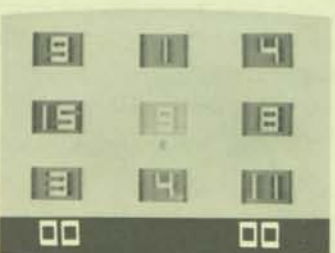
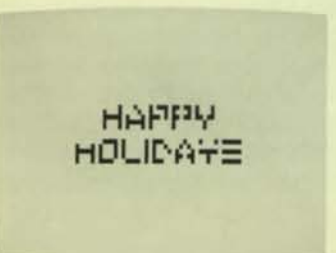
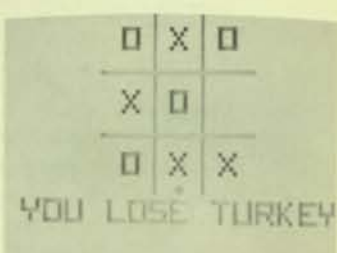
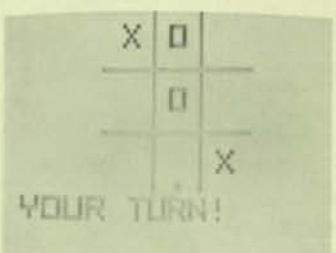
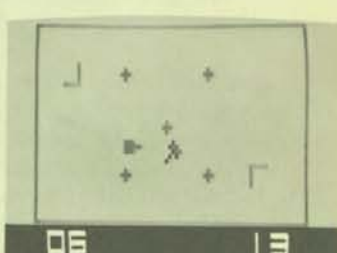
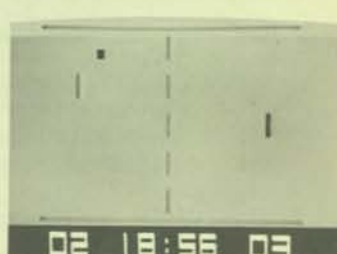
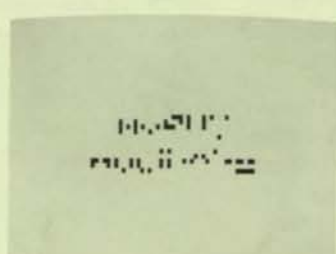
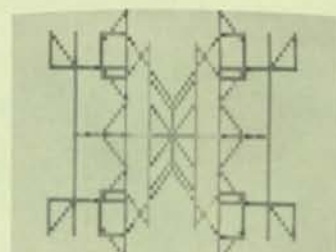
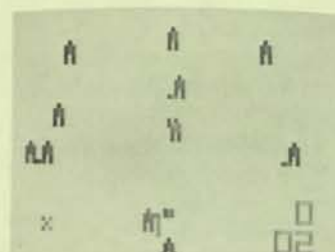


Winter 1977

# HORIZONS

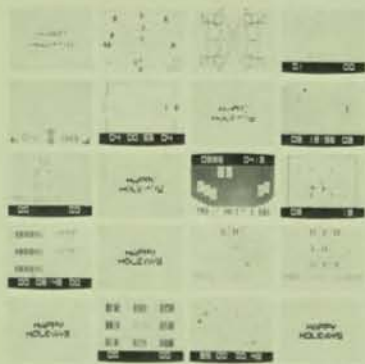
FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

Winter 1977  
**HORIZONS**  
FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**Cover:** The many faces of the Fairchild Channel F™ video game spell out best wishes for a happy holiday season.



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**FAIRCHILD  
REPORTS  
THIRD QUARTER  
RESULTS**

Fairchild Camera and Instrument Corporation reported third quarter earnings October 27 of \$2,893,000, or 54 cents per share, compared with \$4,243,000, or 77 cents per share, in the 1976 period. Sales amounted to \$113,348,000, compared with \$118,157,000 in the prior year.

For the nine months, the company earned \$6,693,000, or \$1.24 per share, compared with \$7,298,000, or \$1.33 per share, a year earlier. Sales rose to \$343,917,000 from \$324,534,000 in 1976.

Wilfred J. Corrigan, chairman and president, said, "Fairchild's third quarter earnings from operations improved over the preceding quarter. While the semiconductor market reflected a seasonal slowdown in July and August, orders strengthened in September and we anticipate moderate growth during the current period.

"In specific high-technology products—notably microprocessors and MOS (metal-oxide semiconductor) memories—bookings reached record levels during the quarter. Sales of our solid-state test systems continued strong, augmented by initial shipments of the new Sentry VLSI (large-scale integration) tester.

"In the consumer electronics area, Fairchild's programmable video games have achieved a strong market position and will contribute to earnings throughout the second half.

"Demand for LED (light-emitting diode) digital watches showed continued weakness during the third quarter. As previously reported, Fairchild has shifted its production emphasis to the continuous readout, or LCD (liquid-crystal display) watch sector.

"The company reduced inventories in the third quarter, resulting in a

decrease of more than \$10 million since the beginning of the year. Working capital and shareholders' equity at the end of the period were \$122,130,000 and \$181,454,000 respectively. Cash and short-term securities rose to \$44,080,000. Spending for research, development and engineering amounted to approximately \$12 million during the quarter.

"We have recently restructured the company's top management organization, consolidating 15 product divisions into two operating groups—Semiconductor Products, and Systems and Equipment. In addition, a corporate office of Strategic Planning and Technology has been established." (For related story, see page 4)

"We believe this new organization will lead to greater operating efficiencies throughout the corporation, as well as improve our capability for strategic management in the future," he said.

**SCHOLARSHIP DEADLINE  
DECEMBER 15**

Applications for the 1978 Sherman Fairchild Scholarship Program are due no later than Thursday, December 15.

Five scholarships will be awarded for the 1978-79 school year, with the winners announced next May. Each scholarship carries an annual stipend of \$2000, renewable for up to four years of full-time study at an accredited college or university.

The scholarship program is now funded by Fairchild Camera and Instrument Corporation, rather than the Sherman Fairchild Foundation as in past years.

Applicants must be dependent children of Fairchild's employees, and must be either high school seniors or high school graduates with no previous college experience. Only one scholarship per family may be awarded.

Complete program details and applications are available from Industrial Relations offices. Applications should be sent to the College Scholarship Service, Sponsored Scholarship Programs, Box 176, Princeton, NJ 08540.

**DR. HOGAN WINS  
IEEE ELECTION,  
OTHER HONORS**

Dr. C. Lester Hogan, Vice Chairman of the Board, was elected Executive Vice President of the Institute of Electrical and Electronics Engineers (IEEE) on November 4. Elected President was Dr. Ivan Getting, President, Aerospace Corporation, Los Angeles, Calif. They will both serve one-year terms.

The prestigious National Academy of Engineering, part of the National Academy of Sciences, initiated Dr. Hogan into membership November 9 at the Academy's annual meeting in Washington, DC. NAE members must have made significant contributions to engineering theory and practice and must have pioneered new and developing fields of technology.

Later in November, Dr. Hogan was selected the Distinguished Bay Area Business Executive by the School of Business at San Jose State University.

Each year, the School of Business honors an area executive for his or her outstanding business achievements and contributions. The program is also designed to increase interchange between business leaders and the academic community.

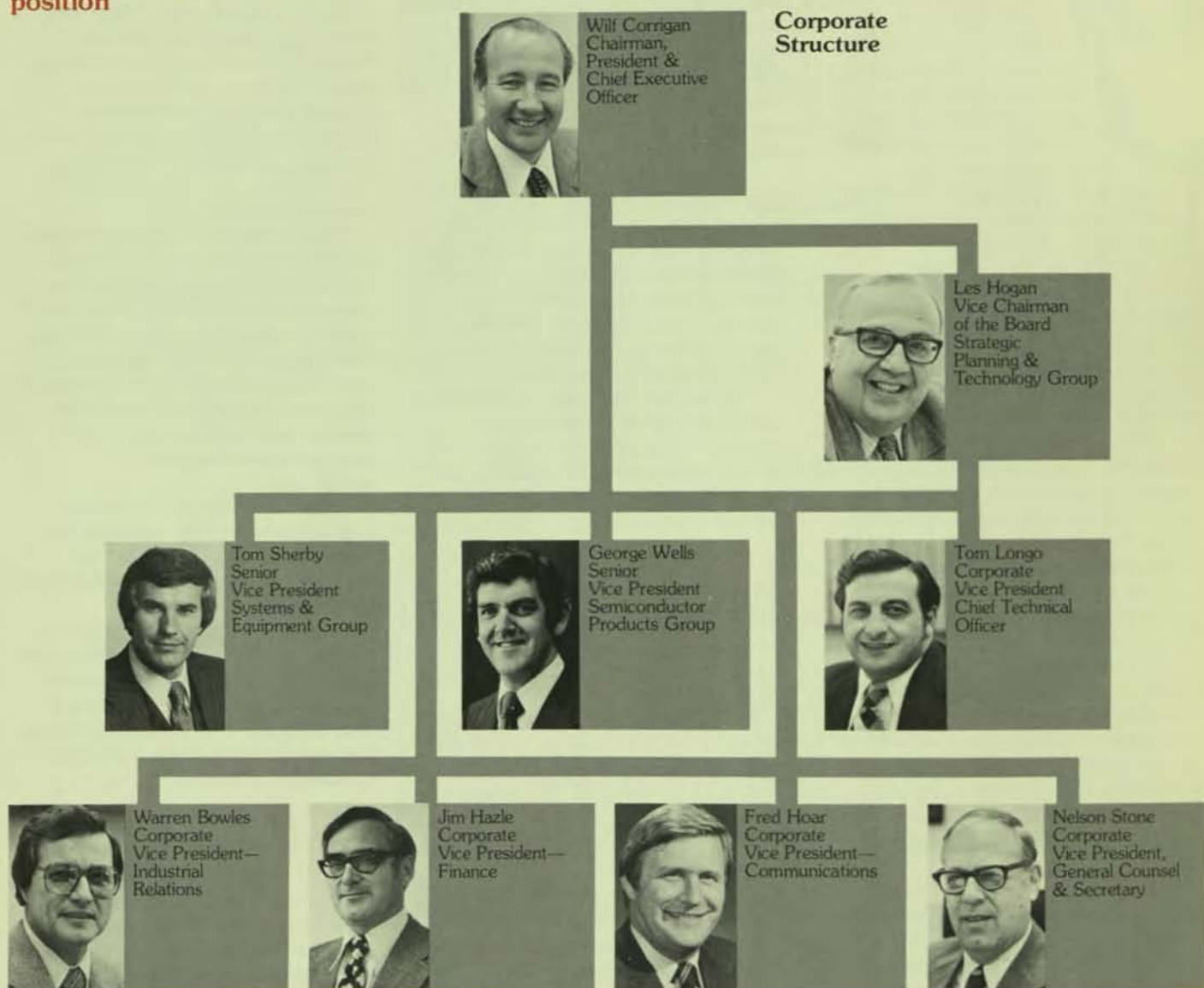
**T.A. SHERBY NAMED  
SYSTEMS AND  
EQUIPMENT HEAD**

Thomas A. Sherby has been appointed Senior Vice President—Systems and Equipment Group, Fairchild announced November 14. Dr. Sherby, formerly Senior Vice President—Operations for Data-products Corporation, will have responsibility for the company's end-equipment businesses, including Federal Systems, Industrial Products, Instrumentation and Systems and Video Products.

A mechanical engineering graduate of Clarkson University, he holds an MBA from George Washington University and a Ph.D. in engineering from the University of Pittsburgh.

# Fairchild Announces New Corporate Organization

Structure designed to improve management flexibility and expand market and technical position



**A** realignment of Fairchild's top management structure, consolidating 15 product divisions into two operating groups and creating a corporate office of planning and technology, was announced in October.

George Wells was named Senior Vice President in charge of the new Semiconductor Products Group, with responsibility for the former Compo-

nents and LSI Groups, and the Time Products Division. Previously, George served as Vice President and General Manager—Components Group.

The Systems and Equipment Group, the second major operating group, is comprised of the Instrumentation Systems Group, the Government and Industrial Products Group, and the Video Products Division. Dr. Thomas A. Sherby was recently named Senior Vice President of this group.

Dr. C. Lester Hogan, Vice Chairman of the Board, will direct the new Strategic Planning and Technology Group, with responsibility for long-range planning and business development, company-wide technical research and advanced product programs.

Corporate Vice Presidents Warren Bowles—Industrial Relations, A. James Hazle—Finance, Frederick M. Hoar—Communications and Nelson Stone—General Counsel and Secretary, will continue to report to Wilf Corrigan.

## Semiconductor Products Group



George Wells  
Senior  
Vice President



John Duffy  
Corporate  
Vice President—  
Worldwide  
Semiconductor  
Marketing



Don Brettner  
Division  
Vice President—  
Manufacturing  
Services Division



Dave Marnott  
Corporate  
Vice President  
& General  
Manager— LSI  
Products Group  
—Bipolar LSI  
Division  
—Exetron Division  
—MOS/CCD Div.



John Sussenberger  
Division  
Vice President &  
General Manager—  
Time Products  
Division



Ed Browder  
Director—  
Integrated Circuits  
Group  
—Automotive  
Division  
—Digital Division  
—Linear Division



Manny Fernandez  
Director—  
Discrete Products  
Group  
—Diode Division  
—Optoelectronics  
Division  
—Transistor  
Division



Tom Sherby  
Senior  
Vice President

## Systems and Equipment Group



Jim Bowen  
Corporate  
Vice President &  
General Manager—  
Instrumentation  
Systems Group  
—Instrument &  
Controls Division  
—Systems Tech-  
nology Division



Lou Pighi  
Corporate  
Vice President &  
General Manager—  
Government &  
Industrial  
Products Group  
—Imaging Systems  
—Space & Defense  
—Industrial Prod.



Greg Reyes  
Corporate  
Vice President &  
General Manager—  
Video Products  
Division

Within the Semiconductor Products Group, John A. Duffy, Jr., previously Vice President—International Division, has been named to the new post of Vice President—Worldwide Semiconductor Marketing. Also reporting to George Wells are David J. Marriott, Corporate Vice President and General Manager—LSI Products Group; John Sussenberger, Division Vice President and General Manager—Time Products Division; Donald M. Brettner, Division Vice President—

Manufacturing Services Division; Edward H. Browder, Director—Integrated Circuits Division and Manuel A. Fernandez, Director—Discrete Products Division.

The Systems and Equipment Group will consist of incumbent Vice Presidents James D. Bowen—Instrumentation Systems Group; Louis H. Pighi—Government and Industrial Products Group and Greg Reyes—Video Products Division. All held the same positions previously, and will

report to Tom Sherby.

Dr. Thomas A. Longo, Vice President and Chief Technical Officer, will continue to be responsible for the company's overall technological capability. He will report to Dr. Hogan.

"This new structure is a major step in strengthening Fairchild for its long-range corporate growth," Wilf Corrigan said. "We believe it will improve our capability for strategic management and significantly expand our market and technical position in the future."



# Two Decades of Semiconductor Progress

1977 is a double anniversary year for Fairchild—our 50th year as a company and our 20th year in the dynamic semiconductor industry. Dr. C. Lester Hogan, who has watched the “second industrial revolution” take place, reflects on an explosive 20 years.

The fall of 1977 marks the 20th anniversary of Fairchild's entry into the semiconductor business. In 1957, Sherman Fairchild agreed to back a group of seven northern California engineers and scientists who had developed a method of mass producing silicon transistors.

That September, Fairchild Semiconductor Corporation was formed in Palo Alto, and in 1961, it became the Semiconductor Division. Within six months of its formation, the new company was profitable. Fairchild has continued to be a leader in technology, and has been the spawning ground for much of today's semiconductor industry.

In some ways, 1957 marked the opening of the new period of technological revolution. It was the year of Sputnik—the first man-made object in space. It was also the year a Navy F8 Crusader jet set a transcontinental speed record by traveling from Los Angeles to New York in 3 hours, 23 minutes and 8.4 seconds. Five Fair-

child on-board aerial cameras recorded the flight. The pilot was a little-known Marine Corps Major named John H. Glenn, Jr., who later would gain worldwide attention as the first man to orbit the Earth, making history aboard a spacecraft equipped with semiconductor components from Fairchild.

The world and the semiconductor industry have experienced dramatic levels of change in the two decades since 1957, and Dr. C. Lester Hogan has been intimately involved with this industry throughout those years. Dr. Hogan came to Fairchild as President in 1968, and became Vice Chairman of the Board in 1974. He recently shared his views on the progress and evolution of solid state technology during Fairchild's first two decades as a semiconductor manufacturer.

**Q:** Dr. Hogan, in the 20 years since Fairchild entered the semiconductor business there have been sweeping changes in the products we make, the places they are used and in the basic nature of the business. Could you outline some of these events?

**Dr. Hogan:** There have been tremendous changes in semiconductor technology. In 1957 the industry was struggling to make simple diodes and single transistors. Silicon was a relatively new material, and many of the transistors in volume production at that time were made of germanium.

A lot of research work had been

carried out in the direction of integrated circuits, using both alloy transistors (the earlier state of the art) and diffused mesa transistors, but it is obvious that we wouldn't have gone very far if we were limited to the use of those structures.

**Q:** Fairchild's development of the Planar\* process is generally considered to be the key to the introduction of improved transistors, as well as making practical the integrated circuit. Is that a fair assessment?

**Dr. Hogan:** Yes, absolutely. I was at Motorola at that time. Bob Noyce and Jean Hoerni of Fairchild had described the Planar invention at the Wescon Show in 1959. Hoerni holds the basic Planar patent and Noyce the patent for extending its use to integrated circuits. There was immediate recognition that this process solved all of the difficulties encountered with every other approach to integrated circuits at that time. At Motorola we immediately organized a team to exploit the new technology. All of the basic elements of today's LSI (large-scale integration) circuit structures are contained in that invention of 1959.

**Q:** When you talk about LSI, you really are talking about the latest developments in integrated circuit technology as well as the mainstream of future technology. How has this progressed over the past 20 years?

**Dr. Hogan:** Let's start with the Planar development in 1959. This gave us a great leap forward in reliability and reproducible manufacturing for transistors.

The basic part of the Planar process is that it places all of the active areas or semiconductor junctions underneath the surface of the silicon material, where they are protected from the outside world by an insulating layer of protective oxide.

The first integrated circuit grew out of this development in 1961 and was a simple switching device known as a flip-flop. This circuit contained about four transistors and an equal number of resistors. Essentially, throughout the decade of the '60s and also through most of '70s, this complexity doubled every year. Of course there were some lags and

\*Planar is a patented process of Fairchild Camera and Instrument Corporation.



Opposite Page, Dr. C. Lester Hogan Vice Chairman of the Board

Above, clockwise from left: Dr. Hogan in a 1974 meeting with Senator Alan Cranston; touring an East Coast plant with Sherman Fairchild, right; at a financial analysts seminar in 1970.



gaps, but on the average density doubled each year.

We currently have achieved densities of the order of 250,000 components on a chip, and we are looking forward to the one-million component level. That is achievable with today's technology. As the complexity has continued to rise, however, the rate of increase has slowed. Over the next five years density will probably double every two years. In fact, it has been predicted that by 1985 the semiconductor industry will produce  $10^{15}$  electronic functions per year—that's a quarter-million functions for every person on Earth.

**Q:** How far can this go? And how can we find a way to use all of these electronic functions?



**Dr. Hogan:** Well, obviously we can't continue to double density every year or two indefinitely. If we could, it wouldn't be long before the number of semiconductor functions would exceed the number of electrons in the universe. And that is impossible. But as I said, a million components per chip is within the capability of today's technology—including electron beam maskmaking, projection printing on silicon, or perhaps some form of using X-rays or electron beams to write directly on silicon.

Beyond that, it is simply too early to predict. The question of how to apply the vast number of electronic functions is a good one, however, and one that is changing the basic nature of the industry.

**Q:** That's another point we would like to consider, Dr. Hogan. How has the industry changed and how do you see it evolving in the future?

**Dr. Hogan:** In the beginning of the integrated circuit era, it was simpler. We provided components for readily existing markets. Transistors replaced vacuum tubes, and then integrated

circuits replaced discrete transistors. As more complex integrated circuits were developed, our customers—the computer industry, for example—were anxious to gobble up the new technology and reduce cost, power consumption, equipment size and so forth. But in the present era of LSI and VLSI, (very large-scale integration) the components themselves are becoming systems.

The effect of this has been to close out markets for our products. In calculators, for example, the chip is essentially the whole system, along with a few keys, a battery and a display. There is no market today for calculator chips, and the only people making calculator chips are those who are making calculators to put them in. The same is true of the digital watch, with a few minor exceptions. And with the advances in other products, we may see something of the same effect taking over. When we reach the point at which we can build an IBM 370-size computer on a chip of silicon, who will we sell it to—a computer manufacturer or a computer user?

Unfortunately, this situation eliminates most of the opportunities for bright young people like the group that founded Fairchild's semiconductor effort to start a new business. To exist in the semiconductor business today, you must offer an advanced memory capability, microprocessors, and a range of other LSI circuits. This takes enormous amounts of start-up capital compared to what was required in the 60s.



There have been no successful start-ups of new semiconductor companies in the 1970s—with one exception. That is Zilog, and they were backed by Exxon. I think this indicates that the age of the semiconductor entrepreneur developing a new technology and carving out a

successful niche is ended.

**Q:** What about the applications of all these new functions?

**Dr. Hogan:** We are on the verge of an intelligence explosion that is unparalleled. As has been said, Silicon is to this century what steel was to the last. In the 19th century industrial revolution machines were developed to multiply man's musclepower and ease the drudgery of labor. The LSI electronic revolution is multiplying man's brainpower.

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**As has been said, we are on the verge of an intelligence explosion that is unparalleled in the history of man. Silicon is to this century what steel was to the last.**

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In the coming years we are going to see every aspect of our lives affected by this technology. Smart terminals and interconnected small computers will proliferate in our offices and factories, as well as in the home. We already have microwave ovens and other appliances with microprocessor controllers. The computer is entering the home in the guise of the programmable video game.

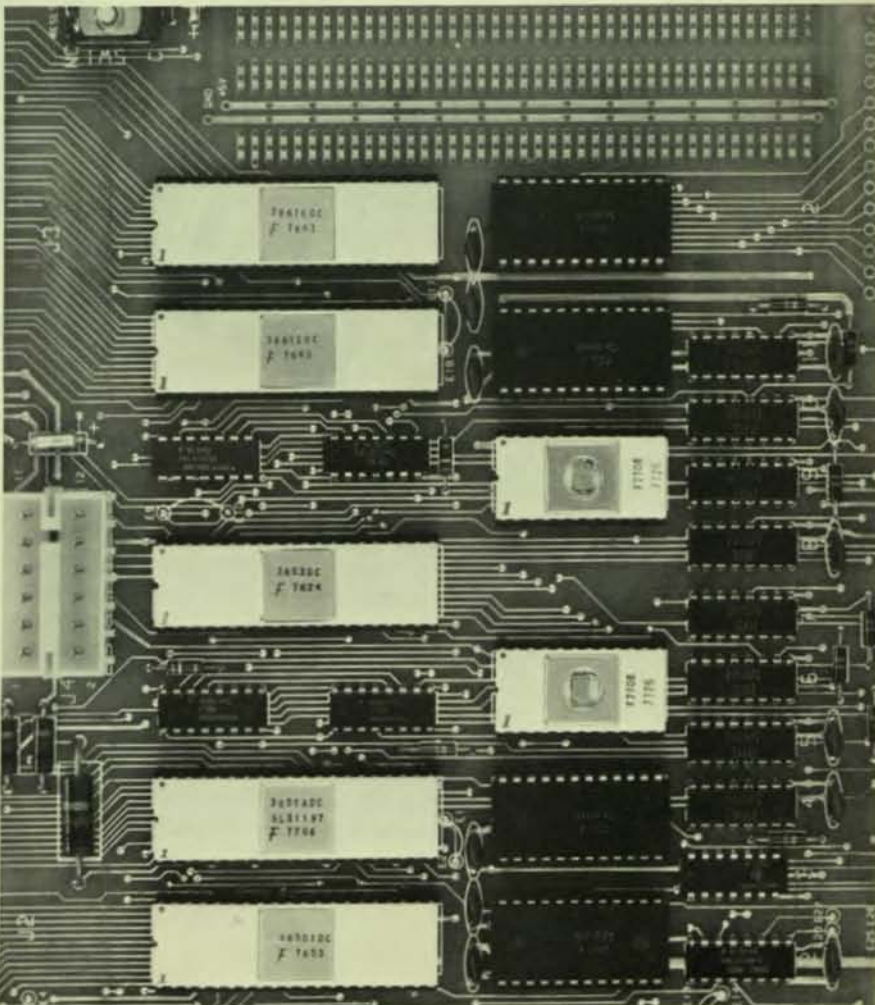
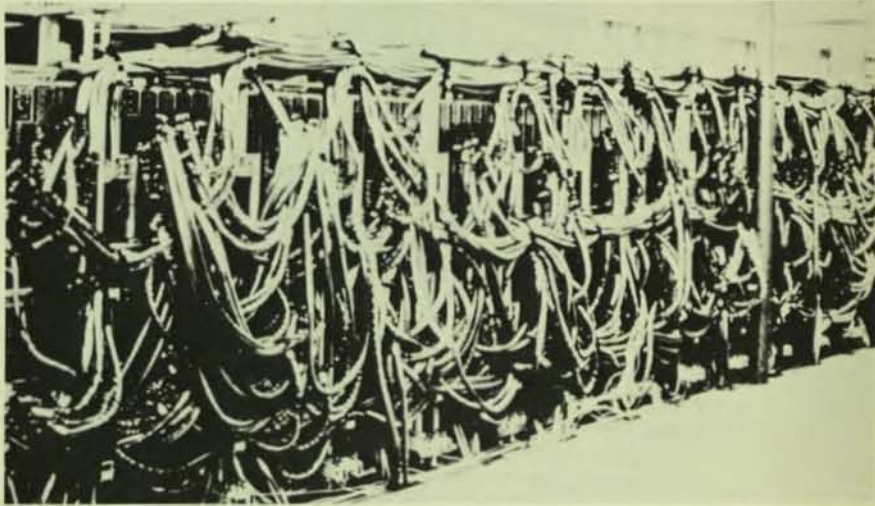
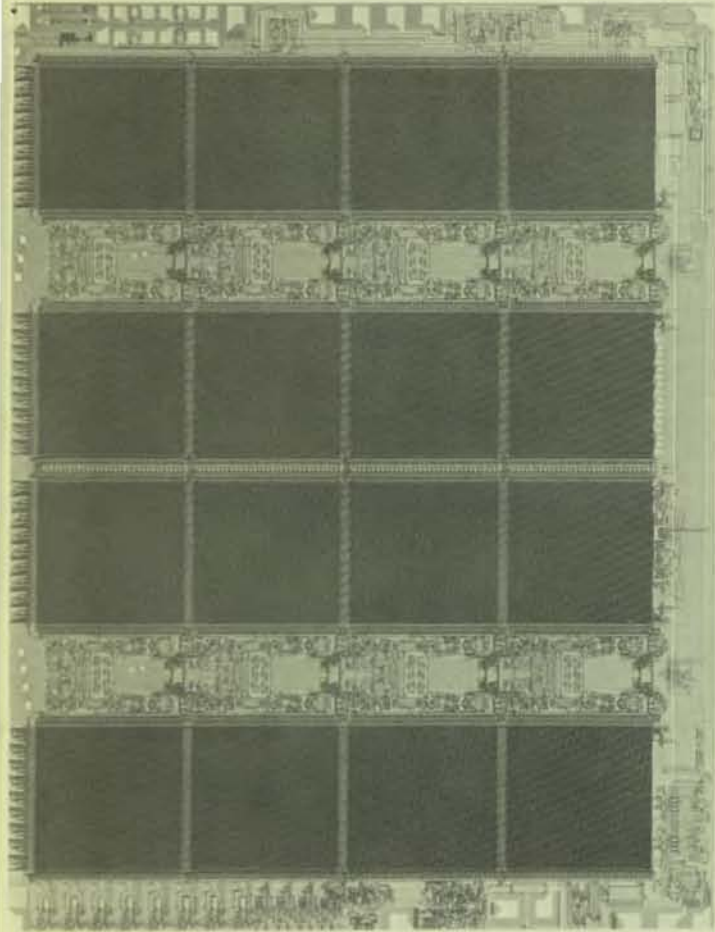
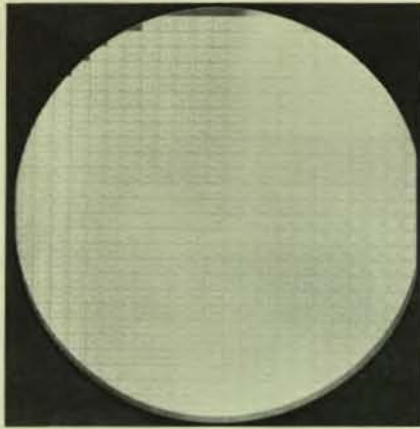
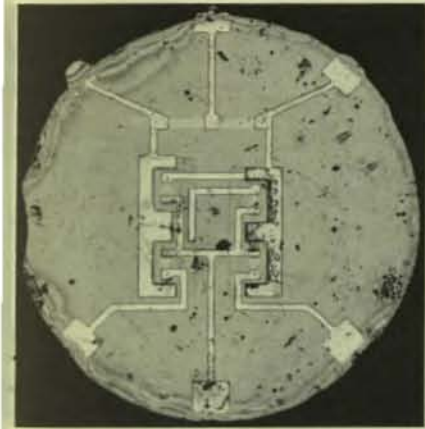
In the future we may well view the TV set simply as a display screen for all of the accessories we hang on to it. These might include games with both entertainment and educational programming materials, a videotape recorder, an interface through the telephone lines for remote computer access, and so forth. Our heating, cooling, lighting and security systems such as smoke and burglar alarms undoubtedly will be operated by some form of home computer.

**Q:** Isn't this sort of thing disturbing to a lot of people who aren't familiar with computer technology?

**Dr. Hogan:** It probably is. Any rapid change of this sort disturbs the status quo, at least for a while. But I think in the long run it is a beneficial development if we just keep it in the proper perspective.

The net effect of all of this really is that machines are going to take over many of the routine tasks we now do manually, or semi-manually. I think the net effect will be to free our time for intellectual and other leisure pursuits, and basically I think that's good.





*Clockwise from top:*  
The semiconductor industry's first integrated circuit available as a monolithic chip was introduced by Fairchild in 1961.

This 4-inch diameter wafer, manufactured by the Exetron Division last year has around 600 die, each containing 5000 transistors.

The Eniac, introduced in 1946 by Univac, was the world's first all electronic digital computer. It occupied 3000 cubic feet and weighed 30 tons.

Part of the back panel wiring for the Eniac.

Today's Fairchild F8™ microcomputer board has the same information handling capabilities as the Eniac, but is 300,000 times smaller, uses 56,000 times less power and is more than 10,000 times more reliable.

In early 1977, Fairchild introduced the 65K CCD block addressable memory, the first semiconductor device suitable for the bulk memory market.

**How a Fairchild veteran and a newcomer took advantage of company career opportunities**

**A**

brand new air-conditioned plant," the ad said. Air-conditioned buildings weren't all that common in the 1950s, so Lee Schank gladly traded a sweltering subway commute for a job at the new Sherman Fairchild and Associates in Yonkers, N.Y., just north of New York City.

Four years later, he joined Fairchild Camera and Instrument's Industrial Products Division in New York, which became his professional home. Starting as an engineering section manager in 1961, Lee today is Division Vice President and Operations Manager at IPD, responsible for all engineering, manufacturing and marketing for IPD's line of audio-visual, aircraft and pressure switch product lines.

For his first 10 years at Fairchild, Lee was also a college student. Using Fairchild's Educational Assistance Plan, which provides reimbursement for much of the job-related course costs, Lee earned a Bachelors degree in Mechanical Engineering from the City College of New York and a Masters in

direction I wanted to go. I love engineering, but I consider myself more a practical than scientific engineer, and that goes well with the study of management."

Lee doesn't recall consciously plotting a career path for himself when he switched to advanced management study, but says that he received encouragement from Ray Hennessey, now Vice President and General Manager at IPD, and other managers he respected who had also combined jobs and school.

"I did consciously plan to take specific classes at night," Lee says, "because I got more out of them. I could come to work the next morning and put what I'd learned right into practice. By going at night, I was also with more experienced industry people, who are much more interested in practical solutions to problems than strictly technical or management theory."

Operating on such a demanding work and school schedule could easily

**RTING**



**A**

Industrial Management from Brooklyn Polytechnic Institute.

"When I came to IPD, we were really building the division, so it wasn't uncommon for us to work until midnight. Between that and carrying a full load of courses, my day was pretty tight, but it did permit flexibility in class scheduling."

The heavy schedule didn't deter Lee from enrolling in his Masters program at Brooklyn Poly almost immediately after completing his undergraduate work. "By that time," he says, "I was Engineering Manager, and I knew management was the

put a strain on anyone's family and personal life and Lee stresses that the support of his family helped make things much easier.

"The roses go to my wife, Phyllis," he says. "I'm not given to hobbies much, so I split my time between work, school and family. A number of times, though, there wasn't much time left after working all day and studying. My wife put up with an awful lot for many years, and I'm grateful for her understanding."

Although he thought he was finished with full time study, Lee gladly went back to school in 1974 when he was selected for a Harvard Business School 13-week program in advanced

management. An intense study program which only accepts candidates recommended by their companies, the Harvard program consists of lectures on management techniques complemented by case study analysis in small groups.

"It was one of the most rewarding educational experiences I've had," Lee says. "You can casually talk with pretty high-level people involved in a broad spectrum of different businesses, and benefit from a real breadth of experience. I saw how different people deal with the same problems I have, and likewise how they could benefit from my experiences.

That was good for me, because I started to run an engineering department when I was relatively young, and I think I had been a little inhibited by that. The program made me feel more confident about my judgment and my ability to be a good manager—management isn't a science by any means. It's a matter of opinion."

levels in Mountain View's Plating Shop.

Bill's successful transfer into a job where he could use his newly-earned law degree is a tribute to both his persistence and his patience, with a little bit of luck thrown in. "I really wanted to work for Fairchild," he says, "because I knew the company and I like the people I'd met here. I decided there probably wasn't a better place to start looking for a job than here."

After learning there were no openings in the Legal Department, Bill made several other calls, following some suggestions made by Ralph Pierleoni, Production Manager in the Plating Shop. With the assistance of Manufacturing Services IR Manager Roy Parfitt, Bill got an interview with John Salazar, who was then Director of Labor Relations and

# P A T H

quickly discovered. One of his first assignments was to obtain passports and visas in two days for a manager moving to an overseas assignment and his family.

Several trips to the San Francisco passport office later, Bill delivered the finished documents in the nick of time.

Like Lee Schank, Bill first came to Fairchild by answering an ad. In late 1975, he took a weekend job, advertised through his school's placement office, operating silicon deposition equipment in Mountain View. He later ran similar equipment on weekends in Palo Alto, before switching to a weekday shift at the Mountain View Plating Shop.

"Although those jobs were all temporary positions, they really were an education," Bill says. "They gave me an understanding of the real nuts and bolts side of the company I probably would never have gotten otherwise."

Working weekends threw both his study and sleeping schedule out of whack, Bill recalls. "It wasn't too bad, though, since I was almost finished with school when I began working. I have a lot of respect for a lot of the new people we're seeing in night law school programs who have families and are putting in 40-plus hours a week at work. That requires an awful lot of motivation."

# C A R E E R

International Industrial Relations.

John, himself a lawyer, is now Industrial Relations Director for the Semiconductor Products Group.

No suitable openings were available then, but Bill was tapped last July to take over Expatriate Administration. "I was very, very happy when I got the call from John," Bill remembers. "I really wanted to work here, and, considering the job market for lawyers right now, I felt very fortunate."

In his new job, Bill is the Industrial Relations representative for the U.S. citizens Fairchild has assigned to company operations overseas. Relocations, movements of household goods and tax administration all come under his jurisdiction. Fast reaction time is also a necessary asset, Bill

Left, Lee Schank reviews a product with Al Massucci, Audio Visual Quality Control Manager.

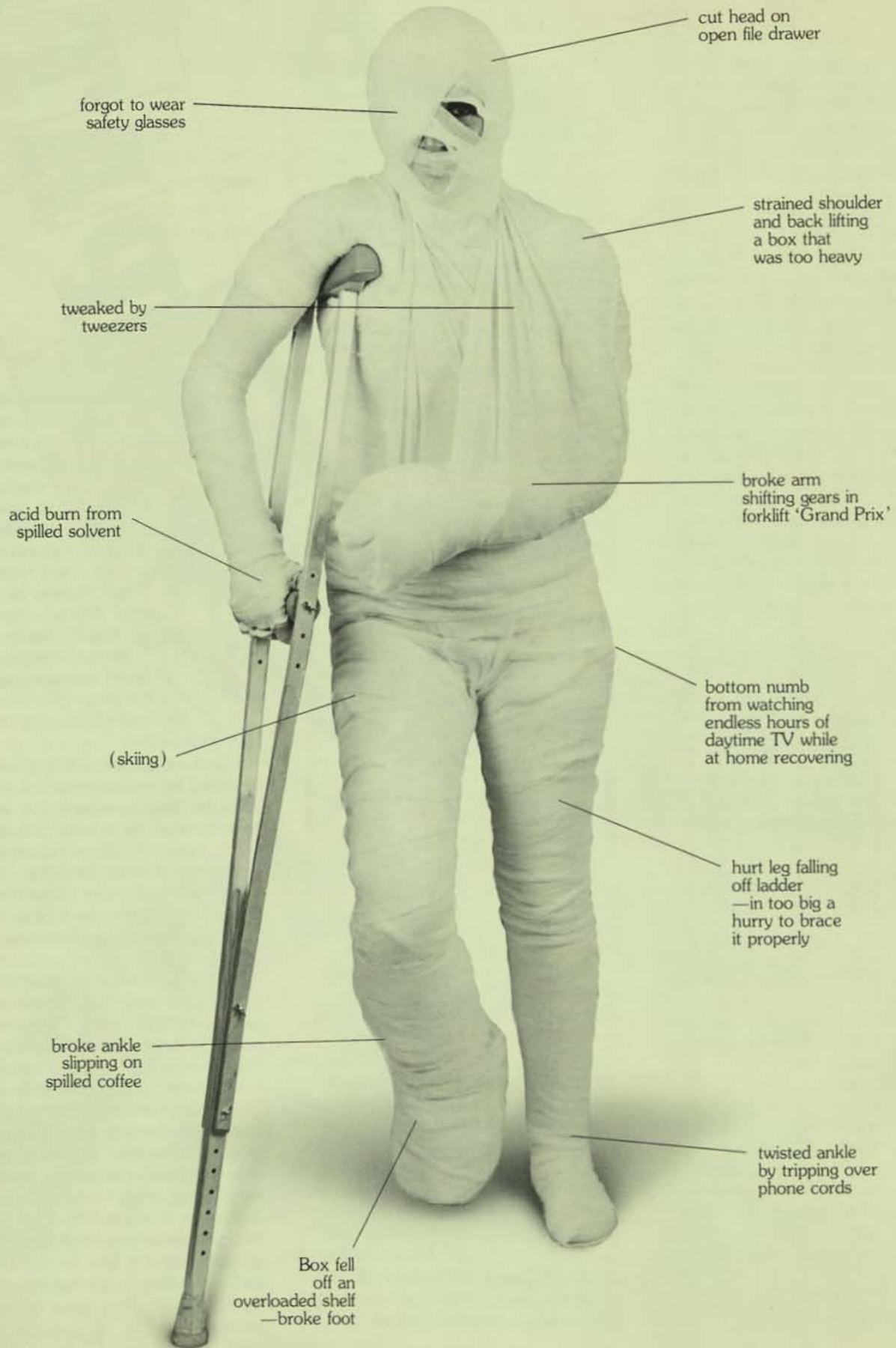
Right, Bill Dullea in his new Mountain View office.

# B

ill Dullea approached his new job in Expatriate Administration with a little bit different per-

spective than most people who move up through internal promotions. While finishing his law degree at the University of Santa Clara, Calif., and preparing to take the California Bar Exam, Bill worked as a clerk charting production





cut head on  
open file drawer

forgot to wear  
safety glasses

strained shoulder  
and back lifting  
a box that  
was too heavy

tweaked by  
tweezers

broke arm  
shifting gears in  
forklift 'Grand Prix'

acid burn from  
spilled solvent

bottom numb  
from watching  
endless hours of  
daytime TV while  
at home recovering

(skiing)

hurt leg falling  
off ladder  
—in too big a  
hurry to brace  
it properly

broke ankle  
slipping on  
spilled coffee

twisted ankle  
by tripping over  
phone cords

Box fell  
off an  
overloaded shelf  
—broke foot

# The \$53 Billion "Ouch"

**"During times of tough competition and low profit margins, attention to safety may contribute more to profits than the company's best sales rep," says the National Safety Council. Nationwide, the Council estimates accidents on the job cost U.S. industry \$52.8 billion last year.**

These costs include lower productivity when a skilled employee is absent, rising insurance premiums, and costs of training substitutes—all of which affect the company's "bottom line" and our ability to expand and create new jobs.

And these figures don't fully reflect the cost to you if you're injured at work. If the injury is slight, you're still in for some discomfort and inconvenience. If it's severe, there's possible hospitalization. Extended convalescence and long periods of inactivity. Reduced income while recovering. Permanent disability.

Fairchild's Safety Department teaches nearly 6000 people a year how to prevent those accidents that are so costly in both human and financial terms. The five-member department consists of Ken Rohner, Director, Labor Relations, Safety and Equal Opportunity; Lee Neal, Safety Manager; Bernie Yurash, Industrial Hygienist; Theresa Ramos, Safety Coordinator and Harold Petersen, East Coast Safety Manager.

The department, assisted by volunteer safety committees from each division, monitors safety conditions throughout the company, presents training classes and investigates the causes of accidents and emergencies at all Fairchild locations.

*Attention to safety can keep you from disappearing behind miles of gauze and plaster. Our thanks to Sherri Skaggs, Medical Department, for volunteering to "disappear" for the picture on the opposite page.*

Staff members are continuously providing instruction in everything from general plant and home fire safety (including knowing how to get out of your house if it's on fire) to



specialized chemical and radiation safety and proper heavy machinery operation (forklifts are not to be confused with 'hot rods'.)

## IN AN EMERGENCY

**1** In locations with red emergency hallway phones, pick one up. It will ring directly through to Security. In locations without red phones, call the emergency Security number listed in the front of your phone book.

**2** Be prepared to tell the Security guard who answers: your name, the location of the emergency, what the situation is, what is being done.

**3** While you are making the call, ask someone else to notify members of the First Aid and Safety teams in your area. They are trained to use the emergency equipment that may be needed.

Last January, Dreyfus Third Century Fund, a New York investment firm, ranked Fairchild second in job safety out of 22 major U.S. electrical equipment and instrument companies rated. The company was ranked first in equal employment opportunity in the same study. Because of its high ratings, Fairchild was designated an approved investment for mutual fund customers in the Third Century Fund.

"Because of the potential hazards that surround all of us, we take accident reduction and safety very seriously at Fairchild," Ken Rohner says. "At the beginning of the year, every division manager, in cooperation with his safety committee, sets accident

reduction goals. Our overall accident rate has dropped 20 percent over the past five years, and we expect to see an improvement in that at the end of this year."

Chemical safety is one typically closely monitored area, since so many Fairchild people work around chemicals on the job and at home every day. Preemployment physicals screen out those people with allergies or sensitivities to solvents used in Fairchild manufacturing, and they won't be sent to jobs in fabrication areas.

Employees who do work with chemicals are protected by air monitoring equipment and protective clothing and medical checkups as needed, plus regular training in chemical safety. "Anyone who works with a hazardous substance at Fairchild knows of the potential dangers and the associated safety procedures," Ken emphasizes. "This is a company requirement, and we make sure it's met."

He adds, "The Safety Department is directly involved with production by monitoring the types of chemicals used and insuring that proper controls are provided. In some cases, this means we don't use the solvent or other chemical that could best do the job, but we use alternates that are safe."

At the heart of the Safety Department's prevention program are the divisional safety committees, composed of representatives from manufacturing, facilities, industrial relations and division management. The committees are responsible for plant inspections, training and accident reviews.

"More than half of our training is done at the request of division safety committees that have recognized a special need or a jump in a particular type of accident," reports Lee Neal. (The remaining classes are mandated by Safety if a division's accident rate is climbing.) "The safety committees are the core of our accident prevention program. Without them, we would just be reacting to individual incidents. The members of the committees volunteer their time, but they can certainly see that their efforts get results."

## more \$53 Billion "Ouches"

According to Safety personnel on both the East and West Coasts, the most frequent injuries to Fairchild people fall into four categories—strains and sprains from lifting and pulling, lacerations and abrasions, foreign bodies in the eyes and contusions.

Many of these injuries are the result of our own negligence. To guard against them, safety committees and the professional staff must depend on the rest of us. "It's everyone's responsibility to eliminate or report hazards," Ken says.

Unsafe situations reported by employees prompt immediate investigations by the Safety and Medical Departments. "If an employee is injured in a fire or other accident," Lee adds, "Safety and Medical work

together to insure both that the victim is properly treated and that the situation isn't repeated."

Teaching the fast, but correct, response to an accident is another critical part of Fairchild's safety training. "If there was an explosion or fire in a fab area, and you ran in with no protection to get someone out, you'd probably be lying there right next to him in a few seconds," Ken cautions. "That's why we teach all our safety committee members and building



Top left, pouring nitric acid into a beaker with an alcohol residue can cause fire and a release of toxic fumes. Clean all equipment thoroughly before mixing any chemicals.

Above, knowledge of fire extinguisher operations is important at home as well as work, as Harold Petersen explains to Syosset's Rosemarie Quiles.

Top right, Palo Alto supervisors get an update on workers' compensation from Ken Rohner.

Above, members of the Mountain View facilities staff learn to douse fires under the direction of Lee Neal, center rear.

Above, Lee, gives final instructions to Don King, Mountain View Facilities, before Don enters a fire training tower wearing an air pack.

facilities staffs how to use our self-contained breathing equipment, the Scott Air Packs. No one should go into an evacuated area without the proper equipment."

In 1970, the federal government became directly involved with monitoring worker safety with the passage of the Occupational Safety and Health Act (OSHA), which set down minimum safety standards for U.S. industry. The act also empowered the government to make unannounced

inspections of industrial facilities to insure compliance.

"Our safety standards parallel, and in many cases exceed, the OSHA standards," Ken says. "For example, if we hired a person with a hearing loss, he or she would not be sent to work in a high noise area, even though the noise level doesn't exceed legal requirements."

Maintaining Fairchild's safety standards and preventing unnecessary injury and property damage comes

down to awareness—noticing and eliminating hazards, plus knowing what to do in an emergency. To protect yourself and your coworkers, check your area for safety hazards and eliminate them. Identify safety committee and first aid team members closeby. Know how to reach Security, your safety committee and the Medical Department in an emergency. Do it right away, so you won't waste time when minutes may count.



Above, simple things become difficult when masks simulate blindness in the Eye Safety class. Bill Green, Facilities, tries bringing his toothpaste and toothbrush together during a session exercise.



Above left and right, Oooow! Serious injuries happen in the office, too, especially from bumping into open drawers or slipping on coffee spilled on the floor.

## SPOTLIGHT

Commuting South Portland trainees ready for IBM project



*Timmy and Theresa Smith and Noreen and Norma Libby are all set with a week's worth of entertainment.*

The doors of the bus wheeze shut and it falls behind two others pulling out of the Fairchild South Portland, Maine, Digital Division plant. Carol Valliere looks back to see her husband shepherding their five children to the car, then settles in for the four-hour bus ride to Burlington, Vermont, 150 miles to the west.

For the next week, she and 150 other South Portland people will work side by side with employees at IBM Corporation's plant, learning to produce IBM memory modules. Housed in hotels and efficiency apartments during the week, they'll all catch a bus for home Friday afternoon to spend the weekend with their families. Carol's kids will do their best not to fight until after Mom boards the bus again Sunday night.

This scene was replayed every week from July through October, as Fairchild prepared to begin work on a long-term contract with IBM, the first of its kind between the two companies. The agreement, announced last April, calls for several million



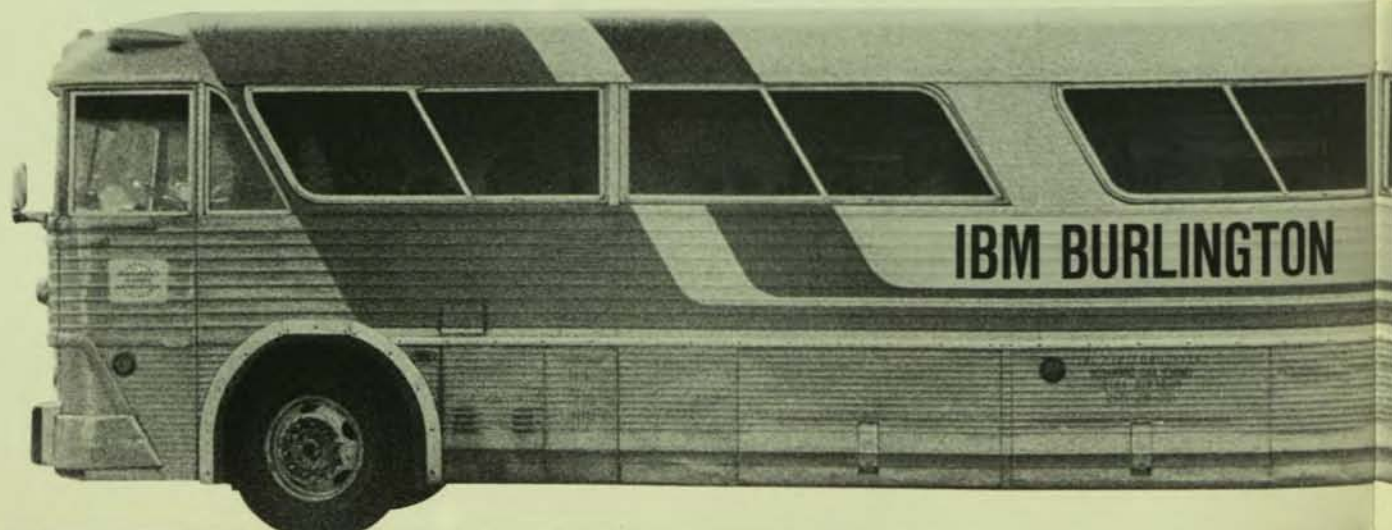
*Robert Valliere contemplates stowing away as he helps load his mother's suitcase onto the bus.*

dollars worth of assembly services on memory modules for IBM data processing equipment. The completed modules will be used at IBM in Burlington.

"The contract is for four years, with a possible extension," says Mike Klyzeiko, project manager. "Our work has been divided into three phases—training in Burlington, which wound up in October; extensive facilities work in our building installing environmental control equipment and IBM equipment and actual production, which has just gotten under way."

Because of the size and duration

# Ridin' the Fairchild







*Richard Valliere says goodbye to his mom, Carol.*

of the project, Mike recalls, IBM conducted negotiations that were lengthy and included an exhaustive inspection of the South Portland plant. "They sent over a six-drawer file of specifications for us to go through just to bid on the project. There were a lot of long hours in conference rooms working out the details. When they came to inspect the plant, they looked under every stone."

"They're very dependent on these devices and they wanted to be sure that they worked the first time," says Mike Morrissette, who was in charge of the task force that put together the winning contract. "IBM needed a reliable workforce trained in the advanced semiconductor assembly technology. Another major factor was our location—they wanted the products made close to Burlington. I think



*Dogs are part of the family too. Before heading for Burlington, Maryse Oak gives final instructions to Jody.*

they were very impressed with Fairchild's capabilities and the caliber of employee we have in South Portland."

"The IBM program makes it possible to train and retain some very skilled people," adds Pete Wiberg, Industrial Relations. "Most of the jobs created by this project were filled from internal transfers or recalls. The IBM evaluation team was particularly impressed with our ability to work with high technology."

Winning the contract meant changes beyond 8 to 5 for trainees like Carol Valliere. Carol had come to Fairchild in 1973, and had been laid off when she heard about the IBM contract. Thinking that there would be openings made by trainees transferred to the IBM program, she called the plant and soon found herself on the



*Mike Klyszeiko, project director, takes a break from supervising special equipment installation.*

bus bound for Burlington to train as an assembler. Like others in the program, she had seldom been away from home before, and never by herself.

"My family encouraged me to do it, but they practically had to carry me on the bus the first night," she says. "I've never been so homesick as I was that first week. And I sure wasn't used to a maid making my bed every morning!"

Now that she's completed her training and is back home permanently, Carol thinks that the experience was good for her whole family. "I didn't think they could function without me, and I don't think they thought so, either. But the family pulled together and everything got done. My husband made a poster for the refrigerator listing everyone's chores each day, so the house was spotless when I came home. Now that I'm home, though, my name goes on the list, too!"

# Child Commuter





## AS THE WORLD SHRINKS

In October, Fairchild became the first non-government organization in the world to install a data communications system between the United States and the Far East capable of transmitting information at 50,000 bits per second. The Far East link is the latest addition to Fairchild's Global Communications Satellite System, which transmits orders and inventory information between company locations worldwide.

The global system was launched about a year ago, in conjunction with the start of the Global Logistics Program, which consolidated warehouses at Mountain View, Hong Kong and Singapore. "Both programs were designed to move information, rather than products," according to Bill Brasuell, Manager of Worldwide Telecommunications. "In the past, products had converged at Mountain View from warehouses worldwide to be shipped to customers. However, goods were often sent from one part of the world to fill orders originating in that same area."

A computerized data communications system operating via satellites changed that. The initial system transmitted 9600 bits per second, and could electronically direct orders to the appropriate warehouse. The new system, at 50,000 bits per second, increases the system's capacity by five times. Depending on use of the system, the company should save between \$8000 and \$19,000 per month on the network.



