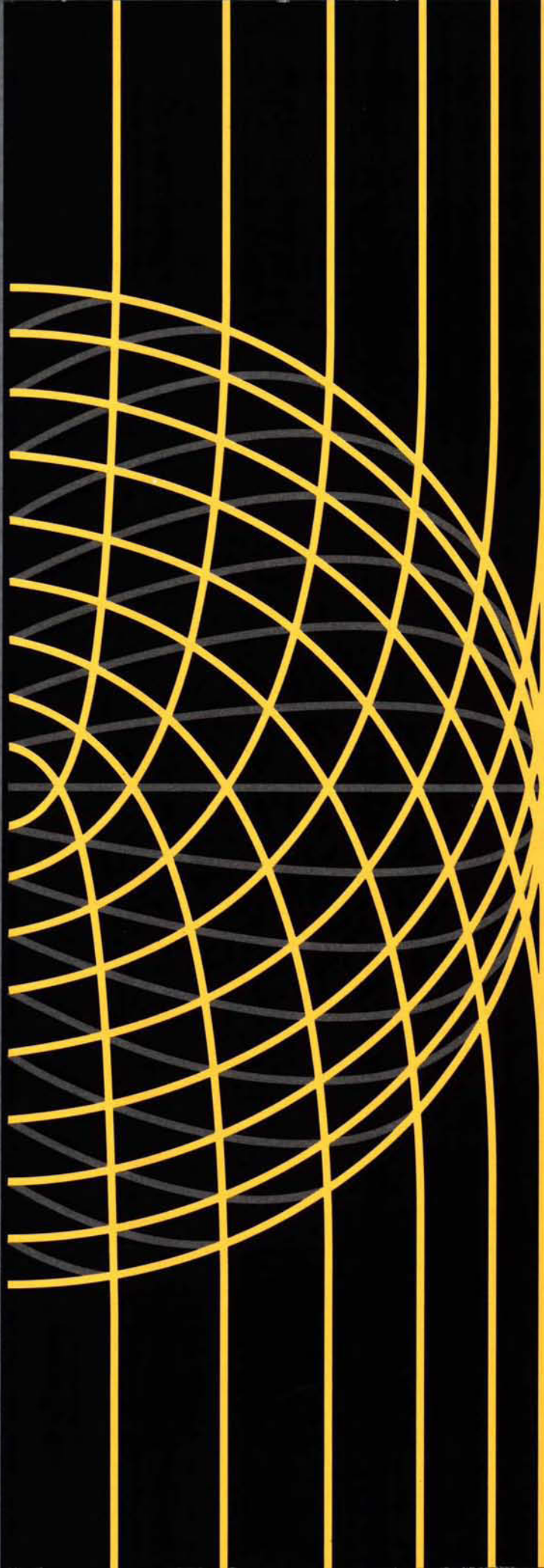


# Consumer Electronics

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Technology Canada

Industrie, Sciences et  
Technologie Canada

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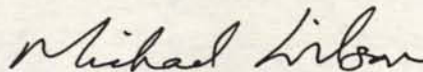
Canada

1990-1991

**CONSUMER ELECTRONICS**APR 28 1992  
BFGJBIBLIOTHÈQUE  
INDUSTRIE, SCIENCES ET  
TECHNOLOGIE CANADA**FOREWORD**

*In a rapidly changing global trade environment, the international competitiveness of Canadian industry is the key to growth and prosperity. Promoting improved performance by Canadian firms in the global marketplace is a central element of the mandates of Industry, Science and Technology Canada and International Trade Canada. This Industry Profile is one of a series of papers in which Industry, Science and Technology Canada assesses, in a summary form, the current competitiveness of Canada's industrial sectors, taking into account technological, human resource and other critical factors. Industry, Science and Technology Canada and International Trade Canada assess the most recent changes in access to markets, including the implications of the Canada-U.S. Free Trade Agreement. Industry participants were consulted in the preparation of the profiles.*

*Ensuring that Canada remains prosperous over the next decade and into the next century is a challenge that affects us all. These profiles are intended to be informative and to serve as a basis for discussion of industrial prospects, strategic directions and the need for new approaches. This 1990-1991 series represents an updating and revision of the series published in 1988-1989. The Government will continue to update the series on a regular basis.*



Michael H. Wilson  
Minister of Industry, Science and Technology  
and Minister for International Trade

**Introduction**

The Canadian information technologies (IT) sector consists of approximately 11 000 firms employing 150 000 people. Services and products from these companies are worth more than \$17 billion. They produce nearly all types of data-sensing, data-processing and communications hardware and software. They also provide consulting and other services relating to computer use.

