure in brackets is percentage imported).

- Voice Frequency Telecommunication Equipment (27)
- High Frequency Telecommunication Equipment (53)
- Electronic Industrial Equipment/Instruments (75)
- Electronic Consumer Goods (8)
- Electronic Circuit Boards (90)

COMPUTER HARDWARE/SOFTWARE

Turkey is rapidly approaching international standards in modern office equipment, automation, computers, and information technology. Broad diversification took place after 1980 in types of data processing equipment used by business thanks to locally-

established sales/maintenance organizations of most internationally-known computer and relevant hardware manufacturers. All major suppliers of data processing/transmission equipment from U.S.A., Europe, Japan, and other Asian countries have sales and after-sale service offices in Turkey. There is stiff competition in the Turkish market for computers, printers, display terminals, magnetic tape units, disks and diskettes, computer programs, word processor programs, relevant auxiliary equipment and systems, automated office equipment, mailing and addressing equipment, and automated banking and retail systems. There are also hundreds of companies providing software services.

The customs duty on imported computers and related hardware was reduced in 1992 to 1.7 percent from 16 percent, which has promoted Turkish import of less expensive equipment from sources such as Taiwan. There also are local companies assembling computers under their own brands with parts made in Japan and other Pacific Rim countries. While opportunities for Canadian companies exist, the Turkish computer market requires long-term commitment and establishment of local support services is essential.

LATIN AMERICA/CARIBBEAN

BRAZIL

ECONOMIC OVERVIEW

Brazil is currently Canada's largest export market in Latin America after Mexico, with two way trade totalling US $1.3 billion in 1991. With an economy ranked in the top twelve globally, Brazil continues to be a country of considerable relevance and potential for Canada. It is striving to overcome longstanding structural problems, hyperinflation and a large foreign debt. While efforts to put Brazil's macroeconomic house in order have been only partly successful, the opening up of Brazil's economy to imports has been particularly beneficial to Canadian exporters as demonstrated by our growing export trend towards manufactured goods. It is believed that the new administration of President Itamar Franco will continue the reform programs initiated by his predecessor, Fernando Collor.

COMMERCIAL OVERVIEW

With the repeal of several significant non tariff barriers such as market reserve, law of informatics and law of national similar, non tariff import restrictions are, in general, virtually non existent. Import tariffs are being gradually reduced, and should reach what are considered to be "normal GATT levels" over the next four years. This means that Brazil, until 1992 an all but closed market for foreign electronic and other products, intends to become a "free market", with minimal import restrictions. The previous restrictive regulations, intended to protect local industry are now history, and Brazilian industry has to compete on an equal basis with foreign competition.

ADVANCED TECHNOLOGY SECTOR

COMPUTER HARDWARE AND SOFTWARE

Opportunities exist in all areas, principally for state of the art products. Large multinationals present in Brazil (IBM, Unysis, Digital) who, by law were able to manufacture only mainframes, can now manufacture PCs. Apple and Commodore are now initiating activities in Brazil. Competition is heavy for computers, but excellent opportunities exist for specialized software and systems. The Consulate General in Sao Paulo will be participating in COMDEX SUCESU SP South America '93, to be held in Sao Paulo from 23-27 August 1993, covering computer hardware, software, systems and supplies as well as telecommunications.

TELECOMMUNICATIONS

New technologies in the telecommunications area are now becoming more prevalent in Brazil. Insufficient telephone lines are obligating the Ministry of Communications to

invest in specialized services (data switching networks, fibre optic links, mobile cellular) to upgrade the system to cope with traffic. The budget for telecommunications is slated at over US $30 billion for the 1993/97 period. Privatization of certain services (B band mobile cellular) depends on constitutional revisions scheduled for 1993. Opportunities exist in all areas including consulting services for mobile cellular systems, mobile and fixed cellular telephone services, consulting services for data communication systems, voice and data terminals and ancillary equipment, consulting services for optimization of satellite communication systems, IOS (KS and PBX) systems and ancillary products distribution, radio-based paging and trunking services and equipment, consulting services and systems for voice and data network planning and management, WAN and LAN data digital access and interconnect systems, short haul digital transmission systems, market research and survey services, small size switching networks and related services for rural applications, EDI and other VAN consulting, software and network services, fibre optics equipment and systems, specialized systems and software for value added and enhanced services, principally for integrated office systems. The Consulate General in Sao Paulo will be participating in TELEX PO93 - 3rd International Telecommunications, Broadcasting and Teleinformatics Exhibition, to be held in Sao Paulo from 13 to 16 April 1993.

SECURITY AND DEFENCE RELATED SECTORS

SECURITY PRODUCTS

Opportunities exist for sophisticated systems, mainly in niche areas such as sophisticated control systems for passports and x-ray equipment for airport security systems. Competition is very heavy in this area. Ministries interested in upgrading systems are the main buyers and normally request financing.

DEFENCE PRODUCTS

Available information indicates that the Armed Forces are on critical budgetary restrictions. The Armed Forces will concentrate on ongoing programs to the extent that current budgets permit, postponing new or non-essential projects for the future. The Aeronautics ministry will continue injecting funds into the AMX fighter (joint venture with Italy) project, and most probably inject substantial funding to Embraer attempting to make it viable enough to privatize. US $600 million allocated for SIVAM (Amazon region surveillance project), originally announced for the end of 1992 has been pushed to early 1994. The F5 refurbishing project has been delayed for at least one year. The Army and Navy have no large projects in the pipeline. All non-preferential projects are on hold. The Armed Forces in general are investing the minimum funds necessary to guarantee national security.

ENVIRONMENT

Excellent opportunities for Canadian companies exist in all sub-sectors of the environmental protection field. From basic sanitation to institutional development and training, the market potential is estimated at US $1.4 billion/year. Large IFI funding and strict environmental legislation have created good prospects for Canadian technologies. Projects like the clean-up of the Tiete River Basin in Sao Paulo, Guanabara Bay in Rio, new waste incinerating facilities etc. require technology and expertise in areas such as construction of sewage/water treatment plants, solid waste disposal and industrial effluent treatment, incineration and recycling (paper, metal, plastic, glass).

SECONDARY INDUSTRY MACHINERY

The Brazilian secondary industry machinery market is quite well developed. The need for up-to-date technology has become imperative since government has set aside the policy of import restrictions which helped local manufacturers. The Consulate will be participating in two major international fairs, Brasilplast '93 - a plastics industry fair ranging from raw materials to machinery and equipment, and FISPAL 93, a food industry fair ranging from raw materials to machinery and packaging equipment. Canadian companies are urged to participate in these events.

CHILE

ECONOMIC OVERVIEW

Chile, often referred to as the best example of a Latin American economic success story, is now entering its ninth consecutive year of economic growth. Indeed, over the last decade, Chile has registered an average real GNP growth rate of 6%. In 1992, growth reached 10%; inflation was 13%; unemployment was below 6%; and foreign investment reached a record of approximately US$1.3 billion. Chile is also becoming increasingly competitive in the global market. Chilean exports could achieve a value of US$10 billion in 1993 (growth of 65% over 1985 exports), and they continue to diversify away from the traditional reliance on copper (40% of Chilean exports in 1992 vs. 80% in 1980). Chile's trade surplus and robust economy allows the government not only to register a fiscal surplus but also to consistently meet foreign debt obligations on time.

Expectations for 1993 are equally promising. Current predictions estimate that GDP should grow by 6%; inflation will approach single digits; unemployment should dip to 5%; and foreign and domestic investment will increase slightly to a level of over 20% of GDP.

TELECOMMUNICATIONS

Chile's economy is heavily reliant upon resource extraction. Mining, forestry, fishing and agriculture continue to account for over 85% of Chilean exports, and over 33% of Chilean GDP. This resource based economy, though prospering, is limited by minimal infrastructure support. The far-flung nature of these industries (mining in the deserts of the far-north; forestry in the south; fishing along the coast) makes high-tech support very important. This is especially true of communications, with the decision-makers based in Santiago and the operations in the provinces. Chile's two major telecom operators, ENTEL and CTC, are both currently engaged in major expansion plans to respond to increased demand.

ENTEL, which enjoys a quasi-monopoly of the Chilean long-distance and international market, has worked extensively with suppliers such as AT&T, NEC and Northern Telecom, to design a two-year US$50 million expansion program. Key elements of this program include: installation of a national fibre-optic network; connection to the telecommunication networks of Chile's neighbours; the consolidation of its satellite transmission facilities; and expansion of rural microwave telephony capabilities. In 1992, ENTEL made profits of over $80 million.

CTC, Chile's dominant supplier of local telephony, is also launching an aggressive expansion plan (US$1.5 billion over 4 years) aimed at: bringing ratio of Chileans to telephones to 1 in 10 by the year 2000 (installation of 1 million new lines); expanding cellular phone systems; breaking into ENTEL's long-distance domain; and developing

better corporate service (i.e. to large data transmission users such as banks, multi-national companies and government departments).

COMPUTING

In 1991, the Chilean computer industry registered sales of over US$342 million, and the forecast for 1992 is US$400 million (the software component of this is valued at US$200 million). In 1993, this market should grow by another 12-15%.

The Chilean ratio of original software per imported computer is 0.2 (significantly higher than elsewhere in Latin America, although lower than the 1.2-1.4 of Europe and North America). Equipment sales continue to be brisk, with US$127 million worth of imports in 1991 (up from US$100 million in 1990), and a market break-down as follows: 55% PCs, 5% peripherals and the remainder mainframes and components. In the combined market of mainframes and personal computers, IBM has a 17.8% share; CIENTEC/ACER 12%; SONDA 7.5%; and OLIVETTI 5.1%. The top five companies command a 60% market share and 36% of the market (US$40 million) is imported. The industry is fully integrated to the global market with a high availability of advanced computer hardware as well as local and international software packages.

DEFENCE AND COMMERCIAL ELECTRONICS

Chief opportunities in this sector lie in the military and large-scale civilian works sectors (i.e. hydro-electric plant construction). The Chilean Air Force is currently pursuing a four-year (1992-96) US$100 million plus "Development Plan" which includes procurement of air traffic control (DME, VOR), navigation and radar aids. The Chilean Navy has awarded a Canadian company with a $65 million contract to lead construction of five naval coast-guard vessels. An important portion of this will be devoted to procurement of on-board electrical components.

INSTRUMENTATION/SECONDARY EQUIPMENT

Estimates of investment in Chile between 1993 and 1997 are:

- Construction (including mining) $ 4.9 Billion
- Non-electric Machinery $ 3.6 Billion
- Telecommunications $ 2.1 Billion
- Transportation Equipment $ 1.5 Billion

The geomatics sector, particularly in remote sensing/GIS, is also of growing interest. Applications in forestry, mineral prospecting, marine resource and ice management, as well as urban planning and agriculture were highlighted during a successful August '92 mission.

AEROSPACE AND SPACE TECHNOLOGIES

Canadian participation in the March 1994 FIDAE avionics trade show (Latin America's largest), will follow on a very successful 1992 show, in which 15 Canadian firms made over CDN $30 million in sales.

Included in the Air Force's 1992-96 "Development Plan" is the construction of two new airports plus a major expansion of Santiago's International Airport. While there are no official figures, this development is estimated to value from $100 million to $600 million.

Chile also intends to expand its satellite capacity (see Telecommunications) and is currently presiding over the CITEL (the Americas telecom and space communications regulatory agency).

ENVIRONMENTAL EQUIPMENT

Chile's nascent environmental rehabilitation sector is only now addressing the decades of neglect, evident in all sub-sectors: water pollution; air emission; solid waste; and industrial contamination. The new democratic government has significantly increased spending on the environment, put in-place stiff regulatory measures to reduce air pollution and is promoting ecologically-friendly development. The World Bank and the IADB are on-side with programs to both support the creation of the necessary infrastructure and to resolve specific problems (e.g. watershed managements, mining contamination, etc...).

The most-immediate area of opportunity is air-pollution. New gas emission regulations are now in force that will require 500 Chilean mid-size industrial plants to reduce particle emissions. Scrubber technology is at a premium, with no existing technology in place. Also pressing is the waste water treatment plans of Chile's 13 regional water corporations. With little modern technology in-place, plus spending plans ranging up to over US$ 1 billion (as is the case in Santiago), opportunities abound.

MEXICO

Outlook of Mexico's economy

In 1992, the Mexico's per capita GNP was of US 3'805.- with a 3.6% of growth rate for 1991, for 1992, year inflation rate was of 11.9% and foreign reserves by November 1992, were of US $18.3 billion. Currency at the end of 1992 was CDN $ = MEX Pesos 2472 approximately.

Economic Policy

Over the past five years, Mexican economic policy has featured a tough anti-inflation program involving government, labour unions and business spokesmen in an economic pact that has combined traditional austerity measures (tight fiscal policy) and unorthodox measures (wage, price and exchange rate controls). The pact has been successful in reducing hyper inflation from 159% in 1987 to 11.9% in 1992. The Mexican Government is taking supplementary measures since it desires to bring inflation rate down further. Objective for 1993 is 9%.

Parastatal Sector

Government has continued to streamline the parastatal sector by liquidating, merging, transferring and selling companies and reducing subsidies.

Deregulation of industry

Foreign investment regulations have been liberalized, allowing foreign majority participation in most economic activities. Rules for the transfer of technology from abroad have been simplified and liberalized.

Canada Mexico trade relations

Mexico is Canada's largest trading partner in latin America. Canadian exports to Mexico declined by over 30% in 1991 due to lower sales volume of traditional commodities. However, exports of high technology items have increased.

Canadian firms, seriously seeking to enter this market will have to consider the appointment of a local agent(s), the establishment of a representative office or possibly the formation of a joint venture with a local firm.

Opportunities

Mexico is turning into an open market and there is a strong demand for capital equipment that will improve productivity and quality.

TELECOMMUNICATIONS

Telefonos de Mexico (Telmex), the local private and only telephone company has initiated the improvement of its unreliable service with a three year modernization plan (1991 to 1993) with an investment for the period of million US dollars 7,200. It is estimated that 35% of that amount will be dedicated to imports. Telmex plans to spend in 1993, US dollars 3,000 million among others, in following:

a) to increase by 800 thousand the offer of telephone lines.
b) to provide rural telephone service to additional 4000 rural communities.
c) to install approximately 30,000 public telephones in the whole country.
d) to enlarge the service of the long distance network, with an increase of approximately 25,000 circuits.
e) install new digital central switching units to replace electromechanical switching (centrals). Simultaneously they will continue the construction of 13,500 kilometres of fibre optics, and will increase the offer of cellular telephony to 200,000 users. Telmex is assuring the systematic access to new technologies with the support of its technology partners France Telecom (France) and Southwestern Bell (USA).

SATELLITE COMMUNICATIONS

Telecommunicaciones de Mexico, a parastate firm, will consolidate its digital earth stations network to provide multiple satellite service. This company has already contracted with Hughes (USA), for the construction of two Mexican satellites.

MOBILE RADIOCOMMUNICATION AND NEW SERVICES

Cellular mobile total telephony service, will be extended to cover in total more than 80 cities. The Ministry of Communications is promoting the development of competition among suppliers of terrestrial, aerial and maritime mobil radiocommunication services. Services for transport fleets, human radio localization and vehicle radio determination: teletext, videotext, voice & data public network, electronic mail and video conference (local & international), will be promoted. An investment of US 12 million dollars is expected for 1993 for infrastructure and marketing of above mentioned value added services. Concessions to operate this type of services are already being granted to private companies.

COMPUTER SOFTWARE

The total computer software market is expected to grow at an average annual rate of 20 percent over the next three years and reach approximately US $1,550 million by 1993, the market for minicomputers in forecast to grow at an average annual rate of 17 percent and that of mainframes at an average of 6 percent over the next three years. The trends in the Mexican computer market, are toward the creation of networks of

computers to share information and system resources, and the use of smaller but more powerful hardware, such as laptops and multiuser systems.

ENVIRONMENT EQUIPMENT AND SERVICES

The state of the environment in Mexico has reached an alarming condition and the Mexican Government is responding with concrete actions. Environmental regulations by the Mexican Government combined with increased pressure from both the domestic and foreign public opinion have created a growing demand from the private sector for different sources of anti-pollution equipment and related services. Demand grew at an average annual rate of 9% between 1989 and 1992, from $US 217.7 million to $US 280.4 million with imports representing approximately 12% of the total market, imports growth is expected to increase at an average annual rate of 15% throughout the mid 1990's. Foresee good opportunities for Canadian companies in solid waste disposal technology, both for hazardous and non-hazardous waste, and engineering consulting in all environmental areas.

ELECTRICITY SECTOR

Demand for electricity in Mexico has grown at 6.5% per year and may grow to 7.5% although a program to encourage mexicans to conserve electricity is being initiated. In the generation of electricity, petroleum fired plants account for 60% account for 60% and Comision Federal de Electricidad (CFE) initiated a program to reduce it to 38.4% by year 2000 with construction of hydro, geotherm, nuclear and carbon plants. CFE is planning to enlarge generation installed capacity of 26.7 gigawatts to 32.7 gigawatts by 1994 and up to 47.2 G.W. by year 2000.

Opportunities for next two years. CFE is planning to distribute its budget as follows: 58% to generation works, 17% to distribution, 15% to transmission, 8% to rehabilitation of generation plants and 2% to various concepts. At present, there are two hydro electrical and two thermo electric steam plants under construction. There are projects in preparation, for construction of three hydroelectric and two thermoelectric coal plants (Puerto Altamira and Colmi) with credits from IADB and WB, CFE will dedicate 780 million US dollars. to the conversion and upgrade of plants (oil to coal) in addition and as turn key projects, a not yet determined number of substations and transmission lines will be required for the following two years.

AERONAUTICAL COMMUNICATION SERVICES

The aeronautical fixed telecommunication services are based on three communication networks: the microwave domestic, operated by the semi-state organization telecommunicaciones de Mexico; the telephone, operated by the private company telefonos de Mexico; the satellite earth stations operated by Seneam (Agency in charge of air navigation) and, also operated by Seneam, other radio links and microwave systems.

Future planning to improve the service

a) To increase remote station network from 32 to 54 stations.
b) To increase satellite earth station network from 16 to over 50 stations.
c) To increase central switching speed to allow instantaneous communications.
d) Voice and data transmission via satellite, linking adjoining domestic and foreign control centres.
e) Implementation of redundant local area network all over the country.
f) Air/ground communication digitalization.

Air navigation services

Navigational aids for enroute and terminal procedures are VOR, DME, NDB and instrument landing systems (operated in CAT I). The enroute radar systems are SSR.

Future planning to improve services

a) Installation of 3 NEW, ENROUTE, MONOPULSO SSR's.
b) Substitution of 4 VOR's and 2 ILS's.
C) Installation of 5 VOR/DME's and 6 NDB,s for the lower space.
d) Modernization of 20 DMS's.
e) Modernization of radar date processing units.
f) Modernization, with advanced technology, of the enroute and terminal radars.
g) Design of a domestic multi radar system.

Meteorological aeronautical system

Future planning to improve the system

a) Installation of 2 radiosonde stations.
b) Installation of one weather doppler radar at the AICM.
c) Extension of weather observation hourly reports.
d) Implementation of sigmet programs, creating 5 severe weather stations.

VENEZUELA

TELECOMMUNICATIONS

Among the different areas of interest, this one remains the most important, ever since the start of the privatization process, when the national telephone company, Compania Anonima de Telefonos de Venezuela (CANTV) was taken over in 1991 by GTE and a local consortium. Since then, the National Commission of Telecommunications (Venezuelan version of CRTC) Conatel, and the Ministry of Transport and Communications have granted concessions to at least thirty private companies in the following services areas: a) basic telephone systems (CANTV), b) cellular telephones, c) private telecommunications networks, d) data service networks, e) added value services, f) trunking, g) private company networks (petroleum and steel industry, and the Armed Forces). These concessions will be operated by local companies, many of which have formed joint ventures with foreign companies. Although these concessions have already been approved for the aforementioned sectors, this does not mean that the door is closed to further concessions. It is to be noted that one area in which concessions have not yet been granted are public service centres.

With these latest developments, there is still an existing potential for Canadian companies to offer expertise and technology in the area of service/operations, as well as supplying me required equipment.

Areas of potential business: a) rural telephone systems and mobile radio communications, b) satellite communications and teleports (service and equipment companies) to provide voice, data, and fax communications between cities in Venezuela and cities abroad, c) fibre optic cables, d) private networks.

Competition: Competition in the area of telecommunications is very strong, especially from the USA, Germany, France and Spain. Project financing plays an important role in most cases. Canadian companies will have to compete with strong local consortiums, and unless locally represented, will have little chance of getting their share of business.

HARDWARE/SOFTWARE INFORMATICS MARKET

The hardware market is well saturated and there is little potential for Canadian companies. However, there are still opportunities for software companies producing more sophisticated types of software, applicable to the petroleum and petrochemical industry, manufacturing plants (quality and process control), software applicable to environmental studies, forestry, agriculture and very important, cadastre.

Canadian market share in the area of informatics is still relatively small but could increase if properly marketed by Canadian companies in joint ventures with local firms.

DEFENCE PRODUCTS

In October of this year, Congress passed legislation approving funds in the amount of US $1.152 billion to be spent over the period from 1993 to 1999, to renovate different parts of the Armed Forces equipment.

Areas of Expenditures

Commissariat	12.50%
Armaments	29.88%
Transport	18.00%
Health Services (includes modernization of military hospitals and new medical equipment)	0.68%
General Procurement	0.12%
Aeronautical Equipment (helicopters)	12.10%
Engineering	10.65%
Communications Equipment	14.08%
Informatics/Hardware/Software	1.99%

Major maintenance services required: The Armed Forces presently operates equipment which is twenty or more years old that will have to be overhauled or replaced. The following areas are over thirty years old and will require serious attention: dental clinics, X-ray equipment etc., overhauling of AMX-13 tanks and armoured cars, trucks, 2.5 tons M-35, 1/4 ton trucks M-151 and M-825 (1967), 3/4 ton ambulances, portable radio equipment, mobile and airborne communications (purchased in 1967 and 1969). Also, soon to be replaced: the MAPATS missile system, the 160mm multiple missile launchers, telephone centrals and telephones, electronic components.

AIRPORTS

Most airports in Venezuela are in serious need of modernization. Specifically, communication systems and ground approach systems need to be upgraded. Control tower equipment also requires prompt attention. This area looks promising for Canadian service and equipment companies.

Joint ventures/local representatives: Canadian companies wishing to do business in Venezuela must seriously consider either one of two approaches: joint ventures or have a good local company to represent them. Without this, any efforts on the part of Canadian companies will be useless. This is a very competitive market, in all areas, in which many foreign companies have been doing business for many years. It is a market in which financing plays a major part (Japan, France and Spain are the biggest threats), and one which requires a lot of "shrewd" bargaining.

AEROSPACE AND SPACE TECHNOLOGIES

This remains an area of limited potential for Canadian companies.

SHOWS AND EXHIBITIONS '93

Canadian companies participating in HiTEC '93 may wish to take note that post has planned to participate in two important events this year: Comexpo 93 in May (telecommunications show) and Inforven 93 which will be held at the end of September (informatics/communications show).

IMPORT DUTIES AND RESTRICTIONS

There are no longer any import restrictions. Duties on products such as mentioned above can vary from one percent to a maximum of twenty five percent ad valorem, depending on the nature of the products.

ASIA PACIFIC

AUSTRALIA

MARKET OVERVIEW

Australia is Canada's sixth most important market in Asia-Pacific and fourteenth most important export market overall, with merchandise exports in recent years ranging from $1 billion to $700 million during the recession. The overall trading relationship is mature, diversified, and balanced. Canadian businessmen are well regarded in Australia, and climate, commercial practice and language combine to facilitate bilateral trade and joint venture arrangements between well-matched companies.

Business opportunities have been identified across a broad selection of sectors where trade development and promotion activities are planned by Canadian trade commissioners in FY 93/94. These sectors include: defence equipment, pay TV and telecommunications, CAD/CAM, environmental equipment, small satellites, software, forestry and mining equipment, and automotive parts.

The Australian Defence Budget currently totals AUD 9,885 million, and has been maintained in real terms at zero growth. Of this amount, $2,625 million is dedicated in 92-93 to the acquisition of capital equipment and logistics. The post in Canberra prepares and distributes, upon request, details of close to 100 current defence opportunities. Please note, however, that the status of projects is liable to change, as priorities change or expenditures are spread over several years.

Detailed project information on each of the following specific civil and military market opportunities will be available from the Canberra-based Commercial Counsellor attending HiTEC '93:

ARMAMENTS

CRV7 Rockets: MRAAWS Assault Weapon.

AVIATION - AIRCRAFT

Advanced jet trainer (MACCHI replacement); Maritime unmanned vehicle (JINDIVIK replacement); Utility helicopter for Royal Australian Navy; Helicopter for ANZAC frigates; replacement of 12 C-130E aircraft.

AVIATION - COMPONENTS

Airborne Early Warning/Control aircraft; P3C Upgrade; Navtrainer (HS 748 Avionics Upgrade); F/A-18 Hornet - upgrade; Generic Aircraft Research Simulator; F/A-18 - Software Support; Acquisition of B707 Simulator; Acquisition of C130 Simulator; Aerial Target System; HS748 Avionics Update; Advanced Air Defence Simulator; Kiowa

OH58B Simulator; Aerial Surveillance/Reconnaissance capability for Army; Seahawk Helicopter Systems.

AVIATION - AIRPORT EQUIPMENT/AIR TRAFFIC CONTROL

Automated ATC Surveillance Radar Systems at 6 RAAF bases.

MARINE

Deep Diving Equipment; Surface Towed Array (ASSTASS); Coastal Minehunters; Oceanographic/Hydrographic Ships; Target Simulation for FFG'S; Oily Water Treatment - Frigate; Acquisition of Training/Helo Ship; Acquisition of Offshore Patrol Boats; Mine Warfare Systems Centre.

SPACE

Military Satellite (MILSATCOM); Light Satellite Program;

ELECTRONIC EQUIPMENT, COMMUNICATION & SECURITY EQUIPMENT

Parare/Geo. Info and Mapping System; Vinson/Cryptography Equipment; Electronic Countermeasures; AUSTACCS/Communications System; Parakeet - Phases 1-6; Shoalwater Bay Communications; Special Action Forces Communications; Compact Tactical Message Switch; Navstar Tri-Service Navigation; Wagtail Combat Radio System; Replacement of Air Ops Communications;

MISCELLANEOUS DEFENCE PRODUCTS

Generator Sets (various); Dehumidifying Equipment; Night Vision and Surveillance Equipment; Radiological Monitoring Equipment; Target Range Simulation; Parachute Systems and Equipment; Early Warning Self Protection.

COMPUTER SOFTWARE

Local agents of Canadian software companies continue to successfully penetrate the Australian market. Market prospects exist for reputable Canadian suppliers of a wide range of products. PC93, to take place in Sydney, will have an Ontario Info-Tech mission attending and offers an opportunity for new exporters to this market. A recent CAD/CAM/CAE study by the post in Melbourne suggests this sector offers near term opportunities and a mission to Australia in May 93 is planned. The recent Canberra-sponsored mission on simulation technology opportunities identified a number of prospective contract opportunities.

Surveys, or updates of surveys, examining market potential in a number of industry sectors are in preparation for the following, and can be ordered from the trade commissioner attending HiTEC '93:

Telecommunications
Pay TV
Packaging Equipment
Robotics
Industrial process control and instrumentation
Re-manufactured wood products
Equipment and products for the handicapped/disabled
Environmental technologies
Cold weather equipment and products
Airport equipment, Australia and PNG

The following events planned for FY 93/94 are subject to funding approval:

CAD/CAM Mission	April 93
AIEE	May 93
Defence Sector Solo Show	October 93
New Exporters Mission	September 93
Remote Sensing Conference	March 94
Environmental Technology Mission	June 93
Software Mission to Canada	September 93
Products for the Disabled	October 93

CHINA

TELECOMMUNICATIONS

China has 174,000 km of public cable communication lines and much of it requires upgrading. It also has 3 million km of overhead lines and more than 30,000 km of microwave route. There is also 5,000 km of optical fibre communication lines. The public network has 9 million exchange lines and over 11 million telephone sets. This represents a density of less than 1.0 lines per 100 population, and between 2.5 and 4 lines in the most advanced cities. Residential telephone service is almost non-existent. About 1 million lines and 970,000 telephone sets serve the 800 million rural population. About a third of the lines are on manual switchboards, and about 80% of the transmission facilities are open wire. Domestic communications by satellite started in 1985. There are now 40 satellite ground stations in operation, many of them used by private networks, especially in the petroleum industry. There are two direct dialling stations in the country, one in Shanghai and one in Beijing, and direct dialling can be done from 310 Chinese cities.

In the seventh Five-Year Plan (1986-1990) Rmb 10 billion (US $2.68 billion) was earmarked for investment in the upgrading and expansion of telecommunications. The Plan's key targets were: 13.5 million telephone sets by 1990 (and 33.6 million by the year 2000); 30,000 mobile telephone accounts; 60,000 lines for long-distance calls; digitalization of 30% of the network; 2.5 - 3 million lines in key urban sectors; to establish a national telex network, and; a low speed data and public cable automatic and semi-automatic switching network. The plan was expanded, however, and the number of long-distance lines was targeted to reach 100,000 and the percentage of long-distance digital circuits was increased to 40%. The annual subscriber growth rate was targeted to reach 10 - 15% during the later portion of the plan and 10% between 1990 - 2000. By that time, there should be about 25 million lines.

The Ministry of Posts and Telecommunications (MPT) controlling the public network is responsible for about 65% of total telecommunications expenditures, the balance being made by "private" network operators such as the Ministries of Railways, Energy, Communications, etc.

On the manufacturing side, there are plans to import advanced technology and establish production lines for programme-controlled exchange facilities and for digital, microwave, optical-fibre and satellite communication systems. By the year 1995, the major coastal cities should have a telephone service density of up to 15%, but the average service density for the country will still be only 2.7 telephones or 1.7 exchange lines per 100 population.

