ELWYN BERLEKAMP
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Mathematician Cut Static Out of Digital Signals

By James R. Hagerty
And Gregory Zuckerman

Elwyn Berlekamp, the son of a pastor in rural Ohio, was a grade-school student in the 1940s when it began to dawn on him that math wasn't a torment inflicted on schoolchildren.

It was a game, he concluded, and also a way to win games.

That discovery shaped his career as a computer scientist whose algorithms helped make possible cellphones, compact discs and transmission of crisp images from spacecraft.

He also helped devise mathematical investment strategies for the hugely successful hedge-fund investor Jim Simons and became an authority on the math underlying games ranging from the Asian game of Go to the pencil-and-paper game Dots and Boxes.

Some of his most important work involved ways of dealing with so-called noise in data transmissions—caused by such things as static, radiation or loss of signal strength—that can turn digital messages into nonsense.

Claude Shannon, who taught at the Massachusetts Institute of Technology, had developed a theoretical framework for adding extra bits to messages to ensure transmission errors could be found and corrected. Others produced codes to do that, but decoding those messages was complicated and costly. Dr. Berlekamp, who worked with Dr. Shannon at MIT in the 1960s, devised more practical and efficient ways to decode the messages.

His algorithms have been used in the Hubble Space Telescope, the Voyager space mission and cellphone transmissions. Variants of his work also allow devices to read smudged bar codes or scratched compact discs.

Dr. Berlekamp, who died April 9 at age 78 from complications of pulmonary fibrosis, spent most of his career as a professor at the

University of California, Berkeley. In his spare time, he juggled and rode unicycles—sometimes at the same time. He and his wife set up a foundation to support math and science education.

In 1973, he co-founded a company, Cyclotomics, to help clients use his error-correcting technology. His sale of that company in 1985 to Eastman Kodak Co. left him with several million dollars to invest.

He began exploring investment techniques with a fellow mathematician, Dr. Simons, who had helped start Axcom, a tiny firm that ran the Medallion Fund.

When Axcom's co-founder, James Ax, left the firm after deep losses and a falling out with Dr. Simons, Dr. Berlekamp bought Dr. Ax's share in the business and began to run it in 1989.

Dr. Berlekamp favored making frequent trades in commodity, currency and bond markets. At the time, most rivals worried commissions and other costs resulting from a higher-frequency approach would offset any profits. With Dr. Simons and other colleagues, he devised a computer-driven quantitative trading style of the sort that now dominates Wall Street.

The revitalized Medallion Fund scored a gain of about 56% in 1990. At the end of that year, Dr. Berlekamp sold his stake in Axcom to Dr. Simons and returned to academia.

Elwyn Ralph Berlekamp was born Sept. 6, 1940, in Dover, Ohio. His father, Waldo Berlekamp, was a minister in the United Church of Christ. His mother, Loretta Berlekamp, was a church librarian.

When Elwyn was 9, the family moved to Fort Thomas, Ky., a suburb of Cincinnati.

In a biographical note, he said he graduated second in his high-school class rather than first "due to a lone B, in Latin."

He enrolled in 1958 at MIT, where he earned both his bachelor's and master's degrees in electrical engineering in four years.

In 1964, he received a doctoral degree at MIT.

Early in his career at Berkeley, in the mid-1960s, he was juggling in his apartment when he heard a rapping from the floor below, where two female roommates objected to the noise. His apology led to an introduction to Jennifer Wilson, an Englishwoman studying at Berkeley. They married in 1966. She survives him, along with three children, four grandchildren and a sister.

Dr. Berlekamp was known for his ability to speak at length about almost anything, and said that ideally he liked to do 80% of the talking in a conversation. When he met other intellectual chatterboxes, he was willing to reduce his share to 60% or so.

On one trip, en route to a conference in Australia, Dr. Berlekamp was asked by a border-control agent whether he was traveling for work or pleasure. He replied that he had arranged his life "such that there shall be no distinction between the two."

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