## SHOWTIME

East met West to display Fairchild's CCD (charge-coupled device) technology at the fall Electro Optics/Laser 77 Conference in Anaheim, Calif. In a joint exhibit, Mountain View's MOS/CCD Division and the Syosset, N.Y. Imaging Systems Division displayed four models of the miniature, lightweight CCD camera.

Included in the display was Imaging Systems' MV-201 camera, recognized in 1976 as one of the 100 most significant new technical products of the year by *Industrial Research* magazine.

CCD cameras from both divisions have varied applications in industrial security, law enforcement, scientific measurement and industrial control.

*Top, Bill Brasuell monitors testing on the newest Global Communications system link.*

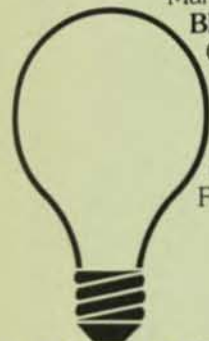
*Above, Joe Rothstein, right and John Stanfield discussed advances in Fairchild's CCD technology with the many visitors to the company's ElectroOptics show booth.*

## NEWSMAKERS

**TOM SHERBY** has been named Senior Vice President—Systems and Equipment Group (see related story, page 3) . . . **GIL AMELIO** has been promoted to Division Vice President and General Manager of the MOS/CCD Division. . . Three Assistant Corporate Controllers have been named: **JIM HEFFERNAN**, Semiconductor Products; **TOM HOWARD**, Systems and Equipment and **JERRY TAYLOR**, Corporate. . . **JOE CONSOLI** has been named Controller for the operations of the former Components Group. . . **JOHN HAMBIDGE** has been appointed General Manager, Exetron Division . . . **CHUCK JACOBY** has been appointed Marketing Director for the Time Products Division. . . Video Products Division has named **JOHN DONATONI** Marketing Director. . . **JOHN ERNSBERGER** has been named International Controller . . . **JIM McALLISTER** has become Plant Manager, Hong Kong. . . The Semiconductor Products Group has named three new Finance Managers: **MIKE O'MALLEY**, Discrete Products; **BOB CREVER**, Integrated Circuits and **MIKE RODGERS**, Semiconductor Financial Control . . . **JOE ROTHSTEIN** has been named MOS International Marketing Manager . . . Industrial Relations Directors have been named for the three new corporate groups: **JOHN SALAZAR**, Semiconductor Products Group; **BILL STRICKLAND**, Systems and Equipment Group and **ROGER BARNEY**, Strategic Planning and Technology and corporate headquarters. Roger will continue as Director of Security. He was also recently elected President of the Board of Hope Rehabilitation Services, a San Jose, Calif., United Way agency . . . **DOUG COOPER** has been named Director of the combined General and Professional Staffing departments . . . **KEN ROHNER** has been named Director of Labor Relations, Equal Opportunity and Safety. . . **FELTON BROWN** has been named Industrial Relations Manager for

domestic Semiconductor Products Group Sales . . . **HANK MAHLER** has been appointed Assistant General Manager, Manufacturing Services Division . . . **FRED SCHMIDT**, General Manager, Space and Defense Systems Division, served as Federal Systems Group United Way Campaign Chairman this year. Co-chairmen were **RUTH MILLER**, Public Relations

Manager and **JOHN BERCZUK**, FSG Operations Director. Employee participation and total contributions both rose in this year's FSG drive.



## PATENTS

Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from August-October, 1977 appear below.

### Analog Division

Terence McCaffrey, Hassan Raza, Bruce Williams  
High-gain, high-voltage transistor for linear integrated circuits  
Patent No. 4047217

### Exetron

R. Kenneth Hose, Keith Riordan, Stephen M. Martin  
Voltage multiplier circuit  
Patent No. 4053821  
Brent Nilson  
Casing for an electronic wristwatch or the like  
Patent No. 625428

### Imaging Systems Division

Ken Hoagland  
Charge-coupled device video-signal generating system  
Patent No. 4038690

### Research and Development

Wilson Alexander  
RF oscillator and modulator having regulated low harmonic output  
Patent No. 718279



## TECHNICAL WRITING AWARDS

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval.

Technical Writing Awards appearing below were given from July-September, 1977.

### Analog Division

T. Taira & L. Blaser  
"An AM/FM Radio Subsystem IC"  
*IEEE Transactions on Consumer Electronics*

### Bipolar LSI Division

F. Hennig, Hemraj K. Hingarh, David O'Brien, Peter Verhofstadt  
"Isoplanar Integrated Injection Logic: A High-performance Bipolar Technology"  
*IEEE Journal of Solid State Circuits*  
Krishna Rallapalli  
"Anatomy of a FIFO"  
*Progress*

"Expandable FIFO Buffers Improve Processor Efficiency"  
*Electronic Design*

Peter Verhofstadt & Dan Wilnai  
"One-chip CPU Packs Power of General-purpose Minicomputers"  
*Electronics*

Dan Wilnai  
"Minicomputer CPU Packed on One Chip"  
*Progress*

### Instruments and Controls Division

Peter Alfke  
"Expanding Microprocessor Output Capability"  
*Progress*

### LSI Marketing

Steve Barton  
"A Practical CCD Filter for the Separation of Luminance and Chrominance Signals in a Television Receiver"  
*IEEE Transactions on Consumer Electronics*

### Research and Development

D. W. Hess & R. C. McDonald  
"Investigation of Silicon Etching and Silicon Dioxide Bubble Formation During Silicon Oxidation in  $HC1/O_2$  Atmospheres"  
*Applied Physics Letters*  
W. B. Sander, J. M. Early, T. A. Longo  
"Low Cost High Performance T<sub>2</sub>L Dynamic RAMs"  
*Electronics*

### Systems Technology Division

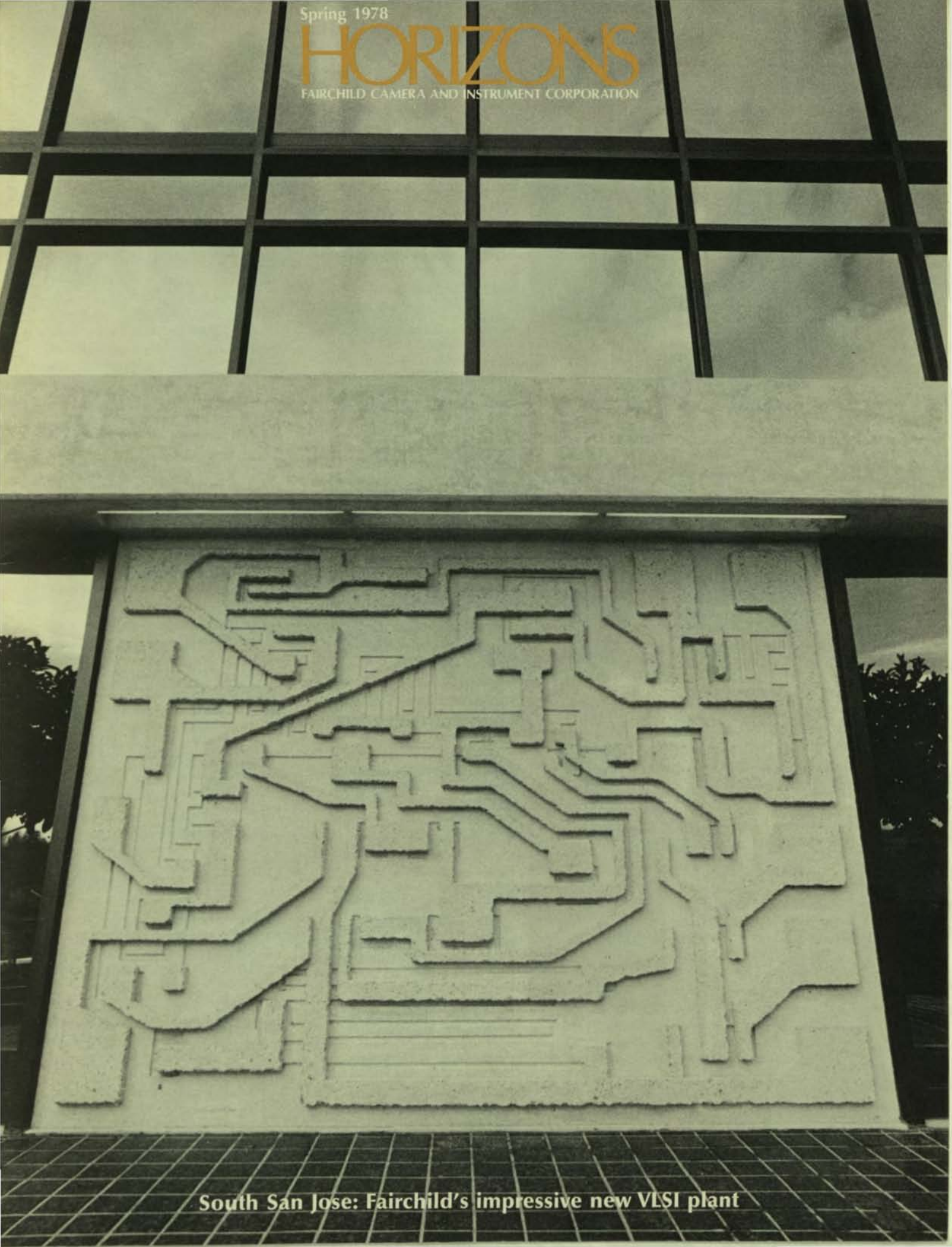
George Niu  
"A Wisely Chosen, Properly Treated Power Supply Won't Give You Grief"  
*EDN Magazine*

HAPPY  
HOLIDAYS

Spring 1978

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



South San Jose: Fairchild's impressive new VLSI plant

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**On the cover:**  
Production on state of the art circuitry has begun at the company's new VLSI facility in South San Jose, Calif. The modern 265,000-square-foot plant has the most advanced production, environmental and safety equipment available.



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**Q: What are first year?**  
**A: We want focusing on successful**

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**East Coast: IPD**—Peg Schinnerer;  
*South Portland*—Pete Wiberg;  
*Syosset*—Ruth Miller;  
*Wappingers Falls*—Dick Feeney;

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## FAIRCHILD CAMERA REPORTS 1977 RESULTS

On Feb. 2, Fairchild Camera and Instrument Corporation reported 1977 net income of \$11,162,000, or \$2.06 per share, compared with \$12,456,000, or \$2.27 per share, in 1976. Sales were a record \$460,108,000, compared with \$443,221,000 in the preceding year.

In the fourth quarter of 1977, the company earned \$4,469,000, or 83 cents per share, compared with \$5,158,000, or 94 cents per share, in the 1976 period. Sales amounted to \$116,191,000, compared with \$118,687,000 a year earlier.

Wilfred J. Corrigan, chairman and president, said, "Consolidated revenues set an all-time high in 1977 despite a sharp decline in sales of digital watches.

"During the fourth quarter, the order input rate for semiconductor components strengthened after a summer lull. At year-end, our semiconductor backlog was at its highest level in 36 months. Bookings and sales in the test systems area showed a substantial increase in 1977.

"Our main-line businesses — semiconductor components and commercial and industrial equipment — grew both in sales and profitability last year. These gains were offset by the severely depressed market for the LED (light-emitting diode) portion of the digital watch business.

"Because of curtailed demand and rapid price erosion, the company sustained major losses, including inventory write-downs, in digital watches throughout 1977. We have restructured this operation, as well as reduced our market exposure, to insure a substantial improvement in 1978.

"The Fairchild programmable video game, based on our F8™ microprocessor, achieved good market acceptance in 1977, its first full sales year.

"Among our advanced product introductions was the Fairchild 9440 Microflame™, a complete 16-bit microprocessor capable of executing minicomputer instructions with full minicomputer performance.

"The company also put into production three significant memory products: The 4K (4,096-bit) bipolar

static RAM (random-access memory), the fastest semiconductor memory of that density; the 16K MOS (metal-oxide semiconductor) RAM; and the 65K CCD (charge-coupled device), the first such product designed for the bulk memory market.

"Fairchild's management of assets improved considerably in 1977, with total inventories reduced by 19 percent and accounts receivable by 12 percent, generating strong positive cash flow.

"At year-end, working capital amounted to \$121,187,000, shareholders' equity \$184,865,000, and cash and temporary cash investments \$43,041,000. Capital expenditures in 1977 were \$22,047,000, while spending for research, development and engineering approximated \$49,700,000."

## 9440 MICROPROCESSOR ANNOUNCED

Fairchild has begun initial shipments of its 9440 Microflame™ 16-bit microprocessor, the industry's first such product that can execute a minicomputer instruction set with minicomputer performance.

The 9440 is a complete minicomputer CPU on one chip, and is based on Fairchild's Isoplanar integrated injection logic (I<sup>3</sup>L™) technology. Its computing power and performance are equivalent to minicomputers constructed with TTL integrated circuits.

Also developed was an initial software package called FIRE I™, part of an introductory kit which will enable users to construct a working system at the board level in their own board format.

## WALTER CURLEY NEW DIRECTOR

Walter J. P. Curley, former U.S. ambassador to Ireland, has been elected to the Fairchild Board of Directors. A native of Pittsburgh, Pa., he served as ambassador from September, 1975 to May, 1977. In 1973-74, he served as commissioner of public events and chief of protocol for New York City, where he and his family have lived since 1957.

He holds a Bachelor of Arts degree from Yale University, a Master's degree in Business Administration from Harvard University and an honorary doctorate in

Law from Trinity University, Dublin.

He is currently engaged in private investment and venture capital operations, and is director of the Fiduciary Trust Company of New York, the Investment Bank of Ireland and the Intercontinental Energy Corporation.

## LICENSING AGREEMENT BETWEEN FAIRCHILD, SANYO

Sanyo Electric Co. and Tokyo Sanyo Electric have reached agreement with Fairchild on a technical exchange and cross-licensing agreement in which information on Fairchild's F8™ microprocessor products would be made available to Sanyo, and information on Sanyo's molybdenum gate, non-volatile memory products would be made available to Fairchild.

Under the non-exclusive agreement, Fairchild will provide Sanyo masks, tape sets, software and technical support for the F8.

Sanyo will become the first second source of the F8 in Japan, and is scheduled to manufacture the microprocessor at Tokyo Sanyo.

The F8 microprocessor, which uses Fairchild's proprietary Isoplanar N-channel MOS process, has superior advantages in specialized controller applications for consumer and other products.

## FAIRCHILD TO ACQUIRE 100 PERCENT OF JOINT VENTURE

TDK Electronics Co., Ltd., of Tokyo has agreed with Fairchild in principle to arrangements whereby TDK-Fairchild Corporation, a joint-venture between the two companies will become a wholly-owned subsidiary of Fairchild.

TDK-Fairchild was formed in 1972 to market semiconductor components and related products in Japan. During the past five years, the joint venture has supplied integrated circuits and other semiconductor devices to the Japanese market. Terms of the agreement were not disclosed.

# On The Way to South San Jose



**MOS/CCD Division starts operations in Fairchild's modern VLSI plant**

About a year ago, the MOS/CCD Division began to expand and establish a new line at Fairchild's newest plant at South San Jose, Calif. It looks like they're going to stay.

The reasons are plenty. South San Jose is Fairchild's most advanced wafer fab production facility. It was conceived and designed to incorporate VLSI (very large scale integration) technological advances and has state of the art four-inch wafer production equipment. It also has the best in environmental and safety controls.

VLSI is one of the most rapidly expanding technological areas in the semiconductor industry. Each individual chip has thousands of circuit functions, making it more than four times more complex in capacity than the LSI (large scale integration) circuit. VLSI technology is used in single chip microcomputers and large scale CCD (charged coupled device) and random access memories (RAMs).

"From the beginning, South San Jose was designed to be a VLSI facility," said Dr. Gil Amelio, MOS/CCD Division Vice President and General Manager. "When the division moved in, we installed the best equipment, used the best people and began producing one of the most exciting products in the history of the semiconductor industry—the 16K RAM. In the next few months, we will begin producing 65K CCD memories, where Fairchild leads the industry. We are producing state of the art products in a state of the art facility."

Division personnel first moved into the building in early 1977. A handful of managers directed installation of equipment and design of fab and office

areas in a portion of the 265,000-square-foot plant. The manufacturing area was designed exclusively to produce four-inch wafers and is currently the largest wafer fab at Fairchild.

In April, the first production employees arrived from Mountain View. By October, manufacturing was producing a respectable volume of products. The rest of the production and management personnel joined their co-workers in South San Jose in January.

Their number will double as production is beefed up in 1978 and the rest of the division's administration moves from Mountain View. By the end of this year, MOS/CCD plans to occupy half of the building, or both floors of one wing of the \$16 million plant.

Except for some CCD operations which will remain in Palo Alto, the entire MOS/CCD Division in California will be transferred to South San Jose. The division's other manufacturing facility in Wappingers Falls, New York, will continue to expand to meet growing needs and will not be affected by the move.

The new facilities are impressive and clean, and the procedures to keep them that way are strict, according to Doug McBurnie, Division Manufacturing Manager. No one can enter the production area without a bonnet, booties and safety glasses, and no one leaves without removing the attire in a special robing room.

Every effort has been made to reduce traffic and the particulate level in the clean areas. Traffic in the halls is minimized by placing dumbwaiters at strategic locations to transport chemicals and supplies from the basement. Liquid nitrogen and other process gases are brought into areas where needed via overhead pipes.

Cleanliness is further protected through the use of automated deionized water generators, one of the most advanced purification processes available. The water is maintained in a recirculating loop and recleaned until it is used. Air is filtered three times before it



*Clockwise from above: Manufacturing Manager Jim Hartman, left, discusses production plans with Plant Manager Dan Barbato; visitors check in at the building's spacious front lobby; Sandy Taylor sets one of South San Jose's precise diffusion furnaces.*







1.



2.



3.



4.



5.

4. Security's Mary Kay Carlson can monitor activities in and around the entire building on one bank of screens.

5. Special clean room clothing helps maintain a low particulate level.

6. The deionized water system provides water more pure than drinking water for use in the fab areas.



6.



7.



3. Fab areas are entered through automatic sliding doors, which prevent the vacuum created by regular hinged doors.



7. Facilities Manager Tom Ellerbee checks the system that brings gases, de-smogged air into areas of the building through pipes housed in a 10-foot section between floors.

8. Paul Hopkins, Facilities, loads a chemical cart, which is unloaded in the fab area through doors on the inside of a specially-designed chemical closet.

is pumped through the air conditioning system, and all doors into the fab area are the automatic sliding-type to avoid the vacuum created by hinged doors.

Even the layout of the production area is designed to cut down on traffic and particulates and handle volume production, according to Dan Barbato, Plant Manager.

"The process areas are separated so we can control activity and environment," he said. "Diffusion, masking, cleaning and thin films are in different rooms, but located so that there is a minimum amount of wafer movement."

Safety is an important part of this clean environment. Computer controlled combustible gas sensors constantly monitor the area and sound an alarm if there is a leak. Also, environmental controls meet or exceed existing and future OSHA state and local regulations.

"Used chemicals and waste water are collected and treated separately before they enter the industrial waste system," said Dan. "In addition, some chemicals, fluorides and solvents are collected separately and not dumped into the city system at all. These are sold to a private company specializing in treating these byproducts. All the production equipment was selected with conservation of water and other resources in mind."

The production equipment at South San Jose is a collection of the most advanced four-inch wafer production machinery in the industry.

"We have incorporated the latest in production equipment and process ideas into one fab area," said Doug. "Most plants have one or two new pieces of modern equipment—we have them all under one roof."

Using new, modern equipment in all process areas insures high product quality at South San Jose. Many are computer controlled for precision and easy use, and leading to fewer reworks, or incorrectly processed wafers.

Heading the list of the innovative types of equipment are precise computer controlled projection alignment machines which photographically

transfer the die patterns to the wafer. The equipment reduces defect and increases the life of the photo mask since it does not touch the wafer.

The new diffusion furnaces are also computer controlled and are precise in temperature and time. Computer monitoring reduces the need for constant checking by an operator and the possibility of mistakes in the "recipe", or time and amount of chemicals used in the furnace.

Other modern equipment includes ion implantation machines and sputter evaporators. Ion implantators precisely control the location and amount of ions buried in the surface of the wafer. Their accuracy allows for the tricky, delicate design of circuits in the layers of the wafer that was not possible with a less accurate system.

The sputter evaporators at the plant are also very accurate. They deposit a thin, precisely controlled layer of aluminum on the wafer at a slightly faster throughput rate than other machine models. Also, coverage is uniform with no gaps or holes.

"Manufacturing four-inch wafers gives approximately twice the yield of three-inch wafers as the surface area is larger," says Dan. "We can process more products using less floor space."


Future products include very high speed static memories using advanced technologies. Fairchild is a leader in the VLSI product area, and Gil Amelio intends to maintain that position.

"We will equip the facility as necessary for each new job," he said. "Some of the more advanced technology will be developed here and we will provide the best in equipment and manufacturing to back up this research."


"We are totally committed to expansion in South San Jose. To succeed in the future, we have to exhibit leadership in the industry, and South San Jose will be an important key."




Training Department Manager Steve Gale demonstrates use of the videotape lab to a customer from Taiwan.



Cloy Miller gives the opening course lecture in Sentry programming.



Diane Lynch, who runs the Center's television studio, sets up a taping session.



Center students get an overview of the lab's Sentry system from Sergio Sepulveda, Tester Maintenance and Diagnostics instructor.

# Lights, Camera... Schematics?

TV, Hands-On Practice Part of Curriculum at Systems Training Center

**A** Honeywell service engineer looked up from a schematic and remarked to his classmates, "I'm going through this training session for the second time, getting updated on some new Fairchild equipment we just bought. I can tell you that this is the best school in the test system industry. They're really dedicated to training people to use their equipment to its full capability."

The "school" is actually the Instrumentation and Systems Group Training Center, which puts maintenance and programming expertise on Fairchild semiconductor test systems as close as a customer's own service staff. Organized in 1972 with one instructor and one classroom, the center has grown into an 8000-square-foot educational facility with a staff of 15 at the Instrumentation and Systems Group headquarters in San Jose, Calif. It boasts a television studio with videotape facilities, six classrooms, and three operating test systems — two Sentry™ and one Xincom — for hands-on training.

In five years of operation, more than 5000 management, engineering, and service personnel from customers including IBM, Intel and Xerox, along with new Fairchild Systems maintenance personnel have "graduated" from Fairchild Systems service courses. A large number of these graduates have also come from other Fairchild divisions, which have purchased Systems testers for use in manufacturing our own components and circuits. A satellite center to serve Europe will open this month in Munich, with a third center planned for Japan later this year.

Sixty class sessions covering subjects ranging from tester maintenance and programming to sales techniques were presented during the second half of 1977. New system introductions and last year's record sales level for the Group will mean nearly a 50 percent increase in class offerings this year, according to Dr. Steve Gale, Systems Training Department Manager.

"Our classes are always full — there seems to be no end to the number of trained personnel our customers really need," Steve says. "As our systems get more sophisticated and our sales grow, we must add more classes to meet the demand."

The center's basic courses cover programming and maintenance of Sentry and Xicom semiconductor test systems. "When customers purchase one of our systems," Steve explains, "they receive free training credits, which permit them to send their people to our center. Here they learn to operate the test system and program it to test any of the current state-of-the-art integrated circuits. They can also study hardware operation, maintenance, diagnostics, and calibration techniques. Our goal is to provide our customers with the most effective training."

Instruction in both the two and three-week programming classes and the five-week maintenance course runs about sixty percent classroom and forty percent "hands-on" training, using the center's three test systems.

During the programming course, managers and test engineers from customer companies and other Fairchild divisions learn program writing, system operation, and the specifics of writing programs to fit the devices their companies will be testing on the Fairchild system.

"The best way to learn programming is by trying to debug a program you've written," Steve says, "so, our students spend a major part of the second week of the course working in the lab with their programs until they run."

In the five-week maintenance course, two weeks are spent on the FST-2 computer and peripherals, with the remaining three weeks devoted to the Sentry tester itself. Training center instructors work closely with the Group field service representative to determine common field problems. (Instructors have been known to purposely use similar situations during system trouble shooting.)

Following completion of the course, the attending managers and engineers spend from one day to a week on the San Jose production floor checking and accepting the system their company has purchased.

Customer training has not eliminated the need for qualified Fairchild Systems service people in the field. Currently, about 60 are spread throughout the world. Two training center instructors work with new Fairchild service personnel full time, teaching separate courses designed to specifically meet their needs. The classes range from one to six weeks, and include time on the production floor, learning the equipment and new options from the ground up.

"Our systems have about 90 to 95 percent uptime nationwide," says Wayne Carlson, National Customer Support Manager, "but when a system goes down, it always seems to be a crisis. We're working with very sophisticated technology, so if customers haven't been through our training, they can make errors in programming that will stop production. Once they've been through our training center, we can usually trouble shoot over the phone, and save them valuable time."

A recent addition to the center curriculum has been training seminars for both new and experienced Instrumentation and Systems Group sales representatives. "We now have an instructor who devotes full time to sales training," says Steve. "We cover topics including our product line, analysis of competing equipment, and the art of negotiation."

Students at the center spend a good deal of time watching television, but it isn't for relaxation. The Systems Training Department has developed one of the most effective instructional television systems available in the industry, and brings trainees current technical information on videotape. TV segments supplement the instructor training in the classroom, covering diagnostics and calibration to sales presentation techniques.

By using two studio cameras, the center can tape instructor and engineer presentations either in the San Jose studio or at field locations. In the studio, sophisticated audio and video recording equipment allows production of high quality audio/visual training aids.

"Television teaching in industry is becoming more common," say Steve, "but it's still pretty rare in our industry. It's extremely practical for service training, because we use many maintenance aids. It also saves a lot of class time that used to be lost while the instructor passed around a piece of equipment or discussed a schematic with each student — now, we just put the information on tape."

Videotaping capability has also made possible the creation of a large tape library accompanied with workbooks for self-paced learning. Students who cannot attend a scheduled class, or who need to brush up on a particular system, may cover such subjects as programming fundamentals or tester theory and maintenance at the center. Customers frequently buy these tapes for use by their service personnel after they complete Fairchild courses.

Since training is essentially part of the system sale, free credits are included with each test system sold. Center instructors keep current by spending time with the group's engineering and field service staffs between courses. "All our instructors are experienced in either maintenance or programming field problems," Steve points out, "so they are very familiar with the types of problems their students are likely to face. However, with the complexity of our systems increasing every year, they themselves need periodic hands-on experience to provide the customer with the best training."



# An Interview with Tom Sherby:

**“The group, and my job, were created in recognition of the importance of the systems and equipment business to Fairchild.”**

## **Tom Sherby, head of the new Systems and Equipment Group, talks about joining Fairchild and his plans for 1978**

*When the Systems and Equipment Group was formed as part of last fall's corporate reorganization, a search began for a person to head the new group as Senior Vice President. In November, Dr. Thomas A. Sherby took the job. Tom, formerly Senior Vice President—Operations for Dataproducts Corporation, Woodland Hills, Calif., and for ten years before that with NCR and its subsidiaries, assumed responsibility for Fairchild's end-equipment groups and divisions, including the Instrumentation and Systems Group, the Government and Industrial Products Group and the Video Products Division.*

*He has held a variety of engineering and management positions in the computer systems industry during his career. Tom holds an M.B.A. from George Washington University and a Ph.D. in engineering from the University of Pittsburgh. In his first interview since coming to Fairchild, Tom discusses his goals for 1978 and his personal and professional motivations.*

**Q:** What attracted you to Fairchild?

**A:** Two things, both of which are, I think, equally important. First, I came because of the very impressive advances Fairchild is making in both systems and component technology. My background is in systems, and I think semiconductor companies are quickly becoming systems companies, as more and more functions are put onto a single chip. As you do this, the chip evolves from performing a simple gating type electronic function through performing groups of more complex logic functions to becoming a system itself, providing the entire solution to a customer's problem.

Fairchild has made a serious commitment to VLSI technology and has established a substantial customer base for systems through its Sentry™ and Xincom product lines. I think my experience and background will provide a good balance to our strong semiconductor management as Fairchild moves further into the systems business.

The move to Fairchild also offered me an opportunity to work in a very entrepreneurial company, which is critical in any time of technical transition. In order to make the jump from components to systems successfully, a company must first be willing to take the risk, which Fairchild is, and second have a good base from which to jump. The systems and end-equipment business at Fairchild has doubled in size since 1976 and now represents about one-third of Fairchild's total business. So, I think we are in an excellent position, both

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**“Another thing I like about Fairchild is the people—they are exciting and very bright. I enjoy working in this type of atmosphere.”**

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technically and financially, to expand the use of our technology in the end-equipment markets.

Another thing I like about Fairchild is the people—they are exciting and very bright. I enjoy working in this type of atmosphere.

**Q:** What is the significance of the creation of the Systems and Equipment Group?

**A:** It's recognition of the size and importance of the systems and end-equipment business at Fairchild. As an example, last year the Instrumentation and Systems Group in San Jose had record levels of both sales and profits. End products are a great market for Fairchild to participate in, and are a big and growing market with excellent returns on sales. The group, and my job, were created in recognition of the importance of this market and to help our part of the business grow faster. That's what we intend to do in 1978.

**Q:** What are your objectives for your first year?

**A:** We want to increase profits by focusing on a limited number of successful large businesses. It takes as much effort to manage a small business as a large one, but you don't get as much return for the time spent. One of the things I've been concentrating on since I started is a review of the various markets in which the divisions in my group compete, with an eye to focusing our efforts where they will produce the most profit. In the main, all three areas are in good shape, but some carefully planned redirection may take place here and there. We plan to have this process completed this year.

In addition to the evaluation of markets, of course, we'll be moving ahead with the major product introduction planned before I came.

The military area of Government and Industrial Products will be proceeding pretty much on plans already in place, since new products can take from three to five years to be developed and work their way into government use. IPD will continue its very successful development of portable projectors, and will be announcing a major new consumer-oriented rear screen projector during the second half.

In Video Products, I believe our strategy to undersupply the Christmas market was absolutely right. Channel F™ sold well during the holiday shopping season, and we have less inventory than other manufacturers because we managed our business better. However, we do want to do more to command the public's attention this year. We'll be putting our name in front of the consumers more often in 1978, and concentrate on really grabbing their attention when they go into a store. We were the first company with a

*Hank Kursawe, General Supervisor of Mechanical Assembly at Syosset and a 36-year Fairchild veteran, shows Tom Sherby the panoramic camera assembly area during Tom's recent tour of East Coast plants.*



programmable game, and we want to continue to capitalize on that strength.

The Instrumentation and Systems Group will be moving into the linear test business, and will be adding a number of support products for the current tester lines. These are very logical technological expansions, which take advantage of System's strong market position. As a general strategy for 1978, we want to expand Fairchild's participation in the total systems and equipment area, by internal growth and acquisition.

**Q:** What are your criteria in evaluating a potential acquisition?

**A:** First, the company would have to give us a sizable presence in a market we are not now involved in, not through a broad number of small product lines, but with a limited number of lines having substantial volume. That market would have to have a relatively high growth rate—probably 20 to 30 percent annually.

**Q:** Let's talk about your reactions to your new job for a moment. How does your image of Fairchild now compare to the one you formed before you came here?

**A:** I found absolutely no surprises. Before I became interested in the company as a place to work, I perceived Fairchild as a high-technology company, well-known in its field, which had the ups and downs associated with a very cyclical industry. Because we are so surrounded, at least here on the West Coast, with our own major industry, we tend to think that the problems we have are only Fairchild

problems. They aren't. Business cycles, for instance, affect all industries, ours to a greater extent than others. We need to take a much more positive image of ourselves.

**Q:** How would you describe your management style?

**A:** I believe that success comes from keeping momentum. You can never slow down and enjoy the fruits of what you did last week—you've got to be continually concerned about what you're going to do next week and how you can do it better. However, without motivated people, that momentum will never get going in the first place, so I put a high value on recognition of people's contributions. Recognition of achievements develops pride, which keeps people charging, thinking about what they are going to do tomorrow, rather than looking back all the time. Recognition also means letting people know you've considered their input very carefully in making a decision, even when the decision goes against their recommendation. If they feel their contributions are an important part of your decision-making process, that's their motivation.

A very important element in the whole thing is having fun. If you don't enjoy what you do, you're not going to be successful. You're in the office eight or



ten hours a day, and that's the major portion of your life. You'd better enjoy it while you're there. If you don't look forward to going to the office every day, I think you should find something else to do.

**Q:** How do you recognize a good manager?

**A:** A good manager has to be willing to take risks, but be intelligent enough to know just what the odds are for success. An equally necessary characteristic of a good manager is empathy for people. Some would call this understanding of

people, but I think it's more than that. Managers have to be able to put themselves in the positions of the people they supervise. In one day, you might deal with 50 different people, and need to take on 10 different management styles. You have to be sensitive enough to know which style is appropriate at which time.

One of the biggest problems in coming into an organization this size is getting to know the people—once you know the players, it's a lot easier to be the coach. I think we have an excellent group of people in the Systems and Equipment



Group, and I've benefitted a lot from working with them over the past few months. As a matter of fact, I've learned more from people I've worked with in my professional career than I've learned anywhere else.

**Q:** How do you balance the demands made on you by your job and your need for a private life?

**A:** If you enjoy what you're doing, you don't really find your job that stressful. I like my work and things I do outside of the office are similar in many ways. I like to play tennis, for instance, but I don't like to play doubles. Singles is a very competitive, fast-moving game that requires a lot of strategic thinking, plus the psychology of knowing your opponent. I've often asked myself what I would do if I had all the choices in the world, but I don't think I'd choose something much different.





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## Personal Computing

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Things are changing so fast in the hobbyist computer market that 1975 and 1976 are now nostalgically referred to as "the good old days" by those who first recognized the potential popularity of home computers. The spring of 1977 is quite likely to be remembered as the time when the home computer market began changing from a small, hobby kit market to a huge mass market for packaged systems.

It all began about three years ago when, virtually unnoticed, the first "hobbyist" computer kit appeared. Long a dream of "computerniks," such an affordable computer was made possible by two developments: the revolutionary,

### **The 'computernik' fact that's becoming a home appliance**

low-priced microprocessor (a-computer-on-a-chip), and the high-capacity semiconductor memory.

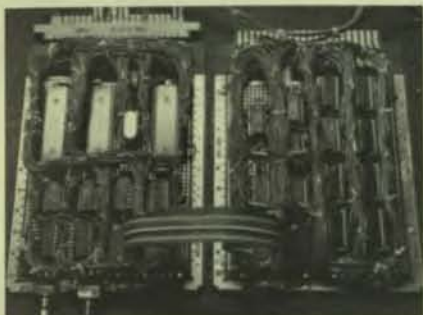
Kits containing this circuitry soon began to appear at prices ranging from \$300-\$2000. By plugging in a keyboard, a TV-set display and other peripheral gear, the home experimenter suddenly had a computing tool more powerful than the largest computer in existence just fifteen years ago.

Soon no home will be without one. The personal computer market will probably exceed \$1 billion in five years,

and the majority of that market will involve non-professional uses in the home. These computers can keep track of just about anything from biorhythms to the latest quotations on coffee commodities, from weather reports to shopping lists. The computer can have water poured into the dog's dish at a certain hour, turn the lights on or off, follow a lawn and plant watering schedule, keep a monthly calendar or daily schedule of events and keep and inventory of the food in the pantry.

Fairchild is becoming heavily involved in the new industry and an enthusiastic group of Fairchild employees have been early customers. The Video Products





Opposite page and top, John Conover, a self-proclaimed tinkerer, fine-tunes his homebrewed computer. Above, John's system is built around a Fairchild F8 microprocessor.

## More Personal Computing

Division, of course, is currently concentrating on the Channel F™ Video Entertainment System, the programmable television game that has been called the forerunner of the home computer. Channel F's plug-in Videocarts™ are now able to teach mathematics as well as challenge you to blackjack.

At the heart of a number of "homebrew" computers is the Fairchild F8™ microprocessor, the brain of the system. The F8 is also being supplied to several companies entering the home computer manufacturing business, including Umtech in Sunnyvale, Calif., producers of the recently-introduced Videobrain personal home computer. Van Lewing, LSI Group Microcomputer Marketing Manager, envisions a day when we'll be able to buy cassette-like information modules for home computers on everything from tax preparation to musical scoring, in the same way we now buy record albums.

Before wide public acceptance is possible, though, Van believes people need to get used to home computers. "As calculators conditioned us to push-button microwave ovens, we are now

becoming familiar with programmable television games. These will, in turn, lead us to the home computer."

A small but enthusiastic group of Fairchild engineers and technicians has developed a network of homebrew computers in the San Francisco Bay Area. One such "computernik" is John Conover, a Linear Division design engineer who works in Mountain View. His involvement with the design of peripheral chips triggered his interest in the personal computer field, and he was one of the first at Fairchild to build his own home system.

"I'm a tinkerer at heart," says John, "and the computer was a new toy." It took him about a year to build his system, with the time divided nearly equally between building and programming. His system involves an F8 microprocessor, keyboard and video display which is based on a Fairchild linear circuit. His system displays through his television set, because that is currently the most economical way to operate. He claims that "the computer was easy to build—the hardest thing to do was to learn how the TV worked.

"Someone could spend \$5000 a year on this hobby, but it's possible to get started for under \$200," John says. He's an example of that statement, having built his personal computer on a shoestring budget. Additions to his system over the past year have come from salvaged parts and gifts from friends.

"Hobbyists try to reduce costs by trading parts, scrounging and looking for deals on equipment." There is, in fact, a rapidly growing number of people, particularly in the electronics industry, who are very much intrigued with and involved in homebrews. There are now at least 80 computer stores in the San Francisco Bay Area alone.

Who is standing in line in these places? John believes computerniks come from all walks of life, but most can be categorized as either professionals, tinkerers or gamers. All want to use the computer to make their lives easier or more fun.

John's system, for example, can be a clock that never loses more than 1/1000 of a second, a computer with ability to do homework, a news service decoder, an income tax computer, and a composer and player of music. He has even played video tennis long distance with another hobbyist based in Phoenix—all with the able assistance of his very own computer.

John has further plans for his newest household helper, including giving "smarts" to the thermostat in the heating

and air conditioning units. This will not only control the in-home environment, but also reduce monthly costs. Almost finished is a burglar and fire alarm system which will dial the appropriate police or fire department to report an emergency. He also hopes to expand his system to benefit the handicapped, by developing a Braille translator or reader using a light pen similar to those used in supermarkets.

And so the tinkerers may be opening new doors for all of us. "If you know a little algebra and can read, you can build one," says John. "Just start with page one of 'Guide to Programming' and jump in."

*Below, customers are filling dozens of stores like this Byte Shop in Mountain View, picking up the latest in hardware and how-to-do-it manuals. Names such as Digital Deli and Proms and Roms Electronics reflect the creativity of the computerniks.*



# New Face in Las Vegas

A group of five video slot machines at the Las Vegas Hilton Hotel boasts a jackpot of a quarter of a million dollars—the largest in Nevada. No one has ever won the whole thing.

Whether the instant fortune goes to a lucky "one-armed bandit" addict or a hitch-hiking college student betting his last dollar will be decided by a Fairchild bipolar PROM (programmable read-only memory) built into the slot machine by its manufacturer, Fortune Coin Co. of Las Vegas.

Fortune Coin, a small company with only 22 employees, has become the largest Nevada slot machine manufacturer in just a year and a half. Since its first machine went on the market in mid-1976, Fortune Coin has been using Fairchild components and LSI circuits.

The company, which has recently moved into quarters twice the size of its original facilities, produces a line of video slot machines which display the traditional lines of cherries and lemons on a television screen. Video poker has recently been added, with keno, blackjack and entirely automated bingo in the works for later this year.

*Walt Fraley inspects slot machine shells that have just been moved into Fortune Coin's new plant. The new facility offers more than twice the operating space of the company's first location.*



Marketing a new product in the slot-machine saturated city of Las Vegas would appear to have the same chance of success as selling the proverbial snow to Eskimos. Not so, says Walt Fraley, Vice President and General Manager at Fortune Coin.

"We didn't start out to fill a need in the market," he says. "We produced a product and generated a market for it. We persuaded half a dozen clubs to test our machines free, and we let the revenue they produced sell them. With our video display we had a novelty—a new kind of slot machine. That's what makes money in Las Vegas. Now, we have people coming to us asking for machines with specific games."

Walt, who is the primary engineering impetus behind Fortune Coin's success, got his inside knowledge of the workings of the gambling industry from running a company which manufactured a blackjack game. When entrepreneur Stan Fulton, now President of Fortune Coin, decided he'd like to give the business a try, he and Walt formed a partnership and set about developing their first product.

*Pauline McFadden, right, shows Purchasing Agent Lil Black some new components just received from Fairchild.*



**Market Report:** A continuing series of articles showing how our customers use our products.





Their first model was ready for Nevada Gaming Commission inspection at the end of 1975, with final approval finally coming along ten months later, in August 1976.

"There's something of a 'Catch-22' in getting Gaming Commission approval," says Walt. "You can't be licensed until you have something to make, but you can't manufacture it until it's licensed." Commission evaluations involve assuring the honesty of the product by confirming that it pays out randomly, seeing that the machine generates sufficient revenue during a test period (standard machines pay back between 80 and 97 percent) and making sure acceptable manufacturing methods are used.

*Ken Peek tests two boards for poker, Fortune Coin's newest game.*



### **Fairchild Components Part of Small Company's Success Story**

"The use of a PROM makes the honesty and frequency of the payback schedule much easier to explain to the Gaming Commission," Walt continues. "There's a minimum of circuitry for their electronics people to check out." Use of semiconductor circuits instead of mechanical parts that break or have to be oiled also makes machine maintenance much easier. Uptime is almost 100 percent.

Two bipolar PROMs in each machine control the formation of pictures on the screen and determine which characters will be displayed. Also in use are Fairchild transistors, which control the lights behind the screen, and several TTL and Low Power Schottky interface circuitry devices, linking the logic and memory functions within the machine. Currently under test at Fortune Coin is a Fairchild Field Programmable Logic Array (FPLA), an LSI chip which replaces a number of TTL logic components and controls the PROM-created display and how often winning combinations will appear.

"Initially, we selected our suppliers on the basis of price," says Lil Black, purchasing agent. "While Fairchild is competitive in that area, we have also been impressed with their service. Purchasing out here in the 'boondocks' is no easy task — we have found it very difficult to get sales and engineering support since we moved to Las Vegas from San Diego, but Fairchild has always provided the support we needed."

When no one's feeding the Fortune Coin video slot machines, the screen flashes inviting phrases including "this may be your lucky day." Right now, in fact, someone may be reading that as he or she approaches the machines in the Las Vegas Hilton which promise to pay \$250,000 to the owner of the lucky silver dollar. The odds that this gambler will strike it rich? About 16 million to one.

# May I have the envelope, please?



Each year, many of our product groups and divisions select outstanding field sales and support people. While the actual awards vary, each recognizes excellence in performance. So far this

year, Fairchild's Semiconductor Products Group, Video Products Division and Industrial Products Division have conferred awards, several of which are named the Sherman Fairchild Excalibur Award in honor of our company's founder. The Excalibur Award includes a silver and gold sword imbedded in a block of cut and polished Steuben crystal, and is accompanied by a \$1000 check.

## SEMICONDUCTOR PRODUCTS GROUP

### 1976, 1977 Semiconductor Products Sales

The Sherman Fairchild Excalibur Award for Sales is not presented solely for exceeding a sales quota. The criteria include advancements in job performance, communication effectiveness with both the plant and customers and total representation of Fairchild in the marketplace.

Field sales representatives and field applications engineers, except for regional and area managers, are eligible for the award honoring excellence in sales. Candidates are nominated by regional sales managers, with winners selected by a special committee of Group management, marketing and sales executives.



Chairman and President Wilf Corrigan, second from right, congratulates sales award winners Dick Parks, Jim Sanders and Pete Onstad.

In 1976, semiconductor sales included both Components and LSI. In 1977, each became a separate part of the Semiconductor Products Group. Because of the split, two awards were given for 1977—one for Components and one for LSI.

Pete Onstad, Account Executive, Minneapolis Sales Office, was awarded the 1976 Excalibur Award. He is presently responsible for sales to all divisions of Control Data and MPI in Minneapolis and was the Components Salesman of the Month in February 1977. He has been with Fairchild 16 years.

The Excalibur Award for Components in 1977 went to Jim Sanders, District Manager, Houston Sales Office. He started his Fairchild career four years ago as a Field Application Engineer and soon shifted to field sales. He is presently responsible for sales in southern Texas. Jim was also chosen Components Salesman of the month in March, 1977.

The LSI Excalibur winner was Richard (Dick) Parks, Senior Engineer, Minneapolis Sales Office. He is presently responsible for sales in the Minneapolis region and is a five-year employee with Fairchild. During 1977, Dick carried the largest LSI quota and is highly respected as a sales person by his customers and Fairchild plant personnel.

The winners received their awards at the Semiconductor Products Group Sherman Fairchild Awards banquet February 10 in Palo Alto, Calif.

### 1976, 1977 Semiconductor Products Sales Support

Behind every good sales person is a good sales support person. The Sherman Fairchild Excalibur Award for

professionalism in sales support recognizes the person who has shown outstanding responsiveness to field sales needs, superior planning and execution of sales programs and top performance in the interface between field sales, the customer and the factory. The selection is made by the field sales force.

The 1976 and 1977 winners were chosen from among the members of the support staff, which includes customer relations, product marketing engineers and sample coordinators. Managers are not eligible for the award.





Alan Ankerbrand, left, and Mary Beth Rotermund receive congratulations from John Duffy, Vice President, Worldwide Semiconductor Marketing.



Bud Dalton, recipient of IPD's 1977 Salesman of the Year Award.



John Pack, left, receives his Excalibur Award from George Wells, Senior Vice President, Semiconductor Products Group.

The winner for 1976 is Mary Beth Rotermund, recently promoted to Market Development Program manager in the Business Development Department, Semiconductor Products Group. Prior to this promotion, she was a Senior Product

marketing Engineer for Linear Division. Mary Beth has been with Fairchild two years.

Alan Ankerbrand, Senior Product Marketing Engineer, Discrete Products Division, is the 1977 Sales Support Person of the Year. He has been with Fairchild for 15 years. According to his co-workers and supervisors, Alan knows almost every phase of the Fairchild operation.

Sales support winners also received the Excalibur Award at the Sherman Fairchild Awards banquet on February 10.

**INDUSTRIAL PRODUCTS DIVISION**

Maurice J. (Bud) Dalton, Industrial Products Division Midwest Regional Manager, Audio Visual Systems, is the 1977 winner of the Salesman of the Year Award in the Industrial Products Division. But the award is not new to him. He has achieved the honor four other times—in 1970, 1971, 1974 and 1976.

The criterion for winning is simple—write the largest amount of sales. For 1977, Bud wrote a record \$5 million in audio visual equipment business.

Bud received the award Jan. 14 at the National Audio Visual Association Show in Houston, Texas. The award is a wooden plaque with his name and sales achievements inscribed on a gold plate. Steve Blucher, Marketing Manager, IPD, made the presentation.

According to Bud, he always shoots for the top sales of the division. "I have four kids in college and two of my daughters are getting married soon," he said. "I have to sell the most."

**TIME PRODUCTS DIVISION AND VIDEO PRODUCTS DIVISION**

An exceptional sales record wasn't the only thing that earned John Pack the 1977 Time Products and Video Products Divisions' Sherman Fairchild Excalibur Award.

The sales representative from the Atlanta sales office also had to manage his sales territory exceptionally well, earn new distribution for Fairchild clocks, watches and games, and excel in promoting and advertising the products at the retail level.

John received the Excalibur Award from George Wells, Senior Vice President, Semiconductor Products, at the Jan. 4 sales meeting preceeding the Consumer Electronics Show in Las Vegas.

John was chosen by a committee of national and general sales managers. His name was one of 15 submitted to the special committee by regional sales managers.

Winning the award came as a complete surprise to John, who has been with Fairchild since 1976. In January, he was also surprised with a promotion to Southeast Area Manager for Video Products, headquartered in Atlanta.



**SPOTLIGHT**

**Fairchild Groups, Divisions honor sales excellence**

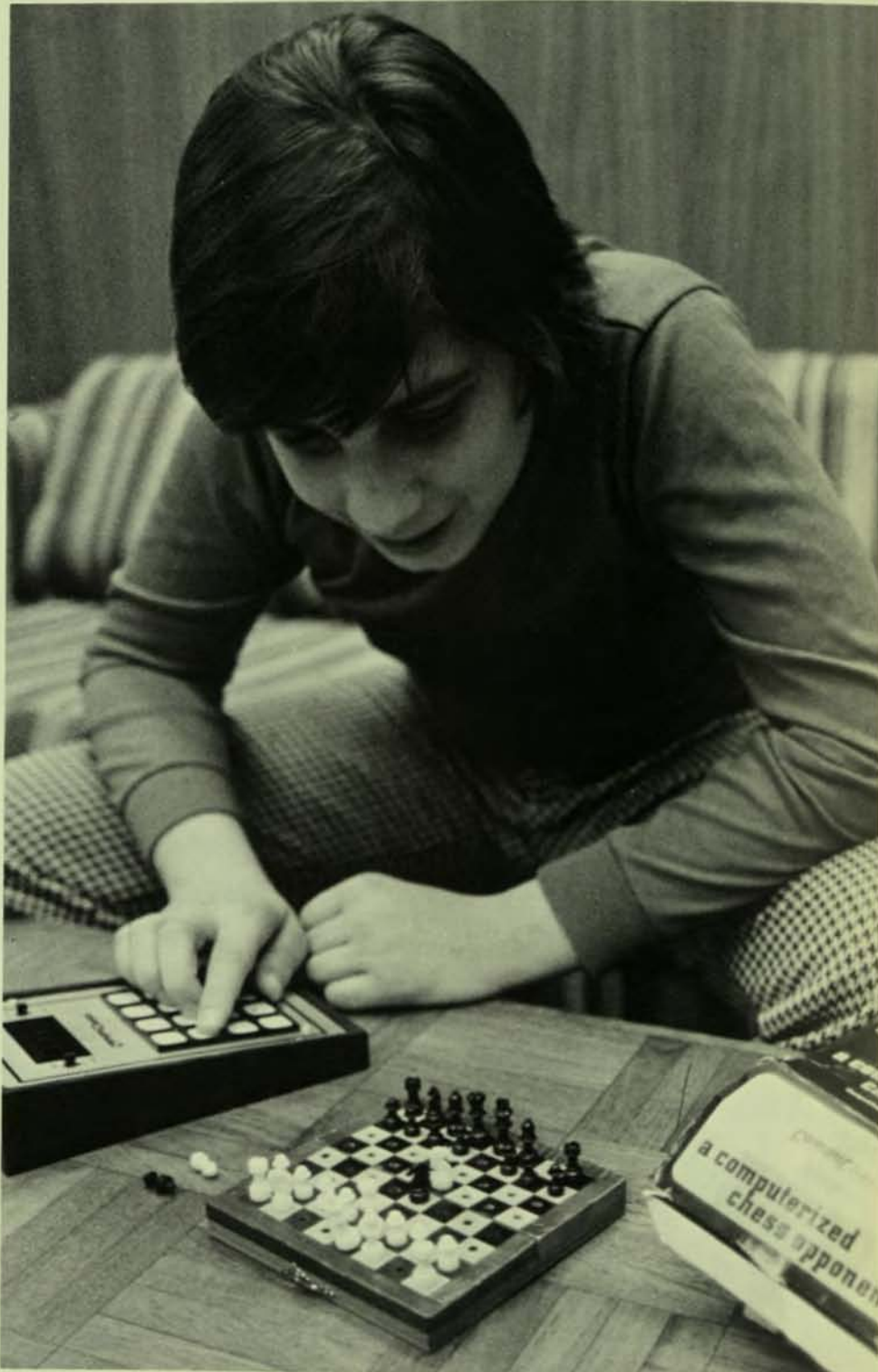
## CHECK-MATE

Electronic games keep getting smarter, and can sometimes be more challenging than a flesh and blood partner.

CompuChess is a pocket calculator-sized entry into this booming market by Staid, Inc., near St. Petersburg, Florida. At the heart of the game is circuitry based on Fairchild's F8™ microprocessor technology.

Structured with six levels of difficulty, CompuChess provides a computerized partner with levels of chess expertise varying from novice to expert. The first four levels are intended for practical game playing, and are aimed at the average chess player in the United States. Levels five and six, in which the game's response time may be upwards of several hours while it scans all possible strategies, can be used for advanced problem solving or, for the avid fan, chess by mail.

Recently, Julian Stone, son of Vice President, General Counsel and Secretary Nelson Stone, challenged CompuChess to a few games. Julian, who learned chess from his father (who can no longer beat him) is the second-ranked chess player in his junior high school. Who won, person or machine? Well, Julian, who is 14, has been playing chess since kindergarten. CompuChess has only been playing since last September.



*Julian Stone matches wits with CompuChess.*





The Government and Industrial Products Group is headed by Lou Pighi, top left, Vice President and General Manager. New positions in Syosset, headquarters of the Space and Defense and Imaging Systems Divisions, were assumed by Fred Schmidt, top middle, now General

Manager, and Chris Lay, bottom left, head of the new Business Development Unit. RF Systems and Equipment headed by Carl Schleicher,

bottom middle, became an independent business unit. The Industrial Products Division has named Ray Hennessey, top right, Vice President, Business Development. Lee Schank, bottom right, has become Division Vice President and General Manager of IPD.

Gil Amelio

## AMELIO ELECTED IEEE FELLOW

Dr. Gilbert F. Amelio, Division Vice President and General Manager, MOS/CCD Division, has become the fifth person at Fairchild to be elected a Fellow of the Institute of Electrical and Electronics Engineers.