In October, 1990, the Ministry of Posts and Telecommunications announced that investment in new facilities in the Eighth Five-Year Plan (1991-95) would be double that

of the previous Plan and reach U.S. $6.73 billion. MPT plans to achieve a 12% annual growth rate in communications handling capacity by installing another 6 million telephones, mainly program controlled models and 10,000 kilometres of trunk optic fibre lines as well as digital microwaves and satellite earth stations mainly in the eastern part of the country by 1993. Of the planned investment by China, about one third will be used to buy foreign advanced telecommunications systems and on research and development. Foreign soft loan financing is considered by the Chinese Government as a key element if projected-growth targets are to be achieved.

Telephone networks operated by different Ministries such as the Ministry of Railways, the People's Liberation Army, the utilities, etc. have accounted for 15-17% of total annual expenditures in the telecommunication sector. This represents U.S. $250 - 300 million annually. Current Chinese imports of telecommunications products (U.S. $980 million in 1990) put China just behind Canada in terms of market size. By the year 2000 annual expenditures on imports are anticipated to be U.S. $1.80 billion.

The eastern and coastal regions, because of their population density, have a potential for high density products such as optical fibre, cellular mobile systems, packet switching, datacoms terminals, and eventually ISDN. The sparsely populated northern, central and western areas constitute a market for satellite based systems. Once the major population centres have sufficient infrastructure, the rural areas will follow. It has been estimated that they will have a requirement for 9,000 small exchanges before the end of the century.

The public network will have annual requirements of 6.5 million lines for the next 5 years and about 10 million from 1995 to 2000. The prime high growth areas will be transmission (PCM, carrier and subscriber systems), microwave, satellite, optical fibre, and PABX. Datacoms and mobile radio will also see rapid growth, but on a much smaller base.

However, the Chinese Posts and Telecommunications authorities are exerting pressure for cooperation of all types in order to have as high a local content as possible. For instance, the MPT plans to source a large share of its central office (C.O.) switches domestically by 1995, through joint venture production. The type of technology transfer that China seeks entails some combination of a multi-year licensing contract, an elaborate training program and partnership in joint business ventures.

Until recently, procurement of telecommunications equipment was conducted at the central level by the MPT. There has been an increasing decentralization of decision making power for procurement, and part of it is now in the hands of the 29 provincial and about 50,000 municipal and rural network authorities. Funding still partly comes from the MPT, but at varying percentages depending on the population density of the province and its state of advancement. It is expected that investments will be eventually shared one third each MPT, provincial and local PTA.

The MPT decision-making power has traditionally been limited to the inter-provincial public long distance network. It also produces and promotes technical standards and for this reason, has an important say in the purchasing decision of the regional authorities.

SPACE

China launched its first satellite in 1970. Since then, it has launched 12 recoverable satellites for remote sensing and micro gravity experimentation, 7 communications satellites, of which 5 were successfully launched into orbit (the 1st and the 7th, which was the latest, launched last November, did not make it to orbit due to launching failures), with 3 still in operation, and 2 weather satellites. The three operational communications satellites, all at C-band are now being used for TV transmission, educational programming, and communications.

The Chinese Academy of Space Technology (CAST) is now developing Ku-band satellites and is also working on mobile satellite (which is based on UHF instead of L-band because of customer requirements). They are also interested in Ka-band, which they see as the technology of the future, and would be interested in cooperating with Canada in this area.

COMPUTER SOFTWARE

There has been little activity by Canadian software companies in the PRC to date. However, the very large contingent of Chinese delegates attending the Softworld Forum in Vancouver in September, 1991, and the ensuing business appointments arranged for them in Vancouver, Toronto, Montreal and Ottawa, indicated a high level of interest by the Chinese in forming strategic relationships with Canadian companies. The recent announcement by the PRC government on intellectual property legislation will be beneficial to future trade activities, but experience in the enforcement of such legislation is required. The Chinese displayed great interest in Unix applications and development tools.

In November, 1992 a small delegation organized by the Information Technology Association of Canada visited the PRC. The China Information Industry Association arranged meetings with software development organizations in Beijing, Shanghai and Shenzhen. Strong interest was expressed in joint venture arrangements.

TRANSPORTATION

Sector Background - China's transportation infrastructure has significantly improved over the past decades. It is key to the country's economic development. China has a major railway system equal to that of India with over 50,000km. Most of the rail system travels from North to South. The country has thousands of kilometres of roads, however, only a few are paved. The automotive industry has grown by leaps and bounds particularly in

manufacturing heavy vehicles. Every year China manufactures about 500,000 vehicles. Urban transit in this Country is still at an early stage. Only two cities have a subway, Beijing and Tianjin. The Shanghai metro is under construction. Aviation is one of the most developed sub-sectors in the PRC. China manufactures many types of civilian and military aircraft and aviation components. The country has several agreements with foreign aircraft manufacturers to supply sub components. There are seventeen regional airlines and one international carrier. China's harbours have significantly expanded in the last decade. There are three major harbours: Shanghai, Tianjin and Dalian. The PRC is one of the world leaders in shipbuilding.

EXPORT OPPORTUNITIES

Harbour: Opportunities will be limited to consulting contracts for project management of the construction of new harbours as well as to the provision of traffic control and communication equipment. Financing from the World Bank and the Asia Development Bank.

Aviation: In the course of the next ten years, China will modernize at least twenty of its airport's air traffic control equipment (ATC). China will purchase flight simulators, airport maintenance equipment and a limited number of small aircraft, similar to the Dash-8.

Financing: Most of the financing for the goods and services imported by China in the transportation sector will be provided by international financial institutions such as the World Bank and the Asian Development Bank. As well, funds will be available from OECF/Japan, a large untied loan to China. On occasion, the Ministries will use their foreign exchange quotas to purchase much needed equipment. This is particularly so for the Ministry of Railways and CAAC. The World Bank will primarily focus its future activities in the railways, road and harbours sub-sectors while the OECF will finance projects in the railways, harbours and aviation sub-sectors.

ENVIRONMENT

The rapid industrial development which took place in China in recent years has resulted in a deterioration of the environment.

As in any industrialized society, the benefits of preserving the environment must be weighted against the cost of a reduced output or of a costlier method. Given its level of economic development, China has often given priority to its economic development over the environment.

Only recently has China acknowledged that its environmental situation has deteriorated so much that something had to be done. The National Environmental Protection Agency (NEPA) was created and was given the responsibility to oversee China's national

environmental policy. Each province and Autonomous Region in China has it own environmental protection agency.

One of China's top priorities is the provision to its citizens of safe drinking water. Canadian firms have been successful in China in this area. In addition to project development, China and Canada have also been discussing other forms of cooperation in environmental protection. There is already a Memorandum of Understanding for cooperation in the field of atmospheric studies between Canada and China.

HONG KONG

INTRODUCTION

Hong Kong remains a vibrant economic centre and ranks as one of the best places in Asia to do business, despite concerns about the eventual transfer of sovereignty from the UK to China in 1997. The Sino-British Joint Declaration on Hong Kong's future ensures that its importance as a regional centre will extend well beyond 1997. This agreement guarantees the continuation of Hong Kong's existing capitalist economic and trade systems, the free movement of goods and capital, and its status as a free port and separate customs territory. Hong Kong's booming economy can be traced both to its function as a hub for entrepot trade with other Asian countries such as China, Japan, Taiwan and South Korea as well as the development of successful textile and consumer electronics manufacturing in the territory itself.

TELECOMMUNICATIONS EQUIPMENT AND SERVICES

Canada is now a well established supplier to this market with total sales of CAD $24.0 million in 1991. In some sub-sectors, Canada has become the third most important supplier (after the USA and Japan), and is an acknowledged leader in digital switching equipment. New opportunities exist across the board for suppliers of telecommunications and data communications products, and for systems engineering associated with new capital projects, such as: satellite systems (ASIASAT II & APT) (CAD $800 million), cable & satellite TV networks systems (more than CAD $1 billion), the CT3 (the third generation cordless telephone system) and other major government projects (CAD $10 million).

COMPUTER PERIPHERALS AND SOFTWARE

While Canada's sales of computer equipment have remained relatively small (CAD $9.74 million in 1991) within a large import market (CAD $3.3 billion), our peripherals suppliers have successfully penetrated the market. Currently, Canada sells significant numbers of specialized graphics monitors and graphics firmware, as well as data communications products. While sales of software are more difficult to quantify, this is viewed as a major area of opportunity. Chinese language software developers, Canadian systems integrators, 4GL suppliers, on-line database providers, applications software houses (for larger computers), EDI and CAD/CAM software suppliers have all made inroads into the market. Each of these areas offer opportunities, and with a 30 percent annual growth rate, the software market is deemed to be the area of greatest promise for the 1990's. Canadian firms are currently enjoying considerable attention, and several new initiatives are planned for 1993-94 (Cenit '93 trade show & SEARCC Conference).

While the outlook is certainly promising, several obstacles can still be expected in new product introduction, notably an immature distribution system. For this reason, it is probable that only larger and better established Canadian firms will be successful.

DEFENCE AND SECURITY PRODUCTS

The government of Hong Kong alone spends about CAD $1.1 billion per year on providing security. While this figure includes wages and other recurring costs, significant capital purchases are also made. Canada currently holds a relatively small share of the overall total of the security equipment import market. We have had some success in vaults/safes, locks/keys, police communications, protective clothing, and alarm systems. Areas of Canadian activity and new opportunities include:

1) maritime security products including patrol vessels, surveillance and detection equipment;
2) perimeter security systems;
3) anti-terrorist devices and training (detection, bomb disposal, etc.);
4) forensic aids (computerized fingerprint analysis);
5) police and emergency services telecom and dispatch systems aid;
6) CCTV

In addition, the Commission for Canada has undertaken a study to identify more precisely the potential for Canadian equipment and services. The study will be made available to Canadian suppliers upon request.

MAJOR INFRASTRUCTURE PROJECTS

1) a variety of civil aviation projects including proposed new airports in both Hong Kong and Macau, air traffic control and landing systems upgrades, and several airport security upgrades;
2) a new Hong Kong port project - management systems and navigational aids.

TRADE SHOW & SEMINAR

For the next fiscal year, the mission is planning to undertake the following export support initiatives in these related sectors.

1) Cenit '93 (telecom & computer product trade show);
2) SEARCC '93 - Oct 5-8, 1993, Hong Kong (XII Conference of South East Asia Regional Computer Confederation).

JAPAN

DEFENCE

Japan continues to pay close attention to the qualitative improvement of its defence equipment that can match the technical standards of foreign countries. As a consequence, a large amount of the Ground Self Defence Force equipment is designed and produced in Japan, but most of the vital defence equipment used by the Air and Marine Self Defence Force is US standard equipment locally procured under license or under FMS sales programs.

With the onset of the recession, the Japanese Government has announced plans to cut Y580 billion ($5.8 billion at $1 = Y100) off its defence budget over the next three years. This will slow defence procurement over the last three years of the FY 1991-95 Medium-Term Defence Program. This will mean a reduction in the original allocated Y22.75 trillion ($227.5 billion) for the 5 year plan. While it does not signal a cancellation of any programs, it will push some procurements into the next five-year plan to commence in 1996. The final allocation for FY 93-94 is likely to equal last year's of Y4.55 trillion ($45.5 billion). Procurement projects which will be somewhat slowed or delayed include armour; helicopters; combat, ASW, utility and training aircraft; and destroyers. Despite cuts, Japan's procurement program is still one of the most ambitious and reflects their cautious approach to the destabilizing factors in the region. This year's program continues to put emphasis on improving quality and on improvements of logistic support such as communications, quality of life for defence personnel, and to strengthen air defence and sea land defence capabilities.

Canadian defence exports to Japan have been either unique high tech products or components incorporated into US defence exports to Japan, or spare parts for US equipment used by the Japanese Self Defence Forces.

AEROSPACE

The Japanese aircraft industry, employing some 29,000 people, produced Y831 billion worth of aircraft, engines and their components during FY 1991. While the 1991 output represents an increase over the previous year, next year's figures are likely to decline as the world recession has slowed the aircraft industry and the local recession has effected defence spending. The Japanese Defence Agency is the single major market for the industry. Over 75 percent of total sales had been to JDA in recent years. In 1990, Japan's aerospace export sales plateaued at Y98 billion with increased deliveries of components for the Boeing 700 series, McDonnell Douglas, Fokker and V2500 engine. When taking into account sales in the space sector, Japanese aerospace industry output exceeds Y1 trillion mark.

Over the last 30 years, Japan's aircraft industry has been mainly involved in the production of equipment and materials for the Defence Agency, with many items being produced under license from the U.S. manufacturers. However, the Japanese aerospace industry is moving to significantly increase its activities in the commercial/civilian aerospace sector. This move becomes more critical with cuts in defence spending and is bolstered by a Government policy which promotes international collaboration on aerospace projects such as hypersonic aircraft development, regional aircraft development and aero-engines.

Canada is a major international participant in aerospace. Canadian companies with unique and competitive products in the areas of avionics, electrical subsystems, structural composites, aero-engines, simulation and training, and service, repair and overhaul may wish to seek areas for sales and collaboration in Japan.

ELECTRONICS INDUSTRY - OVERVIEW

Estimates are for total production of Y25.6 trillion by the Japanese electronics industry for 1991, representing a 5.7% increase from the previous year. This is slightly lower than earlier forecasts due to the poor economic performance worldwide. 1991 estimates called for a 5.6% rise, for industrial electronic equipment production, to Y12.5 trillion. Production of electronic components and devices was expected to advance 6.1% to Y8.8 trillion, and an 8.5% increase, to Y4.8 trillion, in consumer electronics. As world economic recovery remains sluggish, 1992 forecasts call for a 5.6% increase in this sector, to Y27 trillion; the increase being supported by domestic consumption from within a strong economy. Leading demand within these sectors will be for mobile communications equipment. Demand for computer equipment and related software will increase, as will corporate demand for information systems and office automation equipment.

INFORMATICS/SOFTWARE

Imports by the information service industry in Japan have shown an average annual increase of 35% from approximately $2 billion CDN in 1984 and is estimated to exceed $23 billion in the year 2000, while Japan's exports are expected to be just over $13 billion. Software imports are at the core of this import surplus, and is attributed in part to a critical shortage of software developers in Japan.

Custom software was the mainstay of the industry in Japan. However, in light of the recession and with the growing proliferation of powerful local workstations and networks, the custom software/mainframe software market in Japan has slowed significantly. While the utilization of packaged software in Japan has been rather limited, we are seeing emerge a shift in the market toward such software - spurred by the recession which makes packaged software more cost attractive than the traditional preference for

custom software. Software packages which are not translated into Japanese will find little demand. Because of the competing rather than standardized operating systems in Japan and the cost to customize software makes translation of packaged application software very expensive. But here also we are beginning to see a shift in the market as the use of UNIX, OS/2 and WINDOWS systems and software challenge the Japanese operating systems. Canadian software products continue to do well in Japan in the areas of developmental, CASE including support tools, graphics, computer animation, CAD/CAM, rational data bases, scientific, MIS, CIM and industrial processing software. There is also a growing interest in client - server systems.

GIS

A recent Canadian GIS mission to Japan demonstrated that the Japanese view Canada as a world leader in GIS. It is estimated that Japan is 5-7 years behind North America in the use of GIS technology. This presents a growing market in Japan as the industry catches up to utilize RASTER based GIS systems. A recent market study shows market opportunities in the domestic market for forestry management, as well as opportunities for third country sales. Also, growth is foreseen for GIS products with applications in urban, transport, resource and environmental planning and management.

TELECOMMUNICATIONS

The telecommunications system in Japan underwent systematic reform in April 1985. The primary components of that reform was the privatization of the then Nippon Telegraph and Telephone Public Corporation (NTT), and liberalization of the terminal equipment market.

Currently, telecommunications carriers in Japan are categorized as either Type I carriers or Type II carriers. Type I carriers provide service by setting up their own telecommunications circuits and facilities, while Type II carriers utilize the circuits of Type I carriers to provide services. The two categories are covered by different regulatory systems.

These two systems have allowed many new carriers to enter a variety of telecommunications fields. In addition to NTT and KDD, there were 67 other Type I carriers in Japan as of October 1, 1991. They include ten companies providing satellite-based leased-line services; 52 companies providing land mobile radio telephone, maritime mobile radio telephone and personal pocket paging services; and two companies providing international telecommunications services.

Until market liberalization, KDD had been Japan's only international telecommunications carrier. Now, there are two additional international carriers - IDC and ITJ. The result has been keen competition between the three carriers, with the two new entries attaining a 10% share of the market in 1991.

Japan's production of communications equipment in 1990 was Y2.65 trillion yen, a 13.2% increase over the previous year. Wire communications equipment grew by 10.2% and radio communications equipment grew by 24.5%. Cellular telephones, portable phones and pagers showed remarkable growth. Japan's exports of communications equipment in 1990 was Y821.2 billion, a 2.3% decrease from the previous year (decrease attributed to worldwide economic slow-down). During the same period Japan's imports of telecommunications equipment was Y116.7 billion, an increase of 32.9% over the previous year. Since the liberalization of telecommunications in Japan, particularly since 1987, imports of equipment have increased an average of 38.5% per year. However these figures have shown signs of slowing over the last year with the recession, export markets becoming depressed and local users delaying purchases in this area.

Despite the slow down, areas of market opportunity in Japan include client-server networks, PABX, digitalization, high speed systems, and multi-media systems.

MALAYSIA

DEFENCE

In 1991, government defence expenditures were estimated at US$1.73B, or about 3.8% of GDP and 14.8% (including internal security) of the federal operational budget. Currently, Malaysia has no identified external threat, but has recognized the requirement to protect its current oil and gas production and reserves within its EEZ. Its new military role will result in a larger navy equipped with sophisticated surface combatants, including the purchase of Offshore Patrol Vessels. The Royal Malaysian Navy is currently reviewing possible subsystem packages; localization will be a key factor in determining the contract award for the vessels themselves. The Air Force is expected to acquire new fighter aircraft to provide enhanced air superiority capability. The Army will restructure to a conventional equipped force of tanks, self propelled artillery and mechanized infantry that will include one rapid reaction division capable of deploying anywhere in peninsular Malaysia within 24 hours. There will be a continuing requirement for acquisitions from foreign suppliers to enhance the operational effectiveness of the Malaysian Armed Forces.

TELECOMMUNICATIONS

Telekom Malaysia Berhad, formerly called Syarikat Telekom Malaysia Berhad, or STM, is the main operator of telecommunications services in the country. With 28,000 employees nationwide, Telekom Malaysia brings telephone facilities to 1.6 million subscribers in urban centres and rural areas via its local network. About 3.2 million cable pairs are available in the local network and are connected to 562 telephone exchanges with a combined capacity of 2.5 million exchange lines. Of these exchanges, 75% are digital while the figure for the long-distance network is 50%. The company expects to achieve total digitalization by the year 2000.

Telekom Malaysia is committed to provide adequate telephone services to the rural population in support of the Government's efforts to foster national development. Telekom Malaysia is expected to invest nearly Cdn $5 billion in further developing Malaysia's communications infrastructure under the Sixth Malaysia Plan (1991-1995). Under this plan, a major portion of the investment will be used for digitalizing telecommunications networks at the customer end, installing new exchanges and the construction of optical fibre networks. Approximately Cdn $800 million has been allocated for rural telecommunication development over the next five years.

The telecommunications sector growth rate is projected at 12% to 15% for the next five years, with as much as 30% of the growth in telephone lines being accounted for by the business sector alone. The total number of telephone subscribers is growing at an average of 11% a year, and improved efficiency is expected to generate a 12% growth rate for telephone subscribers over the next few years.

Potential areas for Canadian involvement are in computerization and automation, long distance fibre optics, consultancy and training services, network management and integrated services digital network (ISDN). The key to increasing Canadian participation in the Malaysian high technology sector is not just a matter of price, technical compliance, technology transfer or after sales service but also one of "staying power" or the ability to maintain a continued presence in Malaysia.

INFORMATICS (COMPUTING AND SOFTWARE)

The Malaysian computer industry has witnessed substantial growth provided by the Government sector as the single largest user. A five-year programme for a national development information system has been announced which will involve the computerization of 125 district agencies of which 70% are in Peninsular Malaysia. The privatization of a number of major government agencies will further strengthen the demand for computerization in Malaysia.

The related Malaysian electronic component industry has enjoyed a 15% growth rate for the past 10 years. In 1991, a sizable number of foreign manufacturers have relocated or expanded their production lines for computer accessories to the country, and the local computer manufacturing industry is well situated to take advantage of a plethora of downstream support industries from which it can tap up to 20% component production supply.

There is good potential for development of the computer software market provided public perception of cost efficiency is recognized. The first publication rule under the Malaysian Copyright Act provides intellectual property right protection to all works released in Malaysia within 30 days of publication in the country of origin. The areas of activity to date cover manufacturing and distribution, financial, insurance and brokerage services and healthcare, with the educational sector being yet untapped. Client specifications include user-friendliness, installation ease, documentation, price and hardware association, marketing considerations covering commission basis to state-level dealers, multiple-copy discounts, upgrading options, applications training, maintenance, and promotion and advertising. Identified as a value-added export source, the software development industry is a fertile ground for investment especially when its status as an industry enjoying strong investment incentives and support is combined with the availability of trainable manpower. Joint ventures in this area should bring returns conservatively by the third or fourth year.

With both the property market and construction industry buoyant, there is scope for exploration of CAD/CAM applications in a centralized environment. Such enterprises should examine the potential for computer applications particularly in agro-based, electronic and electrical, chemical and petrochemical and metal based manufacturing.

Plans are in place to initiate a nationwide computers-in-education programme which will equip 300 secondary schools with computers in 5 phases from 1990, subject to surmounting the present constraints of hardware budgets and lack of education software available in Bahasa Malaysia.

Local incentives for relocation of operational headquarters and the comparatively low cost of living in the country, supplemented by the ready availability of cost-attractive resources, should point to good potential for a sectoral investment in offshore bureau services including batch data processing and contract programming. This could proliferate as an industry in itself, with spinoffs for developing a pool of trained operators, programmers and support staff.

Without the constraints of regulation, the industry remains favourably disposed for growth and development. The public sector has recognized the need to upgrade its administrative machinery in order to coordinate mechanisms for IT growth propelled by the private sector and within cross-boundaries of the private sector. Steps have been taken to establish projects such as technology parks where entrepreneurs could enjoy basic administrative facilities and consultative linkages.

Canadian consultants and equipment suppliers seeking to enter the Malaysian market are strongly encouraged to align themselves with a local firm. For Canadian firms interested in selling hardware, software or peripherals, the appointment of a local distributor is most likely to be the best means of bringing products to this market.

INSTRUMENTATION AND GEOMATICS

The instrumentation sub-sector is an emerging market in Malaysia with excellent potential for growth due to the massive infrastructural development presently being undertaken. Canadian firms have secured sales in areas such as geological/geophysical apparatus and services, security equipment and systems, scientific, medical and laboratory instrumentation and meteorological and environmental instruments and systems. In these areas, there is already recognition of Canadian capabilities among Malaysian industry and government contacts. A number of opportunities exist for computer-based control, automation and supervisory systems used in applications such as oil and gas, mining, petrochemical, electrical, transportation and water and sewage treatment. Opportunities for geological/geophysical apparatus and services and geomatics products and services are excellent in this market and are already being pursued by a number of Canadian firms in areas such as airborne radar and magnetic surveying, GIS and image analysis.

Many Government organizations with resource jurisdictions follow developments in remote sensing applications closely and the National Remote Sensing Committee has been established for government units with an interest in this field. Most notably, the Geological Survey of Malaysia and the Ministry of Land and Cooperative Development

(Department of Surveys and Mapping) are key agencies for projects in this sector. Within the private sector, oil, gas and mineral exploration firms, major plantations and engineering consultants have all shown an interest in remote sensing and GIS applications.

The Department of Surveys and Mapping is the only organization in Malaysia licensed to conduct aerial surveys. This department must be approached for approval of all independent survey proposals.

Intellectual property legislation is in place and is now being enforced to some degree.

ELECTRONICS

The electronics sector is dominated by foreign investors, many of which are multinational corporations which have been attracted to Malaysia by tax benefits, good infrastructure and a skilled labour force. Malaysia is now participating in the full spectrum of semiconductor technology - from discrete units to large micro-processors and advanced memory devices serving markets in North America, Europe, Japan and Asia Pacific.

Apart from the manufacture of components and parts, there is also a move toward making available specialized services required to support the electronics industry, such as machinery design, development and production and specialized research and development.

Foreign investors should consider seriously the longer term advantages of technology upgrading and quality enhancements that will ultimately determine their competitive edges. In addition to the attractiveness of Malaysia as an investment centre for electronics firms, excellent opportunities exist for the sale of components and electronics products in this market, provided the products are price competitive.

ENVIRONMENT

Malaysia's rapid economic development has drawn heavily on its resource base, ranging from forestry, land and water to fossil and minerals. To sustain economic growth, the Government, through the Department of Environment (DOE) has adopted environmental policy objectives and environmental management strategies and programmes that reflect the continuing efforts to strike a balance between the goals of economic development and environmental concerns.

Major projects to be implemented include the control of air and noise pollution, environmental impact assessments and control of water and marine pollution. In addition, DOE will also embark on programmes such as environmental information and education, and the formulation of guidelines and regulations pertaining to environmental control.

At present, the Government of Malaysia has identified the following as the major environmental issues and concerns which require effective management: 1) air and noise pollution in the urban areas; b) efficient sewage and sanitation facilities in major towns; c) the lack of adequate and efficient on-site/off-site waste disposal facilities; d) the encroachment of economic activities on vegetation, forest cover and catchment areas, and e) soil-related pollution caused by unplanned construction activities.

For Canadian consultants and equipment suppliers seeking to enter the Malaysian market, links with local firms are highly recommended. From the Malaysian perspective, the main benefit would be the technology transfer to the Malaysian party, however the Canadian partner would benefit from increased market knowledge and contacts and an established sales network.

TRANSPORTATION

The Government has allocated Cdn $4.75 billion to the development of infrastructure during the period of the Sixth Malaysia Plan (1990-1995). In the next five years, the transportation sector is expected to grow by 10.5%, a higher rate of growth than that predicted for the economy.

The traffic congestion problem in the greater Kuala Lumpur region has made the implementation of an urban transportation system an immediate requirement. A Study Team recently visited Canada, the United States and Europe to evaluate various transit systems to determine a suitable transit system for Kuala Lumpur.

Major projects in the air transportation sector are the construction of the new KL International Airport in Sepang, (estimated at Cdn $8 billion), upgrading and construction of airports in Peninsular Malaysia, and acquisition of primary and secondary surveillance radars under the Modernization of Air Traffic Services program. In addition, the national airline, Malaysia Airlines, is undergoing a fleet modernization and expansion program and intends to acquire 70 aircraft over the next five years.

The railway, Keretapi Malaysia (equivalent of a Crown corporation) is planning upcoming purchases which include bogie container flats, passenger coaches and locomotives. The Railway will also install a modern signals and telecommunications system. There are long term plans to extend the double tracking nation wide. Keretapi Malaysia will likely be a partner in the plan to operate a high speed rail link from Kuala Lumpur to the new airport in Sepang.

In the maritime sector, it is expected that the total cargo throughput will increase by 9.3% annually. To accommodate this growth, measures will be taken to expand port capacity. Privatization will be pursued actively in the port sector. The remaining services of Port Klang will be privatized followed by the ports of Bintulu, Johor, Kuantan, and Penang.

SINGAPORE

AIR TRAFFIC CONTROL AND AIRPORT EQUIPMENT

Changi International Airport continues its program of upgrading and improvement to keep ahead of traffic demand and passenger expectations. The following Changi International Airport projects are in the pipeline: (1) Terminal 1 is now undergoing a C$160 million two-year refurbishment program to upgrade its interior finishes, create additional space and replace old equipment; (2) the number of aerobridges for aircraft docking in Terminal 2 will be increased from 17 to 31 by building two new piers at a cost of more than C$210 million.

SECURITY PRODUCTS

Excellent market opportunities exist in Singapore for Canadian suppliers and manufacturers who are capable of providing advanced security products that cover military, police, civil, industrial and commercial applications. The total market is expected to reach C$60 million in 1993. To upgrade all military bases, government departments, statutory boards and the Singapore Changi International Airport, the Singapore Government is expected to spend at least C$150 million in the next three years.

Special conditions - Long-term success for Canadian suppliers to market their security products in Singapore will depend on their consideration to appoint a local company to be their distributor or agent who is able to promote their products and also to provide them with commercial intelligence.

Alternatively, Canadian firms that have unique technological know-how but who find it difficult to meet the economies of scale for separate facilities in Singapore may consider setting up a representative office here. In addition to sales and marketing functions, this office shall also be responsible for order-taking, customer liaison, as well as the very crucial function of dispatching.

ENVIRONMENTAL EQUIPMENT AND SERVICES

The current market in Singapore for environmental products and services is estimated to be C$700 million per year. Canadian companies have tended to focus on direct sales or links with an existing Singapore company and its network. Land constraints have lead to declining landfill space and increased emphasis on waste incineration which could potentially be a good market, as 85% of all refuse in Singapore is now incinerated. The land constraint has also encouraged the Public Utilities Board to find ways of decreasing the land used for water treatment, as well as ensure that all water catchments are purified.

Future potential exists in the field of energy efficiency and conservation. This is an area which is not as well explored within Singapore. However, the high cost of energy and increasing use of closed air-conditioned systems indicate possibilities. Energy efficiency in other fields, such as transportation, is also of interest.

Legal controls exist within Singapore and are well enforced. As a result, Singapore does not suffer from the pollution problems experienced by some of the neighbouring countries, and is instead a fairly mature market for environmental products and services. Increasing public awareness is occurring through media campaigns and the "Green Plan", which was designed with Canada's National Packaging Protocol as one of its models. Local companies focus on servicing the region as it too develops greater environmental awareness and enforcement.

As a result of the port and cleanup the petrochemical industry, environmental opportunities exist in the areas of port cleanup/oil spill. The Port of Singapore Authority is concerned with the cleanliness of the port and the incineration of tanker sludge.

Special conditions - The Singapore government has encouraged the development of local based technology through the establishment of a Government-Linked Company (GLC) called Singapore Environmental Management and Engineering Services (SEMES). In general, GLC's are open to joint ventures and technology transfers.

Government restrictions, and other access problems are generally non-existent in Singapore. Government boards, such as the PUB, operate on an open tender system, although considerations of life expectancy and quality mean that tenders may not always go to the lowest bidder.