Companies in the IT sector use established and emerging technologies and generally operate on the leading edge of production techniques and product research and development.

The IT sector is of major strategic significance to Canada. Not only is it a prominent industrial sector in its own right, but it also acts as an enabling technology that has broad applications across the full spectrum of Canadian business activity. To more fully appreciate the impact of the IT sector on the Canadian economy, consult all six of the IT profiles in this series:

- *Computer Services and Software*
- *Computers and Peripheral Equipment*
- *Consumer Electronics*
- *Instrumentation*
- *Microelectronics*
- *Telecommunications Equipment*

**Structure and Performance****Structure**

The consumer electronics industry comprises makers of television sets, radios, domestic sound reproduction equipment, audio and video recorders and automobile stereo

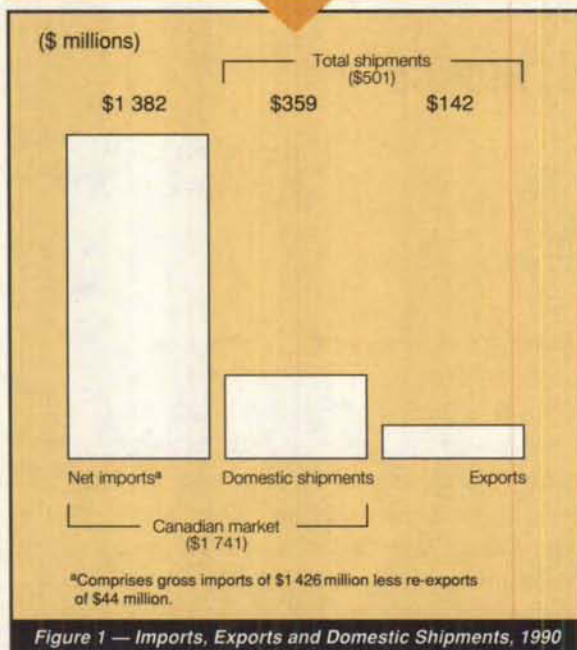


Figure 1 — Imports, Exports and Domestic Shipments, 1990

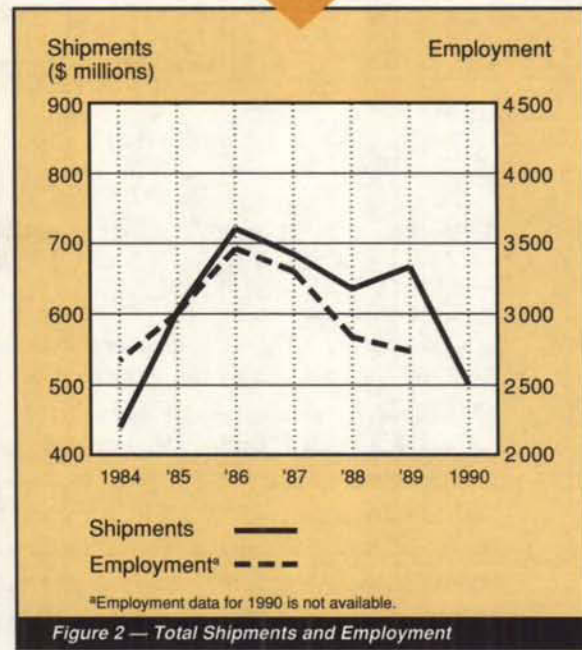


Figure 2 — Total Shipments and Employment

equipment. The Canadian industry supplies only certain product niches for the consumer electronics market. There are five TV assemblers (one manufacturing colour TV picture tubes), one car radio manufacturer and various producers of stereo equipment and loudspeakers. This profile's main focus is the television receiver subsector, which dominates the Canadian consumer electronics industry. The profile does not include wholesalers, distributors or sales and retail outlets.

