



WAYNE MILLER/MAGNUM PHOTOS

The Fairchild Semiconductor founders, circa 1960. From left: Gordon Moore, Sheldon Roberts, Eugene Kleiner, Robert Noyce, Victor Grinich, Julius Blank, Jean Hoerni, and Jay Last.

INDUSTRY  
TALES

## FAIRCHILD AT

# 50

BY DAVID A. LAWS

The Museum hosted a celebration for a pioneering company

**In October 2007, the Computer History Museum and Stanford University hosted a gala celebration of the 50th anniversary of the founding of Fairchild Semiconductor. According to Wyn Wachhorst, the founding of Fairchild “will be seen in centuries to come as an epochal turning point in human evolution.”<sup>1</sup>**

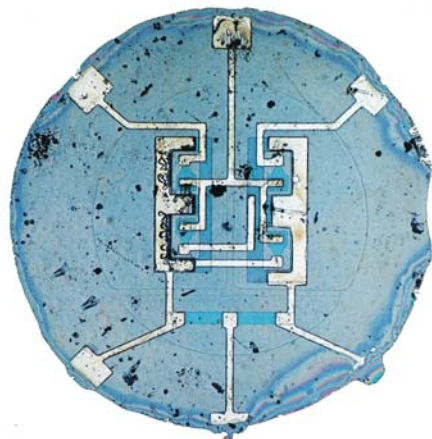
Alumni and friends of Fairchild traveled from around the world to remember the legendary company that delivered some of the most exciting, professionally rewarding, technologically challenging, and frustrating experiences of their careers. Fairchild and its technologies changed the world in ways its founders could never have imagined. And then it faded into obscurity in the 1970s.

### In the Beginning

Fairchild Semiconductor was founded in 1957 by eight young engineers and scientists from co-inventor of the transistor William Shockley's Semiconductor Laboratory in Mountain View, California. Described by Michael Malone as "perhaps the most extraordinary collection of business talent ever assembled in a start-up company,"<sup>2</sup> Fairchild employees pioneered an entrepreneurial business culture; spawned manufacturing and marketing techniques that gave birth to the phenomenon later dubbed Silicon

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Die photograph of the first planar integrated circuit. The Fairchild type "F" flip-flop, comprising 4 transistors and 6 resistors, was introduced in March 1961.



Valley; and reshaped the worldwide semiconductor industry. Fairchild went on to develop some of the most important innovations in 20th century technology and sow the seeds of the microelectronics-driven computer industry and personal digital products of today.

The planar process, developed by co-founder Jean Hoerni in early 1959, is the jewel in the crown of Fairchild's technological achievements. Hoerni's approach revolutionized the production of semiconductor devices and enabled the development of monolithic integrated circuits (ICs). It allowed semiconductors to be manufactured in a high-volume production environment that was amenable to continuous reductions in cost at the same time that it delivered extraordinary increases in the number of transistors on a chip and improvements in their performance. Even today, his basic concept continues to inform the manufacture of billion-transistor microprocessor and memory chips. Historian Christophe Lécuyer ranks it as "the most important innovation in the history of the semiconductor industry."<sup>3</sup>

Fairchild Semiconductor was initially funded as a division of Fairchild Camera and Instrument Corporation of Syosset, New York. It grew rapidly and was highly profitable. At the peak of its influence, the division controlled over 30 percent of the market for integrated circuits. By the late 1960s, it reached \$150 million in annual sales and employed some 30,000 people.

### A Vital Diaspora

Despite—or perhaps because of—the rapid growth spurred by the division's extraordinary outpouring of ideas and innovation, the young company ran into difficulties meeting customer demands, retaining employees, and managing operations. Rather than invest in expanded semiconductor manufacturing capacity and personnel, though, the Syosset headquarters decided to drain its semiconductor profits to finance other ventures.