This honor is given to very limited number of people each year who have made outstanding contributions to the field of electrical or electronics engineering. According to IEEE, the Fellow grade is one of "unusual professional distinction." In its announcement, IEEE said Gil was being selected for his "pioneering technical and managerial contributions to the field of charge-coupled devices." He is one of the youngest men ever to be so honored.

"I was stunned when IEEE notified me I'd been elected," Gil says, "but very honored, principally because of the stature of the group I was joining." Other IEEE Fellows at Fairchild are Dr. C. Lester Hogan, Vice Chairman of the Board, Dr. Thomas Longo, Vice President and Chief Technical Officer, Dr. James Early, Division Vice President - Research and Development Division and Rex Rice, Director of Advanced Development, Test Systems Group. Rex acted as Gil's sponsor during the award selection process.

Gil came to Fairchild from Bell Telephone Laboratories in 1971. Prior to his promotion last year, he was Manager of MOS development engineering and CCD operations. He holds B.S., M.S. and Ph.D. degrees in physics from Georgia Institute of Technology.

## GOVERNMENT AND INDUSTRIAL PRODUCTS GROUP FORMED IN NEW YORK

Operations of the Federal Systems Group and the Industrial Products Division were merged late last year to form the Government and Industrial Products Group, under Vice President and General Manager Louis H. Pighi.

The group, with principal facilities on Long Island, adjacent to New York City, is now made up of the Space and Defense Systems and Imaging Systems Divisions

and the RF Systems and Equipment Unit, located in Syosset, N.Y. and the Industrial Products Division, headquartered in Commack, N.Y. IPD also has facilities in Traverse City, Michigan and City of Commerce, California. With the reorganization, a Group Business Development unit was also formed.

## FIRST TIME'S A CHARM

Fairchild can now save nearly \$23,000 a month in phone costs, with the installation of tiny black boxes called voice digitizers, which can convert the sound of a human voice to digital form (ones and zeroes) and transmit it around the world on the company's Global Communications Satellite System's data link lines.

Voice digitizers make these enormous cost savings possible because voice transmissions occupy only one quarter of the waveband on the data transmission possible. "Therefore, we can lease fewer lines and still meet our communications needs," says Bill Brasuell, Manager of Worldwide Telecommunications. "We can also reduce our use of overseas phone lines."

The new voice digitizers complete Fairchild's hardware acquisitions for the Far East portion of the Global Communications Satellite System, which went into operation in 1976 as part of the company's Global Logistics Program. The communication system links Fairchild's worldwide locations together via satellite-transmitted data on orders and inventory that travels at 50,000 bits per second.

Fairchild's purchase of the digitizing equipment was the first sale made by Time and Space Processing, Inc., a company in Cupertino, Calif., that spent 18 months developing the product before introducing it last June. According to Bill, the equipment was selected because of its realistic reproduction of the human voice.



Actors in "The Fury" will be using the Fairchild Channel F game.



Sandy Perrin, Western Regional Sales Merchandising Representative for Video Products, explains operation of the various Fairchild game cartridges to people attending the Consumer Electronics Show.

## THE (REALLY) BIG SCREEN PREMIERE

Above, while not the star of the show, the Fairchild Channel F™ Video Entertainment System has a featured role in the upcoming Twentieth Century-Fox film "The Fury." The film, which stars Kirk Douglas, John Cassavettes and Carrie Snodgrass, is a parapsychological drama involving the relationship between a government agency and teenagers with psychic powers. The Fairchild game, which is projected on a four-foot screen in the film, is used in an agency training area.

## RECORD BREAKING SHOW

Fairchild's Channel F™ programmable television game was in the center of the action at the recent Winter Consumer Electronics Show in Las Vegas. A record crowd of 43,000 manufacturers, buyers and distributors came to the show to view the latest in home electronics.

Highlighting Fairchild's CES introduction were six new Channel F Videocarts™, including Backgammon, Torpedo Alley, Sonar Search and Pinball Challenge. There are now 17 Videocarts available, providing Channel F users with 30 games and more than 500 variations.

Also introduced was the 1978 Timeband™ series of men's and ladies' digital watches, featuring new six-digit displays and tritium backlighting on some models (see accompanying item). The 28-style Timeband line includes both LCD and LED models, ranging in price from \$22.95 to \$49.95.

## WHAT IS TRITIUM?

Tritium is an odorless, colorless isotope of hydrogen gas, which, when mixed with phosphorescent paint, causes an LCD watch dial to glow. (An isotope is a substance closely resembling the element from which it is derived, but with a slightly different atomic weight.)

Until the early 1950s, radium had been used as a light source in watches, but was banned due to its radioactivity by the Atomic Energy Act of 1954. Watch manufacturers then turned to tritium, which is slightly radioactive but so weak it won't cause a reaction on a Geiger counter. Exposure to tritium causes no ill effects in humans, even if inhaled.

Tritium backlighting has been adopted by digital watch manufacturers because it is constant, eliminating the need to push a button to illuminate the watch display.

## NEWSMAKERS

The Government and Industrial Products Group has announced several management and organizational changes. (See story, pg. 24.) Division Vice President **CHRIS LAY** has been named to head the Group's new Business Development unit . . . **FRED SCHMIDT** has been appointed General Manager, Space and Defense Systems Division . . . **CARL SCHLEICHER** has been designated director of the new RF Systems and Equipment unit, which was formerly part of Space and Defense . . . At the Industrial Products Division, **RAY HENNESSEY** has been named Vice President, Business Development . . . **LEE SCHANK** now heads IPD as Division Vice President and General Manager . . . **JOHN HAMBIDGE** has been appointed General Manager of the newly-formed CMOS Product Division . . . In the Semiconductor Products Group's Worldwide Marketing organization, **BILL O'MEARA** has been promoted to Division Vice President, Semiconductor Sales, **ANDY PROCASSINI** has been appointed Division Vice President—International and **TOM SIMMONS** has been named Director of Marketing Services . . . **HARRY SUZUKI**, International Marketing General Manager in Southeast Asia, has recently assumed responsibility for marketing in Australia and New Zealand . . . The domestic semiconductor sales organization, part of the Semiconductor Products Group, has named four regional managers: **DAVE LaROCK**, North Central; **LES WELBORN**, South Central; **JIM YOUMANS**, Northeast and **PERRY CONSTANTINE**, Western . . . **RODNEY SMITH** has been named Division Vice President and General Manager for the Automotive Division . . . **MIKE AUSTIN** has been appointed Advertising Manager for the Test Systems Group . . . **GERALD JUGANT** has been named Plant Controller, Korea . . . **HANS NAPFEL** has assumed a new position as Director of Engineering at the Industrial Products Division . . . Succeeding Hans as Engineering Manager is **SULLIVAN CHEN**.



Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from November, 1977-January, 1978 appear below.

#### **Linear Division**

Derek Bray

IC compatible variable shunt impedance for Dolby B system

Patent No. 4068139

Fred L. Eatock

Band gap voltage regulator circuit including a merged reference voltage source and error amplifier

Patent No. 4064448

Robert J. Kopp

Process for producing an improved dielectrically isolated silicon crystal utilizing adjacent areas of different insulators

Patent No. 4056414

#### **Research and Development Division**

Harold H. Hosack

Edge etch method for producing narrow openings to the surface of materials

Patent No. 4063992

Process for producing successive stages of a charge coupled device

Patent No. 4061530

David O'Brien

Method of fabricating high-gain transistors

Patent No. 4066473

William S. Phy

Device for forming reference axes on an image sensor array package

Patent No. 4058899

#### **Time Products Division**

James V. Barnett, II; Ernest F. Mayer; James W. Pfeiffer; and Larry D. Wickwar

Shock resistant wristwatch module

Patent No. 4068464

Donald R. Duff, James O. Lamb, Donald Pezzolo

Frequency adjustment circuit

Patent No. 4068462

## TECHNICAL WRITING AWARDS

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval. Technical Writing Awards appearing below were given from October, 1977-January, 1978.

#### **Bipolar/LSI Division**

Jonathan Stinefelfer and Roger Ramirez

"Fast Bipolar 4K RAM"

Midcon/77 Conference Papers

William H. Herndon, Wally Ho, Roger Ramirez

"A Static 4096 Bit Bipolar Random Access Memory"

*IEEE Journal of Solid State Circuits*

#### **Georgia Field Sales**

Jon Colt

"Emulate a Seven-segment Decoder with a Subroutine in a Up Control Program"

*Electronic Design*

#### **Imaging Systems Division**

Robert Bashe

"CCD Imaging, A Revolution for Electro-Optical Systems"

Military Electronics Defense Expo

#### **Instruments and Controls Division**

Peter Alfke

"Microprocessors and Their Impact on Logic Design"

Integrated Circuit Applications

Conference Proceedings

"Which Digital Family?"

*IC Master*

#### **Linear Division**

Russell J. Apfel

"Power Op Amps Come of Age"

*EDN*

"Regulators—To Switch or Not"

*Electronic Products*

Sid Bagwe

"IC Provides Motor Speed Control"

*Design News*

John Conover

"A Six Channel, Eight Bit Microprocessor Compatible Analog to Digital Converter"

*WESCON*

Giorgio Riga

"Failure Analysis, Feedback to IC Design and Fabrication"

*ATFA Symposium*

#### **MOS/CCD Division**

Jim Hayes

"The Localized Plasma Etching of Dielectric and Silicon Films"

Kodak Conference Proceedings

Bruce Threewitt

"A Solid State Bulk Memory for Microprocessors"

*EE Times ICA Proceedings*

#### **Space and Defense Systems Division**

Frank Erlandes

"Jammer Serves Jeeps and Helicopters"

*EW Magazine*

#### **Systems Technology Division**

Steve Gale

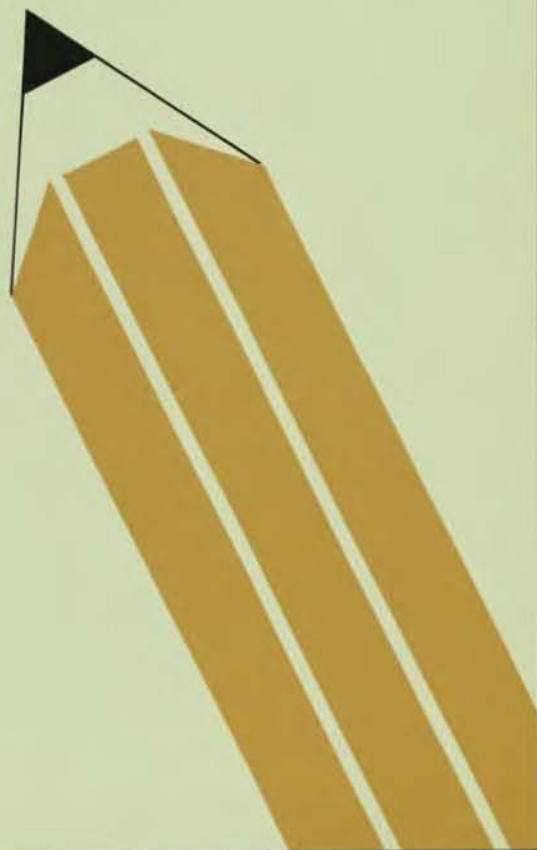
"Training by Television in Industry"

*American Society for Training and Development Journal*

George Niu

"Single Op Amp Implements High-Voltage/Current Buffer"

*EDN*





*Growing up is hard work, so Joan and Vinnie Caronna help Kristine get ready for a nap.*

Long Island had been hit by an ice storm that made the roads practically impassable on the weekend of January 14. That night, the Caronnas had ventured out to a baby shower at a relative's house near their home in Center Moriches, N.Y. Joan didn't realize she was in labor, but shortly after their arrival, Kristine decided to attend the party, too.

With no time to drive the one icy mile to the hospital and no medical help available, Vinnie had to rely on a 15-minute lecture dealing with emergencies that had concluded the last Lamaze natural childbirth class they'd attended. "It all comes back to you quickly, let me tell you," Vinnie says. "In less than half an hour, the baby was born.

"I couldn't have done it without the natural childbirth training. The funny thing is, I really didn't want to go to the classes at first. I was a little leery of what my reaction would be in the delivery room. I shouldn't have worried—it was the best \$45 I've ever spent."

Because Kristine was very small at birth—just four pounds, five ounces—she stayed in the hospital a few extra days. The 13-inch snow storm that hit the New York area when she was a week old made visits a little complicated, but the family came home together after the roads were cleared.

"I didn't realize what I'd done until I was waiting in the hospital's admitting office—then, I did get a little shaky!" And no wonder. Vinnie and Joan hope their next child is born in the summer.



## **Old Man Winter closed the airports, but couldn't stop the stork**

It hasn't been a good year for the East Coast. Ice storms and near-record blizzards have battered the area, forcing closings of businesses, airports and even the New York Stock Exchange.

But when Kristine Caronna was ready to come into the world, she came. She got a little help from her father, Vinnie, a quality assurance engineer at Space and Defense systems Division, Syosset, N.Y. Because a storm kept Vinnie and his wife Joan from getting to the hospital in time, Vinnie delivered his first child.

*Snow drifts like this made travel beyond the driveway difficult for Fairchild people on Long Island during much of January and February.*



Summer 1978

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

# nts électronique



Fairchild in Europe

Summer 1978

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**On the cover:**

Emile Dalle, General Manager, France for Semiconductor Products international marketing, leaves the Porte de Versailles exhibit hall in Paris with France Distributor Supervisor Liliane Léveillé. An article on Fairchild's marketing centers in Europe begins on page 6.



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*San Jose*—Jan Dahlin;

*San Rafael*—Eric Redman;

*Santa Clara*—Jim Molinari;

*South San Jose*—Barbara Estrada

East Coast: *IPD*—Peg Schinnerer;

*South Portland*—Pete Wiberg;

*Syosset*—Ruth Miller;

*Wappingers Falls*—Gene Olan

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## FIRST QUARTER EARNINGS UP SHARPLY, FAIRCHILD REPORTS

Fairchild Camera and Instrument Corporation reported May 5 at the annual meeting that first quarter earnings more than doubled, to \$5,735,000, or \$1.06 per share, from \$2,229,000, or 41 cents per share, a year earlier.

Net sales reached a record first quarter level of \$116,795,000, compared with \$114,988,000 in the 1977 period.

Wilfred J. Corrigan, Fairchild Chairman and President, told the annual meeting in Palo Alto, Calif., that "while the economic outlook is uncertain, the tone of our business currently is strong.

"New orders rose to a first quarter record, exceeding any quarter in the past four years. March bookings set an all-time monthly high. Backlog increased 26 percent over the equivalent 1977 quarter, which should generate appreciably higher billings in the current period.

"Pre-tax earnings before royalty and other income surpassed every quarter last year. Royalty income also increased, due principally to a payment from Thomson-CSF relative to our previously-announced patent agreement with that company.

"Consumer product volume, as anticipated, dropped sharply from quarterly levels last year. However, the company reduced its losses in this business segment, contributing to our overall profit improvement.

"Working capital at the end of the period was \$124,906,000, shareholders' equity \$189,542,000, and cash and temporary cash investments \$55,339,000. Spending for research, development and engineering approximated \$13,000,000 for the quarter.

"Fairchild continues to invest in cornerstone semiconductor technologies and LSI-based systems and equipment as the key to our long range future.

"Last month the company entered into an agreement with Magnuson Systems, Inc. to purchase equity and convertible notes, under terms of which Fairchild may ultimately own a one-third interest in this developer of IBM-compatible computers.

"During the quarter the company broadened its line of microprocessors with the 9440 16-bit Microflame™, the first circuit offering the capability of a minicomputer CPU on a single semiconductor chip.

"Sales of computer-controlled LSI test systems, introduced last year, showed good growth during the quarter. Our New York-based military and industrial product operations also performed well in the period.

"Capital expenditures this year will be approximately \$30,000,000, devoted largely to production facilities for the manufacture of advanced semiconductor products.

"We view 1978 as a good year for Fairchild in both domestic and international markets. For the longer term, we believe our focus on our main-line, high technology businesses will provide the basis for continuing progress in sales and profitability."

## FAIRCHILD INVESTS IN MAGNUSON

Fairchild announced April 20 it has entered into an agreement to purchase equity and convertible notes from Magnuson Systems, Inc. of Santa Clara, Calif.

Magnuson, founded in 1977, is a developer of a line of computers which emulate IBM 370 and 3031 systems. Under conditions of the agreement, Fairchild may ultimately own approximately one-third of the company. Fairchild's investment in Magnuson was for an undisclosed amount.

## McLACHLAN NAMED VICE PRESIDENT-STRATEGIC PLANNING

Murray L. McLachlan has been elected to the new position of Vice President—Strategic Planning. In this new post, he will be responsible for strategic planning, new business activities and evaluation of acquisition candidates.

He joined Fairchild from Airco, Inc., where he was Director of Strategic Planning. A Rhodes Scholar, Murray holds a Bachelor of Arts degree from Oxford University in England, a Bachelor of Commerce degree from the University of Natal, South Africa and an M.B.A. from Stanford University.

## CROSS-LICENSING AGREEMENT WITH THOMSON-CSF

Fairchild and Thomson-CSF of Paris, France have entered into a patent cross-licensing agreement.

Under terms of the agreement, Fairchild and Thomson-CSF have granted non-exclusive licenses to one another for certain of each company's semiconductor patents. The agreement calls for payment of an undisclosed amount by Thomson-CSF to Fairchild.

Fairchild also agreed to dismiss a pending patent infringement suit brought by Fairchild against Thomson-CSF in France.

## ARMY, NAVY CONTRACTS TO GOVERNMENT SYSTEMS

The U.S. Army Electronic Research and Development Command has awarded Fairchild's Space and Defense Systems Division a \$3.2 million contract for development of countermeasure sets and associated test equipment.

The AN/TLQ-17A countermeasures set called for in the contract is an all solid-state, special purpose electronic warfare system which is insensitive to climatic changes and may be operated continuously at remote locations.

The contract is a follow-on to an original award for 53 sets made in February, 1976. Delivery is scheduled to begin late next year. Space and Defense is part of the Government and Industrial Products Group.

Imaging Systems Division, another division within Government and Industrial Products, recently announced a contract from the U.S. Naval Electronics Systems Command for development of a low-light-level, panoramic CCD imaging system for use on sea and land.

The \$740,000 contract is for a two-year program designated LOPATCH, which will further develop technology required to use CCD imagers in low-light-level situations, including viewing through submarine periscopes.

Fairchild's first quarter earnings were the highest since 1974, and sales for that period achieved a first quarter record. Chairman and President Wilfred J. Corrigan told the company's annual meeting May 5.

"Net income in the first quarter increased 157 percent to \$5,735,000, or \$1.06 per share, from \$2,229,000, or 41 cents per share, in the comparable 1977 period," Wilf told shareholders, directors and employees attending the Palo Alto, Calif. meeting. In sales, he said the company set a first quarter record of \$116,795,000 compared with \$114,988,000 a year earlier.

New orders for the corporation set a record during the first period of 1978, exceeding any quarter in the past four years. March bookings also set an all-time high. Backlog increased 26 percent over the equivalent 1977 quarter, which should generate appreciably higher billings in the current period. "Profit margins continued to improve," he said. "Pretax earnings before royalty and other income surpassed every quarter last year."

Royalty income also increased, due principally to a payment from Thomson-CSF relative to a previously-announced patent agreement with that company. These results, Wilf said, demonstrate that Fairchild has gained ground on its strategic objectives—to increase profit margins, balance our technology businesses and improve the return on equity.

"The thrust of our first quarter performance reaffirms Fairchild's character as a technology company," Wilf commented. "The core of the company's strategy focuses on the semiconductor and equipment operations, through which Fairchild expects to achieve its long-range growth objectives.

"In 1974, approximately 85 percent of corporate sales were derived from semiconductor components. Only 15 percent of total revenues flowed

from equipment or end product areas." Last year, end products contributed approximately \$147 million or 32 percent of the total. Semiconductor components comprised 68 percent, or \$31 million.

"Our corporate plan," Wilf said, "is to lever our advanced solid-state technology into end products and equipment, which will represent roughly 50 percent of the total revenue by 1980."

He noted that the rise of LSI circuit densities is turning components into systems and systems into single chip components. In 1961, Fairchild developed the first monolithic integrated circuit, which contained four transistors and four resistors, had a density of 4000 components per square inch.

Today's 16K N-channel random access memories contain some 40,000 components and have a density exceeding a million components per square inch. Fairchild is also producing the most complex semiconductor memory in manufacture today—the 65K CCD memory—through the new electron beam technology.

"The company last quarter began production of its 9440 16-bit microprocessor," he added, "based on our proprietary Isoplanar integrated injection logic (I<sup>3</sup>L™). This device is the

**Progress made on  
Key Technology,  
Profit Goals,  
Annual Meeting  
Told**





first circuit with the full capability of a minicomputer CPU on a single chip.

"Fairchild has made a powerful commitment to these solid-state technologies of the future," Wilf said, noting that the new MOS/CCD Division plant in South San Jose, Calif. is now on-stream and progressively increasing its output. "Fairchild is currently producing the F8™ and 6800, two of the most widely accepted MOS microprocessors in the industry, and production will soon begin on the 3870, perceived by the market as the best single chip microprocessor yet developed.

"We are determined to achieve in MOS the same success which the company has enjoyed in bipolar technology, which will continue to dominate applications for high performance computer requirements well into the 1980s."

Fairchild's subnanosecond ECL logic family has been designed into almost a dozen major computer programs around the world, and our new 4K bipolar static RAM has been specified by many major customers requiring access times of 50 nanoseconds and below.

Growth rates in the company's electronic equipment areas are expected to significantly exceed the rest of the business, Wilf said. Test Systems Group is the paramount supplier of LSI and VLSI testing devices, and by the end of this year, group sales will have more than doubled since 1976.

VLSI devices may have more than 16,000 bits of memory and require up to 10 million separate tests. Fairchild's broad product line and software base serving

this market begins with our Sentry™ V tester and continues through the Sentry VIII, introduced last year. Test Systems is now in full production with the Xincom III distributed processing system dedicated to memory testing.

In 1978, the group plans to introduce a low cost LSI microprocessor tester, as well as a system for evaluating linear devices. "Our intention," Wilf told shareholders, "is to provide the capability for testing not only semiconductor components, but also components on a printed circuit board as well as the board itself."

Fairchild's New York-based government and industrial products operations will provide an important part of the thrust into the equipment marketplace, he added. Major new aerial camera products introduced last year are now being shipped. These include an artillery TV system using Fairchild's CCD technology.

In the audio-visual product area, the company's new version of the Galaxy Super 8 projector as well as the Synchro-Slide 35™ are gaining excellent customer acceptance.

"A key element of the equipment business is a relatively high level of predictability and control of the market," Wilf said. "This, coupled with comparatively low asset intensity, makes this a business which Fairchild will vigorously pursue."

Turning to consumer products, he noted that Fairchild had sustained a major reverse in this area during 1977, due to the deterioration of the digital watch market. "While our most important product lines—semiconductor components and commercial and industrial equipment—were achieving marked gains in both sales and profitability, the watch business skidded down a roller coaster of collapsing prices and seasonal consumer demand." This decline resulted in a \$24.5 million pretax loss in consumer products.

"We believe we have resolved our consumer products problem," he said, noting that in the future, this segment will be managed to less than 10 percent of total company sales. "For 1978, we do not expect consumer products to have an appreciable negative impact on the company's performance."

Concluding his remarks, Wilf said that while the economic outlook is uncertain, the tone of the company's business is strong. "As we move into the second quarter, we view 1978 as a good year for Fairchild in both the domestic and international markets. Above all, we believe our company has embarked on a viable strategic plan, fortified by excellent resources, to accomplish those goals which we have set for ourselves."

1. Fairchild shareholders, directors and employees hear reports at the 1978 annual meeting.
2. Chairman and President Wilfred J. Corrigan made the main address. Also at the head table were (L to R) A. J. Hazle, Vice President—Finance, Dr. C. Lester Hogan, Vice Chairman of the Board, Board of Directors member and former Board Chairman Roswell L. Gilpatric and Nelson Stone, Vice President, General Counsel and Secretary.
3. A coffee hour preceded the annual shareholders' gathering.
4. Bray Barnes, an analyst from Merrill Lynch, Pierce Fenner & Smith, posed a question following the main speech.
5. Brian Sear, Division Vice President and General Manager, Sentry Division, registers at the meeting with Myra Scofield, Corporate Communications department.
6. Ed Ayril, a product line manager for Imaging Systems, explains operation of CCD cameras to James Jensen, Price Waterhouse & Co.
7. Following the meeting, Wilf Corrigan takes questions from Jan Simpson, reporter for the Wall St. Journal, and Mark Dyniewicz, security analyst from Dean Witter Reynolds.



## “If it’s Tuesday, this must be Paris”

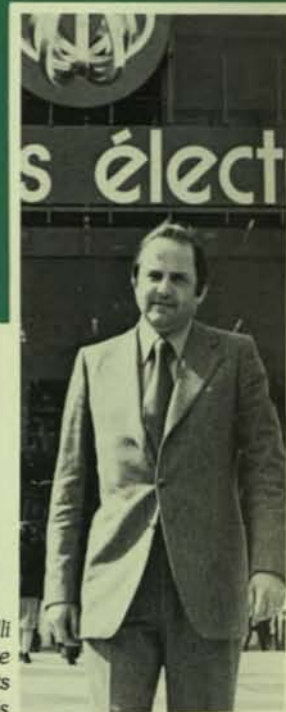


**Three Semiconductor Products international marketing regions serve \$1.5 billion market in Western Europe.**

*Editor’s note: More than 600 people scattered throughout the world make up the Semiconductor Products international marketing team—a critical part of Fairchild’s sales and marketing effort, but one perhaps little known to those of us who live and work in the United States.*

International semiconductor marketing is divided into six regions in three areas of the world—Europe, Southeast Asia/Japan and Latin America. European regions are headquartered in London, Munich and Milan, and Southeast Asia/Japan activities are centered in Hong Kong and Tokyo. Latin American headquarters, plus two manufacturing plants designed to serve local markets, are located in Mexico City and Campinas, Brazil. Each region is headed by a general manager.

This is the first in a series of articles on our company’s participation in the important international marketplace.



*Roberto Stefanelli visits the Composants exhibit in Paris.*

Chris Tubis frowned as he flipped through the pages of his desk calendar. “No, I can’t make it up there this week. He insists on seeing our prototype? All right, I’ll try to make it up there next Monday. Let me talk to Bob and get back to you.” After a fast conference with Northern Europe General Manager Bob Blair, Chris, that region’s Product Marketing Manager, schedules an impromptu marketing trip to Scandinavia.

Similar trips in the past have taken him through the capitals of Sweden, Finland and Norway, often via a floating hotel ferry that sometimes doubles as an



Far left, Émile Mamurek, President of Almex, a Paris distributor, reviews Fairchild promotional material with Liliane Léveillé. Left, Benedicte Le Beillan and Alain Salvi, right, Paris sales office, greets booth visitors.



Visitors to Fairchild's booth at Composants saw displays of a wide variety of new high-technology products.



Before leaving for a European trip, Andy Procassini reviews last-minute details with secretary Barbara Nolan.

The United States accounts for about 45 percent of total semiconductor usage, Europe and Japan 25 percent each, with the remainder scattered through the rest of the world. Within the \$1.5 billion Western European semiconductor market, the United Kingdom, Germany, France and Italy constitute 75 percent of semiconductor consumption.

"Our strongest markets in Europe currently are computer, industrial/telecommunications and consumer products," Andy says, "with our major customers including branches of some familiar U.S. names such as Burroughs, IBM and Xerox, as well as some major European firms including Thompson, SABA, Olivetti and LM Ericson. It's very important to recognize, though, that we must approach Europe not as a miniature U.S. market, but one with an essentially native character.

"Not only do you have differences in culture and economies, but in the structure of the electronics industry. For example, outside the United States, the consumer segment of the market is much larger than it is in this country, and the customer's criteria for product selection are quite different. Nor are our com-



La Scala, Milan.

petitors the same in each country—in many cases, we're competing with European and Japanese companies as well as U.S. firms.

## WORLDWIDE MARKET

"Electronics is an international business—nearly every country in the world is in some way dependent on semiconductor components and circuitry," says Andy Procassini, Division Vice President, International, for worldwide semiconductor marketing. Andy coordinates and supervises all semiconductor sales and marketing outside the United States and Canada.

"Many of our customers, and all of our major competitors, are multinational companies," he explains. "If we want to compete effectively internationally, we must have sales operations overseas. Equally important to our international efforts is Fairchild's technology—our developments have given us an excellent worldwide reputation, which we can translate into sales."



Ruins of the Forum in Rome

icebreaker as it navigates the frigid seas separating the three fingers of Scandinavia.

Chris, and more than 200 other sales and marketing people in the three sales regions of Europe (see map) are part of the Semiconductor Products international marketing organization, which develops business for Fairchild from London to Tokyo to Mexico City.



Above, Big Ben overlooks the Houses of Parliament, England's seat of government. Top right, Bob Blair checks on phone messages with secretary Dorothy Cuthbert.



Right, Chris Tubis prepares a product demonstration for a customer visiting the London office.



London's famed red double-decker buses.

Marketing strategy and objectives must take these other dimensions into consideration, and our international marketing structure enables us to do that."

### THREE REGIONS

Fairchild's European marketing operations employ nearly 200 people and are divided geographically into three regions, each headed by a native general manager. Northern Europe, with headquarters in suburban London, is under the direction of Bob Blair. Bob has held numerous marketing positions in the United Kingdom and Germany during his nine years with Fairchild, and has headed Northern European operations (the United Kingdom and Scandinavia) for the past two years. This summer, he plans to take up a new assignment in Mountain View for international marketing.

Central Europe, headquartered in Munich, West Germany is run by General Manager Siegfried Mack. Siegfried, who has been with Fairchild since 1976, supervises a staff of nearly 70 people responsible for sales and marketing in West

Germany, Austria, Switzerland and the Benelux countries. Siegfried's territory also includes South Africa, Israel, Turkey, Iran and the Eastern Bloc of countries.

Milan, Italy is headquarters for the Southern European region, headed by Robert Stefanelli. Roberto came to Fairchild in 1969 as sales manager for Italy, and held several sales and marketing positions in southern Europe before being named General Manager for that region in 1974. Italy, France, Spain, Portugal and Greece constitute Roberto's territory.

All of Fairchild's overseas marketing centers operate as wholly-owned subsidiary companies. Each regional company is a separate legal corporation, operating in accordance with the Fairchild company policy and the regulations of the host country. In addition to responsibility for sales, product marketing, technical marketing and customer service, each general manager's staff may include finance, MIS and industrial relations functions.

"Our general managers have to have excellent judgment and strong loyalty to the company," Andy says, "because they have to operate without continual approval from Mountain View. They handle their functions in accordance with company policy, of course, but the demands of day-to-day operations make a large degree of local autonomy necessary."

### CURRENCY CHANGES

Dealing with currency fluctuations relative to the U.S. dollar, a problem not faced by domestic business people, illustrates this point, according to Bob Blair. "Dollar ups and downs make doing business in Europe difficult because the rules may be changed in the middle of the game, he says. "If we make an agreement with a customer for sale of some components, and the dollar drops, the European customer's argument is that we owe him a



credit because local currency will now buy more dollars than at the time of the original agreement. If the dollar strengthens, it causes even more problems, because we then have to raise the price of the product in local currency to meet the product's dollar value.

"From accounts receivable to distribution," Bob continues, "currency changes cause operating problems almost across the board, which we must be able to deal with at the local level. Ultimately, it can make life very difficult for the finance people who must account for our business in dollars but conduct their whole lives in the local currency."

### NATIVE MANAGERS

Over the past few years, international marketing has begun shifting foreign management responsibility to natives of the countries in which Fairchild operates. Until the early 1970s, foreign marketing and sales regions were managed by American expatriates.

"People in other parts of the world, particularly Europe and Japan, don't have nearly as much job mobility as we do in the United States," Andy explains. "When



*Chrysanthemums blooming in the Scandinavian autumn.*

*Left, Ola Johannson and Jan Zettegrin return to Stockholm after a marketing trip to Norway.*



*Left, members of the customer service staff in the London office review techniques of a new order processing system.*

they join a company, they tend to stay there for many years. The stability of our overseas staff, in fact, is an important strength in maintaining sales and market share.

"The frequent rotation and replacement of our expatriates was a little unsettling to the people working in our overseas offices, and to our customers there too, to some extent. The advantage of having American managers is that they know the company's products and procedures, but we now have developed a team of highly competent native European managers with a great deal of experience both with Fairchild and in the semiconductor business.

"This approach offers an additional advantage from a marketing standpoint. Our foreign managers understand the cultural differences of doing business in the twenty or so different countries in Europe — they move with ease through countries having totally different languages, currencies and customs. They are attracted to American companies because of our advanced technology, so we have the best of both worlds."

Maria Stoesser, who handles personnel administration for Central Europe, draws another comparison. "People who have worked at both European and American companies generally feel the atmosphere in an American company's office is much more relaxed — they are working with, rather than for, their boss."

## **NO SUCH THING AS 'EUROPE'**

A common misconception when viewing the European market is that Europe is a homogeneous version of the United States. "There really is no such thing as 'Europe' as an entity," Roberto Stefanelli comments. "It's a series of countries which have some things in common when compared to other regions of the world,

but which among themselves are all very different. To perform successfully here, you must learn that the pace and the manner of doing business differs — a lengthy lunch in Paris may take the place of a fast meal and an office meeting in London, but ultimately the same business may be transacted."

"You must adapt to local policies and customs," Siegfried adds. "This is an important part of building a reputation with the customer, and convincing him he can rely on your word. If a customer doesn't feel comfortable with you or thinks you are not making every effort to accommodate his needs, it is difficult to get him to rely on you as a supplier. This is probably true the world over, but it is especially apparent here in Europe."

"Developing this sensitivity only comes from experience," Bob adds. "To understand how the French or the Germans or the British prefer to do business comes only from working with them. You can either go in with the attitude that they're wrong because they don't do things the way you do at home, or you can approach it by saying that you want to understand how they do things and look for common ground. If your objective is to do business with customers in other countries, you'd better work at understanding them, not trying to convert them."



*An ancient Scottish castle*



Engineers and technicians at work in the engineering lab at Fairchild's Munich office.

Munich's famous Clock tower in the Marienplatz



## MULTIPLE FLUENCY

Moving through as many as six countries in the course of their jobs requires Fairchild's international marketing managers to be fluent in several languages, plus familiar with a few more. In overseeing the worldwide international marketing operation, Andy has reached what he describes as "80 percent fluency" in Italian, plus enough French, German and Japanese to handle his travel requirements. The European general managers all speak at least two languages, and say they can get by in several others. But English is the predominant language of business. "With English you can get along

throughout the world," says Siegfried. "Wherever you go to discuss electronics, it is the common language."

Time required by the three general managers to keep in touch with sales offices and major customers in their territories varies from region to region, but is never less than 30 percent. "Unfortunately, I spend about 60 percent of my working hours traveling," Roberto says. "This is the toughest part of the job. However, it's necessary to keep on top of business trends in your markets, and take advantage of every possible opportunity for new business. I'm certainly no superman, but if you don't keep up you don't know what you're talking about."

Emile Dalle, General Manager for France, part of the Southern European region, finds that another advantage of traveling is increasing his customer's awareness of Fairchild. "People want to see Fairchild management, and it helps convince them we're interested in their business. Last year, for example, we weren't getting much business from a major U.S. computer company's subsidiary here in France, so a group of us put

together a sales presentation which included five visits to their top management. They've now recognized that Fairchild wants their orders, and we're becoming one of their principal suppliers.

"The electronics business is just as competitive in Europe as anywhere else," Emile continues. "If you want to sell, you have to move fast and make the extra effort to close the deal and get the product over here."

## COMPOSANTS

In Europe, as in the United States, participation in industry trade shows is one of the best ways to demonstrate your capabilities to both current and potential customers. At the April Salon International des Composants Électroniques in Paris, Emile hosted visitors from all over the world who came to view the latest Fairchild semiconductor microprocessors, memories and other products. Featured at the show were the F8™ and 9440 Microflame™ microprocessors, MOS and bipolar memories, Macrologic™ and subnanosecond ECL circuits, CCD imaging systems and the Channel F™ television game.



Siegfried Mack enters Central European headquarters in Munich.

some Optoelectronics Division products threatened loss of a valuable account. "The customer no longer wanted to talk to the salesman or to me, he wanted to talk to somebody from the factory. So, I made a couple of calls to Mountain View, and within 12 hours Tom Brandt, who was the Division General Manager at that time, was in London. (Tom is now the General Manager for Fairchild's plant in Campinas, Brazil.) He arrived at eight in the morning and took the five o'clock plane back, but it saved the account for us. You can't make requests like that once a week, but when you need that kind of support, you have to be able to get it."



Siegfried Mack discusses marketing strategy with staff members Dieter Bendish and Walter Prochaska

## BEATING JET LAG

Although the airplane and the telephone have put people all over the world a

very short distance from each other, everyone in international marketing must cope from time to time with ravages of jet lag. "When you make one international trip as a tourist, jet lag is a big factor," Andy says, "But when you do it many times a year, you learn to tolerate it. There are a few simple rules, including leaving yourself enough time to comfortably make connections, and doing your best to acclimate to local time within 24 hours. If you try to arrive in London from San Francisco at 8 A.M., hold a business meeting and make decisions, hop back on a plane and fly to Frankfurt for dinner with a key customer, or an important issue, you'll regret it. The next day, you'll be wondering 'what did I tell that guy?'"

When your office covers thousands of miles, traveling can have its advantages, too. "The more you travel, the more friends you make and the more you learn about different countries," comments Ola Johannsen, General Manager for Scandinavia in the Northern Europe region. "Eating in hotel restaurants can get very dull — it's much more interesting to go

where the locals go. In the winter in Finland, for example, I look for a good ice hockey match. When I was Distribution Manager for Scandinavia, I'd take my camper on long trips, so I could enjoy the scenery. After all day in an office or a meeting, it sure beats a hotel room. If you're open to these experiences, business traveling can be enjoyable."

Adaptability to change, a trait essential to the success of any electronics company, seems particularly important in the international marketplace. "Our biggest challenge in international," Andy says, "isn't getting from one place to another, as many people think. It's relating to the events and opportunities in each of these widely divergent markets to our company's overall objectives. Each region of Europe, in fact each region of the world, has particular goals which we try to meet in keeping with what Fairchild is trying to achieve worldwide."

Though Fairchild's marketplace today is indeed global, there are still some things that can make members of our international marketing team feel at home. As Siegfried Mack put it recently, "Give me a glass of wine and a thick steak, and I'm at home anywhere."



Barrel organ on a Holland street

Like other major industry shows in Europe, Composants offers Fairchild's international marketing staff an opportunity to meet with many customers in a short time—customers normally scattered all over the continent. Activities surrounding the show, including a press reception and displays in Fairchild's show hospitality suite, provide additional chances to inform key customers about Fairchild's capabilities and technological advances.

Maintaining good customer relations can sometimes depend on a quick reaction to an SOS, as Bob Blair learned last year when a performance problem with



Village church on the outskirts of Vienna

# Market Report: CCD Chip Speed Reader In 3M Company Fast Fax Machine ...Electronic mail comes to industry



In the office of the future, you may start your day by polling your computer to get mail and messages that have been sent to you electronically.



*Bert Johnson (back to camera) and Chuck Donnelly, center, point out Express 9600 features to Fairchild's Ron Carlson.*

An office in which memos are flickers of green light on a screen rather than sheaves of paper on your desk may still be years off. But the day of high speed electronic mail transmitted in hard copy form over facsimile machines is here. Fairchild CCD (charge-coupled device) chips are an important component in the machines that are leading the trend.

Facsimile (fax) machines have been in wide use since the 1950s. Today's models are ten times faster than early versions, taking only 30 seconds to produce a page of copy that used to take four to six minutes. Fax machines are an effective communication link for high priority mail and enable the transmission of maps and other non-verbal material between offices or continents.

With the new technology involved in high speed fax machines, major corporate and government agency groups are rethinking their use of this communications tool. A recent study done by a communications industry group predicts that a third of the Fortune 500 companies will have internal electronic mail systems by 1982. A U. S. Postal Service survey forecast that electronic mail systems could absorb up to half of that system's first class mail delivery.

The 3M Company's Express 9600, introduced just a year ago, has become one of the leaders in this burgeoning market.

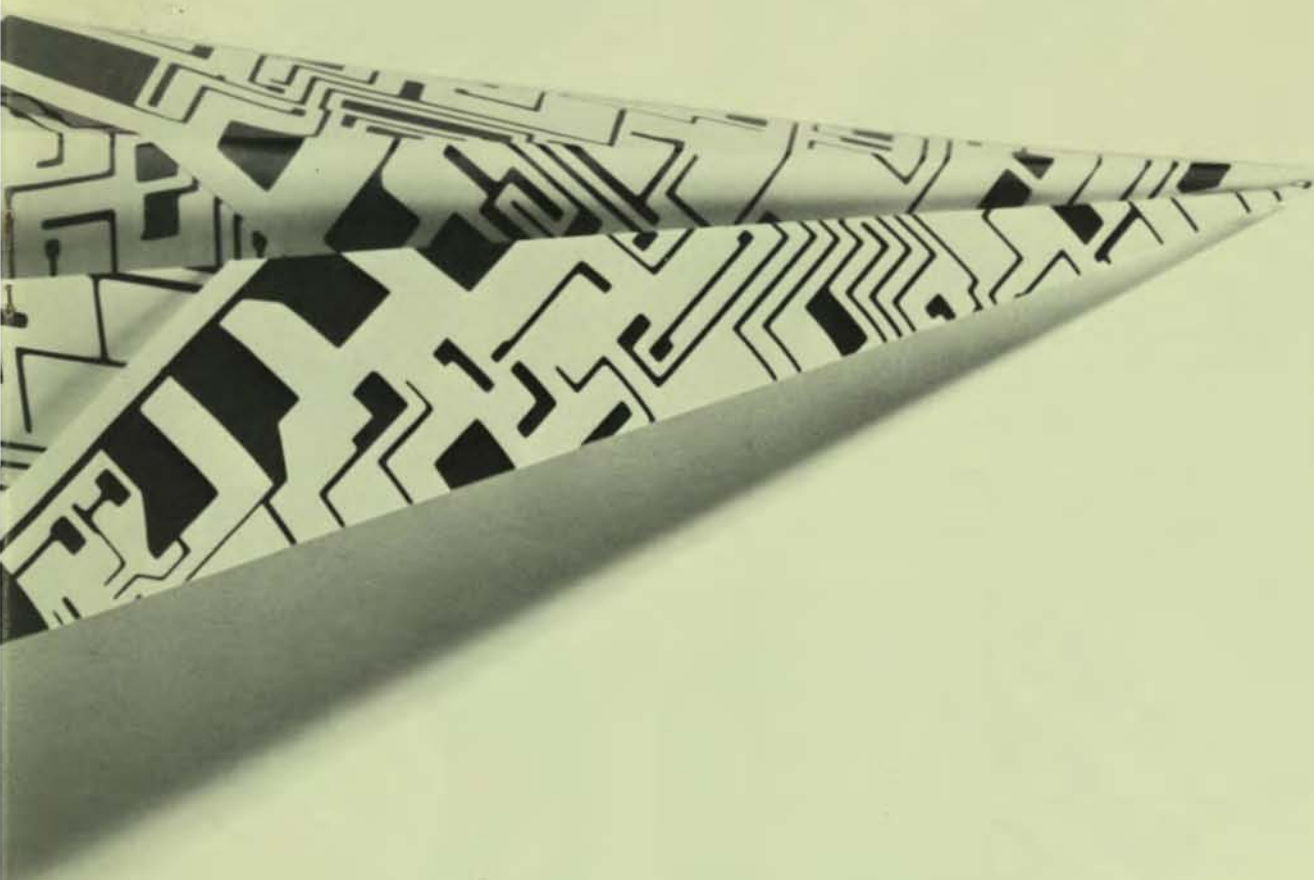
"We can't make them fast enough," Product Development Manager Chuck Donnelly says of the microprocessor-controlled units, which are manufactured at 3M's 250,000-square-foot plant in New Ulm, Minnesota, south of the Twin Cities. Facsimile machines like the Express 9600 are part of 3M's Graphic Systems group, which accounts for 26 percent of the corporation's annual \$4 billion in sales.



*Pat Rist assembles part of the Express 9600 at New Ulm plant.*

The 9600, which can simultaneously send and receive transmissions over conventional telephone lines, dramatically reduces transmittal time due to a new digital scanning system. In earlier models,





*Fairchild's CCD chip in board assembly.*

transceivers scanned a document line by line at a constant speed, reading white space as well as images and converting all that data to electronic signals which could be carried over the phone line.

Digital technology enables a scanner using a Fairchild CCD chip to read a page of copy through a lens, pick up the image on the page and break each line into 1728 information elements. The line-by-line data is then encoded so redundant codes (margins and white space for example) can be eliminated with a data compression technique. At the other end of the phone line, a decoder interprets the signals and an electrostatic printer produces hard copy.

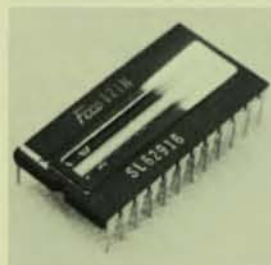
In addition to CCD chips which do the meticulous scanning, 3M also uses MOS/CCD Division FIFO (first in, first out) memories in the data compressor of the 9600 unit and a Fairchild Linear Division operational amplifier in the scanning device. According to Chuck, Fairchild's CCD was chosen because of its high performance, reliability and easy maintenance. Are they testing any new Fairchild components? "We're always interested in what Fairchild has to offer in the way of circuitry and electronic devices.

"The 9600 has been designed to operate itself. Less machine tending is necessary. Even if something should go wrong, self-test devices make it possible to diagnose most maintenance problems by phone, assuring the repair crew will bring the right parts when servicing is needed."

The 3M system's reputation is beginning to precede it, as Bert Johnson found out at a recent Detroit conference.

Bert, who gives 9600 demonstrations in major cities, was approached by the director of communications for Ford Motor Co., who told him he was at the conference because of a recent meeting with Henry Ford II. "He handed me a copy of your sales brochure on the Express 9600 and asked me what we were doing about electronic mail."

If Mr. Ford wants his "better ideas" communicated faster, 3M and its high speed "fax with a brain" will be ready to help. And the brain will continue to rely for its information on a Fairchild chip that can look at 1728 places at once.



*The speed reading Fairchild CCD 121H chip can see more than 1700 elements at one time.*

CHEMICAL TECHNICIAN

Computer Graphics Operator

\$1,000 SALARY CASH

SYSTEMS

Pick Your Position

ASSEMBLY TRAINERS

ASSEMBLY TRAINERS

STAND BACK TO YOU Type wpm?

CAREER OPPORTUNITIES SYSTEM PROGRAM

WAFER FAB SUPERVISORS Swing and Graveyard

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Engineering Operators

GIVE YOUR CAREER A LIFT!

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WORK WEEK Top Pay Absolutely

SWITCHBOARD OPERATOR

STOP READ THIS

RECEPTIONIST

COMPUTER OPERATORS

WANTED:

move up in the world ...

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Your Success is Our Business

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EASY SUCCESSFUL

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PROGRAMMERS

Systems Analysts

Customer Support, Application & Systems Programmers

Systems Programmers

Development Programmers

Programmer and Analyst

ENGINEERS

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FIELD SERVICE

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Systems Analyst

ENGINEER

Sr. Electronic

Sr. Electronic

RECEPTIONISTS

CLERK TYPISTS

OPPORTUNITIES

UNIQUE FIELD

International leader in the audio/video system

Swing and Graveyard

DATA PROFESSIONS OPERATIONS SPECIALIST

Sharpened career perspectives  
of four Fairchild people who left  
the company and returned

# US

*Casting an eye over the fence towards those pastures that look a little greener is a normal reaction for most of us when confronted with seemingly frustrated career plans or just the everyday hassles that go with our jobs.*

*But what makes a feeling of vague dissatisfaction turn to a decision to quit? Generally, it's not compensation, say those who've elected to go through the electronics industry's so-called "revolving door." Most major electronics companies offer competitive salary and benefits packages. Instead, they cite career advancement, the chance to try an independent venture, a bigger title at a smaller company, or just plain wanderlust.*

*Although the loss of valuable employees is a serious problem for Fairchild and other major semiconductor companies, many people who leave our company eventually return. On the following pages, four Fairchild rehires share their sometimes surprising reasons for leaving—and coming back. As one of them says, "The grass is not always as green on the other side of the fence as you think."*



Bill Towler

## Bill Towler

His job interview happened accidentally, in the lobby of a Dallas hotel, as he waited for his friend to be formally interviewed upstairs. Three weeks later, his chance interview resulted in a job, while his friend received the standard rejection letter.

That's how Bill Towler, a Senior Sales Engineer for the Los Angeles sales office in Encino, Calif., got his start with Fairchild. But it hasn't been as smooth as his first interview. Twice Bill left the company for jobs he thought would be better. And twice he came back, when he found the proverbial grass on the other side of the fence had its brown spots, too.

"I've spent a total of 11 years at Fairchild, working in jobs from electronic engineering to my current position in OEM (original equipment manufacturer) sales," says Bill. "Sure, there are lots of frustrations and problems, but I've learned that every company has its own set."

Bill, who earned his engineering degree at San Jose (Calif.) State University, was hired in Dallas in 1967. He came directly to Mountain View as an electrical engineer in the Digital Division, and later moved to the Hybrids Division (now Automotive) as a quality control engineer and later QC Manager.

In 1970, Bill left to join a small company in Sunnyvale, Calif., where his assignment was to set up a new quality department. Though the job was a challenge, Bill soon became disenchanted.

"Late Friday, my boss would give me plane tickets for Dallas, and expect me to spend my weekend preparing for a Monday meeting. That hassle, plus the company's lack of understanding of what it took to do the job, were my main reasons for leaving in 1971. On a ski trip a few days after I left, I met a Fairchild marketing manager who arranged for me to interview for the slot of military marketing manager in Hybrids. I got the job."

From Hybrids, Bill went to the Optoelectronics Division, as a product marketing engineer. Then, in 1972, he went to field sales in Los Angeles. Five years later, in 1977, he left Fairchild for a second time. The reasons were complex—a combination of the personal and professional. There had been a split in the sales organization which customers found hard to understand, as well as some disputes with product managers over pricing. Bill accepted an attractive offer from another company.

"It looked like it would be a great opportunity for me," he recalls. "I thought a smaller company would mean I could get more things done faster—and that I would have more control over decisions. Well, I ran into a different set of frustrations."

Salesmen were expected to drive large, expensive cars and spend a lot of time entertaining customers. Bill, who has a down-to-earth style, was uncomfortable in that role. He also discovered his supposedly great territory wouldn't really blossom for about five years. Most important, he soon saw that conflicts between salesmen and factory—the eternal tension of pricing it high enough to be profitable but low enough to be competitive—were the same as at Fairchild.

"The deal simply wasn't as good as what I'd been promised. I realized that the problems I thought were Fairchild's weren't unique. I added up the frustration points, balanced them with my feelings toward the two companies, and came back to Fairchild field sales in January, 1977.

"Fairchild still has some of the problems that caused me to leave, but I deal with them better now. Besides, I really like Fairchild and respect the people here. I wouldn't have come back if I didn't."



Joe Consoli reviews financial data with Jim Unruh, Vice President—Treasury and Corporate Planning, left, and Tom Sherby, Senior Vice President—Systems and Equipment.

### Joe Consoli

Like others who've left Fairchild and returned, Joe Consoli admits his departure for a smaller company was prompted by the itch to try his wings, or, as he recalls, "to do it all." Joe valued his two years as vice president of finance for a small Bay Area company, but he returned to Fairchild two years ago with a new appreciation for what a large organization can offer.

Last February, Joe assumed his current position as Manager—Corporate Analysis, Mergers and Acquisitions, part of Fairchild's Treasury and Corporate Planning organization. In his new job, he's responsible for financial analysis of firms which may be candidates for merger with Fairchild or acquisition. He joined Fairchild in 1970 as an industrial engineer at the packaging plant then operated in San Diego. Joe transferred to Mountain View later that year, and held a series of financial posts until he left the company in 1974.

"I felt I'd moved up pretty fast," says Joe, "but I was impatient. I wanted to become well-rounded—get broader exposure to general accounting activities, treasury operations and learn more about corporate finance. It didn't look like I'd be able to do that in the near future at Fairchild without going overseas, which I didn't want to do for personal reasons."

Moving to a small company seemed to Joe to be the best alternative. So, he accepted the vice president—finance slot at a small electronics firm in Santa Clara, Calif. because it offered the broad-based experience he was seeking.

"When I joined them, the company planned to go public, but that didn't work out," Joe says. "However, I did get the wider financial exposure I wanted. In the course of my job preparing a public stock offering and exploring other financing alternatives, I dealt with vice presidents and boards of directors at other companies, and got to know many investment bankers and security analysts. I got a taste of a higher level of financial responsibility than I'd previously experienced, and learned to look at problems from a corporate perspective."

But there came a time when Joe realized he'd progressed as far as he could. "I'd hoped the company would grow at a rate to maintain a career challenge, but it didn't. I knew I wanted a job with upward potential, so I was very receptive to an opportunity that was available at Fairchild."

Since his return in September, 1976, as Analog (now Linear) Division Controller, and later as Components Group Controller, Joe has thought a lot about what it means to be part of a large organization. Two criticisms often leveled at big companies—that the environment is too competitive and that there is constant reorganization and change—Joe now sees as advantages.

"A competitive environment is a very healthy one because it keeps you striving to attain higher levels of performance, and it requires you to develop objectivity—two important qualities essential to success," he says. "Naturally, there's competition between people in any company, but I found I missed the stimulation of the competitive level at Fairchild. The depth of management and professional strength here encourages this atmosphere, and also tends to offset weaknesses that are more apparent in smaller organizations."

"One thing that drew me back to Fairchild was its complexity. With the number of divisions, products, plants and countries involved, our problems require team play to solve them. Working here takes real managerial and analytical ability, which I find extremely challenging."