AEROSPACE

The manufacturing and maintenance sectors are poised for tremendous growth. Already in the last decade the cumulative fixed investment grew from C$75 million in 1980 to nearly C$1 billion in 1991 while the industry's output leaped from C$150 million to C$1,000 million during the same period. Singapore's aerospace industry is expected to keep growing in the 1990s.

The industry's related capabilities cover a wide spectrum from maintenance, repair and overhaul and other supporting technical services to increasingly higher value-added manufacturing and design of components and airborne systems. These are centred around the activities of six key Singapore companies and over 40 leading aerospace and aviation-related MNC's, not to mention representative offices of other well-known aerospace and aircraft-related manufacturers and services companies. This concentration of activity has created a wide range of opportunities for Canadian suppliers and companies interested in forming joint ventures with local companies marketing throughout the region.

Special conditions - Long-term success for Canadian companies to market their products in Singapore as well as countries in this region will depend on their consideration either to establish a regional office in Singapore or to appoint local companies to be their distributor or agent who is able to promote their products and also to provide them with commercial intelligence.

ARMAMENTS

Singapore's defence budget for FY 1992/1993 was set at C$3.2 billion, representing 22.8 per cent of the national budget and 5.5 per cent of GDP. With its small population, Singapore's Armed Forces have a total of only 75,000 personnel, 55,000 of whom are conscripts.

Despite the small size of its armed forces, Singapore has proven to be a good market for Canadian defence products and technology; with simulators, air-to-ground missiles, rockets, radars, helicopters and aircraft parts as well as servicing, making up the lion's share of our sales. The total market is expected to reach C$600 million in 1992.

Major participants - Singapore has proven to be a good market for Canadian defence products; with flight simulators, rockets, air-to-ground missiles, field radios, radars, pyrotechnics and non-explosive products and aircraft parts as well as servicing, making up the lion's share of our sales.

Singapore is extremely sensitive about military procurement and our sales successes have gone largely unnoticed. As a general rule, neither the Canadian nor the Singapore side acknowledges, let alone, announces the fact that a sales transaction has taken place. This is due to Singapore's general defence philosophy which believes all aspects of the island's defence to be a matter of national security and, by definition, off limits to public scrutiny.

Special conditions - All procurements of the Singapore Ministry of Defence are made by either public tenders or closed tenders. Public tenders are advertised in local newspapers every Friday (or Saturday when Friday is a public holiday). Closed tenders are for certain equipment and services for which only prequalified suppliers are approached to tender. Lead time given for responding to such tenders is normally 30 days.

Because of the short lead time given to respond to these tenders, it is advisable for Canadian defence suppliers to appoint a local firm to be their agent who is able to promote their products and also to provide them commercial intelligence in answering these tenders.

MARINE

Singapore continues to maintain its role as the leading regional entrepot centre. The Port of Singapore ranks among the busiest and most efficient in the world in terms of both shipping tonnage and container traffic. The Port of Singapore Authority (PSA) has mapped out a comprehensive 5-year plan to improve its facilities and has allocated approximately C$1.3 billion to the task. Plans include upgrades and expansions offering new opportunities for suppliers and contractors. Areas targeted by the PSA include the following: container handling infrastructure, warehouse infrastructure, container handling equipment and computer hardware and software to improve efficiency and reduce the level of bureaucracy. Singapore's extensive shipping activities have given rise to

extensive shipbuilding and ship preparing activities. Local companies in this sector are always interested in identifying new suppliers of goods and equipment.

Major participants - A number of Canadian companies have been very active in promoting their products to the Port of Singapore Authority. They are SHL Systemhouse Inc., Provincial International Cranes, Arva Crane Ltd., and HN Engineering Inc. The main foreign competitors are the U.K., Japan, the U.S.A., Germany and France.

Special conditions - All procurements are made by public tenders which are advertised in local newspapers every Friday (or Saturday when Friday is a public holiday). Lead time given to respond the tenders is normally 30 days. It is advisable for Canadian suppliers to appoint a local firm to be their agent who is able to promote their products and also to provide market intelligence.

TELECOMMUNICATIONS

In April 1992, at a ceremony marking the launch of Singapore Telecommunications (ST) Private Limited, the formation of its subsidiary, Singapore Post (SP) Private Limited, and the reconstitution of the Telecommunication Authority of Singapore (TAS), Singapore Minister of Communications, Mr. Mah Bow Tan announced that "Singapore Telecoms will be spending about C$2.8 billion in the next five years to install an intelligent Network, Broadband ISDN, a new satellite earth station and further upgrading". In addition, "SP will also be investing C$240 million in an automated mail processing centre".

Total importation (including re-export) of telecommunications products into Singapore for the whole of 1992 is estimated at over C$3 billion.

Singapore has a modern, comprehensive and efficient telecommunications infrastructure. With 40 telephone lines per 100 people, it has one of the highest penetration rates in Asia. Despite having a well-established equipment base, there are still opportunities available to Canadian suppliers, in addition to the above, in the following: systems and software solutions to enhance telecommunication services; optical fibre cables and related equipment; consumer terminal equipment; submarine cable and related equipment; transmission and switching equipment; mobile equipment and systems; and other new, advanced, and proven telecommunications hardware and services.

Special conditions - There are few restrictions or access problems associated with the importation of telecommunications equipment into Singapore. However, all telecommunication equipment must be approved by TAS before they can be used in Singapore.

For effective marketing of telecommunications equipment, products, systems, etc. in Singapore, it is essential for Canadian manufacturers or suppliers to appoint a good local agent, distributor, and at later stages to consider forming joint-venture partnerships with local firms. Local companies welcome technology transfer opportunities.

COMPUTER HARDWARE AND SOFTWARE

Singapore's Information Technology (IT) market, consisting of both computer hardware and software, grew by 23.1% to C$ 2.1 billion last year. Compared to the 44.8% growth in the previous year, last year's expansion was more moderate.

The industry generated C$ 1.5 billion in hardware sales in 1991, a 20.1% increase from the previous year. Hardware sales are defined locally as the sales of complete computer systems. Software sales registered a growth of 31.1% with total sales of C$ 255 million. Revenues generated from IT services grew by 32.1%, with revenues totalling C$ 327 million.

There are opportunities for Canadian computer software or systems suppliers in the following fields: Construction and Real Estate; Education and Training; Financial Services; Government; Healthcare; IT Industry; Manufacturing; Media, Publishing and Information Services; Retail, Wholesale and Distribution; Tourist and Leisure Services and Transportation.

Special conditions - The government realizes that billions of dollars would have to be spent by both the public and private sectors to make IT 2000 vision a reality. Hence, to cushion this heavy expenditure, and at the same time capitalize on it, the government through the Economic Development Board (EDB), National Science and Technology Board (NSTB), and the NCB, are encouraging technology transfers, joint-ventures, and R & D development activities to take place in Singapore. Attractive tax incentives and R & D grants are often made available to companies developing state-of-the-art computer hardware or software, etc.

Quite often companies that have been successful in selling to Singapore often combine technology transfer, training, and joint-development elements into one package.

Major participants - The USA is the largest supplier of computer software to Singapore. Canadian hardware suppliers are marketing leading edge technology but will have to become more price competitive in order to capture a larger market share.

SOUTH KOREA

The Korean economy has averaged GNP growth since 1986 of over 9% on an annual basis. For the past two years real growth has exceeded 8%, in spite of stagnant exports, due to an active domestic market. The World Competitiveness Report, the IBRD and other economic forecasts regard Korea as a rising star in the international economic arena. However, real growth is not sustainable at these levels and growth in 1993 will moderate to the 6.0% range. Korea's steel, shipbuilding, electronics and automotive capacities and capabilities are world class. Korea has the 13th largest economy (Canada seventh), is the tenth largest trading nation (Canada fifth) and has 11 companies on Fortune's Global 500 (Canada has 12). Korea is Canada's sixth largest export market. Korea is the major new industrial force on the Pacific Rim.

As Korean industry progresses towards an increased value added manufacturing base there will be enhanced opportunities for Canadian companies with advanced technology capabilities. There are many Canadian high technology companies active and successful in Korea and significant opportunities in Korea still remain untapped.

TELECOMMUNICATIONS

The Korean government is investing heavily in upgrading telecommunications infrastructure and in research and development to realize the Korean goal of becoming a fully advanced country by the turn of the century. The market is expected to exceed US $2.5 billion in 1993 and by the year 2000 will be approximately $5 billion in size. Several Canadian companies have scored major success in this market in the past and more opportunities exist as the market grows and the technological sophistication of Korean companies increases. The Embassy will have available for distribution and discussion at HiTEC a comprehensive and detailed market study on the **Telecommunications Market in Korea.**

SOFTWARE

Total software sales in Korea in 1993 are projected at nearly US $500 million. Korea's software market is expected to grow 25-30% annually over the next three to five years and opportunities for Canadian firms exist in a wide variety of applications areas. Though some problems remain, intellectual property rights are protected and the Korean government supports the development of local capability through tie-ups with foreign firms. The Embassy will have available for distribution and discussion at HiTEC copies of our detailed study on the **Software Market in Korea.**

DEFENCE PRODUCTS AND SERVICES

Korea is Canada's third largest defence market and Korea remains the only developed industrial economy which still faces an immediate and real military threat. In a time of declining defence budgets, the Korean government has committed substantial new resources to new defence procurement in areas such as new fighter aircraft, destroyers,

aircraft upgrades and C^3I. Canada is seen as a quality supplier. The Embassy will have available for discussion and distribution a detailed study on the **Korean Defence Market.**

ENVIRONMENTAL EQUIPMENT AND SERVICES

After years of rapid development, Korea is beginning to take serious measures to protect and repair its environment. However, domestic technology and expertise are not yet adequate to the ambitious programs set by the government and the estimated multi-billion dollar market will be largely met by imports of products and technology. Canada is respected in Korea as a nation with advanced capability and awareness in the environmental area. The Embassy will have available for discussion and distribution at HiTEC a detailed market study on opportunities available in the **Korean Environmental Market.**

AVIATION

The Korean aerospace industry offers industrial cooperation and sales opportunities for civilian aircraft, components, maintenance equipment, avionics, engines and complete aircraft. The Korea Fighter Program (F-16) is currently a focus for Korean learning through joint ventures, risk sharing partnerships, strategic alliances and advanced aerospace related technology. The Embassy will have available for discussion and distribution at HiTEC to interested companies copies of our study on the **Korean Aircraft Related Industry.**

TRANSPORTATION SYSTEMS AND SERVICES

Korea is already a significant player in the international automotive market and Hyundai Automotive's presence in Canada helps attract more interest in Canadian autoparts manufacturers. Significant Korean infrastructure development is now underway in urban subway construction, high speed rail lines, airport construction and modernization and port expansion, modernization and construction. In addition to being able to discuss opportunities in all of those areas, the Embassy will have available for discussion a copy of a study on the **Airport Equipment Market in Korea.**

THAILAND

DEFENCE

Without significant threats on its borders, Thailand is presently aiming for a more compact, efficient force, capable of responding flexibly to a variety of possible challenges to its control over offshore resources and the Eastern Seaboard. Because the military budget contains a non-disclosed component, no accurate comprehensive figures are available. However, the country remains a substantial purchaser of military equipment because of its strategic location and the traditionally strong (though thought by some to be decreasing) military influence. Estimates of about $700M have been made for the total annual military equipment purchases. In the late 1980's, Thailand sourced largely from China, but in recent years, Europe and the United States have regained much of their dominant role.

The Royal Thai Navy (RTN) took delivery in 1991 of the first of six Chinese-built Jianghu class frigates, some of which may require significant amounts of equipment after their arrival in Thailand. There may be purchases of logistic supply ships and the RTN may also be interested in purchasing several used frigates and minesweepers from the U.S. The used ships would likely be refitted with modern communications equipment and weapons systems. The RTN has also announced its intention to procure a small helicopter carrier and aircraft (probably Lynx or SH-2). The purchase is under discussion with Spain at this time. Three used maritime patrol aircraft are on order, and the RTN may be interested in purchasing more. All could be expected to require at least some upgrading.

The Royal Thai Army (RTA) began taking delivery in 1991 of 53 used M-60 A3 tanks from the U.S. These may require some refitting. The RTA may also be interested in purchasing many more main battle tanks, along with artillery. Discussions are also underway for the purchase of 250 armoured personnel carriers. The RTA is also expected to by a significant number of helicopters in the next few years.

The Royal Thai Air Force (RTAF) currently has 18 F-16s on order in addition to the squadron it already has. 20 trainer aircraft (Czech L-39ZE close support/trainer) have also been ordered and it is expected that more aircraft will be ordered in the near future, including ground support transport and early warning and command. The RTAF is also seeking attrition replacements for its F-5 inventory, from South Korea, Taiwan and the Middle East. There may also be a need to upgrade the country's early warning radar system over the next few years.

Foreign military equipment is sold to the Thai Armed Forces almost exclusively through local agents. It is necessary to expend considerable effort to develop contacts with both an agent and the military before sales can be expected. Numerous repeat visits will likely be necessary.

TELECOMMUNICATIONS

The Thai economy continues to be the most rapidly expanding in the region. This expansion will require support in the development of a telecommunications infrastructure in areas relating to international trade, exports, investment and tourism.

There will therefore be a continuing emphasis by the Thai Government on improving international telephone services, telex and facsimile, international data communications via satellite, and cellular radio communication services.

The communications authority of Thailand is responsible for external communications. It plans to continue investment in satellite communication, submarine cable systems, digital microwave systems, radio services and optical fibre communications.

The telephone organization of Thailand is responsible for domestic service. It recently awarded a contract of two million lines to Telecomasia (formerly CP Telecommunications), and is tendering for a further one million lines for rural areas.

A third organization, the post and telegraph department, is now responsible only for radio spectrum management, domestic satellite service and international and regulatory affairs. In addition, banks, universities and large state corporations have built their own voice and data communications networks, as have the military and police forces and other ministries, such as railways and fisheries.

Although international competition is very intense, opportunities exist in all the above areas. There are currently several major Canadian communications companies active in the Thai market, usually through the intermediary of a local agent. The Embassy maintains a list of reliable agents and will be pleased to assist prospective suppliers of high quality equipment and services.

AEROSPACE

Air passenger traffic in Thailand is expected to grow at an average annual rate of 9.8% during the period 1990-95, after growing an average of 15.4% during the period 1986-90. This dramatic growth has severely taxed the country's existing aviation infrastructure and, as a result, planning is in process for the development of a new $3 billion international airport for Bangkok and the upgrading and expansion of several of the country's regional airports.

In addition to the civil engineering expertise required for new airport construction, it is expected that there will be a requirement for the purchase of substantial amounts of aerospace related equipment including microwave landing systems for the major airports and ILS and VOR for the regional airports.

To meet the surge in domestic and international air travellers, Thai Airways International (TG) will take delivery of 30 new aircraft over the next few years. In addition, the government has begun allowing limited competition with TG on some domestic and regional routes from smaller airlines, thus opening up the prospect for

sales of smaller commercial aircraft. There is also a small but growing market for corporate and private aircraft and related services.

The prospects for sale of aerospace equipment to the military can be found in the overview of the military sector.

COMPUTERS

Thailand's computer hardware market in 1992 is estimated to reach a value of 12,032 million Baht, a 23 percent increase over the previous year. Micro-computers sales for the first half of 1992 are estimated at 7,000 units of which forty percent were imported and 60 percent assembled locally. On the workstation market, computer-aided design and computer-aided manufacturing (CAD/CAM) will increase its influence in Thailand with expected sales of workstations in 1992 of 500 units or 252.5 million Baht. Main players in the workstation market include IBM, Hewlett-Packard, Digital Equipment Corp., Intergraph, Silicon Graphics and Sun Sparsstations. An average price/unit is 500,000 Baht. The sales estimate for mini-computers and servers is around 656 units in 1992. The estimated installation of mainframes however, reflects a better performance than in 1991 with sales in 1992 forecast to be 37 units, up from 35 units in 1991. Revenues are also expected to increase by almost 18 percent to an estimated 2,312 million Baht.

SOFTWARE

The size of the local software market can be estimated from the figures for workstations, super minicomputers and mini computer sales, which are the platforms on which most of the lcoal software development is being done.

The Thai software industry is estimated to be valued at 4,281 million Baht. PC software and services is estimated to be worth only 13 percent of this total or 564 million Baht in 1992. 1992 software sales will be comprised of: mainframe; 2,312 million Baht or 54 percent higher than last year; mini and super mini, 1,153 million Baht or 26.93 percent growth; personal computer, 564 million Baht or 13.18 percent; workstation 252.5 million Baht or 5.89 percent. Future trends of the software industry are expected to be in networking, accounting and Unix software. DOS-Windows platforms are also expected to gain greater acceptance in 1993.

The software copyright issue has long been an area of debate. However, a law protecting software is expected to be announced soon resulting from the pressure from both foreign vendors and governments. In addition to non-enforcement of copyright laws, other factors hindering growth of the industry are the lack of skilled programmers and the high import duty on software which is 40 percent.

CONSUMER ELECTRONICS

Thailand's consumer electronics industry is still largely domestic market oriented. Televisions represent the most important production sector, with a domestic TV market of almost one million sets per year. There has recently been greater substitution of local

production for imports of a number of components including electrolytic capacitors, printed circuit boards, speakers, coils and transformers, tuners, flyback transformers, and most recently, cathode ray tubes (CRTs). A large share of the materials that go into such products continues, however, to be imported. During the past 3-4 years, this industry has rapidly grown, owing to the movement of production bases from Japan, Hong Kong, Korea, and other consumer electronics manufacturers. The range of products is also expanding, with at least one Japanese firm producing video cassette recorders and a number assembling VCR parts. In terms of production technologies, the industry remains labour-intensive, with relatively low levels of sophistication. Some firms have invested in automatic component insertion equipment and a number have wave soldering machines. In components, automation levels tend to be higher. For the next several years, Thailand's principal comparative advantage in electronics will remain its competitive labour cost. As the character of the labour force changes with automation and rising technology levels, more engineers and technicians will be needed by Thai firms.

GEOMATICS

Both remote sensing and geographic information systems (GIS) have a relatively short history in Thailand. An earth station for receiving landsat data was built at Lad Krabang in 1981. The station has since been upgraded and it currently can receive data from SPOT, NOAA and MOS-1. Geographic information systems were first used in Thailand as part of a World Bank study" A Geographical Information Systems for Land Policy Analysis in Thailand", published in 1985. Despite the late start, the use of geomatic products and services is growing rapidly. There are presently about 20 government agencies involved in the use of remote sensing technologies and more than 30 known users of GIS technology in Thailand. It is particularly noteworthy that the private sector is now beginning to take an interest in applying GIS technology. Several banks are currently considering using GIS, initially in the management of their real estate assets. The Bangkok Metropolitan Administration is also working on its Bangkok Land Information System (BLIS) project which will also utilize GIS applications in the project. Today, ARC/INFO software for GIS systems still holds a majority of the market. The geomatic market in Thailand is expected to grow rapidly in the 1990's, especially as the private sector realizes the technology's potential.

UNITED STATES

ATLANTA

DEFENCE

At the beginning of 1992, there were nearly 100 military/space facilities in the Post territory. Their distribution was as follows: Alabama 13; Florida 24; Georgia 13; Mississippi 9; North Carolina 13; South Carolina 14; Tennessee 10; Puerto Rico 3.

Although most of these facilities are not procurement centers, there are nevertheless a significant number of key military bases which are the focus of the Post's trade promotional program.

U.S. Navy - Charleston Naval Station, which is the third largest naval base in the United States and the second largest on the Atlantic seaboard, is responsible for all U.S. Navy contracts in the U.S. Southeast and Latin America. Its major activity is training.

U.S. Army - U.S. Army Forces Command (FORSCOM) at Ft. McPherson, a suburb of Atlanta, has the largest concentration of senior military personnel outside of the Pentagon. Its activities are primarily in the areas of tactical and strategic planning. Although, FORSCOM is not a procurement center, it exercises great influence in the identification and promotion of new warfighting technologies, especially in the area of tactical telecommunications. Gen. Colin Powell was the former Commander General. The Desert Storm campaign was directed from the FORSCOM communications center. The Post has become an active member in the Ft. McPherson chapter of the Armed Forces Electronics and Communications Association. There is one Canadian Forces Exchange Officer assigned at FORSCOM.

U.S. Army Missile Command (MICOM), which is located on Redstone Arsenal in Huntsville, Alabama is the most important U.S. Army base in our Post territory in terms of procurement potential. Our Deputy Consul General and Senior Trade Commissioner is the Canadian co-chairman of the MICOM DDSA Working Group which has been established to promote the joint Canadian and U.S. development of new military technologies needed by MICOM. The HOKUM-X target project is one such project. Another project under consideration is the inclusion of Canadian robotics technologies in the U.S. Army Unmanned Ground Vehicle Program.

U.S. Air Force - Warners Robins Air Logistics Command is one of the most important procurement centers in the entire U.S. Air Force. Annual base expenditures exceed $2 billion. Warner Robins is responsible for the overhaul and repair of various military transport aircraft including the Lockheed C-130 Hercules, the workhorse of the U.S. Airforce. The Canadian Forces have seven C-130s. Warner Robins was an important staging base for the airlift operations in Desert Shield and Desert Storm. Senator Sam Nunn, the Chairman of the Senate Defense Sub-Committee is from Macon, Georgia which

is on the outskirts of the base. There is one Canadian Forces defense liaison officer assigned to Warner Robins.

U.S. Coast Guard - Although the U.S. Coast Guard is an agency that reports directly to the U.S. Department of Transportation and is subject to BUY AMERICA, its procurement needs are similar to those of DoD. The U.S. Coast Guard fixed-wing and rotary-wing aircraft repair and overhaul center for the Atlantic seaboard is situated at Elizabeth City, North Carolina. Most aircraft repairs are overseen by this facility.

NASA - Marshall Space Flight Center on Redstone Arsenal in Huntsville, Alabama is the most important NASA facility in the United States in terms of annual expenditures. The Huntsville division of Boeing Aerospace is the NASA prime contractor responsible for major sections of space station Freedom, which is the focus of America's civilian space initiatives. Other NASA facilities in the Post territory are Kennedy Space Center in Florida and the Stennis Space Center in Mississippi.

NEW BUSINESS OPPORTUNITIES IN THE DEFENSE AND SPACE SECTORS

Both defense and space sectors are in a transitional period in terms of future expenditures. Under a Clinton Administration, defense spending cuts over the next five years are expected to be approximately $120 billion. These cuts are expected to be achieved through force reductions, base closures and consolidations as well as reduced weapons production and longer delivery schedules. The Southeast with its historical dependence on defense spending, when compared with other areas of the country like southern California, is expected to fare reasonably well during this transitional period.

For example, our Post territory's largest defence contractor, Lockheed Aerospace of Marietta, Georgia, won the F-22 stealth fighter jet contract to build the U.S. Airforce's new generation of fighter jets. Initially valued at $95 billion, this contract has seen its budget reduced so that fewer jets will be produced and their delivery will be staggered over a longer period of time. Congressional support for the F-22 suggests that this program will not be a casualty of the peace dividend. An out-going mission to Lockheed, which our Post organized in November 1991, identified that business opportunities exist for Canadian composites firms.

The environmental clean-up of military bases represents a new business opportunity for Canadian environmental firms. Bases slated to close, like Myrtle Beach AFB, as well as major bases like Warner Robins AFB, have access to the Superfund for site remediation. Most clean-ups are at the initial stage of a multi-stage and multi-year process. In addition, if ratified, the North American Free Trade Agreement will entitle Canadian and Mexican firms to compete for U.S. Army Corps of Engineers construction contracts. This latter market exceeds $2 billion per annum and would include the actual on-site clean-up operations currently covered by DoD construction contracts. Presently, Canadian

participation in clean-ups is limited by BUY AMERICA to the provision of services and leased equipment.

Finally, it should be noted that defense spending cuts in the areas of research and development will be far less than those related to production. However, this may have grave consequences for the current costing practices of prime contractors and their sub-contractors who have relied on production contracts to underwrite a portion of their research and development costs. Given this uncertainty, primes tend to favour corporate teaming arrangements with firms with proprietary intellectual property which complements and reduces the costs of their research and development activities. This new development represents a new business opportunity for specialty-niche firms which hold a competitive advantage in their specific area of technology.

Trade Promotional Initiatives - For the last four years, our Post's most important trade promotional activity in the defense/aerospace sectors has been the annual Technical and Business Exhibition/Symposium (TABES) in Huntsville, Alabama. Last year, there were over sixty Canadian firms in attendance at TABES, including twenty-seven exhibitors.

This year our office has become active in the Armed Forces Communications and Electronics Association. In December 1992, we operated an information booth in the U.S. Army's 20th annual Signal Corps Symposium at Ft. Gordon (Augusta, GA). This event attracted tactical communications procurement personnel from across the United States.

On March 16 and 17, 1993, Warner Robins AFB will host a Small Business Opportunities Symposium for new suppliers. Our Post will be recruiting interested Canadian firms to attend this important procurement-oriented event which was last held in March 1989. In addition to Air Force procurement officials, many contracting persons from primes are expected to be in attendance.

ENVIRONMENTAL

Post has surveyed, compiled and documented 5 environmental areas for future spending in the SE USA, they total $119 million for 1993. Hazardous and solid waste are the largest at $52 million, water clean-up is $39 million, air remediation is $20 million and services are lowest at $18 million. This does not include SuperFund Clean-ups.

Post has surveyed and documented over 24 prime contractors in Huntsville identifying projects, contacts and technologies that those firms would be interested in acquiring. The major areas are lasers, robotics, sensors, optics, instruments and computers. The Huntsville area agencies and firms control and coordinate over $10 billion each year.

Post surveyed and documented over 30 Government facilities with combined budgets of $83 billion per year. All projected a large and growing environmental market. Savannah River Project facility estimates over $200 billion to clean the next 20 years.

Post surveyed and documented over 26 major airports in the territory, which project nearly $800 million in expansion and overhaul in the next 5 years. Orlando and Miami Airports plan $1 billion each in renovations in next 10 years. Atlanta, Nashville and Memphis are in the $200 to $500 million range of restoration updates.

Post reached, compiled and documented 15 SE USA military Repair and Overhaul facilities. These 200 contacts have budgets ranging from $1.3 billion to 40 millions per year. As an example, Canadian firms sale over $20 million to Litton/Pascagoula facility each year.

Post has initiated a survey to power generation companies to determine what is needed to update and overhaul present facilities. Early indications project this as a $1 billion market for the next five years. Tennessee Valley Authority forecast $120 million in rehabilitation, while a Duke Power projects $220 million in ten years. Environmental or nuclear estimates are not included in these numbers.

BOSTON

The Canadian Consulate General in Boston has responsibility for the five northern New England states of Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

Two way trade between Canada and the six New England states reached C$12.2B in 1991, an increase of 10.9 percent over 1990. Canadian exports increased by C$400M or 6.7 percent to C$6.3B and imports from New England to Canada increased by C$900M or 17 percent to C$6B.

DEFENCE

In New England, defence accounts for 8% of the total goods and services produced. In Massachusetts, 8% of the output goes to defence while in Connecticut, the figure is 9.5%. More than 91% of the regions' Department of Defense direct prime contract awards went to Massachusetts and Connecticut in 1990. Small to mid-sized defence contractors in the region who average 40% of sales to the military are confident about prospects in non defence markets due to the uniqueness of their products and believe that they can weather the defence cutbacks.

The resiliency among defence firms in the region is very important since defence spending peaked approximately three years ago. Defence dollars coming to New England will continue to drop two to five% a year for the next few years.

SECURITY PRODUCTS

The United States Air Force, Electronic Systems Center, Physical Security Center of Excellence (ESC/AVJ), Hanscom AFB, MA., has the world wide mandate to develop, deploy and support effective security systems for the U.S. Air Force.

Critical government and industrial assets present attractive targets for a variety of threats. The best defence against a well trained adversary is the employment of a fully integrated security program which provides a flexible responsive system to achieve maximum performance from a physical security system. Canadian firms with security threat expertise should be in contact with the U.S. Air Force Physical Security Center of Excellence, Hanscom AFB, MA.

Major military buying offices:

HANSCOM Air Force Base — 617/377-4973
Electronics Systems Center
U.S. Air Force Material Command
HANSCOM AFB, MA. 01731

Portsmouth Naval Air Station — 207/438-2233
portsmouth, N.H. 03801-2590

Naval Underwater Systems Center — 401/841-2442 x270
Commercial Acquisition Department
Newport, R.I. 02841

ENVIRONMENT

The environmental sector is one of the largest growing areas of activity in New England. Even with the recession, the growth in environmental business activities within the past years has been in the range of 15% each year. This importance is principally due to the large number of universities and research centers situated in New England; a qualified labor force, especially in chemistry and engineering; the availability of capital; as well as favorable legislation.

The United States' environmental sector has $100 billion total sales in 1991 and should attain $150 billion by 1995. In Massachusetts, the sector reached $13 billion in 1990 and the projections for 1993 are $19 billion. There are 1,300 environmental companies in Massachusetts alone, 2,000 in New England and 16,000 in the United States. The sector generates 73,000 jobs in Massachusetts, 100,000 in New England, and about 1,000,000 in the United States. North California is the other area within the United States where the sector is as important. Massachusetts anticipates an annual creation of 4,000 to 6,000 jobs within the next decade.

Most of the companies involved in the environmental sector offer services (69%), 18% are manufacturers, and 9% are sales agent. The environmental companies offer several sub-sectors of activity, the most important are; environment engineer consulting (40%), installations development (33%), the reduction of harmful emissions (25%), as well as the fabrication of instruments and control of contamination services (20%).

The environmental sector is relatively new. Twenty-seven percent of the companies did not exist five years ago. The number of environmental companies, which is principally composed of small businesses, increased 300% in the last few years. Fifty percent of the companies work exclusively in the sector, and only 20% subsidiaries of other companies. The average sales per company is $15 million.

The clients of this sector vary. Ninety percent of the companies sell to the private sector, but 58% of the sales are destined to the government. Twenty-five percent of the clients are non-for-profit organizations (universities, hospitals, etc.). Today, 4% of the sales in the sector are exports. The sales should attain 8% within the next three years.

