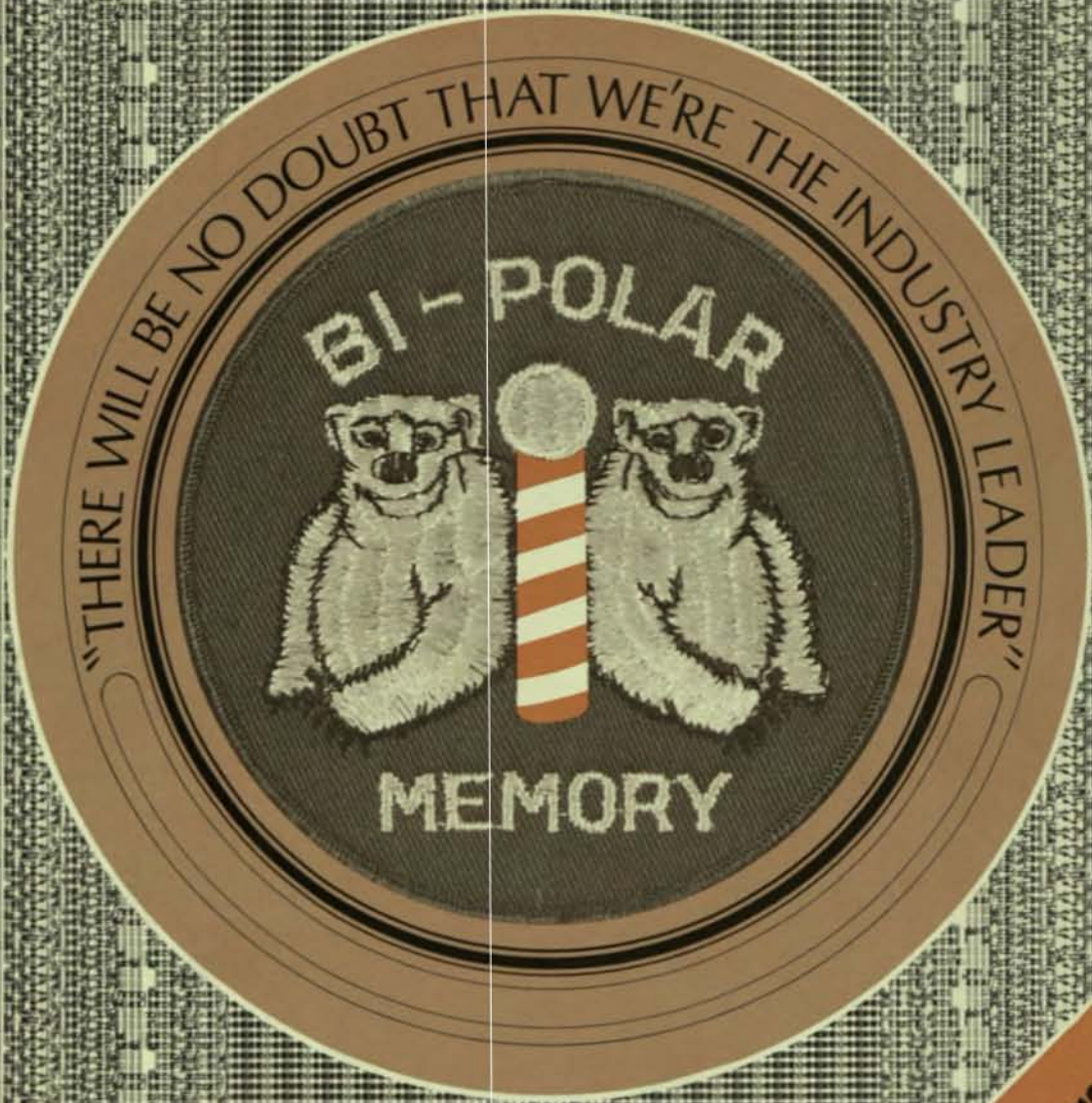
HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

SEPTEMBER/OCTOBER 1976



'77 Scholarship Program Opens

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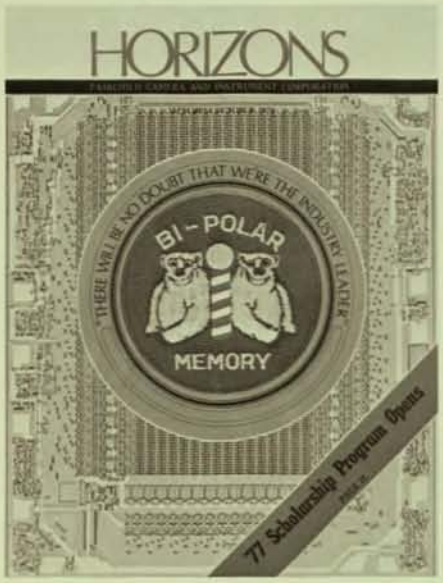

ON THE COVER . . .

The Bipolar Memory-ECL Products Division is far from "bearish" about the outlook for the future. Last year's yield problems have been solved, and the division is aiming at a growth rate of at least 50 percent in 1977. Introductions of high capability memory and injection logic products such as the 4K dynamic random-access memory shown on this issue's cover are aimed at maintaining and expanding Bipolar's strong industry position of technological leadership. For a profile of this innovative division, see page 12. Credits: Photos on page 8 and 9 courtesy AT&T *Long Lines*.

CONTENTS

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Horizons is published six times a year for the employees of Fairchild Camera and Instrument Corporation. Address all correspondence to Horizons, Corporate Communications Department, M.S. 20-2260, Fairchild Camera and Instrument Corporation, 464 Ellis Street, Mountain View, CA 94042.

Member, International Association of Business Communicators and Bay Area Society of Industrial Communicators.