Even though Fairchild was an early leader when it came to granting stock to engineering employees, the number of shares it offered was extremely small. So the management team had a difficult time supporting and rewarding the many new ideas spawned by its engineers. Many of these entrepreneurial-minded engineers were spurred to leave Fairchild and form companies of their own. The results of this entrepreneurial outpouring include Advanced Micro Devices (AMD), Intel, and National

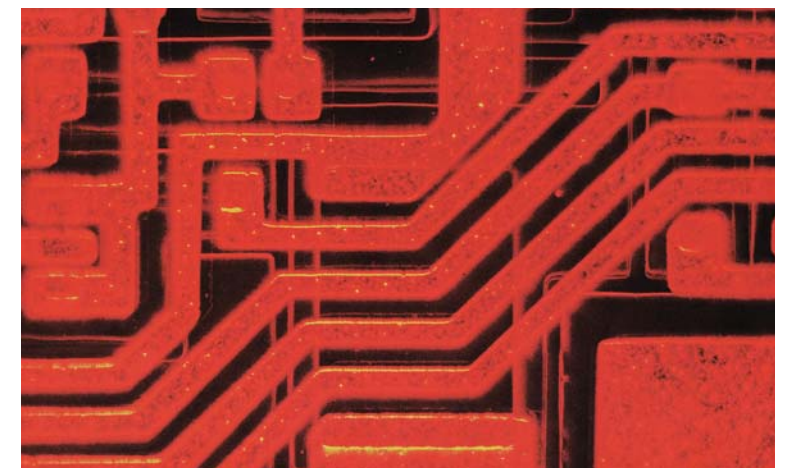
1 Wachorst, Wyn. "The Real Revolutionaries," *Gentry Magazine* (Menlo Park, California, February 2008)

2 Malone, Michael S. *Bill & Dave: How Hewlett and Packard Built the World's Greatest Company* (Portfolio, April 5, 2007)

3 Lécuyer, Christophe. *Making Silicon Valley* (MIT Press, 2006)

Metal interconnect lines on an integrated circuit. Photomicrograph by Richard Steinheimer of Fairchild Semiconductor, circa 1968–1969.

## ACCOMPLISHMENTS



### Other important contributions to computer history from the company's engineers:

The first high-speed silicon transistors, developed for the CDC 6600 supercomputer, on display in the Museum's Visible Storage exhibit.

"Micrologic," the first monolithic integrated circuit family. It powered the computer that guided the Apollo space missions.

The first commercially successful analog, also known as "linear," integrated circuits. Because of their role in interfacing real-world analog signals such as sound, temperature and speed to the language of the digital computer, these form one of the most important segments of the industry.

Early work in understanding and commercializing the MOS (Metal-Oxide-Semiconductor) technology, including the important silicon-gate process that is the basis of 99 percent of ICs produced today.

Invention of the CMOS (Complementary MOS) process that consumes the lowest possible power and permits battery operation of many of our most popular electronic devices.

The observation now known as Moore's Law, which stated that the number of transistors that can be placed inexpensively on an integrated circuit doubles approximately every two years. It has provided a yardstick against which technology progress has been measured for over 40 years.

The first commercial CCD (Charge Coupled Devices) optical imaging sensors used in digital cameras.

Some of the earliest dedicated semiconductor memory devices, including the first commercial shipments of all-semiconductor computer main memory systems; see the ILLIAC IV supercomputer, also in the Visible Storage exhibit.

Semiconductor. This exodus of talent combined with a capacity shortage, an increase in competition, and a steep economic downturn brought about the end of Fairchild's glory days just ten years after it was founded.

### Revival Efforts

In 1968, C. Lester Hogan (1920–2008), previously from Motorola, headed a new management team that attempted to revitalize the flagging company. He moved the corporate headquarters to Mountain View, expanded capacity, and invested in new technologies and products. Revenues grew substantially under this regime but the company didn't regain its former profitability and prominence.

Next, French oilfield services conglomerate, Schlumberger, purchased the company as a diversification move. But when it, too, was unable to restore the company to its previous fortunes, Schlumberger sold the assets to National Semiconductor in 1987.

Finally in 1997, National Semiconductor divested a number of former Fairchild mature product lines in a leveraged buy-out to a group of executives based at Fairchild's former South Portland, Maine facility. And today, the reborn Fairchild Semiconductor is once again a public company with annual revenue of more than \$1 billion.