INFO TECH & ELECTRONIC PRODUCTS

New England is one of the centers of the U.S. Information technology industry. The areas international hardware companies and reputation as a software publishing center make New England an important conduit for U.S. market entry. The region is also home to a number of large financial institutions with major mis requirement.

TELECOMMUNICATIONS

The New England telecommunication industry is growing rapidly. Massachusetts boasts the highest concentration of communications equipment companies of any state in the U.S. Many of these companies are searching for qualified OEM relationships. Important subsectors are; digital switching devices, satellite communication systems etc.

BUFFALO

New York State is among the leaders in hi-tech companies and applied research and development. According to National Science Foundations statistics, New York industries employ 520,000 high tech workers and spends $10 billion on R&D, second only to California.

Opportunities exist in almost every industry for exports, technology transfer or acquisition, and partnering. Some of the major high technology employers included General Motors, Moog (aerospace), Occidental Chemicals, Carborundum, Kodak, Xerox, Bausch & Lomb, Mobil Chemical, IBM, General Electric Aerospace, Toshiba Imaging, NCD, CAE - Link, Bristol Meyers, Anarern Microwave, Magnavox CATV Systems, Reynolds Metals, Laser Precision aud DuPont.

Upcoming Consulate projects of interest are: Update of Defense Prime and Subcontractors Directory, Market Study for High Speed Rail System, Information Booth at Rochester Computer Show, Mission to Industry Looks at Rome Labs (June '93) and International Aviation Snow Equipment Symposium and Show (April '93).

Rome Labs is the Air Force Systems Command research and development centre of excellence for Command, Control, Communications and Intelligence (C3I). The lab has an annual budget of $300 million with ongoing contracts in excess of $1.4 billion. Major solid state sciences and materials, electromagnetics, photonics, signal processing, computer architecture, computer security, and speech processing. Companies interested in attending should contact the Consulate. Rome Labs is receptive to Canadian technology and relatively free of obstacles.

The IEEE has a similar event in May '93 - "Dual Use Technologies and Applications Conference". Topics are similar to those above but are more oriented to industrial applications.

Previous Consulate projects are market studies for medical equipment and pharmaceuticals, environment products and services; computer software and telecommunications. These included potential customer and distributor lists and are available from the Consulate.

New York State offers technology transfer and joint venture opportunities for university and private industry through its matchmaking "Venture Line" service and the "New York State Technology Access System". Access to their services for Canadian companies can be done through the Consulate at no cost.

To foster the growth of high technology in New York State the NYS Science and Technology Foundation has established ten centres for advanced technologies at the following universities:

Cornell University:	Biotechnology in Agriculture
Polytechnic University:	Advanced Technology in Telecommunications
S.U.N.Y. Stony Brook:	Center for Medical Biotechnology
University of Rochester:	Center for Advanced Optical Technology
Columbia University:	Computers and Information Devices
Syracuse University:	Computer Applications and Software Engineering
Clarkson University:	Advanced Materials and Processing
Alfred University:	Advanced Ceramic Technology
Rensselaer Polytechnic:	Advanced Technology in Automation and Robotics

The Research Foundation of the State University of New York has responsibility for technology transfer for the universities and each university has a technology transfer office as do the Centers for Advance Technologies. The Research Foundation is in the top 20% of organizations having patents issued for technology transfer.

CHICAGO

CHICAGO POST TERRITORY OVERVIEW

Address: Canadian Consulate General, Chicago
Two Prudential Plaza
180 North Stetson Avenue, Suite 2400
Chicago, IL 60601
Cable: DOMCAN CHICAGO
Telephone: (312) 616-1860
Telex: 00254171 (DOMCAN CGO)
Fax: (312) 616-1877

Territory: Chicago Post territory includes the states of Illinois, Missouri, Wisconsin, and northwest counties of Indiana (Jasper, Lake Laporte, Newton and Porter). The Post territory has a total population of some 22 million and total GSP of 595 billion US$. Canada is the #1 trading partner for each of the three states.

	*Population	*GSP	**Exports to Canada	**Imports from Canada
Illinois	11.5 M	281.4 B	5.1 B	4.6 B
Wisconsin	4.9 M	99.7 B	1.6 B	1.2 B
Missouri	5.1 M	113.7 B	1.9 B	1.4 B

* Source: State Departments of Commerce, 1991 figures
** Source: Statistics Canada, 1991 figures.

The territory has a diverse economy based on agriculture, heavy manufacturing and services. It has four of the top seventeen metropolitan markets in the U.S. (Chicago, St. Louis, Kansas City, Milwaukee). It has the largest concentration of small- and medium-sized manufacturing companies in the U.S. Annual R&D exceeds $10 billion, nearly three quarters of which is spent on industry-related subjects. Chicago itself has the second highest concentration of Fortune 500 companies in the U.S. and is a major transportation and distribution centre. It is also the second most important financial center in the U.S.

MARKET OPPORTUNITIES

The electronics, telecommunications and computer industries are three high tech sectors that have established a major presence in the Midwest. These three industries have given birth

to many of the fastest growing companies in the area. New materials, manufacturing processes, environmental technology, products and services are of a growing importance. Companies located in the Midwest are awarded more than $10 billion in defence contracts annually. The total defence/aerospace market in the area is approximately $30 billion, with opportunities occurring primarily in the following defence industry subsectors: armaments and vehicles, R&O, aerospace and electronics. Corporate and public attitudes towards Canadian products and services are positive. Government procurement agencies are well disposed to consider bids from Canadian companies.

Wisconsin - Key industrial sectors: electrical machinery and equipment, transportation equipment, fabricated metals, paper and allied products and food processing.

Opportunities for Canadian firms: biotechnology, food processing, and agriculture and food technology (dairy products in particular). Conditions for technology transfer licensing agreements are between the companies taking part in the venture unless the Wisconsin company has received state funding for the development of a particular technology. In this case, the state requires that any production resulting from a business alliance between a Canadian and Wisconsin company take place in Wisconsin.

Illinois - Key industrial sectors: microelectronics, medical equipment, telecommunications and pharmaceuticals.

Opportunities for Canadian firms: medical electronics, environmental technology and services, advanced materials processing, manufacturing processes, testing and equipment, computer science and telecommunications. Conditions for technology transfer licensing agreements are between the companies taking part in the venture. There is no interference from state government in matters of intellectual property rights. However, some federal regulations apply when transfer of defence/security technology is involved.

Missouri - Key industrial sectors: transportation equipment, chemicals, industrial machinery, computers and electronics.

Opportunities for Canadian firms: aerospace (composites, fine materials, avionics, R & O) both civilian and defence related; biotechnology (human therapeutics, plant agriculture, animal agriculture, diagnostics, pharmaceuticals); environmental technology; electronics and telecommunications. Open market with no barriers to technology transfer/licensing agreements/joint ventures.

MAJOR COMPANIES AND COMPETITOR NATIONS, BY SECTOR AREA

Aerospace: McDonnell Douglas Aerospace; Sabreliner Corp.; Litton Precision Gear; Astronautics Corp. of America. Competition from: U.S., France, U.K. and Netherlands.

Electric/Electronics: Motorola Inc.; Richardson Electronics Ltd.; Molex Inc.; Allen-Bradley Co.; Koss Corp.; Johnson Controls Inc.; Stewart-Warner Electronics Corp. (Computer related): Pansophic Systems Inc.; Comdisco Inc.; Cray Research Inc. Competition from U.S., Japan, S. Korea, Taiwan and Mexico.

Telecommunications: Andrew Corp.; Telephone and Data Systems Inc.; Tellabs Inc.; Motorola Communications and Electronics Inc.; Zenith Electronics Corp. Competition from: U.S., Japan and Taiwan.

Vehicles: General Motors Corp.; Ford Motor Co. and Chrysler Corp. have vehicle assembly plants in the post territory. Companies engaged in auto parts manufacture include: Borg-Warner Corp.; Colt Industries; Stewart-Warner Corp.; A.O. Smith Corp.; Bora Instruments Inc. Competition from: U.S. and Japan.

Defence: Two major U.S. army commands, each with procurement and R&D budgets, are located in the region.

The U.S. Army Aviation & Troop Command (ATCOM) in St. Louis, Missouri is a combination of previously existing commands (Aviation & Troop). It is responsible for the design, development and procurement of aircraft, as well as the life-cycle management and its existing fleet of 9,000 primarily rotary and also fixed wing aircraft. It procures and manages all Army logistical support equipment, including ground support and air delivery equipment, bridging, power generators, rail equipment, field hospitals and kitchens. The overall procurement budget (including maintenance, repair, overhaul and spare parts) stands at US $4 billion. The Command is required to reach its target of buying 80% of its requirements on a competitive basis (i.e. more than one source), which represents a growing market for qualified Canadian suppliers estimated at US $1.5 to 2.0 billion. Most spares are Flight Safety Parts that require source approval, offering excellent opportunities in precision machining, metal working, composite materials, avionics, electronics, as well as repair/maintenance/overhaul.

The U.S. Army Armament, Munitions and Chemical Command (AMCCOM), in Rock Island, Illinois is responsible for procurement of ammunition, artillery, infantry and defence weapon systems, components of systems and related materials, integrated commodity management for conventional ammunition for the U.S. Department of Defense, and serves as the lead Army Material Command (AMC) agency for chemical and biological defence stands at slightly over $5.0 billion. Approximately 50% of purchases are competitive.

Significant private sector prime contractors: McDonnell Douglas Aerospace, General Dynamics, Northrop, Bunker Ramo, Gould, Sundstrand, Motorola, Morton Thiokol and Emerson Electric, plus over 325 small prime defence contractors are located in Wisconsin, Illinois and Missouri. Subcontracting opportunities exist with many of these firms. Competition from: other NATO allies, Japan, Israel and Australia. Offsets, or industrial benefits, are thoroughly understood and tolerated by prime contractors.

SEEKING INVESTMENT/TECHNOLOGY PARTNERSHIPS

Companies seeking investment/technology partnerships need to be clear and concise in their statement of requirements vis-à-vis potential partners; provide a business plan; give details of their marketing strategies; their management team (background/expertise), financial record and sales data; size of commitment needed, the venture/product; their own company's background and expertise (what it will bring to the partnership); produce literature; new or unique products being planned; photograph of plant; use to be made of funds/equipment; the management share the new partner should expect; a profile of their ideal partner. Equally important, they should list previous efforts (if any) to seek partner and which organizations/firms should not be approached.

DALLAS

Two-way trade between Canada and the Southwest (Texas, Louisiana, Arkansas, Oklahoma, Kansas & New Mexico) continued to grow at an impressive rate during 1991 reaching approximately $11.4 billion - an increase over the 1990 level of nearly 10%. The Canadian exports portion of that total expanded by 20% to $5 billion.

Although the Texas economy has diversified, the oil/gas industry is still paramount accounting for 15% of the gross state product. The southwest, particularly Texas with its "laissez-faire" government tradition and lack of state income tax continues to be one of three most common venues for corporate relocations and startups. The NAFTA will serve to make Texas even more attractive given its preferred position as a gateway to Mexico and ideal location for distribution north and south.

DEFENCE/AEROSPACE

The Air Logistics Centers (ALCs) in this area perceive a significantly increased long term emphasis on repair and overhaul versus replacement, albeit with short term budget and personnel cuts to absorb. New regulations now have the USAF/ARMY/NAVY competing with each other as well as with industry for the work. The immediate impact on Canadian suppliers bodes well when one considers current and anticipated offset requirements which have stimulated enthusiasm from at least four major primes (Electrospace, Vought Aircraft Co., UTL, Optic Electronics) and the excellent cooperation in new Canadian source development on the part of both Kelly and Tinker ALCs.

General Dynamics, Ft. Worth, has sold its tactical fighter business to Lockheed Corporation. It produces the F-16, a project which is being kept alive through successive export orders to foreign governments and the recent unexpected approval from U.S. Congress to purchase twenty-four. U.S. Government opposition to the sale of 150 F-16 fighters to Taiwan was recently reversed but it's not known how much of the work will go outside.

Lockheed Corporation has announced that with the closing of Carswell AFB, Ft. Worth, they are considering moving a maintenance facility onto a portion of that property.

Bell Helicopter, Ft. Worth is one of many U.S. companies eyeing Unmanned Aerial Vehicles as a potentially lucrative slice of their future business. With the military aircraft market hitting a plateau, the outfitting of thousands of combat units and ships with drones is a growth area. Additionally, commercial use is contemplated by drug enforcement agents, forest rangers etc. to name but a few.

LTV Aerospace-Dallas was recently purchased by the Carlisle Group and the new company name is Vought Aircraft Company. They have numerous offsets with Canada.
The Southwest is a strong center for commercial aviation; second only to the west coast

combination of California and Washington state. Wichita, KS is the home of Boeing Wichita, Cessna Aircraft, Beech Aircraft, Learjet and Piaggio Aviation. The state of Kansas has produced more commercial aircraft than the rest of the world combined. Additionally, Texas is the HQ of the world's largest airline "American Airlines" (AMR Corp/Ft. Worth) with a giant maintenance facility in Tulsa, OK. "American" will be opening an additional maintenance facility at the new Alliance Airport just outside of Dallas/Ft. Worth. The repair of B-747's and 767's will be moved from Tulsa to Alliance and the A-300 and Fokker-100 (short haul jets) will be moved into Tulsa. Continental and Southwest Airlines are HQ in Houston and Dallas respectively.

One thing that is readily apparent is that whether the business is defence or commercial related, increasing numbers of manufacturers are dramatically reducing their number of vendors in order to achieve higher quality control standards. Canadian suppliers will have to supply a noticeable price and or quality standard or new technology to significantly penetrate or participate in this market.

Canada/US DDSA Working Group - The Dallas Consulate co-chairs the USAF Space Systems Division DDSA Working Group with Kirtland AFB in Albuquerque and is actively engaged in identifying critical technology areas in which Canadian suppliers might participate in development projects. Efforts thus far have included two Canadian supplier missions to New Mexico, one to Edwards AFB, Ca. and two industry tours in Canada by USAF/SSD specialists.

NASA - Johnson Space Center (JSC) in Houston is one of the three largest NASA Centers and is the focal point of the US' manned space flight activities. The JSC mandate includes: spacecraft development, manned space flight control (including the shuttle program), crew training, space flight operations and related medical research and life sciences. The center has program responsibility for lunar science, space science (including major elements of the Space Station program), earth resources technology and is involved in advance planning for missions to other planets. JSC employs 20,000 and receives approximately 25% of NASA's procurement budget. The Consulate has initiated a program to introduce new potential suppliers to NASA and particularly to prime and major subcontractors of which about 60 have Houston area operations. To this end, we organized a mission to JSC mid-March '92 and participated in the Space Exploration Show sponsored by the NASA Alumni in October 1992 where 13 Canadian firms exhibited.

SUPERCONDUCTING SUPER COLLIDER

The development of the $8.5 billion SSC is now well underway in Waxahachie, 20 miles south of Dallas, where the Magnet Development Lab, Refrigeration Building and Accelerator String Test Building are virtually complete. The first exploratory shaft has been completed and actual tunnelling for the 87 kilometer circumference SSC ring is underway. The Dallas Consulate has been actively engaged in promoting the potential opportunities for Canadian suppliers to the project and two sourcing\information missions of SSC

for Canadian suppliers to the project and two sourcing\information missions of SSC technical\procurement officials have toured Canada and in the last 12 months two missions headed by ISTC were undertaken. The Consulate, in cooperation with the BC and Ontario Governments, participated with a group of about 20 companies, in the SSC sponsored International Industrial Symposium on the Super Collider in March '92 as part of an ongoing promotional program. The Canadian Commercial Corporation (CCC) has signed a MOU with the US Dept of Energy to facilitate SSC procurement in Canada. Although the budget was reduced from $650 million to $517 million in '92, plans are now underway to ensure funding for next fiscal year. It is likely to be another few months before policy and direction will be given by the Clinton Administration.

High Technology - The Dallas Consulate has compiled a list of some 1,000 companies in the southwest that are primes, sub-contractors or service operators actively engaged in the high technology sector. Specific sectors include Superconducting Super Collider (SSC), Telecommunications, Informatics (computer hardware and software), Instrumentation, Remote Sensing, Semiconductors, Research Laboratories and Electronic Components.

TELECOMMUNICATIONS

The Southwest is an acknowledged market area especially with our proximity to the Mexican market. Within Mexico, electronic components, telecommunications equipment and systems and computer software, are sectors that represent the greatest potential for Canadian firms. This year ICA-Comnet will be held in Dallas and is aimed at corporate managers of voice, data and telecommunications networks.

A quick survey of the leading telecom equipment manufacturers in the Dallas post territory reveals that most firms are shifting focus and moving to become the first and the best in new niche markets. The current industry buzzwords are multi media, ATM (asynchronous transfer mode), PCS (Personal Communications Services), SONET (Synchronous Optical Network) and FTTC (fiber to the Curb). Firms like Itecom; NEC America; Wiltel; Alcatel Network Systems Inc; Northern Telecom; Motorola-Nortel; DSC Communications; Ericsson are a few of the majors in our area.

COMPUTER H & S

A major event in Dallas is Networld and a national stand will be in place for '93. Whether you communicate over LANs, WANs or wireless networks, or operate over diverse operating systems, this show is the venue for state-of-the-art products and services. Show has upwards of 450 vendors demonstrating thousands of new products and communicating on the issues at the forefront of the dynamic world of computer networking and connectivity.

SECURITY PRODUCTS

The American Society for Industrial Security was held in San Antonio Sept. '92 with over

800 booths exhibiting the latest in security products, software systems, technology, officer training tools, building security, etc. Over 40 countries were represented at this show. Dallas participated with an info booth and promotional material from a number of Canadian firms. The '93 show is to be held in Washington. Technology and training lead the way for the 90s, with technology replacing human resources at a furious rate while at the same time professional and consistent training of security personnel is becoming increasingly important. Canadian firms would do well to contact Bob Ayotte, who is the Regional (Canada) Vice President (tel: 613/782-8478) to obtain the latest in security news.

ENVIRONMENTAL EQUIPMENT

The southwestern part of the United States is one of the most active areas in the country for environmental technical sales - over 65% of the petrochemical refining industry is located along the Texas and Louisiana coasts. This area has traditionally been involved in some of the worst incidents of hazardous waste contamination to be found anywhere. The Port of Houston and the Gulf Coast are frequent sites for oil spills from damaged tankers and barges. The Texas Water Commission and the United States Coast Guard are very involved with oil spill emergency response technology. The EPA's technical assistance team, their national contractor for monitoring oil spills and work performed by service contractors is located in Dallas, Texas with teams in Houston, Texas and Baton Rouge, Louisiana.

Among the trade shows and conferences being held in this area is the Petro-Safe Show. It will be held in January, 1994 in Houston, Texas. It offers unique opportunities for potential equipment sales, joint ventures, licensing, technical paper presentation, technology transfer and service related contracts.

Air pollution is also a great concern in this area and air pollution technology is an important issue. Alternative fuel technology legislation and the tightening of industry standards for atmospheric emissions is forcing industry and transit companies to seek out environmental state-of-the-art technology wherever they can find it. The Dallas Consulate, along with the Government of Ontario, the States of Arkansas, Kansas, Nebraska, Oklahoma and probably Iowa, Missouri and New Mexico will be co-sponsoring an alternate fuels conference and trade show tentatively set to be held in September, 1993 in Little Rock, Arkansas. This show and conference was held in 91/92 as a CNG Show Vehicle Conference with Canada, Ontario and Oklahoma as sponsors.

For further information on any of the industry sectors covered by this profile, please contact:

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DAYTON

DEFENCE MARKET FOR CLEVELAND CONSULATE GENERAL TERRITORY (OHIO, KENTUCKY, WEST VIRGINIA AND WESTERN PENNSYLVANIA)

Trade development and promotion in the foregoing territory is the responsibility of the Canadian Consulate in Cleveland and its three satellite offices in Cincinnati, OH, Pittsburgh, PA and on the Wright-Patterson Air Force Base near Dayton, OH. The latter office covers the defence market in the territory.

TRADE OVERVIEW

Of the 50 states, Ohio is the 2nd largest exporter to Canada and 4th largest importer of Canadian products, accounting for 58% of Canadian exports to the territory. Forty-nine "Fortune 500" firms are located in the territory. In 1991 total trade was $18.3 billion, which is greater than that of France, UK, Germany and Italy combined.

Total Canadian exports to the territory in 1991 were $7.6 billion of which the main categories were transportation equipment (16%), metals and minerals (20%), pulp and paper (13%), chemicals and plastics (13%). Total Canadian imports were $10.65 billion, of which transportation equipment, including autos and parts, were by far the largest product sector, followed by coal, minerals and alloys, plastics, and consumer goods.

DEFENCE MARKET SIZE

Despite the decrease in military spending in the U.S., Ohio is still a major multi-billion defence market annually that includes major multi-year procurement programs of Air Force Materiel Command, headquartered at Wright-Patterson AFB. (AFMC is the result of merger in July 1992 of Air Force Logistics and Air Force Systems Commands). These major programs include the F15 and F16, and most recently the F-22 and C-17 that are moving towards production stage and will represent opportunities for Canadian participation as subcontractors to U.S. prime contractors, most of which are situated outside the territory. Aeronautical Systems Center (ASC) funding for RDT&E (Research, Development, Test and Evaluation), weapons systems and other procurements was U.S. $14.2 billion for FY92. Of this, about $2 billion was for contracts to Ohio industry. An important component of the market at Wright-Patterson AFB is the Operational and Central Support Contracting Division of Aeronautical Systems Center (ASC/PKW), which issued contracts in FY92 totalling U.S. $1.2 billion for requirements of base maintenance, ASC laboratories and AFMC Headquarters. Almost half of this amount was for supplies, equipment and services for support of the WPAFB complex. Additional markets are at AFMC's Air Logistics Centers, Product Centers and laboratories situated outside the territory at Air Force Bases around the USA.

In FY 1991/92, Canadian defence exports to the Consulate's territory totalled $49.3 million, mostly to Ohio industry, with the remainder to military bases and Defense Logistics Agency Supply Centers. Sales to West Virginia were negligible. Because of

cuts in personnel at all military establishments, but a continuing need for development tasks, technical services contracts and logistics supplies (ie, build to print) for military products currently in service, it is estimated that a realistic market for qualified Canadian manufacturers is $500 million, or ten times current sales.

DEFENCE MARKET TYPES

There are basically two main types of defence markets in this territory: "knowledge based" contracts and logistics/build-to-print contracts. There are also possibilities for sales of proprietary products and systems to area prime contractors and to the DLA Supply Centers in Dayton (DESC) and Columbus (DCSC), but sales successes for these markets requires aggressive and persistent marketing action. Opportunities for build-to-print contracts are found at DESC and DCSC, as well as the defence and other manufacturers in the territory.

The greatest opportunities for development contracts, and technical services contracts are at the Aeronautical Systems Center Program Offices and Wright Laboratory located on Wright-Patterson AFB, near Dayton, OH. WPAFB ASC authorized manpower is approximately 10,000 people of which almost 25% work in Wright Laboratory. Additional personnel are situated with AFC organizations at Eglin AFB, Florida. Contracts to industry range from service contracts for preparation of documents and tests of equipment, etc., to multi-million dollar development contracts. Similar contracts, to a lessor extent can be won at NASA-Lewis Research Center (near Cleveland). There are frequent possibilities for new software systems, although a local "presence" is usually a condition of the contract.

The Defense Electronics Supply Center (DESC) is responsible for the acquisition, management and supply of electronic components in 93 Federal supply classes for the Military Services and other Federal agencies. DESC manages more than one million electronic items. Examples of these are resistors, capacitors, tubes, transformers, connectors, relays, and microcircuits and components for various communications and weapons systems, and many ADP (Automated Data Processing) components. Last year over 72,000 electronic items were assumed from the Military Services under the Consumable Items Transfer Program. This year 100,000 more items are being taken on, and more are to be added over the next few years.

Other military bases in the territory that offer lessor opportunities, but might be worth exploring by some companies, are:

- Wright-Patterson Central Support Contracting Center (ASC/PKW)
- Department of the Army, Fort Knox, KY
- Naval Ordnance Station, Louisville, KY
- NASA - Lewis Research Center, Cleveland, OH

For further information on the defence market in the territory, including technology transfer opportunities in the defence sector, contact:

Canadian Defence Trade Office
MCLDDP Bldg 11A
1970 Third Street, Suite 6
Wright Patterson AFB OH 45433-7213
Phone (513) 255-4537; Fax (513) 255-1821

CLEVELAND

During the past decade, the region has lost much of its traditional heavy industry steel making for example) but has more than replaced the jobs lost with new firms in such sectors as computer software, new "transplant" auto factories, medical research and treatment and other high-tech service industries. Traditional heavy electrical firms in the region, such as Westinghouse, are doing much more outside sourcing of components and assemblies and the multitude and variety of telecommunication suppliers has led to a much more fragmented market than existed during the Bell monopoly. In Pittsburgh alone, over 700 new high tech firms have started up over the past 10 years and all are much less tied to traditional suppliers than the older generation of American companies. What is left of traditional heavy industry is finally making new investments in updated plants (often in partnership with foreign firms) so some niche markets exist for specialized industrial machinery and consulting services.

Several rapid rail projects are being considered in Ohio, - the most extensive of which would link Cleveland, Columbus and Cincinnati, while in Pittsburgh the construction of a new huge airport terminal has brought forward a variety of exotic proposals to link it to downtown. In each case, the availability of federal or other creative financing are critical if they are ever to become reality. On a more mundane level, each of the major cities have extensive public transit systems and firms offering any and all services in this sector should not overlook this region.

In general, the Cleveland territory offers excellent opportunities to firms in nearly all sectors, especially as a second market to companies who perhaps have a "toehold" in the region just across the border from their Canadian location and are wondering where to go next. In many cases, coming to the Cleveland territory may be a better move than deciding to head off to the more complex markets of New York or Los Angeles.

ENVIRONMENTAL PRODUCTS AND SERVICES

The States of Ohio, Kentucky, West Virginia, and Western Pennsylvania are serviced by the Canadian Consulate located in Cleveland, Ohio and its associated Canadian trade offices in Pittsburgh, Pennsylvania and Cincinnati, Ohio. One-third the size of Ontario, the territory's population approaches that of Canada's. In addition to being one of North America's industrial heartlands, the region has seen steady growth in the technology and services sector. Serving as headquarters for over 57 Fortune 500 industrial companies, the area also boasts a broad array of medium and small-sized technology support firms.

Industries such as steel production, chemicals, plastics, and industrial machinery have been the manufacturing cornerstone of the area. One of the unfortunate aspects of this strong industrial past is the present pollution control and containment problems. These problems are now a priority, not only in the Consulate's territory, but across the U.S. and the world. Estimates for the environmental products/services industry in the United States indicate a total market size in excess of $100 billion annually. By 1995, this figure is expected to increase to $200 billion annually. This includes services, technologies, and capital goods offered to both public and private markets in four major areas of environmental concern:

- Air pollution ($25 billion)
- Water and waste water ($32 billion)
- Solid non-hazardous waste management, treatment and disposal ($25 billion)
- Hazardous waste management, treatment and disposal ($18 billion).

The overall environmental market is also growing at a rate of 20 to 30 percent annually, although industry segments such as consulting, analytical, disposal, and remediation are expanding at different rates as they respond to varying regulatory forces.

DETROIT

GENERAL

The Canadian Consulate in Detroit has as its territory the States of Michigan and Indiana and the City of Toledo, Ohio. Best known for its automotive industry, the territory offers a wide variety of opportunities for high-tech exports in the automotive, defence, machine tool, automation, electronic and environment sectors. There are also opportunities for consumer products with a population of 16 million in close proximity to Canada and well served with communication and transportation links.

DEFENCE

US Army Tank-Automotive Command (TACOM), Warren, Michigan, purchases tracked, wheeled and specialty vehicles and support spares for the Army, other services and allied nations. The R&D Center both conducts projects in-house and contracts for automotive related R&D. Annual procurement exceeds US $6 billion. Many purchases of less complex items are restricted to US small business. This consulate maintains an office at TACOM which may be reached at 313/574-5233, fax 313/574-5219.

Naval Avionics Center (NAC), Indianapolis, Indiana, conducts acquisition, development, limited manufacture and overhaul of naval air systems. Procurement encompasses systems (including sonobuoys, receivers, transmitters, duplexers, and amplifiers), technical services, integrated circuits, electronic components, mechanical parts, raw materials, and manufacturing services.

Naval Weapons Support Center (NWSC), Crane, Indiana, is a procurement, manufacture, engineering and test facility for shipboard weapons systems, ammunition, pyrotechnics and special forces equipment.

Crane Army Ammunication Activity, colocated with NWSC, performs similar functions as NWSC but in response to Army requirements.

Electronics Manufacturing Productivity Facility (EMPF), Indianapolis, Indiana, investigates improved electronic manufacturing technology. EMPF shares its facility with the Technology Transfer Center, a business incubator that provides services and advice to high tech firms. EMPF is closely associated with NAC and NWSC, and is situated close to Purdue University. Interest has been expressed in association with Canadian firms for technology transfer and specialized training.

Subcontract Opportunities: A number of firms in post territory provide military and commercial products to DOD. Most have experienced a reduction in military sales, although, there is potential for Canadian firms as component suppliers. A consulate-

produced publication listing contacts with major defence suppliers in Michigan and Indiana will be available during HiTEC 93.

COMPUTERS AND SOFTWARE

The computer industry is characterized by a large and ever-changing number of small manufacturers, with a relatively small group of large firms. Sales growth has slowed, profit margins are being squeezed and replacement sales are up relative to those of new systems. The industry has been consolidating with mergers and acquisitions. Asian manufacturers have captured about 40 percent of the US computer market. US manufacturers do a large amount of outsourcing, but a considerable amount goes off-shore. There are two Unisys plants in Michigan.

The fastest growing US high technology sector in 1991 was computer software, which grew 13.2 percent from 1990. Computer related services (software, systems design) are predicted to grow 20 percent or more in 1992. Customers are demanding more in software applications, business solutions and compatibility. Canadian producers have a good reputation and have achieved some success in selling into this territory. This consulate conducted a Software Matchmaker event this year and has compiled a list of agents for computer and software sales in our territory.

