

Kangyo Denki Kiki: Coiling Foils, Making Motors

By Shinsuke Semba

The Venture Enterprise Center (VEC), a non-profit organization established to help develop venture enterprises in Japan, has a committee charged with examining in detail the eligibility of companies applying for assistance. The committee checks the business and other relevant aspects of each candidate enterprise, the originality of its development project, the quality of the technology involved, and the marketability and characteristics of the final product. In addition, the president of the enterprise must appear before the committee to answer questions and let the examiners see what kind of person he is.

In the autumn of 1981, a certain venture enterprise submitted an application to the VEC and handily passed the test. The committee was chaired by Soichiro Honda, one of Japan's greatest entrepreneurs, who developed Honda Motor into a world enterprise. Honda Motor started out, as did Sony, as a venture enterprise, and pursued a unique business strategy in the face of formidable obstacles.

Following the interview, Honda told members of the committee that he had been deeply impressed by the way the young president managed his company. Honda also admired the product, a precision sheet coil which he described as "one of those marvelous things which comes along only once in 50 years."

Precision sheet coil: an epoch-making product

The name of this remarkable enterprise was Kangyo Denki Kiki Co., Ltd.,



Michio Sudo, president of Kangyo Denki Kiki Co., Ltd.

with head offices in Tokyo. The name of the young president was Michio Sudo, then an up-and-coming 37-year-old businessman.

The *Nikkei Sangyo Shimbun* of Nov. 20, 1981, reported the new product under a big headline. Said the journal: "Precision sheet coil is an epoch-making product which has caused a revolution in conventional small motors. A motor using this

coil can be one-third the size of a conventional model, and three times as efficient. Moreover, manufacturing cost can be reduced to less than one-fifth the present cost. Already orders are pouring in from VCR (video cassette recorder) makers."

At the time, two types of precision motors were considered "representative" of motors for VCRs. Type A was a conventional wire-wound-type motor, and type B a no-wire-wound-type only half the thickness of type A. In type B a flat spiral coil of thin copper foils resembling a printed circuit board was placed in a flower petal-like pattern. This is a precision sheet coil, and a motor using this coil is called a sheet coil motor. As the president of an appliance firm is said to have quipped: "If A is the motor of Meiji (19th-20th centuries), B is the motor of Showa (20th-21st centuries)."

Clearly sheet coil motors are indispensable not only to VCRs and audio equipment but also to robots and floppy disk drive units for computers. They are also central to many products of the future, like the electronic camera.

Yet precision sheet coil is not a product of chance. Kangyo Denki has 15 years experience with the "hall element," an essential part of the sheet coil motor. The firm began merchandising the product soon after its founding in 1967. The company also has a unique history of product development in other areas. In 1967 it produced a gauss meter using a hall element and an apposition control sensor for rockets. In 1971, in a joint project with Asahi Chemical Industry Co., a major textile maker, it developed an evenness

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tester to control the evenness of fibers in the yarn spinning process. In 1973 Kangyo Denki created yet another product, a fluid crash sensor for safety airbags in automobiles. General Motors soon placed an order for 100,000 units.

This brilliant record, however, is also one of the hardships which the company faced in its development activities. It was a period of struggle in which hard negotiations had to be conducted with banks just to obtain development funds and keep the cash flow going. Sudo later described these days in detail in his book *Ikizama Keiei* (My Life as an Entrepreneur).

It is only recently that Japanese financial institutions have finally become receptive to the needs of venture enterprises and have begun making earnest efforts to help them. "Pioneers" such as Sony and Honda experienced similar difficulties, and it is not hard to imagine how Soichiro Honda, who had overcome such difficulties with his indomitable spirit, was reminded of his own youth by Sudo's ordeals. The two men have something else in common, however: an ability to develop dramatic, successful new products from ideas and concepts that have been around for years but have never before been translated into reality.