But the legacy of the original Fairchild also lives on through the worldwide diffusion of its technology and culture, which spread through the diaspora of former employees. There are hundreds of companies—among them systems, software, and service businesses—in the San Francisco Bay Area and beyond who can trace their roots back to Fairchild.

### A Celebration of the Legacy

Fairchildren, as former employees of the company are often called, are famous for their affection for the company and their gratitude for the semiconductor industry training and ex-

THIS AND OPPOSITE PAGES: FAIRCHILD CAMERA & INSTRUMENT CORPORATION



Panel discussion: Julius Blank, Jay Last, Gordon Moore, and Arthur Rock, moderated by Leslie Berlin on October 4, 2007.

experience they gained there. This is an industry that has treated many of them very well. And although Fairchild's legendary capacity for "working long days and partying long nights" has no doubt been diminished by the passage of time, that didn't stop nearly 1,000 former employees and friends of the company from reuniting for three days in October 2007 to rekindle friendships, swap stories, and celebrate their heritage.

On Thursday, October 4, at the Stanford University campus, Julius Blank, Jay Last, Gordon Moore, and Arthur Rock—three Fairchild Semiconductor founders and the banker who helped them—discussed the firm's significance and its early years in a panel discussion. The panel was moderated by Leslie Berlin, biographer of Fairchild and Intel co-founder Robert Noyce. Stanford University President and CHM Fellow, John Hennessy introduced this panel of esteemed speakers.

Friday, October 5 began with a series of afternoon panels at the Computer History Museum. The panels surveyed eight aspects of the Fairchild experience. In order of presentation, the topics and session moderators comprised:

- The Founding Years & R&D - Harry Sello
- Bipolar Digital Products - Bill Welling
- Linear Products - Norman Doyle
- MOS Products - Gil Amelio

- Manufacturing and Support Services - c. E. "Ed" Pausa
- Discrete Products - George Wells
- International Sales & Marketing - Robert Blair
- North American Sales & Marketing - Bernie Marren

In all, more than 30 panelists recounted—and no doubt embellished—stories from their days at the company. These sessions were recorded on video and the content was transcribed and added to the Museum's oral history archives at: [computerhistory.org/collections/oralhistories](http://computerhistory.org/collections/oralhistories).

Before a packed house in the Museum's Hahn Auditorium, Fairchild alumnus and noted venture capitalist Floyd Kvamme led three distinguished industry leaders through the "Legacy of Fairchild." The noted speakers were all chairmen emeritus from industry giants: Wilfred Corrigan of LSI Logic, Gordon Moore of Intel and W.J. "Jerry" Sanders III of AMD. They gave a wide-ranging and entertaining discussion of their early careers at Fairchild. A video of this session is posted on the CHM YouTube Channel at: [youtube.com/computerhistory](http://youtube.com/computerhistory). The transcript is available on the Museum's oral history page.

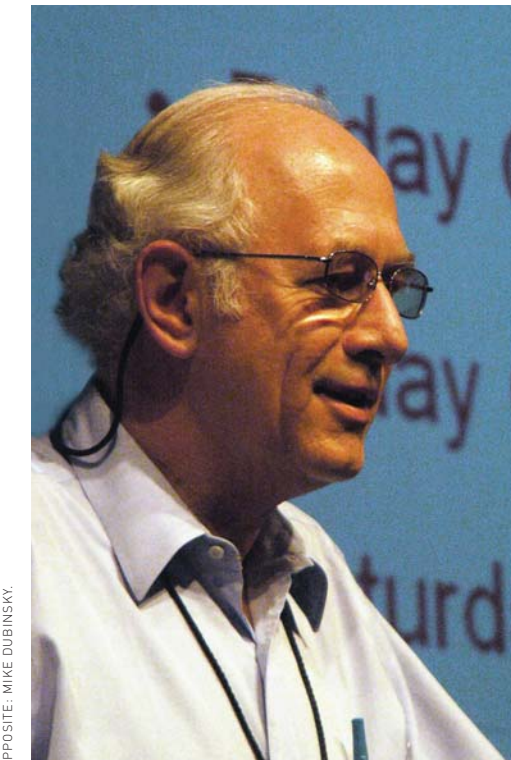
Saturday, October 6 concluded the celebration with a gala reunion party held at the Museum, which was decorated with photographs, posters, and banners of memorable people and products. Attendees circulated through an exhibit of Fairchild artifacts and documents donated by attendees. The celebration also featured a tour of objects associated with the company in Visible Storage, a video theater showed *The Fairchild Chronicles* movie, and multiple projectors displayed continuously changing still images of employees in various states of decency onto giant screens. There was also a room of Fairchild-produced consumer products and video games. The highlight of the décor was a re-creation of the popular company wa-

