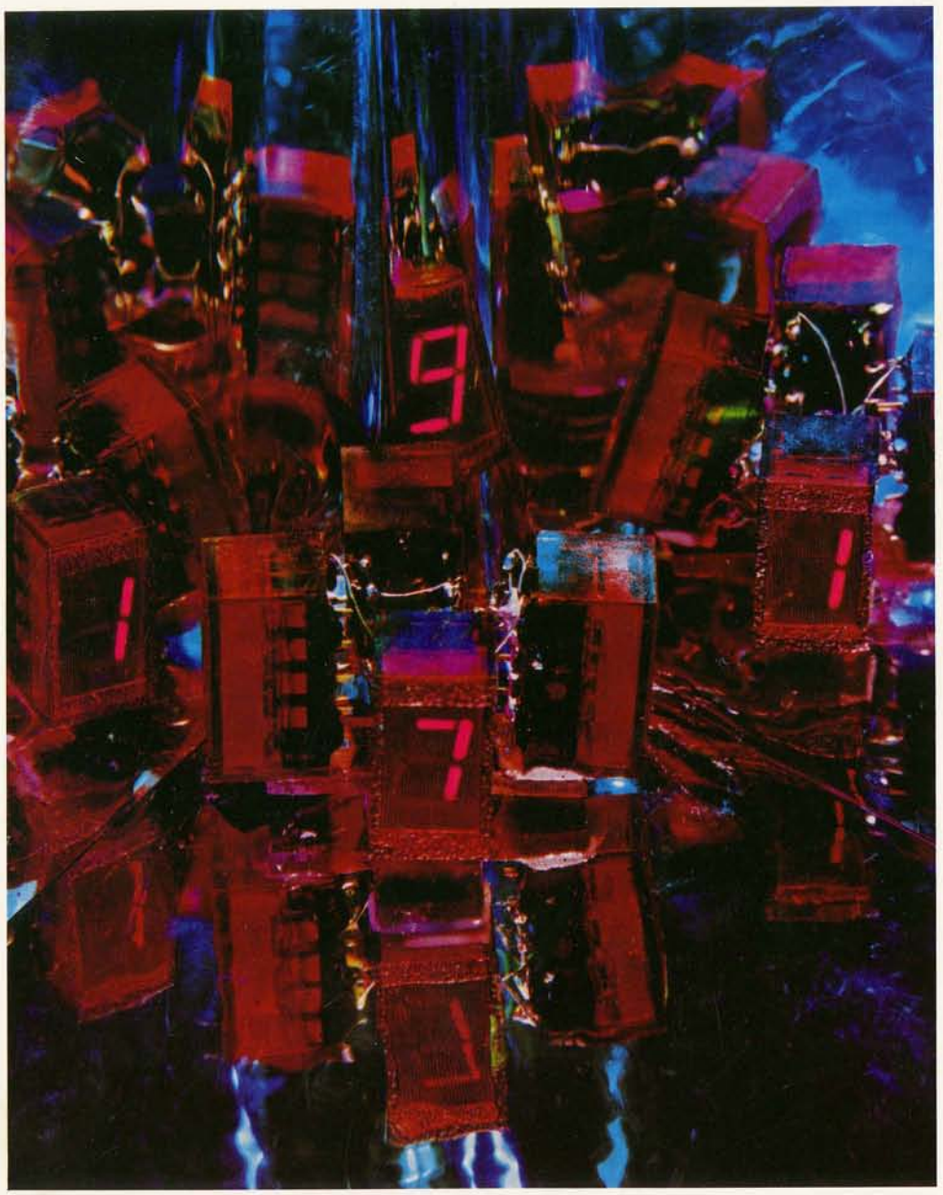
Fairchild Camera and Instrument Corporation Annual Report 1971



Three-Year Highlights

	1971	1970	1969
For the year:			
Net sales	**$193,088,000**	$219,138,000	$250,659,000
Income (loss) before extraordinary items	**(7,841,000)**	(19,309,000)	985,000
Extraordinary items	—	—	1,711,000
Net income (loss)	**(7,841,000)**	(19,309,000)	2,696,000
Dividends paid	—	—	2,188,000
Average number of shares outstanding	**4,385,120**	4,385,715	4,363,192
End of year:			
Working capital	**$ 46,583,000**	$ 49,115,000	$ 75,545,000
Shareholders' equity	**57,798,000**	65,619,000	84,794,000
Number of employees	**15,144**	14,074	23,125
Number of shareholders	**14,486**	15,795	11,381
Shares issued	**4,387,620**	4,387,620	4,376,373
Per share statistics:			
Income (loss) before extraordinary items	**$(1.79)**	$(4.40)	$.23
Extraordinary items	—	—	.39
Net income (loss)	**(1.79)**	(4.40)	.62
Shareholders' equity	**13.17**	14.96	19.38

To Our Shareholders:

Although the company did not resume profitable operations in 1971, results improved over the preceding year. The steep sales decline experienced in 1970 was arrested, and the company entered 1972 with an increased order backlog and growing confidence in the economic improvement underway.