NEWSCLIPS

FAIRCHILD TO SUPPLY FASTEST MOS 4K RAM

Fairchild announced last month that the MOS/CCD Products Division, Mountain View, will be an alternate source for industry's fastest 4K MOS dynamic memory, the Mostek Corporation's 4027 4K RAM (random-access memory).

The 4027 is a 16-pin, 4096-bit dynamic RAM with an access time of 150 nanoseconds. MOS/CCD Division has been supplying the 4096 RAM, with a 200 to 350 nanosecond access time, for the past year and is now in high volume production. Alan Gregory, Division Vice President and General Manager, says of the new 150-nanosecond circuit, "We believe this circuit to be the best sub-200 nanosecond 4K RAM on the market and it is a logical extension of our 16-pin philosophy."

QUARTERLY DIVIDEND DECLARED

On August 26, Fairchild's Board of Directors declared a quarterly dividend of 20 cents per share, payable September 21, 1976 to shareholders of record September 7, 1976.

MICROSYSTEMS ANNOUNCES $10 MICRO-PROCESSOR CIRCUIT

Microsystems Division, San Jose, has announced new prices of $9.95 for its F8™ microprocessor CPU (central processing unit) and PSU (program storage unit) circuits.

The division also introduced two upgraded versions of the PSU circuit, which provide the user with 2-kilobytes of on-chip memory—twice the storage capacity of the standard PSU.

The new PSU circuits are the 3856, suited for general purpose applications and the 3857, designed for memory interface outputs for memory intensive systems. Both contain local interrupt controls and a timer.

IMAGING SYSTEMS DIVISION AWARDED AIR FORCE CONTRACT

A contract to develop and fabricate a CCD (charge-coupled device) laser evaluation system for the Armament Development and Test Center, Eglin Air Force Base, Florida has been awarded the Imaging Systems Division, Syosset.

The system will be used to evaluate the accuracy of airborne laser designators by providing real-time television images of the targets as they are illuminated by laser beams. The images may be recorded on video tape for later detailed study.

The key element in the Laser Evaluation System is the Fairchild CCD television camera, with its low light sensitivity and high degree of metricity and linearity.

SYSTEMS TECH ANNOUNCES ADVANCED TEST SYSTEMS

At the recent WESCON/76 electronics show in Los Angeles, the Systems Technology Division announced two semiconductor test systems with expanded capability.

The Integrator™, a new concept in semiconductor test system architecture that correlates total test results into a meaningful management information system, was introduced.

The new system, aimed at both manufacturers and volume users of complex large-scale integrated circuits, supplies the missing link in management of a testing operation. It integrates raw data from on-line test systems to tell managers what's happening at various stages of semiconductor processing. As semiconductor technology has advanced, the compilation and correlation of test data from independent tester location has become more difficult. Data could either not be correlated meaningfully, or had to be correlated manually from numerous individual location reports.

The division also introduced the Sentry VII, an enhanced computer-controlled test system designed to interface directly with the Integrator. The Sentry VII has expanded capability and increased speed over previous test systems, and provides the most advanced testing capability for devices such as microprocessors, high-density memories and other complex integrated circuits.

from counseling to airsickness pills . . .

Putting Medical Care All Together For Fairchild People

Dr. O. Bruce Dickerson jumped on the back of a passing pickup truck and yelled a hurried set of directions to the driver. The truck moved quickly through the Fairchild Mountain View parking lots and deposited the doctor, white coat still flying as he ran, at the back door of a plant building where a heart attack victim lay barely conscious. It was one of the moments Dr. Dickerson and his staff in the company's Medical Department must be constantly prepared to cope with.

"I must have looked pretty ridiculous standing on the back of that truck with my coat flying all over the place," the Corporate Medical Director recalls, "but I had to get to the patient as fast as I could. The first few minutes determine if a heart attack victim lives or dies. Fortunately, the stricken woman recovered."

The Fairchild Medical Department, headquartered in Mountain View with auxiliary dispensaries at company plants throughout the world, provides Fairchild employees with some of the best treatment programs and facilities in the electronics industry. Under Dr. Dickerson's direction for the past six years, the department responds to everything from sprained wrists to heart attacks and offers services from overseas travel medical kits to alcoholism counseling.

Fulltime nurses and fulltime, parttime or referral physicians are available at every major Fairchild location worldwide. Last year, Fairchild people made some 30,000 visits to the three Mountain View dispensaries alone, and a total of 160,000 visits to the medical facilities throughout the world.

The department's primary focus is on occupational medicine—illnesses, injuries and accident prevention. Beginning with a pre-employment medical

Jane Hall, Corporate Nursing Manager, reviews treatment records with Trudy Ward, Workers Compensation Assistant.

evaluation, confidential medical records are maintained on all Fairchild people throughout their career with the company. Specific periodic checkups are made on employees working with hazardous chemicals, and those exposed to radiation or consistent loud noise. One of the first programs begun in 1970 was a vision protection program involving regular monitoring of the large number of employees using microscopes in their daily work. The individual vision profiles and job placement using vision criteria which resulted from this program reduced employee complaints of eye fatigue and headaches dropped dramatically.

Since Fairchild personnel make a great many overseas trips each year, the Medical Department has developed an international travel program which includes shots and an examination before and occasionally, when indicated, after the trip, a first aid kit and a brochure with overseas travel do's and don't's. In addition, the Medical Department prepares families for overseas assignments and monitors their health status while overseas.

"Some of the best treatment programs and facilities in the electronics industry."

To most Fairchild people, the Medical Department is represented by the site dispensary nurse. A staff of nearly 20 nurses and assistants, under the direction of corporate manager of nursing Jane Hall, administers treatment programs at all major domestic company locations. "Our nurses handle medical problems from emergencies to the flu," she says, "and they all can lend a sympathetic ear when that's needed. They're all specialists in industrial and occupational health, and we sponsor continuing education programs so the entire nursing staff has access to the most current treatment techniques."

