

Just Send It by Facsimile

By Kazuhisa Maeno

Of all the new devices that have flowed into offices and homes in Japan on the wave of the technological revolution of recent years, perhaps the most widely used is the facsimile machine, sales of which continue to spiral upward year by year. This apparatus now plays such an important role in communications that no business can do without one.

The facsimile machine, or fax for short, is an apparatus that reproduces images—written messages, estimates, drawings, maps, and so on—in permanent form over a telecommunications system. The name comes from the Latin *fac simile*, meaning “to make something similar.”

Facsimile transmission works as follows. First the transmitting machine scans the black and white shades of a document to generate electrical signals through photoelectric conversion, then these signals are modulated onto a carrier wave for transmission over a telephone circuit. At the receiving end, another facsimile machine demodulates the incoming signals to reproduce the black and white shades of the original document.

Despite the advanced technology involved, the facsimile machine actually has a long history, the principle having been conceived by an Englishman, Alexander Pain, as long ago as 1843, six years after Samuel Morse invented the telegraph and 33 years before Alexander Graham Bell invented the telephone.

The prototype of the modern facsimile machine was completed in 1925 by Bell Telephone Laboratories Inc. in the United States. For a long time, however, only limited users such as media organizations and government offices used the machine in Japan, because it could only be hooked up to specially leased circuits.

The breakthrough to wider use came in 1972, when the government gave permission for facsimile machines to use the public telephone network as a transmission medium. The facsimile received a further boost in 1981 with the launching



Nearly 40,000 facsimiles a year are produced at this plant alone.

of a network for the exclusive use of facsimile service.

Because they have relatively simple alphabets, Americans and Europeans at first found the facsimile less convenient than the telex. But for the Japanese, who use complex *kanji* characters in their writing, the facsimile was a godsend, because it enabled them to transmit handwritten messages in an instant.

Lightning speed

Following the establishment of international standards and the speeding up of facsimile transmission, the facsimile began to become popular on a worldwide scale. Transmission time, based on a standard A4-size sheet of paper sent over the public telephone network, has been reduced from 6 minutes for G1 machines (low-speed type) to 3 minutes for G2 (mid-speed type) machines, 1 minute for

G3 (high-speed type) machines, and 30 seconds for G4 machines. The superfast G5 machine, which is already being used in the United States and Western Europe, transmits a page in a lightning 2 seconds over a digital telecommunications system.

The output of facsimile machines in Japan soared from 9,800 in fiscal 1972 to 242,000 in 1982 and 917,000 in 1985. The figure topped the 1-million mark to reach 1,401,000 in 1986, then climbed even further to 2,846,000 in 1987 and 4,710,000 in 1988. The output in fiscal 1989 is estimated to reach at 5.3 million.

Japan is also active in exporting facsimile machines. According to the Communications Industry Association of Japan, in the period January–December 1988, Japan exported 1.44 million facsimile machines to North America, 1.3 million to Europe, and 520,000 to Asia and other regions.

What are the reasons for the facsimile's success? The first merit of the facsimile is that it transmits information accurately. Say you want to make a reservation at a golf course for yourself and some important business associates. When you apply, you have to give your name, the pairings, the schedule and other information—no easy matter over the telephone, which transmits only sound. Make a mistake, and you run the risk of ruining a valuable business relationship. So instead of telephoning the information, you write all the details down, check them, and send them by facsimile. Neither you nor the golf course needs to worry about making a slip.

An increasing number of hospitals, worried about the possibility of mistakes being made over the telephone, are using the facsimile to send prescriptions to the pharmacy. If the pharmacy gets the name of the medicine or the quantity wrong, the consequences could be serious. The patient's health depends on the prescription, so it is essential that accurate information be transmitted.

The second advantage is that because the facsimile receives messages automatically, information can be sent even when the other party is absent. For example, the on-site offices of construction companies are often empty, because the people in charge have to spend a lot of time going round the building site. So when a construction firm's head office wishes to relay a message concerning building materials or the work process, it does so by facsimile. Many construction companies also use the facsimile for sending blueprints to carpenters and other subcontractors.

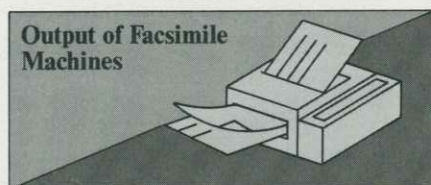
can therefore send the same written message simultaneously and instantaneously to all of them. In the fresh food industry, where conditions are constantly changing, an information center gathers the latest data from markets and producing areas, and transmits them by facsimile simultaneously to producers, shippers and retailers.

The fifth advantage is that the facsimile transmits messages in written form, so it is extremely useful for people with impaired speech or hearing. The city of Nagareyama in Chiba Prefecture provides financial assistance so that households with members who have impaired hearing or speech are equipped with a facsimile, thereby enabling the city to communicate with such people and at the same time building a network of communication among such people themselves. The number of local governments using facsimile transmission in their welfare services is increasing.

Facsimile transmission is not without its problems, however. As the number of facsimile machines in use has increased, so has the number of cases of electronic eavesdropping. If a special device is attached to the telephone circuit transmitting the facsimile message, the facsimile signals can be picked up and the information reproduced on a separate machine.

This eavesdropping device is almost the same as that used to bug telephones. When the device is used to tap telephone calls, the quality of the sound deteriorates, and the user soon realizes the phone is bugged. But in the case of facsimile transmission, messages are sent from machine to machine, so it is impossible to know that the line is bugged and information is being stolen.

Nippon Telegraph and Telephone Corp., which operates Japan's domestic facsimile system, is working hard to find a way of preventing such eavesdropping, but so far it has failed to come up with an effective solution. ■



FY	Quantity (1,000 units)	Growth rate (%)
1961	2.0	25.0
1972	9.8	23.9
1973	18.0	84.6
1974	29.9	65.8
1975	19.5	-34.7
1976	23.4	19.9
1977	31.4	34.3
1978	53.4	70.1
1979	75.4	41.2
1980	104.2	38.2
1981	153.3	47.1
1982	241.9	57.8
1983	354.1	46.4
1984	584.9	65.2
1985	916.9	56.8
1986	1,401	52.8
1987	2,846	103.2
1988	4,710	65.5
1989 (estimate)	5,300	12.5

Source: Communications Industry Association of Japan

Designers' boon

The third advantage is that the facsimile can transmit drawings. In the apparel industry, the designer, maker and sewing factory must consult with one another over and over again from the planning stage to delivery when they are marketing new fashion. With facsimile transmission, they can relay detailed changes in design to one another without having to make time-consuming visits. Designers, makers and factories in the accessory industry also make full use of the facsimiles when they discuss the design of such items as rings, earrings and necklaces.

Many dentists have also equipped themselves with a facsimile machine, using it to send impressions of patients' teeth to a dental technician so that they can have a discussion over the phone while looking at the impressions and thereby be surer of making false teeth or crowns that fit perfectly.

The fourth advantage is that the facsimile can transmit written messages to hundreds of places simultaneously. A company that has many branches and sales offices dotted around the country

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