Kloss' economies without scale

Large companies had a wait-and-see attitude about projection TV, but an impatient Henry Kloss developed his own machinery

By Michael Ball

The idea was to let someone else do the work for once. Henry E. Kloss (rhymes with dose) intended to license the technology, not to set up a mass-production facility.

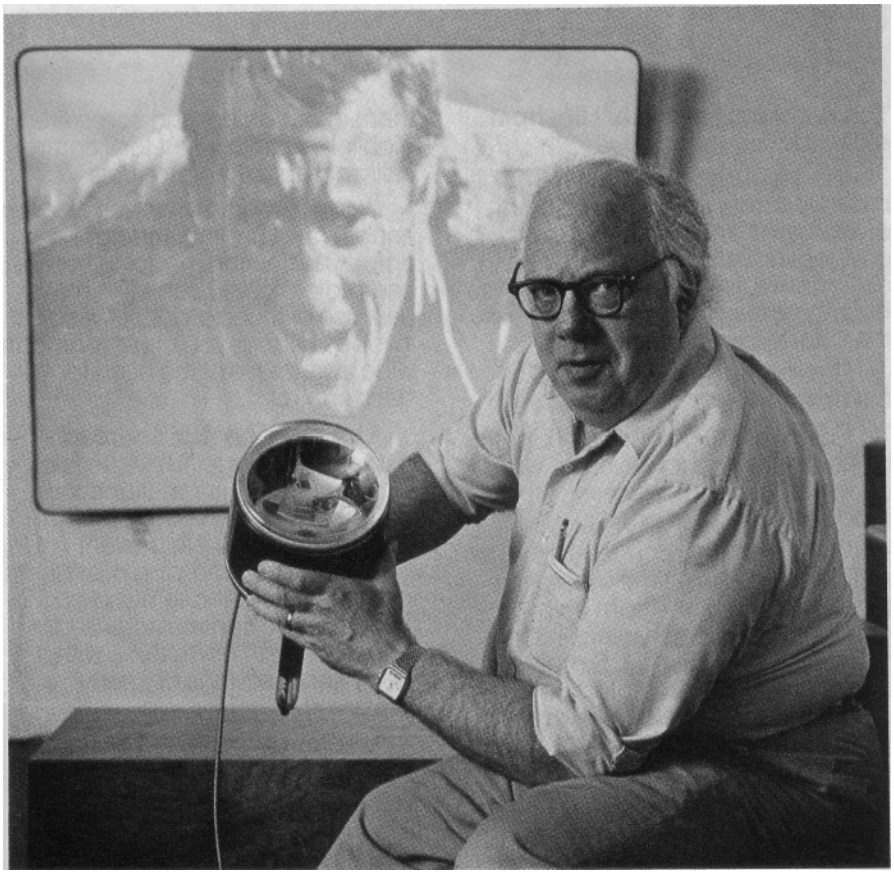
But when no major electronics company was willing to pick up the option, Kloss Video Corp. of Cambridge, Mass., went into the business of building projection televisions. On the way, it developed some unique production equipment, which gave it efficient methods even before it could benefit from economies of scale.

Even after four profitable years, Kloss Video's 1984 sales of $20.4 million are not making Zenith or Sony quake. But some people are convinced. Reviewer after reviewer rates the Kloss system the best - at any price. And the People's Republic of China, not known for frivolous purchases, sought out Kloss, sent seven people over to see his factory, and will buy one of his production lines for $2.5 million. Also, an ITT division in West Germany has ordered 3,000 Kloss Video models.

President Kloss claims he did not found the company to be a manufacturer. "I had a good product, one designed for efficient production," he says. "But everyone except Sony came in and didn't want to make the investment."

Rejection of his concept was not new to Kloss. As president of Advent Corp., another company he founded, he devoted his publicly held company's resources to his first projection television. "The banks didn't think there was a market, and the stockholders didn't like it," he says. "They asked me to leave."

In April 1977, he started Kloss Video, setting up a small demonstration plant to show how the projectionTV system could be made. According to Kloss, some TV manufacturers made as many as seven visits, but in the end all were unsure how large the potential market was or would be. Although the estimated $2 million to $3 million investment in production facilities would have been small for a consumer-electronics maker, none wanted the technology - either to make or buy the components.