In 1990, industry shipments accounted for \$501 million, with Canadian production supplying about 21 percent of domestic demand (Figure 1). Canadian exports, valued at \$142 million, were destined almost exclusively for the U.S. market. Imports, net of re-exports of \$44 million, were valued at \$1,382 million, and supplied about 79 percent of the Canadian market. Japan, the United States and, to a lesser extent, the Republic of Korea, Taiwan, Hong Kong and Singapore were the principal sources of imports. In 1989, total employment in the industry was 2,740. Approximately 21 establishments are active in Canada in this industry.

The industry is predominantly foreign-owned. Little research and development (R&D) is carried out in Canada by the major suppliers and there is only limited production engineering capability. All major Canadian plants are located in Quebec and Ontario, which account for 99 percent of total shipments.

Canadian television assemblers are branch plants that carry out final assembly of parts kits, largely for the domestic market. The Canadian industry has concentrated its

production on larger colour TV sets with screens measuring 53 or 71 centimetres (21 or 28 inches) diagonally, which make up 90 percent of total TV shipments. Black-and-white sets are no longer produced in Canada; they are imported primarily from the Republic of Korea. Canada has one picture tube facility, Mitsubishi Electronics of Midland, Ontario, which supplies the Canadian and U.S. markets. TV assembly plants alone employ over 1,000 workers, with a further 700 people employed by their principal suppliers, cabinet and cabinet parts assemblers.

The only car radio operation in Canada is Ford Electronics. This subsidiary of the U.S.-based Ford Motor Company produces radios for other Ford divisions, mainly in the United States. Employing in excess of 1,000 workers, Ford Electronics operates under the conditional duty-free provisions of the Canada-U.S. Automotive Products Trade Agreement (Auto Pact) implemented in 1965. The company serves a rationalized North American automotive market and has the advantage of a captive market in the North American Ford divisions.

The stereo and loudspeaker components manufacturers are the other major employers. Their plants are small and serve mainly the domestic market. Although primarily foreign-owned, this subsector also includes a few well-established Canadian manufacturers.

The United States is the world's most lucrative market for consumer electronics and is also a major foreign production site for Asian producers. Branch plants in North America carry out the final assembly of parts kits supplied by the parent but,



because they are not vertically integrated, these plants are generally less efficient than the parent plants. The Canadian TV assembly plants are typical in that they are domestically oriented and only a small portion of their production reaches the export market. However, the Ford Electronics car radio plant and the Mitsubishi Electronics picture tube plant are exceptions. They are highly automated and are oriented towards the larger North American market.

From a global perspective, the industry in the United States and Canada faces severe competition from Japan, the Republic of Korea, Taiwan, Singapore, Malaysia, Hong Kong, Mexico and Brazil. Within the North American context, the principal competitors of Canadian plants are sister facilities in the United States.

### **Performance**

The Canadian consumer electronics industry has been shrinking for the past 20 years. Import penetration increased, and employment dropped from more than 7 500 in 1971 to nearly 2 800 in 1989. Throughout the 1980s, both employment and shipment levels fluctuated (Figure 2).

The change in the Canadian industry is best understood within the context of the ongoing reorganization of the global consumer electronics industry and the internationalization of world markets and production systems. The past decade has witnessed two significant trends. The first trend is in the consumer electronics markets in developed countries, where fierce competition for market share and leadership has resulted in the rapid growth (and decline) of particular product groups. The industry is characterized by a constant search for new products as the market for "standard" products becomes saturated. Innovation in recent years includes the video cassette recorder (VCR), compact disc player and camcorder. The second significant trend is the ascendancy of Japanese firms in every major market. Japanese products are rapidly becoming the de facto standard for the industry worldwide due to their quality and superior technology.

To maintain their leadership position, Japanese producers are following certain strategies, such as investing substantial R&D funds in new-product development. These high-technology products are produced principally in Japan. The manufacture of older technology or standard products (such as radios and tape players) is being transferred to other Asian countries, such as Taiwan and Thailand.