Dana Goodrich, Medical Department nurse, administers one of the shots necessary for overseas travel to Jaime Bayan, Transistor Division.

Dr. Bruce Dickerson, Medical Director, assisted by nurse Dana Goodrich, checks results of an electrocardiogram test taken by Steve Gonia of Corporate Professional Staffing, left. Fairchild is one of the few companies of its size to offer EKG service, and its availability is testimony to Dr. Dickerson's aim of educating Fairchild people on the importance of preventive medicine.

Your Medical Department Offers You . . .

1. Fairchild Blood Bank for all employees and their immediate families.
2. Influenza programs during years of significant risks.
3. Vision Screening Program.
4. Hearing Testing Program.
5. Health Counseling.
6. Weight Control Program.
7. Administration of emergency first aid.
8. First Aid Courses:
   A. Certified by the American Red Cross
   B. Industrial First Aid
9. Health Screening Programs.
10. Pre-employment medical evaluation, where indicated with appropriate laboratory procedures.
11. Evaluations and examinations of employees exposed to potentially hazardous chemicals.
12. Post-illness examinations prior to returning to work.
13. Treatment of occupational illnesses and injuries.
14. Immunizations for foreign travel on company business.
15. Health evaluations and monitoring for expatriate employees.
16. Health Education Programs through:
   A. Published articles
   B. Pamphlets
   C. Educational films
17. Referrals to community agencies such as:
   A. Mental Health Agencies
   B. Alcoholic Rehabilitation Agencies
   C. Drug Abuse Rehabilitation Agencies
18. Personal referrals to private physicians.
19. Coordination with safety engineers and industrial hygienists to evaluate environmental conditions.

When accidents and injuries do happen, the Medical Department depends heavily on what Jane calls "the backbone of our program"—the volunteer first aid teams in each company division. Fairchild first aiders go through a specially-developed 16-hour company training course, which is a combination of general Red Cross first aid instruction and special Fairchild instruction.

The Medical Department works closely with Fairchild's Safety Department in treatment of these on-the-spot injuries, accident prevention and maintaining a safe working environment. A prevalent example of men cooperating is the program that has been established for the use of hazardous chemicals, such as arsenic, in semiconductor production. "We have to be on our toes in medical monitoring of effects of hazardous chemicals," Dr. Dickerson says. "We must meet government standards for permissible levels of arsenic in the air and length of exposure of our employees to such a chemical. Wherever hazardous substances are used, we also maintain constant monitoring on our own to insure that the employee's health is not endangered. Under no circumstances will we allow an employee to work under unsafe conditions or where a current or potential health hazard exists."

Dr. Dickerson's philosophy is that occupational medicine should offer comprehensive evaluation and treatment programs and not just be concerned with treating industrial injuries. As a result, the Medical Department has augmented its traditional function with individual counseling and medical referral programs not always found in industry.

"I think industry has an opportunity to put medical care all together for a person," he says. "Fairchild employees spend a good portion of their days here, so we would like to offer them as many services as we can, and to help them make use of community resources for services we do not provide.

"I'm not suggesting we take over the personal medical care of all our employ-

Pete Battaglia, Chemist, demonstrates an industrial toxicology safety measure to Dee Zilgme, Senior Health Counselor at Federal Systems Group.

ees—we obviously don't have the resources to do that. But, in addition to providing direct industrial medical treatment, we can help our people choose proper medical care and learn to practice preventive medicine."

Dr. Dickerson has instituted active counseling programs on alcoholism, drug abuse and marital or personal problems during the last few years "to help our people deal with the pressures they face in their working and personal lives." Referrals to private counseling programs come either from a supervisor who sees a personal problem affecting job performance or as a self-referral. In either case, all diagnosis and treatment information is kept strictly confidential, and is never released except to an employee's private physician.