The corporation lost $7,841,000, or $1.79 per common share, in 1971, compared to a loss of $19,309,000, or $4.40 per share, a year earlier. Sales were $193,088,000 compared to $219,138,000 in 1970.

The company's recovery from the recession has been slower than anticipated, due to general U.S. economic conditions and intense competition from large and small semiconductor companies, both here and abroad. Reduced demand for semiconductors in Europe and Japan was an additional negative factor last year. Price attrition, more moderate in the last half of 1971 than earlier, remains a characteristic of the industry.

C. Lester Hogan

Sales volume in 1971, while influenced by a soft economy, also reflected the elimination of certain product lines. This pruning continued in the first quarter of 1972 when the company sold for cash its Graphic Equipment Division. We intend to concentrate resources on those operations and product lines which offer more significant growth potential.

The company generated sufficient cash flow in 1971 to cover losses, capital expenditures and debt reduction. Last July our $25 million line of domestic bank credit was renewed for 12 months at the prime rate. The current ratio at year end was 2.3 to 1.

The Internal Revenue Service is presently completing its examination of the company's Federal Income

Walter Burke

Tax returns for the years 1964 through 1969. Information with respect to this matter and claims which might result therefrom are explained in detail in footnote #3.

In a basic organizational change, the company aligned its 11 operating divisions into three groups—Semiconductor Components, Commercial Systems and Federal Systems—each constituted as a profit center. This action, we believe, has resulted in a stronger and more fully integrated company. In a related move, elements of research and development were decentralized and coupled directly with the operating groups, to focus R&D more specifically on current market opportunities.

The Semiconductor Components Group last year introduced a variety of standard and custom products, including silicon gate metal-oxide-semiconductor circuits, new linear integrated circuits, and an expanded line of transistor-transistor-logic devices, the dominant product family in the digital IC market. Recently we announced high-speed emitter-coupled-logic circuits offering both power supply and temperature compensation, an industry first. Fairchild's Isoplanar process, a technique which nearly doubles the packing density of bipolar devices, went into production in mid-year with the first product a fully-decoded 256-bit random-access memory. This year Isoplanar is being applied to higher levels of circuit integration.

The Commercial Systems Group late in 1971 announced a modular series of six semiconductor test systems, whose common hardware and software provide the customer with maximum flexibility in upgrading his equipment. The test systems market, which had been severely affected by the recession, has shown signs of strengthening, and response to this new product line has been encouraging.

A highlight for the Federal Systems Group was the successful performance of its Lunar Mapping Camera, which took the first precision mapping photographs of the moon's surface from lunar orbit. Federal Systems received a number of advanced aerial camera contracts during the year, among them a development award for a solid-state camera operable in daylight and darkness.

The business outlook for 1972 is one of gradual improvement in the markets served by Fairchild, consistent with the general recovery of the economy. Some growth in semiconductor industry sales is expected. In the capital goods sector, which affects our Commercial Systems Group, we foresee a modest upturn which should gain momentum as the year progresses. Sales in the government area are likely to remain flat as compared to 1971. We are confident in the long-range growth prospects of the electronics industry, particularly those technologies in which Fairchild is most proficient, and believe the operating improvements made last year will strengthen the company's participation in this growth.

All those who knew Sherman M. Fairchild, founder and chairman of the board, and his many contributions to science and industry deeply mourned his passing on March 28, 1971. The new chairman was elected in April by the board of directors, of which he has been a member since 1957.

