

## U.S. Leadership in Electronics Threatened, Says Commerce Report

While the U.S. electronics sector has historically, and continues still to be, the worldwide leader, there are strong indications that Japan may capture that distinction in the years ahead, according to a recent study, "The Competitive Status of the U.S. Electronics Sector from Materials to Systems," published by the Department of Commerce's International Trade Administration.

The shift in gears can be blamed both on domestic and international factors, the report states.

Domestically, compared to competitor nations, the United States is plagued with a higher cost and lower availability of finance capital, weaknesses in vocational training and science education, and stricter (sometimes seemingly antiquated) anti-trust laws. Other countries, on the contrary, have instituted policies to foster their domestic industries, including restricting their own markets, funding joint R&D projects, and forcing the transfer of suppliers to firms based in their own countries.

The willingness of the governments of

other countries to coordinate inter-industry groupings also appears to be more beneficial than America's system. Similar to some other emerging areas, industries across a rather broad area in the electronics sector are linked together. For example, manufacturers who produce ultra-pure silicon wafers must work closely with makers of semiconductor manufacturing equipment, automatic test equipment, and semiconductor devices to ensure that such products as dynamic random access memories can be produced cost effectively in high volume. From there, suppliers of systems products — including computers, business equipment, and telecommunications equipment — will design these chips into their latest products. Software is an overriding item and is found in all these products, whether embedded in the circuitry or the chips or recorded on magnetic disks or tape.

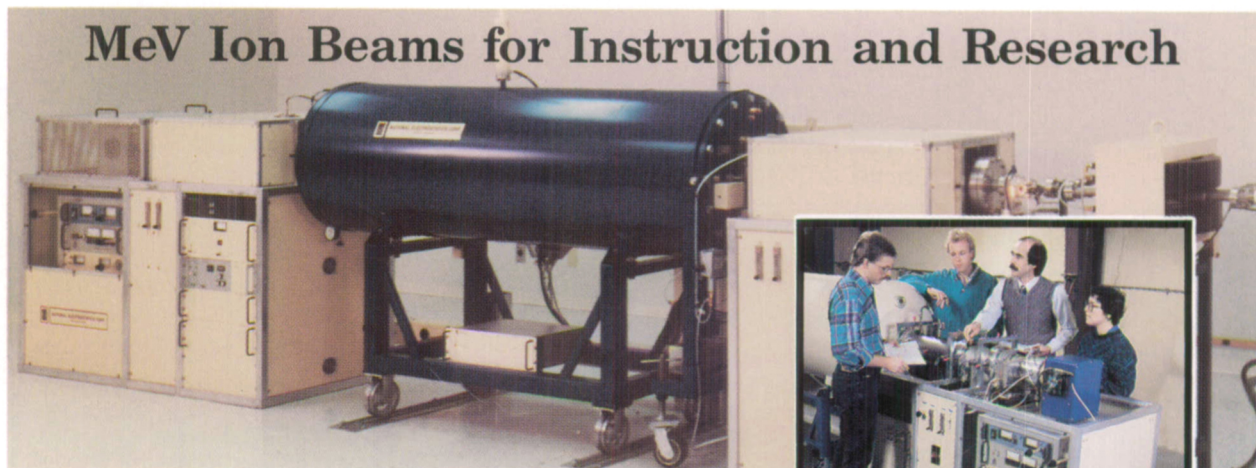
"While generally acclaimed for their innovative research, U.S. electronics firms are at a competitive disadvantage in manufacturing processes and product development," says the report. "Part of this disadvantage is due to the fact that U.S. firms generally devote less attention to R&D in manufacturing processes and part

is due to the fact that there has been relatively little emphasis on manufacturing in engineering and master of business administration curricula. Manufacturing is often viewed as a linear process in which design and engineering are separate from production and marketing."

Internationally, American companies have been faced with foreign competition at its worst — including dumping and intellectual property rights violations, the report notes.

Non-U.S.-based companies understand that electronics can play a key role in the growth of their economies. To protect themselves, they have constructed a variety of market barriers, including: import/licensing quotas, restricted markets, investment restrictions, preferential procurement, exclusionary standards, local content requirements, export performance requirements, forced technology transfer/investment, financial support and offsets.