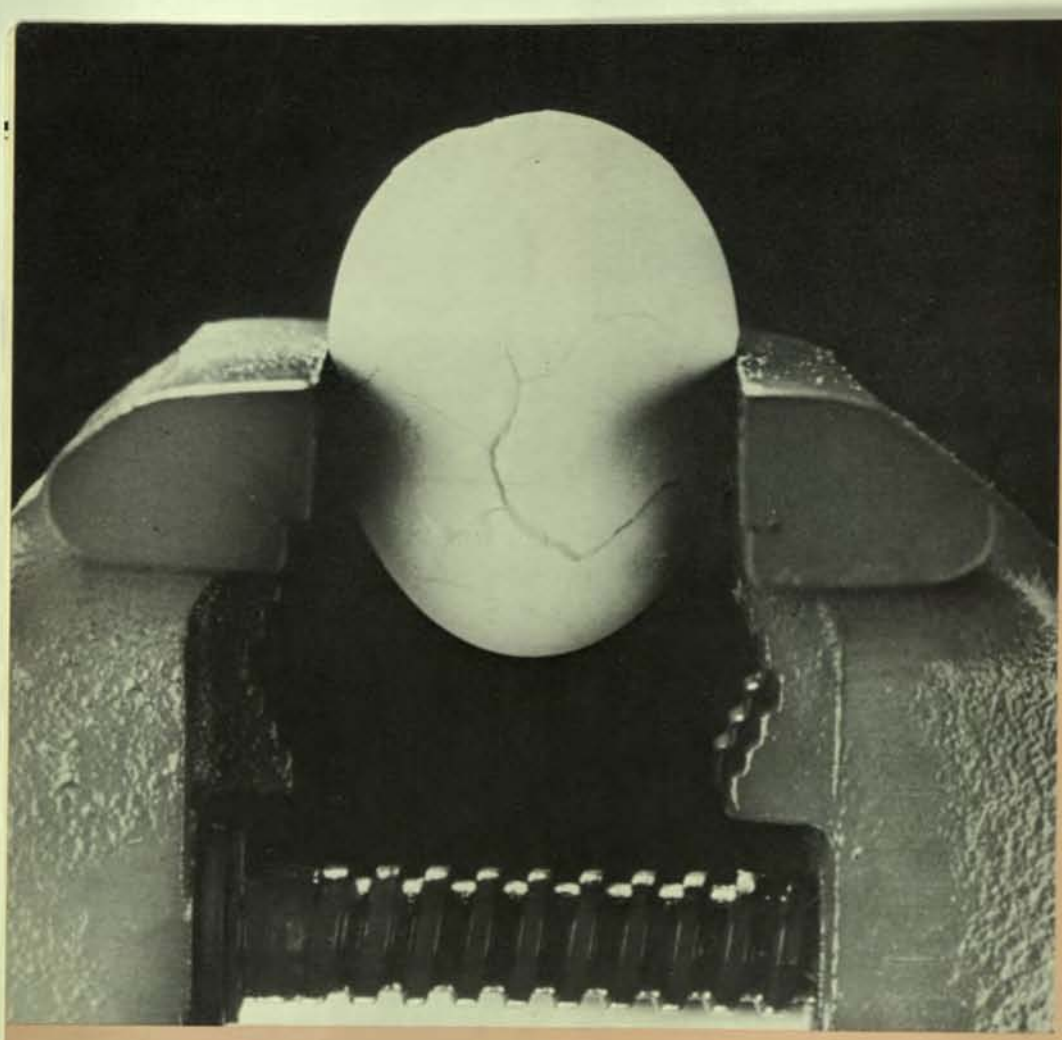
The success of the Medical Department's "put it all together" program is perhaps best shown through the experience of a man employed at the Fairchild plant in Korea. Thanks to Dr. Dickerson's interest in bringing Fairchild people with major medical problems together with the people who can best help them, this man now has a partially rebuilt heart. "When I first saw this patient about two years ago," the doctor recalls, "he had an improperly-operating heart valve that was causing him some discomfort, although nothing severe. When he came to California on a business trip last year, however, he was having chest pain and significant breathing difficulty. So I arranged for him to see a cardiologist and to have heart surgery at Stanford Hospital.

"He's now fully recovered. In fact, when I was in Korea this summer on my annual visit to the international facilities, the plant manager took me out to watch him play tennis. And he won!"

"No employee will be allowed to work under unsafe conditions."

Palo Alto Health Counselor Pat Alvarado counsels Bobbie Nelson, Optoelectronics Division, on proper diet and nutrition. Medical Department staffers provide counseling on physical and emotional problems in addition to treating illness and injury.

Health Counselor Bonnie Page greets a patient at a Mountain View plant dispensary. Nurses and full or parttime physicians provide medical treatment to Fairchild employees at dispensaries company-wide.



don't break under STRESS

In conjunction with this issue's profile of Fairchild's Medical Department, *Horizons* is pleased to introduce the first in a series of articles by Dr. Bruce Dickerson on current health problems many of us may face in our daily lives. *Horizons* welcomes your comments on the articles and suggestions for future subjects.

Dr. Bruce Dickerson has been Fairchild's Medical Director since 1970. A graduate of the University of Missouri School of Medicine, he holds a Masters degree in public health from UCLA. Dr. Dickerson is a Board member of the Santa Clara County Mental Health Association and the Western Occupational Medical Association, and was recently elected a vice president of the American College of Preventive Medicine.

By Dr. O. Bruce Dickerson
Medical Director

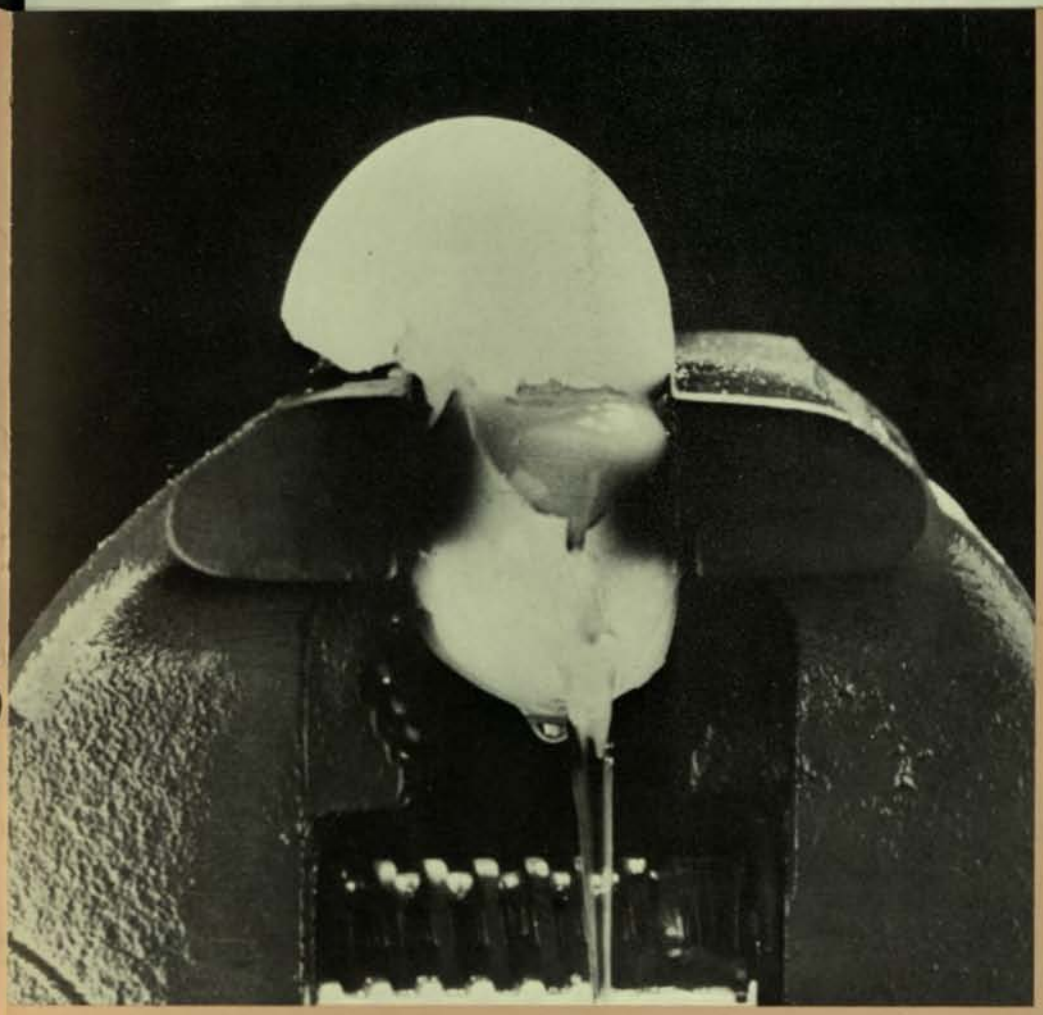
Again this morning, your boss talked to you about your performance on the job.