HENRY KLOSS: `When I saw the big manufacturers were not going to take sat it seriously, I down and thought about how I would make it'

"It is a nice idea, and the price is right," Kloss says. "So, when I saw that the big manufacturers were not going to take it seriously, I sat down and thought about how I would make it."

That meant combining electronic, mechanical and optical innovation. It meant entirely new boards. It meant inventing production equipment. It meant developing all the technology for a new product within a small company, then creating a market.

Made-to-order benefits

Perhaps the most startling portion of a Kloss Video plant tour is the sight of so many production machines without name plates - and not because they were bought in a generic factory store. Each machine is unique, but the most imposing is an 80-stage tube-production oven, complete with internal and external conveyors. Kloss built all of from scratch - beginning with a raid on his kitchen.

"The prototype used two lobster pots, which I just recently replaced at home," he says. "The original was

done in my basement, and I worked on and off for a year playing with just the right temperatures and heating schedules."

Even before developing the machinery, Kloss designed the cathode tube for ease of manufacture. Still, there are several minor tricks in producing the system, but the equipment makes them easier. These include such mundane procedures as spreading the fritting compound and such complex ones as aligning the tube's lenses and mirror.

"At Advent, the frit solution was squeezed onto the glass with a ketchup bottle," Kloss says. At his company, an internally produced machine rotates the assemblies evenly and applies the toothpaste-type material uniformly.

The critical operation is alignment of the lenses. However, because each two-piece set of lenses is ground together, alignment really requires only minor adjustments in the clean room just before the assembly is put into the oven for sealing. Workers simply place the lenses on tubes of several slightly varying lengths to find the perfect spacing. Next, they place the finished assemblies on a small metal pallet on a conveyor leading to and through the oven. The tubes go through the oven, emerging sealed and cool enough to handle.

However, as far as Kloss is concerned, the real productivity feature is the tube's design, the most significant aspect of which is that the tube's components can be placed approximate to each other during production. Although the tube's electronics are relatively simple, combining them with the optics had been "too expensive and too difficult," Kloss says. "I integrated the optical system, the mechanical system and the envelope," dramatically reducing the number of stainless steel parts from the original version's 37 to a half dozen. But, Kloss notes, "if you make a vacuum tube and there's a mistake inside, you can't go in and fix it."

Still, Kloss maintains that his design and machinery make producing the tube far easier than making a standard color-TV tube. "There is nothing special about the glass," he says, "and there was no new material invented for the tube."

However, unlike most electronics manufacturers, his plant does much of the ophthalmic work on the lenses or, as Kloss puts it, "we just rub the two surfaces together, since they have to be the same." The company buys the glass blanks and grinds its own lenses to ensure that their spherical centers match those of the cathode rays. "We

Who will buy?

"Many people believe it is unnatural to have a six-foot television set," Henry Kloss admits. While he has no doubt that the market will continue to grow, he understands consumer reluctance to buy.

So far in the United States, there are fewer than half a million projection TVs, many of them in operation in institutions and businesses. Sales were 140,000 last year and should reach 17&,000 in 1984, according to Cincinnati's U.S. Precision Lens Inc., which makes most of the lenses used in the sets. Long-term growth will be steady, according to market researcher Predicasts Inc. of Cleveland. The consultancy predicts annual sales of 275,000 units by 1990 and 340,000 by 1995.

"It is already a permanent product category," Kloss says, albeit one growing by only about 10% a year. But this rate may pick up when people see good sets in the homes of friends or neighbors. "When, as with VCRs, it gets to the point where everyone knows two people with projection TVs, the market will take off," Kloss claims. Achieving success is "a coincidence - having a good product and a market," he says. "We have the first and are finding the other."

He adds that neither the press nor large consumer-electronics companies are convinced of the market yet.

He bemoans the fact that articles on home entertainment often mention color cameras but not projection TVs, even though dollar sales of the latter are far higher.

Kloss's competitors are not rushing to a potential market that represents only 1% of all TVs sold and may never exceed 5%. So far, Kloss Video's 5% to 10% after-tax net is not particularly impressive for the electronics industry although, Kloss notes, "We have a good margin for the entertainment business."