"The changes, and reorganizations, which many people think are disadvantages of working here, provide tremen-

dous opportunities for learning and career progression in a relatively short time. I found it is much more difficult to go to work knowing nothing was going to change significantly for several years than to wonder what will change today or this week. Life is never boring at Fairchild."

Looking back to his leave-taking in 1973, Joe says, "it now seems that my reasons were as much personal as career-oriented. In many ways, I was just restless. Obviously, if I'd left because I disliked the company, I wouldn't have returned. And it couldn't have been because of the people, because I'm working with the same people now. I matured a lot professionally while I was gone, and I realized the grass is the same shade of green everywhere—the difference is how you view it."



Mary Anne Potter checks a project with Bob Banzet in the Palo Alto CCD reflex measurement lab.

### Mary Anne Potter

The bigger the responsibility, the better the job. To Mary Anne Potter, it's that simple. In choosing a company, she ranks challenge as the deciding factor—which is why she came back to Fairchild after two years elsewhere.

Mary Anne, currently CCD operations manager for South San Jose, returned to Fairchild last February to coordinate the transfer of the 65K CCD (charge coupled device) memory production from Palo Alto to the new MOS/CCD Division plant in South San Jose. Her decision to return, she says, was not based on salary—she was attracted by the broad range of responsibility she would have and the chance to work on an important new high technology product.

"We need to expand our manufacturing capabilities for the 65K to meet our current and anticipated demand," Mary Anne says, "so we need to transfer the operation into the larger quarters available at South San Jose. It's my job to oversee everything from wafer processing

to manpower planning—getting the job done in an orderly manner, but in time to meet production demands.”

Mary Anne’s operations management experience with Fairchild and several other electronics companies gives her excellent credentials for the hectic CCD post. She had already compiled a hefty resume in 1974, when she first came to work for Fairchild as Engineering Manager at the MOS/CCD plant in Wappingers Falls, N. Y.: a degree in physics, twelve years in semiconductor engineering and a stint in Texas setting up a semiconductor company’s three-inch wafer fab production operation.

Her assignment at Wappingers Falls lasted two years, during which time she was promoted to Operations Manager. An offer from a West Coast semiconductor company to head up western manufacturing brought her back to California.

“It was the kind of offer you don’t often get,” she recalls, “and one I didn’t feel I could pass up. I had start-to-finish responsibility—everything from buying wafers to shipping the finished product, and supervised 225 people. I felt I was ready for that scope of responsibility, and welcomed the opportunity to prove myself.”

As attractive as that position seemed, Mary Anne eventually moved on when she received an offer from a Santa Clara valley microcomputer company that was about to start up high-volume production on several products. Four months after she landed the job, the company decided not to go high-volume after all, and Mary Anne’s challenge disappeared.

At that point, she’d had it with company-hopping. “I decided,” she says, “to do some very careful looking around for a place I could stay a long time. Almost immediately, I realized it would have to be a big company. I identified several candidates, including Fairchild, and spent about a month looking at the pros and cons of each one.”

During the course of her search, Mary Anne called her friend and former boss, Doug McBurnie to ask if he had heard of any suitable job openings in the area. Doug, who has recently been named General Manager for the Transistor Division, was serving at that time as Operations Manager for MOS/CCD Division. He promptly asked her if she’d consider returning to Fairchild to take over the CCD transition, and her job search was over.

During her two years away, Mary Anne discovered that things that bothered her most during her first job with Fairchild—such as the time involved in getting approval on everything from proposals to equipment requisitions—are frustrations almost everywhere. When she returned, she also saw that progress has been made in some former problem areas. “For instance, there is much better communication now between Mountain View and Wappingers Falls than when I worked in New York,” she comments.

Mary Anne feels she also came back with a lot more tolerance. “I’ve made a decision that it’s going to take a big, big problem to make me even think about moving again. I’m also finding I deal differently with problems when they do come up. I know they’re going to occur and I work harder at solving them. Maybe in time, I can do something to help change a few procedures. I’ll sure try.”



Norm Chanoski checks a shipment with Mike Keyashian, LSI QA Manager.

### Norm Chanoski

It didn’t take Norm Chanoski long to learn about the quality of the grass on the other side of the fence. Three months after he left Fairchild, he was back—which is, he says, “If not a record turnaround, pretty close to one.”

Norm, who is Reliability and Quality Assurance Manager for LSI Products Group, says his story is the classic case of imagining that things are better elsewhere. “Unfortunately, it sometimes takes going there to find out that the grass isn’t any greener.” Norm left Fairchild last November, and was back at the end of January.

Like Joe Consoli, Norm thought he would enjoy working at a smaller

company. His new job was to set up a reliability and quality program for a promising, well-respected young firm. “I thought it would be a good spot to establish a solid program and watch it grow.” But the job didn’t turn out to be what he’d anticipated.

Norm also found that the small company environment didn’t suit his style that well, either. “The pace was slower, the demands on my time were less. I guess overall the challenge just wasn’t there.”

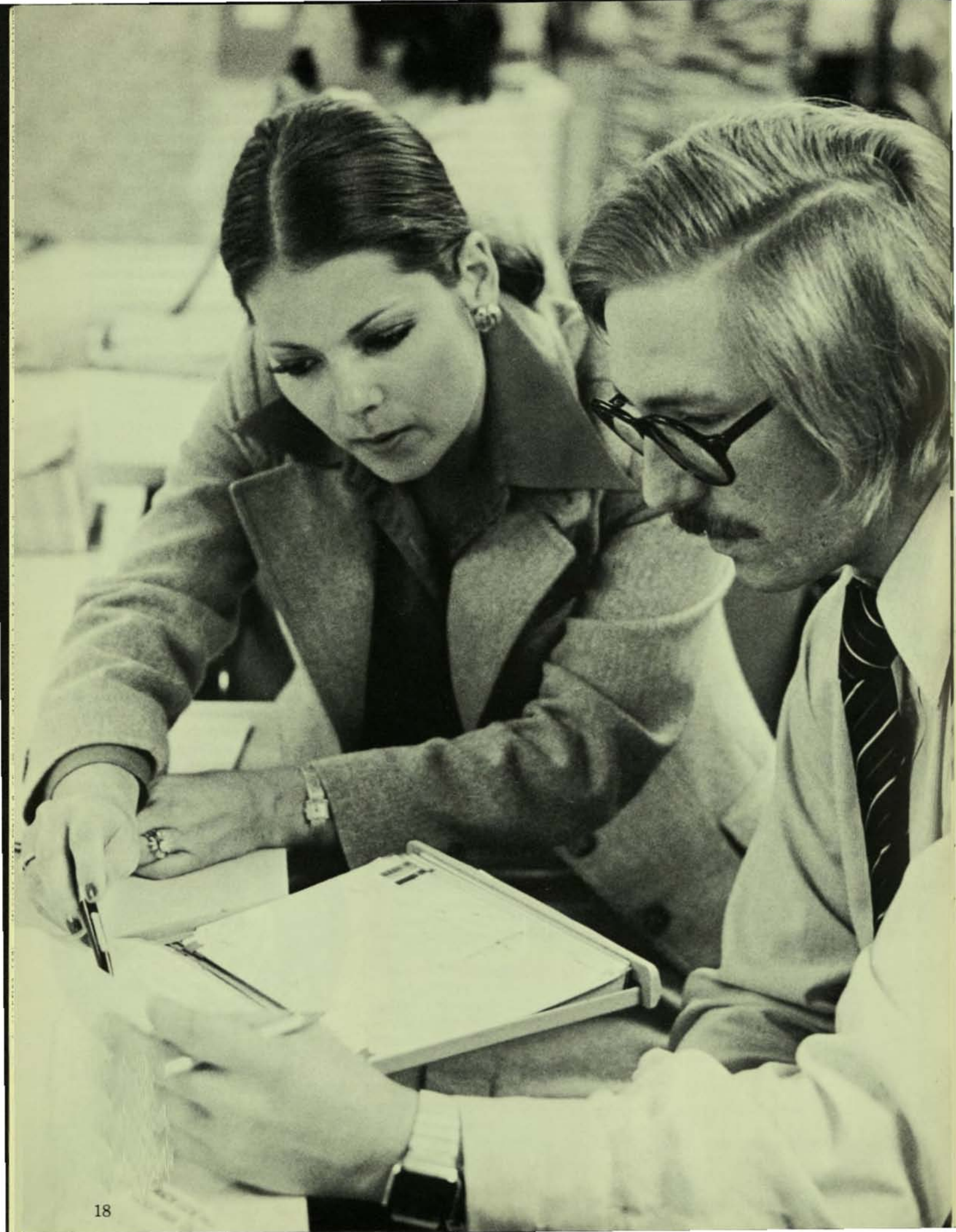
Several months into the new job, Norm got a call from Fairchild and was asked if he was happy in his present situation. By then, he realized he wasn’t. “So I sat down with Industrial Relations and they outlined the position I now have in LSI. It’s a job which offers a great deal of challenge—one in which I can contribute as well as learn.”

In his previous Fairchild job, Norm felt he had “peaked” in the slot—which is one reason he decided to look elsewhere.

In his second time around as a Fairchild manager, Norm, because of his outside exposure, thinks he is more sensitive to his staff’s gripes and frustrations. “If I hear somebody talking about their dissatisfactions, I probably work a little bit harder than I did before to understand why they’re unhappy—because I found myself in the same position last year.

“I don’t believe there are any problems at Fairchild that don’t exist at other companies straight across the board. As far as day-to-day problems are concerned, they are the same everywhere. There may be more stability at some other companies, but I have to believe that, in our industry, those companies are few and far between. The other guy’s lawn always looks better at a distance.”







Susan reviews the week's orders with Dave Okamoto.

Mesa and the G. S. Marshall offices in Canoga Park and Irvine.

These distributors either buy products and stock them on their shelves or they have them sent directly to the customer. Susan works closely with the distributors' product managers, providing current information about Fairchild products, deliveries and prices so she can direct the distributor to the proper Fairchild product. Equally important in her job is frequent contact with Fairchild marketing managers, whom she supplies with competitive data, sales objectives and market information.

Besides being constantly involved with the basic sales functions of her clients, Susan maintains Fairchild visibility by offering training programs and sponsoring promotions. "Training programs educate salespeople about Fairchild products and sales opportunities and promotions provide some competition and fun," she says. Susan also holds distributor meetings every six weeks to review inventory, new product information, Fairchild policies, or to answer problems or questions that come her way.

Good relationships with her distributors are very important to Susan's success. She is rarely in the office, preferring productive on-site hours spent advising, dealing with problems and interfacing with her distributors and their management. Doing a good job increases Susan's credibility and adds to the trust her distributors have in her.

"Involvement is the best word to describe my job," she said. "It's not just the sales skills, or rubbing elbows with the boys, but it's understanding my customer's needs and relating these back to the factory. The sale isn't the only thing. Service is very important too. The chance for new business tomorrow is based on the service level today."

The service level is highly dependent on the factory. Susan puts her personal credibility on the line each time she quotes price and delivery time. If there is a problem at the manufacturing end, Susan is hurt along with the company and the next sale is twice as hard. Sometimes frustration is part of the job, and she handles it with the same positive attitude as she does the rest of her duties.

Another aspect of Susan's job is the emphasis on socializing with her distributors, which also helps Fairchild maintain visibility and mind share. Each distributor has a softball team and the

competition is as fierce on the field as on the sales floor. Susan has also sponsored picnics, wine tasting and boating parties.

"This is the best way to know my clients and see their real personalities. A good sense of humor comes in handy, especially if I'm the only woman in the group. I try to strike a balance between being businesslike and being personal friends with these people," said Susan.

Susan holds a B.A. in Communications from California State University, Fullerton and she landed in sales because communication jobs were scarce when she graduated in 1972. "Why not" was her enthusiastic answer to an offer from Xerox to sell reproduction equipment. Two years later, she was a sales rep for Fairchild.

Susan was one of the first women Fairchild hired in sales. She is aware of her position and sees herself as a pioneer of sorts.

"I want to be able to change some old-fashioned attitudes toward women in this business," she said. "Women who have an opportunity to break into new fields must perform well or they'll make the job tougher for the next woman. I want people to respect me for the job I do."

"Fairchild has been good about supporting my efforts and the effect snowballs with my clients—but only if I continue to do a good job."

In a crowded, noisy distributor's sales office near Los Angeles, over the sound of phones ringing and voices shouting to be heard, distributor sales people are making fast decisions on whose product to sell, depending on price, delivery and proprietary status.

Susan Votaw, Fairchild Regional Distribution Manager, Orange County, Calif., is in the middle of the commotion. Her job is to have these sales people think of Fairchild when they're making sales decisions.

"Maximum 'share of mind' is the goal," said Susan. "I maintain high visibility for Fairchild so the salesman's first thought is my company, giving me first chance to quote for the business. The competition is rough. Los Angeles is a major market area, but we must be doing something right. We've had some record high months recently."

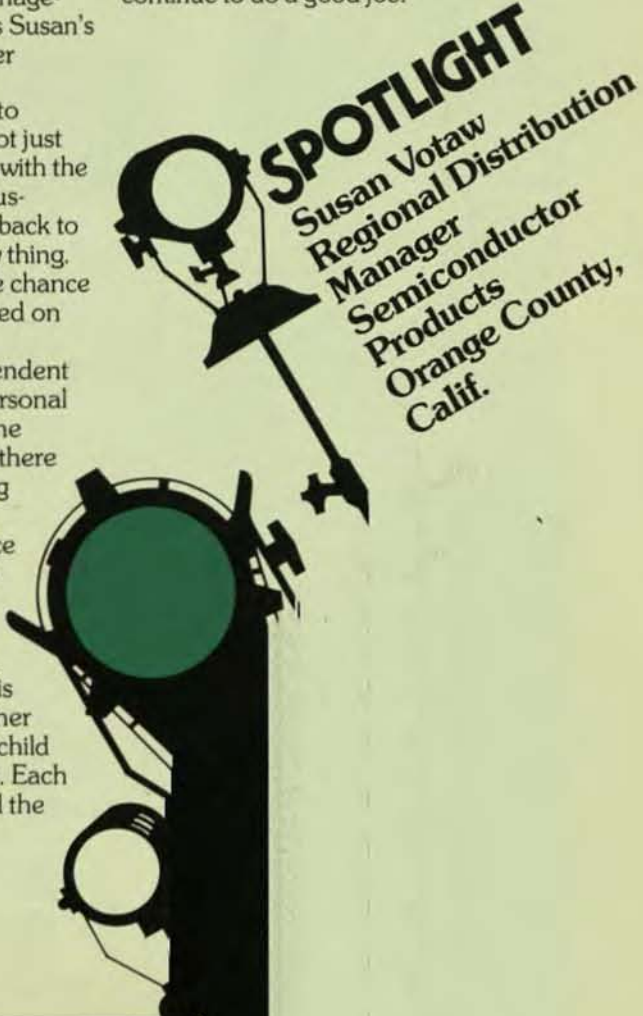
For Susan, visibility means constant service and contact with her customers. She monitors the order process and delivery of products and quotes on new business opportunities from distributor salesmen. It's a fast-paced job, requiring an agile mind, tireless enthusiasm, an assertive attitude and a sense of humor.

Hired by Fairchild in 1974 as a field sales engineer and promoted to Regional Distribution Manager a year later, Susan spends her day communicating with her four distributors, the "factory," as she calls Fairchild manufacturing, and with other Fairchild and industry salesmen.

Susan is the only one handling the distributor marketplace out of Fairchild's Santa Ana sales office. The region is headed by Dave Okamoto, Regional Manager for Orange County and San Diego, who has four original equipment manufacturer (OEM) salesmen.

Susan's customers include Hamilton Electro Sales, located in Culver City (the largest distributor in the world), Liberty Electronics in El Segundo, Avnet in Costa

Susan discusses product literature with Bill Buckley, Hamilton's Fairchild product manager.





Nurse Phyllis Pelosi assists a South Portland employee.

## #1 NURSE

The Occupational Health Nurses Association of Maine recently honored Phyllis Pelosi, nurse at the Digital Division's South Portland plant, with the organization's Schering Award, given each year to the outstanding occupational health nurse in the state.

Sponsored by the Schering Co., a large pharmaceutical firm, the award recognizes exceptional performance in the field of occupational health. An educational grant will be made to Phyllis' chapter in Maine in her name.

Phyllis, who has been with Fairchild since 1963, is the only occupational health nurse in the state of Maine who has received certification in her specialty. "I was thrilled to be selected by the state chapter," Phyllis recalls, "particularly since the award involves a grant which will encourage young people to pursue occupational health careers."

Jane Hall, Corporate Manager of Nursing, said, "Phyllis is most deserving of this award, and it is especially meaningful, since she was elected to this position by her peers." Congratulations, Phyllis.

## BEST IN SHOW

The Northern California chapters of the Public Relations Society of America recently selected Fairchild's *Horizons* magazine the best Internal/Employee publication for 1977. *Horizons* was chosen from more than 30 entries for graphic design and balance and variety of editorial content. Award presentations were made in March at the third annual Northern California PRSA awards dinner.



*Horizons* received this award at the Northern California PRSA competition.



West Coast  
Left, Andrea Baum  
Kyle Kashima



Field Sales  
Chris Rossie



East Coast  
Left, Patricia Graham  
Monique Hilton

## 1978 FAIRCHILD SCHOLARSHIPS AWARDED

Five winners of Sherman Fairchild scholarships were named in May. Recipients include two students from the San Francisco Bay Area, two from Long Island, New York and one from Kansas City, Kansas.

The recipients' parents are employed in Linear and Space Defense Divisions, corporate Management Information Systems and Semiconductor Products field sales. Career aspirations for the new Fairchild scholars include law, medicine, economics, dietetics and communications.

Each student will receive a renewable \$2000 annual stipend, covering up to four years of full-time undergraduate study at an accredited U.S. college or university. The scholarship program was established in 1973 by the Fairchild Foundation, Inc., for the children of Fairchild Camera and Instrument Corporation employees. The program is now financed by Fairchild. The scholarships are in honor of the late Sherman Mills Fairchild, founder of the company.

Winners are selected on the basis of scholastic achievement, community and school involvement and scores on the College Entrance Examination Board's Scholastic Aptitude Test. Selection was made by a committee of educators chosen by the Educational Testing Service, administrator of the scholarship program.

## WEST COAST

Andrea Baum is the daughter of Alois Baum, a Programmer for corporate Management Information Systems. Andrea will graduate this month from Cubberley High School in Palo Alto, Calif., and will begin studies in nutritional science and dietetics at the University of California at Davis this fall.

Kyle Kashima, also from Cubberley High School, plans to enroll at Stanford University this fall. Kyle will major in pre-medicine, and hopes to become either a physician or research scientist. He is the son of Mitsugi Kashima, a Linear Division Package Engineer.

## FIELD SALES

Christopher Rossie, a June graduate of Shawnee Mission South High School in Overland Park, Kansas, also plans to attend Stanford University this fall, majoring in economics and mathematics. Chris is the son of Ronald Rossie, Semiconductor Products District Sales Manager, Kansas region.

## EAST COAST

Patricia Graham is the daughter of John Graham, Associate Engineer at Space and Defense Systems Division. She will graduate this month from Smithtown East High School in St. James, N.Y., and plans to major in political science this fall at LeMoyne College in Syracuse, N.Y. She hopes to pursue a career in law or government service.

Monique Hilton, a June graduate of Massapequa High School in Massapequa, N.Y., is the daughter of John Hilton, an Instrument Maker at Space and Defense Systems Division. Monique will attend the State University of New York in Oswego this fall, and plans to major in communications.

## SUPERWALKER RAISES MONEY - AND BLISTERS

Maureen Borzell could barely walk for two days afterward, but she had the satisfaction of knowing she'd gone the distance. Maureen, a marketing secretary in Imaging Systems Division, Syosset, was one of 15,000 Nassau County, N.Y. residents who marched, walked and hobbled against birth defects in this spring's March of Dimes "Superwalk" walk-a-thon.

Staked by a \$1-a-mile donation from Fairchild plus contributions from her family and friends, Maureen raised \$210 by walking the entire 20-mile walk-a-thon route. "I was almost totally numb at the end, but I felt good knowing I'd walked the whole course," she says. "It was the first time I'd done it, but I plan on being back hoofing it next year." But not before stocking up on epsom salts!

Maureen Borzell sports her Superwalkers walk-a-thon T-shirt.





Dr. Hogan signs the membership roster of Britain's IEE.

## DR. HOGAN IN GOOD COMPANY

Dr. C. Lester Hogan, Fairchild's Vice Chairman of the Board, was recently elected an Honorary Fellow in the British Institute of Electrical Engineers (IEE). Dr. Hogan is the only living American to be chosen an IEE Fellow. Other Americans so honored during the organization's 107-year history have included Alexander Graham Bell and Thomas Edison.

The American Association for the Advancement of Science also named Dr. Hogan a Fellow this spring, citing his "pioneering contributions in microwave electronics and his leadership in industrial research and engineering." Dr. Hogan invented the microwave gyrator, isolator and circulator, which were the world's first passive non-reciprocal circuit elements. These devices are now used in nearly every microwave system in the world.

## STARTING HERE, STARTING NOW

Fairchild's technological breakthroughs have repeatedly made industry history—from the Planar<sup>®</sup> process, which insures that critical semiconductor junctions are never exposed to surface contamination, to today's Isoplanar integrated injection logic (I<sup>3</sup>L<sup>™</sup>), which combines the speed of bipolar circuitry with the packing density possible with MOS technology.

New product advances plus Fairchild's lead in employee benefits are the theme of an employee referral sweepstakes call "We Started It All." The program is under way at all West Coast locations, plus South Portland, Maine and Wappingers Falls, N.Y. on the East Coast. Under the program, which began in March and runs through September, Fairchild employees referring friends to the company for either full-time or permanent part-time positions requiring previous experience are eligible for cash, prizes and expense-paid vacations to destinations including Palm Springs and Tahiti.

If a referral is hired, the Fairchild employee receives a cash award based on the job grade of the newly-hired person. Referrals for "hot jobs"—those considered difficult to fill—earn the sponsoring Fairchild employee company store gift certificates in addition to cash. Employees referring people who are hired have their names placed in a drum from which prize winners' names are drawn.

Periodic prize drawings will be held throughout the duration of the contest, with five expense-paid trips for two awarded by a drawing in October.

Twenty-two new people were hired from the 117 applications received during the first month of the internal program. Running concurrently is an external recruiting campaign including radio, television and newspaper advertisements.

Specific details of the "We Started It All" program operation at your location are available from your Industrial Relations Manager.

\*Planar is a patented process of Fairchild Camera and Instrument Corporation.

*Florence Mendez, left, and Clarita Ona, Bipolar LSI Division, get referral program prizes from LeAnna Stanger, Corporate Staffing. Partially hidden is Clara Antolin, Bipolar.*

## NEWSMAKERS

**RONALD ALESSIO** has been elected Treasurer by Fairchild's Board of Directors. Previously, Ron was Assistant Treasurer . . . **G. F. TAYLOR** has been named Fairchild's Controller. Jerry had been serving as an Assistant Controller . . . **FREDERICK SCHMIDT**, General Manager, Space and Defense Systems Division, has also been named Division Vice President for Space and Defense . . . **DOUG McBURNIE** has been appointed General Manager of the Transistor Division. Most recently, Doug had been Operations Manager for the MOS/CCD Division . . . **GUNNAR HURTIG** has been named Product Marketing Manager, LSI Group. Previously, Gunnar was Product Marketing Manager for Fairchild in Japan . . . **JOSEPH CONSOLI** has been appointed Manager, Corporate Analysis. Joe had been serving as Components Controller until his promotion . . . **CARLENE ELLIS** has been named Manager of Information Processing. She had previously been Computer Operations Manager for Management Information Systems data center . . . **ROBERT BASHE**, previously Marketing Manager for Imaging Systems Division, has been promoted to ISD Director of Marketing . . . Imaging Systems has also named **AL ARENA** Director of Photographic Systems. Al had been Photographic Systems Manager for the division . . . **JOHN BLIGH** has been appointed Business Manager for Space and Defense Systems Division . . . **FRANK ERNANDES** has been appointed Technical Director for Space and Defense. Most recently, he was Technical Director for RF Systems . . . Imaging Systems Division has appointed **ART SCHOPPER** as Business Manager. Previously, Art served as Proposal Manager in the division's Accounting Department. . . . Government Systems divisions in Syosset, N.Y. have won the first place Gold Award from the United Way of Nassau and Suffolk Counties. The award, given for last year's campaign, recognizes Fairchild's 83 percent employee participation and 15 percent increase in contributions. Chairman of the drive was **FRED SCHMIDT**, who was assisted by co-chairpersons, **JOHN BERCZUK**, Director of Operations and **RUTH MILLER**, Public Relations Manager.



Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from February - April, 1978 appear below.

#### **Bipolar/LSI Division**

Richard E. Crippen, Hemraj K. Hingarh, Peter W. J. Verhofstadt  
Graduated multiple collector structure for inverted vertical bipolar transistors  
Patent No. 4084174

#### **CMOS Products Division**

Thomas J. Davies, Jr.  
Incrementer/Decrementer circuit  
Patent No. 4075464

#### **Instrumentation and Systems**

Peter H. Alfke  
Programmable counter  
Patent No. 4084082  
David H. Chung  
Microprocessor system  
Patent No. 4086626

#### **Time Products Division**

Mark R. Schneider  
Case for an electronic wristwatch module  
Patent No. 4077200

#### **Video Products Division**

Ronald A. Smith  
Hand-held controller device  
Patent No. 4085301  
Nicholas F. Talesfore  
Hand-held controller for a video game or the like  
Patent No. D247754  
Video game console  
Patent No. D247755

## **TECHNICAL WRITING AWARDS**

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval. Technical Writing Awards appearing below were given from February - April, 1978.

#### **Advanced Product Operations**

Peter W. J. Verhofstadt  
"VLST and Microcomputers"  
*1978 Spring Compton*

#### **Bipolar/LSI Division**

Eric Breeze  
"A New Design Technique for Digital PLL Synthesizers"  
*IEEE Transactions on Consumer Electronics*  
Peter W. J. Verhofstadt  
"Optimal Applications for Injection Logic"  
*IEEE Spectrum*

#### **Imaging Systems Division**

John Stanfield and Edward J. Ayril  
"Cost Savings Through Video Training Devices"  
*Symposium on Training Munitions and Devices, ARRADCOM*

Ralph Wight  
"Sensor Implications of High-Altitude, Low-Contrast Imaging"  
*ACSM-ASP Proceedings*  
Norman Gutlove and John Stanfield  
"TOW Missile Sight Video Training Systems"  
*Conference Proceedings*

#### **Instrumentation and Systems**

Peter Alfke  
"Extend uPuC bus 'time' simply and inexpensively"  
*EDN*  
Robert Hickling  
"Semiconductor Memory Testing"  
*Automatic Testing of Integrated Circuits*  
Don Villa  
"Improved End Product Reliability via Inhouse Testing of Components"  
*Semiconductor Test Symposium*

#### **International Marketing**

Ray Rees  
"Display Systems: the choice"  
*Electron*

#### **LSI Products Division**

Bruce Threewitt  
"A Solid State Bulk Memory for Microprocessors"  
*EE Times ICA Proceedings*

#### **Linear Division**

David B. Jones  
"Universal Switching Regulator Diversifies Power Subsystem Applications"  
*Computer Design*

#### **MOS/CCD Division**

Frank Bower  
"CCD Fundamentals"  
*Countermeasures*  
Mark R. Guidry  
"CCD Memory for Mass Storage Applications"  
*Sixth Texas Conference on Computing Systems*  
Rudolph H. Dyck and Ralph Wight  
"A High Quantum Efficiency, Front-side Illuminated CCD Area Imager"  
*SPIE*

#### **Optoelectronics Division**

Don Peterson  
"Build a 450 MHz Frequency Counter"  
*Radio Electronics*

#### **Research and Development**

B. E. Deal, D. W. Hess, J. Plummer and C. Ho  
"Kinetics of the Thermal Oxidation of Silicon in O<sub>2</sub>/H<sub>2</sub>O and O<sub>2</sub>/H<sub>2</sub>O and O<sub>2</sub>/C<sub>12</sub> Mixtures"  
*Journal of the Electrochemical Society*

#### **Space and Defense Systems Division**

Edward Magill  
"MSK Modulation for Multiple Access"  
*Electronic Design*

3/8/78

Dear Mr fairchild

I am glad you gave us the ping pong game and the channel F. They are fun to play with. Thankyou for the games.

From Yvette Pantoja I am 8 years old.

Fairchild, like most other large corporations, supports essential community services and activities through the company's corporate contributions program.

Recently, Fairchild donated a Channel F™ Video Entertainment System to the Tracy Community Center in Tracy, Calif. The center works with disadvantaged children from the community, offering sports programs, family counseling, employment referrals and assistance with medical care.

Channel F is a hit in Tracy, and Center Director Michael Suyematsu sent us a letter to tell us about it. "I can't tell you how happy and thrilled our kids were at receiving your video game," he writes. "Within the first month, literally hundreds of children have enjoyed using it. The game has been a tremendous asset, bringing in many youths who normally would have no contact with our center and its services. Due to your kind generosity, these children are finding out about programs that can help them, and they are enjoying something they would never have been able to use otherwise."

Some of the newest fans of Channel F put their two cents in, too.

Dear Mr. Fairchild

I am glad you gave us that ping-pong game and the channel F it gives us something to do when we are not busy with something else. It was real nice of you and I just wanted to thank you. I am 9 years old

From: Kim Gomez

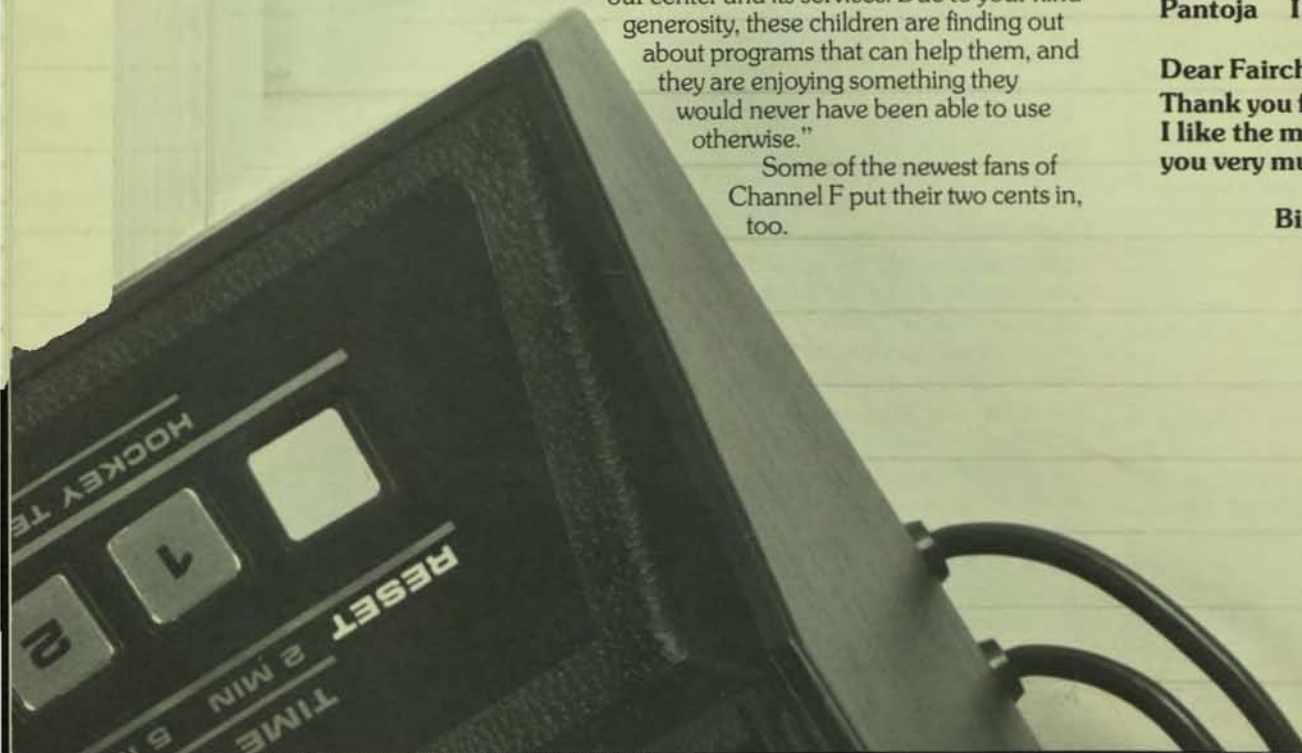
Dear Mr. Fairchild

I am glad you gave us the channel F it gives us something to do when we are not busy. Thank you. From Paul Pantoja I am 7 years old

Dear Fairchild

Thank you for T.V. games. I like the mouse game. Thank you very much.

Your Friend  
Bill Gonzalez, Age 10





**MICROFLAME**

The Team  
Behind the 9440—  
Fairchild's Hot New  
Microprocessor

FALL 1978

**HORIZONS**  
FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

FALL 1978

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**On the cover:**  
Hem Hingarh, left, and Dick Crippen, part of the 9440 design team, in their Mountain View lab. An article on development of Fairchild's newest microprocessor begins on page 6.



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*Santa Clara*—Don D'Andrea;  
*South San Jose*—Barbara Estrada  
 East Coast: *IPD*—Peg Schinnerer;  
*South Portland*—Pete Wiberg;  
*Syosset*—Ruth Miller;  
*Wappingers Falls*—Gene Olan

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## **FAIRCHILD REPORTS RECORD SALES, IMPROVED EARNINGS FOR SECOND QUARTER**

Fairchild's second quarter earnings increased by a factor of four, to \$6,271,000, or \$1.13 per share, from \$1,571,000, or 29 cents per share, a year earlier, the company reported August 3.

Net sales for the quarter were a record \$127,541,000, up 10 percent from \$115,581,000 in the comparable 1977 period.

For the first half, Fairchild earned \$12,006,000, or \$2.18 per share, more than triple the \$3,800,000, or 70 cents per share, reported in the prior year. Net sales rose six percent, to \$244,336,000, from \$230,569,000 in the 1977 period.

Wilfred J. Corrigan, chairman and president, said, "Second quarter operating profits (pre-tax earnings before royalties and other income) climbed 57 percent from the immediately preceding period.

"Our semiconductor and electronic equipment businesses strengthened across a broad range of products and geographic regions. Order input rates maintained the momentum established earlier in the year, further enlarging our total order backlog.

"In response to market demand, we are expanding semiconductor production capacity at our plants in the U.S. and the Far East. Capital appropriations have been increased substantially for the year.

"Our test systems activity showed continued growth, paced by a high acceptance of our advanced Sentry VIII LSI (large-scale integration) tester. During the quarter the company acquired the assets of Testline, Inc. of Florida and in July agreed in principle to acquire Faultfinders, Inc. of New York.

"In consumer products, the marketplace in the first half reflected seasonally weak demand. Although operations in this product group are much improved from a year ago, losses in 1978 will not be reduced to the extent previously anticipated.

"Working capital at the end of the second quarter was \$126 million and shareholders' equity \$195 million.

spending for research, development and engineering amounted to approximately \$13 million for the period.

"Current business conditions are strong in both our domestic and international markets. We expect this situation to continue throughout the second half," he said.

## **FAIRCHILD AND GEC AGREE TO FORM U.K. JOINT VENTURE**

Fairchild and The General Electric Company, Ltd. of England (GEC) have agreed in principle to produce semiconductors in the United Kingdom on a joint venture basis.

Subject to the settling of detailed terms and to the entering into of a definitive agreement, Fairchild and GEC will form a new company to manufacture MOS (metal-oxide semiconductor) products based on Fairchild's technology.

## **FAIRCHILD ACQUIRES TESTLINE, TO BUY FAULTFINDERS**

On June 28, Fairchild agreed in principle to acquire Faultfinders, Inc. a

Latham, N.Y., manufacturer of printed circuit board test systems. The acquisition is contingent on approval of Faultfinder shareholders.

Recently, Fairchild also acquired substantially all the assets of Testline Instruments Inc. of Titusville, Florida. Testline manufactures in-circuit digital printed circuit board test systems.

## **MARCONI AVIONICS TO MARKET CCD CAMERAS**

Fairchild has entered into an agreement with England's Marconi Avionics Limited, a GEC-Marconi Electronics Company, under which Marconi will market Fairchild's solid-state miniature CCD television cameras in the United Kingdom and Europe.

Under the agreement, Marconi Avionics' Electro-Optical Products Division, Basildon, England, will sell the MV-201 CCD television camera, manufactured by Imaging Systems Division, Syosset, N.Y. The cameras will be sold as part of complete TV systems or as individual products to the industrial, commercial and military markets.

## **LT. GEN. JAMES B. LAMPERT**

His many friends at Fairchild Camera were saddened to learn of the death of Lt. General James B. Lampert (U.S. Army Ret.) on July 10, in Washington D.C. after a brief illness. Gen. Lampert, 64, Vice President for Research Development at the Massachusetts Institute of Technology, had been a member of the Fairchild Board of Directors since 1973.

Gen. Lampert retired from the U.S. Army in 1972 after 36 years of service. During his military career, he headed the Nuclear Power Program for the Corps of Engineers, and served as Superintendent of the U.S. Military Academy at West Point, from which he graduated in 1936.

As the last U.S. high commissioner of the Ryukyu Islands, which includes Okinawa, Gen. Lampert was involved in negotiations for transfer of the islands' civil administration to Japan.

From 1966-69, he served under President Lyndon Johnson as Deputy Assistant Secretary of Defense for Manpower and Reserve Affairs. Gen. Lampert was a fellow of the American Society of Civil Engineers, and a member of the Council on Foreign Relations and the Society of Military Engineers.

Gen. Lampert is survived by his wife, Margery, and three children. He was buried with full military honors on July 13 at West Point.

# SPECTRUM

## Six Worldwide Areas Convene for International Sales Conference

Spectrum '79 was the theme last month as more than 50 Fairchild people from Semiconductor Products' six international sales areas gathered in Palo Alto, Calif. for the 1978 International Sales Conference.

Last year, sales outside the United States and Canada represented one-third of Fairchild's total. One task of the conference, according to Andy Procassini, Division Vice President, Worldwide Semiconductor Marketing, was to establish plans to increase that percentage.

Managers and sales representatives from Northern, Central and Southern Europe, Japan, Southeast Asia and Latin America reviewed sales trends and marketing plans with factory personnel at workshops covering all Fairchild's major semiconductor product lines. The group also heard presentations by company executives on subjects ranging from the complexities of multi-national finance to advances in the global logistics program.

Highlighting the week's events was announcement of two Sherman Fairchild Excalibur Awards at the meeting's closing banquet. The awards were presented by George Wells, Senior Vice President, Semiconductor Products.

Toshikiyo Nishiura, an OEM salesman from Fairchild Japan in Tokyo, was the recipient of this year's International Sherman Fairchild Award for Sales Professionalism.

Given each year in both the domestic and international Semiconductor Products field sales organizations, the award is made to the outside sales person voted most effective in customer relations and representation of Fairchild in the marketplace.

Nishiura-san, selected from among six nominees, was chosen for his ability to "set sales goals, organize and plan effectively, and persistently pursue his objectives," according to Fairchild Japan President Bob Skurko.

The Sherman Fairchild Award for International Sales Support went to Freeman Rosebrooks, International Marketing Manager, Integrated Circuits Group. The sales support award goes to the individual judged most responsive to field and customer needs.

Freeman was nominated by Siegfried Mack, General Manager, Central Europe, who cited his "excellent communication with sales and marketing groups in giving sales training and customer support."

1. Visitors from Fairchild Japan in Tokyo take a coffee break.
2. Nick Phillon, Milan, checks in Monday for the week-long meeting.
3. George Wells, far right, in his native Scottish attire, and Andy Procassini, far left, congratulate Sherman Fairchild Award winners Freeman Rosebrooks, second from left and Toshikiyo Nishiura.
4. The week's program opened with several general session presentations.
5. Sales people from Latin America confer with plant personnel during lunch.
6. Representatives from Northern Europe discuss their key markets with divisional marketing staffs.
7. Ola Johannsen, Scandinavia, listens to a briefing on recent integrated circuit product introductions.



# RUM 79



### Thinking small pays off big: How a Fairchild team developed the first microprocessor with minicomputer capabilities

Even at bargain basement prices, it would be hard to buy a conventional computer for less than about \$5,000. Today's microprocessors, tiny computers-on-a-chip, can provide significant portions of mainframe computing capability for under \$250. In addition to shrinking computers and bringing new capacity to the telecommunications market, these microprocessors have put data processing intelligence into everyday equipment from telephones to automobiles, causing a virtual revolution in the home, as well as industry.

Last January, Fairchild introduced one of the largest-capability microprocessors yet developed—the 9440 Microflame™. A 16-bit bipolar micro-



processor, the 9440 was the industry's first circuit with minicomputer power on a single chip—it can rapidly perform the sophisticated information handling of minicomputers many times its size and price.

The 9440 family, including the central processing unit and auxiliary hardware, is a group of products developed using Fairchild's proprietary Isoplanar Integrated Injection Logic (I<sup>3</sup>L™), a process that combines the higher speed and faster access time of bipolar technology with the packing density of the MOS production process.

But the 9440 story is more than one of advanced product performance. It began four years ago in labs in Mountain

View and Palo Alto, with a handful of people who were convinced they had a good idea—a high performance bipolar microprocessor capable of handling and storing twice as much information as anything then available. With only a few changes, the team that started forming in 1974 remained intact to see its project introduced to the market last winter as the industry's first microprocessor capable of executing a minicomputer instruction set with minicomputer performance.

*The 9440 development team included, above, Hem Hingarh and Dick Crippen, and facing page, Dan Wilnai, left and Chuck Erickson.*

# LIGHTING THE FIRE







Development of the technology that is the basis of the 9440—integrated injection logic—actually began in 1973 when Dr. Thomas Longo, Fairchild's Vice President and Chief Technical Officer, began plans to develop a large capacity, high speed technology that would capitalize on Fairchild's strength in bipolar processing.

"At that time, I felt we had the best opportunity to develop a high performance LSI microprocessor using our bipolar technology," Tom recalls. "The injection logic developed to that point was relatively slow, so our initial work was to demonstrate that we could make high performance injection logic. We also felt that our microprocessor, to achieve a significant revenue base, had to offer minicomputer capabilities at costs closer to those of the microprocessor world. If cost and performance objectives could be met, the barrier between minicomputer capabilities and many new cost-sensitive applications would disappear."

I<sup>3</sup>L, or Isoplanar Integrated Injection Logic, incorporates Fairchild's proprietary Isoplanar technology, an adaptation of the basic process for making semiconductors, with integrated injection logic, to produce the best of the bipolar and MOS worlds.

Traditionally, bipolar memories have offered higher speed than those produced with MOS technology, while MOS components could pack a lot more gates on each integrated circuit chip. With the advent of I<sup>3</sup>L, circuits can be designed to combine bipolar speed with MOS packing density. As many as four times more gates can now be put on a single chip, while access time—the time required to get stored information out of memory—remains low.

The 9440 offers operating speed of 10 megahertz. Significantly faster than other one-chip mpus, it was also the industry's first microprocessor capable of handling 16 bits of information with minicomputer speed. (A bit, an abbreviation for binary digit, represents a single piece of digital information, either a one or a zero in the binary system, that uses only on/off or high/low conditions.)

Initial I<sup>3</sup>L development began in 1973 at the Research and Development Lab in Palo, under the direction of Tom and Dr. James Early, Division Vice President and Director of R&D. The following year, actual hardware and circuit design on the 9440 central processing unit and peripheral circuits began in the Advanced Products Group in Mountain View. Work on the engineering process that eventually made production of the 9440 possible continued in R&D until last year, when that function was merged into Advanced Products.

"One of the greatest challenges of this project, and the principal reason it took four years to bring it to market, was that we were developing the technology from scratch at the same time we were designing a very complex product," says Peter Verhofstadt, Director of Advanced Products, who has been with the 9440 project since its inception.

"Typically, when you want to develop an extremely complex new product, you do it using technological processes you already have and understand. On the other hand, when you're working on a totally new technology, you usually test it on low-complexity products previously developed. When we started this program, I don't think we fully realized the impact each of these projects would have on the other."

Although the likelihood of a long stretch might not have been obvious to the 9440 team at the outset, they can now identify a number of critical milestones in each phase of the project.

"There were four basic ingredients that made up the whole—hardware design, software development, circuit design and process engineering," Peter explains. "Following the product family's introduction, of course, we have added more manufacturing and marketing people, but the 9440 development took place in those four stages."

The product family is built around the 9440 central processing unit, and contains a complete line of memory and control circuits, evaluation system boards and software. Names for the various products are coordinated around the cpu label, Microflame, and include the Spark-16™ evaluation board, the FLAME-16™ single-board minicomputer and the FIRE™ (Fairchild Integrated Real-Time Executive) software.

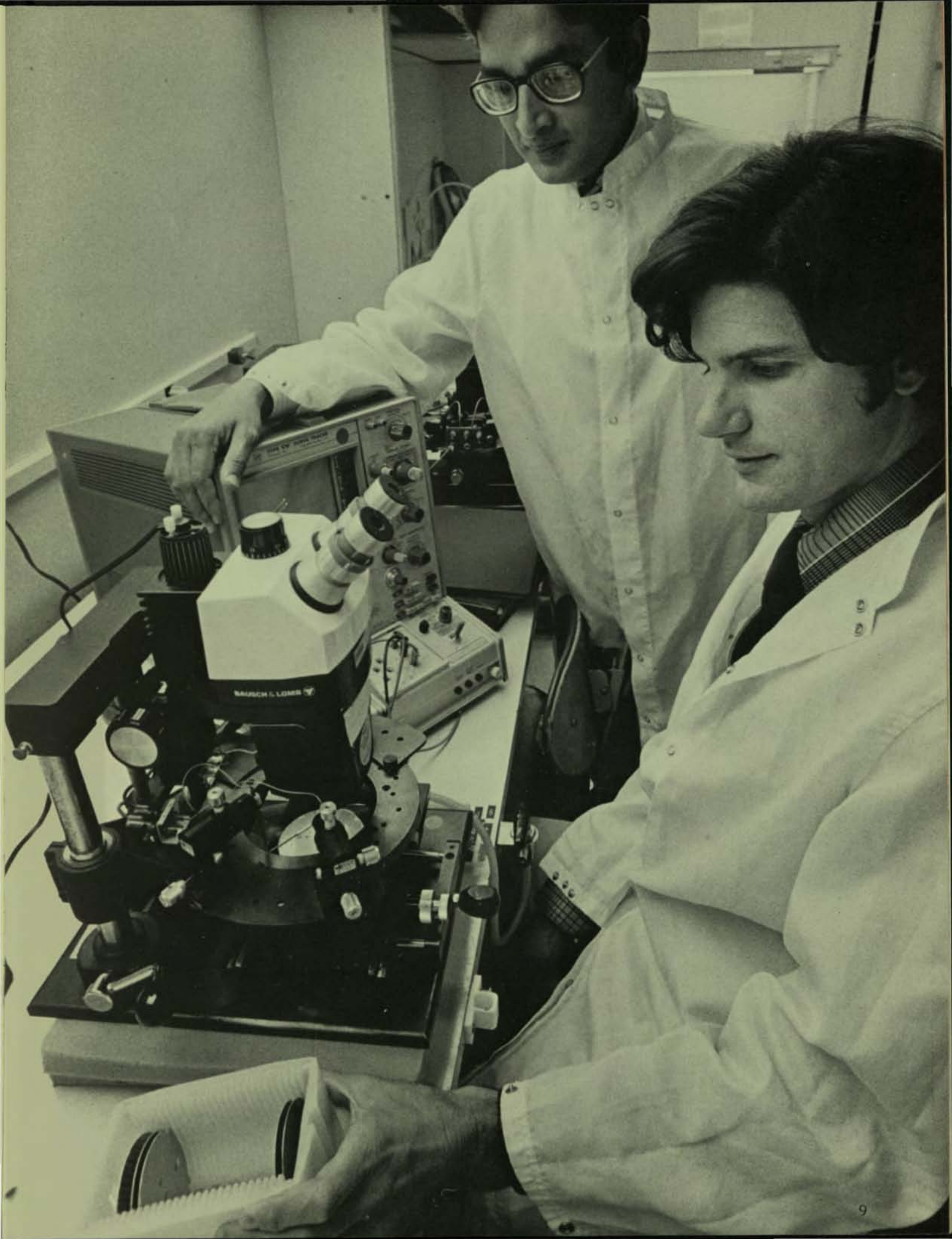
In hardware design, the project's first stage, the actual capabilities of the 9440 cpu, and later the peripheral circuits, were first defined. "We knew what signals had to enter and leave the cpu, for instance, so we had to find a way to achieve our goal while working within existing physical constraints," Peter says. "Once our hardware design group came up with an idea, people from all the other areas would sit down with them and go over it. This group atmosphere fertilized the thinking process, and helped us anticipate problems farther down the line."

When hardware design for the 9440 was completed, the conception of the microprocessor had been transformed into a series of breadboards containing several groups of components. These boards, of course, had to be converted into a tiny finger-nail size chip, so the 9440 then moved into circuit design.

There, a "road map" of the final circuit was drawn, tested and reworked over many months until just the right combination of components, connected in just the right way to perform the designated tasks was achieved. At this stage, the circuit was the size of a large tablecloth. It could then be reduced and converted into a set of tiny masks, so that the circuit could be transferred onto a silicon wafer.

While Advanced Products had been concentrating on hardware and circuit design, the R&D lab in Palo Alto had been tackling the equally challenging assignment of developing the process for actual manufacture of the 9440 chips.

*At right, Maduh Vora, standing, and Marty Garnett check wafer specifications during 9440 production.*





Through an occasionally frustrating series of experiments, the process engineering staff developed a 36-step "recipe" for production of the Microflame cpu and other parts of the 9440 family. These steps specified the types and concentration of dopants required to give the circuit desired electrical properties, necessary horizontal and vertical circuit geometry and the complex mask sequences needed to construct this multi-layered minicomputer on a chip.

Relatively early in the 9440 program, after the initial decisions on the right type of technology had been made and hardware design was still in its earliest stages, a selection of the fourth critical element—software—had to be made.

"One of the first questions to be answered in developing this project was what instructions would we use?" Tom says. "Were we going to use an existing set of software instructions, or come up with our own?" After examining the existing minicomputer instruction sets, the Data General NOVA 1200\* set was chosen because there seemed to be a

large growing base of existing application software owned by OEMs (original equipment manufacturers), software houses and independent programming consultants."

Software development basically takes place in three stages. Programs are first developed in source code—assembly language, or English—then converted to object code and written as a computer program. The final stage involves transmitting these object codes to a form useable by the customer—paper tape, PROMs (programmable read-only memories), floppy disks or magnetic tapes. 9440 software on PROMs or paper tape, plus instructional manuals, are sold to the customer along with the initial hardware kit.

The first working 9440 cpu was produced in late 1976, and in early 1977, Peter presented a paper on the project to the International Solid State Circuits Conference. Further work on chip yields, as well as final development of auxiliary products, had to be done before commercial introduction was possible. That took place in January, 1978, and the product has drawn a great deal of attention from both current and potential customers since then.

During the four years required for development of this product family, there were problems as well as victories. The frustrations associated with developing complex technology from scratch were coupled with delays caused by some difficult financial times for Fairchild. "Most of the key people on the 9440 team stayed with the project throughout its development because the 9440 idea itself was very exciting," Tom says. "Our group had the chance to work on something that was well beyond the state of the art when we started. It was a great challenge to our creativity."

Peter agrees. "This was a tremendous team effort. There were many long hours at critical times, but I don't think anyone considered it a great sacrifice. It was a challenge, and we pulled it off."

*Peter Verhofstadt, above left, confers with Ashok Suri in the Advanced Products' computer lab in Mountain View.*

\*Trademark of Data General Corporation



# YOUR INVISIBLE PAYCHECK



## THE 1978 EMPLOYEE BENEFITS REFERENCE CHART

The benefits plan available to you as a Fairchild employee constitute income protection and opportunities which go far beyond your payroll dollar. This special Horizons supplement is for you to use as a quick reference chart to all your company benefits.

The statements in this supplement are subject to the detailed provisions of the several plans and programs, and they are intended to be illustrative and an overview only.

1. Income Protection
2. Leave Benefits
3. Training and Advancement
4. Services and Facilities

All of these benefits represent an "invisible" second paycheck to you and your family, one which you can cash, for example, in case of illness or injury, or to further your education. They are, of course, subject to modification at the sole discretion of the company.

As currently implemented, these benefits apply to all full-time permanent employees, and to part-time permanent employees where noted, except those covered by a collective bargaining agreement whose terms and conditions provide different benefits. Fairchild pays the premium for the coverage unless otherwise noted. Full details on the benefit program are available from the Corporate Benefits office, Mountain View, or from your Industrial Relations Manager.





<b>BENEFIT</b>	<b>WHEN ELIGIBLE</b>	<b>WHO PAYS</b>	<b>WHAT IT MEANS TO YOU</b>
<b>LEAVE BENEFITS</b>			
VACATIONS	6 months	Fairchild	5 paid days after 6 months, 10 paid days after 1 year, increasing from 11-20 days from 3-20 years.
HOLIDAYS	Immediately	Fairchild	9 paid holidays annually.
PAID PERSONAL ABSENCE DAYS (PPA)	1 month	Fairchild	Paid days off annually for illness or personal reasons.
ADDITIONAL DISABILITY ALLOWANCE (ADA)	1 year	Fairchild	Additional paid sick days granted to hourly and salaried non-exempt personnel. Amount increases with length of service.
BEREAVEMENT ABSENCE	Immediately	Fairchild	Paid leave up to 3 days upon death of an immediate family member.
JURY DUTY	Immediately	Fairchild	First week, full pay. After that, difference between jury duty fee and regular pay.
LEAVES OF ABSENCE	6 months	Fairchild	Leave granted for medical, military or personal reasons when circumstances permit. Benefits can continue for specified periods.

