

Memory from optical hole-burning

- A tuneable laser that can be adjusted to very precise frequencies (about 10 000 frequencies is the present practical limit but theoretically 10 million is possible), is shone on a selected array of spots on a slab of crystal at one colour or frequency, say red. This is the hole-burning or "write" function of the memory;
- Light sensors are arranged on another surface behind the crystal;
- Then, in order to read the memory a floodlight of the same red colour is used to illuminate the entire slab;
- The light shines through the previously burned holes but is blocked everywhere else on the crystal;
- The same procedure can be followed with different colours, green etc., in different patterns on the same crystal;
- The idea that such a memory could store as much as 1 000 trillion (10^{15}) bits per square centimetre is derived by multiplying the 100 million (10^8) narrowly-focused laser beams that can be accommodated in a square centimetre by the 10 million (10^7) different frequencies to which each of these lasers can be turned.

Greatly increased capacity

According to Dr. Szabo, "this memory will be as much as a million times bigger than conventional memories and will undoubtedly completely change the computer game". The 1 000 trillion bits which could be stored on a fingernail-sized square centimetre of material in such a memory, he points out, surpass the 100 trillion bits estimated capacity of the entire human brain.

Dr. Szabo predicts that computers with such memories will eventually be impossible for humans to program. They will require the development of a true learning algorithm or self-programming capability. And such computers, he says, will be the first true examples of artificial intelligence, of machines with the ability to learn from experience as humans do. In short, Dr. Szabo's memory may not only aid the development of fifth generation computers, it may require them.

Dr. Szabo received patents on the hole-burning memory in Canada and the United States in 1975. Recently he has succeeded with a new US patent describing both a method of sweeping the laser across the crystal for rapid and efficient writing and reading, and a technique for creating holographic movies from the crystal memory.

(Condensed from an article by Paul Tisdall in *Science Dimension* 1984-85.)

Trade minister in London, Budapest and Belgrade

Canada's Minister for International Trade James F. Kelleher made his first official visit to Britain, Hungary and Yugoslavia in November.

In London, Mr. Kelleher met with representatives of the British government and business leaders, including the Confederation of British Industry. In his meetings Mr. Kelleher discussed Canadian priorities in international trade and current bilateral links with Britain, Canada's largest trading partner in Europe. He also promoted joint trade possibilities and emphasized industrial co-operation opportunities.

In a speech to the Canada-UK Chamber of Commerce he highlighted Canada's new approach to foreign investment and reviewed the government's November 8 economic statement. It was the first major address in Europe on economic themes by a member of the new government.

East European visit

As the guest of Foreign Trade Minister Peter Veress in Hungary, Mr. Kelleher led a Canadian delegation of businessmen and officials from governmental agencies in bilateral trade consultations. Meeting with representatives in foreign trade, industry and transport, they identified and discussed the possibilities for greater co-operation between the two countries in various economic and commercial fields.

The contacts, ranging in scope from oil and gas field equipment through articulated buses to agricultural telecommunication equipment, are expected to strengthen the bilateral trading relationship between Canada



Trade Minister James Kelleher (right) and Ambassador John Fraser at the plaque unveiling for Canada's new chancery in Yugoslavia.



L'orchestre sympathique perform at the opening of the Canadian chancery in Belgrade.

and Hungary, as well as to identify areas for commercial co-operation in third markets.

On behalf of Canada, Mr. Kelleher signed a Canada-Hungary transport agreement with Hungary Transport Minister Lajos Urban. The agreement is for technical co-operation and exchanges in the fields of highway construction and safety, railways, urban transportation and the application of computers in transport operations.

In Hungary, Mr. Kelleher also presided over the inauguration ceremonies of the new Canadian chancery in Budapest.

During his visit to Belgrade, Yugoslavia, Mr. Kelleher officially opened another Canadian chancery and consulted with senior government officials on international economic issues. He led the delegation of Canadian business representatives interested in expanding bilateral trade opportunities.

On behalf of Transport Canada, he signed a Canada-Yugoslavia air agreement to institute regular air service between Toronto and Montreal in Canada and major cities in Yugoslavia. In addition, he signed a memorandum of understanding in the field of veterinary medicine with the Yugoslavia Federal Committee for Agriculture on behalf of Agriculture Canada.

Reflecting the importance of the cultural aspect of bilateral relations between the countries, *The Canadian Landscape*, a major exhibition of paintings from the Firestone art collection was presented in Yugoslavia. It was the first showing of an exhibition involving many important Canadian artists ever presented by Canada in East Europe.