It's the third time this week, and he has a point. You haven't been working up to par, and it's becoming pretty obvious to you and those who work with you.

But your mind's been elsewhere. Trouble at home, a late mortgage payment, or maybe the job itself is putting you under a lot of pressure. And as if that wasn't enough, for the last several days you've noticed your heart beating faster and you've been plagued with headaches and knots in your stomach. If you could just get a few days off . . .

Your symptoms and the circumstances surrounding them indicate you may be suffering from one of today's most common afflictions—stress. While there may be no outward signs of stress—a physiological and emotional reaction to irritating, frightening or confusing circumstances—stress-caused increases in your heartbeat, metabolism and blood pressure may surface as headaches, stomach cramps or an unexplained feeling of tension.

Our bodies' response to stress is involuntary—it's built-in at birth. Psychologists term this the "fight or flight" response—one which prepares us for immediate confrontation or escape. As more adrenalin flows through our system, the heart rate, blood pressure and muscle contractions speed up, and the whole body tenses.



While we rarely face the life-or-death situations for which nature intended this response, the response itself remains to be activated in areas requiring behavioral adjustments. If this "fight or flight" response occurs too often and is not correctly channeled, the buildup of stress can result in heart attacks, strokes, ulcers and hypertension. This occurs when unpleasant emotions accumulate and cause a body organ to break down.

Each of us reacts differently to life's problems, and each of us has a different "breaking point." However, while responses to stress may differ among individuals, the end results may be dangerously similar.

The constant buildup of stress, left unchallenged, may not only bring on psychosomatic diseases such as heart attacks but can also result in what's commonly called a nervous breakdown. Characterized by a loss of control and disorganization of mental function, this condition frightens the patient but is usually temporary and responds well to medical treatment.

Physical manifestations of stress don't necessarily indicate present or future mental illness, as people often suppose. Physical side effects of stress do show that a person is struggling with a problem temporarily beyond his control. Seeking prompt professional medical and counseling assistance to cope with the effects of stress is as important as getting help for a broken leg. It's important to get the right treatment as soon as possible.

Dr. O. Bruce Dickerson, Fairchild Medical Director

STRESS Continued

What helps alleviate stress? Too many people attempt to treat the symptoms without understanding the cause. They resort to the false panaceas of alcohol and pills. Only the most extreme cases require psychiatric care. For the majority of people, physicians recommend physical exercise and an organized approach to mental relaxation.

Exercise, particularly tennis, bicycling and swimming, cause us to put our problems aside while concentrating on the sport. The past five years have seen an enormous increase in popularity of several "schools" of mental relaxation, including Transcendental Meditation, Transactional Analysis and biofeedback.

TM requires daily periods of meditation, using a word (mantra) or other focal point for achieving concentration. The mind is given a rest and anxious thoughts rise to the surface and are dissipated.

In Transactional Analysis, a therapist guides a group of people into emotional interaction, explaining that each person can behave as a parent, a child or an adult in different situations. The therapist helps group members achieve positive feelings about themselves and others.

Biofeedback includes the use of electronically recorded information on a person's vital functions, such as blood pressure and heart rhythm. By achieving deep relaxation, one learns to control these bodily functions and dampen stress.

Our goal in dealing with stress is not to avoid it—change and probably progress cannot occur without stressful situations. Instead, we must learn to understand stress and how to control it.

The Social Readjustment Rating Scale*

Drs. Thomas H. Holmes and Richard H. Rohre, psychiatrists at the University of Washington Medical School, have designed a scale of stressful events based on case histories of hundreds of patients. They hypothesize that crises and breakdowns occur when an individual sustains a cluster of major events. Although these events are not always negative, they always include circumstances to which a person must adapt.

As an example, losing a spouse by death requires twice as much coping as getting married and nearly four times as much as a change in living conditions. The more points accumulated on this scale, the greater the need to take positive steps, such as seeking professional help, to prevent emotional imbalance.