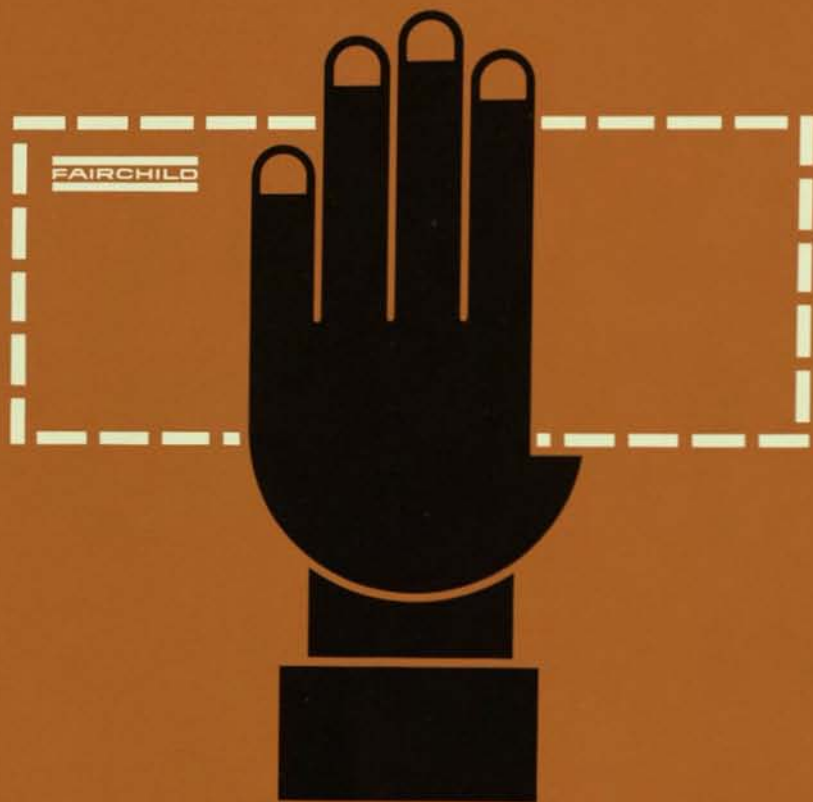
## **TRAINING AND ADVANCEMENT**

CAREER CENTER	Immediately	On site—Fairchild Off site—Fairchild and Employee	Job-related courses, co-op programs with area universities.
EDUCATIONAL AID PROGRAM	6 months	Fairchild 90% Employee 10%	Financial aid for approved courses.
JOB OPPORTUNITY SYSTEM	6 months	Fairchild	Opportunity for career advancement within company.
SERVICE AWARDS	5-year increments	Fairchild	Employee honored with service award.
SERVICE RECOGNITION INCREASE	6 months	Fairchild	Additional compensation based on length of service.

## **SERVICES AND FACILITIES**

MEDICAL DEPARTMENT *	Immediately	Fairchild	Medical treatment, counseling and other services. Free medical treatment if injured on the job.
SAFETY DEPARTMENT *	Immediately	Fairchild	Monitors working and facility conditions for safety. Conducts employee safety training.
EQUAL OPPORTUNITY DEPARTMENT *	Immediately	Fairchild	Insures all employees and applicants equal opportunity with respect to all terms and conditions of employment.
SHERMAN FAIRCHILD SCHOLARSHIP PROGRAM	2 years	Fairchild	Financial aid for college costs. Recipients chosen through Educational Testing Service competition.
CREDIT UNION *	Immediately	Employee	Savings and loan program available to all employees.
SAVINGS BOND PROGRAM *	Immediately	Employee	Savings through payroll deduction
RECREATIONAL ACTIVITIES PROGRAM *	Immediately	Fairchild	Social activities, discounts on major purchases and family entertainment.
REFERRAL AWARDS	Immediately	Fairchild	Cash awards for employee referrals for jobs above trainee level.

\*Applies to permanent, part-time employees.



**A SPECIAL SUPPLEMENT  
TO DETACH AND SAVE**

# Feelin' Fine

**From jogging to mountaineering,  
Fairchilders keep fit in mind and body**

Just about everybody talks about the value of exercise these days. According to a recent poll, 52 percent of Americans aren't just talking about it—they're getting out there and doing it. And they're investing substantial amounts of time and money in their quest to become fit. Last year alone, sales of running equipment totaled \$257 million. It's no wonder that the press has started to refer to the popularity of physical fitness as a "mania," an "obsession," even an "epidemic."

Whatever tag is put on it, most doctors think this concern with exercise is all to the good. Though jumping pell-mell into sports after years of sedentary living can be dangerous, a program of progressively more strenuous exercise has been shown to have a number of positive effects. It can expand lung capacity, regulate blood pressure, increase energy levels and alleviate insomnia and depression. In short, it is a powerful antidote to the stress of modern life.

*Thousands of joggers, including several from Fairchild, run over San Francisco's famous hills in the annual Bay to Breakers race each May.*



Like millions of other Americans, Fairchild employees are getting out on the track, the tennis courts, and high mountain trails. They have found dozens of ways to pursue exercise, matching their personalities and temperaments to a wide range of activities. In the process of becoming fit, they usually find themselves performing better at work and being happier in general.

The Fairchild athletes on the following pages are just a small sample of the hundreds of people in our company who have found that fitness is a holistic enterprise; exercising the body can focus one's goals and values in new ways.



**Joe Suarez**  
Government Systems  
Syosset, N.Y.

"I'm 50 years old," says Joe Suarez, "but most people don't think I look it. I guess I feel pretty good about that."

Joe, who has been with Fairchild 27 years, attributes his trim, youthful appearance to more than heredity. Bicycling is largely responsible.

Joe bought his first bike six years ago. Since then, he's been a regular two-wheel commuter, pedaling from his home on Hicksville, to his job at Government Systems in Syosset.

It's a six-mile round trip, and that regular stint plus his weekend pleasure rides help keep him in shape. In winter, when cold weather keeps him off the roads and the paddle ball courts, he finds he must resort to calisthenics.

Fitness hasn't always been a top priority with Joe. "When I turned about 44, certain things started to seem important to me—spending more time outdoors, staying fit, learning to relax with my job." In the same year, Joe bought a camper—with which he and his wife, Nivea, an Engineering Aide in the Design and Drafting Department, have covered most of the Northeast. He also bought a bicycle.

*Joe Suarez ends his morning commute at the Syosset plant.*

"I'd ridden a bike as a youngster, but I'd never had my own. I saw how much fun my kids had with their 10-speeds, and I finally decided to get one, too."

Soon he was riding his bike to work. Though he thinks he's "the only nut at the plant who commutes this way," Joe claims it's no big deal. He just pulls a nylon windbreaker over his shirt and tie and pedals off, "pushing a little if I'm running late, enjoying the scenery if there's extra time, but *always* staying alert. You have to be defensive as a cyclist or it's dangerous." That caution has paid off. In his six years on the road, Joe has never had an accident—or even a flat tire.

A balance and control supervisor for Management Information Systems, Joe controls all workflow at the Syosset Computer Center—computer headquarters for the company's 1200 East coast employees. Like any responsible job, this one has its pressures, "but a good bike ride can really help put your work behind you," says Joe.

There's more, of course, to Joe's commitment to riding than a trimmer waistline and fewer worries. "Biking is my time to be with nature—at my own pace, in my own way. I'm a loner when it comes to riding. I guess it's my form of solitude."

Though racing doesn't interest him, Joe does care about measuring his endurance. Last summer he took a 101-mile trip from Hicksville to Montauk, at the tip of Long Island. His goal was to complete it in less than ten hours, which he did.

Bicycling makes Joe feel so much better that he thinks biking is *the* sport for staying fit, particularly if you're over 45. "With a 10-speed, there doesn't need to be any strain, but it gives you consistent exercise. It requires coordination and mental alertness; there's no way you can get lazy riding a bike."

Joe recalls the time he was stopped by the side of the road on a long trip, and a white-haired cyclist pulled up beside him. "We got to talking," says Joe, "and I asked him how long he'd been riding. He told me that just a year before he'd had open heart surgery. His doctor had recommended bicycling for getting his strength back, and now, said the guy, 'I feel like a million bucks.'"

How long does Joe plan to keep riding? "I don't see myself ever stopping. I may be 90, but I'll still be out there."

**Lynn Harris**  
Transistor Division  
Mountain View, Ca.

She had come to the hillside simply to demonstrate her cross-country style to a photographer. But within a few minutes, a passing band of runners hailed her, "Hey, c'mon," called the leader, "we're just going to the top. Why don't you join us?"

She hesitated, then danced off through the high grass, her blonde, hip-length ponytails swinging with every stride.

In a minute or two she was back. "I hate to turn down any invitation to run," she explained. "But I reminded myself I've already done 12 miles today."

Twelve miles already (four before work and eight at lunch), and still—at 7 p.m.—she could have gone farther. It's a little hard to comprehend unless you're a serious runner, or have observed the breed. Lynn Harris, who is a factory planner for the Transistor Division in Mountain View, definitely falls in the serious category.

She is a marathoner—a runner of 26.2-mile races, those punishing events that until recent years only a relative handful of Americans attempted. Today, every major marathon is choked with entries, though the participants still form an exclusive club. There are nearly 20 million runners and joggers in the U.S., but only 25,000 of them completed marathons in 1977.

Lynn now has five to her credit. She finished her last, the Avenue of the Giants race in Humboldt County, Calif., in just three hours and nineteen minutes, a time that's already qualified her for next year's Boston—"the king of them all."

Marathon running requires devotion—in Lynn's case, at least 60 to 70 miles a week over city streets and wooded hills. Certainly a fraction of that work would be enough to keep her in shape. But she goes those many extra miles because "running is the best thing I've ever done. When my running is 'on,' the rest of my life works. I've really acquired discipline, at work and in my personal life."

Lynn started running three years ago. "I'd been a lifeguard and swimming coach for four years, and I didn't like the relative lack of physical activity when I changed to an office job. Finally a co-worker asked if I'd be interested in running. I started just to keep from being bored at lunch—first a mile a day, then



Lynn Harris tries an afternoon workout near Stanford University.

two, keeping at it even though I didn't see any very dramatic results for at least a year."

In May, 1976, Lynn entered her first race—San Francisco's famous 7.6-mile Bay to Breakers. From the minute she crossed the finish line, she was hooked. "That's when I knew I wanted to do a marathon."

Running around a city park at lunch is now such a ritual that "if I miss, I'm a grump for the rest of the day. Here in Production Control, it can get pretty hectic at times, but if I've had a good run, things just don't get to me—and you never get the afternoon blahs.

"But perhaps most important," says Lynn, "running has made me goal-oriented. You are constantly trying to improve—to increase your endurance, cut that time, take on new kinds of terrain and types of races. That desire to accomplish starts to affect all of your life."

Sports and competition are nothing new to Lynn. She swam competitively from age 8 to 17, reaching the Olympic trials as a freestylist. But running eclipses all her other sporting experiences. In fact, she refuses to call running a sport. "It's so much bigger than that. I can't really call running religious, but it's that kind of feeling."

For Lynn, the shimmering dream is a race this month around Lake Tahoe—72 miles in all. No woman has ever finished it. Lynn would like to be the first, and she'd like to do it in 15 hours. "There's no way you can call a run of that length pleasurable," she says. "But it's an incredible challenge. I'm doing it because I want to test myself. It's scary, but very exciting."

**Rob Bussell, John Salazar and Bob Schumacher**  
Industrial Relations  
Mountain View, Ca.

John Salazar and Rob Bussell don't scale granite cliffs to set a record or experience an adrenalin rush—though those things may certainly happen during the course of their pursuits.

They go rock climbing because, as Rob puts it, "I've never encountered any other activity which left me with such a sense of wholeness"—or as John expresses it, "When I'm on that rock, I'm closer to being who I really am than at any other time."

Pretty strong statements. But they believe them intensely.

Rob has been climbing for three years, John for less than one. Already, climbing has had a positive influence on their personal lives as well as their jobs in corporate Industrial Relations, where John is Director of I.R. for Semiconductor Products, and Rob is Manager, Management and Supervisory Development. Both active, athletic men who have participated in a variety of sports, they didn't start rock climbing to

physically fit, but because it intrigued them. Somewhat to their surprise, an impressive mind-body fitness has resulted.

Rob's first taste of the sport came on a summer trip with a friend "who spent half the time talking about climbing. I finally asked if I could try a climb—and got hooked."

Before Rob's current assignment in Mountain View, he was an Employee Relations Specialist at the Diode Division in San Rafael. Visiting Rob there on business one day, John was struck with the climbing posters and mountain scenes that plastered Rob's office. "Climbing was something that had fascinated me for a long time but I'd never actually met anyone who did it," recalls John. "When Rob told me he was into climbing, I decided it was something I'd like to try."

They took their first trip together last fall. Rob introduced John to his favorite climbing area, a place called Strawberry, not far from Lake Tahoe on the California-Nevada border. Just as Rob had done two years earlier, John started out on a few boulders, getting the feel of friction and balance, learning what the toe of a boot, an elbow, or a well-placed palm could do. Then John tied into the rope for his first real climb, a 230-foot face dubbed The Farce.

"It took an hour and a half," says John, "and I was exhilarated. It had been totally engrossing. I'd conquered something awesome and difficult."

*Top, Rob Bussell, left, and John Salazar complete a section of their climb. Left, before starting a climb, Rob discusses the route with Bob Schumacher, who was official photographer for this summer's expedition. Right, Rob and John survey the day's terrain.*



The total concentration demanded by rock climbing impresses everyone who tries it. And perhaps that's why it's such a powerful release from the workaday world. "There's absolutely *no room* to think about anything else when you're on that rock," says Rob. "Your mind can't wander when you're trying to figure out where to put your left foot if you move your right one to that little knob over there—or how to keep your knuckles jammed in that crack while swinging your leg up to the next ledge."

Bob Schumacher, Director of Development and Compensation in Industrial Relations, went along as official photographer on John and Rob's last foray. A long-time backpacker and mountaineer, Bob was admittedly impressed by the rigors of technical rock climbing. "They were so close to that rock, so intimately involved with every bump on its surface, it sometimes seemed like they were inside of it."

One of the great attractions of the sport is its immense variety. Every rock has different problems. It is one thing to do a face climb, where you are leaning out from the rock, using small holds and balance moves to ascend, and quite another to negotiate a chimney, a large crack which you shimmy up from the inside. There are "elegant" climbs on which the graceful can demonstrate their finesse, and there are "sheer grunts" routes that are sweaty, awkward struggles the whole way.

Climbing is physically taxing, no doubt about it. "I'm definitely in better shape than I was three years ago," says Rob. "But I'm not climbing for exercise. I'm climbing for overall fitness. This is the most complete sport I know. It gives you a new perspective on everything, from work to personal relationships."

Rock climbing has the image of being a dangerous sport. And it can be, since the protection offered by climbing equipment is only as good as the people using it; when an insecurely placed anchor pulls loose, it can be fatal. "But done carefully," insists Rob, "climbing is extremely safe."

That doesn't mean climbing is without fear. Hanging from a rock several hundred feet above the ground and not seeing another handhold or foothold within reach is the kind of scare climbers face continually. To John that experience is what makes climbing so important.

"In climbing, I've learned to deal with fear," he says. "You have to or you don't move up the rock. And that's got to be one of the most important lessons in life, since fears frequently hold us back.

"When you're climbing, you have to be totally honest with yourself—about your abilities and vulnerabilities. There's no bluffing on the rock. Climbing makes you accept yourself and makes you aware of the tremendous potential people have. This gave me the impetus to take on more challenges. Climbing has helped me really know myself for the first time."



**Dino Agbayani**  
Time Products Division  
Palo Alto, Ca.

No one ever had to convince Dino Agbayani that physical fitness was important. From the moment he threw his first baseball as a kid, he was a go-go athlete.

"I guess I was something of a jock in high school and college," he admits. "Baseball, basketball, football—whatever was in season, I was playing it. I love to compete."

Once he settled into his first engineering job, Dino had to reduce his athletic schedule somewhat, but he played in industrial leagues whenever he could. About four years ago, around the time he came to Fairchild, Dino reached a turning point. He was 29, and "I realized," he says with a half mocking smile, "I was past my prime in football and basketball. But I wasn't about to give up athletics. I simply had to find a tamer outlet."

He settled on tennis. Today, Dino is regarded as one of the best tennis players at the Time Products Division in Palo Alto, where he is a Reliability and

Quality Assurance Engineer. His most frequent Fairchild partner is Dave Treat, a Process Engineer in Optoelectronics. Says Dave of his long-time opponent across the net, "Dino is a hustling and aggressive player, definitely a challenge."

In addition to playing tennis three times a week, Dino swims regularly and plays baseball in the Fairchild league. When he's not hurrying to one of his own after-work games, he's likely to be doing a little sideline coaching for his wife's softball team. He weighs exactly what he did in college.

"I just have to be active," he says. "If I'm not hitting a ball or putting it through a hoop, I get bored.

"From my standpoint, the more competitive I am, the more release I get from everyday tensions. When I'm really out there to win, I forget about everything else. I think the competitive discipline of athletics has a tremendous bearing on your work. In sports, you soon learn that if you want to get to the top, there are a lot of routines you have to practice and master. If you intend to win a game, you'd better have your strategy down cold. There's no time in a tennis match to be thinking 'what do I do now?'"

For Dino and his wife, Priscilla, fitness is a shared concern. An avid softball player, Priscilla is also learning to play tennis, and Dino expects they will be regular doubles partners within several months.

In return, Priscilla has recruited her husband into a Polynesian dance troupe. "I've learned some ancient Samoan and Maori dances, and have gotten in touch with my cultural roots," says Dino, who grew up in Hawaii. "I've also learned that non-competitive forms of sport are just as demanding as any other. They, too, force you to test your limits, to excel—which is what I think physical fitness is all about."

*Above, Dino Agbayani, right, takes a break between games with frequent opponent Dave Treat.*



Homeowners save energy and money with California firm's F8-based monitor

Market Report:

# THE ENERGY MISER

If every home in America reduced its energy consumption by 20 percent, our country would save 200,000,000 barrels of oil a year. A new company in southern California is using Fairchild products in a system which offers U.S. homeowners the chance to save twice that much energy—and a lot of money in the bargain.

Energy Conservation Systems, located in the suburban Orange County, Calif. community of Costa Mesa, is preparing to install the first units of its patented Energy Economizer, an electrical consumption monitoring device that provides homeowners with a running dollars and cents total of their energy use.

At the heart of the product is the Fairchild F8™ microprocessor, which is

the master controller for the Economizer's complex monitoring, recording and automatic billing system.

Before the severe energy shortages of 1974, charges for electricity use were calculated on an inverse basis—the more you used, the less it cost per kilowatt hour. This policy, of course, encouraged energy consumption, rather than conservation. Due to subsequent



high costs of fuel, and the multi-billion dollar cost of constructing new power generating plants, utility companies no longer offer a price break as energy usage rises. Through revised rates, and new emphasis on "time-of-day," or peak load pricing, utilities are encouraging their customers to reduce their overall use of energy.

At certain times of the day, such as noon to 6 p.m. in the summer, energy demand is significantly higher than during other periods. Complex, "time-of-day" pricing schedules which charge the consumer up to 14 times the off-peak rate for energy used during peak periods, have now been adopted for residential test programs in 49 of the 50 states.

Three years ago, Dan Kincheloe, now Chairman of the Board of ECS, and Ed Gould, ECS President, began design of a system that would assist utility companies in implementing time-of-day pricing, while at the same time giving homeowners a means to effectively control their own use of energy.



Ed Gould demonstrates the capabilities of the Energy Economizer (shown as installed at the right).

"Time-of-day pricing is critical to energy conservation, because it costs a utility from five to 35 times as much to supply the extra electricity needed during those times," Dan says. "To meet the extra demand, they must go to 'peaker' plants—typically older plants—converted to 'overflow' status when new generating plants were built.

"These plants are very inefficient and frequently polluting, so utilities want to avoid using them if possible. Reduction in energy consumption is the obvious way to accomplish this."

The Energy Economizer brings this need for conservation right into the customer's home. Soon to be tested by Southern California Edison on 100 Los Angeles County homes, the ECS system consists of a monitoring apparatus attached to the home's electric meter and a display box usually mounted in the kitchen. The box shows the charges made for the homeowner's energy use so far that month, and automatically

produces a bill at month end. When the customers mail in payments, they receive new magnetic cards, which are inserted into the machine for printing of the next month's bill. The machine retains usage and charges for three months, should a customer neglect to pay a bill.

Each month's mag card shows peak period hours for that month, which may vary slightly. Customers then know when to avoid using non-essential appliances, thus decreasing their electric bill.



Economizer units are tested by Mel Siebels in preparation for the first product installation.

Studies conducted by the Energy Research and Development Administration (ERDA) have shown dramatic decreases in energy use by customers getting feedback on their consumption rates. In one ERDA study done in conjunction with Princeton University, people who got feedback on their energy use saved 38 percent more electricity than those who did not.

The Energy Economizer can also solve another major headache for utility companies—blackouts. "If Consolidated Edison had been using our system in 1977, New York would have probably not had its blackout—or, it would have been over in a few minutes," Dan says.

"If a system overload threatens, our system is equipped to off-load non-essential appliances, such as dishwashers, in thousands of homes in a matter of seconds. Once the crisis has passed, the appliances are then automatically turned back on a few at a time. It could totally eliminate crippling energy system interruptions."

The system can also help prevent electrical theft. Tampering with electric meters now results in a \$3 billion loss to U.S. utilities annually.

The recording, display, monitoring and billing functions of the ECS system are run by the Fairchild F8 microprocessor, which is housed in the box which attaches to the electric meter. Fairchild TTL circuits provide logic interface between the F8 and other parts of the system, including display modules and the mag card reader.

"We selected the F8 when we first designed our system because it was the most reliable, highest production micro-processor on the market," says Ed. "Since then, we have found Fairchild to be a cooperative supplier with reliable products and good delivery schedules."

That will be important when ECS begins filling another large order—installation of the Economizer in the new athletes' housing units being built in Lake Placid, N.Y. for the 1980 Winter Olympics.

Now that testing of their first product is underway, Dan and Ed have turned their attention to additional products in the conservation field. Currently being designed is a gas metering system similar to the Energy Economizer, which measures and displays gas use in homes which use this method of heating.

In the prototype stage is a telephone monitoring system that could potentially save industry millions of dollars in unauthorized use of company phones. The system, which displays a running cost of the call currently being made, as well as the monthly charges to date, will provide a printed record of telephone usage at the end of each month, as well as an automatic bill.

The ECS energy conservation system so impressed the U.S. Senate Finance Committee that a tax credit for purchase of the Energy Economizer has been written into the energy bill currently before Congress. "We were asked to make a 10-minute presentation to the committee that ended up lasting an hour and a half," Dan recalls. "It passed the entire Senate with only one dissenting vote. That came from a Senator who said they shouldn't give a tax credit for it—installation should be mandatory."



Dan Kincheloe places a call using the telephone cost monitoring system recently developed by Energy Conservation Systems.



Harry Sello, center, veteran auctioneer, is surrounded at the Fairchild table by production personnel and other volunteers during the recent KQED auction.

## GOING ONCE, TWICE . . . SOLD!

It was once again a record-setting year for KQED, the San Francisco Bay Area's public television station.

During a hectic 12-day auction in early June, merchandise and services donated by local firms brought in more than \$700,000 to support programming on the publicly-supported station.

Fairchild's auctioneer, Dr. Harry Sello, Technical Director for International, has been on camera with the auction since the first two-day version in 1955 that raised \$6000.

Fairchild again underwrote one of the large display tables for one day of this year's event, and auction activities during "Fairchild Day" were simulcast during evening prime time by a local commercial television station.



**JOHN DUFFY**, a Corporate Vice President, has been named General Manager of the Discrete Products Group . . . **ANDY PROCASSINI**, Division Vice President—International, succeeds John as head of worldwide semiconductor marketing . . . **DICK BOHNET** has been appointed Division Vice President and General Manager, Video Products Division . . .

**CY HANNON** has been named General Manager, Digital Products Division . . . CMOS Products Division has announced the appointment of **OSCAR OLSON** as General Manager . . . **DICK BELCHER**, General Manager of the Optoelectronics Division, has been promoted to Division Vice President . . . **PETER TURNER** has joined Fairchild as Managing Director of Fairchild Camera and Instrument (UK) Ltd., headquartered in London . . . **MAX MAYDEW** has been named Semiconductor Products Controller . . . **MIKE PELLE** has been named Industrial Relations Director for the Government and Industrial Products Group . . . **JOE KRALJIC** has assumed the post of director of Procurement for Government Systems . . . Also at Government Systems, **JOHN McCAULEY** has been named Manager of Labor Relations, succeeding **LARRY WEYBRECHT**, who has been appointed Manager, Industrial Relations, for the Industrial Products Division . . . Larry replaces **BILL METZGER**, who has assumed the new post of Industrial Relations Manager for Corporate staff, in Mountain View . . .

**DON D'ANDREA** has rejoined Fairchild as Industrial Relations Manager for the CMOS Products and Video Products Divisions . . . Worldwide Semiconductor Marketing has named **AL ENAMAIT** Marketing Manager, computers and aerospace and defense; **AL CHAME**, Marketing Manager, telecommunications and **DAN SEALE**, Marketing Manager, special projects. **SID BAGWE** was also named Marketing Manager for the U.S. automotive market . . . **GARY SUTTON** has been

*The backdrop for Fairchild's display of its microcomputers goes into place at this summer's National Computer Conference. The Fairchild booth—designed around the theme "Nobody has a broader spectrum of microcomputers than Fairchild. Nobody."—featured the complete microcomputer product line. The show held in Anaheim, Calif., drew capacity crowds throughout its three-day run.*

promoted to the post of LSI Group Controller . . . **ED WELCH** has joined the Transistor Division as Controller . . . **ED FARRELL** has been appointed to the new post of Manager, Intra-Company Sales in Semiconductor Products sales . . . **FRED WOLFRUM** has joined Fairchild as Group Financial Manager, Strategic Planning and Technology . . . **FLOYD (BUD) OLIVER**, Automotive Division, has been appointed Manager for the Division's Bosch Program . . . **STEVE BARTON**, Semiconductor Products, has received a second place award from the IEEE Consumer Electronics Group for his paper on "A Practical Charge-Coupled Device Filter for the separation of Luminance and Chrominance Signals in a Television Receiver."



## PATENTS

Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from April-July, 1978 appear below.

### Research and Development

Lloyd R. Walsh  
Compact, Two-Phase Charge-Coupled-Device Structure Utilizing Multiple Layers of Conductive Material  
Patent No. 4097885

Theodore I. Kamins and Juliana Manoliu  
Controlled Temperature Polycrystalline Silicon Nucleation  
Patent No. 4087571

### Test Systems

Yuk Bun Chau, George Niu, Rudolph Staffelbach  
High Speed Testing Circuit  
Patent No. 4092589

### Video Products Division

Ronald A. Smith and Nicholas F. Talesfore  
Cartridge Programmable Video Game  
Patent No. 4095791  
Nicholas F. Talesfore  
Plug-In Cartridge for Video Game and the Like  
Patent No. D248470

# TECHNICAL WRITING AWARDS

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval.

Technical Writing Awards appearing below were given from April-July, 1978.

## Advanced Products Division

Ashok Suri and Dan Wilnai  
"The Family FIRE"

*Progress*

## Bipolar/LSI Division

Paul Chu  
"Utilizing Bipolar FIFO in High-Speed Peripheral Controller Design"

*Computer Design*

Paul Chu and Vernon Coleman  
"Expanding the Addressing Capability of the Microprogram Sequencer"

*EDN*

William H. Herndon  
"A 35 Nanosecond Static 4096 Bipolar Random Access Memory" IEEE Semiconductor Memory Symposium

William H. Herndon, Wally Ho, Warren Ong

"4096 Bit and Larger Bipolar"

*WESCON*

James W. Hively  
"Subnanosecond ECL Gate Array"

*WESCON*

David K. Myers  
"What Happens to Semiconductors in a Nuclear Environment"

*Electronics*

Krishna Rallapalli  
"Input/Output Counters Enhance FIFO Operations"

*Progress*

Jonathan Stinehelfer, John MacDougall, Ludwig Arndt, Tom Goodman, Bruce Threewitt  
"Applications of Bipolar Isoplanar Memories"

*Electro Technical Preprints*

## Digital Division

Charles Alford  
"4 Bit Adder Serves as 5-Input Majority Gate"

*Progress*

"Idea for Design"

*Electronic Design*

## Georgia Sales

Jon Colt  
"Program Size vs. Speed—Not Always a Tradeoff"

*EDN*

## Imaging Systems Division

Harvey L. Balopole  
"TV Imaging with Charge Coupled Devices"

Long Island Forum for Technology

Vincent Diehl and Ralph Wight  
"LOREORS: Concepts and Applications"

*Airborne Reconnaissance III*

Irving Hirschberg  
"A High Resolution Solid State (CCD) Spaceborne Earth Imager"

SPIE's Technical Symposium East '78

Irving Hirschberg, Robert Bashe, Harvey Balopole  
"CCD Imaging Applications"

SPIE Technical Symposium East

## International Marketing

B.J. Harding  
"CCD Imaging"

*Seminex*

"CCD Memory Technology and Applications"

*Seminex*

A. M. Pope  
"An Approach to a Universal Switching Regulator Design"

*Seminex*

Ray Rees  
"LCD—Dot Matrix (40 Character)"

*Seminex*

## LSI Market Development

Steve Barton  
"CCD Comb Filters for Television Receivers"

*Progress*

"Quad Comparator Makes a Low-Cost Level Shifter with Time Delay"

*Electronic Design*

Steve Barton and Brian Sadler  
"A New LSI IC for Line Recognition and VIR Signal Processing in Television Receivers"

*IEEE Transactions on Consumer Electronics*

## Linear Division

John Conover  
"Exploiting the Versatile uA2240"

*Progress*

David B. Jones  
"µA78S40 Converts Low Voltage Batteries to Fluorescent Lamp Supply and Dimmer"

*Electronic Design*

## MOS/CCD Division

Mark R. Guidry  
"Charge Coupled Device Digital Memory—A Forward Look"

Camp Con Presentation

Bruce Threewitt  
"CCD's Bring Solid-State Benefits to Bulk Storage for Computers"

*Electronics*

"64K CCD Memory—First Low-Cost Solid-State Bulk Memory"

*Progress*

## Optoelectronics Division

Keith Riordan  
"What is an LCD"

*Progress*

## Research and Development

Bruce E. Deal  
"Thermal Oxidation Kinetics of Silicon in H<sub>2</sub>O and 5% HCl/H<sub>2</sub>O Mixtures"

*Journal of the Electrochemical Society*

B. E. Deal, C. P. Ho, J. D. Plummer and J. D. Meindl

"Thermal Oxidation of Heavily Phosphorus-Doped Silicon"

*Journal of the Electrochemical Society*

B. E. Deal, A. Humle, M. Schulz  
"Chlorine Concentration Profiles in O<sub>2</sub>/HCl and H<sub>2</sub>O/HCl Thermal Silicon Oxides Using SIMS Measurements"

*Journal of the Electrochemical Society*

Ramesh C. Varshney and K. Venkateswaran  
"A Block Organized 64K-Bit CCD Memory"

*IEEE Journal of Solid State Circuits*

"A Cost Effective 64K Bit CCD Memory"

*ISSCC Solid-State Circuits Journal*

"Characterization of a MOS Sense Amplifier"

*IEEE J. Solid State Circuits*

## Space and Defense Systems Division

Donald Grieco  
"A Comparison of Routing Techniques for Tactical Circuit-Switched Networks"

*International Communications Conference*

Anthony Kolodzinski and David Wainland  
"Multiplying with a Microcomputer"

*Electronic Design*

## Technical Administration

Thomas A. Longo  
"Genesis of Microflame and FIRE Products"

*Progress*

## Test Systems

Peter Alfke  
"Digitally Controlled Sine Wave Generator"

*Progress*

"Foreword to Microprocessor Data Manual"

*Electronic Design*

Jim Campbell, Anthony Taylor and Eiko Johnson  
"A New Software System for LSI Testing"

*IEEE Computer Society Digest of Papers*

Dave Corbin  
"Microprocessor Based Solar Controller"

*Progress*

Jim Healy  
"Algorithmic Execution of Heuristically Generated Subroutines for Efficient Testing of Microprocessors"

*International Microcomputer Conference Presentation*

"Characterizing Microprocessors"

*Electron*

"High Through-Put Testing"

*Electron*

"Is It Really Necessary to Test LSI?"

*Electron*

# 1978-79 SCHOLARSHIP COMPETITION OPENS

**A**pplications are now being accepted for the 1978-79 Sherman Fairchild Scholarship Program. Five grants of \$2000 each, renewable annually for up to four years of full-time undergraduate study at an accredited U.S. college or university, will be made for the '78-'79 school year to children of Fairchild employees.

Scholarship applicants must be the dependent children of full-time Fairchild employees or retired, permanently disabled or deceased former employees. The parent must have completed at least two years of full-time service

**B**y September 1, 1978, and must be employed by the company on September 1, 1979 for the student to accept the award.

The parent must also be, or have been, employed in Fairchild U.S. operations, or be an expatriate assigned to Fairchild operations abroad.

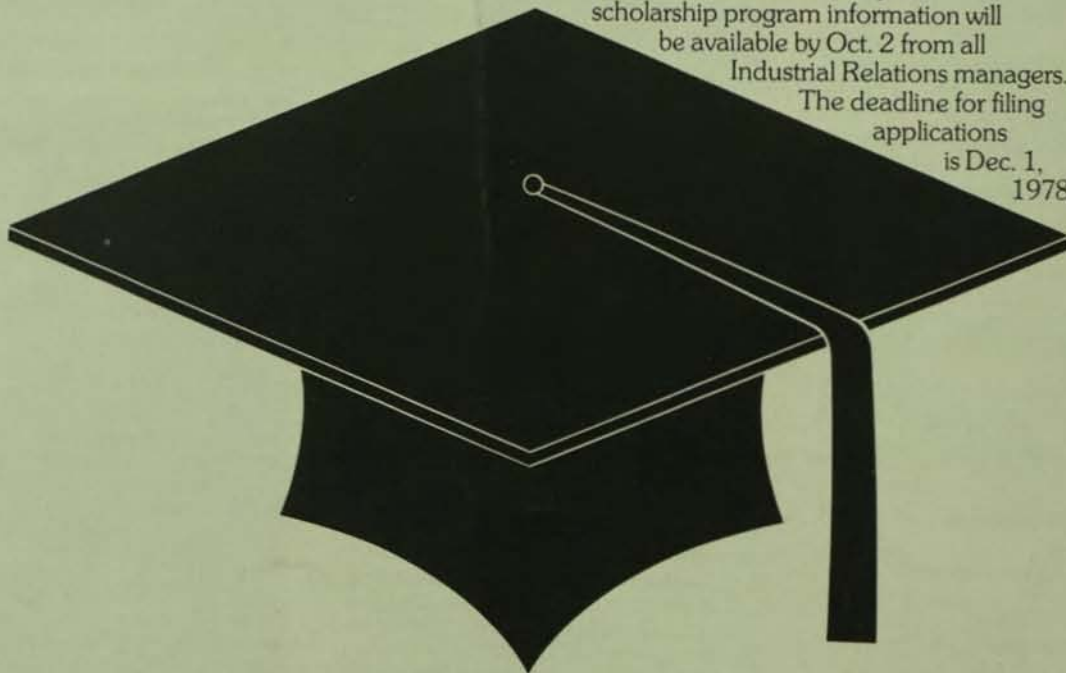
Students applying for Fairchild scholarships must be either high school seniors who will graduate during the current academic year, or high school graduates who have not previously attended

**C**ollege or junior college.

The competition is conducted by the College Scholarship Service, a division of the Educational Testing Service, Princeton, N.J., where a board of educators evaluates the applications based on scholastic achievement, community and school involvement and scores on the College Entrance Examination Board's Scholastic Aptitude Test.

Application forms and complete scholarship program information will be available by Oct. 2 from all Industrial Relations managers.

The deadline for filing applications is Dec. 1, 1978.





SUMMER, 1979

**HORIZONS**

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**Cover:** Westerners with instant-developing cameras are items of wonder in China, as Chuck Smith, lower left, found out. Chuck and two other Fairchild Semiconductor Products executives visited China in February. Story on page 4.



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## RECORD FIRST QUARTER SALES REPORTED BY FAIRCHILD CAMERA

Fairchild Camera and Instrument Corporation reported first quarter earnings May 4 of \$7,056,000, or \$1.27 per share, up 23 and 20 percent respectively from the \$5,735,000, or \$1.06 per share, earned in the year-earlier period.

Net sales increased 25 percent to a record first-quarter level of \$145,881,000 compared with \$116,795,000 in the 1978 period.

Wilfred J. Corrigan, Fairchild Chairman and President, said, "The company's solid first-quarter performance reflects the persistent strength in our major businesses evident throughout 1978. At present, we expect sales and earnings to continue strong for the balance of the year.

"Operating profits (pre-tax earnings before royalties and other income) for the first quarter were 63 percent above those of the comparable 1978 period. The first quarter of last year included a one-time payment of \$1.3 million, or 13 cents per share, received from Thomson CSF under a patent settlement.

"Order rates maintained their momentum during the quarter and continued to exceed billings by a significant margin. Backlog increased to a new record, 65 percent higher than the equivalent 1978 period.

"Sales of both semiconductor products and electronic equipment grew significantly as the result of continued strong demand and expanded manufacturing capacity. Volume decreased moderately from the fourth quarter of 1978, partly as the result of the discontinuance of digital watch operations. We expect total corporate sales to reach an all-time quarterly high in the current quarter.

"Working capital at the end of the quarter was \$120 million and shareholders' equity \$213 million. Spending for research, development and engineering rose to approximately \$15 million for the quarter. Our capital expenditures in 1979 will be about \$75 million, up from \$32 million in 1978," he said.

## SCHLUMBERGER TO ACQUIRE FAIRCHILD

On May 19, Schlumberger Ltd. and Fairchild, announced in New York that they had entered into an agreement providing for the acquisition of Fairchild by Schlumberger.

The agreement provided for a cash tender offer at \$66 per share for any and all common stock of Fairchild. It further provided that any shares of Fairchild remaining outstanding after the tender offer will be converted into cash at \$66 per share in a merger transaction. Fairchild's Board of Directors, with one director absent, unanimously approved the transaction. The tender offer opened May 29 and closed June 18.

Jean Riboud, Chairman and President of Schlumberger, and Wilfred J. Corrigan, Fairchild's Chairman and President, said, "We are delighted with this association which will be beneficial to both companies, their employees and their shareholders." Mr. Riboud further stated that Fairchild would operate under its present management as a separate subsidiary of Schlumberger, and that Schlumberger intends to continue the present or comparable Fairchild employee benefit programs.

Schlumberger, a world leader in providing well-logging services to the petroleum industry, had sales of \$2.7 billion in 1978. The company also provides oil drilling and production services and manufactures energy measurement and control equipment.

Fairchild's Board of Directors also considered a revised proposal from Gould, Inc. on May 19, to acquire up to 2,225,000 shares of Fairchild common stock at \$70 per share in cash plus a new issue of Gould preferred stock. Gould, a battery and electronics company headquartered in Rolling Meadows, Ill., had previously proposed to acquire 45 percent of Fairchild common stock at \$54 cash per share, and the balance for Gould common stock. The proposal was later changed to \$57 cash per share for 2.5 million shares and the balance for Gould common stock.

Gould withdrew its offer on May 21, following Fairchild's acceptance of the Schlumberger merger proposal.

## DR. HOGAN RETIRES AS FAIRCHILD VICE CHAIRMAN

Dr. C. Lester Hogan, 59, retired as Vice Chairman of the Board following Fairchild's annual meeting on May 4.

He will continue as a member of the Board of Directors and will remain in limited service to the company as technical advisor to the president.

Dr. Hogan serves on the boards of Rolm Corporation, United California Bank, Tab Products Corporation and Electromagnetic Sciences, Inc. He was recently nominated for a second term as Executive Vice President of the Institute of Electrical and Electronic Engineers.

Dr. Hogan joined Fairchild as President and Chief Executive Officer in 1968 and became Vice Chairman in 1974. He previously had been Executive Vice President of Motorola Corporation, in charge of its Semiconductor Products division.

## XINCOM ANNOUNCES 25 MHz AND BUBBLE MEMORY TESTERS

SEMICON/West in late May was the site for Xincor Division's introduction of two key memory test systems.

Unveiled were a magnetic bubble memory device tester and a 25 megahertz semiconductor memory test system. The bubble memory system, designated Model 5585, is designed to test bubble memory devices up to 65 million bits. The system balances both engineering and production test capabilities by featuring strong diagnostics and device evaluation testing.

The 25 MHz tester, which offers the timing precision, narrow pulse widths and fast cycle times required by devices demanding full speed testing, can test static and dynamic RAMs from 4K to 64K or greater.

Fairchild 100K temperature compensated ECL devices are used in all critical timing paths to the system to minimize propagation delay variations.







*Top, more than 500 statues of Buddha are housed in Peking's Temple of the Azure Clouds.*

*Above, George Wells, Senior Vice President, Semiconductor Products, at the Peking railway station.*

*Left, the subjects of Chuck Smith's Polaroid photographs were so fascinated that Chuck, Division Vice President and General Manager, Manufacturing Services Division, right, brought home only one of the 40 he took.*



He is an interpreter, and his story is China's story. Thirteen years ago, he was nearing completion of his training in Peking as an English interpreter, his country plunged into the turmoil of the now discredited Cultural Revolution—a ten-year movement from 1966 to 1976 aimed at removing a presumed elitist class of intellectuals, scientists and professional people from their positions of authority in China, and reasserting the supremacy of the workers.

Consequently, in an effort to resolve an intense political struggle, China shut itself off from the rest of the world. Very little news went in or out for nearly a decade. Regardless of their previous training, most of China's one billion people were sent to work in the fields, factories and other areas of menial labor.

The interpreter was one of them. He spent ten years as a farm hand and has only recently been reinstated to his former job. Today, although visitors tell him his English is quite good, his polite contradiction is that it was much better ten years ago.

China is a nation dedicated to making up for lost time. For most of the past 30 years, the country has cut itself off from the rest of the world, attempting to pursue a policy of total self-sufficiency. Political changes since the death of Chinese Communist Party Chairman Mao Tse-Tung in 1976 have brought China about-face. The country, under Party Chairman Hua Kuo Feng and Vice-Chairman Teng Hsiao ping, is actively seeking exchanges of goods and information with the outside world. Last February, three Fairchild Semiconductor Products executives were part of the first group of Western industrialists to visit Tientsin, China's third largest city and an electronics manufacturing center.



*Top, Peking's Forbidden City, home of China's Emperor in former days. Above, Harry Sello, Technical Director for Semiconductor Products Marketing, during a stop on a tour of the Forbidden City*

# China

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## Open for Business

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Top, acrobats perform at a show put on for the visitors in Tientsin. Middle, a Tientsin semiconductor manufacturing plant. Bottom, there are no traffic jams on Peking's wide streets. China has few cars, with bicycles the major mode of transportation.

For Harry Sello, Technical Director for Worldwide Semiconductor Marketing, the five-day tour of Tientsin and its factories was a return visit to China. For George Wells, Senior Vice President for Semiconductor Products, and Chuck Smith, Division Vice President and General Manager, Manufacturing Services Division, it was their first exposure to the country behind the Great Wall. The trip was arranged by the Hong Kong Chamber of Commerce, and the three Fairchild men were among a group of 14 businessmen representing companies with facilities in Hong Kong.

**A**rriving in Peking on a bitterly cold night in late February, the group hired a cramped minibus for the journey to Tientsin. What they had been told was a 60-mile trip was actually well over 100 miles, made all the more uncomfortable by the lack of heat and legroom in the bus (built to accommodate Chinese, not taller, larger Westerners). The temperature inside their Tientsin hotel was barely warmer than outdoors, and the travelers were only able to heat up their rooms by turning up space heaters full blast and running lots of hot water in the bathroom.

"It was a long, miserable journey," George recalls, "but at least we were there ready to start work the next morning." Led by a delegation of Chinese authorities, the group spent the next three days touring Tientsin electronics factories.

**C**hinese semiconductor manufacturing resembles what we were doing with simple integrated circuits in the U.S. more than ten years ago," Harry comments. "For example, they're assembling ICs in what we knew then as the ceramic 16-lead flatpack, as contrasted to the prevalent use today of the dual in-line packages. That technology was very good at that time, but has since been greatly improved. Information on these improvements has been widely available for the past decade, but the Cultural Revolution denied Chinese technical people the chance to see and read about all of these things taking place."

Despite this isolation, China has built a semiconductor industry from scratch. Their approach reflects the philosophy of Mao Tse-Tung, who unified the Chinese under the socialist

system, and preached a doctrine of self-sufficiency. For centuries before Mao came to power in 1949, China had been weakened and divided by feuding warlords and invading foreigners. When Mao proclaimed the People's Republic of China in 1949, he urged his followers to maintain their independence by relying on themselves.

"As a result," says George, "the people in Tientsin are making their own basic supplies—including their own silicon and gases, and are making wafers with furnaces and bonders they put together themselves. Their semiconductor factories are each totally self-contained units—everything they need they build or make themselves. This obviously creates a lot of duplication and enormous inefficiency, because their factories are essentially groups of small workshops. However, through tremendous effort, they are making a usable product. They may only be making 1½ inch wafers circa 1966, but their circuits work.

**I**t won't take them long to catch up, either—they're determined to achieve modernization in four areas—agriculture, industry, science and technology and national defense—by the year 2000. Banners throughout the country urge the Chinese to 'LEARN' and 'UNITE'—they have a billion people working toward the same goal."

To rapidly achieve these "four wants," as the four modernization goals are called, the government has divided China into regions, with each region assigned to develop a specific industry. In the Tientsin region, as well as the one surrounding Shanghai, China's largest city, that industry is electronics. "China is desperately short of the foreign capital they need to grow," says Chuck. "They want to do it all, but just can't generate the cash they need. But, there will be money for certain industries, and the leader of our host delegation told us China is focusing on the computer and semiconductor industries as major priorities."

This thirst for modernization is extending throughout the Chinese population, according to the Fairchild visitors. "I took over 40 photos with my Polaroid camera," Chuck recalls, "and only came home with one. The people at the various factories and on the streets are fascinated to watch the picture developing right before their eyes, and insisted on keeping them."

**W**e were great curiosities, of course," Harry adds, "but the people were warm and friendly wherever we went—nowhere were we made to feel alien."

The great majority of Chinese today, both men and women, all dress in simple blue or green pants and what have become known as Mao jackets, with no visible distinction by rank, sex or occupation. Their principle transportation is by bicycle. Each person receives a primary and secondary general education, including a thorough indoctrination in Communist ideology, and then is assigned a job. Job changes are not permitted unless reassignments are made by the government, as in the case of the doorknob factory workers recently told that they would now be building computers. Also banned is moving from the city where you were born without government permission.

"There's no such thing as unemployment," Chuck says, "and their system of compensation is quite different from Western economies. The average operator in a semiconductor plant there makes about 40 yuen, or about 25 U.S. dollars per month. (One yuen is worth about 60¢.) They pay for their rent, food, clothing and medical expenses out of this, then must bank the rest. If they want to spend money for anything else, they must get a permit—and there's very little else for them to buy anyway. This is one of the problems a U.S. company would face in doing business in China. While they are beginning to provide an incentive for people to produce more, what good is it if they can't spend the extra money they earn?"

**T**his is an area where it's hard to communicate with the Chinese, because they have a completely different economic system," says George. "When you attempt to discuss profitability and productivity, they respond that they don't know how they'll deal with it because they haven't worked it out yet. They have a closed system where the money just gets shoved from one pocket to the next. However, they will have to resolve those questions soon, because they recognize their need for foreign investments, and will do what is necessary to attract them.

"One of our principal suggestions to them was to concentrate on streamlining travel. Currently, the situation is dismal—Tientsin has six million people and no airport. We waited four days in

Hong Kong while our passports were processed before we could enter China. These are obstacles the Chinese will have to remove."

Fairchild has a number of options regarding any involvement in China, ranging from a technology exchange to operation of a plant. The country offers a large, readily available workforce, but the differences in political and economic systems mean significant philosophical and practical problems must be solved. In addition, China currently is subject to the same trade embargo act which governs our interactions with the Soviet Union and other socialist countries, so any U.S. electronic industry agreements with China would be subject to U.S. government approval.

The Fairchild people who visited China plan to observe the modernization situation closely for a period of time before making any decision about the company's involvement there.

**C**hina has a two-fold need which any foreign company must be aware of," says Harry. "To raise the money they need for their own industries to grow, they need to siphon off part of their production for export. At the same time, they need to learn about new technology that will enable them to build up their industries and supply their internal needs. They don't want to buy all the finished parts they need from the outside world, because this doesn't help them learn—and they have to learn. It is this area that may offer trade opportunities to companies like Fairchild."

China has already begun to prepare for visitors from the West—Intercontinental Hotels plans to build several hotels in the next two years (with better heating systems), and Coca-Cola plans a large bottling plant so Westerners will have something familiar to drink while in China.

Some changes in the airline reservation system also seemed to be needed, according to the three men. "I got a little apprehensive," George says, "after being told for four days that yes, we had seat reservations—unfortunately, there was no plane. The plane was off doing something else. It finally showed up—two days late. Our hosts promised to work on that problem before our next visit."



*Top, one of China's many beautiful pagodas.*

*Middle, the visitors receive an explanation of operations in a Tientsin semiconductor factory.*

*Bottom, George Wells and Chuck Smith, right, join their group for another leg of their tour.*



Mark Thurman, Marketing Communications Manager, prepares a computer at Testline for an advertising photo.



The entrance to Testline's newly opened headquarters.



Secretary Sandi Meyers takes a call from a Fairchild customer.

## Short Circuiting Testing Failures

**The light's usually green for customer's of SATS, Fairchild's newest division.**

In-circuit testing is one of the fastest growing areas in the test equipment business. These systems can fit right into a manufacturer's production line, catching faults when they can be easily corrected.

Last year, Fairchild's Test Systems Group entered this expanding market. Faultfinders, Inc. in Latham, N.Y. and Testline Instruments Inc., Titusville, Fla. (near Orlando) were combined to form the Subassembly Test Systems Division. SATS manufactures printed circuit board testing systems and interface products, and is part of Test Systems Group. The division is headquartered at the Faultfinders' production site just outside Albany, New York.

"Our current product line is printed circuit board testers, but our future charter is much broader," says Joe Rivlin, Division Vice President and General Manager. "The device testing market, which is served by Test Systems' Sentry, Xincom and Sentinel equipment, is limited to component

and circuit manufacturers. Those testers are expensive and only large companies can come up with that kind of money. The electronics assembly market, which is much larger, uses a great many printed circuit board testers, such as those made by Testline and Faultfinders. Any company that uses a PC board in its product could conceivably use a Subassembly Test Systems product during manufacturing or in field maintenance."

Faultfinders products, strong in analog and hybrid capability, are production testers that perform fault isolation tests on bare and loaded printed circuit boards. The Mechanical Products business unit produces the thinline interface system for use with in-circuit testers. Testline systems, strong in digital capability, are built for in-process testing, repair depot testing and field maintenance.

Since the formation of the SATS Division, Faultfinders product development has concentrated on analog and hybrid testers, while Testline will stress development of digital testing equipment.

Printed circuit board testing is a complex process which requires testing of a great variety of components and connectors on each board. Conventional or functional PC board testing derives its name from the fact that the

*Right, Joe Rivlin, SATS Division Vice President and General Manager, and Jim Bowen, Vice President and General Manager, Test Systems Group, officially launch construction of the new SATS headquarters building.*





Installing Testline's computer system are, left to right, Fred Boxberger, Plessey, Mike Mathews and Keith Bennett, Testline programmers.



Dick Naparty, Systems Test Supervisor, and Bob Clickner, Operations Manager, review specifications of a Faultfinders system.



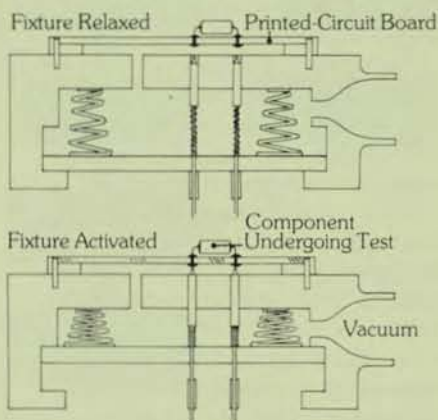
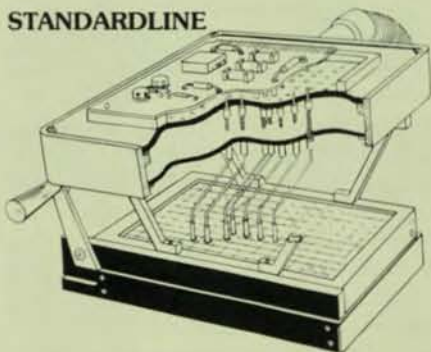
Bob Roberts, Marketing Manager for Faultfinders products, discusses international marketing plans.

board's functions are being tested. Edge connectors are employed to send programmed test patterns through the circuitry to verify functionality. The SATS Division markets products take a different approach, referred to as in-circuit testing. In this system, which uses a bed of springloaded nails (see box) connecting to each node on the PC board, each device is tested as if it were

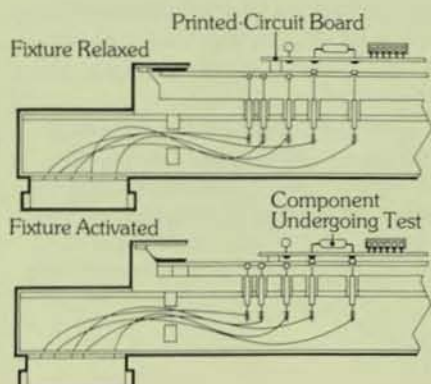
The Subassembly Test Systems Division offers two types of fixturing systems. The Standardline is best suited for customers testing one type of printed circuit board, while the Thinline™ system may be easily adapted for testing a variety of board types. In both cases, springloaded nails put testing probes in direct contact with the component or board to be tested, hence the term "in-circuit" testing.

