Spectra-Physics: Laser Success Story

By Toshio Iwasaki, editor of the *Journal of Japanese Trade & Industry*

Most people know that a laser is a device that emits an intense beam of light. And some might even be able to name a few laser applications. Ask for more detail, however, and you are likely to draw a blank. To most laymen, these sophisticated tools are the epitomy of science fiction, obviously powerful, yet mysterious and difficult to understand.

Spectra-Physics, Inc., the world's largest commercial laser company, has taken an arcane technology and turned it into a down-to-earth business success story. Its wholly owned Japanese subsidiary, Spectra-Physics K.K., is out to see that story repeated in Japan.

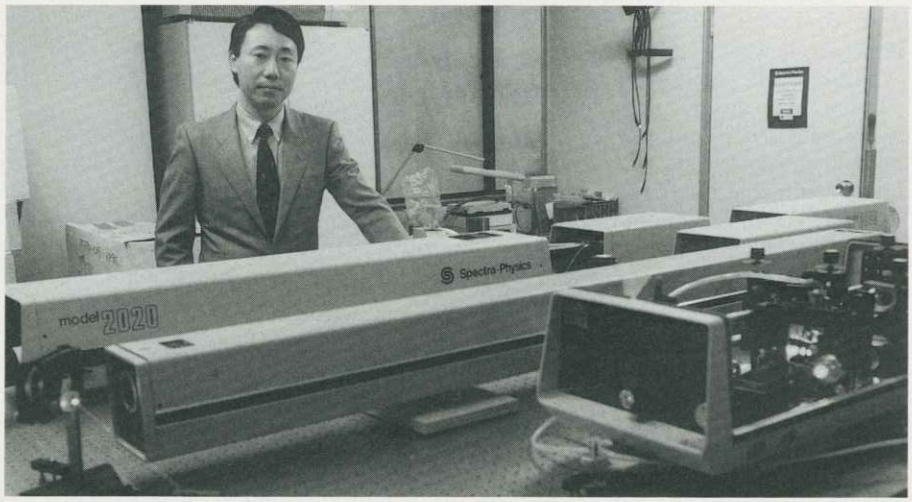
The word laser is actually an acronym. The letters stand for "light amplification by stimulated emission of radiation." According to a company brochure, a laser is, in essence, "a device that converts one form of energy into a special kind of light with several unique properties. The unique characteristics are: coherence, monochromaticity, and intensity."

What that means in practice is that a laser beam is produced by bombarding certain responsive materials with light, which is of course a form of energy. The energy sets the material oscillating, and when it does it emits light of its own. The difference is that the light it emits is more intense, and is monodirectional (going in only one direction rather than radiating in all directions like light from a light bulb) and monochramatic, using only one frequency from the visual spectrum instead of the full range such as is found in natural light.

These properties lend themselves to a wide variety of applications in communications, measuring instrumentation, optics, precision machining and medicine. Indeed, some consider lasers the most important invention of the 20th century. To see how pervasive they have become, stroll over to the nearest supermarket with a POS (point-of-sale) system. See how the sales asistant runs each product over a bar code reader that emits a red light, instantly calculates the price and transmits it through the POS terminal? Well, that is a laser in action, reflecting its light off the white spaces in between the black bars of the bar code on the product package to read the pricing code.

Lasers are used outside of the distribution industry as well. They are valuable tools in the construction industry, and indispensable in research and development. A Spectra laser system provides a constant reference beam that helps workers lay drainage pipes at the right slope. Other lasers ensure accurate cement pouring and the placement of interior ceilings.

In the R&D field, lasers are indispensable research and analysis tools in such high-tech areas as biotechnology. By using laser pulses, which have extremely short intervals of as little as one-trillionth of a second, it is possible to measure reactions in the cells of living organisms, which occur at about the same speed. The manufacture and marketing of custom-made laser systems for research and analysis is yet another field in which Spectra is a leader.



Akinobu Tohya, representative director of Spectra-Physics K.K.: Success in the Japanese market depends on maintaining close contact with customers.