AUTOMATION SUPPLY

South-East Michigan is one of the fastest growing high technology centers in the United States. A major industrial sector has been established in Michigan to supply advanced process technologies to American manufacturing. This sector has estimated annual sales of US $4.4 billion. A recent study has indicated that 59% of the suppliers to Michigan manufacturers in this sector are located in Michigan, 33% elsewhere in the US and 7% foreign (includes Canada). Almost one-third (number, not necessarily dollar value) of the inputs bought from these suppliers are high-tech; mainly machine tools, material handling and advanced gauging equipment.

ELECTRONICS AND ELECTRICAL EQUIPMENT

In the second half of 1991, the US electronics industry realized only a one percent increase in shipments from 1990. More than 25 US printed circuit board manufacturers went bankrupt. US exports for the semiconductor industry increased to Europe and Japan. Indiana has over 200 electronics manufacturing firms doing more than US $9 billion in sales and development. These firms employ over 70,000 people. Indiana is the center for automotive electronics due mainly to the Delco Electronics complex in Kokomo. This division has annual sales of US $3 billion buying over US $900 million in electronics components annually, in addition to its own production. Other manufacturers include Sony Audio Disk, Dupont Photomasks, Thompson Consumer Electronics (TVs), Ritron two-way radios and twenty others with over 500 employees.

Our post marketing guide lists representatives for electrical circuits, electro-mechanicals, telecommunications and other electrical products. The sales of computer, electronics and electrical equipment firms in our territory is estimated to total US $30 billion.

ENVIRONMENTAL PRODUCTS AND SERVICES

Pollution control activities in the US grew to US $139 billion in 1991 and are expected to increase at 20 percent per year over the next several years. Current expenditures may be broken out as US $33 billion on air pollution, $52 billion on water and waste-water and $45 billion on solid waste. Michigan and Indiana offer plentiful opportunities due to long-established and concentrated industrialization. This consulate has produced a list of manufacturers' representatives in this sector and has commissioned a study to establish detailed lists of projects, firms and opportunities.

SECURITY PRODUCTS

A wide range of security products are purchased by individuals, companies and government agencies in our territory. These products range from reflective vests to sophisticated perimeter monitoring, training, and computer security systems. This post intends to conduct a Canadian Security Products show in late March, 1993, in Detroit.

COMMENTS

Substantial opportunities exist in Michigan and Indiana for a wide variety of other high-tech products including plastics, composite materials, industrial machinery, robotics, and safety systems.

Frequent face-to-face visits with customers are an important factor. If the Canadian supplier cannot maintain that direct consistent contact, it is recommended that a manufacturers' representative be employed. This is a well established practice in this territory.

The trade section at the Consulate in Detroit is there to assist you in your efforts to export into Michigan, Indiana and Toledo, Ohio. Though we have limitations in the support we can provide to any one company or individual, we can help you in many ways. Our phone is 313/567-2340, fax 313/567-2164. Do not hesitate to call or write if you are interested in doing business in our territory.

LOS ANGELES

TELECOMMUNICATIONS

The United States market is the largest and most open in the world. Telecommunications is a $30 + billion market. The market in Southern California for telecommunications products and services is highly competitive, very active and at the same time, open to new technologies. The United States operates on the same standards as Canada, which makes acceptance and licensing easier than any other country in the world.

The main competition is from U.S. companies, many of which are large well known conglomerates. Canadian companies are not strangers to this geographic area. This market is growing even in a slow economy. Large investments are being made especially by the telephone operating companies and long distance carriers. Also, the larger financial institutions, insurance companies, universities and public transportation authorities are worthy of attention.

Opportunities exist for products and services that are directed towards local and wide area networking, voice and data transmission, security systems, software enhancements to exisiting products, integrated services digital networks, and fibre optics.

Companies will do well that can provide a unique product, undertake aggressive marketing programs and form strategic alliances with U.S. companies. Local representation is a must for successful market entry.

The major trade show for telecommunications products is the **Telecommunications Association** annual conference held in September 1993. The Canadian Consulate has proposed to participate. Contact Jeffrey Gray at (310) 335-4439.

DEFENCE

California is the nation's largest recipient of military spending, with prime contract awards totalling over $50 billion per year for the last five years. The rapid buildup in U.S. defence spending seen in the past decade is now leveling off. In absolute terms, Los Angeles County is by far the largest recipient of contracts, receiving over one-half of the value of all prime contracts entering California.

For Canadian firms wanting to bid on subcontract requirements, it should be pointed out that almost all involve an element of high technology. Even precision machining requirements involve complex procedures and past experience in military work. In all cases, the Canadian company must be fully qualified to the appropriate MILITARY SPECIFICATIONS and have an approved quality assurance program in place.

Defence Electronics

By most estimates spending on defence electronics will decrease by 31% by the year 2000. However, at the same time, the entire defence budget is now expected to be reduced by 36% over the same period. Thus, in proportion to total spending, systems content made up by electronics will actually increase.

In the post territory, all major DoD contractors are involved in defence electronics except Lockheed, which has such facilities in Santa Clara. Defence electronics work in the post territory consists of navigation/guidance, imaging/targeting, electronic counter/support measure (ECM/ESM), radar/fire control, simulation, and communications systems. Many of these systems are subcontracted on a small scale ($10's - 100's million) and thus it is difficult to track opportunities. However, the trend is for commonality and systems which have joint services (USAF-USN-USA) applications, increasing the total number of units per contract. This trend will increase as the DoD realizes greater efficiency from economies of scale in production. Among the higher priority systems, Identification, Friend or Foe, (IFF) will receive attention as a Gulf War operational change so that all NATO forces will have one common system, the MK XV IFF. Such a program will be one of the highest valued in defence electronics due to the number of units required.

Global Positioning System (GPS) receivers are currently being incorporated into nearly every weapon system in both updated versions of existing systems, and in new systems. There are even plans to incorporate GPS receivers into smart munitions such as guided bombs. Although the latter example will not likely go into full scale production sooner than 5 years from now, this is an opportune time for Canadians to make themselves known to both prime contractors of new systems as well as to contractors performing modifications to existing systems.

Additional progress is being made in new inertial guidance systems, particularly in the area of ring-laser gyros for commercial, as well as military applications. New versions and developments of imaging/targeting systems including night attack infra-red imaging are underway and will provide continuing opportunities for Canadian content.

There remains a great deal of business and new opportunity for radar and fire control systems in the post territory, mainly with Hughes RSG in El Segundo. In terms of funding, the highest valued program is for the APQ-181 Synthetic Aperture Radar system deployed on the B-2 bomber at $16 million per aircraft. In terms of future business, the APG-73 system, a follow on to the APG-65 for previous F/A-18 models will be installed in all F/A-18 E/F models, as well as the F-22. This translates to a market for approximately 1,750 of these systems whose value will vary between $4 - 6 million each. There is especially good opportunity for Canadian content on this program due to previous offsets on the CF-18 radar system. Full scale development will begin in FY'94. Hughes RSG will be a sole source on the program. All of the BQM-145A UAV's

produced by Teledyne Ryan will incorporate a smaller version of the Synthetic Aperture Radar developed by Hughes RSG for the TR-1 (update of U-2 spyplane).
Among communications systems, the largest program under development at General Dynamics Electronics in San Diego, a block II version of the Single Channel Ground-Air Radio System, SINCGARS, will begin full scale development in FY'94. The program will require 290,000 radios and provide $1.5 billion/year in business. Under block I contracts, 29,000 radios have yet to be produced under an FY '89 award.

The major trade show for defence electronics is the **Armed Forces Communications and Electronics Association** which will be held January 10 -12, 1994. The Defence Liaison Office in El Segundo will participate. Contact Jeffrey Gray at (310) 335-4439.

Defence and aerospace

Contracts are placed with Canadian firms under the terms of the U.S.-Canada Production Sharing Arrangement which provide for duty-free entry and waiver of the Buy American Act. At $34 billion, the portion of the 1992 DoD procurement budget to be spent in the post territory represents 13.6% of the U.S. total, more than twice the second largest share in Texas.

As far as the F/A-18 is concerned, foreign military sales will increase contracting value to the post territory by at least 42% for the next two years. Similar results are expected from foreign sales of the F-15 due to its Hughes APG-70 radar and fire control system and other locally produced electronic subassemblies. The portion of the DoD budget for SDI, GPALS, and theatre ballistic missile defenses has also experienced an increase and can expect to do so over the next 5 years. Final assembly and purchasing for the C-17 will be done in Long Beach, and full scale production will begin next year. Numerous programs will begin production on improved variants of current models, such as the F/A-18 E/F model, and blocks III and IV of the Tomahawk cruise missile. Even programs not based on the post territory such as the F-22 Advanced Tactical Fighter, whose final assembly will be done in Marietta, GA, will provide significant opportunities in the region by way of subassembly work and subcontracting for various systems.

TRANSPORTATION

Potential business opportunities will exist for the following projects: Metro Green Line, Metro Red Line Phase I (MOS-1), Metro Red Line Phase II, First Segment (MOS-2), Metro Red Line Phase II, Second Segment (MOS-3), The Pasadena-Los Angeles Light Rail Project, Commuter Rail-5 County Rail Connection, Los Angeles International Airport, Palmdale Regional Airport Specialized Rail Transit Project, The San Fernando Valley East-West Specialized Rail Transit, Trolley Bus Study, Central Orange County Fixed Guideway Agency, and Commuter Rail. Details regarding these projects will be available at HiTEC.

ENVIRONMENT

California's environmental regulations are the most severe in the country, routinely surpassing those of the EPA. With a national environmental services market exceeding $130 billion, California accounts for about 15 percent of that total. The recently created California EPA unites the various regulatory concerns under one umbrella, and brings about a more efficient regulatory system.

Air pollution is a major concern; the basin area surrounding Los Angeles has the highest ozone concentration in the country. Population growth and a topographical inversion layer compound the problem. The Clean Air Act amendments of November 1990 commit the federal government to achieving healthful air quality nationwide within 20 years.

Resulting business expenditures are projected between U.S. $20 billion and U.S.$30 billion throughout the U.S. The 1990 Act sets attainment of federal standards for VOCs, NOx, carbon monoxide, particulate matter, sulfur dioxide and lead. In the South Coast basin, CFCs and Halon gas must be phased out by January 1, 1997 . Hydrofluoric acid will be banned by December 31, 1994. Clean fuel programs for vehicles are underway, including methanol, ethanol, and natural gas. Natural gas emerges as the favorite alternative fuel because it is generally cleaner and more economical, and would be the logical bridge to hydrogen, a carbon-free gaseous fuel that can be produced directly from solar energy. As to electric battery power, two percent of the cars built for the state by 1998 will have to be electric.

Water and wastewater are also in the forefront. A four-year drought in Southern California led the giant Metropolitan Water District to order mandatory water rationing last year. The cutbacks affected agencies serving 15 million residents. MWD plans to build some 70 major projects by 1999, at a projected cost of $6 billion.

Los Angeles' Hyperion Wastewater Treatment Plant is undergoing revamp and expansion work, ultimately to achieve full secondary treatment by 1998. Total cost is estimated at $2.5 billion. The City of San Diego is now embarking on its own secondary wastewater treatment facility, at an estimated cost of $3 billion over a ten year period.

Hazardous waste management currently shows the highest growth rate in the environmental services field, at some 30 percent. Treatment, storage and disposal facilities are a primary target; the EPA proposes national corrective action that some say will rival in scope and impact the Superfund program for remediation of uncontrolled hazardous waste sites.

Solid waste is subject to pressure from legislators and from the public. California faces the fact that landfilling space is becoming very scarce and costly. The State's goal is to reduce the waste stream by 50% through recycling and composting. Product areas where Canadian exporters are currently enjoying success include electronic components, printed circuit boards, precision machining, shock-proof cabinetry, investment castings, avionics and cockpit instrumentation, aircraft landing gear, actuators and subsystems, test equipment, satellite subsystems, optical sights and other related items. Contracts are placed with Canadian firms under the terms of the U.S.-Canada Production Sharing Arrangement which provide for duty-free entry and waiver of the Buy American Act.

MINNEAPOLIS

DEFENCE (including Aerospace & Marine)

Although the defence sector is downsizing in the region, important prime contractors such as Paramax, Alliant Techsystems, Honeywell, Rockwell, Collins, and Control Data offer solid possibilities for Canadian sub-contractors. Paramax and Alliant have Canadian Industrial Benefits requirements.

Market size:	$225 million, Canadian share about 15 percent.
Products:	Castings, capacitors, resistors.
Event:	SUBCON, Vendors to Primes mission, May'93.

COMPUTER HARDWARE AND SOFTWARE

Post territory continues to be one of the top five areas in development of electronics and computer technology. Cray Research, Unisys, Honeywell, IBM (Rochester, Minnesota), Control Data, and Gateway 2000. Numerous smaller firms are component suppliers.

Market size:	$2.6 billion, Canadian share about 4 percent. Japan and other Pacific Rim countries represent competition.
Products:	PC boards, connectors, castings, plastic components, automated production equipment, software.
Events:	Midwest Electronics; Northwest Computer Show, February '94. Expo, May '93; Software mission, February '94.

TRANSPORTATION (including airport equipment)

Twin Cities continue to consider LRT as an option. Minneapolis/St Paul International Airport is the 15th busiest in the world, and, as a principal hub for Northwest Airlines is due for expansion. There are two local manufacturers of jet engine test equipment, and Northwest Airlines plans construction of two Airbus maintenance bases in North Eastern Minnesota. Duluth is a major port at the head of the St. Lawrence Seaway, and significant Mississippi shipping originates in Minnesota. Northern Pacific and Soo Line (CP owned) are headquartered in territory, while Burlington Northern is an important regional factor.

Market Size:	Could vary widely, depending on developments.
Products:	Rolling stock, rails, railway ties, flight simulation, materials handling equipment, control and monitoring systems.

ENVIRONMENTAL EQUIPMENT

This is a growing market in an environmentally conscious region of the U.S.A. Products offering market potential are water and waste water treatment equipment, recycling equipment, hazardous waste and pollution controls, monitoring equipment and components such as pumps and valves.

ELECTRONIC COMPONENTS AND ACCESSORIES

The electronics industry in Minnesota alone has evolved into a sophisticated, diverse industrial base manufacturing a wide range of products. There are 168 electronics firms in the state employing over 15,000 people. In addition to the computer industry, major companies are Seagate (disc drives), Hutchison (peripherals), Ault (power supplies), Zytec (power supplies), Sheldahl, (flexible circuitry, membrane switches and protective coatings).

Events: Midwest Electronics Expo, May '93.

MACHINERY AND PROCESSING EQUIPMENT

In addition to being the largest market for Canadian agricultural machinery and equipment, Post territory includes a range of industries in mining, forest products including pulp and paper, automotive (Ford), food processing, and packaging.

Events: Various product shows in region, such as Omaha, Des Moines, Sioux Falls, as well as Twin Cities.

NEW YORK and PRINCETON

The tristate area is a source of hi-tech opportunities for most Canadian companies that are well prepared, ready to export, to licence or to develop strategic alliances or even to find investment funding in the region. The competition in the area is tough, but with a population of 24 million, there is plenty of room for good, innovative and new products, processes and services.

The Consulate General in New York and the Princeton Trade Office are there to help identifing markets. The Princeton office, with the support of the trade officers of the Consulate General in New York, has the overall responsibility for the hi-tech sector. Princeton has been opened as a consequence of the FTA implementation. The location has been chosen because New Jersey known as the "invention state", is a leader in hi-tech products. It is home to more than 700 research facilities and 25% of all R&D spent in the USA is spent in New Jersey, (mostly by the private sector and multinationals from all over the world). It also ranks second in the USA in per capita income, and third in corporate headquarters locations.

The tristate area is the centre of numerous trade shows in the hi-tech sector and there are opportunities for more aggressive marketing of innovative Canadian ideas. The area is a very dynamic market, and despite the economic slowdown has only 6.8% unemployment in New Jersey.

Attached are some of the market opportunity profiles that have been developed in the hi-tech sector including the names of the officer responsible and the major trade shows taking place in our region in that sector. Those include profiles on the following sectors: environmental products & services; computer equipment & software; telecommunications.

In the above sectors, the Princeton office works in collaboration with the investment section of the Consulate General.

In addition to these sectors the Princeton Office has the responsibility for the defence sector. The relationship with two military bases, CECOM at Forth Monmouth (Communications, Electronics Command) & ARDEC (Armament Research, Development & Engineering Command) are both located in New Jersey and both have procurement responsibilities under the Canada-USA Defence Sharing Agreement; they also have research activities. One of the event conducted at Fort Monmouth is Canada Day (end of June) where Canadian companies showcase their products or processes, mostly for sub-contracts to USA prime contractors. One of the new priorities of the post is to develop a capacity for Canadian companies to specialize in the clean-up of military bases. This is the only growth sector in the defence area that we can foresse in the near future given the major cuts to defence expenditures.

ENVIRONMENTAL PRODUCTS AND SERVICES

The US market for environmental products and services was estimated at US$ 80 billion in 1990 and growing at an annual rate exceeding 5%. This sector represents one of the major market opportunities for Atlantic Canada firms due to its size and variety of needs.

Among the environmental sectors in which Canadian firms find the most opportunities for equipment and services are waste water treatment, hazardous materials and waste management and recycling processes. This last category could be of particular interest as the disposal of used materials in an environmentally acceptable manner is one of the most pressing problems facing industry and government, particularly in the Northeast.

While much of the recycling movement finds its impetus in government requirements, the field for more effective processing and new application for recycled materials is enormous. Old newspapers, for example, provide an interesting case of a need to find new applications for waste material. With government mandated programs requiring increased newspaper recycling, the market for this material has been so overwhelmed that much of it now finds its way into landfills and incinerators.

Canadian participation is planned for Hazmat, an international trade show being held in Atlantic City, New Jersey, 9-11 June 1993. It is especially suited for firms engaged in the transportation, storage, disposal and treatment of hazardous materials. A modest participation is planned at the New Jersey Water Pollution Control Association Conference and Exhibition May 4-6, 1993, also in Atlantic City. It is especially suitable for firms in the water treatment and remediation field. We strongly encourage firms with products suitable for these shows to participate through the Canadian stand.

The Consulate's commercial section can supply market intelligence and is designing a communications project to enhance awareness in the tristate area of Canadian capabilities in this sector. As well, both the Investment Development Division and the Trade Office in Princeton N.J. are actively engaged in this priority area.

Contact: Mr. Donald L. Russell, Marketing Officer
Phone: (212) 596-1658, Fax: (212) 596-1793

COMPUTER EQUIPMENT AND SOFTWARE

The U.S. imported approximately US$ 23.3 billion of computers and peripherals in 1990. Canada was the fourth largest supplier with a 7.3% share, or approximately US$ 1.7 billion. Imports of this hardware to the US consisted primarily (65%) of peripherals. The rate of economic recovery, capital spending as well as a shake-out of existing firms implies a 4 percent increase in U.S. imports for 1992.

The total US market for packaged software was worth more than US$ 23 billion in 1992. Only nine other software markets were worth US$ 1 billion or more: Japan, Germany, France, the United Kingdom, the Netherlands, Canada, Spain and Switzerland.

Market trends indicate that independent software suppliers will face more competition from systems suppliers attempting to augment hardware sales with software and services revenues.

The demand for software should reflect the trend toward smaller computers and systems - especially PCs. PC add-ons, single user work stations, and smaller multi-user systems valued between US $10,000 - 100,000 will account for 72.9 percent of the U.S. hardware market, up from 69.3 percent in 1991.

Canadian suppliers of packaged software have successfully demonstrated proven capabilities to supply niche markets and this portion of the market is expected to continue growing.

Atlantic Canada firms are encouraged to participate at PC Expo '93 in New York, the premier international trade show held annually in June. A total of 735 exhibitors including 28 Canadian firms offered a broad range of computer products and services at PC Expo 1992, to a trade attendance of 81,000. The Consulate expects to obtain EAITC funding to repeat last year's successful participation.

Canadian firms requiring additional information on this sector can contact:
Mr. Donald H. Garretson Jr., Marketing Officer,
Phone: (212) 596-1656 Fax: (212) 596-1793

TELECOMMUNICATIONS

The U.S. imported a total of US$ 4.25 billion of telephone and communications equipment in 1991. The market grew by 2% in 1992 and annual increases of 2.3% are projected for the next five years.

Growth areas include software packages for key systems to direct and equalize incoming calls, call detail recording, automatic number identification and voice mail. The implementation of ISDN, which will connect/upgrade present analog equipment and systems to digital, is expected.

Canada is a major exporter of telecommunications equipment to the US with shipments of US$ 515 million in 1991 - 12% of US imports - the second largest foreign supplier after Japan.

Atlantic Canada supplied CDN$ 1.7 million in telecommunication and related equipment to the tristate area in 1991, mostly from Nova Scotia. A better market share is within reach due to the extent of market requirements in the public and private sectors.

The Consulate has submitted a proposal for participation is the main exposition in this sector the October '93 Communications Managers Association Show (CMA) in New York City. Members of the CMA are communications professionals who shape and execute corporate communications strategies for U.S. firms of all sizes including some of the largest corporations. Atlantic Canada firms in this sector are encouraged to participate in this show which, in 1992, drew 7500 decision makers responsible for identifying company needs, initiating purchases, approving orders, evaluating products and vendors and recommending suppliers.

Don Garretson, the Consulate's marketing officer responsible for the sector can provide additional information on the show as well as guidance to individual firms interested in exploring market potential in the tristate area.

Contact: Mr. Donald H. Garreston Jr., Marketing Officer,
Phone: (212) 596-1656 Fax: (212) 596-1793

ORLANDO

AIRPORT EQUIPMENT

More than 41.5 million travelers enplaned in Florida's commercial airports in 1990. Among the states, Florida ranks third in the number of airline passengers and fourth in air cargo volume. Twenty-two commercial airports have scheduled air service and many have undertaken significant expansion programs in the past few years. Aviation planners see a need for 18 new airports in Florida. Preliminary information obtained through an ongoing survey has identified a number of business opportunities, details of which follow. Information on airports not listed below will become available later in 1993.

Orlando International - Construction plans call for expanding the international arrival section, a fourth runway and a fourth airside terminal. Conceptual plans have also been initiated for an additional 100 gates complex called "Worldport 2000". This expansion program, projected through the year 2006, is expected to accommodate passenger levels of over 35 million.

Fort Lauderdale - Hollywood International - The airport authority expressed an interest in: (1) environmental services of all types. Specifically, underground contamination, water runoff, wetlands, noise and air quality; (2) airport design companies with expertise in runway extension and terminal design. Contract management was also highlighted as an area of opportunity. Purchasing of airport equipment results from a sealed bid process, and it is suggested that Canadian manufacturers request to be added to the airport authority's mailing list for solicitation of proposals.

Jacksonville International - The airport authority is planning to reconstruct an 8,000 ft runway and add another 2,000 ft to it. This project is out for bid and ground breaking is expected in early 1993.

The Aviation System Plan Steering Committee for the Northeast Florida metropolitan area recommended the following: (1) development of another runway, parallel to the one being reconstructed in 1993; (2) explore the feasibility of reconfiguring the airport radar service area (ARSA), to maximize the traffic handling efficiency in Northeast Florida.

COMPUTER HARDWARE AND SOFTWARE

The Florida computer hardware and software industry is one of the most highly developed in the United States.

The Orlando area (Tampa - Orlando I-4 corridor) has acquired a reputation as a center for financial services software for the entire country. It started with the Kirchman Corporation, 24 years ago, which specializes in computer programming services for the

banking industry. There are now 30 major companies in the Orlando area alone, competing for a share of this market niche.

TechData, the number two computer hardware and software distributor in the United States, in terms of volume, is headquartered in Clearwater. This company has nationwide distribution to the value added reseller/value added dealer market. The Miami market has a number of firms reselling computer hardware and software to the Caribbean and Latin American markets. Although this volume is not significant, it is growing rapidly. IBM has a significant presence in Florida in terms of manufacturing of computer hardware as well as software development.

DEFENCE

Florida is one of the top four recipients of defence expenditures, behind California, Texas and Virginia. In 1991, $11.2 billion (US) was injected directly into the state's economy. This amount, which is an increase of $600 million over the 1990 figure, represents 5.1% of total U.S. 1991 defence outlays and 4.5% of Florida's 1991 gross state product.

Florida has 15 major military installations. The state has experienced DoD cutbacks, but not major ones. The realignments or partial closures that were approved have in fact been counter-balanced by a number of relocations from elsewhere in the U.S.

A significant portion of defence contracts go to Floridian firms with high technology products. Included among these are industries offering guided missiles, communication equipment and electronics.

Canadian companies can acquire part of that business through a strategy focused on frequent liaison with Florida defence companies. The emphasis is clearly in the electronic sub-component supply sector, but that does not rule out entirely the mechanical component sector. Key to success with Florida defence primes is a demonstrated capability to meet agreed upon delivery schedules.

Also, Canadian firms have to invite survey teams for plant visits and must comply with all U.S. Government regulations. It is important to include non-recurring costs in bid estimates rather than separating these costs out to be factored in at a later date. Most of the U.S. defence primes expect Canadian suppliers to have instituted a system of statistical process control.

ECONOMIC OVERVIEW

Space - There will be some 30 NASA shuttle flights through 1995. Even more launches will be required from 1996 to 2000 if the U.S. begins to install segments of the international space station. Tallahassee will help establish a commercial launch industry that could generate sizeable business and provide an anchor for private sector spinoffs.

1993/94 Fiscal Year Planning - Canadian Goverment trade development efforts in Florida are spearheaded by two one-person trade satellites in Orlando and Miami, which report to the Senior Trade Commissioner at the Canadian Consulate General in Atlanta. Whereas Miami's territory is largely a consumer market, Orlando's territory covers much of Florida's manufacturing and technology.

SPACE

Canadian companies participating in NASA programs are accorded domestic status similar to that accorded by DoD under the DP/DDSA. However, selling to NASA on a strictly commercial basis has proven somewhat elusive to Canadian companies because of a strong in-house preference for domestic sources. Additionally, supplying "one off" items typically purchased by NASA procurement centres is often not commercially viable. The first step in marketing to Kennedy Space Center is to submit a Solicitation Mailing List Application to the Industry Assistance Office for the purpose of being added to KSC's Automated Source System for procurements over $25,000. A pre-recorded listing of procurements over $25,000 is available by calling (407) 867-3707.

The main thrust of Canadian market development efforts should be directed at major U.S. prime contractors to NASA. In Florida, opportunities for technology development are most likely related to Boeing's work, but there are probably significant other possibilities. There will be some 30 NASA shuttle flights through 1995. Even more launches will be required from 1996 to 2000, if the United States begins to install segments of the International Space Station.

TELECOMMUNICATIONS

In the past two years Florida has put in place literally thousands of miles of fiber optics. Packet switching is available and it is only a question of time before an Integrated Services Digital Network is in place to send voice, video and data over the same lines. Significant growth is expected over the next ten years, especially in long distance service and various information services transmitted over telephone lines and an eventual ISD network.

Entering the Florida market - Price competition has been the driving force in the telecommunications industry for the past two decades. Divestiture opened the door for more price competition in the 1980's. It follows that the main barrier to entry into the

market has been providing competitively priced equipment while maintaining a profit. The recent decline in the value of the Canadian dollar should mitigate in favour of more price-competitive Canadian products and services.

The equipment industry is undergoing major changes. Customers are looking for service, technological expertise and system integration. The successful equipment manufacturer or vendor will be able to provide these additional services, or be able to partner with an interconnect or manufacturer that can.

Dealerships with regional Bell operating companies and long distance carriers are expected to become more important as the industry moves toward consolidation. A small manufacturer will need to partner with a distributor that is large enough to withstand industry consolidation, or can maintain a dealership with a regional Bell operating company or large carrier. Package or solution marketing incorporating the new technologies will have to be marketed to meet customers' more sophisticated requirements. The successful distributor will offer a strategy aimed at addressing customer requirements and will apply new technologies to the solution. Manufacturers of new technology (voice, imaging, etc) can benefit from partnerships with distributors who can provide custom services, installations and upgrades.

TRANSPORTATION

High Speed Rail - The US Department of Transportation recently designated the Miami-Orlando-Tampa corridor as one of five nationwide high speed rail corridors to begin receiving federal funds for corridor improvements. This should place the state in an excellent position to receive additional federal funds in the future to build a high speed ground transportation system.

Pursuant to the 1992 Florida High Speed Rail Transportation Act, the State is authorized to issue a Request for Proposals (RFP) to solicit new private sector applications to build and operate an intercity high speed ground transportation system in the state. Several companies, including Bombardier, Alsthom, ASEA Brown Boveri and others, have expressed their interest in applying for a high speed rail franchise once the RFP is issued.

Florida Maglev Project - The State is also overseeing implementation of the Florida Magnetic Levitation demonstration project in the Orlando area. The 13.5 mile system will connect the Orlando International Airport to the attractions area, and is expected to begin operations in late 1996. This $622 million (U.S.) project is currently planned as an airport shuttle. However, the project has the potential to extend and become part of the State's intercity high speed ground transportation system.

Urban Buses - Good prospects for Canadian companies able to address Buy American provisions would appear in this sector. For example, it is projected that Orlando's population will increase by 350,000 within the decade and Lynx (until recently called Tri-County Transit) is aggressively following its plan to increase its 125 bus fleet to 500 buses. Ontario Bus Industries plays a major role in Lynx's recent and projected acquisitions.

Additionally, environmental concerns and the Clean Air Act are opening the doors to innovative ideas regarding alternative fuel. With technology in using CNG available from Canada, Canadian companies should be in a good position to exploit that opportunity. Lynx anticipates that 1/4 of the buses in its next acquisition contract (January 1993) will be CNG powered. The Metro Dade Transit Agency, which currently operates 500 buses, is conducting a four year study with 20 alternative fuel buses (CNG, LNG, propane and methanol).

PHILADELPHIA

The Philadelphia territory of responsibility includes most of Pennsylvania and Maryland, Delaware and Virginia. Within this territory there are over 50 Department of Defense Procurement Centres and over 200 prime contractors and first tier subcontractors. The two facets of the defence market in this territory represent a buying power of approximately $7 billion (US) of which Canadian industry receives contracts valued at approximately $200 million (US) annually.