## THE BED-OF-NAILS FIXTURE

### STANDARDLINE



### THINLINE



home  
FAIRCHILD  
Test Systems



*Sally Joslin, configuration wiring, works on a system at Latham.*



*Assembling Test-line printed circuit boards are, front, Helen Grovier and Carol Cicardo (hidden).*



*Tom Greeley, systems assembly, checks a Faultfinders tester.*

an individual component. A 95 percent acceptance rate on completed products is common with the use of in-circuit testing.

"This system has two obvious advantages for the customer," Joe comments. "First, faulty components can be located very quickly. Secondly, the computer program needed to perform these tests can be generated in days instead of months."

During the early 1970s, engineers at Faultfinders devised a technique for in-circuit testing of analog devices, including diodes, capacitors and transistors. At the same time, Testline devised a nondamaging testing method which sends short pulses of power through an integrated circuit.

In-circuit tester manufacturers face the problem of simplifying their test programming operations so that their systems can be run by operators with limited technical training. Through automatic test program generation, an operator at a console enters a list of items to be tested, and a built-in program produces a test program for those devices. Once loaded, the program gives a red or green light to each device. When testing a PC board, the program directs failure reports to malfunctioning I/O devices.

Faultfinders was first to offer this software solution, which can be personalized for each customer's application. An expanding program with a field service staff will produce personalized programs at a customer's site.

"Currently, we're concentrating on shortening the programming cycle even further by putting our people in the field," says Pete Lemme, Manager of Contract Programming Operations. "Shorts make up 75 percent of a manufacturer's problems, so if we can send an engineer to program at the customer's site, a few days of programming can quickly solve most of his problems. When we do it at the plant, the customer has to wait until the program is completed before we ship it."

"Fairchild can meet all of our customers' testing needs," says Jim Bowen, Vice President and General Manager, Test Systems Group. "We're creating an umbrella product line with the slogan, 'The First Family of ATE,' that will cover the entire manufacturing range from incoming inspection to in-process testing of components and PC boards."

SATS Division operations are currently expanding at Latham. In March, ground was broken about a mile from the existing plant for a 98,000-square-foot division administration and manufacturing headquarters building, expected to be completed this summer.

Construction is also underway at Testline, located just a few miles inland from the Kennedy Space Center at Cape Canaveral, Florida. In mid-March, most of Testline's 100 employees

*Dorothy Hmura, System Wiring at work on a Faultfinder tester.*





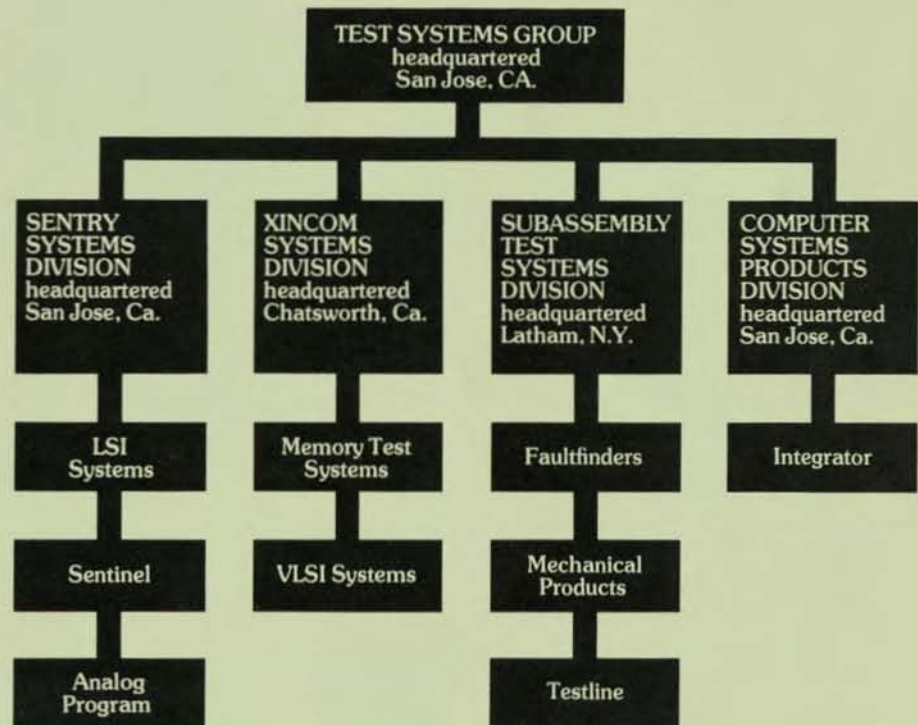
Faultfinders' current headquarters building in Latham.



Bill Sano, SATS Division Controller, pauses to greet a visitor.



Marie Rickson, Programmer, works on a Faultfinders system circuit.



moved into a new office building adjacent to their expanding manufacturing plant. Construction on a plant addition which will triple Testline's manufacturing space is expected to be completed by fall.

Testline had grown rapidly in its first seven years. To sustain that growth, the management realized, as did Faultfinders, a large corporation offered necessary marketing and financial expertise.

Successfully integrating different operations can be a difficult process,

but it's one that Joe Rivlin knows well. Before transferring to Latham in January, Joe spent two years heading up Xincom, in Chatsworth, Ca. Xincom, also part of the Test Systems Group, manufactures semiconductor memory test systems.

"Employees in successful operations all have a tremendous sense of pride in their accomplishments—we want to keep that going in our division."





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# BOTH SIDES NOW

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## **New Key Technologists' Program Makes Dual Career Path Official for Fairchild Engineers, Scientists**

There's another old saying about being sure you know where you're going, or you might end up somewhere else. For the gifted technical employee in a large corporation—whether engineer, technician or research scientist—career direction has been a traditional source of frustration. Most people are drawn to technical careers in electronics because they enjoy experimenting with technology, pushing it to its full capability. However, as a technical person advances professionally he or she may get sidetracked by corporate structure.

"The message has been 'if you want to make it, earn a lot of money and be recognized, you have to go into management,'" says Roger Barney, Director of Industrial Relations for Corporate staff. "Here at Fairchild, as in other electronics companies, our technical talent is our most important resource. But we realized that we were giving these people a very conflicting message—we depended on their contributions to produce new products, but our only formal recognition and reward program was for those who performed well as managers."

So, last year, Roger and several of Fairchild's senior technical people set out to add a second track to the career

path system. In early 1979 the new Key Technologists' program was officially launched at dinners welcoming the 150 charter members, representing all the Fairchild operating groups. Working with Dr. Thomas Longo, Vice President and Chief Technical Officer, Roger and several members of the Industrial Relations management staff began their planning by surveying Fairchild's technical community throughout the country.

"Essentially, we asked them to give us their 'wish list,'" says Al Graf, Manager of Technical Education at Fairchild's Career Center. "It's a common belief that technical people—engineers especially—don't need a lot of fanfare or congratulations for their developments outside their own group peers. 'Give an engineer a well-equipped lab and a challenging assignment, and his motivation will perpetuate itself,' people say. Well, we discovered that was an oversimplification. Although facilities, technical reputation and intellectual challenge are important, our

**"Technical know-how has been put on an equal level with managerial skill."**

**Two Key Technologists talk about their new program:**

**“**The term Isoplanar seems to have been around Fairchild forever. A process that makes very small, fast transistors for high speed logic RAMs and PROMs, Isoplanar was first conceived ten years ago. On the development team was Doug Peltzer, currently Technical Director for the Bipolar LSI Group. Doug joined Fairchild in 1969, and is today responsible for Bipolar's development and process engineering, wafer fabrication and manufacturing support. Doug's name appears on the original patent for the Isoplanar process, and over the years he's worked on numerous others.

Today, although he has joined the management ranks, Doug remains very much a key technologist. A project occupying a lot of his time these days is construction of a new Bipolar fab area in Mountain View, and the installation of advanced step-and-repeat cameras that will allow die sizes to be shrunk from 25 to 40 percent.

"I'm personally very pleased with the new Key Technologist program," Doug says. "Engineers who come up with really significant improvements deserve a great deal of recognition. They're solving problems that cost the company a lot of money, and they help ensure future jobs.

"An engineer," he continues, "puts a great personal investment in his or her reputation. A primary motivation is the respect of one's peers, and the opportunity to be part of a team working on an important project. Fairchild's recognition of the particular importance of our technical community is a very important step. The Key Technologists are regarded by the people on my staff as members of a genuinely prestigious group."

**”**



**Doug Peltzer**  
Bipolar LSI Group



*Tom Longo, Vice President and Chief Technical Officer, is Chairman of the program's Technical Development Committee.*

technical people are concerned with the same things other Fairchild people care about."

The interviews identified three areas of concern—recognition, both financial and non-financial; communication among the company's technical community and professional development.

"Recognition comes both in tangible and intangible forms," Tom Longo comments. "Obviously, our technical people want to know they are being fairly paid, and Fairchild is certainly competitive in this area. But it also means being part of a select group of people who have made critical technical contributions to the company, either through process or product development."

"Many of our key technologists are also managers, of course, and we encourage people to pursue this career direction if they wish. However, others prefer to remain in engineering and research. This program lets them do that, while advancing in compensation and status as a key manager would."

The "dual career path" concept resulted in creation of two senior job grades, designated Scientist and Senior Scientist. Additions have also been made to the existing technical awards program, which previously included money paid when patent applications were filed or technical articles published. A Technical Development Committee headed by Tom Longo has been set up to make three additional types of monetary awards, including a significant number annually of \$500 awards for technical achievements. Recipients of this award each year will automatically be eligible for the Chairman's Award (\$5000 to \$10,000 per individual) which can be given to up to six people a year, and the Sherman Mills Fairchild Award (\$10,000-\$20,000), which can be given once per year. Winners of these two awards will be named Fairchild Fellows, an honorary title they will carry throughout their careers.

"The Technical Development Committee will evaluate nominations for these awards, but may not necessarily make both the Chairman's and Fairchild awards every year," Roger says.

**“Development of the Sentry® has been a process of evolution, rather than revolution. Outside the Sentry VIII is basically the same machine as the Sentry 600. Inside, there’s hardly a single thing that hasn’t been changed.”**

Bert Graeve should know. He’s been working on hardware and circuit design for the line of automatic semiconductor test systems since the first Sentry was introduced in 1970. A ten-year Fairchild veteran, Bert today is Engineering Department Manager for the 20-megahertz Sentry tester set for initial shipments later this year. Under Bert’s direction a team of ten engineers is designing the printed circuit boards, controllers, timing and subsystems for the new high speed, high capability test system.

“Our challenge is to anticipate future testing needs and develop machines that are more powerful, but are compatible with our existing systems, because our customers have a large investment in software,” he said.

Bert’s career at Fairchild has spanned the evolution of testing technology. He and his group designed the computer and high-speed test head for the Sentry VII, one of Test Systems Group’s most successful products, as well as the hardware for Sentry II, its predecessor.

A charter member of the Key Technologist program, Bert says his initial reaction was very positive. “The program’s various aspects, particularly the Scientist and Senior Scientist classifications and the awards, provide a valuable incentive. Technical know-how and competence are being more fully recognized, and are being put on an equal level with managerial skill. If things work out as they’ve been planned, this will be a very good program.”

”



**Bert Graeve**  
Sentry Systems Division  
Test Systems Group

Awards will be made annually at the Key Technologists Banquet, which will be held in conjunction with the newly-established Fairchild Technical Seminar.

The seminar, which will feature guest speakers and presentations of papers on key developments, was set up to improve interdivisional communications between engineers and researchers.

“Most engineers interviewed said although they frequently encountered similar problems, they had little opportunity to interact with colleagues outside their own area,” says Al. Under consideration is publication of a journal, called the Fairchild Technical Review, as a meeting summary, and a review of the many technical papers published by Fairchild technologists throughout the year.

Professional development was also high on the “wish list.” Advancements in engineering happen so quickly that it’s hard for technologists to keep up with changes, even in their own specialties.

To answer this need, new courses will be offered through the Fairchild Career Center covering subjects including integrated circuit engineering and design, automated test system design and manufacturing management. Co-operative masters degree programs in technical areas may also be developed with universities near Fairchild facilities.

“The really significant thing about this program is that it’s developed totally for technical people and it’s administered by the technical community,” says Roger. “Criteria for consideration are demanding—they include development of an original device, process or system or contribution to a major product cost reduction while at Fairchild. Since major breakthroughs take a long time, the Key Technologists program is saying that we are a technical company, committed to technical excellence. If people want to contribute to that effort, they will be very well rewarded.”



*Roger Barney, right, Industrial Relations Director for Corporate staff, reviews program proposals with Al Graf, Career Center Manager of Technical Education.*

## 5 WIN SCHOLARSHIPS

Five college-bound young people were named winners of Sherman Fairchild scholarships in April. The awards will help them study at U.S. colleges and universities towards careers that include financial administration, electrical engineering, medical technology and law.

The recipients' parents are Fairchild employees from Chatsworth, California, Syosset, New York and South Portland, Maine.

Each scholarship winner will receive \$2000 annually for up to four years of full-time study. The scholarship program was established in 1973 by the Fairchild Foundation in honor of Sherman Mills Fairchild, founder of the company. The program is now financed by Fairchild.

Winners are selected for their scholastic achievement, school involvement, community activities and scores on the College Entrance Examination Board's Scholastic Aptitude Test. A committee of educators chosen by the

Educational Testing Service, the administrator of the scholarship fund, made the selections.

Scholarship competition for the 1979-80 school year will open in October.

**Robert C. Burd**, 18, is the son of Edward M. Burd, Director of Engineering for magnetic memory test equipment at the Xicom Division in Chatsworth. He plans to major in electrical engineering at the University of California at Los Angeles after graduating from Crespi Carmelite High School in Encino in June.

**Krisann Caruso**, 18, is the daughter of Anthony P. Caruso, Director of Quality Assurance at Space and Defense Systems Division, Syosset, New York. She attends Smithtown High School East in Smithtown, N.Y. She plans a career in financial administration, and will begin studies this fall at The College of William and Mary in Williamsburg, Virginia.

**Doris Muller**, 18, is also the daughter of a Space and Defense Systems employee, Joseph K. Muller, a Jigborer. Doris will study medical technology at St. John's University in Queens, New York. She is a June graduate of Hicksville High School, Hicksville, N.Y.

**Jean Millette**, 17, will attend Harvard University in the fall, after he graduates from Biddeford High School in Biddeford, Maine. His mother, Jeannine R. Millette, is an Assistant Accountant in the Digital Division, Semiconductor Products, at the South Portland facility. Jean has not yet chosen a major, but his interests span broadcasting and film to computer programming.

**Paula Norbert**, 17, is the daughter of Stanley J. Norbert, a Quality Control Manager for the IBM Memory Module Contract Line at South Portland. The scholarship will help Paula attend the College of the Holy Cross in Worcester, Mass. She now attends Portland High School, and plans a pre-law major.



Robert C. Burd



Krisann Caruso



Doris Muller



Jean Millette



Paula Norbert

## THE LONGEST YARDS

Locals call it the Boston Marathrong. The record books call it the world's oldest footrace. To some runners, it's more important than the Olympics. It's a punishing 26.2-mile course that is so popular officials consider stiffening entrance requirements almost every year.

Nearly 8000 runners from all over the world competed in the 83rd Boston Marathon in April, with the winning time a swift 2:09:27. It was the first Boston for Fairchild's Lynn Harris. Lynn, a factory planner in the Transistor Division, had better times and ran longer distances in other races. But finishing *this* race was also a personal record.

"Boston is *the* marathon. Because of its prestige, you're surrounded by world class runners. Although at times you ache through to your soul, you just don't want to stop—you want to make it."

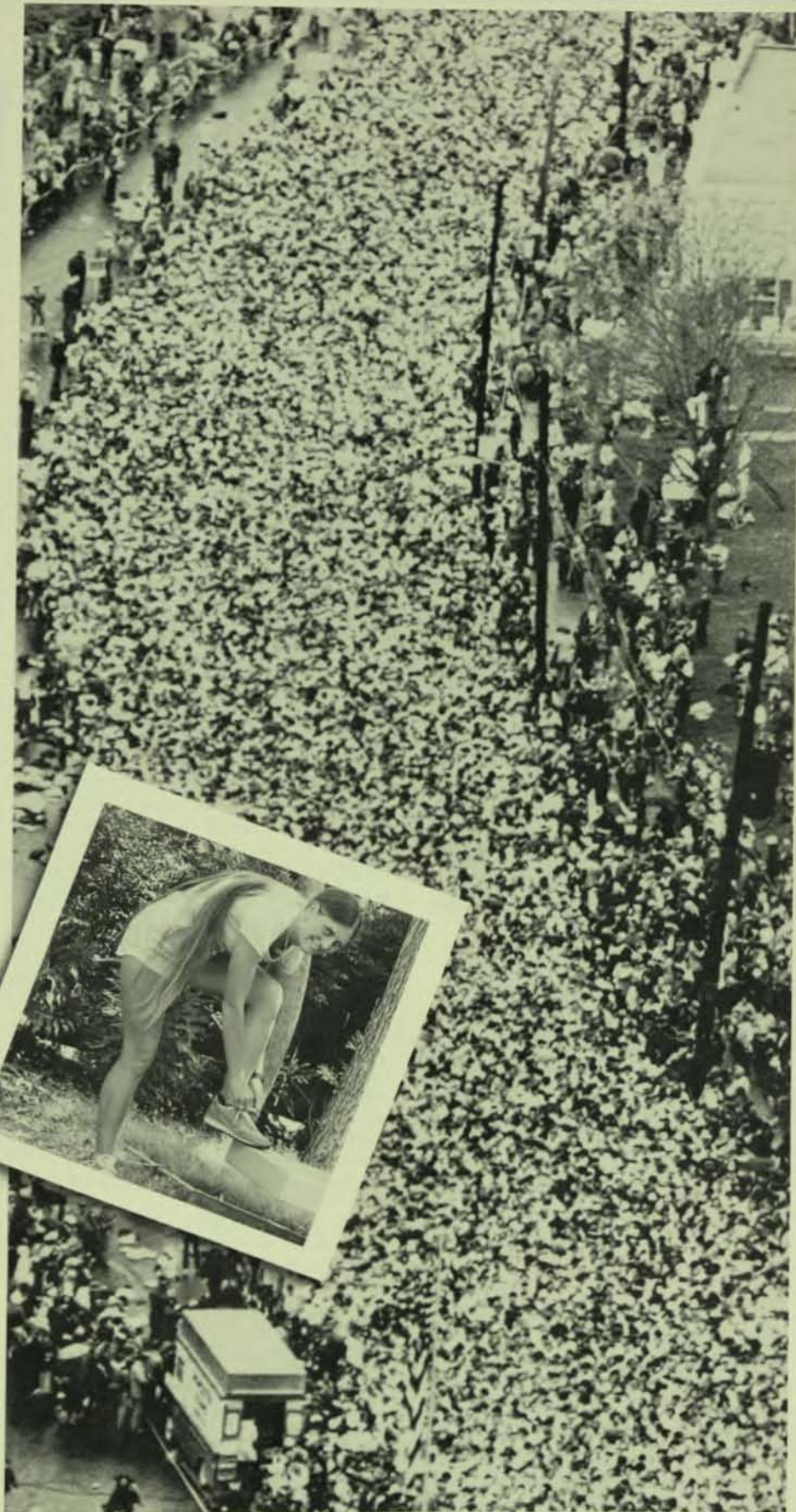
A cold drizzle and a recent stress fracture were obstacles facing Lynn as she joined the mass of runners last April 16. "Because of the crowd, we didn't cross the starting line for seven minutes after the opening gun," she recalls. "It was so cold that most of the California runners started the race wearing large trash bags with holes cut out for our heads and arms—they kept us warm, but didn't weigh us down."

The marathon course winds through the Massachusetts countryside into downtown Boston. Spectators line the entire course, cheering on runners with flagging spirits or feet. Lynn remembers "I'd spent about everything I had after 16 miles. But the Bostonians really love the runners—they yelled 'c'mon, keep going, Fairchild' at me as I'd go by. It really helped."

Seeded 124th in a field of 560 women, Lynn finished the Boston in three hours, 34 minutes. To qualify, women entrants must have broken 3:30 in a previous marathon, which Lynn has done three times in California.

"This year," she says, "the race had me. Next year, I want to conquer it and break three hours."

*Somewhere in that crowd, Lynn Harris (inset) works her way across the Boston Marathon starting line. In the race, Lynn wore a specially-designed Fairchild T-shirt.*



## AND THE WINNER IS . . .

It may not have a full orchestra or an entrance flooded in searchlights, but it resembles the Academy Awards, just the same. The Excalibur Awards Banquet which concludes each year's Semiconductor Products Domestic Sales Conference leads off with the awarding of two coveted prizes—recognizing Professionalism in Sales and Sales Support.

This year's ceremony, in May, marked the tenth anniversary of the Semiconductor Excalibur Awards. The two men honored each received a silver and gold sword imbedded in a block of cut and polished Steuben crystal and a \$1000 check. Gathered together at the Excalibur Awards Banquet are Andy Procassini, Vice President—Worldwide Semiconductor Marketing; George Wells, Senior Vice President—Semiconductor Products; Winners Jary Stahl, an Integrated Circuits Group Production Control Manager, and Hal Clausen, Account Executive in Poughkeepsie, N.Y. and Hal Mumma, Vice President—Sales, North America, Semiconductor Products.

## PROFESSIONALISM IN SALES

Hal Clausen, Account Executive in Poughkeepsie, N.Y., was honored for his accomplishments as District Manager responsible for IBM. Hal has been calling on IBM during his entire ten years with Fairchild. Hal's efforts have been instrumental in identifying new business opportunities at IBM in the Poughkeepsie area. Northeast Regional Manager Jim Youmans, in making the nomination, said Hal represents Fairchild "in a most professional way with all product lines being sold."

The Sales Professionalism Award is given based on excellence in customer relations, communications with customers and the plant and total representation of Fairchild in the marketplace. Field sales representatives and field application engineers, except for regional and area managers, are eligible for the award.

## PROFESSIONALISM IN SALES SUPPORT

Jary Stahl, a Production Control Manager in the Integrated Circuits Group, was named the sales support award recipient. Jary joined Fairchild's Diode Division in 1969. Today, he is a Production Control Manager in the I.C. Group and is responsible for the Digital Division's South Portland, Maine PC operations. He was nominated by Dave LaRock, North Central Area Manager.

The Excalibur Award for Professionalism in Sales Support recognizes responsiveness to field sales needs, superior planning and execution of sales programs and top performance in the interface between field sales, the customer and the factory.

Nominees are selected from the field sales support staff, which includes customer relations and product marketing personnel.

## TENTH ANNIVERSARY HONOR ROLL

Those honored by their colleagues for professionalism 1969–1978

### IN SALES

- 1969 BERT PISER**  
Phoenix Sales, Fairchild Sales Rep
- 1970 AL TASHIAN**  
Spectrum Associates, Fairchild Sales Rep
- 1971 BOB RUSSO**  
no longer with Fairchild
- 1972 PERRY CONSTANTINE**  
Western Area Sales Manager
- 1973 HERB PERRY**  
Simpson Associates, Fairchild Sales Rep
- 1974 RICH PARKER**  
Product Marketing Manager, Diodes
- 1975 STEVE BOROCHOFF**  
District Sales Manager, Encino, Ca.
- 1976 PETE ONSTAD**  
Account Executive, Minneapolis, Mn.
- 1977 (L.S.I.) DICK PARKS**  
Account Executive, Minneapolis, Mn.
- 1977 (COMPONENTS) JIM SANDERS**  
Account Executive, Houston, Tx.
- 1978 HAL CLAUSEN**  
Account Executive, Poughkeepsie, N.Y.

### FOR PROFESSIONALISM IN SALES SUPPORT

- 1969 DICK BEBEE**  
no longer with Fairchild
- 1970 MARY JANE O'BRIEN**  
Distribution Customer Service
- 1971 RAY BORTNER**  
I.C. Group Product Marketing
- 1972 LARRY SEBBEN**  
no longer with Fairchild
- 1973 NADINE HENDERSON**  
OEM Customer Service
- 1974 BILL WALTON**  
IC Group Product Marketing
- 1975 DUNCAN LOOP**  
Account Manager, Business Development
- 1976 MARY BETH ROTERMUND**  
I.C. Group, Product Marketing
- 1977 ALAN ANKERBRAND**  
Discrete Group Product Marketing
- 1978 JARY STAHL**  
IC Group Production Control



## NEWSMAKERS

**JERRY TAYLOR**, Corporate Controller, has been named a Corporate Vice President . . . Semiconductor Worldwide Marketing has named **HAL MUMMA** Division Vice President, Domestic Sales and **JACK JORDAN** Division Vice President, Asia/Pacific Marketing . . . Semiconductor Products has also named **JIM ELICK** Division Vice President, Marketing for the Integrated Circuits Group, **DOUG McBURNIE** Division Vice President and General Manager, Transistor Division and **CONNIE PASQUA**, Division Vice President, Purchasing . . . Test Systems Group has named Xincom Division General Manager **MICHAEL CHALKLEY** Division Vice President for Xincom. He has also recently become an American citizen. Test Systems Group also named **KEN DAUB** Division Vice President for the group's Worldwide Sales and Service . . . **JOHN BERCZUK** has been appointed General Manager, Operations for Government Systems in Syosset . . . **GORDON SCOTT** has joined Fairchild as Director of Finance for Semiconductor Products . . . **ART HECKLER** has been appointed Director of Marketing for RF Systems, part of the Government and Industrial Products Group . . . RF Systems has also named **HARRY SMITH** Director, ECM Systems and **TONY ANASTASAS** Program Manager, AN/GLQ-3A Program . . . Space and Defense Systems Division has named **DAVID JURENKO** Director, COMSEC Systems . . . **GERRY BUHL** has been named Manager of New Business Development for Government Systems . . . **KEN RINALDO** has been named Manufacturing Manager for the Subassembly Test Division's Testline operations . . . **DICK BECK** has been appointed LCD Operations Manager in the Optoelectronics Division . . . Industrial Relations has named **TOM ROUSE** Manager of Corporate Compensation and Benefits, **PETER KIRBY** Industrial Relations Manager for Europe, **GREG KLEIN** Industrial Relations Manager, Semiconductor Worldwide Marketing and

**ROY PARFITT** Industrial Relations Manager for the Discrete Products Group...  
**MERCER CURTIS** has been named Director of Marketing Services, Semiconductor Worldwide Marketing...  
**HY KAPLAN** has been named East Area Sales Manager for the Test Systems Group...  
**DAVID GORDON** has been appointed Southeast District Sales Manager for the Industrial Products Division...  
**VERN FLINK** has been named acting Semiconductor Worldwide Marketing Controller...  
**JIM McALLISTER** has been appointed Manager, Central Facilities Department...  
**MIKE KLYSEIKO** has joined the Linear Division as Production Control Manager...  
**BRUCE CAREY** has been named Power Product Manager for the Transistor Division...  
**JIM LORO** has been appointed Marketing Manager for the Optoelectronics Division.

## PATENTS

Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from February-April, 1979, appear below.



### Bipolar LSI Group

Martin J. Alter  
 Method of Fabricating Conductive Buried Regions in Integrated Circuits and the Resulting Structures  
 Patent No. 4149177

Barry J. Robinson  
 Schottky Bipolar Two-Port Random-Access Memory  
 Patent No. 4138739

### MOS Products Group

Gilbert F. Amelio  
 Line-Addressable Random-Access-Memory Decoupling Apparatus  
 Patent No. 4139787

### Research and Development

Wilson E. Alexander  
 Transistor Microstrip Oscillator and Diode Attenuator Modulator  
 Patent No. 4140982

Ronald L. Koeppe  
 Alarm Sounder for A.C. Operated Solid-State Devices  
 Patent No. 4148018

Wendell B. Sander and William H. Shepherd  
 High Beta, High Frequency Transistor Structure  
 Patent No. 4151540

### Time Products Division

James V. Barnett, Donald R. Duff, Larry D. Wickwar  
 Crystal Controlled Oscillator and Method of Tuning Same  
 Patent No. 4141209

## TECHNICAL WRITING AWARDS

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval.

Technical Writing Awards appearing below were given from February-April, 1979.

### Advanced Products Operations

FIRE Microcomputer Division  
 Glen Taylor, Dan Wilnai  
 "Control FIRE Computers with Thermostat"  
*Progress*

Dan Wilnai  
 "BLAZE-16 Minicomputer"  
*Progress*

### Automotive Division

Len Arguello  
 "High Current Switching Regulator"  
*Progress*

### International Marketing

Brian Tuvey  
 "An Uncompromised Approach to High Throughput MPU Testing"  
*Internecon Minutes*  
 "Production Testing Complex LSI RAMs"  
*Proceedings of ATE Journal*

### Linear Division

John Conover  
 "Improve Settling Time vs. Ripple in the uA9706 d/a Converter"  
*Progress*  
 "Using Tracking A/D Converters in Analog Microprocessor Interfaces"  
*Progress*

### MOS Products Group

Dean Bennett  
 "Techniques for Applying Single Chip Microcomputers to Automotive Problems"  
*SAE Conference*  
 Bill Owens, Paul Chu, Cheuk Chu and Daniel Wong  
 "8-Bit Microprocessor Slices with Subnanosecond Performance, Built with ECL Technology"  
*IEEE International Solid-State Circuits Conference*  
 Bruce Threewitt, Jim Hook  
 "The Problems of CCD Testing"  
*Electronic Packaging and Production*

### Optoelectronics Division

Don Peterson  
 "Programming the F6850 for Various Interfaces"  
*Progress*

### Research and Development

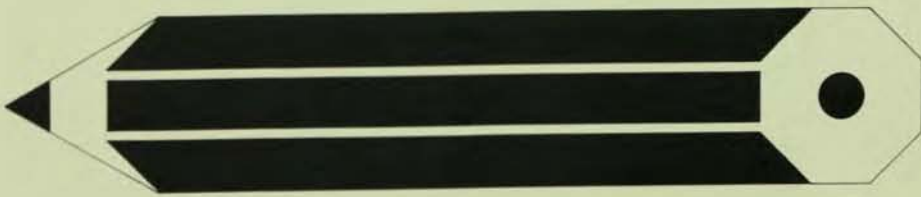
John J. Barnes, K. Shimohigashi and R. W. Dutton  
 "Characteristics of Short Channel VLSI MOSFETS in the Punch-Through Current Mode"  
*Proceedings of Electron Devices Meeting*

### Telecommunications R&D

Claude Alleaume, Don Lake  
 "The Fairdial Repertory Dialer"  
*Progress*

### Test Systems Group

Peter Alfke  
 "Building an Adjustable-Voltage Power Supply"  
*Machine Design*  
 Jim Healy  
 "Choosing an IC Test System in Ten Steps"  
*Evaluation Engineering*



# Goodbye Inflation. Hello Company Store.

If you think inflation has about knocked all the buying power out of your paycheck, it's time to visit your Fairchild Company Store.

It's a lot more than watches, clocks, and video games these days (though you'll find plenty of these on hand). The Company Store inventory includes over 100 different products. All with one important thing in common. Low prices.

Every item at the Company Store is priced just a few percentage points above cost. That means savings for you, not profits for the store.

Here's a preview of what you'll find:

## Good fun, good health.

If you aren't already a jogger you probably will be soon. It's part of the swing to better fitness. To keep you in style you'll find Fairchild t-shirts and training shorts for both men and women. To keep track of your training progress you'll find an electronic pulse meter and an electronic bath scale. Then there's Ripper™, a mini pocket that straps to your shoe for your housekey and identification.

Rippers about \$3.50 retail.  
Your price \$2.00

Pulse Meter about \$75 retail.  
Your price \$44.99

Electronic Scale about \$60 retail.  
Your price \$34.95



## Personal electronics.

Of course you'll find a full range of Fairchild's own LCD and LED watches, clocks and video games. But you'll also find calculators that tell time, play tunes and remind you of appointments.

Pocket AM /FM clock radio about \$120 retail. Your price \$75.47  
Calculators about \$40 retail. Your price from \$24.48.



## Good things for the kitchen.

The kitchen is still the most popular place in the house. Make it even more so with items like a sourdough starter gift set, or a grow-your-own sprouts kit, or exotic oriental spices. For fun gourmet cooking you find crepe pans, woks, tempura cookers, and much more.

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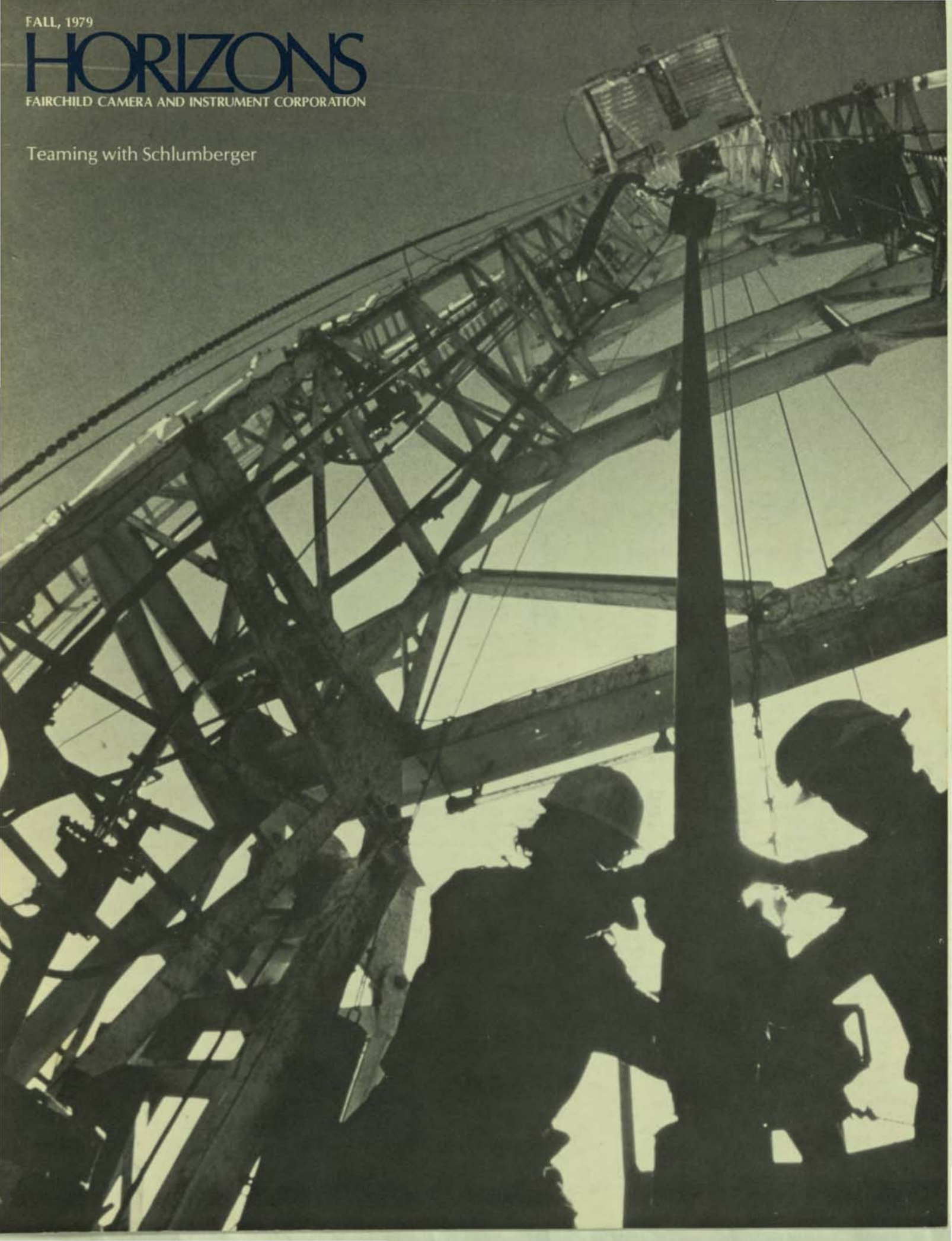


FALL, 1979

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

Teaming with Schlumberger



# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**Cover:** Fairchild's acquisition by Schlumberger, international oilfield services and electronics company, will be completed later this year. See page 4 for a profile, plus a recap of the major merger events.



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### Thanks, Harry

Many Fairchilders have asked who took the many interesting photos for the article on China in our last issue. The photographer was none other than Harry Sello, Technical Director for Semiconductor Products World-wide Marketing. Harry took the photos when he visited China last winter as part of the tour described in the article.

## **SALES AND EARNINGS ANNOUNCED FOR SECOND QUARTER, FIRST HALF**

Fairchild Camera and Instrument Corporation reported July 26 that second quarter net income increased to \$12,562,000, a record, or \$2.11 per share, compared to \$6,271,000, or \$1.13 per share, earned in the comparable 1978 period.

Net sales reached a quarterly high of \$167,966,000, an increase of 32 percent over the \$127,541,000 reported in the same quarter of 1978.

For the first six months of 1979, net income rose to \$19,618,000, or \$3.41 per share, compared with the \$12,006,000, or \$2.18 per share, in the first half of 1978. Net sales for the six months climbed to \$313,847,000 from \$244,336,000 a year earlier.

Wilfred J. Corrigan, Fairchild president, said, "Second quarter results reflect the continued worldwide demand for our semiconductor and electronic equipment products. Orders for semiconductor products exceeded billings during the quarter, and were 29 percent higher than the comparable 1978 period; backlog was 86 percent higher. Electronic equipment sales grew 47 percent and new orders were 56 percent ahead of the preceding year.

"While the environment in our segment of the electronics industry remains generally strong, we anticipate that the slowing of the U.S. and world economy will have some impact on our business later in the year.

"In May, Fairchild's board of directors voted unanimously to recommend to the shareholders a cash offer from Schlumberger Limited to purchase the company's outstanding shares of common stock for \$66 per share. On July 16, Schlumberger completed the purchase of all shares which were properly tendered, over 93 percent of the company's common stock. The remaining stock will be converted to cash at \$66 per share in a subsequent merger transaction," he said.

## **TRANSISTOR, DIODE DIVISIONS COMBINE**

Operations of Mountain View's Transistor Division and the Diode Division in San Rafael have been combined to form the new Discrete Division. Headquarters will be at San Rafael. Doug McBurnie, Division Vice President and formerly General Manager of the Transistor Division will head the new organization. Bill Kirkham, Division Vice President, will continue as General Manager of Diode operations, reporting to Doug.

The Discrete Division's product line will include all current diode devices, small signal transistors (TO-92 and metal can) and the TO-5 power transistor line. Production of bi-mesa power transistors has been discontinued.

With this consolidation, the Discrete Products Group has been redesignated the Components Group—comprised of the Automotive, Discrete and Optoelectronics Divisions. The group will continue to be headed by John Duffy, Vice President and General Manager.

## **PLANT TO OPEN IN PHILIPPINES**

Semiconductor Products plans construction of a plant in Cebu City, Republic of the Philippines. Located on Cebu Island, about 400 miles south of Manila, Cebu City has a population of 800,000. Scheduled to be completed next spring, the 100,000 square-foot plant will eventually employ about 3,000 people.

Both integrated circuits and discrete products will be manufactured at the new plant. Preliminary production operations are set to begin in late 1979 at a small temporary building on the main plant site.

## **DIGITAL METER LINE SOLD**

Fairchild's line of "chip and wire" construction digital panel meters has been sold to General Microwave Corp., Farmingdale, N.Y. The line consists of DC-powered models 30 and 31 and the AC-powered model 35.

The sale included the transfer of all inventory, designs and tooling. No personnel were involved in the transaction.

General Microwave is a manufacturer of microwave components instruments and hazard warning meters. General Microwave's Gralex Industries Division will manufacture and market the DPMs, and Fairchild authorized distributors will also continue to market the equipment. Gralex will assume warranty maintenance on units previously sold by Fairchild.

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# FAIRCHILD TO MERGE WITH SCHLUMBERGER

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## COMPANY WILL BE PART OF WORLDWIDE OILFIELD SERVICES AND ELECTRONICS CORPORATION

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The announcement came on May 19, after a Saturday meeting in New York City. Fairchild had agreed to merge with Schlumberger Limited, an oilfield services and electronic equipment company with whom few Fairchild employees were familiar. The announcement ended a month of heavy activity for many at Fairchild and began a new chapter in the company's history.

Investor and press attention focused on Fairchild beginning April 26, with the announcement that Fairchild had received an unsolicited merger proposal from Gould, Inc., a Chicago-based battery and electronics manufacturer. Fairchild's Board of Directors considered and unanimously rejected that and a subsequent offer and com-

menced legal action to prevent Gould from proceeding with its proposed tender offer to Fairchild shareholders.

At this point, Schlumberger (pronounced Schlum-burr-jay) became interested in a possible merger with Fairchild. Following discussions between the two companies, an agreement to merge was reached, approved by Fairchild's Board of Directors and recommended to Fairchild shareholders.

The Schlumberger cash tender offer to purchase any and all outstanding Fairchild common stock at \$66 per share opened May 29 and closed June 29. By July 24, Schlumberger had purchased approximately 94 percent of Fairchild's shares. Final merger arrangements are in progress.

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### 1927 WAS A VERY GOOD YEAR

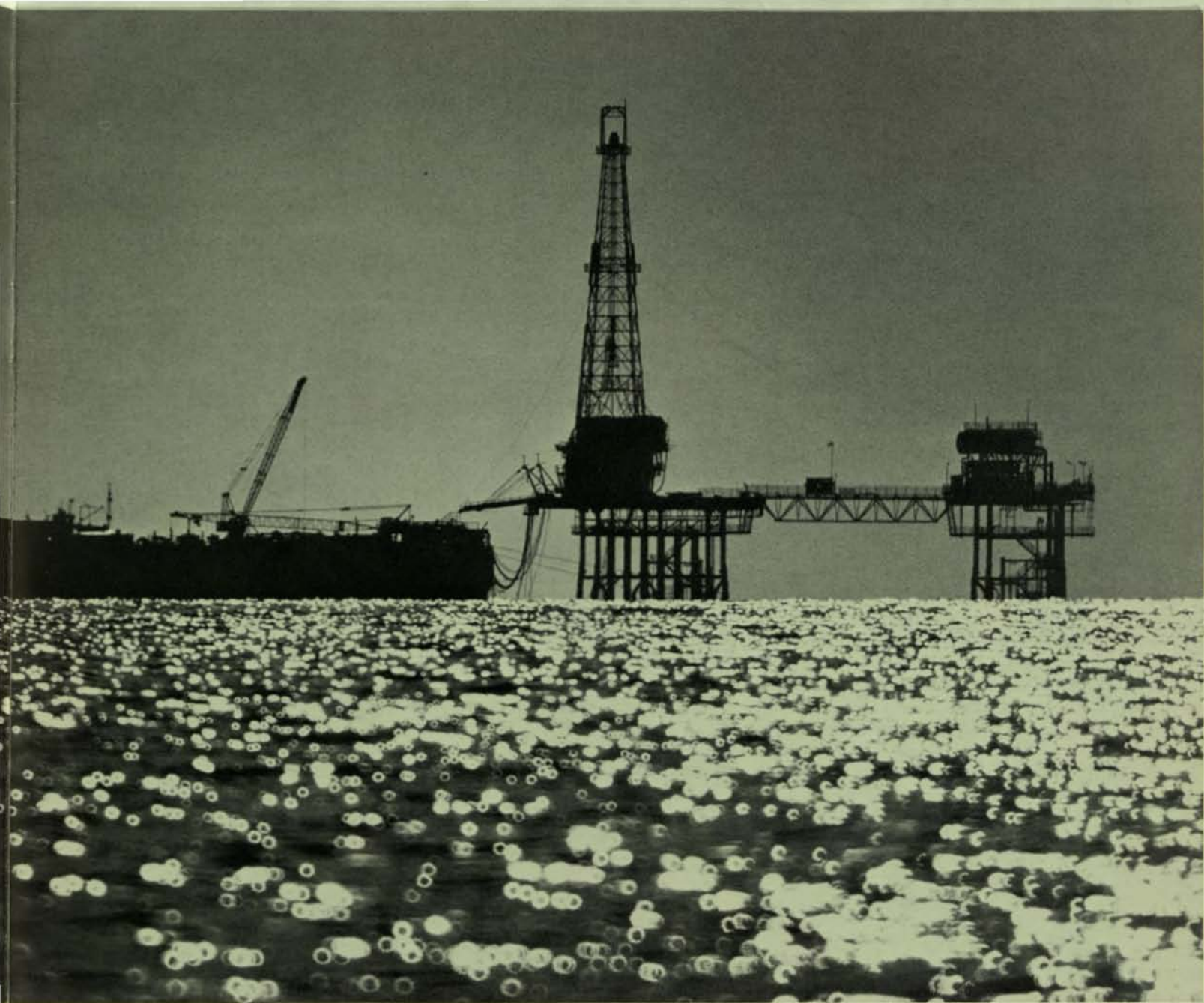
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That, of course, is really only the beginning of the story. Fairchild's new parent company employs about 55,000 people and had \$2.7 billion in sales and \$500 million in profits last year. It has been called by Forbes magazine the IBM of the energy industry and "one of the most successful corporations on earth." Dun's Review last year rated Schlumberger one of the five best managed companies in the U.S.

Company history dates back to the era when Sherman Fairchild was building his first aerial cameras. In 1927, the same year Fairchild Aviation Corporation (from which Fairchild Camera later came) was formed, brothers Conrad and Marcel Schlumberger ran the first electric log in an oil well.

The Schlumberger brothers had formed a company on the idea that electrical measurements made on the surface of the earth could define the earth's subsurface structure. Conrad, a physics professor, and Marcel, a mechanical engineer, began their research in the early 1900's and together developed this technique. In 1927 they constructed an instrument to be lowered in a drilled hole to make electrical measurements in the subsurface environment. This first electric log was run in an oil well in the Alsace region of France for the Pechelbronn Oil Company. It did little more than record subsurface electrical anomalies but it gave the petroleum industry a powerful new exploration tool, and set Schlumberger on a course that was to lead the new company to international prominence.





*Above, a drilling operation off Indonesia. Far left, engineers check for abnormal pressure trends on a Measurement While Drilling (MWD) log running in real time during Gulf of Mexico drilling. Left, a log printout provides vital information to field engineers in Saudi Arabia.*

## MOVE TO THE U.S.

From the beginning, growth meant pursuing the far-flung mining and oil businesses. The boom in the North American oil industry brought the brothers to Houston, where they formed the Schlumberger Well Surveying Corporation in 1934. Oil exploration in the 1930's was based much more on educated guesses and luck than science. However, the information provided by the wireline logs proved essential in locating underground oil and gas deposits. By 1938 the Houston company was running 1,000 electric logs per month, and in 1956 the millionth well-logging job was run.

As the oil industry expanded throughout the world after World War II, four Schlumberger well-logging companies were organized in the Western and Eastern Hemispheres. While corporate headquarters remained in Houston, the Company was incorporated as Schlumberger Limited in 1957 in the Netherlands Antilles, a small Caribbean island country north of Venezuela. The president at this time was Pierre Schlumberger, son of Marcel who with his brother had founded the Company.

In 1965, Jean Riboud was elected Schlumberger's president, having been executive vice president of Eastern Hemisphere operations. At the same time company headquarters were transferred from Houston to the current location at 277 Park Avenue, New York.

Under Riboud's administration, Schlumberger has expanded its Oilfield Services operations and moved into one of the major growth industries of the past two decades—electronics.

Schlumberger moved into the electronics industry in the early 1960's with the acquisition of several French and English electronic companies, and Daystrom, a U.S. corporation. Further expansion occurred in 1970 with the acquisition of Compagnie des Compteurs, a French utility meter manufacturer. The merger with Fairchild represents Schlumberger's entry into semiconductor components and equipment. The company had previously concentrated its electronics expansion in the area of measurement and control with emphasis on energy management.

"Two things we are sure of," explains Roland Genin, Executive Vice President of Operations. "The price of oil won't go down and the price of electricity will go up. As it does, the U.S. will have to



*Above, Jean Riboud,  
Chairman and President*

turn to the more sophisticated regulation of electricity that is already practiced in Europe, where electricity is costly." Metering and controlling energy use is a rapidly developing market with Schlumberger holding a leading position.

"I do not believe in being in businesses where Schlumberger cannot occupy first or second place," Jean Riboud has said. "Anything else is meaningless." Although a number of firms now compete with Schlumberger in wireline services, the company is seen by many as the undisputed leader. In many areas of electronic measurement and control, Schlumberger has also established strong market positions.



*Above, a Junior Field Engineer answers a tough question during his "hands-on" final exam with a Cyber Service Unit at the Corpus Christi, Texas learning center. Schlumberger hires 1% of the graduating engineers in the U.S. every year. Top, repeat formation testing with a logging tool in the Algeria desert. Right a field engineer discusses the day's measurements with customers in Saudi Arabia.*



## IN THE OIL FIELDS

The Oilfield Services Group, made up of Wireline and Drilling & Production Services, is one of Schlumberger's two business segments and last year represented more than half of the company's total sales.

Schlumberger provides the petroleum industry with information essential to the economical discovery and production of oil and gas.

The term "wireline" refers to an armored electrical cable used to lower electronic instruments into a drill hole. These instruments measure physical properties of underground formations and transmit this information to the surface via the wireline, where it is recorded on a magnetic tape and a graph called a "log," which resembles an electrocardiogram. This recorded log information is processed for analysis at the wellsite through Cyber Service Units (CSU), a computerized field laboratory, and later at computer centers located worldwide. Interpretation of these logs determines the location and producible quantity of oil and gas.

From the beginning, research and development has maintained Schlumberger's leadership in wireline services. Over 300 engineers and scientists are now involved in the wireline research program. Schlumberger Doll Research Center in Ridgefield, Connecticut, is the breeding ground for all new concepts and techniques. These developments are supplemented and extended for field use by engineering departments in both Houston, Texas, and Clamart, France.

Since wireline services require such a specialized technology, Schlumberger designs and builds nearly all its own technical equipment. Wireline has two principal manufacturing facilities located in Houston and Clamart. Both plants engineer and build downhole tools and surface instrumentation. Measurement and Control units also manufacture equipment for wireline companies.

A typical land rig alone can cost an oil company \$10,000 a day; an offshore platform, \$50,000 a day. Estimates are that without oil well logging, the \$35 to \$40 billion spent by the world's oil companies last year on drilling and exploration might have been double or triple that amount to get comparable results.

Schlumberger Drilling & Production Services, the other part of the Oilfield Services segment, provide a variety of services to the industry. Forex Neptune, one of the largest drilling contractors for both onshore and offshore operations, operates worldwide except for the North American continent. Other companies in this group are Flopetrol, Johnston, Macco and Dowell-Schlumberger (50% owned). These companies provide a variety of oilfield production services: for testing and evaluation of oil and gas potential; for completing new wells; for rejuvenating old wells; and for stimulating oil flow.



## ENTRY INTO ELECTRONICS

The first venture into the electronics business was EMR, a company formed by Schlumberger after World War II to carry on electronics research which had been started to aid the U.S. war effort. Innovative design in data communications established the EMR division as the leader in aerospace telemetry, a position it still holds. In 1962 Schlumberger acquired Daystrom Corporation, a diversified electronics company. Daystrom had two electronics divisions, Weston, a manufacturer of electronic instruments and systems, and Heath, maker of Heathkit home electronics sets. As part of the Daystrom acquisition, Schlumberger Limited stock began trading on the New York Stock Exchange in February, 1962. The stock has split six times since then.

EMR, Weston and Heath became part of Schlumberger's second business segment, Measurement & Control. (In July, Schlumberger announced an agreement in principle for the sale of Heath to Zenith Radio Corporation.) This group is divided into North American and European sections.

In 1975, U.S. Measurement & Control operations were expanded when the company acquired Sangamo Electric, a manufacturer of watt-hour meters, load and rate control systems

and components. Today, all U.S. electronic operations are combined under Measurement & Control—North America which is comprised of three operating divisions: Sangamo, Weston and EMR. Sangamo provides equipment for electrical energy measurement, transmission and distribution and electronic components. Weston makes process controls, transducers and instruments and test systems. EMR produces data communications systems, photomultipliers, and vehicle recorders.

Measurement & Control—Europe has operations in Europe and South America and has six main operating divisions: Enertec, Flonic, Sereg, Service, International and United Kingdom. Enertec makes meters and load management equipment for electricity distribution; relays and transformers for electricity transmission; instruments and automatic test systems, and broadcasting equipment. Flonic makes water and gas meters and systems. Sereg produces industrial controls and petroleum, nuclear and industrial valves. Water and energy distribution products are offered by the Service Division, and the International group manufactures and markets electricity, water and gas meters and related systems in several countries of Europe and Latin America. The United Kingdom companies make electronic instruments, transducers, training systems, test systems, and related products.







*Above, Enertec inspectors check a central part of a utility meter at the plant in Poitiers, France. Far left, Flonic water meters undergo automatic testing in Abbeville, France. Left, examining meters on a thermal demand rack at a new Sangamo plant in Rabun County, Georgia.*

## TEAMING WITH SCHLUMBERGER

Fairchild's 1979 results will be consolidated in Schlumberger accounts beginning July 1. The combined volume will likely push Schlumberger well over the \$3.5 billion sales mark for the year.