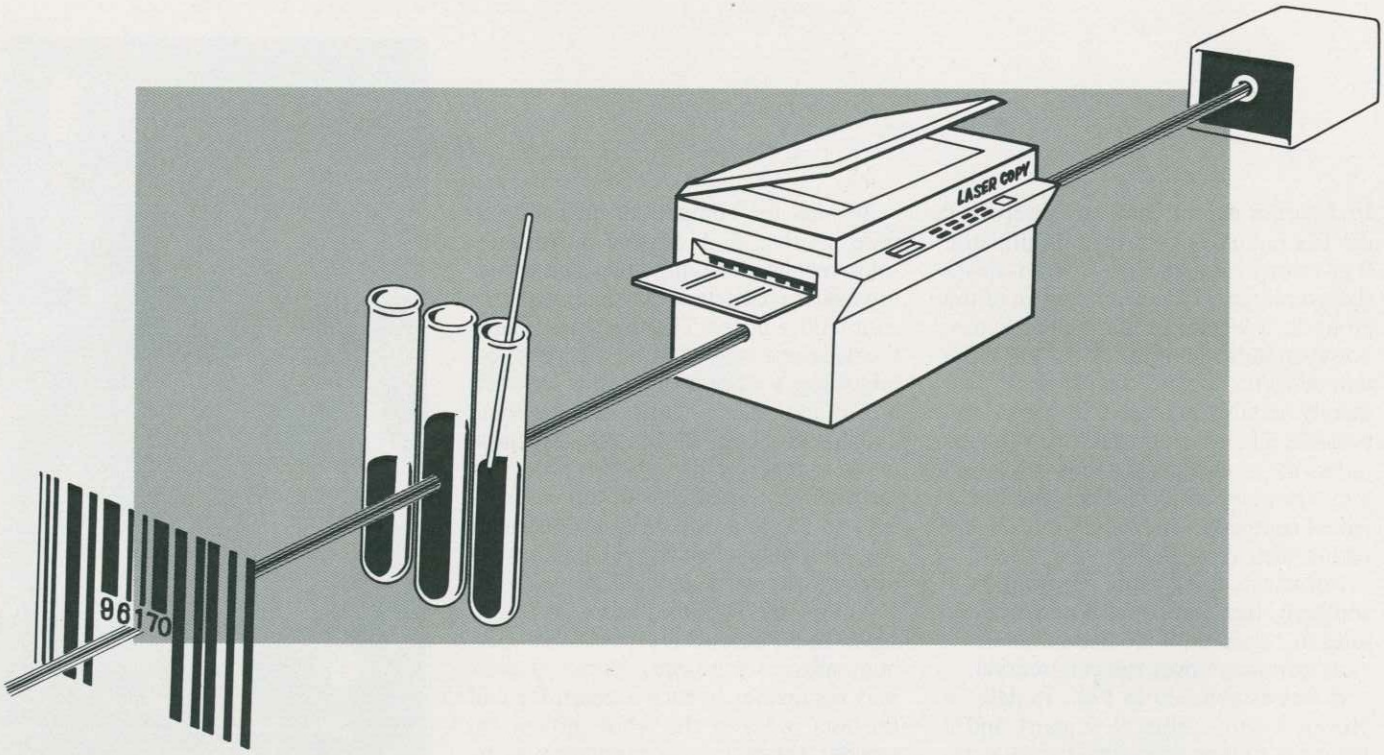
Winning acceptance

"Applications must be studied before a product can win wide acceptance for industrial purposes," says Akinobu Tohya, representative director of Spectra-Physics K.K. "If you work hard to develop a system for research purposes, you can be reasonably sure it will find industrial applications further down the line."

Let's back up a bit. Spectra-Physics, Inc. was established in California, mecca of high-tech start-ups, in 1961, only a year after the first laser beam was produced in a laboratory experiment. Its founders were five scientists and engineers from VARIAN Associates, a major optical instruments maker.

Among the five was Herbert Dwight, an optical scientist who would later become Spectra's president. In 1962, Dwight and his associates produced the world's first commercial laser, and the company has been growing ever since as the world's premier integrated producer of integrated laser systems.

"Spectra-Physics is the largest, not only in terms of annual sales, but also in the range of technologies and applications it handles," says Tohya.



Tohya takes pride in what he regards as the technological excellence of his company's products, stemming from its devotion to R&D. At Spectra Technology, Inc. in Bellevue, Washington, R&D staff are involved in a wide range of fields, from gas and solid state lasers to plasma physics and energy technologies. Spectra Technology also develops commercial products in cooperation with the various divisions of the parent company.

Technological excellence has greatly helped the company to develop its Japanese market. According to Tohya, Japanese buyers of laser systems usually demand performance well exceeding the specified standards. Special applications must be developed to meet such demands, he says, and it is the company's technological capacity that makes it possible to produce such tailor-made systems for its Japanese customers.

For example, scanners used in the color graphics field usually can use only one wavelength of laser light at a time. One Japanese customer, however, demanded that their scanner emit two wavelengths simultaneously. It was a technically difficult demand, which the company was able to meet.

"In the United States and other Western industrial countries, customers first will buy a product with standard specifications," says Tohya. "If the product doesn't meet some particular requirement of theirs, they try to work out solutions on their own. But Japanese customers often ask for the product specifications to be altered to order before they buy. We convey such demands to our head office in the United States, and tell them that it is important to satisfy these needs in order to promote our position in the Japanese market.

"It's our job to make headquarters understand this," Tohya adds. "Making specific requests about the product to be purchased is a practice peculiar to Japan, yet I think it shows that Japanese customers are more critical about specifications. In that sense, the Japanese market is more mature."