LIFE EVENT	MEAN VALUE
1. Death of spouse	100
2. Divorce	73
3. Marital separation	65
4. Jail term	63
5. Death of close family member	63
6. Personal injury or illness	53
7. Marriage	50
8. Fired at work	47
9. Marital reconciliation	45
10. Retirement	45
11. Change in health of family member	44
12. Pregnancy	40
13. Sex difficulties	39
14. Gain of new family member	39
15. Business readjustment	39
16. Change in financial state	38
17. Death of close friend	37
18. Change to different line of work	36
19. Change in number of arguments with spouse	35
20. Mortgage over $10,000	31
21. Foreclosure of mortgage or loan	30
22. Change in responsibilities at work	29
23. Son or daughter leaving home	29
24. Trouble with in-laws	29
25. Outstanding personal achievement	28
26. Wife begins or stops work	26
27. Begin or end school	26
28. Change in living conditions	25
29. Revision of personal habits	24
30. Trouble with boss	23
31. Change in work hours or conditions	20
32. Change in residence	20
33. Change in schools	20
34. Change in recreation	19
35. Change in church activities	19
36. Change in social activities	18
37. Mortgage or loan less than $10,000	17
38. Change in sleeping habits	16
39. Change in number of family get-togethers	15
40. Change in eating habits	15
41. Vacation	13
42. Christmas	12
43. Minor violations of the law	11

* T.H. Holmes and R.H. Rahe, The Social Readjustment Rating Scale, *Journal of Psychosomatic Research* 11:213-218, 1967. Reprinted by permission of Pergamon Press Ltd., Oxford, England.

1977-78 Scholarship Program Opens

The Sherman Fairchild Foundation has opened competition for the 1977-78 Fairchild Scholarships. Six grants covering tuition, room, board and fees for undergraduate study at an accredited college or university will be made for the '77-'78 school year to children of Fairchild employees.

Applicants must be the sons or daughters of fulltime Fairchild employees or the children of retired, permanently disabled or deceased former employees. The parent must have completed at least two years of fulltime service with Fairchild by September of 1977. The parent must also be, or have been, employed in Fairchild U.S. operations, or be an expatriate assigned to Fairchild operations abroad.

Applicants for the grant should be in their final year of high school or enrolled in college.

The competition is conducted by the Educational Testing Service, Princeton, N.J., where a board of educators evaluates the applications based on the student's performance in high school, results of the Scholastic Aptitude Test and involvement in extracurricular and community activities.

ETS is currently accepting applications for the 1977 awards. Application forms and scholarship program information will be available shortly from all Industrial Relations managers. The deadline for filing applications will be December 1, 1976.

One-chip bipolar microprocessor possible next year . . .

We're Going To Stay Number 1

"There will be no doubt in anyone's mind, including those of our competitors, that we are the leading manufacturer of bipolar LSI and memories."

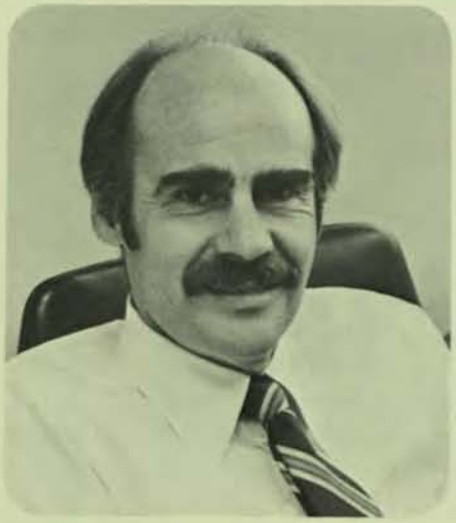
That's the clear resolution of Dick Abraham, Division Vice President and General Manager, Bipolar Memory-ECL Products Division. The Mountain View-based group is solidly behind him.

Plagued with what Dick terms "an old-fashioned yield bust" late last year, which sent Bipolar production and earnings into a stall, the division has solved its yield problem and doubled production this year. It is aiming at a growth rate of 50 percent or more next year, on the strength of 1976 introductions of high capability memory and injection logic products created through innovative Fairchild technologies.

In the "alphabet soup" of the Bipolar memory and logic product lines—products include PROMs, ROMs, RAMs—(see the glossary at the end of this article) are some of the most advanced workhorses used in modern computers.

Read-only memories and random-access memories provide the information storage capability in computers ranging from calculators to giant installations filling several rooms. Logic circuits using Isoplanar integrated injection logic (I^3L^{TM}) and TTL (transistor-transistor logic) empower a computer to perform operations such as comparing, sorting and making references, where logical yes-or-no quantities are involved at speeds a million times faster than the human mind.

Later this year, the division plans to officially announce the industry's first 4K static RAM, using TTL technology. This component will provide the largest static memory capacity currently available anywhere.



Dick Abraham, Division Vice President and General Manager, Bipolar Memory-ECL Products Division

EARLY POSITION OF LEADERSHIP

The division had its beginnings in 1973 when the Bipolar Memory Strategic Business Unit was broken out of the Digital Products Division. In 1974, it became the first SBU to achieve divisional status. Fairchild had already achieved a position of leadership in bipolar memory technology when the separate unit was formed.

"In the late 60's, Fairchild emphasized development of MSI (medium scale integration) structures, while the rest of the industry put most of its eggs in the SSI (small scale integration) basket," according to Peter Verhofstadt, Manager of Advanced Product Operations for the division.

Scale size is determined by the number of logic "gates," or individual circuit functions, on an integrated circuit chip. Gates are laid down with a density of 50,000 to 100,000 units per square inch. SSI means 20 gates or less, MSI 20-100 and LSI (large scale integration) 100 or more gates.

"This concentration," Peter continues, "gave Fairchild an image as a complex structure leader. Then, in 1972, with the introduction of our Isoplanar process, we again proved to the industry that bipolar technology could produce the complex structures required today. There was a lot of discussion at that time about whether or not bipolar technology had reached its peak as far as complexity goes. Fairchild's introduction of Isoplanar put that myth to rest."

While bipolar complexity and capacity has risen dramatically over the last decade, costs have dropped by a factor of almost 100. The 16-bit memory circuit, the first bipolar memory, which was introduced in the mid-1960's, sold for about 50 cents per bit and later for about 20 cents per bit.

