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# **Gary Starkweather Invented a Laser Printer at Xerox**

Optical specialist revolutionized computer printing after outmaneuvering a skeptical boss



Gary Starkweather PHOTO: XEROX

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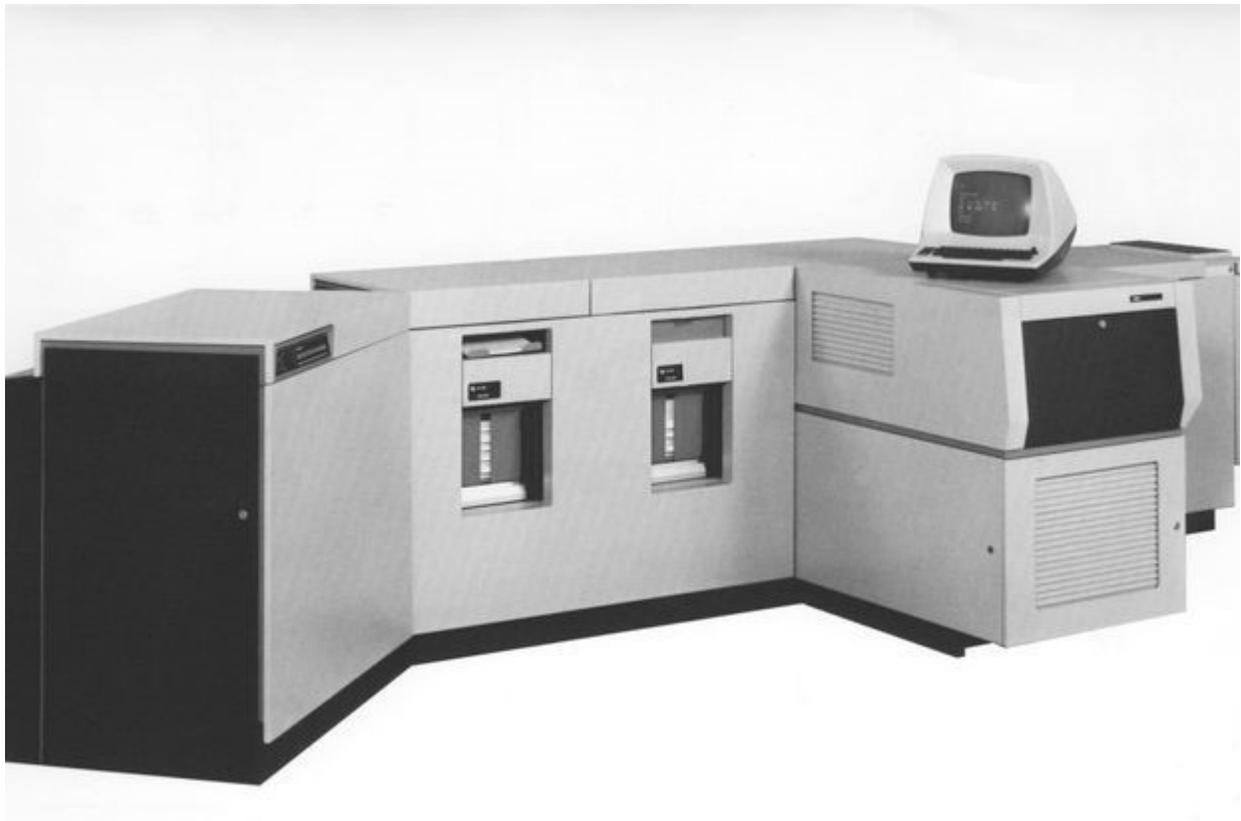
*By*

*James R. Hagerty*

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In the 1960s, computer printers were noisy contraptions resembling automated typewriters. They rattled out simple lines of text, with little variation of font or spacing. Sophisticated graphics were out of the question.

While working for Xerox Corp. in the late 1960s, Gary Starkweather proposed to build a laser printer, able to reproduce any image created on a computer. His boss told him it was a terrible idea.



The 9700 laser printer, Xerox's first commercial laser printer, introduced in 1977, weighed more than a ton and was priced at \$295,000. PHOTO: XEROX

Mr. Starkweather's persistence—and finesse in maneuvering around that boss—led to the introduction in 1977 of the Xerox 9700. It became one of the company's top-selling products, generating more than \$1 billion of annual revenue.

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When introduced, the 9700 occupied as much space as five or six washing machines, weighed more than a ton and was priced at \$295,000. Mr. Starkweather spent much of his career improving printers and lived long enough to see them become standard desktop tools costing as little as \$100 or so. He died Dec. 26 in Orlando, Fla., of leukemia at the age of 81.

After the boss nixed his idea in 1969, Mr. Starkweather recalled in an oral history produced by the Computer History Museum, "I couldn't get this thing out of my head. I thought, 'He's wrong. This is so good that it's got to work.'"

Mr. Starkweather reached higher in the organization, sold his vision and obtained a transfer to Xerox's Palo Alto Research Center, where he began working on prototypes. He did the mechanical and optical work. Two colleagues, Butler Lampson and Ron Rider, figured out the electronics and software allowing the computer to tell the printer what to do.

In a laser printer, pulses of laser strike a photosensitive drum. Toner adheres to the spots touched by light. Heat and pressure fuse the toner to paper passing through the machine.

To avoid blurry prints, Mr. Starkweather had to find ways to direct laser pulses precisely. He devised a cluster of revolving mirrors and a lens to guide the light. One of his breakthrough ideas came while he was mowing the lawn; he turned off the mower and drove to the lab to test it out.

He then had to survive a print-off with designers of rival machines, including one using a cathode ray tube. "When everybody reproduced the documents, the laser printer won hands down," Mr. Starkweather said.

Though it was a bonanza for Xerox, the laser printer didn't make Mr. Starkweather rich. He later worked as a researcher and mentor for [Apple](#) Inc. and [Microsoft](#) Corp. He retired in 2005 and was [elected to the National Inventors Hall of Fame](#). A third of his three-car garage was devoted to his model-train layouts. (He preferred the electronics to the landscaping work.) He also taught Sunday school.

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“I’ve had the great good fortune of God’s blessing in allowing me to have more joy and more thrills than I ever thought I could expect,” he said.

Gary Keith Starkweather was born Jan. 9, 1938, in Lansing, Mich. His father managed a dairy. An only child, Gary spent much of his youth taking apart and reassembling whatever mechanical and electrical equipment he could scavenge. “We had a basement, and as long as I didn’t blow up the house I was allowed to do whatever I wanted down there,” he said.

“I was very much turned on by things that hum and buzz, and conduct electricity,” Mr. Starkweather said.

At Michigan State University, he studied physics and developed an interest in optics. After graduating in 1960, he got a job at Bausch & Lomb and began studying for a master’s degree in optics at the University of Rochester. Recruited by Xerox, he worked on large facsimile machines. He later recalled wondering, “What if, instead of copying someone else’s original, which is what a facsimile does, we used a computer to generate the original?”

The resistance he met from some Xerox executives reflected a lack of imagination, preventing them from seeing the possibilities of solving technical problems and bringing down costs, Mr. Starkweather said.

He is survived by his wife of 58 years, Joyce, whom he met while she was studying nursing, as well as their two children and four grandchildren.

Though he never lost his fascination with technology, Mr. Starkweather worried about some of the consequences. “We talk about productivity,” he said, “but I’ve watched people go from 40-hour weeks to 60-hour weeks.”

He disliked the pressure to stay digitally connected at all times. “A big question about the future of information technology,” he said, “is, ‘Do I get to stay human in the process?’ ”

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