The Canadian Defence Production Office (CDPO) deals on a routine basis with seven of the major procurement centres and 107 prime contractors in the territory. Although the DoD procurement budgets have generally decreased, the reorganization of procurement responsibilities makes many of these centres an increasingly important market for Canadian manufacturers. Since April 1991, the management and procurement responsibility of some one million separate items was transferred from each branch of the armed services to the Defense Logistic Agency procurement centres. Consequently, products which were previously purchased by Army, Navy and Air Force Centres across the USA will be concentrated at the five DLA hardware centres. Of these five Centres, three are located within the Philadelphia area of responsibility. They are: The Defense Industrial Supply Centre (DISC), the Defense Personnel Support Center (DPSC), and the Defense General Supply Centre (DGSC).

In addition, the CDPO has been working extensively with the U.S. Coast Guard at their headquarters in Washington, DC, and at their repair and overhaul offices for aviation parts in Elizabeth City, N.C. and for ships parts in Curtis Bay, Maryland.

Defense Industrial Supply Centre (DISC) - DISC procures and manages vital industrial hardware items for use by the armed services throughout the world. The Center presently manages approximately 857,000 separate industrial type items and components used in repair and maintenance of equipment and weapons systems. However, the Center was expected to receive some 400,000 additional items following the transfer of procurement responsibilities from the three services. Items purchased include bearings, block and tackle, chain, rigging and slings, ropes, cable and fittings, fasteners, hardware, packing and gasket materials, springs and rings, metal bars, sheets and shapes, electrical wire and cable, and aeroengine components.

Defense Personnel Support Centre (DPSC) - DPSC procures items which service the "personal" requirements of the members of the armed forces. As such, DPSC provides food, clothing, and medical materiel at the wholesale level to meet these requirements on a worldwide basis. The Center is divided into four separate Directorates: Subsistence, Clothing & Textile, Medical, Materiel and Manufacturing. Due to legislative restrictions, Canadian industry is virtually prohibited from selling anything except medical materiel and pharmaceuticals to the Center. Unlike the other DLA

Centres, DPSC is not expected to receive additional procurement responsibilities following the transfer of procurement activities from the three services.

Defense General Supply Centre (DGSC) - DGSC is responsible for the supply and management of assigned items and distribution of these items for the services worldwide. DGSC procures a variety of item categories of a general nature including non-powered material handling equipment, rubber fabricated materials, plastic fabricated materials, photographic supplies, measuring instruments, batteries, safety equipment and rescue equipment, electrical equipment including transformers and motors, electrical hardware and supplies, industrial chemicals, and aircraft components and structures. DGSC presently manages and procures approximately 500,000 items, however, this level of procurement activity is expected to increase by some 300,000 items being transferred from the three services, the most important of which is Federal Stock Classification 1560 (aircraft structural components), and 1680 (aircraft accessories and components), and miscellaneous.

In addition to the three major DLA Centres in the territory, there are numerous research and development centres and two major United States Navy Procurement Centres. The two US Navy Centres, called inventory control points, are the following:

Aviation Supply Office (ASO) - ASO is responsible for the procurement, inventory control, and distribution of all Naval and Marine Corp aviation spare parts, systems and related equipment. As such, it has the responsibility to forecast spares requirements for the total aviation fleet of the USN and of those foreign governments which use USN type aircraft in their fleets. ASO procurement level is approximately $1.0 billion (US). ASO is responsible for all repairable and critical parts and only consumable parts will be transferred to the DLA Centres.

Ships Parts Control Center (SPCC) - The procurement responsibility of SPCC has decreased dramatically over the last year with the decline in the DoD budget. However, this trend is expected to level out to result in a procurement responsibility level of approximately $500 million (US). Procurement responsibility for consumable items was transferred to the DLA in 1991.

United States Coast Guard (USCG) - USCG is not a DoD organization. It belongs to the Department of Transportation and as such is not party to the DDSA/DPSA arrangements and agreements. Indeed, the Buy America Act applies. However, because of USCG's close association with DoD, in particular with USN, CDPO has been actively promoting the participation of Canadian suppliers in the USCG repair and overhaul program in its facilities in Curtis Bay (MD.) for ships and in Elizabeth City (NC) for aviation equipment. USCG buys approximately $750 million worth of equipment yearly. $225 million is reserved for the procurement of major systems. USCG marine equipment includes boats (under 65 ft.), cutters, icebreakers, tugs and patrol boats. Its

aviation equipment includes fixed aircraft (C-130's, Falcons) and helicopters (Seakings, Dolphins and Jayhawks).

Representatives of DGSC, DISC, SPCC, and ASO will be available at HiTEC '93 for those firms requesting an appointment.

Canadian Vendor Opportunities with U.S. Prime Contractors in mid-Atlantic Region

There are over 200 US prime contractors in the mid-Atlantic region, making it a ripe area for Canadian suppliers of mil-spec qualified material. The primes are concentrated in the major manufacturing areas of Philadelphia and suburbs; Lancaster-York, Pennsylvania; Baltimore and suburbs in Maryland; Washington, DC and suburbs in Virginia. In southern Virginia the primes are well spread out.

The US primes in the mid-Atlantic region manufacture a full range of military equipment and products including: helicopters, aircraft parts for repair and overhaul, ordnance, timing devices, military computer systems, vertical launch equipment, electronic systems, optical night vision equipment and systems, nuclear propulsion equipment, mobile shelter systems, valves, fittings, and gears, communication transmission equipment, military refrigeration equipment, hydraulics, and monitors for computer systems.

Vendor supply opportunities continue to exist for mil-spec qualified Canadian companies offering superior quality, pricing and service.

SAN FRANCISCO

The territory of the Canadian Consulate General, San Francisco covers six states: California [north of Bakersfield], Nevada [except Clark County], Utah, Colorado, Wyoming and Hawaii.

California, with a GDP of $680 B, is the 6th largest economy in the world. Northern California, population 14 million, represents 40% of this economic output, or US$270 B (45% of Canadian GDP). Defence activity, mainly in electronics and other advanced technology areas, is holding up well. Northern California continues to lose manufacturing jobs to the southern U.S. and Mexico, but has gained in the service and advanced technology sectors.

The Bay area's local economy includes a high percentage of service industries, primarily related to finance and international trade, as well as the highest concentration of advanced technology companies in the country. The Bay area is home to 50 of the Fortune 500 companies, including Bank of America, Bechtel, Chevron, Del Monte, Genentech, Hewlett Packard and Intel. It is the second most important marine, rail and air transportation hub on the west coast, behind Los Angeles/Long Beach. Some 5 million tourists visit San Francisco annually.

The Bay area is the leading center in the U.S. for computer technology, hardware and software. It has 2 to 3 times the number of advanced technology firms of any state, is home to 1/4 of the country's fastest growing companies, and also has more jobs in biotechnology than any other state or country. It is a spawning ground for new high tech companies and is home to about 25% of the nation's advanced technology venture capital firms. The region contains 1400 research labs spending $22 billion annually and 6 major universities including Berkeley and Stanford. To sum it up, the Bay area is a main focus for many of the technologies which are critical to Canada's future. The satellite office in San Jose, in the heart of Silicon Valley, will continue to promote our advanced technology products and services; seek marketing, investment and technology transfer opportunities; and seek partners to provide needed technology, capital or marketing assistance to Canadian firms.

At least 30 market research firms are based here. The State has the strictest environmental laws in the U.S. Hence, if products or technologies are accepted here, they will likely be accepted throughout the U.S.

Numerous cities in Northern California use Canadian urban transit equipment. With the multibillion dollar commitment of the California government to expand mass transit over the coming years, prospects for Canadian equipment are promising. Some other products or sectors offering potential include: instrumentation; farm, food processing and industrial equipment; environmental equipment and services; medical equipment; printed

circuit boards and other electronic components; local area network products; and data communication equipment.

Denver, home of a satellite Trade office with jurisdiction in Colorado and Wyoming, is an important regional business, transportation, services and communications center. Canadian capital and expertise has played a leading role in the region. Export opportunities are good in a number of sectors, notably for products and services from the western provinces. Colorado is home to a growing number of advanced technology firms in areas such as computer peripherals, GIS, and aerospace. Construction of the new Denver International Airport is underway and a light rail system is planned.

Utah, with a population of only 2 million, is a small market, but home to a number of important defence contractors, including Thiokol, E-Systems, Hercules and Williams Research. Salt Lake City is also considering a new rapid transit system.

Many of the distributors servicing Hawaii are based in San Francisco and some Canadian products find their way to the islands unbeknownst to our exporters. Hawaii offers good potential for products and services related to tourism, agriculture and food processing, and marine services.

New potential will result from the new airport planned for Denver, and from expansion of cruise ship operations to Canada resulting from changed U.S. regulations. We will continue to promote growth of traffic from Hawaii and Utah, and of conventions, conferences and incentive travel in Canada.

ENVIRONMENTAL PRODUCTS AND SERVICES

The environmental industry in California is very much regulatory driven with the state setting the pace for the rest of the country. The Federal Environmental Protection Agency frequently patterns its regulations after California's. The recently created California EPA unites the various regulatory agencies under one umbrella, resulting in a more efficient regulatory system. These agencies are located in Sacramento, a two hour drive from San Francisco. If a new environmental technology is accepted in California, it will usually be accepted in the rest of the U.S. This makes the state a good starting point and testing ground for the U.S. market. The Northern California environmental products/services market is estimated to be greater than $8 billion in 1993 and more than $9 billion in 1994.

Hazardous waste management currently shows the highest growth rate in the environmental services field, at some 30 percent. Treatment, storage and disposal facilities are a primary target; the EPA proposes national corrective action that some say will rival in scope and impact the Superfund program for remediation of uncontrolled hazardous waste sites. Thus **site remediation** of the Department of Defense, the Department of Energy, state, municipal and industrial land must be urgently undertaken.

This opens up numerous opportunities to sell to or partner with U.S. environmental firms to penetrate the Northern California market.

Water and waste water are also in the forefront. A six year drought in Northern California resulted in mandatory water rationing in the San Francisco Bay area for the past three years. There is a strong market for the latest in water conservation equipment for industrial and residential users.

Solid waste is subject to pressure from legislators and from the public. California faces the fact that landfill space is becoming very scarce and costly. The State's goal is to reduce the waste stream by 50% through recycling and composting.

Air pollution is a major concern, even in Northern California and Colorado, primarily due to the extensive use of the automobile in densely populated areas such as the San Francisco Bay Area with its population of 7 million. Business expenditures are projected between U.S. $20 billion and U.S.$30 billion throughout the U.S.

AEROSPACE, SPACE AND DEFENCE

Northern California's leading sectors are in avionics, aircraft landing gear, actuators, defence electronics, computer hardware, data communications, software distribution and environmental products and services. Funds are also spent in the post territory on aerospace and electronics by NASA and DARPA, which is expected to remain stable as the U.S. cuts back production on deployable system and emphasizes R&D. The portion of the DoD budget for SDI, GPALS, and theatre ballistic missile defences, of which many of the post's territory's prime contractors are involved in, has also experienced an increase and should continue to do so in the future. As the Operations and Maintenance budget decreases, the need for simulation systems will receive increased emphasis, benefiting Lockheed, Evans and Sutherland and McDonnell Douglas.

Concerning space programs in the post territory, NASA's Ames Research Center is located at Moffet Field between San Jose and San Francisco. Of NASA's top 100 contractors, 14 are in the Post territory, with Thiokol in **Utah** being the third largest. **Colorado** has companies concentrating in space-based communications and defence electronics such as Ball Aerospace, Martin Marietta Astronautics Group and TRW Communications.

There are seven major international airports in the post territory. The new Denver airport's first phase of construction should be operational during 1993 and a major expansion of the San Francisco International Airport has recently been announced. The following is an overview of FMC, Sacramento ALC, GenCorp's Aerojet, and aerospace/defence contractors in Utah.

FMC Corporation (Santa Clara) is a prime manufacturer of armored personnel carriers and mobile weapon systems. DoD last December selected FMC Ground Systems Division, teamed with General Dynamics Land Systems, to continue work on the chassis that will carry the Army's next main battle tank (dubbed Block 3, cornerstone of the Army's US$63 billion Armoured Systems Modernization Plan). FMC presents opportunities for machining, forging, and casting however there remains strong competition from current suppliers.

The **Sacramento Air Logistics Center** at McClellan AFB is a key assembler of communications equipment and aircraft (radar and communications). McClellan provides worldwide support of assigned weapon systems, equipment and commodity items, and has maintenance, distribution and contracting services essential to AF Logistics. McClellan has established strict environmental standards for all of its operations on the base. This opens opportunities for the supply of environmental monitoring, measuring and control equipment. The base began a major site remediation program two years ago and has developed many innovative clean-up and pollution prevention technologies that they would like to commercialize in some manner. In turn McClellan is interested in obtaining new technologies to incorporate into their existing programs.

Aerojet Solid Propulsion Company, Aerojet Boosters and **Aerojet Tech Systems** are the aerospace-defence segment of GenCorp. Aerojet does three basic areas of technology: rocket propulsion, ordnance and defence electronics. Aerojet is working on the next generation of boosters for the space shuttle, developing a smart munitions system to defend against heavily armoured vehicles, producing powerful engines for the new Titan IV, and designing advanced sensor systems for defence and meteorological applications.

Aerojet Solid Propulsion buys chemicals and man-made fibres, not electronics. Aerojet's supplier base provides: electro-mechanical, castings and forgings of all sizes, large assemblies, gear boxes, rotor blades and rocket motor systems and valves. They are interested in components for valves, flow form machine parts (e.g. for tactical rocket motor cases), rubber material, turbo-cones, graphite structures and chemicals.

Aerojet TechSystems manufactures liquid rocket motors. The best way to market here is to target new programs by meeting their Manager for New Technology. Techsystems is a system designer and assembler, with most manufacturing done outside the company. Opportunities exist for Canadian firms in foundry work (structure type castings), high pressure tanks (titanium or composites w/titanium liners), actuator valves and transducers. Aerojet has won 6 of the 10 NASA contract bids totalling US$72 million for advanced development of propulsion components for the new ALS liquid rocket engine.

THE STATE OF UTAH - Utah's economy is dependent on local military bases and defense contractors. Salt Lake was voted #1 U.S. city in which to locate a business by

Fortune magazine based on its generous supply of workers with advanced skills, a strong work ethic and strong local government support for corporate newcomers. Opportunities exist in the defence industry for highly specialized companies.

Ogden Air Logistics Center at Hill AFB offers potential for defence suppliers. The Base has worldwide logistics management and maintenance support responsibilities for some of the Air Force's most sophisticated weapon systems. It has system program management for two of the Air Force's foremost fighter aircraft and is the depot-level overhaul and repair for all types of aircraft landing gear, wheels, brakes and tires, and all Air Force photographic and reconnaissance equipment. Potential opportunities lay in aircraft and aircraft-related (weapon systems) sectors. There are opportunities at Ogden ALC in repair work for electrical and electronic items, mainly for the F-16. It's easier to become source approved on repair items than on new parts. Once approved on repair items, this can often lead to manufacturing approval for new parts.

Thiokol's Tactical Division annually accounts for over $80 million of which half is sub-contracted. For their Standard Missiles and HARM, 20 items make up 87% of sub-contracts, notably in case assemblies, ignition system components, raw materials and chemicals.

E-Systems, Montek Division, has interest in electro- and electrical mechanical capabilities; mechanical/hydraulic actuators account for 60% of their business. Montek is all commercial aerospace with a large percentage of it being a major supplier to Boeing on nav-aids etc. The larger number of small machine shops in the Salt Lake area are meeting most of E-Systems' machine requirements. Much of the assembly work is still in-house.

Hercules Aerospace was tapped by NASA to conduct a program designed to improve the quality of nozzles used on solid-fueled rocket motors. Its primary focus in on electronics and instruments, with the TITAN IV being its largest program. Buying times have been stretched out on the Delta, Trident and Peacekeeper programs.

McDonnell Douglas' facility in Salt Lake City is relatively new. Originally the fuselage for the MD-80 was built there. In 1992 the MD-80 tail section assembly was transferred to Salt Lake City form Macon, Georgia. Also, the sourcing, purchasing and supplier relationship functions for the tail assembly were transferred to Salt Lake City from Long Beach, California. Canadian suppliers are primarily providing components to this facility for the MD-80 tail assembly.

Paramax Systems Corporation business is primarily on the TRC170 program. They purchase electrical/electronic items such as PCB's and machined and fabricated parts.

SANTA CLARA

BIOTECHNOLOGY

Silicon Valley is the center of "Biotech Bay," home of over 360 biotechnology companies and suppliers. California has more biotechnology activity than any other state, and more than any other country. The San Francisco Bay Area in particular, has the largest concentration of private sector biotech activity in the U.S. In addition, "Biotech Bay" is home to ten major universities and institutional bioscience research centers. The emerging technologies within biotechnology are: Antisense, Gene therapy, Rational drug design, Cellular therapy, Vaccines, and Carbohydrate chemistry.

Major biotechnology firms in the area:

Genentech, Chiron, Systemix, Xoma, Syntex, Genencor, Alza, Scios, Nova, Mast, Immunosystems, Affymax.

TELECOMMUNICATIONS/DATA COMMUNICATIONS

Over 25% of the USA's telecommunications and data communications companies are headquartered in California, many of them in Silicon Valley. Some of the key players in our territory are listed below.

Major Data Communications firms in the area: Nortel, 3COM, Novell, Atalla, Synoptics, Octel, Pacific Bell, VMX, Bridge, Rolm, Linear, Hughes Lan, Cisco, David Systems, Network General.

RESEARCH & DEVELOPMENT

Silicon Valley is a major center for R&D. Such organizations as UC Berkeley, San Jose State University, University of San Francisco, Stanford University, Lawrence Livermore Lab (8000 researchers), Stanford Research Institute (3500 researchers), Xerox Parc, IBM-Santa Theresa Labs (2000), Lawrence Berkeley Laboratory, and over 1400 other private research centers, make this a good market for high tech and biotech research.

If you are looking for new technology or to cooperate on state of the art research, the Bay Area is a good place to start.

COMPUTER HARDWARE

Silicon Valley is the world center for the design and manufacture of personal computers, semiconductor, and networking systems. Canadian firms with new technologies should

come to Silicon Valley to negotiate OEM and distribution agreements with the major vendors. Of particular interest are firms with subcomponents for PC systems.

Major high tech firms in Silicon Valley

FIRM	REVENUES
APPLE	$ 6.4 B
HP	$14.9 B
TANDEM	$ 1.9 B
SUN	$ 3.5 B
NATIONAL SEMI	$ 1.7 B
AMD	$ 1.2 B
INTEL	$ 5.0 B
IBM/ADSTAR	$ 5.0 B

Software Distribution - Silicon Valley is the home of several major software distribution firms. A sample of these firms is listed below. Also, many Canadian software producers have forged joint marketing alliances with the major hardware vendors. The Post would be happy to assist in setting up such alliances, if the firm has a clear business plan, and sufficient finances. In addition, the San Jose Trade Office has written a guide on US Software Distribution that is available free of charge.

Major Software Distribution Firms - Businessland, Computerland, 800 Software, Software Establishing Corporation, Egghead Software.

Venture Capital - Silicon Valley is the source of about 30% of all high tech venture capital invested in the United States. The 25 largest VC firms in the area have US $6 billion currently under management, with individual portfolios ranging from $60-600 million. While VC firms generally prefer to invest within their own geographic area, they may be interested in Canadian opportunities if the deal is really attractive, and there is a Canadian co-investor. Key ingredients are the quality of the technology and entrepreneurial manage-ment with experience in the sector. A list of VCs and their industries of investment focus is available from the trade office in San Jose.

Post Resources - The Post has a database of over 6,000 contacts in Silicon Valley. This data can be sorted to your specifications, (i.e. VARs, dealers, universities, venture capitalists, etc.)

In addition we have CorpTech, a database of U.S. high tech companies; and Computer Select, a CD-ROM database of the computer industry, its products and technologies.

Post Activities - Upcoming Post Programs - HITEC, Monthly Investment Fora/High Tech/ Biotech, Software Publishers' Association Annual Conference - March ' 94,

International Industrial Symposium on the SuperCollider (IISC), Info Booth, San Francisco - May '93, Biotechnology, Mission to IBEX Show, October '93.

TELECOMMUNICATIONS/DATA COMMUNICATIONS

Market Study - May 93
General Systems
Government Procurement, Sacramento, May 1993

Contact:
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Consul & Trade Commissioner
Canadian Consulate Trade Office
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SEATTLE, WASHINGTON

The hitech market in the Pacific Northwest (PNW) is concentrated primarily in the states of Washington, Oregon and to a lesser degree, Idaho. Industry leaders include Boeing, Microsoft, Intel, Nintendo, John Fluke Manufacturing, Tektronix, Battelle, Hewlett Packard, and Immunex. Anchors comprise Boeing with its $88 billion in back orders for commercial airplanes and Microsoft with annual sales of prepackaged software in excess of $3 billion. The PNW is currently home to approximately 1500 software companies, 100 biotech companies, 600 electronics manufacturers, and 1,000 environmental businesses, and is the highest growth hitech area in the U.S. As a result of close historical, political, environmental and economic ties with the provinces of B.C. and Alberta, and the advent of the FTA, Canadian companies and products are highly regarded and effectively compete with their respective domestic U.S. counterparts.

Individual and group missions offer the best vehicle for making contacts in the PNW hitech market; trade shows, generally, tend to be regional in nature and lack the impact/attraction of national events which are held in the larger centres.

AEROSPACE AND DEFENCE

Boeing is still the world's largest producer of commercial airplanes and procures Canadian goods and services in excess of $500 million annually. Newcomers must be prepared to meet the highest quality standards (D1-9000), deliver on time and quote prices on a straight line basis over a 2-5 year period. Competition is tough; a local sales representative is highly recommended.

New Boeing projects include production of the world's first computer-designed jetliner, the 777, set for delivery in 1995, an expanded version of the 757, an expanded 747, a 767 widebody freighter, a supersonic transport, and development of a super jumbo 600 passenger jet with Daimler-Benz of Germany and British Aerospace PLC. Recent cutbacks in spending on defence by the U.S. Congress have resulted in a dramatic decrease in Boeing's aerospace and defence activities. Opportunities are limited and focus on developing avionics for the B1-B strategic bomber, prototype production of the F-22 advanced tactical fighter, development of a new generation of heavy-lift space rockets, and building the living and lab modules for space station freedom.

US GOVERNMENT PROCUREMENT

Major U.S. buying agencies include the Naval Supply Center (NSC) in Bremerton, WA., the Bonneville Power Administration in Portland, OR., the National Oceanic and Atmospheric Administration (NOAA) in Seattle, WA., and the General Services Administration (GSA) in Auburn, WA. There are basically no restrictions regarding

U.S. federal procurement of Canadian products for military use. However, Canadian firms should be aware of American policies favoring this country's end products, namely the Buy America Act and small business and minority business set asides. In order to sell to the NSC, a Canadian supplier must be certified as an approved supplier by the Canadian Commercial Corporation (CCC). With few exceptions, Canadian companies can effectively bid for U.S. Government contracts in the PNW. Consideration should be given to appointing a U.S. sales agent.

ADVANCED TECHNOLOGY/COMPUTER HARDWARE SOFTWARE ELECTRONIC EQUIPMENT

The fastest growing area within the hitech industry in the PNW is software development. Among the approximately 1500 software development companies in the PNW, home-grown leaders include Microsoft, Aldus, Boeing, and Weyerhaeuser. These giants, in turn, have generated hundreds of smaller spinoffs. A recent survey indicated that 54% of area firms develop prepackaged software; 40% were tied to custom development; 22% offer software consulting and 10% are linked to hardware applications. Major distribution channels include: direct sales (83%), dealers and distributors (49%), mail order and VARS (19%). Overseas sales from this area are strong, particularly to Japan and Europe. Washington state ranks 5th in employment in the U.S. for prepackaged software development. The PNW presents three major concentrations within the electronics field of hitech: computerization, microcircuitry, and measurement and control. Other opportunities are in the areas of telecommunications, robotics, biotech, and marine technology. Area leaders include: Tektronics, Mentor Graphics, Keytronic, Eldec, Hewlett-Packard and Intel. The PNW is now home to more than 30 Japanese electronics manufacturing companies including Epson, Fujitsu, Nec, Sharp and Matsushita.

SECURITY PRODUCTS

Corporate security, government (police, military, and port authorities), and consumer security are the three fundamental markets for security products in the PNW. Major corporations with offices abroad offer the most promising upstart segment of this market. Companies such as Morrison Knudsen, Boeing, McCaw Cellular, and Microsoft are examples of the type of multinational companies which maintain corporate security programs and have head buying offices within the Seattle Consulate General's PNW territory.

ENVIRONMENTAL EQUIPMENT/SERVICES

Opportunities for marketing environmental products and services in the PNW are similar to other areas of the U.S. with differences that reflect the unique character of the territory. There is a high demand for energy conservation and renewable resources including forestry and fisheries management. Washington state is considered among the

leaders in environmental remediation and recycling and is the location of the Department of Energy Hanford Nuclear Site which has been designated the world's largest clean-up project. The Energy Department is spending in excess of $218 million to build a lab run by Battelle that will conduct research using microbes to clean up contaminated groundwater and vitrification (a technique for containing wastes by encasing them in a glasslike substance). Washington's environmental industry is strongest in remediation (especially bioremediation), environmental review and environmental engineering and industry players are open to partnering with Canadian firms offering complementary niche technologies and services. Key areas of focus are hazardous/toxic waste management, water and waste water management and pollution prevention programs. Canadian firms need some form of local presence or industry-acclaimed expertise.

MARINE

The commercial marine sector represents a number of opportunities for Canadian suppliers. Washington is home to the 2nd largest container import/export activity in the U.S. The Port of Seattle (4th largest in the U.S.) is the Trans-Pacific's great circle route and gateway for the lower 48 states, Alaska and Asia. The PNW fishing fleet harvests in excess of 40% of the nation's total seafood providing further opportunities for Canadian companies. The recreational marine sector is one of the strongest in the U.S. The annual Seattle boat show attracts over 100,000 visitors with displays of inflatables, 60 ft. motor yachts, replacement motors, safety and communications equipment, etc. It is estimated that 50% of the 500 exhibitors make 25% of their total annual sales during this show. Canadian recreactional marine suppliers with competitively priced products should seriously consider this event.

AIRPORT EQUIPMENT AND SERVICES

Purchase of equipment and services for the major airports in this territory are handled by each state's respective port authority. The Port of Seattle purchases approximately $40 million of goods and services annually for maintenance, repair, operations and capital equipment. There is a good market for competitively priced Canadian products and services. Sea-Tac Airport is presently completing the final phase of an environmental impact study for development of a third all-weather runway. Purchasing for both marine and air operations is centralized: Contact Mr. Timothy Jayne, Senior Buyer at 206-728-3237; Address - Port of Seattle, P.O. Box 1209, Seattle, WA 98111.

WASHINGTON, D.C.

The embassy in Washington is responsible for market development in the mid-Atlantic region of eastern Pennsylvania, Virginia, Maryland, Delaware and the District of Columbia. (In addition it handles trade policy and market access issues for the US as a whole.) Its responsibility for defence marketing is primarily restricted to the greater Washington area, with the satellite office in Philadelphia covering the rest of the mid-Atlantic region. (See separate profile).

The region includes three key markets: the Delaware Valley (Philadelphia-Wilmington), the Washington-Baltimore corridor, and the state of Virginia. Commercially developed and affluent, the mid-Atlantic represents some 6 % (16 million) of the U.S. population, but a full 9 % ($350 billion) of U.S. personal disposable income. Delaware and Virginia are expected to far surpass national averages for population and personal income growth by the year 2000 and 4 cities in the region, Baltimore, Norfolk, Wilmington, and Richmond, have registered promising economic and population increases. Mid-Atlantic retail sales account for 10 % of the national total with the combined markets of Baltimore and Washington generating some $50 billion in sales annually.

The following is a brief description of market opportunities and developments and assistance provided by the embassy in areas of particular interest to exporters of high technology:

AEROSPACE AND DEFENCE PRODUCTS:

General Outlook: The U.S. defence budget is huge: US $ 274 billion for the current fiscal year. (This includes US $ 55 billion for acquisition, US $ 40 billion for research and development and US $ 81 billion for operation and maintenance.) The budget will continue to be huge even with further cuts. (Based on what we know about DOD's new roles in the post war era, lessons learned from the Gulf War and other information sources it is clear that some broad areas of opportunity do exist. Such areas may include defence environmental initiatives; more sophisticated C^3I (including surveillance); management information systems; unmanned aerial vehicles; technologies with application to special operations and low intensity conflict (SOLIC); space equipment; technologies which facilitate the rapid deployment of forces; depot level maintenance and life extension and upgrade programs; and advanced electronics systems with emphasis on electronics upgrades, commonality, inter-operability, and dual-use technologies. Canadian companies may wish to explore possibilities for exploiting such opportunities through teaming arrangements with U.S. small and minority-owned businesses, or if appropriate, through development projects funded under the Defence Development Sharing Agreement.

Embassy's Role: Embassy staff can assist exporters in resolving market access problems and provide advice and counselling on development sharing projects, on marketing and on defence procurement procedures and regulations (including FMS., protest procedures, the various set-aside programs, export licensing requirements, rights in data, Foreign Weapons Evaluation, subcontracting requirements, the defence budget process etc.)

Embassy staff also assist exporters in participating in the major defence trade shows held in Washington. (These include the Air-Sea-Space Show, the Marine Corps Show, the Armed Forces Communications and Electronics Show, the Association of the US Army Show, the Air Force Show, Comdef, the SOLIC exhibition etc.)

Contact: David Buxton, Tel: (202) 682-7743 Fax: (202) 682-7795

FEDERAL MARKET FOR INFORMATION TECHNOLOGY
(Hardware, Software, & Telecommunications)

The U.S. federal government forecast FY92 expenditures in this market of over C$19 billion. Government buys hardware and software sold on the commercial market, but eighty per cent of this budget is spent on complex integrated systems or on large commodities purchases by a single agency. Many major systems acquisitions are co-ordinated by agency headquarters offices in or near Washington D.C. Spending on hardware, software and systems and services in civilian departments is predicted to grow at about two per cent a year through 1997, while Department of Defense budgets in this sector are forecast to shrink three per cent per year.