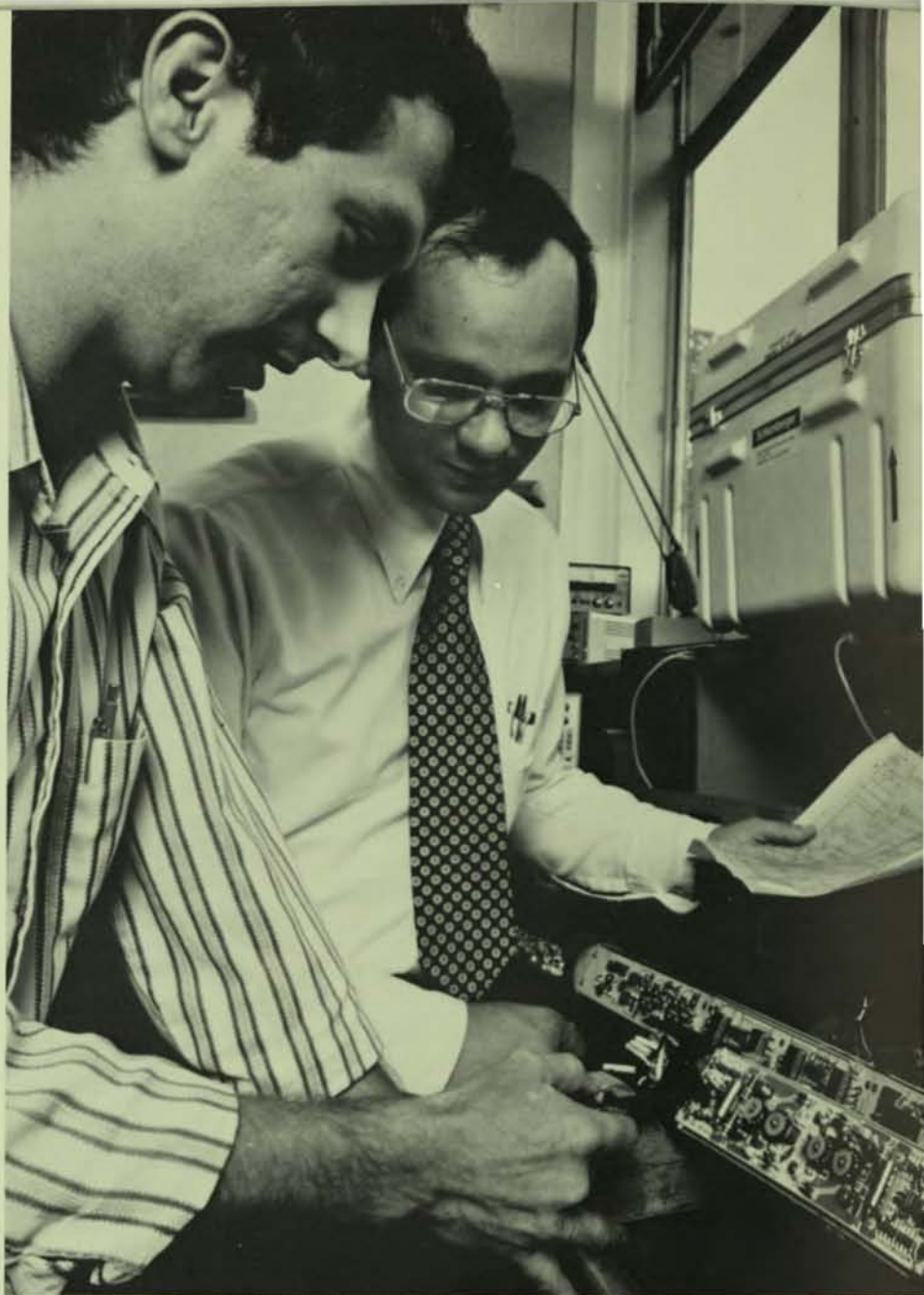
But what does the merger mean for Fairchild's future? Says Fairchild President Wilfred J. Corrigan, "Schlumberger's dedication to technical excellence combined with Fairchild's technological leadership in semiconductors, test systems and related products will greatly enhance the future of both companies."

The key to success in state-of-the-art electronics has always been a strong investment in research and development. Schlumberger historically has spent more on wireline R&D than all of its competitors combined, and has a reputation for developing the most advanced logging systems available in the industry.

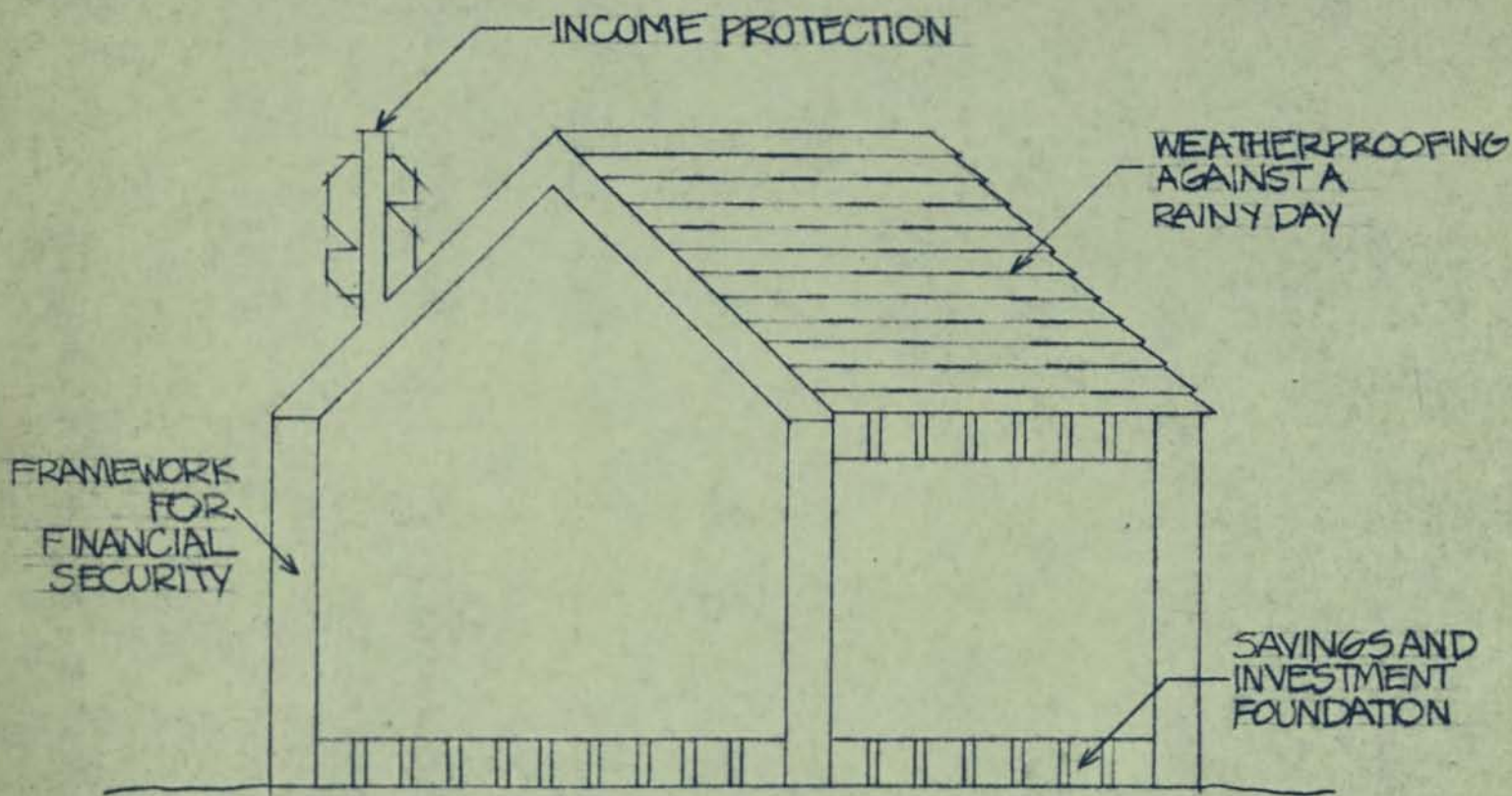
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**"OUR CONSTANT PREOCCUPATION," SAYS PRESIDENT JEAN RIBOUD, "IS WITH THE SUPERIORITY OF OUR TECHNICAL EFFORT."**

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*Above, experts at the Schlumberger Doll Research Center in Ridgefield, Conn., evaluate a new research logging tool. Left, final test and calibration of data tape recorders at EMR in Sarasota, Florida.*



# BENEFITS BLUEPRINT

## 1979 EMPLOYEE BENEFITS REFERENCE CHART

Think of your budget as a house, a solid financial shelter you build for your family. Your paycheck pours the concrete foundation. For each budgeted purchase you carefully fit in another brick. Your savings and investment dollars nail down layers of weatherproofing.

The benefit plans available to you so long as you are a Fairchild employee are like strong mortar for this house. They help protect you against gusts of inflation and unexpected storms. Income protection in case of illness or injury, leave benefits, training and advancement, services and facilities—there are programs in each category that back-up your paycheck in rough financial weather.

Use this special Horizons supplement as a quick reference chart to your Fairchild company benefits. The statements in this section are subject to the detailed provisions of the several plans and programs, and they are intended to be illustrative and an overview only.

Benefits plans are, of course, subject to modification. You will be promptly informed of any changes.

As currently implemented, these benefits apply to all full-time permanent employees, and to part-time permanent employees where noted, except those covered by a collective bargaining agreement whose terms and conditions provide different benefits. Fairchild pays the premium for the coverage unless otherwise noted. Full details on Fairchild's benefit programs are available from the Corporate Benefits office in Mountain View, or from your Industrial Relations Manager.



**BENEFIT****WHEN ELIGIBLE****WHO PAYS****WHAT IT MEANS TO YOU****LEAVE BENEFITS**

VACATIONS	6 months	Fairchild	5 paid days after 6 months, 10 paid days after 1 year, increasing from 10 to 20 days from 2 to 20 years.
HOLIDAYS	Immediately	Fairchild	9 paid holidays annually.
PAID PERSONAL ABSENCE DAYS (PPA)	1 month	Fairchild	Paid days off annually for illness or personal reasons.
ADDITIONAL DISABILITY ALLOWANCE (ADA)	1 year	Fairchild	Additional paid sick days granted to hourly and salaried non-exempt personnel. Amount increases with length of service.
BEREAVEMENT ABSENCE	Immediately	Fairchild	Paid leave up to 3 days upon death of an immediate family member.
JURY DUTY	Immediately	Fairchild	First week, full pay. After that, difference between jury duty fee and regular pay.
LEAVES OF ABSENCE	6 months	Fairchild	Leave granted for medical, military or personal reasons when circumstances permit. Benefits can continue for specified periods.

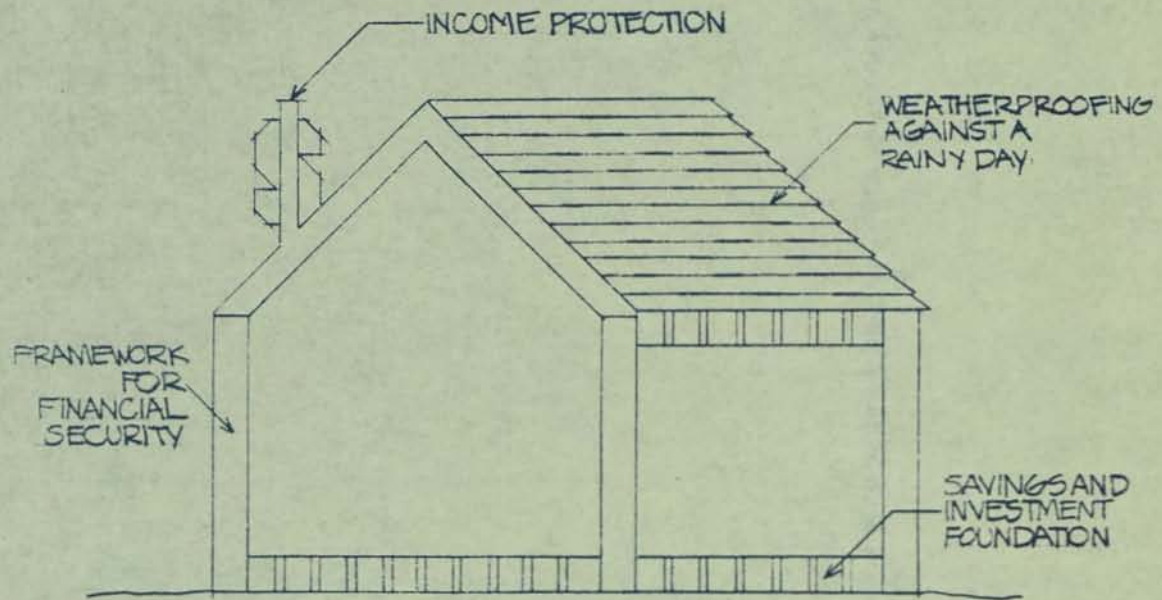
**TRAINING AND ADVANCEMENT**

CAREER CENTER	Immediately	On site—Fairchild Off site—Fairchild and Employee	Job-related courses, co-op programs with area universities.
EDUCATIONAL AID PROGRAM	6 months	Fairchild 90% Employee 10%	Financial aid for approved courses.
JOB OPPORTUNITY SYSTEM	6 months	Fairchild	Opportunity for career advancement within company.
SERVICE AWARDS	3 years	Fairchild	Employee honored with service award.
SERVICE RECOGNITION INCREASE	6 months	Fairchild	Additional compensation based on length of service.

**SERVICES AND FACILITIES**

MEDICAL DEPARTMENT*	Immediately	Fairchild	Medical treatment, counseling and other services. Initial medical treatment if injured on the job.
SAFETY DEPARTMENT*	Immediately	Fairchild	Monitors working and facility conditions for safety. Conducts employee safety training.
EQUAL OPPORTUNITY DEPARTMENT*	Immediately	Fairchild	Insures all employees and applicants equal opportunity with respect to all terms and conditions of employment.
SHERMAN FAIRCHILD SCHOLARSHIP PROGRAM	2 years	Fairchild	College financial aid for employees' children. Recipients chosen through Educational Testing Service competition.
CREDIT UNION*	Immediately	Employee	Savings and loan program available to all employees.
SAVINGS BOND PROGRAM*	Immediately	Employee	Savings through payroll deduction.
RECREATIONAL ACTIVITIES PROGRAM*	Immediately	Fairchild	Social activities, discounts on major purchases and family entertainment.
REFERRAL AWARDS	Immediately	Fairchild	Cash awards for employee referrals for jobs above trainee level.

\* Applies to permanent, part-time employees.

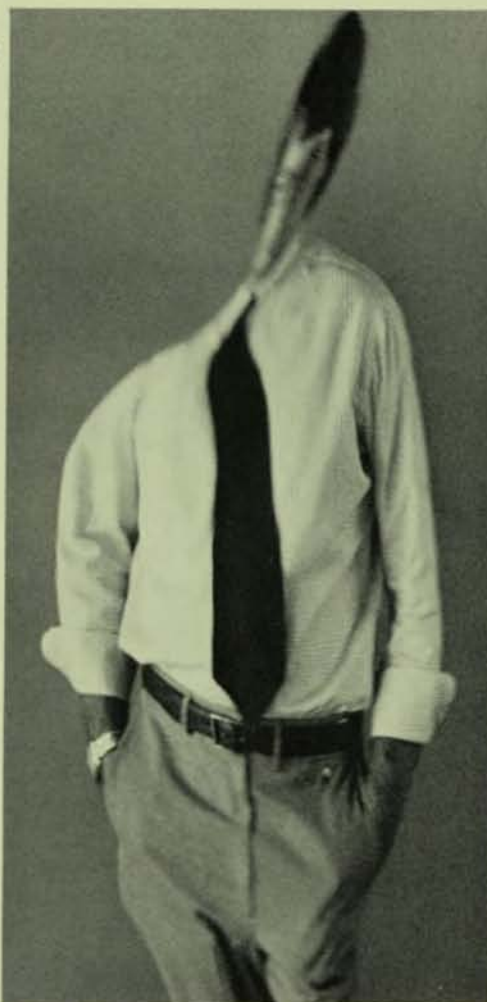


**A SPECIAL SUPPLEMENT  
TO DETACH AND SAVE**

# LOSING YOUR GRIP

**T**heresa had always been one of those employees that supervisors count on. In four years with Fairchild, she rose from entry-level assembler to work leader. Consistently she received good appraisals, as much for her ability to coax everyone in the fab into enjoying their work as for her excellent productivity.

The first written warning was a long time in coming. Theresa's worried supervisor decided against discipline the first few times that Theresa's inattentiveness disrupted work on the line. But as she began to straggle into work a little later each day, and after three unexplained absences inside of two weeks, the supervisor had no choice. Theresa's numb acceptance of the probation, and her lack of explanation did nothing to ease the supervisor's anxiety. The warning also seemed to make little difference in Theresa's deteriorating performance.



**Fairchild's employee assistance program, SHARE, helps people resolve health and personal problems**

**J**ack believed in the rule that what his people did on their own time was none of his business. Of course he had heard rumors that Peter, Production Control Manager in his division, had had too much to drink at the past couple of TGIF gatherings. Peter's frequent Monday morning flu had become an office joke, but Jack ignored the whispers, even those that said Peter's car-pooling enthusiasm was because of a suspended license.

But now with Peter's secretary sitting in front of him, terrified to be telling her boss' boss that Peter was drunk and nearly passed out in his office, the rule offered little guidance. Peter was a valuable part of his management team, one he would hate to fire as an alcoholic. Considering what he'd heard about the way drinkers refuse to accept help, he was afraid that alternative might become unavoidable.

**“If I tell somebody that I have a problem, will I get fired three months down the road because I drink too much or I can’t pay my bills?”**

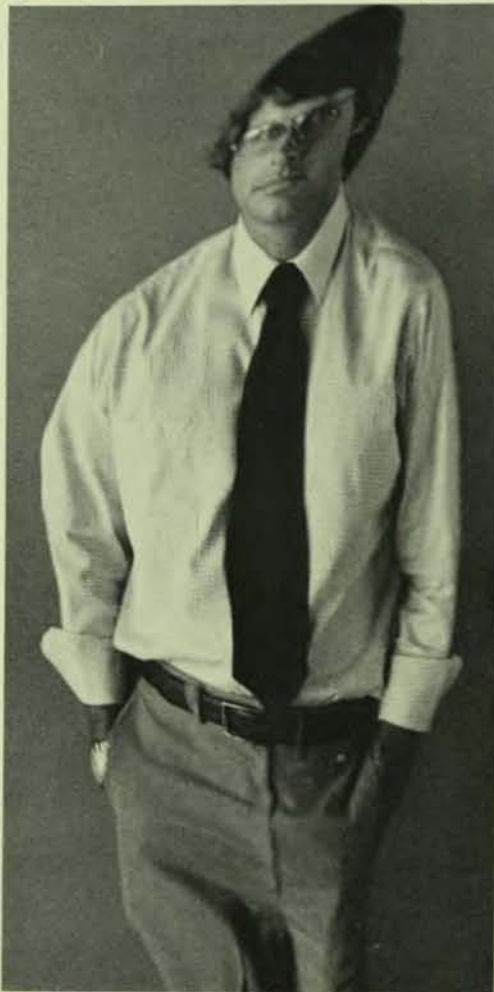
**T**heresa and Peter are fictitious people. Vary the names, jobs and some of the circumstances, however, and you have examples of a large number of actual cases referred to SHARE, Special Health Assistance and Resource for Employees, a Fairchild program that often discovers positive solutions to employee problems.

Fire these people and everybody loses. Theresa and Peter must hunt for new jobs burdened with old handicaps, supervisors face the headaches of reduced staff and finding qualified replacements, and the company loses one of its most important assets: people who take pride and job satisfaction home with their paychecks.

Through SHARE, the supervisor of a troubled or failing worker can ask Fairchild’s Medical Department to step in and determine if physical and mental health problems are contributing to the employee’s deteriorating performance. The object is simple—to help the employee through medical diagnosis and treatment of a hidden disease, with referral to a community agency that can solve family problems, or with an attentive, sympathetic ear.

Jane Hall, R.N., Corporate Manager of Nursing Services, created the fictitious Theresa as an example of the emotionally troubled people she counsels in her Mountain View office. Happily, the end of this fictional story is typical of the way many SHARE cases are closed.

In a real-life situation Theresa’s supervisor would have asked Jane to help. After being assured her conversation was completely confidential, Theresa gradually discussed her teenage son. The boy was a drug addict



who was destroying his mother’s health as well as his own. Jane convinced Theresa to visit her doctor for treatment of anemia and insomnia. She also gave her a list of social service agencies that would be able to help her son fight his addiction and find part-time work. In time, Theresa’s attendance and performance showed steady improvement.

“I tell everyone who comes into this office that this is a place where they can talk confidentially,” Jane said. “The

biggest fear—from top managers to the person on the line—is this: ‘If I tell somebody that I have a problem, will I get fired three months down the road because I drink too much or I can’t pay my bills?’ We make sure they know that their problems won’t get back to their supervisor.”

In every SHARE case, the employee is protected. No SHARE records go into the employee’s file, since a supervisor’s request is not considered a disciplinary action. The cause of the employee’s problem is also kept confidential subject only to disclosures required by law. The SHARE counselor tells the supervisor only that the employee has legitimate medical or personal difficulties and that he or she is seeking assistance.

Any case that involves a medical diagnosis is referred to a physician. Bruce Dickerson, M.D., Fairchild’s Medical Director, sees 30 to 50 individuals a month (half of them SHARE referrals) for emotional health counseling. He estimates that 15 percent of these patients are having marital difficulties serious enough to interfere with their work. Problems with weight and smoking, exercise counseling, alcoholism and stress-induced mental illness are also common.

All 12 of Fairchild’s plant nurses in the United States counsel SHARE referrals and the many others who come in on their own. Jane opens 10 to 15 new SHARE cases a month, and sees an average of six people each month for ongoing counseling. “People don’t have to be referred through SHARE,” she stresses. “Anyone can make an appointment with their plant’s medical department for counseling.”



**“The primary symptom of alcoholism is denial. If a man is too hungover to come to work, his wife will call in and say, ‘George has the flu today.’”**

Phyllis Pelosi, R.N., plant nurse at the Digital Division's plant in South Portland, Maine for 16 years, has seen her counseling traffic pick up since she placed a notice in the plant newspaper inviting people to come in. She has just completed a two-year home study course for occupational health nurses leading to a certificate in mental health counseling.

“I wish our supervisors would use the SHARE program a lot more than they do,” Phyllis said. “My biggest problem is convincing them to document the early signs and absences that indicate an employee is under stress. If they wait until the person starts missing a lot of time, it can be too late. SHARE gives both the supervisor and the worker some choices in the beginning, before discipline is the only answer.”

As many as 25 percent of the people who receive counseling have problems related to alcohol. In most cases, a medical diagnosis is warranted.

Dr. Dickerson pieced together Peter's story from his experiences with employees who suffer from alcoholism.

“In Peter's case,” he said, “I would send him home in a cab and ask his boss to fill out a SHARE form, listing all the symptoms and absences leading up to the time he came in intoxicated. If the history indicated the classic pattern of alcoholism, I'd sit down with the employee and advise him that he has this disease. Depending on the severity of his problem, I might recommend that he be hospitalized for a period of several weeks. When he returns to work, his chances of rehabilitation are about 80 percent.”

Several Fairchild patients have been treated at the Sequoia Hospital Alcohol-



ism Treatment Unit in Redwood City, Ca. Fairchild's medical insurance plans pay a percentage of laboratory expenses and physician's fees during inpatient care. Employees are also entitled to short-term disability benefits when they are inpatients at this kind of facility.

Richard Carlson, M.D., Medical Director at the Sequoia unit, estimated that a third of his patients are referred through counseling programs like Fair-

child's. He praised such programs because they give employees and their families room to be truthful.

“The primary symptom of alcoholism is denial,” Dr. Carlson said. “If a man is too hungover to come to work, his wife will call in and say, ‘George has the flu today.’ We can understand why she does this. She is afraid George will be fired, so she's caught up in the denial system she thinks is protecting him. But if the company can handle a truthful communication, then there's an opportunity to begin breaking through the denial system.”

“Keeping a job might be enough incentive to get the alcoholic here for treatment. Ultimately, the alcoholic won't stop drinking just to save his job, but he has to get here for treatment to have the best chance.”

“Increased management awareness of SHARE has helped us see a lot more people in the past two or three years,” Dr. Dickerson said. “Our success in getting patients to the help they need is almost 100 percent.”

He agrees with Jane, however, that it's difficult to measure the lasting success of the program. “We do all we can,” she said, “and after that, only the person being helped knows if he or she is going to make it.”



*Dr. Bruce Dickerson,  
Medical Director*



*Jane Hall,  
Manager of Nursing  
Services*

# I've been working on the railroad all the livelong day...

This model railroad was a stop on a Hollywood tour.

When Felix Medak held his open house last year, people came by the hundreds. His home was even a stop on a bus tour through North Hollywood, Ca.

It wasn't actually his home that brought the crowds—it was his garage. The usual paraphernalia of lawn mowers and tool benches has given way to a two-car-garage size model railroad layout. It's one of the largest privately-owned model railroads in the country. It's also a labor of love—and a work of art.

More than 200 railroad cars guided by 37 engines run over track proportional to 34 actual miles. City skyscrapers light up at night, an operating ski lift carries tiny dolls up and down an aerial tram and a container loading facility stows cargo aboard miniature rail cars. Track runs through a ski resort and two cities, complete with suburbs. Restaurants are filled with dinner guests and a wedding party is emerging from a village church as bells chime.

It's been six years since Felix started work on this system, his fourth and most ambitious layout. His work with model railroads goes back nearly 30 years, when he built his first one for his young son. "Actually, I wanted to build one, but doing it for my son gave me a good excuse to start," he admits.

Twenty-two years ago, Felix came to the Industrial Products Division's West Coast facility in Los Angeles. Today, he is Quality Control Manager and Contracts Administrator for IPD/West, which builds the division's flight data recorders and does partial assembly of IPD's airplane cockpit voice recorders. Mandated for use by commercial airlines in most major countries in the world, these systems record in-flight information vital to promoting better airline safety.

When he goes home from work at night, Felix turns his attention from airplanes to trains. "I'm not a tele-



vision watcher," he says, "so I work on my layout practically every night. The work is never really finished—I'm constantly updating the electronics and track design."

Far from developing the layout as the spirit moved him, however, Felix started the project in 1973 with a detailed plan. Design of the basic structure took two months, followed by construction of the framework, tracks and controls. Mountains and landscapes were fashioned from old sheets dipped in plaster of Paris, then painted. Buildings and scenery were added with the help of Felix's wife, Helen, who did most of the scenery painting and design. "I wouldn't have had the patience she had," Felix says. "When you're putting flowers in a window box about a quarter of an inch high, you need a very steady hand."

Felix had to have a pretty steady hand himself when he built his N gauge railroad cars and track system. A scale smaller than the average toy train size, one N gauge inch equals 167 actual inches. "It's possible to get four times as much track and equipment into the same space with N gauge versus HO gauge, the normal toy train size," Felix says. His layout runs on tables around three sides of his garage, leaving just enough space for the family compact car, which sports license plates reading "NGAUGE."

Model railroading has become highly specialized, and Felix readily admits that his first love is the electronics. "To me, the building and running of the trains is secondary. New electronics components are constantly coming out which make it possible for me to use space and energy more efficiently. The basic layout is still the same—it's hard to rip out the plaster and frames once they're built. But I'm constantly changing the track system, adding things like progressive signaling, where the train will only proceed on a green light."

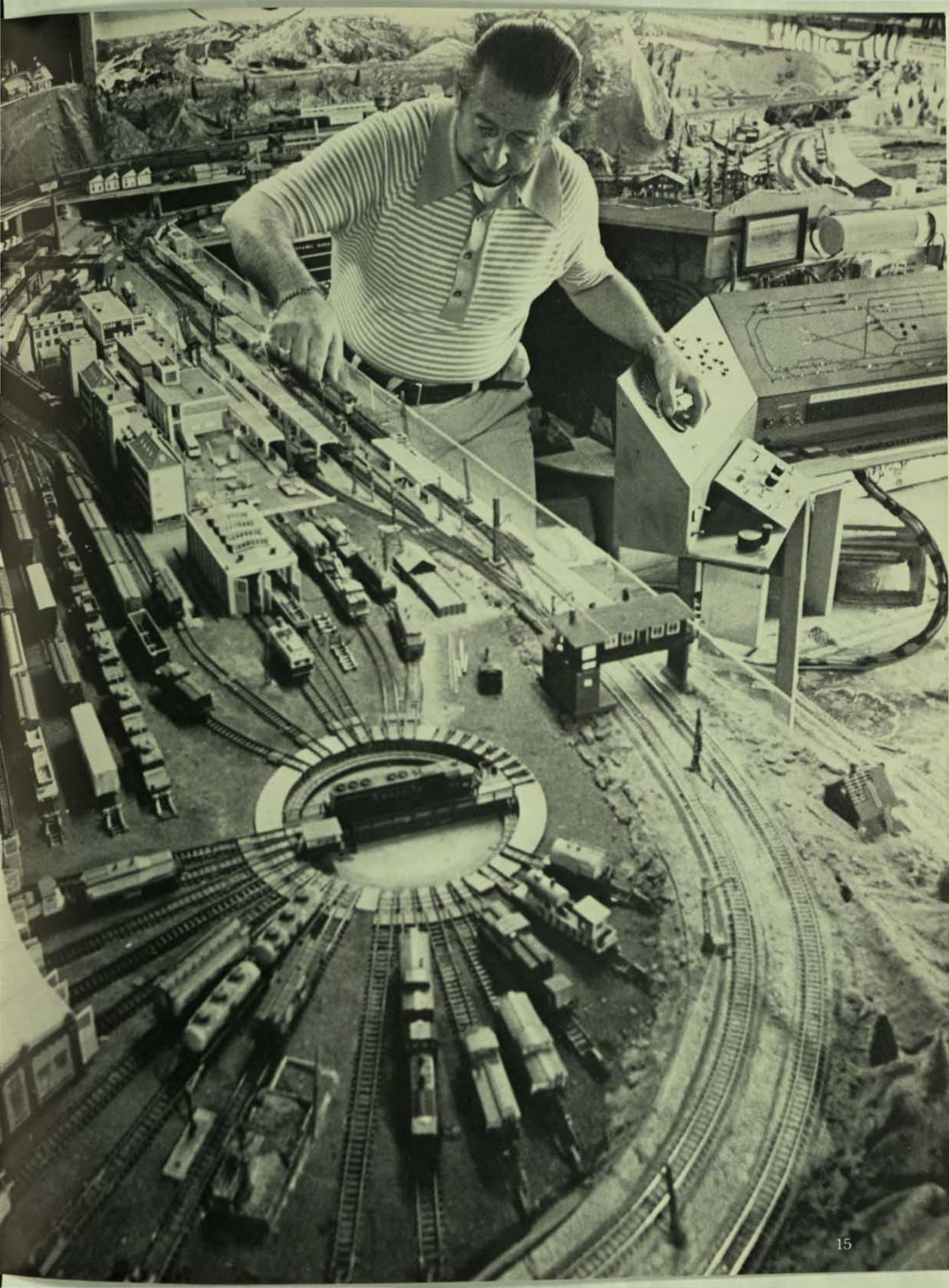
Some Fairchild integrated circuits and microprocessors operate parts of Felix's system, and he was instrumental in seeing that Fairchild components were used in the design of the computer operating a model railroad layout that has become a tourist attraction at Griffith Park in Los Angeles.

Griffith Park's Travel Town Museum, which features historic trains donated by railway companies, has one of the largest model railroad layouts in the world. Trains can run for more than half an hour without touching the same piece of track. Felix, a charter member of the Griffith Park model railroading club, helps his colleagues run the trains for the public.

The Griffith Park club and other model railroading groups in the area helped host a national model railroading convention in Los Angeles last year. In typical Los Angeles style, visitors were treated to a bus tour—but they saw model trains, not movie stars' mansions. The Medak home was a popular stop, and Felix's layout was subsequently featured in a model railroading hobby magazine. Five hundred people came through in two days.

What were their reactions? "Mostly amazement at the size and detail," he says. One of the visitors' most frequent questions was the total cost of Felix's project. His answer? "I don't want to know."

Right, the railroad surrounds three sides of Felix's garage, and he says the building is "never finished."

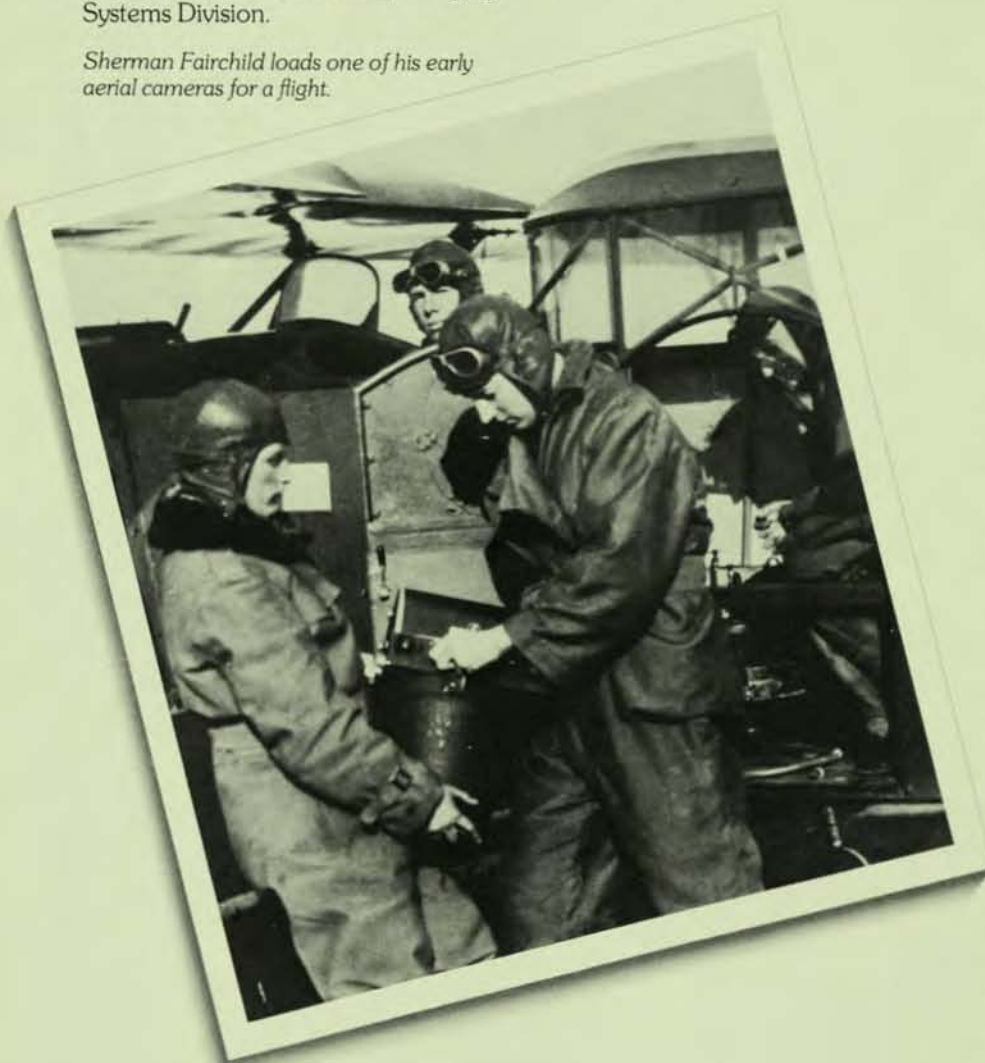


## SHERMAN FAIRCHILD HONORED BY AVIATION HALL OF FAME

Sherman Mills Fairchild, founder of Fairchild Camera and Instrument Corporation, was posthumously inducted into the Aviation Hall of Fame on July 21 at ceremonies in Dayton, Ohio. The Congressionally-chartered organization honored Mr. Fairchild as an outstanding aviation pioneer for his developments in the aerial camera and aircraft industries.

Fairchild Camera and Instrument Corporation was represented at the ceremonies by Ray Hennessey, Vice President—Business Development, Industrial Products Division, and Ralph Wight, Technical Director and Irving Doyle, Technical Consultant, Imaging Systems Division.

*Sherman Fairchild loads one of his early aerial cameras for a flight.*



Mr. Fairchild who died in 1971, was a highly successful inventor and business entrepreneur. His improvements in the aerial camera during World War I made possible the aerial mapping industry. Dissatisfied with the early biplanes used in aerial mapping, he developed a closed-cabin monoplane which was used extensively by early airlines, bush pilots and private owners. He also invented hydraulic landing gears and brakes for aircraft. A Fairchild plane, the FC-2, hangs in the Smithsonian Institution's famed National Air and Space Museum.

## QUALITY EXPERT INSPECTS BIPOLAR

The man who has helped make quality a part of every job in Japanese industry taught his philosophy and his methods to a broad cross-section of Bipolar LSI Group managers, production people and quality assurance staff in July.

J. M. Juran, acknowledged father of the post-war Japanese quality management reformation, came to Mountain View at Bipolar's invitation because the group is planning its own quality revolution to forestall foreign competition in U.S. semiconductor markets.

Juran put in five long days the week of July 9, examining the Bipolar LSI operation from top to bottom, teaching an accelerated version of his American Management Association course on quality control, and making recommendations. He presented the seminar to three levels of Bipolar managers and supervisors from departments including R&QA, production, engineering, marketing and industrial relations. Also attending were QA managers from other divisions and Fairchild vendors—about 90 people in all.

"Our goal is a formal quality plan that involves every employee," said Frank Durand, Bipolar Division R&QA Manager, who organized Juran's visit. "We want everyone to be concerned with doing the job right the first time instead of relying on someone sorting out the mistakes later. This plan will mean a turn-around in quality control philosophy from top management on down."

Frank outlined three steps that are the basis of Fairchild's new program: analysis of problems and their causes, management commitment to doing whatever is necessary to improve quality, and mass education of every worker in the importance of consistent quality. "A program like this recognizes each worker as a part of the team," Frank said. "People will have a chance to develop improvements for their own operations and then deal with management to make the necessary changes."

## SEMICONDUCTOR GIVES INTERNATIONAL SALES AWARDS

Paris, France and San Rafael, California were well represented as the 1979 International Marketing Conference drew to a close with the annual Sherman Fairchild Awards Banquet.

Taking top honors this year were Liliane Léveillé, Distributor Supervisor for France, winner of the International Sherman Fairchild Award for Sales Professionalism and Randy Wyatt, Discrete Division, recipient of the International Sherman Fairchild Sales Support Award.

Liliane joined Fairchild in 1974 as a strategic accounts sales representative. In 1977, she switched to distribution, and is currently in charge of marketing to Fairchild distributors throughout France. She was nominated jointly by Roberto Stefanelli, General Manager for the Southern European region and Emile Dalle, General Manager for France. Roberto describes her as "hard working, highly cooperative and with excellent sense of professionalism in customer contacts and relationships."

Two European general managers cited Randy Wyatt's outstanding performance in nominations for the Sales Support Award. Randy, who joined Fairchild in 1971, is currently Hi Rel Product Marketing Manager for the Discrete Division. Prior to that, he served as the division's European Product Marketing Manager. He was nominated jointly by Roberto Stefanelli and Northern Europe General Manager Peter Turner. Roberto called Randy highly deserving of the award due to his "excellent attitude and familiarity with our customers and their unique needs."

Both the sales and sales support award winners are chosen each year from nominees proposed by each of the six worldwide Semiconductor Products sales regions. Recipients are selected by group management.



President Wilf Corrigan, right, congratulates Randy Wyatt and Liliane Léveillé.

## FAIRCHILD DISTRIBUTOR HONORED WITH JAPANESE EMPEROR'S AWARD

The "Who's Who" of Japan's electronics industry gathered at the Royal Hotel in Osaka recently to honor Katsuyoshi Okamoto, a leading Fairchild distributor and winner of the coveted Ranju Hoshu or Emperor's Award.

Given annually to prominent Japanese citizens in recognition of outstanding national and civic contributions, the Ranju Hoshu is a highly respected award which, according to Fairchild Japan General Manager Bob Skurko, "would be exceeded in the Western world only by knighthood."

Mr. Okamoto heads Okamoto Mussen Corp., a principal Fairchild distributor in Tokyo and Osaka, Japan's second-largest city. The award recognized his contributions as a business leader in Japan since 1950, as well as the significant contributions he has made to many civic organizations. Recently, Mr. Okamoto headed one of the first Japanese trade missions into mainland China.

More than 600 people gathered in Osaka to honor Mr. Okamoto a few days after he had received the award from Emperor Hirohito at the Imperial Palace in Tokyo. Fairchild's Bob Skurko was one of several people invited to speak at the huge banquet, and Bob describes the event as "a memorable, emotional experience for me—one that is impossible to completely describe."



After his speech, Bob Skurko greets Mr. and Mrs. Okamoto.



## FAIRCHILD RECOGNIZED IN HIRING HANDICAPPED

The May meeting of the President's Committee on Employment of the Handicapped brought Fairchild national recognition for company efforts in employing and training the handicapped. At the conference, the Electronic Industries Foundation presented Fairchild with its first Foundation Award for "extraordinary support" of the Bay Area Project with Industry (PWI), an agency which matches handicapped people with available jobs.

The foundation particularly recognized the work done by Theresa Ramos, Corporate Labor Relations, who helped set up ADEPT (Assisting the Disabled with Employment, Placement and Training), the PWI operation in California. "Through ADEPT," she says, "our current job openings go to every rehabilitation agency in the area—thus eliminating the problem of establishing individual recruiting sources at each of Fairchild's California locations. Our employment department is committed to interviewing every applicant referred through the ADEPT program. Without this commitment, the program could not be a success."

## NEWSMAKERS

**JIM HAZLE**, Vice President—Finance, has been appointed Vice President—Corporate Projects... Succeeding him as Vice President—Finance is **JIM UNRUH**, previously Vice President—Treasury and Corporate Development... **TOM POPEK** has been appointed General Manager, CMOS Products Division in the Integrated Circuits Group... Test Systems Group has named **FRED LACCABUE** General Manager of the new Computer Systems Products Division and **BILL WIRTH** General Manager of Testline operations of the Subassembly Test Systems Division... Semiconductor Products Worldwide Marketing has named **GERALD THOMAS** Division Vice President—Europe for Semiconductor Products Worldwide Marketing and **HORST SANDFORT** has been named Director of European Marketing Programs... **RICH PARKER** has been named Domestic OEM Marketing Manager for the Components Group... **RAY SETH** has joined Fairchild as Corporate Director of Management Information Systems... Industrial Relations has named **BILL BROWN** the IR Manager for domestic operations of the Manufacturing Services Division and **HERB DESSLING** Fairchild's Technical Development Program Manager, with responsibility for the company's Key Technologists Program... Government Systems, Syosset, has named **HOWARD WEINSTEIN** Director of Q&A and **RUDY UNDERWOOD** Plant Services Director... Government Systems Business Development has appointed **FRANK ERNANDES** as Technical Director and **HOWARD GABBERT** Product Development Director... Space and Defense Systems Division has named **PAT McNELIS** Technical Director, **AL BORCHERT** Director, Ammunition Systems and **WALTER LUNK** Avionics Systems Marketing Manager...

**JOHN MICKLOVICH** has been appointed Marketing Manager for RF Systems... **BRUCE MATHEWS** has been named Electro-Optical Systems Marketing Manager, Imaging Systems Division.



Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from May-June, 1979, appear below.

### Imaging Systems Division

Harvey L. Balopole  
Dual Clock Logic System for Charge-Coupled Device Drive Circuit  
Patent No. 4158181

### Linear Division

Jerome A. Frazee  
Input Stage for Automotive Ignition Control Circuit  
Patent No. 4163160

### Optoelectronics Division

Thomas Courtney and Vijay K. Lumba  
Optically Coupled Isolator Device and Method of Making Same  
Patent No. 4160308

### Semiconductor Products

Stephen M. Martin and Ralph P. Miller  
Wireless Multi-head Smoke Detector System  
Patent No. 4160246

Ken Shimasaki

Clock  
Patent No. D252499

## TECHNICAL WRITING AWARDS

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval. Technical Writing Awards appearing below were given from May-June, 1979.

### Advanced Products Operations

Hartesh Grewal  
"Memory Expansion for the SPARK-16 Microcomputer"  
*Progress*

Dave Corbin  
"A Simple Parallel Input/Output Interface for the SPARK-16 Mini-computer"  
*Progress*

Ashok Suri, Peter Verhofstadt and Dan Wilnai  
"Take Advantage of Bipolar Computing Power and Get Mini Performance with a Micro"  
*Electronic Design*

### Automotive Division

Jim Comstock  
"Selecting a Digital Panel Meter"  
*Progress*

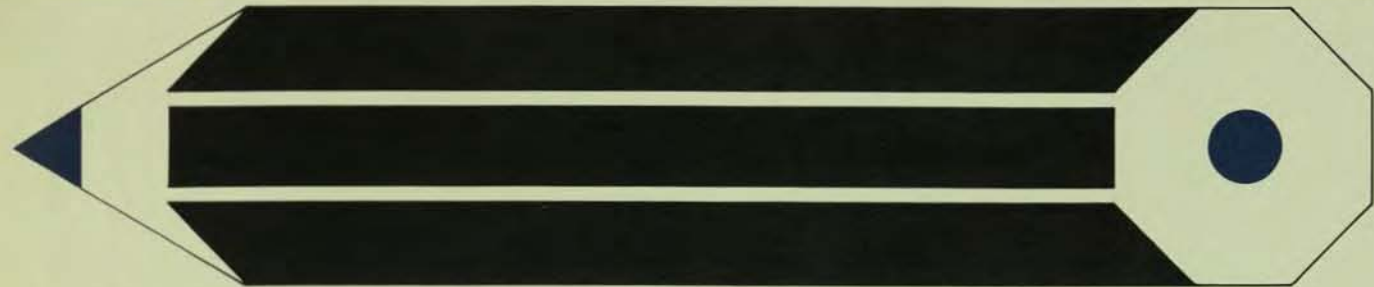
Wally Fiedler  
"Microelectronics for the Automotive Industry"  
California Quality Week Conference

### Bipolar LSI Group

David W. Bley  
"Testing of Bipolar Memories"  
Xincom Users Seminar  
Paul Chu  
"ECL Gate Array and 8-Bit Microprocessor Slice for Very High Speed ECL Design"  
*EE Times Seminar Series Proceedings and Advanced Concepts in Using Microprocessors*

### Digital Division

Charles Alford, Bob Bechdolt, Dave Ferris, Paul Griffith and Steve Goodspeed  
"FAST, An Elegant Use of Power"  
*Progress*



### **Imaging Systems Division**

Harry M. Hastings  
"Split-Scan Panoramic Cameras"  
SPIE Tech. Symposium East  
04 Sidney Hoff  
"A Mobile Photographic Laboratory"  
International Defense Review  
Robert Kleehammer, John Hunt  
"WOWS—A Real-Time Airborne  
Sensor for Automatic Detection  
and Recognition of Wire-Like Objects"  
SPIE Tech. Symposium East  
Bruce Mathews, Henry Sadowski  
"LOPATCH—A Real-Time Panoramic  
Sensor for Low Light Level and Low  
Contrast Imaging Applications"  
SPIE Tech. Symposium East  
Edward Muehleck  
"LORAP—Long Range Aerial  
Panoramic Photographic System"  
SPIE Tech. Symposium East  
Stan Roth  
"Electronic Mail Scanner"  
*EE Times*

### **Linear Division**

Jerry D. Freeman  
"uA7391 and uA7392 Motor Speed  
Controllers"  
*Progress*  
Don Lewis  
"Testing Op Amps"  
*Electronic Test*  
Ted Vaeches  
"Switching Regulator Operation"  
*Progress*

### **MOS Products Division**

Rudolph H. Dyck  
"The TDI Image Sensor for the  
Loreors Camera"  
GOMAC 78  
Chuck Erickson  
"Encryption—An Ancient Art  
Enhanced by LSI"  
*Progress*  
Don Peterson, Herb Brunner  
"Microsphere—Auto Dial Program  
Interface"  
*Progress*

K. Venkateswaran  
"Design Issues for 256K CCD  
Memory"  
IEEE Tech. Committee on Semi-  
conductor Memories  
"A Model for Life Testing Buried  
Channel CCD Memory"  
5th International Conference on  
Charge Coupler Devices

### **Research and Development**

Bruce E. Deal, James M. Early  
"Silicon and Germanium Semi-  
conductor Materials and Process  
Technology: 1952-1977"  
*Journal of Electrochemical Society*  
James M. Early  
"Present and Future of Bipolar  
Dynamic Memories"  
WESCON/78  
Howard Murphy, Will Steffe,  
David Wen  
"Second Generation Line Scan Image  
Sensors"  
*Progress*

### **Semiconductor Products**

Don Buccini  
"An Interfamily Communications  
Interface for Microcomputers"  
*Progress*  
Steve Yeung  
"Development in PLL Tuning System"  
*New Electronics*

### **Space & Defense Systems Division**

Anthony R. Kolanjian  
"A Common Bomb Fuze for Tri-  
Service Applications"  
American Defense Preparation Assn.

### **Subassembly Test Systems**

Tom E. Finnell  
"ATE Justification: A Simple  
Approach"  
Electronics Test and Circuits Mfg.  
and ATE Seminar/Exhibit

### **Test Systems Group**

Jim Healy  
"An Interactive Approach to Micro-  
processor Testing"  
Productronica Conference  
"Easy Testing of Mixed Devices"  
*Electronic Weekly*  
"Economic Realities of Testing  
Microprocessors"  
IEEE Cherry Hill  
"Probleme bei der Freigabe—und  
Wareneingangsprufung von Halbleiter-  
speichern"  
Sonderdruck Elektro-Anzeiger  
Robert Huston  
"A Review of Today's Very Large Scale  
Integrated Circuit Testing Problems  
and Solution"  
Internepcon  
Phil Nutburn  
"Memory Test Evolution and Micro-  
processor Test Strategy"  
The Micro-Test Symposium  
"Simplifying Generation of Complex  
Timing Sequences"  
*New Electronics*  
"Some Economic Consideration of  
Testing Integrated Circuits"  
*New Electronics*  
Donald W. Villa  
"Automated Test Equipment Service  
Contracts: Should I or Shouldn't I?"  
*Evaluation Engineering*  
**Transistor Division**  
Bill Roehr  
"VMOS—A Giant Step Toward the  
Ideal"  
*Progress*

# MONEY FOR SCHOOL

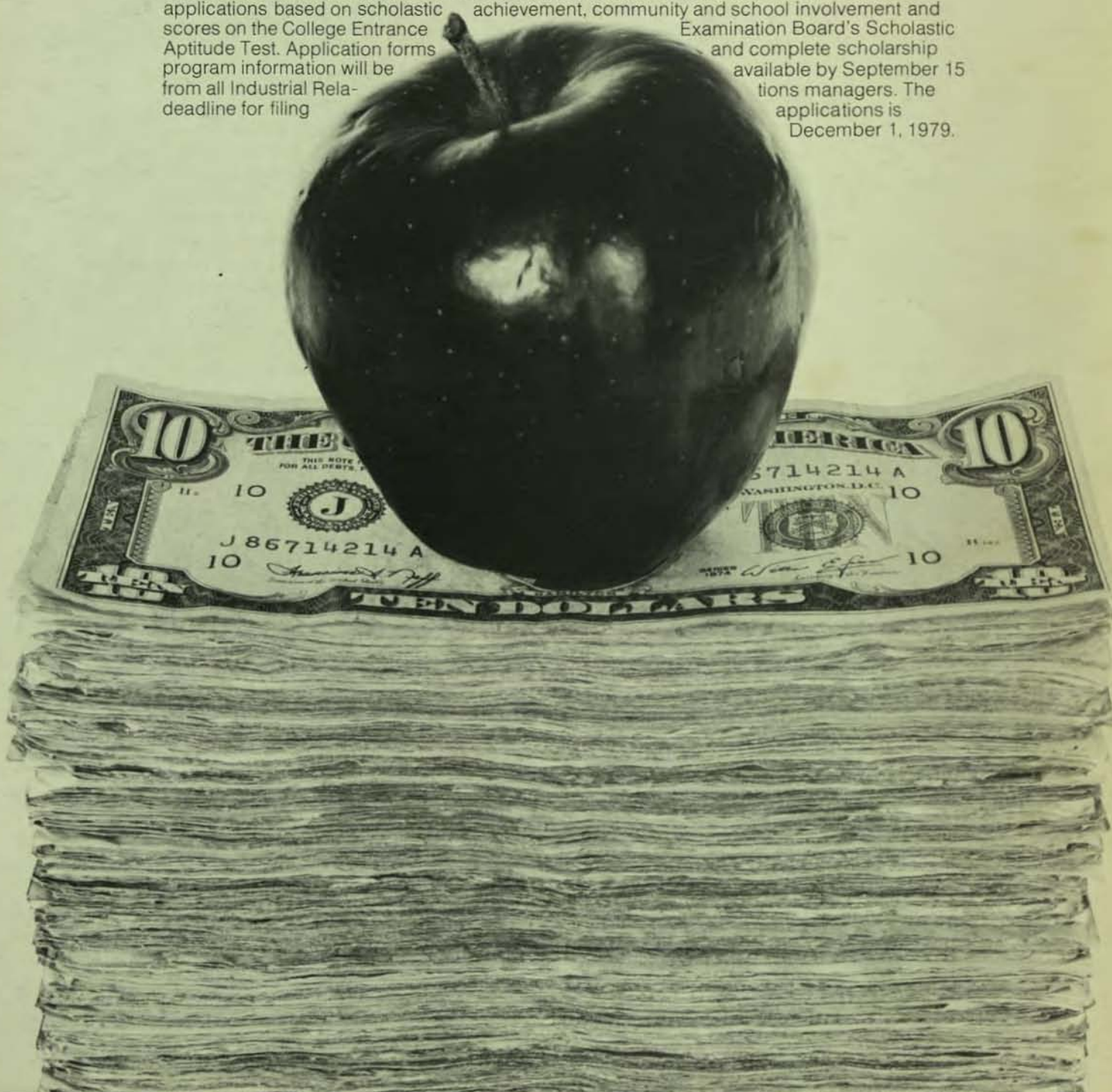
## 1979-80 Scholarship Competition Opens

Applications are now being accepted for the 1979-80 Sherman Fairchild Scholarship Program. Five grants of \$2000 each, renewable annually for up to four years of full-time undergraduate study at an accredited U.S. college or university, will be made for the '79-'80 school year to children of Fairchild employees.