All the dominant consumer electronics firms exhibit a high degree of vertical integration and an ongoing capital commitment to engineering and production automation. The result is that the major plants, located primarily in Asia, are highly efficient, world-scale operations that can achieve low-cost production unmatched elsewhere. Among newly industrialized countries (NICs), the Republic

of Korea and Taiwan are becoming significant players in the worldwide consumer electronics industry.

The competition from Japan and low-cost production centres has resulted in a reorganization and realignment of the consumer electronics industry in other developed countries. Industry reorganization in Canada and the United States, in particular, has been dramatic. European production has rationalized around a small group of independent companies that increasingly are adopting international, outward-looking strategies in order to survive. Adjustment problems following the emergence of Japan and other Asian countries have led governments of some developed countries to legislate protective measures. In response, Japan and, more recently, the Republic of Korea have made defensive investments in countries that import their products in order to ensure continued market access.

In particular, the TV assembly subsector in Canada has undergone a fair amount of restructuring and consolidation during this period. Import penetration from Asia and the United States has left TV assemblers operating at well below capacity (around 50 percent). In 1988, the subsector shipped approximately 500 000 sets (about 40 percent of the domestic market), with 10 percent of total production exported to the United States. The relatively large share of the Canadian market held by domestic shipments, however, disguises the real level of import penetration in parts and components in the TV assembly subsector.

In contrast to the domestically oriented TV assembly facilities, substantial capital investments have been made at the Mitsubishi Electronics picture tube plant, which can supply approximately 10 percent of the North American market. These picture tubes have made substantial inroads into the U.S. market, despite a U.S. tariff of 15 percent in 1988, which will be eliminated under the Canada-U.S. Free Trade Agreement (FTA) by 1 January 1998.

Ford Electronics, the single Canadian manufacturer of car radios, has also performed strongly in both shipments and exports. The Canadian plant has benefited from significant investment in the latest manufacturing equipment.

Canadian loudspeaker manufacturers have steadily increased their market share through R&D, reliable engineering, good marketing and competitive pricing. Estimates indicate that at least 50 percent of the speakers sold in Canada are made by Canadian producers, either under foreign brand names or as part of the growing number of Canadian brand names.

## **Strengths and Weaknesses**

### **Structural Factors**

At the upper end of the international consumer electronics market, product design and quality are sources of comparative advantage. Brand-name loyalty is also a factor that may allow



well-known companies to charge a premium for their products. Across the market spectrum, but particularly at the lower-priced end of the market, low production costs are critical to international competitiveness. Economies of scale, product innovation and the development of sophisticated manufacturing technologies separate the winners from the losers.

Canada has essentially no indigenous consumer electronics industry. With the exception of some parts of the loudspeaker subsector, all other Canadian production is composed of foreign-owned assembly plants, which import a major portion of their parts and components.

Canadian plants in the TV assembly subsector are semi-automated and domestically oriented. They cannot compete on an equal footing with plants in the Far East and suffer from the fact that the Canadian market is far smaller than the U.S. market. In the production of TV consoles, Canadian companies have a small advantage because of the product's bulkiness, which gives local suppliers an advantage in regional markets. The Canadian content of most colour television sets is very low, although the bigger TV consoles have a Canadian content in excess of 50 percent.

The two largest Canadian plants, Ford Electronics (car radios) and Mitsubishi Electronics (picture tubes), have invested in automation and production technology geared to the whole North American market, making them competitive relative to similar facilities in the United States.

In the loudspeaker subsector of the industry, Canadian firms have strong R&D and engineering capabilities. In addition, because the product's bulkiness gives an advantage to local production, this is one niche of the consumer electronics market in which Japanese and other Asian producers are not particularly strong.

### **Trade-Related Factors**

Canadian tariffs on consumer electronics from countries having Most Favoured Nation (MFN) status are 9.8 percent on loudspeakers and amplifiers; free to 5.5 percent on turntables, depending on the changing mechanism; 9.5 percent on video recording or reproduction apparatus; from 7.5 percent to 8.2 percent on colour home television sets, depending on the tube size; free on black-and-white home television sets; and 9.3 percent on colour TV tubes.