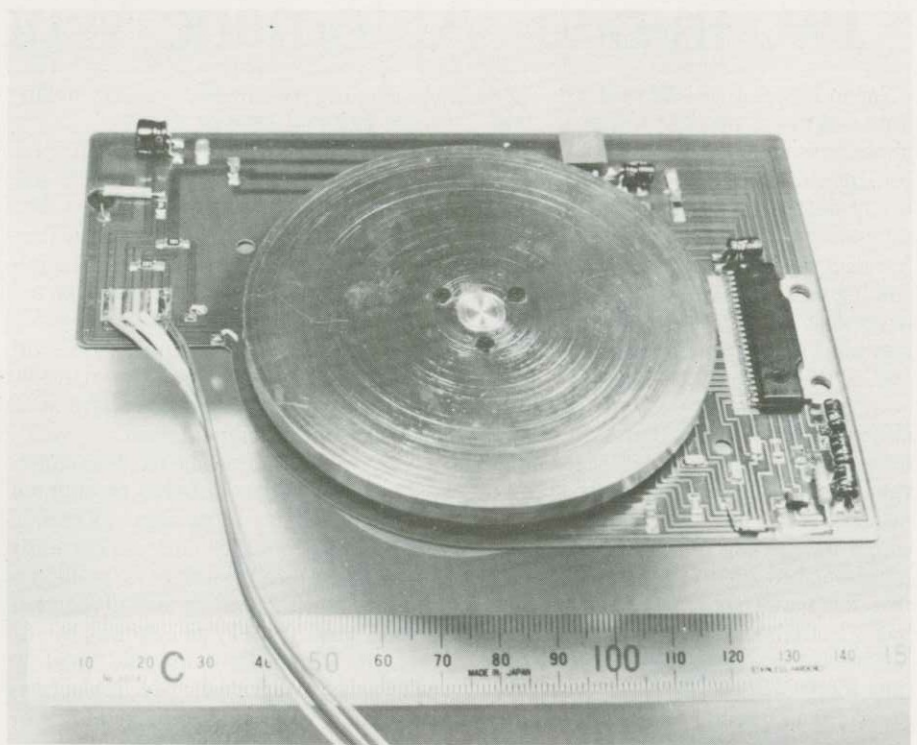
New plant in Gunma: a giant step forward

In 1985 Kangyo Denki constructed a fully automated mass-production plant in Itakura, Gunma Prefecture, at a cost of ¥7 billion (about three times total sales). The company's existing plant, also located in Gunma, had proved unable to meet the growing demand for precision sheet coils with its monthly capacity of only 30,000 units. The new plant can produce up to a million units each of coils and motors a month.

The Itakura plant has two three-story buildings with closed clean rooms, and covers some 17,500 square meters. One building is for manufacturing sheet coils and the other for assembling sheet coil motors. The factories are completely automated and operate continuously on three shifts. Eventually the work force will total up to 150 persons.

Initially the plant will produce 600,000 units a month, increasing to 1,000,000 in a year's time. This breaks down to 400,000 motors for floppy disk drives, 300,000 for VCRs, 200,000 for audio equipment, and 100,000 coil stacks. The company plans to export 50% of the sheet coil motors.

"After completing the plant we would like to export an entire set of plant machinery and equipment," Sudo said back



Precision sheet coil motor: small but mighty

in 1984 before the facility was finished. "I strongly believe that the production and development technology we have established here will prove one of the world's major technologies. Therefore it is necessary for us to set up a Kangyo family of plants around the world. Through active plant exports we can supply our sheet coil motors on a stable basis to users everywhere."

Sudo said the company has plans to export plants about the size of the Itakura facility to the United States, Europe, Taiwan, South Korea, and other regions by 1986. "In Taiwan we already have a concrete plan to launch a joint venture," he added. "In Europe we're negotiating with several electronics and precision equipment makers."

One complete plant will be worth several billions of yen. So far Kangyo Denki has spent ¥2-3 billion (\$10-15 million) on product research and development, which is included in this price. "But," says Sudo, "I think the price is acceptable to our prospective partners because they will have to spend far more if they are to enter this business on their own."

Although foreign enterprises badly need sheet coil motors, in the case of VCRs, European and American makers have allowed Japanese makers to mount an offensive in their home markets. This is because they have been unable to produce small, high-efficiency motors on their own.

"Once makers in Europe and Amer-

ica start supplying their own sheet coil motors, however, they could quickly turn the tide in their favor," predicts Sudo. "Since this is a product that could pull the fat out of the fire, I am sure we'll be able to construct plants abroad in the not too distant future."

The "best boy" of venture business

In 1985 *Nikkei Venture* magazine published its "1985/1986 Venture Ranking" based on a survey of 60 Japanese experts. Kangyo Denki placed first among the "10 best enterprises that have been most active this year." Sudo also ranked first among the "10 best businessmen who have been most active this year."

On October 24 *Nikkan Kogyo Shimbun* reported in a front-page article that Kangyo Denki had completed a mass-production system for a compact multilayer flexible printed circuit board which cost 30% less than conventional products. The new board, the paper noted, has found wide use in large electronic equipment such as computers and switching systems, as well as in personal computers, word processors, digital watches, electronic cameras, and electronic toys.

Kangyo Denki promises to grow into a world enterprise by the time the 21st century rolls around 14 years from now. Someday, the up-and-coming firm may well be known as the "Honda" of the electric industry. ●