Scholarship applicants must be the dependent children of full-time Fairchild employees or retired, permanently disabled or deceased former employees. The parent must have completed at least two years of full-time service by September 1, 1979. In the case of current employees, the parent must be employed by the company on September 1, 1980 for the student to accept the award. The parent must also be, or have been, employed in Fairchild U.S. operations, or be an expatriate assigned to Fairchild operations abroad.

Students applying for Fairchild scholarships must be either high school seniors who will graduate during the current academic year, or high school graduates who have not previously attended college or junior college.

The competition is conducted by the College Scholarship Service, a division of the Educational Testing Service, Princeton, N.J., where a board of educators evaluates the applications based on scholastic achievement, community and school involvement and scores on the College Entrance Examination Board's Scholastic Aptitude Test. Application forms and complete scholarship program information will be available by September 15 from all Industrial Relations managers. The deadline for filing applications is December 1, 1979.





Winter 1979

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION  
A Schlumberger Company

**Keeping current:**

*The hurrieder I go, the*

*behinder I get*

*(Page 4)*

# HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



**Cover:** Getting behind trying to keep up? See how some of your colleagues do it beginning on page 4.



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*San Rafael*—Eric Redman;

*Santa Clara*—Don D'Andrea;

*South San Jose*—Don Ramsey

East Coast: *IPD*—Peg Schinnerer;

*Latham*—Mark Thurman;

*South Portland*—Peter Miles;

*Syosset*—Ruth Miller;

*Titusville*—Sandi Meyers;

*Wappingers Falls*—Gene Olan

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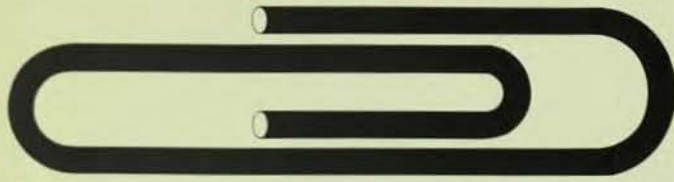
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### **FAIRCHILD**

A Schlumberger Company

An Equal Opportunity Employer



## **SCHLUMBERGER ANNOUNCES 3RD QUARTER RESULTS**

On October 25, Schlumberger Limited reported third quarter net income of \$174 million, up 28 percent over the same period last year; earnings per share were \$1.37 compared to \$1.07.

The results of Fairchild have been consolidated with those of Schlumberger beginning July 1, 1979. Taking into account Fairchild's third quarter results, interest expense on the purchase price and purchase accounting adjustments including amortization of goodwill, Fairchild contributed approximately \$4 million to Schlumberger net income.

Revenue in the third quarter was \$984 million (Fairchild revenue was \$174 million for the same period).

For the first nine months of 1979 and including Fairchild for the third quarter only, net income was \$463 million, up 27 percent, and revenue increased to \$2.5 billion.

Jean Riboud, Chairman, said that the results of the third quarter continued the trend of the first six months. He noted that oilfield services performance improved due to strong recovery in North America, aided by record activity in the eastern hemisphere and South America. He pointed out that Fairchild semiconductor and test equipment sales continued at high levels worldwide.

## **TOM ROBERTS NAMED FAIRCHILD PRESIDENT**

On Nov. 7, Schlumberger Limited announced the following management changes:

Thomas C. Roberts has been elected President and Chief Executive Officer of Fairchild Camera and Instrument Corporation, following the resignation of Wilfred J. Corrigan. Mr. Roberts has been promoted to Executive Vice President of Schlumberger Limited.

Mr. Corrigan will remain Chairman of the Board of Fairchild to assist Mr. Roberts in the assumption of his new responsibilities.

Mr. Roberts previously was General Manager of Schlumberger's Measurement and Control operations in the United Kingdom. In July, 1978 he was appointed Vice President of Schlumberger Limited and Chief Financial Officer.

Effective January 1, 1980, Arthur Lindenauer will join Schlumberger Limited as Executive Vice President and Chief Financial Officer. Mr. Lindenauer is, at present, a partner of Price Waterhouse and Company in New York.

## **IMAGING SYSTEMS WINS \$7.4 MILLION CONTRACT FOR COCKPIT TV**

A \$7.4 million contract to supply aircraft cockpit television systems and ground support equipment to the U.S. Air Force has been awarded to Fairchild's Imaging Systems Division, Syosset, N.Y.

The systems will be supplied to the Air Force's Aeronautical Systems Division at Wright Patterson Air Force Base, Dayton, Ohio. The initial award is for 717 systems with deliveries starting in mid-1980. The multi-year contract has the potential for approximately 4000 systems costing more than \$30 million.

Each Cockpit Television Sensor (CTVS) System is comprised of a small sensor head and a remote electronics unit. The system will be installed on tactical fighter aircraft for documentation of combat and training missions. CTVS enables videotape recordings of real-time situations as seen by the pilot, plus mission symbols projected to the pilot's heads-up display.

CTVS incorporates a Fairchild-developed solid state charge-coupled device (CCD) image sensor, which offers low power requirements and high reliability.

## **20 MHz LSI TESTER ANNOUNCED BY TEST SYSTEMS GROUP**

The Cherry Hill IEEE Test Conference was the site for the introduction of Test Systems Group's Sentry® Series 20, a 20 megahertz general purpose LSI (large scale integration) test system.

The system can test LSI devices at an uncompromised 20 MHz test rate for 60 pin chips and at a 40 MHz rate for 30 pins. The tester fully exercises high speed devices, such as microprocessors, associated support chips, logic arrays and bipolar and MOS memories.

Also announced at Cherry Hill were two new options for the Integrator® II which improve management communications for standard and high reliability testing applications.

The Integrator is an information processing host computer for collecting and interpreting data from remote test locations. The newly-introduced graphics option offers a colorful one-page summary of data consolidated from multiple sources. A high reliability software option efficiently tracks and tailors reports to operators and managers of sophisticated hi rel facilities.

# *The hurrieder*

*I go,*

*the behinder*

*I get*

*Can't keep up with the information explosion? These Fairchild people tell how they keep up to get ahead.*



It used to be that only cars and clothes and wringer washing machines went out of style. Things became obsolete, but people kept up by learning what was new in the world.

People are still learning, but the race to keep current has stretched into a dead run. For many people, just keeping up with the information they receive on the job means constant sifting through pounds and pounds of trade journals, memos, print-outs and newspapers. As one Fairchild employee says, "If I lived on a desert island for a year, I'd be obsolete."

In the electronics industry, as well as everywhere else, people have discovered that staying ahead is synonymous with advancing in their profession. An engineer, a marketing manager or a corporate lawyer all worry about learning those things which will help them do their jobs better. So they read, take classes, join professional societies, do the trade shows, and hope that they've learned enough to be up to date.

**Reda Razouk**  
**Research and Development Division**  
**Palo Alto, Ca.**



"There's an advantage to being in R&D. One gets exposed to the latest research and development in the industry." If you've ever imagined that there's a lot of information keeping your "in" basket continually overflowing, you're not alone. R&D is everywhere, hypothesizing, experimenting and publishing at an amazing rate. Even researchers have trouble keeping up.

At Fairchild's R&D laboratory in Palo Alto, Calif., Dr. Reda Razouk divides his time between absorbing and generating information. As a member of the research staff, Reda works on several projects at a time, some in conjunction with outside research teams. It's a part of his job to publish the results.

"We do the work that's within our capability and we seek partners who can do things that are beyond our resources. An exchange of information with universities and the government is most important for industrial researchers."

Dr. Bruce Deal, who manages R&D for Device Technology, holds weekly staff meetings, occasionally with guest speakers. Reda also meets monthly with members of the Material Sciences and Electrical Engineering departments at Stanford University to share progress on a joint project. He finds the interaction between professional researchers in both settings enormously informative.

"We meet with many people who are working on a wide variety of projects. They give a concise summary of what they are doing, and listen to our progress report. The discussion that follows gives everyone a good perspective on the progress we've made as a group."

Researchers in Palo Alto have access to an extensive library of technical publications. Every day the librarians make photocopies of the contents pages of each new arrival, allowing the staff to spend a minimum amount of time deciding what they should read. Reda says, "It only takes a few minutes a day with this system. I tend to drift back there at the same time each day, just to see what's new. Once I'm there, I sit down and read those papers of interest."

Although Reda has a doctorate in electrical engineering, he plans to continue his education by attending seminars that pertain to his work. He thinks highly of Career Center for engineering staff, and recommends that the people who work with him attend that sequence. "Seminars round you out. An advanced degree doesn't mean that you know everything that's happening in the industry."

---

**Art Heckler**  
**RF Systems**  
**Syosset, NY**



"Knowing my customers' preferences is most important. Usually it's a matter of a green widget rather than a red widget, but knowing which one he prefers can mean making the sale."

Making sales is Art Heckler's job, and keeping track of his customers and their product preferences takes him out of his Long Island office three days out of every week. Art is Director of Marketing for RF (Radio Frequency) Systems, a unit of the Government and Industrial Products Group in Syosset, N.Y. RF Systems produces radar and communications jamming equipment, primarily for the military.

Selling to the government is a specialty that requires constant tracking of procurement policies and changing personnel as well as knowledge of new technical developments. "My job is to retain good relationships with a customer so that I can understand his requirements and the solutions he prefers. I come back to our engineers and we pattern a system on what the customer thinks is best. When we also make use of the newest technology, then we've offered him the best possible system."

These customer contacts are a valuable way to keep current, Art finds. He depends on seminars to keep him abreast of the technical advancements, long-range military planning and organizational changes that help him direct his efforts to the right people and places. He says he attends at least four seminars a year and would gladly double that number if he could fit them into his schedule and budget.

"Seminars are an extremely cost-efficient learning tool. Many marketing people have a real reluctance to invest time in the classroom, but I think they don't appreciate how much they need to learn. Even if you know everything today, you won't know everything tomorrow."

Art uses speedreading to get through the eight trade journals he receives each week, doing much of his reading on airplanes between customer visits. He also makes it a habit to consult with the Government Systems Business Development people in Syosset. "They routinely look at the big picture. I discuss my part of that picture with them, and they tell me if my plans are in perspective."

**Lisa Erdberg**  
Corporate Tax Department  
Mountain View, CA



"Maybe I'll only use one idea I learn at a seminar. But if it saves the company a hundred thousand dollars, then it's worth the \$200 it cost to go to the class."

Lisa Erdberg has discovered a persuasive argument for spending a lot of time keeping up: there is a direct relationship between knowing the latest in corporate tax law and saving Fairchild money. It's one of her responsibilities as Manager of Tax Research and Planning to know how legislation and interpretation of cases in the courts will affect the company's tax situation. The other part of her job—planning company transactions so that Fairchild ends up in the best tax position—would be a useless exercise without up-to-the-minute knowledge of the laws.

Lisa uses the quiet time at the end of the day to scan digests of new cases and rulings that come out weekly. Although the cases are summarized in head notes, allowing her to skip the ones that pertain to other areas of tax law, it is still necessary to read a lot of material.

"I can generally get the same information from several different sources. But I have to look at all of them because I can't rely on any single one to be accurate and complete. I have to read every day to keep up. The department gets only one copy of each journal, so if I hold something up for a week, then others don't get the information they need."

Information that moves between people in the tax department is as important for Lisa as most outside sources. A circulating reading file contains copies of all work produced by the ten people in the department. Lisa and the lawyer she supervises contribute to the volume of information by preparing summaries for their colleagues when major new tax legislation is passed in Washington. The tax staff was also meeting quarterly for an internal seminar, but the enormous amount of work associated with Fairchild's merger with Schlumberger preoccupied them. Lisa said she hopes they will soon have time to get back on the seminar schedule.

She also finds outside seminars helpful, especially those conducted by the Bar Association after a major piece of legislation has been passed. "I almost always pick up helpful ideas, and the reference materials I bring back are useful."

**Tom Hewitt**  
Test Systems Field Sales  
Chicago, IL



"Nobody wants to talk about their device failures. I have to read between the lines of the trade journals to get information that helps us in the LSI test equipment market."

Try running a race where you have to be twice as fast as the person next to you, just to keep up. That's the challenge facing engineers in the automatic test equipment (ATE) industry, as they struggle to keep abreast of technology.

Tom Hewitt, a Field Sales Product Specialist in Fairchild's Test Systems Group, says the advances in ATE technology keep pace with semiconductor device technology. It's equally important for him to keep up with new devices—how they work and why they may not—as with new ways to test for device failures. Direct customer contact is his best source of information because much of the data he works with is proprietary, and testing requirements vary with each product's design and function.

Working directly with customers means a lot of traveling. Tom is based in the Chicago field sales office, which covers a huge 16-state area in the center of the country. "User accounts, which require the most support, are a generation behind semiconductor manufacturers," Tom says. "But that's an advantage when it comes to keeping ahead of my customers in products and equipment."

Tom says he learns a lot about new products and his competition at trade shows and by subscribing to six technical journals. He reads at home for two hours each Monday evening, the day several of the magazines arrive in the mail. It's a system that forces him to keep up, he says, even during football season. Tom has a home computer, which he bought to help with financial investment analysis. He hopes to use it to develop programs for some of the test equipment his group sells. "It's a hobby so it's fun. But it also keeps my software skills sharp."

"The Test Systems Group has some excellent internal resources that help us in the field keep up on Fairchild's sales and product news," Tom says. "I call someone from SWAT at least once a week." SWAT is the Sales Worldwide Applications Team that was set up to solve field applications problems. Tom also enjoys receiving the *Sentrygram*, a monthly sales news letter published at Test Systems San Jose headquarters.

**Carl Fender**  
MOS Products Division  
Wappingers Falls, NY



"Development engineering is a type of built-in protection against obsolescence. I'm constantly required to keep up with new ideas simply by doing my job."

Every engineer has to work at keeping current, but development engineers like Carl Fender spend a great deal of time keeping up with new discoveries. Fortunately, the amount of required studying will vary, depending on the project at hand. In an industry where the pace is usually frightening, these slower times are a welcome breather.

Carl is currently working on a new wafer fab process for smaller and faster MOS (metal-oxide-semiconductor) devices. Like other projects he's tackled at the MOS Products Division plant in Wappingers Falls, NY, this one calls for breaking new ground in processing technology. "The goal of each particular project is different," Carl said, "so I try to keep my knowledge fairly broad. I may have to learn something brand new for one, and re-learn something I haven't used in a long time for another one. I'm not specializing."

The luxury of learning on the job doesn't mean that Carl necessarily has time to do all the required reading at work. He says he's reading five or six hours a week for his current project, most of it at home during the evening and on weekends. Although he has never taken speedreading, Carl says he's developed the ability to read technical journals and books very quickly.

"Projects always have deadlines," Carl said, "so I depend on other people in the field to save me time. If other people I know in another department or division have had good luck with a new plasma etcher, for example, then it helps me to hear about it. I use their leads and then do my own follow-up tests for our product. Equipment vendors are another good source of information, but you have to take their salespitch for what it is.

"I like being in development engineering because I'm expected to keep up with advances in the field. What I learn today will help me solve problems tomorrow. A job that offers opportunities for constantly learning new things can be a real plus."

**Rich Hauser**  
Bipolar LSI Group  
Mountain View, CA



"I thrive on my reading—I need to know what customers are doing with my products, and I need to stay creative."

One of Rich Hauser's major concerns is getting the product out. As a Supervising Product Engineer for PROM Products in the Bipolar LSI Group, Rich is responsible for developing programs that will detect device failures, monitoring yields and analyzing customer returns.

"I keep up with competitors because ignorance of competitors is foolish. I try to keep up with the latest technology so I can solve customer problems faster, recognize failure modes more easily, and do better all the things I'm supposed to do. I work at keeping current because I think it's important to be ready for new opportunities when they come along."

Rich has followed the example of people around him by developing the habit of reading every day. Al Graf, who used to work in PROM Products and is now Manager of Technical Training at the Career Center, impressed Rich with his daily dedication to keeping up. "Al never misses a day. When I was working with him I told myself, 'I want to know as much as this guy,' so I've tried to start each day with 30 minutes of technical reading. It's a tough habit to form."

In turn, Rich is trying to set a similar example for engineers and technicians in his area by starting a library of technical journals. "Although many articles in trade magazines are too general to help us solve production problems, we need to know what's new in semiconductor science. Even my brother's college engineering textbooks have things that weren't there three years ago."

Like many engineers, Rich feels he will one day have to choose between staff engineering and management. By keeping his eyes open and learning as much as he can now, he thinks the decision may be easier to make.

"If I step into a manager's position, I'll spend even more time with outside work and in-depth reading. I always want to have hobbies that make demands on my creative knowledge. Managers can appreciate the problems engineers solve, but they don't have time to work on each one. Good engineers have a craving to know everything about the projects they're working on. Managers become generalists, and have to sacrifice this need to specialize."



*The Hotel Negresco in Nice,  
France was the site of  
the 1979 Test Systems  
User's Conference.*





# FIFTY-FIVE HEADS ARE BETTER THAN ONE

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Guests and hosts trade problems, solutions at Test System's 3rd annual European User's Conference

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The blue Mediterranean and the famous Hotel Negresco in Nice, France, welcomed some 55 technical managers and senior engineers to Test System's third annual European User's Conference this past June. For 2½ days, conference goers heard Fairchild's Sentry Systems experts present the latest in large-scale integration testing developments, listened to customer presentations on new techniques and did some plain old trouble-shooting.

"Our purpose is to bring people together to discuss common testing problems and solutions," says Jim

Healy, Test Systems General Manager, Domestic Sales and formerly International Sales Manager. "It's definitely two-way. The Fairchild technical staff is there to update people on our products, but they learn as much as they teach. Our customers help us a great deal in planning needed new product development."

Jim launched the first such User's Conference in 1977 in Switzerland, and the concept of an annual technological exchange between manufacturer and customer proved so popular that similar seminars are now held throughout the world. This year's European session, with the largest-ever number of companies represented,

covered subjects ranging from compatibility of test heads to the latest software utilities, with customer presentations a substantial part of the total agenda.

Miklos Boda, LSI Test Specialist for Datasab in Sweden, was one of the newer Fairchild customers at the podium. His paper on the strangely-named Schmoo Plot covered development of a method to observe the interaction of test program parameters so that users can more easily communicate with each other about problems.





*Michel Bilbault, Test Systems Southern European Area Manager, (back to camera) confers with customers after a seminar session.*



*Keiji Muranaga, left, Technical Director for SWAT—the Sentry Worldwide Applications Team—reviews testing developments with customers during a conference break.*

“By sharing this kind of information, we can all avoid problems,” he says. “This is my second year at the User’s Conference, and information sharing is the major value for me.” (The Schmo Plot is a pattern of a semiconductor device’s characteristics, used to evaluate areas in which the device will operate. It usually resembles a blob and is so named for a similarly-shaped cartoon character.)

Datasaab has recently added two Sentry VII LSI test systems to its test equipment inventory. In Nice, the customer said the Sentry was chosen principally for its one-millivolt option.

This gives a higher precision measurement and better resolution. With this option, a high frequency stimulus—say 10 megahertz—can be applied to a device with a voltage resolution tolerance of 1 millivolt.

The conference’s aim of providing support and encouraging technological interchange brought about this year’s introduction of the User’s Program Exchange Club. Suggested last spring by Michel Bilbault, Test System’s Southern European Area Manager, the idea was well-received at the conference and a number of customers signed up. “Because of

the high cost of program development, the idea of an exchange was very attractive to our customers,” says Michel. “With the establishment of a few ground rules, it will soon be possible for users of test equipment to exchange programs on magnetic tapes.”

Michel Pichon of CII Honeywell Bull in St. Ouen, France is one of Fairchild’s most experienced test system users. A 1973 purchaser of a Sentry 600, he followed this in 1977 and 1978 with Sentry VII’s and a new Sentry VIII this June. A member of the new User’s Exchange Club, he originally chose Fairchild test equipment for its evolu-



*Diners were surrounded by elegant tapestries in this famous old Cote d’Azur hotel.*



*Michel Bilbault toasts Shirley Perera's winning of an important Scandinavian sales contract.*



*Fairchild's Dennis Vittecoq, left. Michel and a customer catch some sun at the nearby beach boardwalk.*



*Christina Schroeder, right, from Test Systems Munich office, organizes some last-minute assembly of conference materials.*



tionary quality and the commonality of peripherals. The quick access to mass data storage and flexibility of available software are both features he continues to demand. "The notion of comprehending a system to the core to fully appreciate its capabilities and understand its limitations is fundamental," he says. "This User's Conference gives me a lot of valuable information on new developments through direct contact with Fairchild engineers."

"By maintaining contact between Fairchild and other test equipment users, it's possible to keep on top of

technological development," observed Hans Plickshaw of SEL Stuttgart. "My company just ordered a Sentry and we want it to be as productive as possible. I came to learn software possibilities, to learn from other participants and to exchange experiences with other customers." In setting up a test group, SEL is interested in purchasing test programs and signing onto the User's Exchange Program. The more personal contact, the more information obtained, is Mr. Plickshaw's belief. A final personal observation, he stated, "You either live to work or you work to live. Adhering to the latter principle, I'd

have to say that I haven't minded all the sun, sea and fine cuisine either!"

How to top off a totally enjoyable 2½ days in Nice? With a special closing banquet, of course! On the final evening everyone piled into a bus headed for the rustic old Ferme St. Michel in Villefranche, half an hour from the city. As the bus climbed up to the Moyenne Corniche, conference-goers caught breathtaking views of the sea along the way. (It takes a visit to Nice to fully appreciate the meaning of azure blue.) After the closing banquet, a final magnum of champagne was shared, to toast next year's conference.



*Richard Bladowski, left, a Fairchild TSG rep in Munich, and Keiji Muranaga review Sentry capabilities with Petr Ryduval of Siemens.*



*Small, informal troubleshooting sessions throughout the conference provided valuable chances to expand on general session discussion.*



**“How do you do business here  
in Washington?”  
“Well, it’s not the average  
territory.”**

**It’s a \$100 billion plus annual market, but some  
projects can take more than 10 years, say our men  
in Washington.**

It never closes. During the day, its population matches that of a small city. It has its own subway station downstairs, and local department stores and banks have opened branches on its main concourse. People working here and in the surrounding area will authorize the spending of more than \$120 billion this year on national defense.

It is, of course, the Pentagon. Located just across the Potomac River from the United States Capitol, this huge five-sided landmark houses the decision-makers in the American military services. Here, plans are made and implemented for the aircraft, ships, ground equipment and weapons systems needed to insure national security.

*Bud Hyatt heads out of the Pentagon through the River Entrance, which is used whenever military or civilian VIPs visit the building.*





It is the center of a market unlike any other in which Fairchild competes. To the outsider, it can seem like a maze. The Pentagon has five stories above ground, two floors plus a mezzanine below ground. The floors above ground are laid out in the form of a five-sided wheel—10 corridors serve as the spokes in the wheel and 5 concentric circles beginning at the center connect the corridors. Twenty-seven thousand people work in the Pentagon, and it can take a year or more to really learn your way around. Identifying and developing business opportunities in a marketplace of such physical and operational complexity can take many years.

Bud Hyatt and Harry Smith, directors of Fairchild's two Washington area offices, are long-term Washington hands. Bud and Harry, who learned the ropes throughout Washington during their prior military careers, have now brought their expertise to Fairchild's Government Systems, headquartered in Syosset, N.Y.

The U.S. government has been buying Fairchild products since the 1920's—the days of the first aerial camera. Today, Government Systems provides the military services with sophisticated aerial and surface surveillance equipment, electro-optical imaging products and secure communications systems.

As Director for the Washington Region, Bud works out of a Crystal City office building that is within sight of the Pentagon. Daily rounds may take him there via a short ride on Washington's new Metro subway. His duties include calling on military officers and civilian Department of Defense managers responsible for areas ranging from systems requirements to foreign military sales. Much defense research is conducted at military labs surrounding Virginia and Maryland cities, so Bud frequently visits these facilities to track progress of projects under development.

"Elapsed time from proposal to actual delivery and installation of a sophisticated system can be three to five years—much longer than in Fairchild's other product groups," Bud explains. "The principal advantage my military experience gives me is that I understand the way a military product comes into being, and I don't get frustrated by the time it can take.

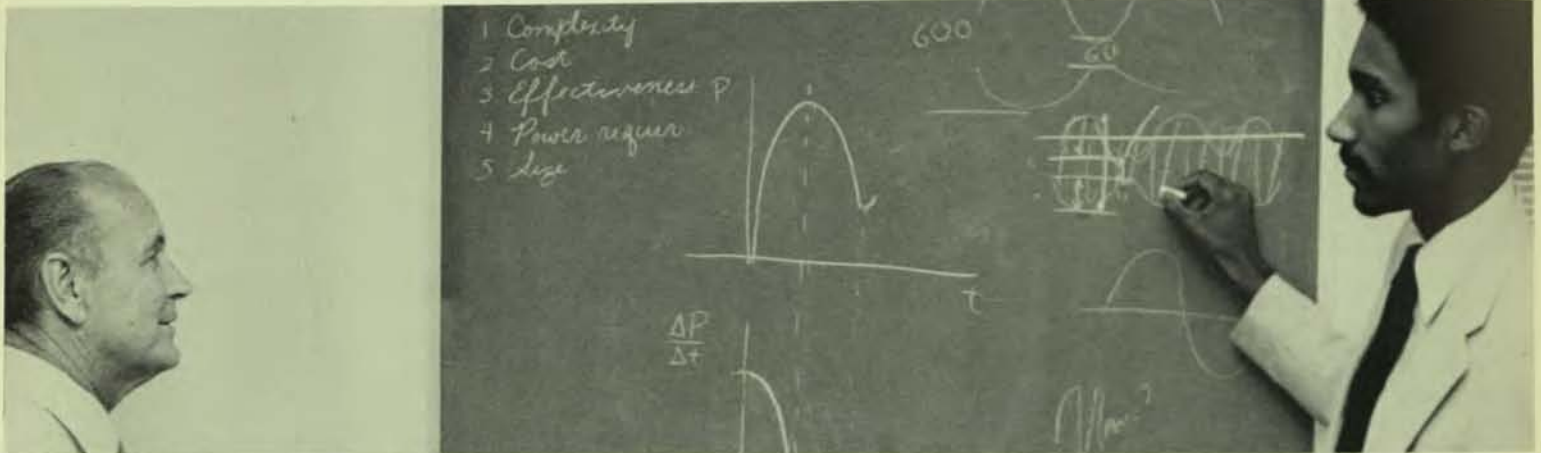
"This isn't a typical sales territory, where you make a few calls, then close the deal. Fairchild may actually be granted a major contract only a half a dozen times a year, but each contract is the result of several years' effort by many people. The price tags on today's military systems are high—each service spends millions every year. A lot of review goes into committing those kinds of dollars."



*Bud's new quarters in Arlington, Va. are minutes from the Pentagon and Capitol Hill.*



Bradley Thomas, Staff Engineer, discusses parameters of a new system with Harry Smith.



Bud cites one example of this long leadtime. By the end of the year, he expects the Air Force to award a contract for development of a jamming module for an electronic warfare pod, a rounded metal container that will hang under an airplane wing. This pod will carry electronic equipment capable of jamming radars of all types.

"Discussions about this project, the ALQ-131 pod, have been going on since 1970," Bud says. "If Fairchild participates in this project, it will be as a prime contractor, developing equipment to go inside the pod. We often act as a subcontractor to the primary contractor, although many contracts are granted to the company directly by a branch of the service. The ALQ-131 award would be a contract received directly from the Air Force as a result of competitive proposals.

"If the Air Force decides to build this particular equipment for the ALQ-131 pod, production probably won't begin until 1983—13 years after the idea was first suggested. The complexity of these products, as well as the size of the government bureaucracy that appropriates the money, makes this a business for the long distance runner, not the sprinter."

Keeping track of programs and specific projects is not an easy task. Three stages of Federal budgets must often be juggled concurrently. Once the military budget is developed by DoD and approved by the Executive Branch, it is included in the President's budget and is submitted to Congress every January. "The military planners and procurement personnel are concerned with the implementation of the current 1979 budget, the 1980 budget now making its way through Congress and the 1981 budget being prepared to go to Congress next January," Bud explains. "To an outsider this process is difficult to comprehend.

"As one plan is being formulated, the next is being debated and the next is being executed," Bud says. "We pay close attention to this process, both to identify opportunities and to keep the military and the government aware of our capabilities."

Demonstrating those capabilities to senior military technical people is also vitally important. Since seeing is believing, RF (Radio-Frequency) Systems operation, a business unit of Government Systems, has recently opened an engineering and demonstration center in suburban Vienna, Va., about 30 minutes from downtown Washington. Opened last January with a move to the present quarters this June, the office is headed by Director Harry Smith.

"Eighty to ninety percent of the circuitry in today's military aircraft and ground equipment was dreamed up by industry," Harry comments. "The military came up with the need, but the answer was provided by industry.

"Take the new remotely-piloted vehicles (RPV) the Air Force is using. Once these started flying, the military realized they were capable of greater effectiveness with improved radar and communications jamming systems. But, they didn't necessarily know that it took to develop those systems—we in industry did that. Our marketing people find out what the services' needs and objectives are, then engineering comes up with a way to do it. The job then is to convince that particular service that Fairchild has the best and cheapest solution to their problems."

The new Virginia office is part of the strategy. Staffed by six military engineering specialists, the office is equipped with a demonstration lab and a specially-constructed steel-walled security vault.



"If you can give the customer a prototype of a product he needs, have him plug it in, see it light up, or take it out and give it a flight test, he knows you have the capability to solve his problem. It increases your credibility as a supplier." Harry continues, "That's exactly what we're doing with the ALQ-131 pod. Our Syosset plant is building a prototype, and when it's ready, we'll be able to demonstrate it and to show test data which proves we understand and can solve the technical problem.

"Usually, when you're competing for a contract, the 15 or 20 initial competitors will result in six or so proposals that are technically acceptable. After that, it is usually a question of who has the lowest price. We feel there's a better solution, and that's what we're trying to do with this new office.

"If we come up with an idea that will meet a need, and the customer likes it, we can in essence say that our solution is company proprietary. It is then in his best interest, and that of the taxpayer, to buy the initial items sole source. This almost completely eliminates his risk, since he can 'try before buy' a product developed at Fairchild's risk. Of course, production will end up as a competitive procurement.

"If you've built something that the customer can see, test and weigh, and it does the job, the customer is working with a known quantity. The risk and procurement time is significantly less than it would be if he went out with a proposal request, then selected a supplier who had the lowest price, but may not really have the capability to do the job.

"Having an office here gives us a tremendous advantage in this 'show-and-tell' process. An interested government representative can be out here in half an hour, spend an hour working with the equipment, and be back in his office two hours after he left it. Taking people to our plant in New York means they are out all day. People are more willing to give up two hours than eight or ten."

Another objective of the Washington-area office is to broaden Fairchild's base of government business. "Many times," Harry says, "a company has no control over lost government business. Military programs stop and start, stop and start, and they're always vulnerable to funds hold-ups by Congress. You may only get a month's work done on a project, then the whole thing is stopped. So, you need a variety of contracts and that's what we're after."



*Harry Smith, left, hosts Bud and Carl Schleicher, Director, RF Systems, at his newly-opened office in Vienna, Va., about half an hour outside of Washington.*

## Capacity-limited? Well, we're working on that.

**There's something of a building boom at Fairchild—both in Semiconductor Products and Systems and Equipment. Here's what all the hammering, sawing, painting, measuring, drilling, moving and unpacking's been about . . .**

### BIPOLAR GETS BIGGER... AND SMALLER

Operating space will double and advanced photolithography equipment will enable production at the smallest geometries ever possible when the Bipolar LSI Division completes its new facility in Fairchild's South San Jose, Ca. plant early next year.

The west half of the building, which was opened in 1977, is currently occupied by the MOS Products Division. Bipolar operations will move into the three floors on the east side, and both divisions will share support functions that will be housed in a new annex due to open next fall.

Each of the Bipolar floors is two-thirds the size of a football field for a total of nearly 100,000 square feet. Construction is nearing completion on the middle floor fab, with equipment scheduled for checkout in January and production set to start in April. Facilities on other floors include a wafer sort area, training room complete with a fully-equipped mini fab and some recreational areas. Future plans call for construction of a Par-course behind the main plant, for use by both Bipolar and MOS employees.

Offices will occupy the front portion of the third floor, with the rear reserved for expansion needs. All Mountain View production will remain in its current location, as will division administration personnel.

Wafers produced in the new South San Jose fab will be entirely four-inch, and will make use of photolithography equipment which will allow Bipolar to fit more functions on a chip, therefore

making higher density memory parts.

Jack Mills, Bipolar Manufacturing Engineering Manager, says "Customers buy our LSI products because of density and speed, and this new process will give them advantages in both areas."

Evaluation of equipment to be used in the new four-inch facility is being done in a preliminary "fine-line" fab Bipolar constructed in Mountain View, according to Jack. "Because of the strong demand for our products, we wanted to work out any problems with the production process or the new equipment before starting operations in San Jose. Doing this will save us valuable time next spring when we're ready to start up."

To help meet the demand for skilled employees to staff the new operation, Fairchild has donated equipment for a training fab at the Center for Employment Training in Gilroy, Ca., south of San Jose. CET, which provides job training for disadvantaged and lower-income people, is training operators and technicians for jobs at South San Jose in both the Bipolar and MOS Divisions.

*Project Engineer Tom Perry, left, reviews Bipolar construction plans with Bill Faulkner, one of the local contractors working on the project.*



### SOUTH PORTLAND ADDS 4-INCH FAB LINE AND ION IMPLANTER

"It's the closest thing to a real clean room." That's how Rolf Dries, Engineering, describes the four-inch fab which recently began production at the Digital Division's plant in South Portland, Maine.

Planned by a consultant who had previously used the technique at NASA, the entire new fab room acts as a hood. Conventional fabs have hoods built over every work station, and these are equipped with temper-

ature control equipment and exhaust fans. Special construction and modern air-conditioning equipment combine to make the new ceiling of the South Portland fabrication area one large hood, enhancing production and energy efficiency.

Nearly a year of construction at South Portland ended with production start-up in August—full production is to be reached by mid-1980. The completion of the four-inch line is the first phase of an expansion plan that will eventually shift all SPOR production to that size.

In addition to the "room as a hood" concept, designers separated wet photo-fabrication operations from dry, because of previous damage to projection aligners from excess moisture in the air.

The plant also installed Wafer Trac—advanced wafer fabrication machines that combine several production steps. "It's the only equipment of its kind," according to Tony Bantley, Manufacturing Manager, "and Fairchild has the first on the East Coast." Wafer Trac equipment is also currently in use at Wappingers Falls.

As part of an overall plan to upgrade equipment at South Portland, the plant has also installed its first ion implanter. A highly sophisticated system, the implanter can diffuse several substance layers at once, and makes great accuracy possible by implanting by force rather than by conventional heating methods.

Spotless floors, shiny new equipment and technicians clad in white clean room garb give the new fab more of a hospital atmosphere than that of a high volume semiconductor plant. "As we get up to full production next year, it's bound to get more of lived-in look," Rolf says, "but it's one of the company's most advanced fabs, and we plan to keep it looking as new as possible."



*Modern design of the new four-inch line in South Portland reduces contamination levels.*



## CONVERSION TO 4-INCH DOUBLES CAPACITY AT WAPPINGERS FALLS

"Production of the four-inch wafers almost doubles our capacity without having to add significantly more space," says Carl Manco, Wappingers Falls Operations Manager. "We should finish 1979 at twice the wafers per week we did last year." As Manufacturing Manager, Carl directed the plant conversion, which involved selection of new equipment and the modification of fabrication tunnels. "Wafers now move through the production process faster, because each tunnel has only one specific function—projection aligning, coating, inspection, etc.," Carl says. "Previously, people in each tunnel area did all the fabrication jobs. The new system has made our production move a lot faster."

As an integral part of the new plant design, masks no longer leave the clean area at any time during their use. "A new shuttle between the mask shop and alignment tunnels has reduced particulate contamination," Carl explains. In circuit fabrication high precision projection aligners have also replaced contact aligners at Wappingers Falls, and plasma etching is now being used in place of wet etching. "Because plasma etching gives us better control over critical dimensions on the circuit's surface, we consistently expect better reproducibility," Carl says.

Demand is high for the 3870 and 6800 microprocessors, the 3608 EPROM and the 4K MOS static RAM produced at Wappingers Falls, so equipment downtime isn't welcome. "Some of the new equipment we have is the first of its type to be used in the industry, so some breaking in is to be expected—but it's still frustrating," Carl comments. "In a sense, though, it's a good problem to have—better to break in new equipment than patch up the old."



Denise LeBeouf loads wafers into a carrier on Wappingers Falls four-inch fabrication line.

## SENTINEL OPENS DOORS

More than 100 families roamed the hallways and tried out the computer terminals at the new Santa Clara, Ca. Sentinel building on October 7. The Industrial Relations staff hosted a Sunday afternoon open house, which included demonstrations of production equipment, entertainment, T-shirt sales by the employee recreation committee and refreshments.

Sentinel™ is the newest line of automatic test equipment built by Fairchild's Test Systems Group. It is targeted for high-volume producers of LSI (large-scale integration) semiconductor devices, incorporating features that save manufacturers time and money in testing operations. The system was introduced early in 1979 and has enjoyed booming sales.

The new building, a 58,000 square-foot facility near Great America, was constructed in under four months. Some production people moved into the new plant in June, with the rest of the staff following on July 31. Prior to the move, Sentinel staff had been scattered in temporary quarters in three different locations.

"From the beginning we've had tremendously cooperative people giving their all to get this product out,"

*The opening of Sentinel's new 58,000-square-foot building brought operations together that had been scattered in three temporary locations.*



Tony Taylor, left, Engineering Applications Supervisor, plays a game on a Sentinel system terminal with his wife, Connie and their son, Michael. The Taylors were among more than 100 families attending Sentinel's October open house.

says Wayne Pittenger, Sentinel Business Unit Manager. "Without these people, we wouldn't be where we are today."

Operations Manager Kent Goheen says that now they are driving hard to keep up with incoming orders. The management team is also concentrating on expanding the production force, introducing product enhancements and planning new designs for the system.

"Nothing is going to happen automatically, but I have a lot of confidence in this team of people," Wayne said. He believes that the enthusiasm of Sentinel employees will make the months ahead increasingly productive and successful for the operation.

## NEW HOME FOR SATS

Two-inch thick styrofoam wall panels and ground cover reaching right to the front office area windows will reduce fuel costs this winter at the Subassembly Test Systems Division's new headquarters in Latham, N.Y.

SATS, which includes operations of Faultfinders and Testline, two 1978 Fairchild acquisitions, manufactures computer-based electronic test systems for printed circuit boards. These high speed testers, both portable and in-plant versions, are used throughout the electronics industry.

Ground for the headquarters building was broken in March on a 21-acre site about a mile from the Faultfinders plant just outside Albany, N.Y. Construction of the new plant allowed consolidation of SATS operations in leased space in several buildings surrounding the original Faultfinders headquarters. The new 100,000 square-foot building houses administration, engineering, marketing and manufacturing for the division. Testline operations remain based in their recently opened facility in Titusville, Fla., near Orlando.



Guests tour the new plant in Latham after the formal opening.

## Schlumberger Orientation Meetings Held

During September and October, Fairchild employees were introduced to Schlumberger at special orientation sessions held throughout the United States. Employees saw a slide presentation describing the products and organization of Fairchild's new parent company, and had an opportunity to ask questions about the merger.

Many questions asked concerned possible changes in employee benefits. Specific benefit programs cited included profit sharing, medical insurance and stock purchase plans. Schlumberger will continue present or comparable Fairchild benefit programs, as was stated in the May 19 announcement of the proposed merger between the two companies.

"Schlumberger is a decentralized company. It has no standard employee benefit program, but allows each of its divisions and subsidiaries to maintain its own package," explains Warren Bowles, Vice President—Industrial Relations for Fairchild. "Our management will continue to review company benefit programs, as it has in the past. Changes will be made as business conditions dictate."

Following are additional questions raised at the orientation meetings.

### You Asked . . .

**Q.** Now that Schlumberger has acquired Fairchild, will they license someone to build parts for us in Europe, or will they open a Fairchild manufacturing plant in Europe? This question is of interest to our European aerospace and defense customers.

**A.** Fairchild will continue to operate its own manufacturing facilities throughout the world, and is not presently

operating any plants in Europe. Currently under construction, however, is the GEC (General Electric of England)-Fairchild joint venture plant near Manchester, England. Products from that plant are intended for sale in the Common Market countries.

**Q.** Does Schlumberger intend to combine or relocate any Fairchild operations?

**A.** Schlumberger has announced no plans to combine or relocate any Fairchild operations. As previously stated, Fairchild will operate as a separate subsidiary.

**Q.** What happened to the \$2 million that was to go into the profit-sharing fund this year? When will a new profit-sharing statement come out?

**A.** The \$2 million profit-sharing contribution for 1978, authorized by Fairchild's board of directors, was delivered to the trustees of the plan in early 1979. There has been a delay in distributing statements to employees because of a change in the data processing system that produces these documents. Statements have recently been sent to participating employees.

**Q.** I read in the *Wall Street Journal* that Schlumberger had to divest itself of Heath and Sangamo. This disagrees with the slide presentation. Which is correct?

**A.** Schlumberger has not been ordered to divest itself of either Heath or Sangamo. Unrelated to its acquisition of Fairchild, Schlumberger recently sold the Heath Company to Zenith Radio Corporation. Sangamo is part of Schlumberger's Measurement and Control-North America group of companies.

## NEWSMAKERS

**BRUCE STROMSTAD** has been named Operations Manager for the Digital Division's plant in South Portland, Maine . . . Systems and Equipment has made these appointments: **DICK BOHNET** to Division Vice President, International Business Development . . . **DICK BARR** to Staff Vice President, Group Strategic Marketing and Business Planning . . . **RAY GRAMMER** to Staff Vice President, Group Finance and Operations . . . **LANNY ROSS** to Division Vice President and General Manager, LSI Test Systems Division (formerly Sentry Systems) . . . **JIM HEALY** to General Manager, Domestic Sales for the Test Systems Group . . . Fairchild's corporate legal department has named **SUSAN KUDLICK** as Director . . . **TRAVIS WHITE** has rejoined Fairchild as Operations Manager, Automotive Division . . . Automotive has also named **TREVOR SMITH** Engineering Manager and **CURT KESTING** International Marketing Manager . . . **BOB RAISIG** has been named Controller for P.T. Fairchild in Jakarta, Indonesia . . . Worldwide Semiconductor Marketing has announced these appointments: **CHUCK JACOBY** as director, Tactical Marketing and Services . . . **BOB BOBRINK** as Director, Headquarters Mini/Micro-computer Marketing . . . **JIM JOHNSON** to Director, Business Center Operations . . . **HERB BRUNNER**, Manager, Training and Development . . . **CHARLIE GRAY** as Marketing Director, Southeast Asia . . . New appointments in Strategic Industry Marketing for Semiconductor Products include **HARRY SUZUKI** to Manager, Consumer Segment . . . **BRIAN BRACKLE** to Manager, Computer Segment and **JERRY SWOBEN**, Manager, Aerospace and Defense Segment . . . Industrial Relations has appointed **BOB DAVIDSON** to Group Director of Industrial Relations for corporate staff and **DENNIS McDONALD** as I.R. Manager for corporate headquarters . . . **BIPIN SHAH** has been appointed R&QA Manager for the Linear Division.

# TECHNICAL WRITING AWARDS

Fairchild employees authoring articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Awards Program. To qualify, get approval of your idea from your supervisor, then submit the final article to your Division General Manager, the Corporate Communications Department and the Patent Department for approval.

Technical Writing Awards appearing below were given from July–September, 1979.

## Automotive Division

Ellis Erwin  
"Compact Power Amp and Motor Driver"  
*Progress*

## Bipolar LSI Group

Paul Chu  
"8-Bit ECL Building Blocks for High Performance Microprogrammed Systems"  
*Electronics*  
"Local Buffering of Peripheral Controllers with FIFOs"  
*Progress*

## Digital Division

Charles H. Alford  
"TTL Circuit Implements IEEE-488 Logic"  
*Progress*  
Bob Bechdoit, Dave Ferris and Paul Griffith  
"FAST, Low-Power Schottky TTL"  
*Electronics*

## Discrete Division

Hans Palouda  
"Ein Zerstörungsfreier SOA-Tester (Power Transistoren und Hybrids)"  
*Elektronik Entwicklung*

## Imaging Systems Division

Ed Ayril and Arthur Roberts  
"A Concept for Laser Designated Training"  
Interservice/Industry Training Equipment Conference  
Arthur Roberts, I. Hirschberg, D. Wen  
"Analog Image Storage Using Charge-Coupled Devices"  
SPIE Symposium  
Michael Vickers-Harris  
"A Solid State (CCD) Cockpit TV System"  
Military Electronics Defense Expo

## Linear Division

David Jones  
"Switching Regulator Operates Fluorescent Lamp"  
*Progress*  
Theodore Vaeches  
"Design Consideration for an Integrated, Cost Effective, Flexible Switching Regulator Subsystem"  
Solid State Power Conversion  
"Evaluation Systems for Microprocessor-compatible D/A Converter"  
*Progress*

## Munich Sales

Klaus Pliotter  
"Microflame"  
*Artikel Elektronik*  
Herman Schwab  
"Hybrid"  
*Artikel Elektronik Informationen*  
Hans Tonn  
"SH 1605"  
*Artikel Elektronik Informationen*  
Matthias Weiss  
"I<sup>3</sup>L"  
*Artikel Elektronik*

## Optoelectronics Division

Keith Riordan  
"What is an LCD?"  
Radio Electronics  
Solid State Power Conversion

## Research and Development

Bruce E. Deal  
"Properties and Measurements of Charges Associated with the Thermally Oxidized Silicon System"  
Microelectronics Measurement Technology Seminar

## Technical Marketing

Anthony M. Pope  
"Using the uA78S40 Switching Regulator"  
*Electronic Engineering (UK)*

## Test Systems

Steve Gale  
"Fairchild Training Centers are the Key to Getting the Most from Test Equipment"  
*Evaluation Engineering*

## Testline

Keith R. Blackey  
"In-Circuit Testing of PC Boards"  
CY-Con Southwest

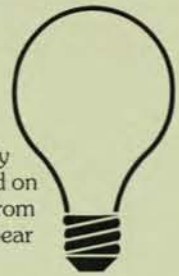
## Willow Grove Field Sales

Don Buccini  
"Direct Memory Access Subsystem Adds DMA Capability to Microcomputers"  
*Progress*

## Xincom

Phil Burlison  
"Bubble Memories are High Technology Devices that Demand High-level Testing"  
*Electronic Design*

# PATENTS



Fairchild's technological leadership depends, to a great extent, on the creativity of its people. Inventors listed on patents issued to Fairchild from August–October, 1979, appear below.

## Advanced Products Operations

Madhukar B. Vora and C. Michael Powell  
Method for Forming Oxide Isolated Integrated Injection Logic Semiconductor Structures Having Minimal Encroachment Utilizing Special Masking Techniques  
Patent No. 4168999

## Bipolar LSI Group

Jonathan J. Stinehelfer  
Addressable Word Line Pull-down Circuit  
Patent No. 4168490

## MOS Products Division

James Hayes  
Insulated-gate Field-effect Transistor with Self-aligned Contact Hole to Source or Chain  
Patent No. 4169270

William K. Owens and Steven R. Kahermanes  
Preset Circuit for Information Storage Devices  
Patent No. 4172291

Ramesh C. Varshney, Kalyanasundaram Venkateswaran, Gilbert F. Amelio  
Serial-parallel-serial Charge-coupled Device Memory Having Interlacing and Ripple Clocking of the Parallel Shift Registers  
Patent No. 4165541

## Research and Development

Peter A. (Tony) Crossley  
Process for Forcing Field Dielectric Regions in Semiconductor Structures without Encroaching on Device Regions  
Patent No. 4170500

## Semiconductor Products

Mark R. Schneider  
Electronic Watch Apparatus  
Patent No. 4167850

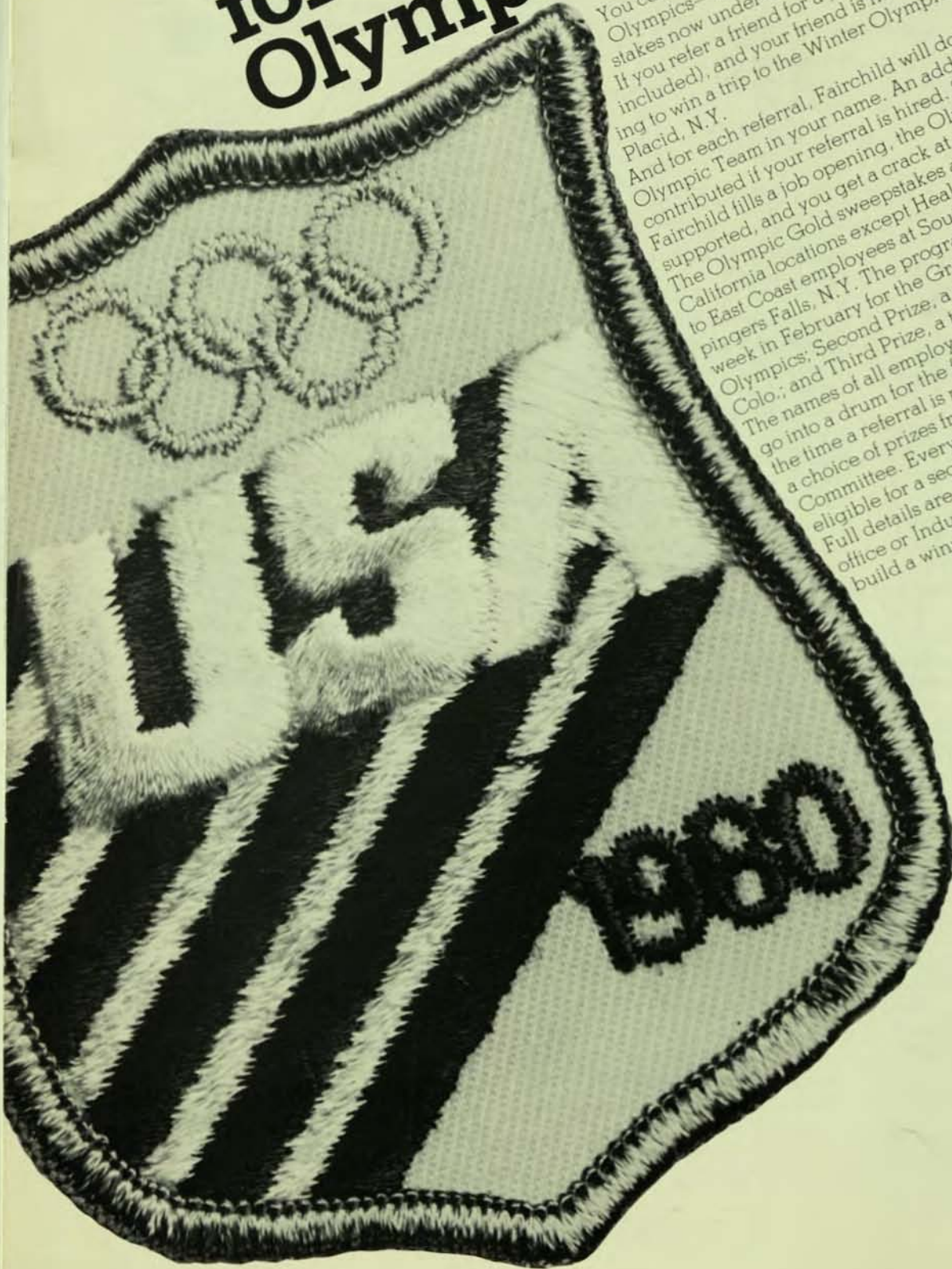
## Systems and Equipment

Nicholas F. Talesfore  
Digital Clock  
Patent No. D252854

## Test Systems

Anthony R. Beccia, Robert D. Boehije, Peter T. Jacobsen, Richard Olney  
Microprocessor System Having a Single Central Processing Unit Shared by a Plurality of Subsystems Each Having a Memory  
Patent No. 4167781

# Try out for Fairchild's Olympic Team



You can get a chance at the gold medal—a trip to the Winter Olympics—in the Olympic Gold employee referral sweepstakes now under way at many Fairchild U.S. locations. If you refer a friend for a job at Fairchild (trainee levels not included), and your friend is hired, you're eligible for a drawing to win a trip to the Winter Olympics next February in Lake Placid, N.Y.

And for each referral, Fairchild will donate \$5 to the U.S. Olympic Team in your name. An additional \$25 will be contributed if your referral is hired. So, there are three winners—Fairchild fills a job opening, the Olympic Team's efforts are supported, and you get a crack at a great trip!

The Olympic Gold sweepstakes are open to employees at all California locations except Healdsburg and South San Jose, and to East Coast employees at South Portland, Maine and Wappingers Falls, N.Y. The program will close with a drawing the first week in February for the Grand Prize, a trip for two to the Winter Olympics; Second Prize, a winter vacation for two in Aspen, Colo.; and Third Prize, a trip for two to Lake Tahoe, Ca.

The names of all employees making successful referrals will go into a drum for the final prize drawings. In addition, at the time a referral is made, the referring employee has a choice of prizes from Fairchild and the U.S. Olympic Committee. Every hire makes the referring employee eligible for a second round of prizes.

Full details are available from your Employment office or Industrial Relations Manager. Help build a winning team in 1980!