The United States has the following MFN tariff structure: 4.9 percent on loudspeakers and amplifiers; free to 3.9 percent on turntables, depending on the changing mechanism; 3.9 percent on video recording or reproduction apparatus; 5 percent on colour home television sets; 5 percent on black-and-white home television sets; and 15 percent on colour TV tubes.

Under the FTA, tariffs on consumer electronics products are being phased out in 10 equal, annual stages, beginning on 1 January 1989. Products must meet rules-of-origin criteria to be included. In addition, new rules of origin require 50 percent of the total, direct manufacturing costs to be incurred in Canada and/or the United States.

The North American market is the only one relevant to Canadian producers. The European Community (EC) has taken a number of measures to protect domestic suppliers from imports, including the establishment of unique national standards that incorporate patents held by local suppliers and the introduction of import quotas.

### **Technological Factors**

With the exception of the loudspeaker subsector, there is little R&D or product engineering in the Canadian consumer electronics industry. In this respect, Canadian and U.S. TV assemblers are similar. Prior to 1980, the consumer electronics industry in North America (primarily colour TV set production) was sustained by the use of patent protection based on unique broadcast standards. By 1980, most of the existing patents had expired, the colour TV market was saturated and the standards for new products, representing future sales, were based on products developed in Japan. This situation caused a major change in the industry for all firms, since many no longer had access to the new manufacturing technologies developed by Japanese firms. As a result, those firms that could not compete have ceased production. In Canada, therefore, producers rely totally on foreign design and production technology.

Canadian TV assemblers produce on such a small scale that automated techniques are not as appropriate as in larger facilities in the United States and the Far East. Where production is geared to the whole North American market (car radios and picture tubes), plants are automated and compare favourably with U.S. facilities.

R&D by Canadian companies in the loudspeaker subsector is supported by the National Research Council's (NRC) test facilities in designing new speakers and upgrading existing designs.

### **Evolving Environment**

The consumer electronics market as a whole is expected to continue to grow moderately. There is real potential, however, for the rapid development and introduction of new mass-market products that will penetrate a high number of households. An example of the enormous outlays that product research can require are the efforts currently under way in



Japan, the EC and the United States to develop display technology for high-definition television (HDTV) systems. HDTV promises a clearer picture and sharper sound than ever before. However, for the home viewer, that promise may not be delivered for at least a decade.

Products expected to dominate the market in the early 1990s can already be identified: compact disc players, audio-fidelity tape recorders, stereo TVs, large-screen TVs and compact camera recorders. The Japanese industry is expected to continue its dominance of the world marketplace. European firms, however, are also in the race to develop next-generation TV sets. Within this environment, there is also potential for low-cost suppliers. The Republic of Korea has been successful in the TV market and has now entered the VCR market, and China is beginning to develop its TV industry.

Within North America, it is expected that some production will remain in the United States and Canada. The U.S. market is the single most lucrative market for consumer electronics, and major suppliers continue to invest in facilities there. Canada, although an attractive and substantial market, will continue to compete with the United States for foreign investment.

By making its decision to digitize TV signals, the United States has taken a major step to integrate radio, television, communication networks and computers. R&D that is under way on compressing TV, radio and video programs so that entire programs and movies can be transmitted in minutes will massively increase the capability of cable and satellite systems and facilitate an even broader range of consumer choice.

Inherent in this process is a new and improved range of consumer electronic products. Digital television sets will not only be clearer, but will also be able to store and even review programs to show only desired segments. Digital sound of virtually the same quality of compact discs (CDs) will be taken for granted. By operating on the same basic electronic principles, new products will emerge that fundamentally change how entertainment is marketed and how society spends its working and leisure hours.

Currently, Canada is studying the technical, cultural and industrial impacts of the digital integration of its consumer electronics, cable, satellite, telecommunications and computer systems. These issues are complex because of overlapping jurisdictions, but they offer the potential for very dynamic industrial opportunities.