A decade later, in 1976, Bipolar introduced a 4096-bit memory (4K), that in volume will sell at approximately 25 cents per bit. "Over a period of about 10 years," Peter says, "we've gone from 16-bit complexity to 4000-bit complexity, and the price per package has remained essentially the same."

Equally impressive is the vast improvement in packing density made possible by 10 years of research and production. Each bit in the 1966 16-bit memory

occupied about 200 square mils (millionths of a square inch), while one bit in the 1976 4K version has been squeezed into a little more than one square mil.

Increases in speed and packing density have been accompanied by enormous reductions in access time—the time it takes to get stored information out of a memory. A 16-bit memory, vintage 1966, had an access time of 100-150 nanoseconds (billionths of a second). A 16-bit memory manufactured today would produce the desired information in under 5 nanoseconds.

PROMISING NEW TECHNOLOGIES

The technology creating the most interest within the Bipolar Division and promising even more complex and faster memory and logic products is Isoplanar Integrated Injection Logic (I^3L). I^3L incorporates Fairchild's proprietary Isoplanar technology with integrated injection logic to produce the best of the bipolar and MOS (metal-oxide semiconductor) 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. But with the advent of I^3L, circuits can be designed to combine bipolar speed with MOS packing density.

"With I^3L," Dick comments, "we can now put 2000 gates on a chip. With previous bipolar technology, we could only put on about 500. Access time remains low, so we've added more density and kept the advantage of bipolar speed."

Components using I^3L technology which are already on the shelf include the 4K dynamic RAM. (The two types of bipolar memories produced by Bipolar are static and dynamic. In a static memory, the information stored there remains for a long time. In dynamic storage, the information must be refreshed frequently.)

The Macrologic ™ family of digital integrated circuits, introduced last year is another important new product area for Bipolar. Macrologic is a combination of LSI parts that, according to Dick, can be put together to duplicate the performance of a number of machines at a greatly reduced cost. "Macrologic is a full set of building blocks for microprogrammed systems. It can emulate any microprocessor or minicomputer, and do a good job of both. Our Macrologic business is growing, and we anticipate continued demand for this versatile system."

Bipolar Memory-ECL Products Division is Back and Growing

A Bipolar operator aligns glass photomask over a silicon wafer during fabrication of Isoplanar memory circuits. Ultraviolet light exposes the wafer to the pattern of circuit elements on the photomask.

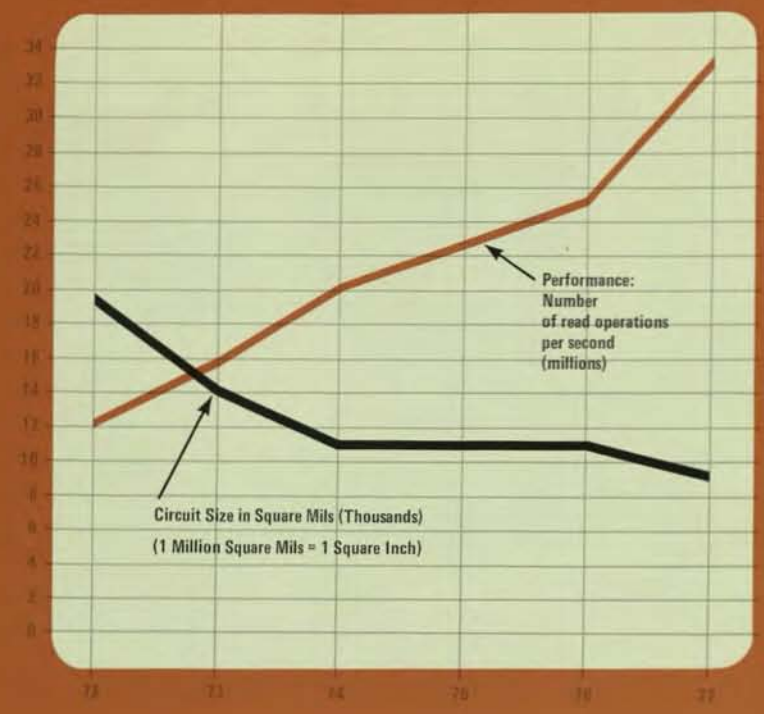
The division sees major advances in both the I^3L and Macrologic product areas over the next year, based on Fairchild's technology and the strong position the company commands in both markets. In addition, significant growth is expected in the area of ECL (emitter-coupled logic) devices. ECL permits extremely high-speed circuit switching, and should be the basic technology for big high performance computers by the end of the decade.

Advances in bipolar technology promise to take the division into previously untapped markets. While the major customers will remain the large computer manufacturers, Peter notes increasing amounts of memories are going into microprocessors and related products.

A BIPOLAR MICROPROCESSOR

"Television and electronic game manufacturers and instrumentation companies are using more and more memories for data storage," he says. "One of the most fascinating and potentially important areas for us is telephone and data communications.

Peter Verhofstadt, Manager of the Division's Advanced Product Operations



As the capability of Fairchild's circuits has risen, the chip size needed to hold the memory circuitry has steadily dropped. This chart of circuit performance vs. size in the 1024 bit RAM shows that since 1972, memory capability has risen from 12 million read operations per second to 33 million in 1976, while the requisite circuit size has dropped from 19,500 square mils (.0195 square inches) to 9000 square mils (.0090 square inches). Component cost, partially a function of the circuit size (usually called "die" size), has shown a similar decrease over the past four years.

"We're involved with introducing TV games into the home at the moment, but once that happens, that system can also be used for educational and labor-saving purposes. Once the basic terminal and data processing equipment are in place, there's no reason I couldn't call my home and instruct the oven to start cooking or the washer to start washing—all electronically. This could be done by dialing my home number, then dialing additional numbers that translate into specific machinery instructions—hence, the need for memory components."

