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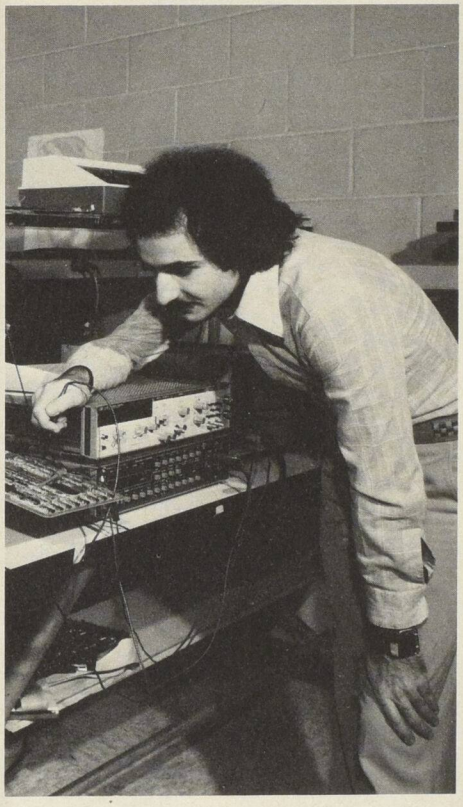
Getting on the bus
Helping hand for computers

"Before the mid-1970's data transfer was, at best, an ad hoc situation," sums up Karl Swinimer of the Division of Physics' computer group. "The problem lay in the bewildering variety of laboratory instruments available to the researcher and the need for direct communication links between them. In common practice, communication was accomplished by spending long hours at a bench with a soldering iron devising ways to hook the intruments up to one another so that the desired interaction could take place."

Some steps were taken during the early 1970's to relieve this problem, and a number of "interface" devices began to appear on the market. "The time and effort needed to link machines in this manner often led researchers to sacrifice instrument capabilities for the convenience of compatibility," says Peter Grant of the NRC research group. "It's very easy to become locked into one manufacturer's system in this way." At times, however, this proved counterproductive to the research. Masses of data could disappear into the morass of a data storage system and never be retrieved for later use because the computer couldn't "hear" the recording device.

A major effort to simplify machine communication came with the development of what is called the General Purpose Interface Bus or GPIB by the standards organization of the electronics world, the Institute of Electrical and Electronic Engineers (IEEE). One of the more serious problems was a lack of commonality of such things as cable connectors, voltage and signal levels, and logic coding, and the Bus provided a set of standards for manufacturers to follow. Since it was introduced five years ago, manufacturers have been quick to bring their equipment into line with the new standards.



A Dynalogic technician tests one of the computer's circuit boards. *(Photo: Dynalogic Corporation)*

Un technicien de Dynalogic vérifie un circuit imprimé de l'ordinateur. *(Photo: Dynalogic Corporation)*

Swinimer and Grant took the standard Bus a step further. Several years of close working relations with other scientists outside their field had indicated a need for equipment that could be used with little or no computer expertise. Researchers needed a device that combined flexibility, low cost and a data storage system in which information retrieval was a relatively simple process. It was at this point, with Swinimer, Grant and project originator John Sankey reviewing their ideas on what was needed, that the Ottawa electronics firm Dynalogic Corporation approached NRC with a request for assistance in the further development of an existing microcomputor system. Working in close cooperation over two years, the NRC-Dynalogic team developed a small computer known as the Laboratory Microcomputer System (LMS). "It is a compact instrument well suited to the needs of a small research installation," says Swinimer, "and it is designed to be 'friendly' with nearly any instrument in the laboratory. Not only does it have the desired data transfer capability, but it exercises any desired degree of control over the instruments as well."

In short, the Dynalogic LMS is a BASIC language microcomputer with a data storage system based on "floppy discs", a device resembling 45 rpm records of an earlier day. It is capable of communicating both with other instruments via the GPIB and with other computers.

"We have already marketed this system in Europe," says Roger Wainwright of Dynalogic, "and met with an enthusiastic response. Small laboratories and businesses are finding its variable precision arithmetic and reliability to their liking. And, after all, the test of an effective system is a satisfied user." Most laboratories in the Division of Physics now have one of the systems in use. It is also finding a home in many federal departments and small industries as more and more people discover the blessings of this low-cost, reliable computer.□

Stephen A. Haines