Such moves have caused the U.S. electronics industry to change its tactics, the report observes. For example, forced technology transfer in exchange for access to a country's market has meant that foreign competition has emerged more rapidly and that a U.S. company's revenues over



Pelletron® Ion Beam Systems are ideal for teaching physics, modern technology, and the latest applied physics techniques. Pelletron accelerators provide MeV ion beams for a variety of labs, class demonstrations, and advanced research. Pelletrons operate quietly with very low radiation. The ease of operation and high reliability gives students confidence and enthusiasm for the equipment and its applications. The modern technologies in Pelletron systems will attract and motivate top students.



**National Electrostatics Corp.**

Graber Road, Box 310  
Middleton, Wisconsin 53562-0310  
Tel. 608/831-7600 • Telex 26-5430 • Fax 608/256-4103

the life of a product have been reduced. Additionally, some of this trade has flowed back to the United States, negatively affecting trade balance.

Japan and the United States are about equal in the area of computers and peripherals. The United States is ahead in microcomputers, workstations, and high-performance computer systems. Japan leads in optical storage, laser printers, and video displays.

As is the case in other technologies, Japanese businesses have successfully taken advantage of other markets without surrendering their own. Their strategy has consisted of entering an electronics market as an original equipment manufacturer (OEM) for companies based in the United States and elsewhere and then beginning a subsidiary in the other country.

As enumerated in the electronics study, there are two often conflicting camps concerning what U.S. policy should be regarding foreign competition. One group believes that "extraordinary measures must be taken to avoid a crippling of the sector or its total disappearance." The other, more moderate in tone, is the group the administration seems to represent.

While U.S. trade has slipped, it believes that "free trade is a compelling ideal, generally accepted worldwide."

The list of recommendations for the Department of Commerce to follow reads like a laundry list of do's and don'ts, some innovative and some that appear to seep into most such policy reports. Some of the more innovative ones include:

(1) Establishing a Foreign Technology Assessment Specialist in Tokyo to provide U.S. electronics companies with early-warning breakthrough announcements;

(2) Reviewing dumping, subsidies, and intellectual property rights policies based on the strategic view of technical and market trends to anticipate foreign threats;

(3) Encouraging firms to establish new measures of productive performance such as indicators of quality, productivity, product-development time, and time-to-market, rather than merely indicators of short-term financial performance; and

(4) Encouraging increased emphasis on manufacturing R&D and continuous improvements in manufacturing process technology through seminars.

Perhaps the most important conclusion of the report is that "the challenge will be

how to preserve those elements that have made the U.S. electronics sector preeminent in the past and to select and modify those elements of foreign success that will help to ensure its survival in the future."

### NSF Notes

#### SBIR Awards Made to 139 Firms

Small high-technology firms in 29 states have received grants from the National Science Foundation to conduct cutting-edge, high risk, potentially high-payoff research under the Small Business Innovative Research (SBIR) Program.

This year, 170 Phase I awards for a total of \$8.4 million were made to 139 firms. Under Phase I of the three-phase program, NSF awarded up to \$50,000 to each firm, selected from 1544 proposals submitted in June 1989.

Abstracts of the 1989 SBIR Phase I awards and copies of the 1990 solicitation can be obtained from: National Science Foundation, Forms and Publications Office, 1800 G Street NW, Room 232, Washington, DC 20550. □

## Ceramics and Advanced Materials

*Joint meeting of the New Mexico Section of the MRS and  
the New Mexico Section of the American Ceramic Society*

Friday, October 5, 1990, *The Inn at Loretto*, Santa Fe, New Mexico

Two concurrent symposia: Optical, Electronic, and Optoelectronic Materials  
Microstructure and Processing of Ceramics  
*Conference fee: \$50, \$25 students*

MRS Shortcourse: Film and Coating Deposition Techniques  
Don Mattox, IP Industries (formerly Sandia National Laboratories)  
*Course fee: \$345, \$60 for students*

Registration information: Protocol Office  
MS-P366  
Los Alamos National Laboratory  
Los Alamos, NM 87545  
(505) 667-6574

Send abstracts to: Kurt Sickafus  
MS-K762  
Los Alamos National Laboratory  
Los Alamos, NM 87545  
(505) 665-3457