In fiscal 1991, fifteen companies won contracts worth almost fifty per cent of the federal information technology budget. It is possible to begin by selling computer products and services to a few good prospects in order to develop a customer base. However, the selling cycle is typically twelve to eighteen months for products other than the most basic commodities. Requests for Proposals (RFP's), the principal contracting vehicle for the large systems, are often in development for years.

U.S. federal program managers are interested in products and services that meet a specific agency requirement, or helps them to meet their program objectives. A Canadian firm with a strong sales record in the U.S. commercial sector is a good candidate for the large volume, or "Schedule", contracts similar to the Canadian government's Standing Offer program. Canadian companies with a track record of strong, innovative technology and solid experience in Canadian government or private sector contracts may be able to arrange partnerships with American prime contractors.

Contact: Judith Bradt, Tel: (202) 682-7746 Fax: (202) 682-7619

ENVIRONMENTAL MARKET:

The US environmental market (estimated to be worth more than US $130 billion) has an average growth rate of an astonishing 15% per annum. It represents over 2% of American GNP and by the year 2000 is expected to be equivalent in size to the defence market - or about 3% of GNP. Nearly 70,000 businesses, employing some 2 million Americans, sell to the market.

The Environmental Engineering and Consulting market is one of the market's key sectors, with estimated expenditures of US $ 12 billion in 1990 and an average annual growth rate of 16%. **The Hazardous Waste Management segment** (worth over $ 13 billion annually) is essentially a low technology market at this time. However, there is a strong existing need for hazardous waste treatment systems, monitoring systems, and instrument supply and good long-term potential for high technology products in the areas of bio-remediation, fixation/stabilization, and thermal destruction. **The Remediation market** is worth some $ 3 billion annually. There are currently 1,200 sites on the Superfund (ie national priority) list for clean up and 30,0000 industrial sites already identified as requiring clean up (out of an estimated 130,000 to 425,0000 industrial sites in total). The number of identified sites continues to grow rapidly. Current estimates for the multi-year costs of cleaning up key **public sector** sites (mostly Dept. of Defense and Dept. of Energy Superfund sites) exceed US $300 billion. **Private sector** clean up estimates are over $ 100 billion. Clean up costs for all currently identified sites now exceed US$ 1 trillion. The need to undertake clean ups more efficiently is fostering the development of sophisticated new remediation technologies including: thermal, biological, vacuum extraction, stabilization, solvent extraction, soil washing, in-situ vitrification, supercritical fluid extraction, and molten glass furnaces. There is a strong need for incineration technologies and equipment for on-site use. **The Nuclear Waste Management market** (worth an estimated US$ 1 billion in 1990) includes clean up of former DOE and DoD sites as well as management at power utility sites. Key areas for future technology growth and needs include robotics, nuclear bio-remediation, and materials for waste stabilization and solidification. **The Analytical Services market** (worth some US$ 2 billion) is largely driven by regulatory requirements for constant analyses of soil, water and air for a range of toxic substances. Long term growth, however, is likely to be quite flat when compared with other market segments.

Contact: David Weiner, Tel: (202) 682-7745 Fax: (202) 682-7619

GOVERNMENT DEPARTMENTS

AND AGENCIES

EXTERNAL AFFAIRS AND INTERNATIONAL TRADE CANADA

AEROSPACE AND DEFENCE PROGRAMS DIVISION (TAG)

TAG is one of the four divisions which make up the International Marketing Bureau. Its primary role is to provide a global market perspective for defence and commercial aerospace, space, electronics, marine and security products and services. By doing so, it helps Canadian industry to export in these areas.

TAG has developed three Global Market Intelligence Reviews which synthesize market information obtained from over 120 Posts abroad. These are living documents which will provide industry with a comprehensive view of where government-initiated market development activities will be focused. These reviews represent a close collaboration among all government and industry stakeholders and are intended to reflect an ongoing consultative process between government and industry. The objective is to ensure industry maximum opportunity to influence government international marketing support activities. The three reviews produced to date include: space and space-related products and services, aircraft repair and overhaul and security products.

TAG also manages formal government-to-government defence economic relationships including the Canada - U.S. Defence Development/ Production Sharing Arrangements (DD/DPSA); the defence Research, Development and Production (RDP) agreements with Western European countries; the Defence Industrial Cooperation (DIC) agreements and NATO infrastructure procurement.

Canada - U.S. Defence Production Sharing Arrangement (DPSA): This arrangement gives Canadian manufacturers the opportunity to provide defence supplies and services to the U.S. military and to the U.S. defence contractors on essentially the same basis as domestic U.S. suppliers. Under this program, the U.S. government has waived customs duties and its Buy America Act.

Canada - U.S. Defence Development Sharing Agreement (DDSA): This unique program, a companion to the DPSA, enables the Canadian Government to share in the cost of a U.S. Department of Defense development project based upon a U.S. requirement. Qualified Canadian companies act as prime contractors for approved projects.

RDP Agreements: Canada maintains bilateral defence RDP agreements with European partners (Belgium, Denmark, France, Germany, Italy, The Netherlands, Norway, Sweden and the United Kingdom). The objective of these agreements is to forge strong government-to-government relationships with a high level of industrial representation.

Through this, cooperative projects (R&D, production, licensing etc.) are developed under the RDP. Defence economic cooperation represents a strong element of RDP's. Industrial cooperation is encouraged for the mutual benefit of our defence industry bases.

DIC Agreements: In addition to the RDPs, Canada also has created cooperative industrial agreements with Spain, Saudi Arabia and Australia and is in the initial stages of negotiation with South Korea. These agreements key on projects which will mainly benefit industry through joint ventures, transfer of technology, industrial benefits and shared manufacturing techniques.

The NATO Market: As a member of the North Atlantic Alliance, Canada contributes to NATO infrastructure projects and cooperative armament projects. These projects require a wide range of goods and services, and present opportunities for Canadian companies to participate.

Other Defence Markets: TAG provides assistance to companies selling defence products to other world markets as permitted by Canadian export controls policy.

Civilian Aerospace, Security Products, Air Traffic Control, Airport and Marine Markets:

TAG also provides a full range of marketing support to exporters of the above products and services. The division is helping to organize, for example, the Subcontractors Exhibition which is tentatively scheduled to take place in Abbotsford B.C. in conjunction with Airshow Canada on the 4th of August, 1993.

TAG co-chairs with ISTC, a Working Group on Trade in Space Products and Services which co-ordinates trade development activities of five federal government departments. The goal is to bring together the resources of both government and industry to maximize the effectiveness of both groups' promotion activities. Cross Canada consultations with industry have been held and a Capability Guide for distribution by our Embassies and Consulates has been produced.

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EXTERNAL AFFAIRS AND INTERNATIONAL TRADE CANADA

ADVANCED TECHNOLOGIES DIVISION

External Affairs and International Trade Canada (EAITC) has the primary federal government mandate for assisting Canadian industry in its efforts to market products and services internationally. The Advanced Technologies Division (TAE) is the Departmental focal point for facilitating the international marketing of advanced technology products and services.

Trade Commissioners assigned to TAE provide global marketing expertise and support for the fields of telecommunications, computer based technologies, instrumentation, geomatics (including remote sensing), components and electronics. They have a broad knowledge of global activities and opportunities in these sectors and provide counselling and assistance to Canadian firms in identifying and accessing business opportunities abroad.

In cooperation with Trade Commissioners from Canadian trade posts and the geographic trade divisions within EAITC, TAE coordinates foreign market intelligence collection and dissemination and advises on the implementation of selected promotional activities including industry participation in major international trade exhibitions, foreign market exploration missions, incoming buyers missions, seminars and conferences. For promotional use abroad, the Division produces sectoral publications and diskettes highlighting the capabilities of Canadian companies.

For more information about how we can assist you with your international marketing plans, please contact:

ADVANCED TECHNOLOGIES DIVISION (TAE)

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Fax: (613) 944-0050
Telex: 053-3745/462

EXTERNAL AFFAIRS AND INTERNATIONAL TRADE CANADA

SECONDARY INDUSTRIES DIVISION

The mandate of External Affairs & International Trade Canada (EAITC) includes the promotion of the export of Canadian goods and services through improved access and through trade development activities in concert with the business community.

As part of the International Marketing Bureau, the Secondary Industries Division (TAC) provides global market information and strategic guidance on Canadian capabilities on a broad range of industrial machinery, equipment and related services, in particular for: urban transit and rail; mining; pulp and paper equipment; plastics, labelling and packaging, and agricultural equipment; automotive products; environmental and energy equipment; furniture; textiles; houseware and hardware; apparel; footwear; sporting goods; consumer electronics; medical devices; and educational equipment.

The Secondary Industries Division (TAC) acts as the sectoral focal point within EAITC for the collection of global market information from Trade Commissioners abroad, and its dissemination to trade and industry associations, OGDs, provinces, and Canadian companies, and provides international market advice on "where the world shops". It provides input in setting departmental priorities and program resources, and to Government-funded programs and services (e.g. PEMD). It also provides advice on international trade exhibitions, outgoing trade missions and incoming buyers' missions. In cooperation with OGDs, the division produces sectoral capability guides on Canadian industry and technology for promotional use abroad.

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EXTERNAL AFFAIRS & INTERNATIONAL TRADE CANADA

EXPORT CONTROLS DIVISION

If you export high technology, military or atomic energy products then chances are an export permit is required, by law, before goods may be exported from Canada. The Export Controls Division is responsible for the administration of export controls under the Export and Import Permits Act. Permits are required for a wide range of strategic goods and technologies as defined in the Export Control List (ECL). Goods identified on the ECL require permits for export from Canada to all destinations (except the USA in most instances). In addition, permits are required for the shipment of all goods whether appearing on the ECL or not to Area Control List (ACL) countries. The ACL includes Libya, South Africa, Haiti, Yugoslavia, Bosnia-Herzegovina and Croatia.

The controls that apply to exports of strategic goods are based on national security considerations and are actually implemented on a multilateral basis. Canada, along with its NATO partners (except Iceland), plus Australia and Japan, participates in the Coordinating Committee for Multilateral Strategic Export Controls (COCOM) the purpose of which is to maintain export controls on the shipment of military and strategic goods and technologies to COCOM proscribed destinations (Albania, Armenia, Azerbaijan, Bulgaria, Byelarus, The People's Republic of China, the Czech and Slovak Federal Republics, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, The Democratic People's Republic of Korea, Poland, Romania, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan and Vietnam).

Within COCOM, International Control Lists (industrial, munitions and atomic energy) are established that define goods and technologies considered to be strategic. In addition to COCOM, Canada also participates in various non-proliferation regimes including the Missile Technology Control Regime (MTCR), the Australia Group, and various nuclear non-proliferation regimes. Under the MTCR, goods are controlled in order to reduce proliferation of missile systems capable of delivering nuclear, biological and chemical weapons. The Australia Group establishes controls over certain chemicals, biological agents and related dual-use equipment which could be used in chemical and biological weapons systems. Finally, the nuclear and atomic energy controls regulate the export of nuclear/atomic energy goods to prevent international proliferation of nuclear weapons. All goods identified by these various non-proliferation regimes are controlled under Canada's Export Control List.

Exporters of military goods are advised that Canadian policy on the export of military equipment is a restrictive one. Companies planning to export military goods to destinations other than the United States should be sure to meet with personnel from the Export Controls Division at HiTEC '93.

EXPORT CONTROLS DIVISION (KPE)

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EXTERNAL AFFAIRS AND INTERNATIONAL TRADE CANADA

EXPORT AND INVESTMENT PROGRAMS DIVISION

PROGRAM FOR EXPORT MARKET DEVELOPMENT (PEMD)

The Program for Export Market Development (PEMD) is the cornerstone business program of External Affairs and International Trade Canada.

PEMD's objective is to improve Canada's international trade performance and, at the same time, stimulate the Canadian economy through increased production and employment. In keeping with the government's industrial and international market strategies, PEMD shares the risk with Canadian business to undertake new export activities that they could not, or would not, normally undertake on their own.

PEMD offers recoverable financial assistance to Canadian businesses that wish to participate in, or undertake, various types of international trade promotion and export activities. The Program covers projects initiated by industry, as well as projects planned by government that business participates in by invitation. PEMD is targeted at small-to-medium size Canadian companies (revenues of $250,000 to $50 million).

Assistance is available for the following export marketing activities.

Industry Initiated

- Participation in recognized trade fairs outside Canada.
- Visits outside Canada to identify markets, and visits of foreign buyers to Canada or to another approved location.
- Marketing Agreements to undertake a combination of the above activities.
- Project bidding, or proposal preparation, at the pre-contractual stage, for specific projects outside Canada involving international competition and formal bidding procedures. Covers the supply of Canadian goods and services for major capital projects including consulting services, engineering, construction and equipment.
- Special activities for non-sales trade associations for the benefit of their members. Activities may include participation in trade fairs, visits, technical trials, product demonstrations, seminars and training, and commodity promotion. Activities must be incremental to those the association would normally undertake in any case.

Government Initiated

- Trade Missions from and to Canada.

- Trade Fairs abroad in specific industrial sectors or for specific types of products. Participants in government-planned trade fairs pay a participation fee.

The assistance provided for PEMD industry-initiated activities is repayable if export sales result.

If you are in an established Canadian business that has considered exporting, or if you are an experienced exporter wanting to explore a new market, you may be eligible for PEMD assistance.

EAITC has published the PEMD Handbook which outlines the various eligibility criteria for potential participants, applicants and activities. The Handbook also describes how to apply for assistance in industry-initiated export marketing activities. For a copy of the Handbook and the appropriate PEMD application form, contact EAITC's InfoExport (1-800-267-8376 or 993-6435 for Ottawa callers), the Export and Investment Programs Division (613 944-0018), or the International Trade Centre in the nearest Regional Office of Industry, Science and Technology Canada.

INVESTMENT DEVELOPMENT PROGRAM (IDP)

The Investment Development Program encourages targeted foreign corporations and other potential investors to bring new capital and technology into Canada. The program also promotes joint ventures and strategic partnerships between Canadian and foreign firms.

IDP activities are carried out by investment officers and counsellors at 43 EAITC trade offices around the world. The program initially focused on Canada's traditional foreign investment sources: the U.S.A., the U.K., France, Germany, Japan, Hong Kong and Holland. It has now been expanded to cover additional European and Pacific Rim countries and the Middle East. Promotional campaigns, direct mail, seminars and other activities focus on sectors where Canada has demonstrated expertise and opportunities. The program actively promotes strategic alliances in knowledge intensive industries. Investment kits are produced which outline the industry in Canada and profile firms and research institutions interested in pursuing strategic alliances. A major selling point is the improved access Canada offers to the U.S.A. market under the Canada-U.S.A. Free Trade Agreement.

The Department works closely with Investment Canada, Industry, Science and Technology Canada (ISTC) and provincial and municipal governments to identify investment priorities in Canada.

TECHNOLOGY INFLOW PROGRAM (TIP)

Program Objectives: The program assists Canadian companies to acquire foreign technology to develop new Canadian products, processes and services.

TIP helps companies acquire technology in two ways. First, technology development offices located in posts abroad advise companies on technology sourcing, licensing, strategic partnerships and visitor services. Second, IRAP provides financial assistance for companies to travel abroad to investigate foreign technology acquisition and for working visits to assimilate the technology. These services are provided domestically through the NRC IRAP Industrial Advisors (ITA's) and internationally through EAITC Technology Development Officers (TDO's).

Terms and Conditions: TIP funding is based on cost-sharing principles. Contributions are provided to support international travel and living expenses. Support for specific TIP projects will not normally exceed $10,000.

Eligibility: Incorporated (or registered) Canadian companies with fewer than 500 employees.

Contact: Applications may be made through your regional IRAP office listed in the yellow pages under "Technology Assistance" and the National Research Council Canada, Industrial Research Assistance Program, Montreal Road, Bldg. M-55, Ottawa, Ontario, KIA 0R6, tel: (613) 993-5326 and fax: (613) 952-1086

FOR MORE INFORMATION ON ANY OF THE EXPORT AND INVESTMENT PROGRAMS CONTACT:

Export & Investment Programs Division
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Tel: (613) 944-0018
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NATIONAL DEFENCE

DIRECTOR GENERAL INTERNATIONAL

AND INDUSTRY PROGRAMS

The Director General International and Industry Programs (DGIIP) is responsible for the coordination of assistance by the Department of National Defence to industry and other departments of government in the marketing of Canadian defence products abroad. As well, DGIIP is responsible for providing the National Defence input to multilateral and bilateral Defence Materiel Armaments Cooperation Agreements and Research, Development and Production programs negotiated with various allied nations. These programs are designed to reduce the R&D and procurement cost of new weapon systems by exploring ways of cooperating with our allies with the aim of eliminating duplication and furthering the concepts of standardization and interoperability. These programs are also intended to explore opportunities for joint industrial participation.

DND's assistance to industry is predicated on ensuring that a viable industrial base responsive to defence requirements exists in Canada. Such assistance also complements the government's socio-economic objectives. In support of Canadian Forces readiness and sustainment, DGIIP is involved in defence industrial preparedness planning and analysis of industrial base issues, with emphasis on the Canada - U.S. defence economic relationship. This includes the coordination of departmental interests regarding industrial issues and representation of these issues outside of the department.

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NATIONAL DEFENCE

DIRECTOR GENERAL QUALITY ASSURANCE

The Department of National Defence (DND) is a customer for a wide range of goods and services procured from industry at home and abroad. As a customer, DND must ensure that the goods and services it buys are suitable for their intended purpose. To do this, DND has established a Quality Assurance organization headed by the Director General Quality Assurance (DGQA).

The Defence Departments of other nations also have similar Quality Assurance organizations to supervise the quality assurance of the goods and services they procure. Most Defence Departments procuring goods in Canada seek the services of DGQA to provide Quality Assurance on their behalf. Similarly, DGQA requests services of other Quality Assurance organizations in the respective country of procurement.

NATO has achieved a high degree of standardization in this request with most members using the same quality assurance specifications in their contracts. Other nations are confident that the Quality Assurance services they will receive in Canada are consistent with the requirements developed by NATO and, as a result, various agreements have been developed.

Reciprocal arrangements have been made by Canada with other foreign governments for the provision of quality assurance services on defence material procurement. Australia, Sweden, Switzerland, the United States and South Korea are party to bi-lateral agreements with Canada for these services. Also, Canada is a party to multi-lateral agreements with members of NATO Alliance and the American-British-Canada-Australian (ABCA) Standardization Program. The most prominent of these multi-lateral agreements are the NATO Standardization Agreements (STANAG). STANAG 4107 contains the procedures, terms and conditions for mutual Government Quality Assurance (GQA), and STANAG 4108 contains the list of Allied Quality Assurance Publications and the criteria for their use. The agreements, in broad terms, provide that the National Quality Assurance (NQAA) in a manufacturing country will, on the request of the NQAA in the purchasing country of NATO organization, provide QA service under standardized conditions. The DND QA authority (DGQA), will consider requests of GQA from countries other than NATO members, however, any service rendered under these circumstances normally will be on a cost-recoverable basis.

The DND QA Program is planning changes to organizational structure, Government Quality Assurance methodology and Quality Assurance Standards in 1993. Late Spring 1993 will see the implementation of ISO 9000 series of standards with only necessary supplements as the quality requirements for DND national procurement. DGQA will continue to participate in the NATO mutual GQA program based on the latest editions of AQAPs.

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INDUSTRY, SCIENCE AND TECHNOLOGY CANADA

AEROSPACE

Characteristically, the industry is niche market oriented and heavily reliant on access to export markets. Over 70 percent of the sector's output is exported, primarily to the United States. The sector's markets include transport and general aviation aircraft manufacturers, airlines, major civil aerospace and defence contractors, military end-users and governments. The relatively limited demand in the Canadian market for aerospace and defence goods and services has led the sector to its present strong export orientation. In particular, the defence-related elements of the sector have close ties to the major defence contractors in the United States. Recently, several Canadian firms have established supplier relationships to the European Airbus consortium; as a result, the current U.S. share of Canadian exports (approximately 62 percent) is expected to decline slightly.

In general, the Canadian aerospace sector has been relatively competitive on international markets over the last two decades. The U.S. export share of the Canadian market, on the other hand, declined by 34 percent during the same period.

Aerospace is one of the most R&D-intensive industry sectors in the world. The Canadian industry traditionally invests about 10 percent of total sales in R&D. Though the level is high relative to other Canadian manufacturing industry sectors, it has always been less than that of the United States, France and the United Kingdom aerospace industries. The comparable U.S. figure is 17.5 percent while the OECD average is 16 percent. These nations have large defence requirements that generate the higher level of their industry's R&D activity. Canadian R&D expenditures tend to be driven by international civil market opportunities.

SECTOR STRATEGY

The Canadian government has supported the maintenance of research and development capabilities in the aerospace and defence sector through the Defence Industry Productivity Program (DIPP). Firms themselves have responded, investing heavily in product research and in new production equipment and facilities. ISTC direct support accounted for approximately 13 percent of funding for new investments in 1991.

Free access to international markets is critical to the long-term viability of the Canadian aerospace sector. This access has generally been facilitated by trade agreements and other bilateral trade arrangements. For instance, most of the Canadian aeronautic sector's products are traded on an essentially tariff free market environment protected by the GATT that limits tariff and non-tariff barriers on civil aircraft products. In addition, special bilateral defence arrangements (DDSA/DPSA) allow relaxation of tariff barriers on trade in defence products. In spite of these bilateral arrangements, there are still a

large number of non-tariff barriers, particularly in the U.S, that prevent the Canadian aerospace sector from fully exploiting defence market opportunities in the U.S. and elsewhere.

The increasing trend in the late 80's towards strategic partnering among the world aerospace companies was the primary result of the increasingly high cost and risk of aerospace product development programs. Such partnerships, in addition to mitigating the risk and cost of product development, provide access to new markets, improve market share performance and limit competition. Only a few of the Canadian aerospace firms have formed such partnerships with foreign aerospace companies.

Offsets requirements, which during the 70's were primarily a defence market phenomenon, became widespread in civil aircraft procurement programs during the 80's. The Newly Industrialized Nations as well as some European countries demand industrial benefits/offsets on civil procurement. This results in a smaller proportion of the product being manufactured in its country of origin.

DEFENCE INDUSTRY PRODUCTIVITY PROGRAM (DIPP)

OBJECTIVE - The objective of DIPP is to develop and maintain strong defence related industries across Canada capable of competing successfully over the long term in domestic and export markets. The industrial environment is characterized by relatively high commercial, technical, and financial risk and by foreign firms which are typically heavily supported directly and indirectly by their respective governments. This objective includes the development and maintenance of a defence technology capability.

ASSISTANCE - Four types of assistance are available under DIPP. Contributions are provided towards the eligible costs of the following types of projects carried out in Canada.

Research and Development - research and development of defence related products and for sustaining the associated technology base.

Source Establishment - establish qualified Canadian suppliers of defence related products.

Capital Assistance - to acquire advanced production equipment to modernize or upgrade engineering and/or manufacturing capability in Canada for defence related products.

Market Feasibility - studies to establish the specifications and characteristics of defence related products required to meet market demand or to determine market sector characteristics for those products when needs have been identified in Canadian or export markets.

Marketing feasibility studies will normally be associated with the early stages of Development and Source Establishment project and the outcome of the studies will be a factor in determining the continuation of such projects.

Marketing feasibility studies may be carried out at the discretion of the applicant requesting program support depending on the adequacy of its marketing resources, or delegated to an appropriate marketing consultant.

Who May Apply - Any corporation institution co-operative, association partnership or individual wishing to undertake a project in Canada related to the development manufacture or support of defence related products.

FOR FURTHER INFORMATION on DIPP call Aeronautics and Defence Electronics Branch at (613) 954-3526, Space Systems Branch at (613) 954-3779 and Shipbuilding, Marine & Land Defence Systems Branch at (613) 954-3148.

SPACE SYSTEMS

The Canadian government views the space industry as a key strategic industry and continues to be strongly committed to its development through such federally assisted programs as the Defence Industry Productivity Program (DIPP) of ISTC, the Space Industry Development Program of Communications Canada, the Industrial Research Assistance Program (IRAP) of the NRC, to name a few. These programs assist the industry in developing spinoffs from space expenditures.

Because of Canadian industry's dependence on export markets, the trend towards commercialization is a welcome development. The Canadian government recognizes the importance of the Canadian industry and is supporting its quest for commercial opportunities and export markets. Government initiatives, such as sharing R&D costs with Canadian space companies help develop the Canadian subcontractor and supplier base and encourage companies to undertake activities in robotics, artificial intelligence and electro-optics. The Canadian government both as a purchaser at home and as an

export promoter abroad has helped Canadian space companies sell into export markets in the space industry in the past and will continue to do so in the future.

Prospects for the Canadian space industry are good, particularly in communications satellite systems and in sensors and processing equipment for remote-sensing satellites. Canadian companies are also exploring new market opportunities for terrestrial applications of technologies originally developed for use in space. In the future, material processing in space (such as manufacturing high-quality drugs, alloys and crystals) may become commercially attractive. The Canadian government is attempting to position its industry to take advantage of these opportunities.

Given the small size of Canada's domestic market, the industry must develop products with broader market appeal -- items that will lower costs and improve competitiveness. The industry is introducing business management techniques to increase the competitiveness of the planning, designing, developing and manufacturing processes. Recent events in the international marketplace suggest that Canadian companies must consider entering into alliances or partnerships with other Canadian companies and international players to ensure market access and to create economies of scale.

MARINE & LAND DEFENCE SYSTEMS DIRECTORATE

DEFENCE TECHNOLOGIES

The Defence Technologies sub-sector groups companies with advanced defence technology capability for defence related products and services. The sub-sector includes advanced applications in alternative power sources, the environment and optics, robotics and advanced industrial materials.

There are approximately 20 companies manufacturing numerically and remote controlled, audio-visual and voice actuated defence robotic systems. Annual sales total $500 million. Defence related sales account for approximately 70% of annual production, of which 50% is exported.

Approximately 20 companies are involved in the development and production of advanced materials for military applications. Annual sales total approximately $100 million. Defence sales account for 30% of annual production, of which 25% is exported.

Typical applications are protective body armour, vehicle chassis parts and components, armour, structural components for aircraft, missiles and other systems, including ceramic bearings and surface coatings. Although the industry faces trade barriers and bid restrictions as applicable to some military procurements, divisional staff is very actively engaged in assisting the industry in realizing their full export potentials.

MUNITIONS AND SMALL ARMS

The Munitions and Small Arms sub-sector is composed of small arms, ammunition, explosives, and propellant manufacturers. The sub-sector consists of approximately 10 companies with annual sales totalling $600 million. Defence sales account for 50% of annual production, of which 25% is exported.

MARINE DEFENCE PRODUCTS

The Marine Defence Products sub-sector consists of approximately 80 small and medium sized companies. Annual sales are estimated to total $600 million, and roughly $140 million is exported mainly to the U.S.

MILITARY VEHICLES, PARTS AND COMPONENTS

The Military Vehicles, Parts and Components sub-sector is made up of approximately 100 small to medium sized manufacturers of military oriented parts and components. Annual sales are estimated to total $600 million, and roughly 75% is exported mainly to the U.S.

DEFENCE SECURITY PRODUCTS

The Defence Security Products sub-sector is made up of approximately 70 small and medium sized companies with annual sales ranging from $3 to $50 million. Overall sub-sector sales are estimated to total $600 million annually. Defence related sales account for roughly 67% of annual production, of which 40% is exported.

The majority of companies are in niche markets and are actively seeking export opportunities. Typical applications are in the areas of bomb disposal, weapon and narcotics detection, military apparel for both NBC warfare and cold weather protection, including weather and impact resistant communications equipment.

SUMMARY

The Directorate's effort is to assist industry in competitively developing new products and services as well as improving and assisting companies with their marketing in the U.S. and global markets. Specifically, the Defence Industry Productivity Program (DIPP) and other departmental programs and services will play a major role in the delivery of the Directorate's mandate and service to the industry. The Marine and Land Defence Systems Directorate has a portfolio for 181 DIPP projects as related to Research and Development, Source Establishment, Capital Assistance, and Market Feasibility Studies with Canadian companies who are in the defence business.

INFORMATION TECHNOLOGIES INDUSTRY (ITI))

INDUSTRY OVERVIEW

- Canadian firms account for about three percent ($40.2 billion) of world IT production and services. IT manufacturing contributes 7% of manufacturing GDP; services, 5% of services GDP.

- Canada's $49 billion domestic market for IT goods and services is the 7th largest, ranked in order behind the U.S., Japan, Germany, France, U.K., and Italy.

- Canadian IT firms export three-quarters of their production and are extremely dependent on the import of intermediate inputs. (70% of the apparent domestic market.)

- Over the past decade, IT imports have outpaced export growth. Consequently, Canada has an IT merchandise trade deficit (1991 - $6.2 billion) that grew about 10% a year through the 1980s.

- The industry in Canada, relative to its foreign competition, has been less successful in adapting to changing demand patterns, improving productivity, and thereby in raising its share of growing foreign markets.

- The IT industry in Canada is composed predominately of small and medium-sized enterprises (SMEs), Northern Telecom and approximately 30 subsidiaries of foreign MNEs. A significant portion of Canada's IT trade is between the subsidiaries of these global corporations.

- Thirty-five percent of all Canada's industrial R&D is performed by the IT sector. (12% of revenue average).

GOALS

- To assist Canadian information technology industry **double** its world market share by the year 2000, by focusing on opportunities matched to Canada's strengths.

- To assist **5,000** SMEs become internationally competitive by the year 2000, by focusing on management improvement and the application of information technologies.

PROGRAMS AND SERVICES

- Sector Campaigns: Microelectronics, Software, Photonics
- Advanced Manufacturing Technology Application Program (AMTAP)
- Manufacturing Visit Program (MVP)
- Strategic Technologies Program (STP) - PRECARN, IRIS
- Federal Artificial Intelligence Research Fund
- Microelectronics and Systems Development Program (MSDP)
- Canadian Network for the Advancement of Research, Industry and Education (CANARIE)
- Workshops on Informatics for Senior Executives (WISE)
- Manufacturing Assessment Services (MAS)

INITIATIVES

- Mandate for Export and Research and Development in Information Technology (MERIT)
- Canadian Telecommunications Action Committee (CTAC)
- Strategic Microelectronics Consortium (SMC)

- Information Technology (IT) Round Table
- National Software Working Committee (NSWC)
- Software Industry Liaison Committee (SILC)

ENVIRONMENTAL INDUSTRIES -- INTERNATIONAL MARKETING

The world environmental market is US$200 - 300 billion, of which OECD countries account for 82%, spending approximately 1.2% to 1.5% of Gross Domestic Product (GDP) on related products and services. The average growth rate for OECD environmental expenditures is expected to be 5.5% per year.