Walter Burke
Chairman of the Board

C. Lester Hogan
President and
Chief Executive Officer

March 24, 1972

In the second major semiconductor manufacturing step, ingots are sliced into silicon wafers approximately .012-inch thick (photo at right), which are polished to a mirror finish (left photo, opposite page), and covered with a protective layer of silicon oxide. Wafer fabrication, the next step, consists of two main operations, masking and diffusion. In masking, the upper surface of the wafer is coated with a protective material which hardens when exposed to ultraviolet light. Glass photomasks are aligned over the wafer (center photo, opposite page) and it is exposed to create the specified pattern of circuit elements. Each wafer contains as many as 1500 identical individual circuits. In diffusion (right photo, opposite page), additional additives which determine the functional characteristics of the circuits are deposited by exposing the wafer to precisely controlled compounds in a high-temperature furnace. A typical integrated circuit requires seven to eight such masking and diffusion operations. Wafers are then separated into individual circuit chips, or dice, typically about 1/10-inch square.

Operations Review

Semiconductor Components Group

Total semiconductor industry sales, reacting to general softness in the economy, declined last year. In 1972, however, industry shipments are expected to begin growing again. This increase is predicated on a broadly forecast economic improvement in 1972, which was foreshadowed by accelerating bookings late in 1971.

On the technical front, the year saw advances in several areas of long-term significance in the semiconductor industry. These included silicon-gate MOS, increased density of conventional bipolar MSI and LSI structures, use of gallium phosphide in light-emitting diodes, and Fairchild's new Isoplanar process.

The company is committed to all of these technologies, as well as to the other rapidly growing product categories in the industry, which include linear circuits, integrated micro-systems and bipolar memories.

The technical strides of last year will have a favorable impact on the semiconductor end-use markets served by the company—computers, consumer products, industrial equipment, and aerospace/defense systems—as well as in sales derived through distributors.

Traditionally, computer mainframe manufacturers have been Fairchild Semiconductor's largest customer category. This market segment turned down sharply in 1970 and remained soft, so Fairchild last year launched a countervailing effort to improve its position in other semiconductor sales areas. However, efforts also continued to strengthen production and development capability in computer products, in preparation for resumption of growth in this area. The outlook is for improvement in the computer and peripheral equipment segment this year.

Among actions taken to retain Fairchild's position as a major factor in this market segment were expansion of its standard TTL (transistor-transistor-logic) line, and the development of a family of temperature and voltage-compensated ECL (emitter-coupled logic) devices. The corporation also introduced its first Schottky-barrier TTL devices and began development work on a line of Schottky MSI circuits.

TTL is the dominant logic form in computer peripheral and high-speed digital equipment. ECL is extremely fast digital circuitry, but before the advent of Fairchild's unique compensation features, customer acceptance was curtailed by sensitivity to temperature and supply voltage variations. Schottky-barrier TTL devices, which fall between TTL and ECL in speed and power advantages, are currently used to upgrade existing systems without altering basic designs.

Moving to strengthen its position as the largest supplier of bipolar computer memory devices, the company introduced a 256-bit bipolar RAM (random-access memory) circuit, the first product utilizing Fairchild's Isoplanar technology. Building on this foundation, the company this year is introducing a 256-bit ECL random-access memory, which will be the fastest available, and larger TTL RAMs, all utilizing Isoplanar technology. Though initially applied only to memories, Isoplanar has potential application in many other product lines, including MOS.

The consumer segment of the semiconductor market displayed the healthiest growth in the industry last year, a trend expected to continue in 1972. Fairchild supplies this market, which ranges from TV to auto manufacturers, with linear and digital integrated circuits, as well as transistors. One emerging trend was the increasing use of monolithic linear circuits in color TV sets. Anticipating this evolution, Fairchild has developed a line of linear integrated circuits capable of performing all small-signal TV processing functions with five devices.

Another trend is the use of MOS circuits in television receivers and sound equipment. Such circuits, high in functional density, are slower but less expensive than bipolar. Approximately 75 percent of the current MOS market consists of custom circuitry, which constituted the bulk of Fairchild's production in this field last year. However, the company also introduced its first line of standard

silicon-gate MOS devices. These MOS circuits offer advantages over the earlier metal-gate devices in speed and power requirements, and are finding a spread of applications which cross market lines.

The industrial equipment market for semiconductors was dominated in 1971 by electronic calculators and data processing peripheral equipment, to which Fairchild supplies bipolar and MOS circuitry, and light-emitting diodes and displays. As the year ended, there was evidence of stronger demands in other areas, such as process control, test, measurement, and communications equipment—all important outlets for Fairchild components.

Aiming at this diversified market, the company last year enlarged its linear integrated circuit line with both proprietary and second-source devices, including a family of seven precision voltage regulators and a highly versatile operational amplifier.