Japanese customers are also more demanding about product quality. According to Tohya, his sales staff are frequently asked by their counterparts at the parent company in the United States why Japanese customers are so picky. "Usually, the head office people accept our position, but they soon forget," says Tohya. "So we must continue this argument (over higher-than-usual quality standards) time and again."

This kind of "communication gap" between a Japanese subsidiary and the parent company is a common problem in industries where Japanese and foreign companies work as partners. Since the laser industry has a relatively short history, however, Tohya thinks it will be fairly easy to close the communication gap. The relative youth of the industry, he points out, means that people in managerial positions are comparatively young and more receptive to new ideas.

Time and quality

A more difficult problem, he says, is delivering products that meet the customer's strict requirements on time. "We have a reputation for very high quality control," he says. "The problem is that we have to purchase hundreds of parts and components from outside suppliers. We guarantee the quality of our finished products because we check every item supplied to us to ensure it complies with our strict quality standards. But because our inspection is so demanding, it could happen that many parts and components fail to pass our tests. When that happens, we can't make the necessary number of products, and consequently may miss delivery deadlines."

According to Tohya, this problem has much to do with industrial structure. "Checking the quality of incoming parts is a defensive form of quality control.

In Japan, a parent company intervenes directly in quality control at its affiliates. It gives them guidance and thereby raises the overall level of quality control of the group as a whole. In the United States, however, individual companies are more independent, making the kind of total quality control practiced in Japan impossible. The problem won't be resolved unless the level of quality control is raised industry-wide, no matter how hard individual companies try to improve quality within their respective organizations."

Notwithstanding these problems, the company has continued to expand its sales in Japan, until today it maintains a clear advantage over the competition.

It was established in 1981. Initially, it provided only technical support and a Japanese trading company handled imports and sales. This indirect sales setup was replaced by a direct sales system in April 1988.

Tohya was recruited from another foreign-affiliated company to become president of the Spectra subsidiary in August 1985. His appointment is in line with the localization policy followed by Spectra, whose 10 overseas subsidiaries are all headed by local nationals. "Every country has its own ways of doing business and its own distribution system," says Tohya. "So it is the position of the parent company in the United States that the top executive of an overseas subsidiary must be a local national who is well versed in conditions in his own country."

"It's not necessarily bad policy to appoint a man from head office as president of an overseas subsidiary," he continues, "provided he has a good undestanding of local commercial customs, the culture and so forth, and is in a position to give the head office advice from the local point of view. Rather, the real difficulty comes when a local national at the top of a subsidiary has somebody from head office working directly under him. In that case, number two man tends to become the contact man for the head office, making it hard for the local boss to maintain responsible communication with his superiors back home. That kind of situation can make it impossible to run the organization properly."

To beat the competition in the Japanese market and achieve satisfactory sales results, foreign-owned companies must offer products of excellent quality at competitive prices. They also must follow the Japanese way of doing business—establishing a close relationship between buyer and seller. "Other things being equal, success or failure in the Japanese market depends on whether you can maintain close contact with your customers and create a climate of mutual trust and friendship in which orders are placed directly with sales people," he said.

Among the 10 subsidiaries, the one in Japan ranks second after the West German subsidiary in sales. These 10 overseas companies in turn account for half the total sales of the whole group. No wonder Tohya exudes confidence as he speaks of marketing philosophy.

Language problem

Tohya has 46 staff, all of them Japanese, working under him. Most have technical backgrounds, as does the president himself. Since it is a high-tech company, employees receive technical training not only within the company, but also at the parent company back in the United States. The group as a whole attaches great importance to employee training.

The products the Japanese subsidiary sells fall into three major categories—lasers for physical and chemical applications, lasers for POS scanners and lasers for construction-related applications. Sales are about equal in each of these fields. Computing integrators—the company's only non-laser item—are only rarely marketed in Japan. "The data displayed on the integrator is all in English," explains Tohya. "We have confidence in the performance of our hardware, but software is another matter because it takes extra investment to adapt it. Integrators are a good example of foreign products that are extremely difficult to sell in Japan because of the language problem."

Lasers pose no such problem. Yet, while Spectra and other U.S. integrated machinery makers still maintain a dominant position in the field, Japanese makers are gaining strength, particularly in the field of lasers for machine tools. The Japanese laser market is becoming increasingly attractive, not only to foreign makers, but to Japanese manufacturers as well.

"Currently we feel secure because our products perform better than Japanese products. But over the longer term, there is no room for complacency, because Japanese products are expected to have better performance characteristics in the future."

This is why, Tohya says, foreign-owned companies in Japan, including Spectra, must avoid the U.S.-style managerial emphasis on short-term profit and instead make investments based on long-term commitment to the market. "We must build better service, training and maintenance systems, rather than concentrate on immediate sales," he said. "Once we have established such a service network, we can expand our sales activities more easily." Spectra, at least, has found its own answer to what is a common problem facing foreign-owned companies in Japan.