The **United States** market (40% of the world market) is valued at about US$100 billion and is growing at an annual rate of 5.4%. **Western Europe** accounts for about 27% of the world market with environmental expenditures of US$60 billion. The **Asia-Pacific** market, dominated by **Japan**, is valued at US$30 billion, or 12% of the total world market. **East European and C.I.S.** environmental markets amount to about US$15 billion and are growing at about 4% per year. New opportunities are developing in Mexico with NAFTA, and in South and Central America and Africa.

The challenge is to expand Canada's domestic and export market shares by aggressive marketing, by developing market-responsive environmental products and services and by commercializing new and innovative technologies. The first objective is to ensure access to world markets and to build on markets already established by Canadian firms. A highly targeted strategic approach is to accelerate exports and the establishment of strategic alliances between Canadian and foreign firms for investment, technology transfer and new business development.

Industry, Science & Technology Canada
235 Queen Street
Ottawa, Ontario
K1A 0H5

SUPPLY AND SERVICES CANADA

AEROSPACE, MARINE AND ELECTRONICS SYSTEMS DIRECTORATE

INTRODUCTION

The Aerospace, Marine and Electronics Systems Directorate (AMES) of Supply and Services Canada (SSC) provides procurement services relating to the aerospace, marine, armoured vehicle, armament and electronics systems requirements of federal government departments and agencies as well as foreign governments whose requirements are normally met through the Canadian Commercial Corporation.

The directorate procures or provides approximately three to four billion dollars in goods and services annually and employs over 600 persons.

ORGANIZATION OF THE AEROSPACE, MARINE AND ELECTRONICS SYSTEMS DIRECTORATE

Responsibility for regular procurement operations in AMES is vested in two Procurement Operations Branches, one dedicated to aerospace and electronics systems and the other to marine and armament systems. In addition, specific projects, because of their size and complexity, are designated as Major Crown Projects. They are managed by inter-departmental project offices. Most of these major projects provide subcontracting opportunities for Canadian companies.

SUBCONTRACTING OPPORTUNITIES

Because of their nature and complexity, goods and services purchased by AMES are obtained from prime contractors who, in turn, create opportunities for small and medium-sized manufacturers and service providers, as subcontractors.

Canadian companies wishing to market high technology products abroad must be able to demonstrate that they meet security requirements.

ASSETS MANAGEMENT

AMES has assets management responsibilities covering production assets such as special production tooling, special test equipment, Department of National Defence loaned equipment, U.S. Government property, Defence Industry Productivity Program (DIPP), machinery and equipment and any other Crown property for which Supply and Services Canada has been charged with assets management responsibility.

AEROSPACE, MARINE AND ELECTRONICS SYSTEMS DIRECTORATE
Supply and Services Canada
11 Laurier Avenue
Place du Portage
Phase III, 7C1
Hull, Québec
K1A 0S5

SUPPLY AND SERVICES CANADA

INDUSTRIAL AND CORPORATE SECURITY BRANCH

The mission of the Industrial and Corporate Security Branch of Supply and Services Canada includes ensuring that the Government of Canada's national and international industrial security commitments are met, and providing security support to Canadian industry in its marketing, liaison and technical requirements. The Branch provides a facility and personnel security clearance service to various directorates within Supply and Services Canada with respect to their specific sensitive or classified contractual arrangements with Canadian industry. Essential to this process is ensuring that the Government of Canada can repose full confidence in individuals in the private sector who are to have access to sensitive or classified information. Frequently, the company's ability to carry out the proper physical safeguarding of sensitive or classified information must be ensured.

Support to industry includes making visit arrangements, whether for precontractual (marketing) reasons or in relation to performance of a specific contract; arranging international (government-to-government) channels for the transmission of classified documents or materiel and arranging for special security assistance by other government agencies (e.g. RCMP, EDP Security inspections).

A system for certifying eligible contractors for access to unclassified military critical technical data has been developed between Canada and the United States. The Joint Certification Program enables certified contractors to attend restricted-access meetings where DoD-sponsored scientific and technical papers are presented, to bid DoD contracts which specify the release of technical data only to certified contractors and to obtain a freer access to DoD-controlled technologies which could stimulate both their military and commercial R&D efforts.

INDUSTRIAL AND CORPORATE SECURITY BRANCH
Supply and Services Canada
10B3 Place du Portage, Phase III
11 Laurier Street
Hull, Québec
K1A 0S5
Telephone: (819) 956-3681
Facsimile: (819) 956-5140

U.S. - CANADA JOINT CERTIFICATION OFFICE
Defense Logistics Services Center
Federal Center
Battlecreek, Michigan
USA 49017-3084
Telephone: (616) 961-7431
Facsimile: (616) 961-4352

SUPPLY AND SERVICES CANADA

OFFICE AUTOMATION, SERVICES AND INFORMATION SYSTEMS (OASIS) DIRECTORATE

The Office Automation, Services and Information Systems (OASIS) Directorate is the procurement centre responsible for the acquisition of the following goods and services for federal departments and agencies: electronic data processing (EDP) systems, computer hardware and software, informatics professional services, micrographic services, office equipment, office furniture and supplies and Stocked Item Supply (SIS).

OASIS is organized into four branches: the Information Systems Procurement Branch, the Informatics Services Procurement Branch, the Stocked Item Supply Services Line Management Group responsible for procurement, and the Operations Support Branch. The latter is responsible for the key support functions to the Directorate and serves as a focal point of contact for client departments as well as industry.

In addition, OASIS is currently responsible for the procurement operations relating to the Canadian Forces Supply System Upgrade (CFSSU) Major Crown Project with National Defence as well as the Income Security Programs Redesign (ISPR) on behalf of Health and Welfare Canada.

For further information on OASIS programs/services, please contact:

OPERATIONS SUPPORT BRANCH
OASIS DIRECTORATE
Supply and Services Canada
Place du Portage, Phase III, 4C1
Hull, Québec
K1A 0S5

Telephone: (819) 956-1009
Facsimile: (819) 956-1018

or telephone our "Gold Service" line at (819) 956-95-OASIS (956-2747).

Client departments may obtain the latest purchasing tools for personal computers while visiting HiTEC with the Micro/Lan Group of OASIS.

CANADIAN COMMERCIAL CORPORATION

Canadian Commercial Corporation (CCC) is a Crown Corporation wholly owned by the Government of Canada. CCC's principal objective is to facilitate export sales of Canadian goods and services by assuming the role of prime contractor. Through such transactions, the Corporation undertakes to deliver products or services from Canadian suppliers to foreign customers.

The Corporation has two operational divisions, one of which handles sales to the U.S., and the other to overseas customers. In the first instance, CCC continues to play its traditional role, notably with the United States Department of Defense under the terms of the Canada-U.S. Defence Production Sharing Agreement, and the Canada-U.S. Defence Development Sharing Agreement. It also handles bid solicitations and contracting in Canada on behalf of other U.S. government departments and agencies. On the overseas side, CCC assists in sales to other foreign governments and international agency customers (e.g., United Nations procurement agencies), including non-defence sales, and in capital projects in response to Canadian exporters' needs or at the request of foreign buyers.

The principal services and advantages of using CCC are:

- Assistance in contract negotiations and contract management, which includes payment to suppliers (accelerated payments to small businesses), and collection from customers.
- Guarantee of contract performance.
- CCC's participation, on behalf of the Government of Canada, enhances the credibility and competitiveness of a supplier in the eyes of a foreign customer.
- Increase the customer's confidence in the Canadian supplier's financial and technical capability of conforming with bid specifications, contract terms, and supplier warranties.
- CCC's services are free of charge in most instances.

Enquiries concerning CCC may be addressed to:

CANADIAN COMMERCIAL CORPORATION
Metropolitan Centre, 11th Floor
50 O'Connor Street
Ottawa, Ontario
K1A 0S6

Telephone: (613) 996-0034
Fax: (613) 995-2121
Telex: 053-4359

When abroad, enquiries may be directed to Trade Commissioners at Canadian Embassies, High Commissions or Consulates.

EXPORT DEVELOPMENT CORPORATION (EDC)

EDC is a unique financial institution that specializes in helping Canadian exporters compete internationally. EDC facilitates export trade and foreign investment through the provision of risk management services, including insurance and financing, to Canadian companies and their global customers. EDC is committed to the highest standards of service, quality and professionalism.

EDC's programs fall into four major categories:

- Export credits insurance, covering short- and medium-term credits;
- Performance-related guarantees and insurance, providing cover for exporters, financial institutions and surety companies against calls made on surety bonds;
- Foreign investment insurance, providing political risk protection for new Canadian investments abroad; and
- Export financing, providing medium- and long-term export financing to foreign buyers of Canadian goods and services.

For information on the full range of EDC services, contact any of the following EDC offices:

Head Office - 151 O'Connor Street, Ottawa, Canada, K1A 1K3,
Tel: (613) 598-2739, Telex: 053-4136, Fax: (613) 237-2690.

Vancouver - 505 Burrard Street, Suite 1030, Vancouver, British Columbia, V7X 1M5
Tel: (604) 666-6234, Fax: (604) 666-7550, (Serving British Columbia, Yukon Territory).

Calgary - 510 – 5th Street S.W., Suite 1030, Calgary, Alberta, T2P 3S2
Tel: (403) 292-6898, Fax: (403) 292-6902, (Serving Alberta, Northwest Territories).

Winnipeg - 330 Portage Avenue, 8th Floor, Winnipeg, Manitoba, R3C 0C4
Tel: (204) 983-5114, Fax: (204) 983-2187, (Serving Manitoba, Saskatchewan).

London - 148 Fullarton Street, Suite 1512, London, Ontario, N6A 5P3
Tel: (519) 645-5828, Fax: (519) 645-5580, (Serving Southwestern Ontario).

Toronto - 150 York Street, Suite 810, P.O. Box 810, Toronto, Ontario, M5H 3S5
Tel: (416) 973-6211, Fax: (416) 862-1267, (Serving Ontario).

Ottawa - 151 O'Connor Street, Ottawa, Canada, K1A 1K3
Tel: (613) 598-2992, Fax: (613) 237-2690, (Serving Eastern Ontario, Western Quebec).

Montreal - 800 Victoria Square, Suite 4520, P.O. Box 124, Tour de la Bourse Postal Station, Montreal, Quebec, H4Z 1C3, Tel: (514) 283-3013, Fax: (514) 878-9891, (Serving Quebec).

Halifax - 1791 Barrington Street, Suite 1003, Halifax, Nova Scotia, B3J 3L1
Tel: (902) 429-0426 , Fax: (902) 423-0881, (Serving the Atlantic Provinces).

DEPARTMENT OF COMMUNICATIONS

BEFORE YOU TAKE YOUR TECHNOLOGY ABROAD, TALK TO TECHNICAL MARKETING AND INTERNATIONAL COOPERATION

We're part of the federal Department of Communications with all its research and engineering resources. Our backbone is technical: two major research centres with five technology divisions and a host of engineering resources. We know the telecommunications business. We have the contacts - in Canada and worldwide - and a track record of success in supporting the telecommunications industry in its marketing activities.

WHAT CAN WE DO FOR YOU

First of all, we know the telecommunications sector. That means we understand the communications environment - here in Canada and abroad. It also means we know enough about the technologies and products to recognize viable telecommunications opportunities (and likely competition).

We're in regular contact with our counterpart telecommunications agencies around the world. The ministries of communications and the PTTs (Posts, Telecommunications and Broadcasting Agencies) in other countries are often the main customers for telecommunications products and services. And if they aren't, they are usually directly involved in providing communications facilities and services (such as managing the tender or request for proposal process). These organizations prefer to deal directly with their Canadian counterpart - the federal Department of Communications.

We know the telecommunications policy and regulatory environment. Our international network keeps us in close touch with telecommunications organizations - during bilateral policy consultations, negotiating technical cooperation agreements or memoranda of understanding, and organizing professional exchanges, training programs and jointly sponsored technical seminars. We are familiar with local content laws...bidding procedures...registration requirements.

And because we're part of the international telecommunications network, we can gather useful sector market intelligence. Members of this telecommunications network exchange market data and keep each other up-to-date on communications technology in our respective countries. We know what plans are afoot... what new services are contemplated and where... what the implications of new regulations and bilateral technical agreements can be.

Let us plug you into our network. We work closely with External Affairs and International Trade Canada to see to it that Canadian firms in the telecommunications industry go abroad with appropriate industry groups...that they see the government and business representatives who can help them most...that foreign visitors meet with appropriate Canadian suppliers in Canada...that our best is represented at international symposia and trade shows.

And we can lead you to other marketing support programs for launching new ventures abroad. In addition to our network of telecommunications organizations, including the International Telecommunication Union (ITU), and our collaboration with External Affairs in marketing Canadian telecommunications know-how, we work with the Export Development Corporation, the Canadian International Development Agency, the Canadian Commercial Corporation and other organizations - federal and provincial - to promote telecommunications business abroad.

WE'RE IN BUSINESS TO HELP YOUR BUSINESS SUCCEED

With over 10 years of experience, our services include:

- contact with PTTs around the world;
- technical marketing advice;
- telecommunications market intelligence;
- project support and guidance to government programs;

If you are part of Canada's telecommunications, information technology or broadcasting industry, Technical Marketing and International Cooperation is here to help you develop a strategy to market your products and services abroad.

For more information, contact:

TECHNICAL MARKETING AND INTERNATIONAL COOPERATION DIRECTORATE
Department of Communications
300 Slater Street
Ottawa, Ontario
K1A 0C8

Telephone: (613) 990-4214
Telex: 053-3342
Fax: (613) 990-4215

U.S. GOVERNMENT AGENCIES

US DEPARTMENT OF THE AIR FORCE

AIR FORCE MATERIEL COMMAND

AFMC LIAISON OFFICE (Canada)

This office represents the United States Air Force (USAF), Air Force Materiel Command (AFMC), in a program for research and development cooperation with Canada. Our mission is to achieve improved utilization of Canadian scientific, technical, and industrial resources through increased Canadian participation in AFMC research, development, and acquisition (RD&A) projects. A secondary goal is to enhance rationalization, standardization, and inter-operability of military equipment in the interest of mutual defense. The Memorandum of Understanding in the Field of Cooperative Development between the United States Department of Defense and the Canadian Department of Defence Production was signed on 21 Nov 63. That MOU is the basis for this office and defines our primary mission. Our office is sponsored by the International Marketing Bureau, Aerospace and Defence Programs Division, External Affairs and International Trade Canada.

The office promotes participation in the Defense Development Sharing Program (DDSP). Under this program, appropriate AFMC programs receive partial funding from the Canadian government for contracts placed in Canada. We provide interested AFMC project and procurement officers with suggested Canadian sources for their requirements. We publish biennially an informative Guide to Canadian Aerospace-Related Industries that is distributed to all AFMC procurement centers. Copies are also sent to Air Force Logistics Centers, United States Army and Navy research and development establishments, and major prime contractors in the United States. We help Canadian industry by providing specific points-of-contact for their products and expertise within the Air Force Materiel Command.

Other functions of the AFMC Liaison Office (Canada) include:

a. Maintaining contact with Canadian government, industrial, and academic communities to identify basic research, development, and production efforts of mutual interest.

b. Recommending to both AFMC and Canadian agencies those areas that show potential for new cooperative RD&A projects.

c. Providing educational materials to AFMC organizations about Canadian industry capabilities and United States-Canada joint RD&A arrangements.

d. Helping Canadian representatives in making travel arrangements to AFMC installations.

e. Providing technical assistance, sponsorship, contacts, and visit arrangements for AFMC visitors to Canada.

Our office can be reached at:

Mail: United States Air Force
Materiel Command Liaison Office
110 O'Connor Street, Suite 202
Ottawa, Canada K1P 5M9

or

AFMC Liaison Office (Canada)
PO Box 5000
Ogdensburg NY 13669

Email: STLOCAND@WL.WPAFB.AF.MIL

Telephone:	Telefax:
(613) 993-7725	(613) 990-6787
DSN 843-7725	DSN 840-6787

Louis M. Ayers, Lt Col, USAF	Donald J. Pearson	Pat Hemphill
Chief	Deputy Chief	Liaison Asst

U.S. ARMY MATERIEL COMMAND (AMC)

U.S. ARMY RESEARCH DEVELOPMENT AND STANDARDIZATION GROUP - CANADA

U.S. ARMY MISSILE COMMAND (MICOM)

AMC is responsible for equipping and sustaining the Army, developing and acquiring non-major systems and equipment and developing superior technologies. Through its Commodity and Research and Development Commands, AMC procures a variety of engineering and technical services and equipment, components, materials, supplies and spare parts in the categories of aircraft, ammunition, electronics, missiles, surface mobility equipment, avionics and weapons. AMC is also responsible for managing and performing depot maintenance on Army systems, testing equipment, weapons and materiel systems intended for use by the Army and manufacturing and procuring ammunition. AMCs 1991 procurements totalled 23 billion dollars.

MICOM is a major commodity command of AMC located at Redstone Arsenal, Alabama and is responsible for missiles and rockets and the supporting equipment to field them as weapon systems. MICOM also supports the unmanned aerial and ground vehicle (robotics) project offices colocated at the Arsenal. The command's mission includes: research, development, testing, engineering, procurement, production, logistics and demilitarization of operational missile and rocket systems. The annual budget is about 7 billion dollars.

The U.S. Army Research, Development and Standardization Group - Canada serves as the U.S. Army's liaison to Canada for research, development, standardization and acquisition activities. The mission is to foster cooperative efforts between the U.S. Army, Canadian military and U.S. and Canadian industrial communities. The Group is located in National Defence Headquarters, Ottawa and will assist Canadian firms who wish to enter the U.S. Army defence market.

U.S. ARMY RESEARCH DEVELOPMENT AND STANDARDIZATION GROUP - CANADA
National Defence Headquarters
MGen George R. Pearkes Building
Ottawa, Ontario
K1A 0K2

Colonel George M. Mullen: Commander Telephone (613) 992-5737

DEFENSE INDUSTRIAL SUPPLY CENTER

OVERVIEW

The Defense Industrial Supply Center (DISC) was established in 1962 as a primary level field activity under the Defense Logistics Agency. DISC procures and manages vital industrial hardware items for use by U.S. Armed Forces throughout the world. DISC is responsible for the support of the four military services in excess of 1 million separate industrial type items and components used in repair and maintenance of equipment and weapon systems. These items include bearings, block and tackle, chains, rigging and slings, rope, cable and fittings, fasteners, hardware, packing and gasket materials, spring and rings, metal bars, sheets and shapes, electrical wire and cable, as well as certain primary materials. The items purchased by DISC are used in the repair and maintenance of key weapons systems.

PROCUREMENT TRENDS

The level of procurement activity at DISC has remained somewhat stable at approximately $550 million but peaked in FY88 at $652 million. However, with the shrinking DoD budget, the procurement activity for FY91 & FY92 was respectively $468 million and $361 million. With the shrinking DoD new-equipment procurement budget, increased emphasis is being placed on the procurement of replacement parts. Accordingly, DISC was given the responsibility to manage and procure an additional 300-400,000 items commencing in 1991. This increased responsibility, particularly in the area of aero-engine components, required the Center to issue larger contracts and to group like-products into a single contract, making the Center an even greater market potential.

PROCUREMENT PROCEDURES

As is the case with all Department of Defense Procurement Agencies, it is necessary to be included in the Bidders Mailing List (BML) before your firm will receive solicitations. In addition, according to the U.S. Defense and Federal Acquisitions Regulations (DFARS), U.S. DoD procurement agencies are unable to contract directly with a Canadian firm for any contract value over $25,000 (U.S.). The procedure followed is that the procurement agency will place a contract with the Canadian Commercial Corporation in Ottawa which will in turn write a back-to-back contract with your firm for the products required. This procedure has advantages to both the Canadian industry and to the U.S. DoD and cannot be circumvented. Accordingly, it is equally important for your firm to register with the Canadian Commercial Corporation.

DEFENSE GENERAL SUPPLY CENTER

OVERVIEW

DGSC is responsible for supply management of assigned items and for distribution of these items to the four services worldwide. These functions include cataloguing, forecasting of requirements, procurement, inspection and quality control, warehousing, and distribution of new materiel and the maintenance and overhaul of existing equipment.

DGSC provides to the United States Armed Forces a variety of item categories of a general nature. Major product groups purchased by the Center include: non-powered material handling equipment, rubber fabricated materials, plastic fabricated materials, photographic supplies, measuring instruments, batteries, safety equipment and rescue equipment, food service equipment, electrical equipment including transformers and motors, electrical hardware and supplies, packaging materials, aircraft components and structures, hand-packaged fuels and industrial chemicals. In addition to its responsibilities for procurement and supply of the U.S. Military School System overseas, the Center also supports over 850 weapons systems with the resultant responsibility for the management of nearly 500,000 items of supply.

PROCUREMENT TRENDS

The Commanding Officer and senior staff of DGSC have been extremely enthusiastic about developing Canadian sources of supply and, as a consequence, over 130 Canadian firms are registered as suppliers to the Center. In 1992 alone DGSC participated in three missions to Canada in an effort to increase this supplier base. During these missions, officers of DGSC have been particularly enthusiastic regarding Canadian sources of supply because of the industry's willingness to adapt production to meet the low-run requirements of the Center. In addition, because the Center purchases many items which are not purchased to military specifications, the Center is a particularly attractive procurement agency for Canadian industry.

DGSC is the largest of the Defense Logistics Agency facilities in the United States and has continued to grow as an increased number of items are transferred to DGSC from other Centers which have less procurement staff. Consequently, the Center increases as a market opportunity for Canadian industry as items continue to be transferred. A recent important example of this transfer of responsibility was for items under Federal Stock Classification 1560 (aircraft structural components) and 1680 (aircraft accessories and components, miscellaneous). Under these two categories alone, DGSC manages approximately 50,000 items to support those non-front-line aircraft which are no longer managed by the individual services.

DGSC procurement responsibilities have gradually increased in recent years and average approximately $850 million (US). However, the forecast for procurement level for FY92 is expected to be approximately $434 million (US). Of this procurement activity, approximately 20-25 percent is directed to small business under restricted procurement

activities. Consequently, the DGSC market available to Canadian industry is approximately $347 million (US) annually.

PROCUREMENT PROCEDURES

As is the case with all Department of Defense Procurement Agencies, it is necessary to be included in the Bidders Mailing List (BML) before your firm will receive solicitations. In addition, according to the U.S. Defense and Federal Acquisitions Regulations (DFARS), U.S. DoD procurement agencies are unable to contract directly with a Canadian firm for any contract value over $25,000 (US). The procedure followed is that the procurement agency will place a contract with the Canadian Commercial Corporation in Ottawa which will in turn write a back-to-back contract with your firm for the products required. This procedure has advantages to both the Canadian industry and to the U.S. DoD and cannot be circumvented. Accordingly, it is equally important for your firm to register with the Canadian Commercial Corporation.

DEFENSE GENERAL SUPPLY CENTER
Richmond, VA
23297-5000

DEFENSE CONSTRUCTION SUPPLY CENTER (DCSC)

DCSC's responsibility as manager of those defence supplies assigned to it by the Defense Logistics Agency (DLA) includes requirements computation and inventory control of stocked items, item management, classification, procurement, storage and shipping of military supplies.

It currently manages over 650,000 items including automotive and construction equipment and components, and many repair parts for construction and automotive equipment, military aircraft, ships and weapons systems. Its customers include a number of non-military Federal Agencies. The DLA will continue to take on increasing portions of DoD business, and estimates that by the end of FY93 it will add about 1 million new items, of which over 200,000 will be handled by DCSC, including many more consumables ranging from batteries to brake shoes.

Of total procurement by DCSC annually of over $1 billion U.S., over 90% consists of contracts valued at less than $25,000 each. With few exceptions, these are subject to being directed to small and minority and other businesses under restricted procurement activities, and not accessible to Canadian suppliers unless as sub-contractors.

Over half of DCSC's business is in spare parts, much of which is on a competitive basis. Canadian sources of end items such as snow-blowing and fire fighting equipment continue to be of strong interest to DCSC and constitute a significant portion of the DCSC market available to Canadian industry. DCSC's records indicate that for FY92 and so far in FY93 contracts awarded to Canadian sources exceed $10 million U.S. The potential is much higher.

As is the case with all Department of Defense Procurement Agencies, it is necessary to be included in the Bidders Mailing List (BML) before your firm will receive solicitations. In addition, according to the U.S. Defense and Federal Acquisitions Regulations (DFARS), U.S. DoD procurement agencies are unable to contract directly with a Canadian firm for any contract value over $25,000 (U.S.). The procedure followed is that the procurement agency will place a contract with the Canadian Commercial Corporation in Ottawa which will in turn write a back-to-back contract with your firm for the products required. This procedure has advantages to both the Canadian industry and to the U.S. DoD and cannot be circumvented. Accordingly, it is equally important for your firm to register with the Canadian Commercial Corporation.

The Defense Construction Supply Center (DCSC) is a principal manager of automotive and construction equipment and components, and many repair parts for construction and automotive equipment, military aircraft, ships and weapon systems. Its customers also include a number of non-military Federal Agencies.

DCSC manages over 650,000 items and plans to add some 200,000 more by the end of FY93. One half of its business is in spare parts, much of which is on a competitive basis. Canadian sources of high-value end items are of strong interest to DCSC.

UNITED STATES NAVY

AVIATION SUPPLY OFFICE

OVERVIEW

The Aviation Supply Office (ASO) was officially established at the Naval Aircraft Factory in Philadelphia on 1 October, 1941, and since that time has grown to become one of the USN's two inventory control points. ASO is responsible worldwide for the procurement, inventory control, and distribution of Navy and Marine Corps aviation spare parts, systems, and related equipment. As such, it has the responsibility to forecast spares requirements for the total aviation fleet of the USN and of those foreign governments which have USN-type aircraft in their fleets.

The items which ASO procures include gas turbine jet engine spare parts; airframe accessory equipment; aircraft engine accessory equipment; propeller assemblies; installed aircraft instruments; airborne communication and navigation equipment; aircraft fire fighting, rescue, safety, and survival equipment; aircraft armaments equipment; guidance and launching equipment; test equipment; specialized ground servicing and aircraft handling equipment; photographing equipment; meteorological equipment; specialized aircraft maintenance and repair shop equipment; reusable containers; airborne safety equipment; spare parts components or assemblies required for support of Naval aviation and armament simulators and devices.

PROCUREMENT TRENDS

ASO procurement responsibilities have gradually increased from a level of $1.62 billion (US) in FY87 to $1.736 billion (US) in FY89. However, the forecasted procurement level of FY92 was expected to be $1.44 billion (US), and because of the shrinking U.S. defense market it is expected to remain stable for the next few years. Of this expected level of procurement activity, $625 million (US) will be component parts and $815 million (US) will be repairable parts. ASO has initiated plans to contract to the private sector for the repair and furbishment of avionics, airframes, and air engine components, whereas in the past this has only been possible if the Naval Repair Depots (NAVDEPS) did not have the capacity to overhaul that particular item or system.

PROCUREMENT PROCEDURES

As is the case with all Department of Defense Procurement Agencies, it is necessary to be included in the Bidders Mailing List (BML) before your firm will receive solicitations. In addition, according to the U.S. Defense and Federal Acquisitions Regulations (DFARS), U.S. DoD procurement agencies are unable to contract directly with a Canadian firm for any contract value over $25,000 (US). The procedure followed is that

the procurement agency will place a contract with the Canadian Commercial Corporation in Ottawa which will in turn write a back-to-back contract with your firm for the products required. This procedure has advantages to both the Canadian industry and to the U.S. DoD and cannot be circumvented. Accordingly, it is equally important for your firm to register with the Canadian Commercial Corporation.

AVIATION SUPPLY OFFICE
700 Robbins Avenue
Philadelphia, PA
19111

GENERAL SERVICES ADMINISTRATION

The General Services Administration's Information Resources Management Service (IRMS) will represent the U.S. federal government. IRMS establishes the policies that regulate and support technology projects and procurements throughout the Federal government. In FY92, IRMS delegated contracting authority to other agencies valued over $26 billion. IRMS also establishes schedule contracts for computers, software, telecommunications equipment, and services. In FY92, agencies purchased nearly $2 billion of products and services under these schedules.

The U.S. Federal Market for Information Technology

The U.S. federal government forecast expenditures of over $19 billion (CDN) on information technology products and services in the fiscal year beginning in October 1992. The U.S. federal government buys hardware and software sold on the commercial market. The Electronic Industries Association reports that eighty percent of this budget is spent on complex integrated systems or on large commodities purchases by a single agency. Many major systems acquisitions are co-ordinated by agency headquarters offices in or near Washington D.C. Spending on hardware, software and systems and services in civilian departments is predicted to grow at about two percent a year through 1997, while Department of Defense budgets in this sector are forecast to shrink three percent per year.

In fiscal 1992, the federal government is expected to spend on:

computer services	$ 6.8 billion
systems integration	$ 3.9 billion
telecommunications	$ 4.7 billion
large systems	$ 2.8 billion
microcomputers	$ 1.4 billion
mid sized systems	$ 1.3 billion
software	$ 1.2 billion
workstations	$ 0.5 billion

It is possible to begin by selling computer products and services to a few good prospects in order to develop a customer base. However, the selling cycle is typically twelve to eighteen months for products other than the most basic commodities. Requests for Proposals (RFP's), the principal contracting vehicle for the large systems, are often in development for years.

The U.S. federal sector can be profitable. U.S. federal program managers are interested in products and services that meet a specific agency requirement, or helps them to meet their program objectives. A Canadian firm with a strong sales record in the U.S. commercial sector is a good candidate for the large volume, or "Schedule", contracts similar to the Canadian government's Standing Offer program. Canadian companies with a track record of strong, innovative technology and solid experience in Canadian government or private sector contracts may be able to arrange partnerships with American prime contractors.

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