The changes under the FTA are expected to have a positive impact on the Canadian consumer electronics industry. Mitsubishi Electronics has already made inroads into the U.S. market, and elimination of the 15 percent American tariff on colour TV tubes under the FTA will further assist it to export

to the United States. Ford Electronics may benefit from the new rules of origin under the FTA, which are stricter than the current Auto Pact requirements. These rules should result in the increased procurement of automotive parts, including car radios, in North America by both North American manufacturers and Asian manufacturers based in the United States and Canada. In the loudspeaker subsector, Canadian manufacturers have not been export-oriented. However, the current development of technologically sophisticated products may mean that these companies will seek new markets in the United States. The removal of the U.S. tariff can be expected to encourage this process. For TV assembly plants, the FTA is expected to have a neutral impact.

At the time of writing, the Canadian and U.S. economies were showing signs of recovering from a recessionary period. During the recession, companies in the industry generally experienced reduced demand for their outputs, in addition to longer-term underlying pressures to adjust. In some cases, the cyclical pressures may have accelerated adjustments and restructuring. With the signs of recovery, though still uneven, the medium-term outlook will correspondingly improve. The overall impact on the industry will depend on the pace of the recovery.

## Competitiveness Assessment

Asian suppliers have significant cost and technological advantages (both in manufacturing and products) over North American and European manufacturers. Protectionist measures by non-Asian developed countries forced Asian firms to make defensive investments. Except for those measures, the majority of the firms would be located in the Far East.

The Canadian TV assembly subsector is composed of Asian-owned facilities that produce mainly for the Canadian market and are smaller and less efficient than the parents' Asian operations. Consumer electronics imports from the United States, Japan, the Republic of Korea, Taiwan, Hong Kong and Singapore have maintained a major share of the Canadian market and this trend is expected to continue. The largest plants in the Canadian consumer electronics industry are comparable with facilities in the United States and are competitive within North America. Canadian manufacturers are strong in the high-end loudspeaker subsector, where they are developing technologically superior products.

The overall impact of the FTA on the industry to date has been positive. The tariff removal should particularly benefit the Canadian car radio and picture tube facilities. Canadian loudspeaker manufacturers should also benefit in the longer term.



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For further information concerning the subject matter  
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## PRINCIPAL STATISTICS<sup>a</sup>

	1984	1985	1986	1987	1988	1989	1990
Establishments	16	17	19	25	19	21	N/A
Employment	2 676	3 008	3 462	3 298	2 838	2 740	N/A
Shipments (\$ millions)	439	604	721	684	635	666	501 <sup>b</sup>
GDP <sup>c</sup> (constant 1986 \$ millions)	132.1	187.1	220.1	209.5	248.6	277.5	170.5
Investment <sup>d</sup> (\$ millions)	20.3	23.8	13.0	20.5	X	X	X

<sup>a</sup>For greater detail on establishments, employment and shipments, see *Electrical and Electronic Products Industries*, Statistics Canada Catalogue No. 43-250, annual (SIC 3341, record player, radio and television receiver industry).

<sup>b</sup>ISTC estimates.

<sup>c</sup>See *Gross Domestic Product by Industry*, Statistics Canada Catalogue No. 15-001, monthly.

<sup>d</sup>See *Capital and Repair Expenditures, Manufacturing Subindustries, Intentions*, Statistics Canada Catalogue No. 61-214, annual. Data are for capital expenditures only.

X: confidential

N/A: not available

## TRADE STATISTICS

	1984	1985	1986	1987	1988 <sup>c</sup>	1989 <sup>c</sup>	1990 <sup>c</sup>
Exports <sup>a</sup> (\$ millions)	178	199	192	137	207	244	142
Domestic shipments (\$ millions)	261	405	529	547	428	422	359
Imports <sup>b</sup> (\$ millions)	1 655	1 563	1 707	1 486	1 579	1 741	1 426
Re-exports <sup>b</sup> (\$ millions)	7	7	8	8	27	26	44
Net imports (\$ millions)	1 648	1 556	1 699	1 478	1 552	1 715	1 382
Canadian market (\$ millions)	1 909	1 961	2 228	2 025	1 980	2 137	1 741
Exports (% of shipments)	40.5	32.9	26.6	20.0	32.6	36.6	28.3
Net imports (% of Canadian market)	86.3	79.3	76.3	73.0	78.4	80.3	79.4