A portion of the market's sluggishness is attributable to the systems' cast. The least expensive ones are nearly $2,000 and many cost between $3,000 and $5,000.

Additional problems are that families are used to less imposing, one-piece sets; that many people have never seen a system in operation; and that those who have usually have seen the least expensive, poorest-performing models.

Many of the systems being sold are one-piece, with a large folding screen. Kloss notes that the consumer-electronics industry perceives the public as demanding a one-piece system. However, he adds disparagingly, "This is the same industry that held onto console sound systems." He says that he expected one-piece systems to form the bulk of initial sales because the concept is new.

Overcoming price objections may not be as much of a problem as the difference between the prices of regular and projection TV, suggests.

Kloss says that a lot of his customers are businesses and churches, which readily can afford the price. In fact, this year Kloss Video will introduce a $6,000, high-resolution model, largely for computer-graphics applications by businesses.

Analyst Martin Roth of Herzog, Heine & Gelduld Inc. adds that while the price may have to drop, it does not have to come down to the $300 to $700 range of many color TVs. "For years, the magic price for projection TV was $1,000; perhaps that is $2,000 now," he says.

In addition, there is a "whole new market for projection TV," Roth says, listing;

–video text, including home shopping;
–teleconferencing;
–additional cable services; and
–coming U.S. high-resolution broadcasting.

Meanwhile, many of the systems, particularly 10-foot sets, go to businesses, Boeing Aircraft uses them to show engineering blueprints to many employees at the same time. Some companies already use them for teleconferencing, but perhaps the biggest single market is organized religion.

"Churches use a lot of them," Kloss reports. "They have messages and money, and they are smart. There are a lot of other groups, such as insurance companies, that have the message and money. But maybe they are not smart enough."

set up an optical shop with storebought machines," he says. "That was easy. I wish we simply could buy all the technology."

Yet, even in the lab and demonstration factory phases, Kloss's idea was "to show people that they can make the components more efficiently than they can buy them." This meant internal development of about one-third of the electronic content, as well as all the custom tube equipment. "The electronics is better, more elaborate, on a larger scale than that of other projection TVs," Kloss says.

One of the primary circuit board's major tasks is to make sure each of the three color tubes' rays are properly out of alignment at the set so that they will converge on the screen. According to Kloss, nothing on the market was good enough, so his own engineers designed the circuits, which are made by conventional methods in his plant.

The plant's assembly side does not look too different from those of many electronics companies, except for dark rooms for testing and final adjustments. Board manufacture and set assembly are largely manual. Since there are several variations - two models, numerous screen sizes, floor or ceiling mounts - sets largely are built to order. This was also typical of Kloss' other companies' methods, which "were really pretty efficient for a manual operation," he says.

The plant turns about 40 completed systems a day. Kloss says that he built the facility anticipating steady growth of at least 10% a year. "The line can handle up to 15 times that load."

Do-it-yourself electronics

No one else does what Kloss Video does; its competitors buy their components. Also, Kloss's production lines are new, so measuring efficiency is difficult. However, the company's "real strength is in its degree of vertical integration and in-house manufacturing expertise," says Martin Roth, an analyst with New York securities firm Herzog, Heine & Gelduld Inc. A follower of Kloss Video, he says that it would take competitors years to duplicate the company's production efficiency.

So far, Japanese companies have shown some interest in the market. However, with the large volumes in more conventional electronics and the strong dollar, they have not made major efforts. Mitsubishi and Matsushita began marketing Advent-style projection TVs in 1975, a year after Kloss introduced his first model. Lately, Mitsubishi has been competing for the largely institutional high end of the market with a high-quality system similar to that of Kloss Video. And RCA Corp. puts its label on a Hitachi system for domestic sale.

Kloss says he fully accepts that he is in a low-margin end of the projectionTV business. "I guess I would rather that everyone was as excited about it as I am," he muses. "But were it the computer kind of boom, there would be an inevitable bust. The relative steadiness of the market is somewhat disappointing, but I don't mind its slow growth."

Kloss Video is keeping its market share and has a good compounded increase in annual sales. As Kloss puts it, "A 25% growth rate is something, but it should have been more."

Ball is a Boston-based business and technical writer.