The aerospace/defense segment continued to feel the pressure of reduced government spending and the outlook is for a slight decline this year. Ongoing Fairchild programs include supplying radiation-hardened digital devices for the Poseidon missile guidance system and high-reliability components for the Safeguard antiballistic missile system and the F-14 and F-15 aircraft.

In the distributor segment, the company launched an effort to increase market penetration, thus broadening its customer base. Actions taken included consolidating all distributor service functions in a single organization, increasing inventory available for immediate shipment, and improving delivery performance.

In the vital R&D area, Fairchild pressed ahead with a number of projects essential to continued technical leadership. Significant progress was made in ion implantation, an advanced semiconductor fabrication technique, which has many times the precision and reproducibility of present diffusion technology. It can improve product yields, and may make possible new products which cannot be manufactured with today's processes. Half of the company's semiconductor components are expected to utilize ion implantation within five years, and nearly all by the end of the decade. Fairchild's first production ion-implanted devices, a varactor tuning diode and a switching diode array, were marketed last year.

Another laboratory achievement was the utilization of gallium phosphide as the active compound in light-emitting diodes. Gallium phosphide provides brightness equal to the conventional gallium-arsenide-phosphide devices, but at much lower electrical current levels.

In a program on the leading edge of semiconductor technology, Fairchild moved ahead in the development of charge-coupled devices, which are expected to become as dominant in the field of visible photosensing as integrated circuits are today in electronic circuitry. These devices may eventually replace the vidicon tube in TV cameras, and are already being developed for low-light-level cameras.

The Semiconductor Components Group last year concentrated on marketing and product development, having completed a major facilities modernization program in 1970. However, new facilities for the fabrication of digital integrated circuits were brought on stream in the South Portland, Me. plant, a fabrication line exclusively for MOS production was established in Mountain View, and a plastic TTL line was added in the Singapore plant.

Federal Systems Group

The markets served by the Federal Systems Group were influenced by three trends in 1971: reduced Department of Defense expenditures, emphasis on existing equipment use, and stress on "fly-before-buy" procurement procedures, as compared to combined development and production contracts. Though these factors restrained sales growth for the group, and are expected to continue to do so in 1972, substantial progress was made in continuing programs and R&D.

The most dramatic moment for the group was the success of the Space & Defense Systems Division's Lunar Mapping Camera, which accomplished its mission aboard Apollo 15.

BOARD OF DIRECTORS

Walter Burke	Chairman of the Board of the Corporation
C. Lester Hogan	President and Chief Executive Officer
William C. Franklin	Consultant
Roswell L. Gilpatric	Lawyer; Member of the firm of Cravath, Swaine & Moore
Louis F. Polk, Jr.	Chairman and Founder, Leisure Dynamics, Inc. and Northstar Industries, Inc.
William A. Stenson	Board of Directors, The Surveyor Fund, Inc.
J. Bradford Wharton, Jr.	Management Consultant; President of the Wealdon Company; Investments and Farming

OFFICERS Corporate Staff

C. Lester Hogan	President and Chief Executive Officer
Warren J. Bowles	Vice President — Industrial Relations
Frederick M. Hoar	Vice President — Communications
Henry C. Montgomery	Vice President — Controller
A. Lee Munson	Vice President — Treasurer
Richard de J. Osborne	Vice President — Finance
Nelson Stone	Vice President, General Counsel and Secretary
John J. Giblin	Assistant Controller
Philip Haas, Jr.	Assistant Secretary and Tax Director
Richard Franklin	Assistant Secretary (Attesting)
Stanley Winston	Assistant Secretary (Attesting)

Operations

Wilfred J. Corrigan	Vice President and Group General Manager Semiconductor Components Group
Louis H. Pighi	Vice President and Group General Manager Federal Systems Group
Eugene R. White	Vice President and Group General Manager Commercial Systems Group
Raymond G. Hennessey	Vice President and General Manager Industrial Products Division
Thomas A. Longo	Vice President and General Manager Digital Products Division
Roy H. Pollack	Vice President and General Manager MOS Products Division
George M. Scalise	Vice President and General Manager International Business Development
F. Joseph Van Poppelen, Jr.	Vice President and General Manager Microwave & Optoelectronics Division

General Counsel	Cravath, Swaine & Moore, New York
Independent Certified Public Accountants	Price Waterhouse & Co.
Transfer Agent	The Bank of New York
Registrar	First National City Bank of New York

Design: Steven Jacobs