<sup>a</sup>See *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

<sup>b</sup>See *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

<sup>c</sup>It is important to note that data for 1988 and after are based on the Harmonized Commodity Description and Coding System (HS). Prior to 1988, the shipments, exports and imports data were classified using the Industrial Commodity Classification (ICC), the Export Commodity Classification (XCC) and the Canadian International Trade Classification (CITC), respectively. Although the data are shown as a continuous historical series, users are reminded that HS and previous classifications are not fully compatible. Therefore, changes in the levels for 1988 and after reflect not only changes in shipment, export and import trends, but also changes in the classification systems. It is impossible to assess with any degree of precision the respective contribution of each of these two factors to the total reported changes in these levels.



### SOURCES OF IMPORTS<sup>a</sup> (% of total value)

	1984	1985	1986	1987	1988	1989	1990
United States	22.7	26.1	28.4	31.8	37.9	33.1	36.7
European Community	1.2	1.5	1.7	1.5	1.4	1.3	1.6
Asia	70.5	64.4	63.4	62.4	58.4	60.3	55.8
Other	5.6	8.0	6.5	4.3	2.3	5.3	5.9

<sup>a</sup>See *Imports by Commodity*, Statistics Canada Catalogue No. 65-007, monthly.

### DESTINATIONS OF EXPORTS<sup>a</sup> (% of total value)

	1984	1985	1986	1987	1988	1989	1990
United States	97.3	96.3	95.3	84.7	89.4	88.5	82.9
European Community	1.3	0.5	1.5	7.4	3.8	3.3	8.2
Asia	0.1	0.4	0.2	0.9	4.4	4.5	5.5
Other	1.3	2.8	3.0	7.0	2.4	3.7	3.4

<sup>a</sup>See *Exports by Commodity*, Statistics Canada Catalogue No. 65-004, monthly.

### REGIONAL DISTRIBUTION<sup>a</sup> (average over the period 1986 to 1988)

	Atlantic	Quebec	Ontario	Prairies	British Columbia
Establishments (% of total)	—	32	68	—	—

<sup>a</sup>See *Electrical and Electronic Products Industries*, Statistics Canada Catalogue No. 43-250, annual.



## MAJOR FIRMS

Name	Country of ownership	Location of major plants
Appollo Electric	Canada	Toronto, Ontario
Audio Products International Corp. <sup>a</sup>	Canada	Scarborough, Ontario
Audiosphere Audio Research Corp. Ltd.	Canada	Markham, Ontario
Bose Canada Inc.	United States	Sainte-Marie, Quebec
Bryston Ltd. <sup>a</sup>	Canada	Rexdale, Ontario
Ford Electronics Manufacturing Corporation	United States	Markham, Ontario
Global Sound Systems Ltd.	Canada	Scarborough, Ontario
Hitachi (HSC) Canada Inc.	Japan	Montreal, Quebec
Matsushita Industrial Canada Limited	Japan	Toronto, Ontario
Mitsubishi Electric Sales Canada Inc.	Japan	Waterloo, Ontario
Mitsubishi Electronics Industries Canada Inc.	Japan	Midland, Ontario
PSB International <sup>a</sup>	Canada	Pickering, Ontario
Paradigm Electronics Inc. <sup>a</sup>	Canada	Weston, Ontario
Sanyo Industries Canada Inc.	Japan	Montreal, Quebec
State of the Art Electronik Inc. <sup>a</sup>	Canada	Ottawa, Ontario
Thomson Consumer Electronics Canada Inc.	United States	Prescott, Ontario

<sup>a</sup>Member of the Canadian Audio Research Consortium.



## INDUSTRY ASSOCIATION

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## SECTORAL STUDIES AND INITIATIVES

The following initiative is supported by Industry, Science and Technology Canada:

### **Canadian Audio Research Consortium (CARC)**

CARC is an industrial consortium consisting of five Canadian audio equipment manufacturers working together with researchers from the National Research Council's Institute for Microstructural Sciences on a \$1.6 million R&D venture known as Project Athena. This joint project will undertake precompetitive research in order to develop technology for a new generation of adaptive loudspeakers.

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