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tering hole, "Walker's Wagon Wheel," which included wagon wheels from the Museum collection and a section of the original bar rescued from the demolition site. Founders Julius Blank, Jay Last and Gordon Moore ceremonially cut a "Happy 50th Birthday" cake.

The events held at Stanford were co-sponsored by Stanford Libraries and the Bill Lane Center for the Study of the North American West. Celebrations that took place at the Museum were made possible through the generous donation of funds, materials and time by dozens of dedicated alumni volunteers, Fairchildren and family and friends, as well as the Computer History Museum. ○

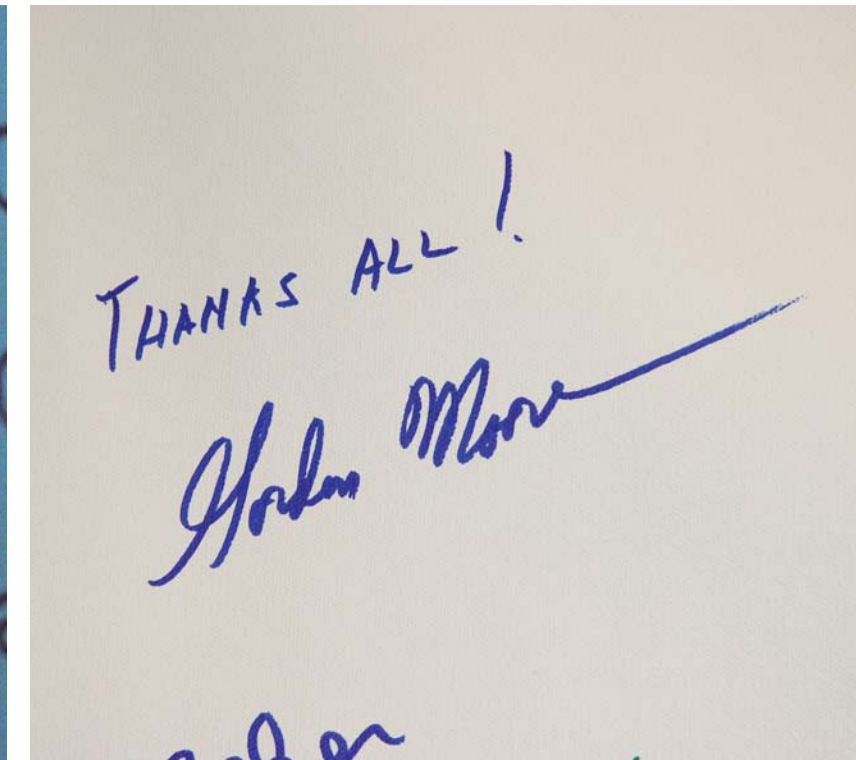
David A. Laws joined Fairchild affiliate SGS-Fairchild in London, England in 1966. He moved to the Silicon Valley headquarters in 1968, where he later worked for Advanced Micro Devices, Altera and other companies in senior management positions.



LEFT: MIKE DUBINSKY / RIGHT: JULIE HENDRIKS / OPPOSITE: MIKE DUBINSKY

David A. Laws, Fairchild alumnus and former Director and a member of the CHM Semiconductor Special Interest Group, addresses the audience.

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Signature of Fairchild co-founder Gordon Moore.