To further tap this market, Bipolar hopes to have a complete bipolar microprocessor on one chip available next year. Present microprocessors are produced using MOS technology, with a fixed architecture. Present bipolar microprocessors are actually a combination of several chips, which allow more flexibility of design but not the convenience and cost effectiveness of one-chip operation that the new bipolar microprocessor will offer.

The Bipolar Memory-ECL Products Division is aiming for an industry-wide image of technological leadership. Dick recalls that when he took over as head of the division last November, he had to temporarily push that idea to the back of his mind.

"I was spending my time focusing all the division's resources (and any others I could find) on trying to solve our production problems and get the yield back up. It took about three months to get back to normal. From that point on, we have aimed at two things. First, we've worked to maintain our technical leadership and market position, which in many areas is excellent. Second, we evaluated new products and markets where we could use our technology to the best advantage. This will maintain our position, I'm sure, as the leader in bipolar technology."

A Short

As a technology leader in the semiconductor industry, we at Fairchild sometimes tend to overlook the fact that not all employees are technically oriented. So, in conjunction with our Bipolar Memory-ECL Products Division profile, and at the risk of boring the scientific wizards, *Horizons* is attempting to present a layman's explanation of basic semiconductor principles and terminology that many of us hear daily in our jobs, but which we may not really understand.

Perhaps the best place to begin is with a brief explanation of what a semiconductor is, accompanied by a glossary of common terms. Additional subjects and terms will be treated in subsequent issues of *Horizons*.

All of us are familiar with the terms *conductor* and *insulator*. A copper wire is easily recognized as a conductor, and glass, ceramic or plastic materials are just as readily recognized as insulators (or non-conductors of electricity). The reasons for these differences probably are unclear to most of us, however.

Essentially, electrical conduction or non-conduction (that is, current) depends on the basic atomic structure of a given material. In copper, for example, the outer electrons (negatively charged particles) in each atom are so loosely bound that they are free to move when an electrical force is applied. By contrast, in an insulator, the outer electrons are so tightly held that they cannot move when a force, or voltage is applied. Since opposites attract, free electrons move toward positively charged areas.

The origin of the term semiconductor is very simple. Semiconductors are materials in which the electrical conduction falls somewhere between that of conductors and insulators.

However, a semiconductor is more than just a poor conductor or a poor insulator. Perhaps the most significant difference is that electron movement, or current flow, can take place by two mechanisms in a semiconductor.

First, the electrons can move freely, just as in a conductor; but also, a movement of vacant electron sites (called

Course in "Semiconductorology"

"holes") can occur. This is hard to visualize, but if an atom is missing one outer electron, a loosely bound electron from a neighboring atom can jump into the vacancy, leaving behind a new vacant site or hole. This new hole in turn can be filled, and the "hole" shifts or moves, but in the opposite direction to the electron. Thus a series of holes can be said to move through the material. This movement of holes can usefully be considered as a flow of positive charges through the material.

Semiconductor material in which conduction is primarily due to a flow of electrons is called N-type material (N for negatively-charged carriers). Material in which conduction is by movement of positive holes is called P-type material (P for positive carriers). Naturally enough, what accounts for the difference is that the N-type material has an excess of atoms with loosely bound or "free" electrons; while P-type material consists of atoms which are missing outer electrons.

Silicon is the most important semiconductor material. What makes it so important is that it is relatively easy to add "dopant" or "impurity" elements by which we can "tailor" the conduction. If we add phosphorus, for example, this produces N-type silicon; or, if we add boron, the result is P-type silicon.

The operation of most semiconductor devices depends on preparing silicon so that it has P-type and N-type regions adjacent to one another. These form into structures known as a PN junction or a series of such junctions.

By applying differing voltages to these junctions in the proper fashion, a piece of silicon can be made to control the direction of current flow as well as the amount of current flow. Such a piece of silicon can perform a wide variety of useful functions. This is the heart of the transistor and integrated circuit business.

GLOSSARY

Active device—a device with PN junctions capable of current gain or switching, such as a diode, transistor or vacuum tube.

Passive device—a device incapable of current gain or switching, such as a resistor or capacitor.

Integrated circuit—a complete electronic circuit capable of performing an electronic function fabricated as an inseparable assembly of active and passive circuit elements (transistors-diodes, resistors) in a single monolithic structure.

Yield—the ratio of the number of good devices produced to the maximum possible number expected.

Bipolar device—a device which depends on the movement of two types of carriers (negative electrons and positive holes) through P-type and N-type regions for its operation.

MOS device—(Metal-Oxide-Semiconductor) a device in which current flow occurs in a single channel of P or N-type material, and is controlled by an insulated electrode on the surface of the channel region.

Logic circuit—an integrated circuit which provides a fixed set of output signals, according to the signals present at the input.

Logic gate—several individual device functions on an integrated circuit chip.

I^3L—integrated injection logic (I^2L) technology permits formation of transistors in both the horizontal and vertical directions within a silicon wafer for greater density than other bipolar technology, in which transistor structures are either vertical or horizontal. Combining this structure with Fairchild's Isoplanar processing (I^3L) provides even greater density along with the increased operating speed of injection logic.

Memory circuit—an integrated circuit device which stores information in the form of electrical charges.

RAM—(Random Access Memory) a memory device which has both read and write capabilities, so that the stored information (write) can be retrieved (read) and be changed by applying new information to the inputs.

ROM—(Read-Only Memory) a memory device in which the stored information is fixed at the time of manufacture of the integrated circuit device. It always supplies the same (standard) information when read. (Useful for storing fixed tables of information.)

PROM—(Programmable Read-Only Memory) a memory device in which information can be changed after manufacture, but then is fixed, as in a standard ROM.

ECL—(Emitter-Coupled Logic) or **TTL** (Transistor-Transistor Logic)—particular types of integrated circuit logic consisting of diffused transistors and resistors formed simultaneously on a silicon wafer.

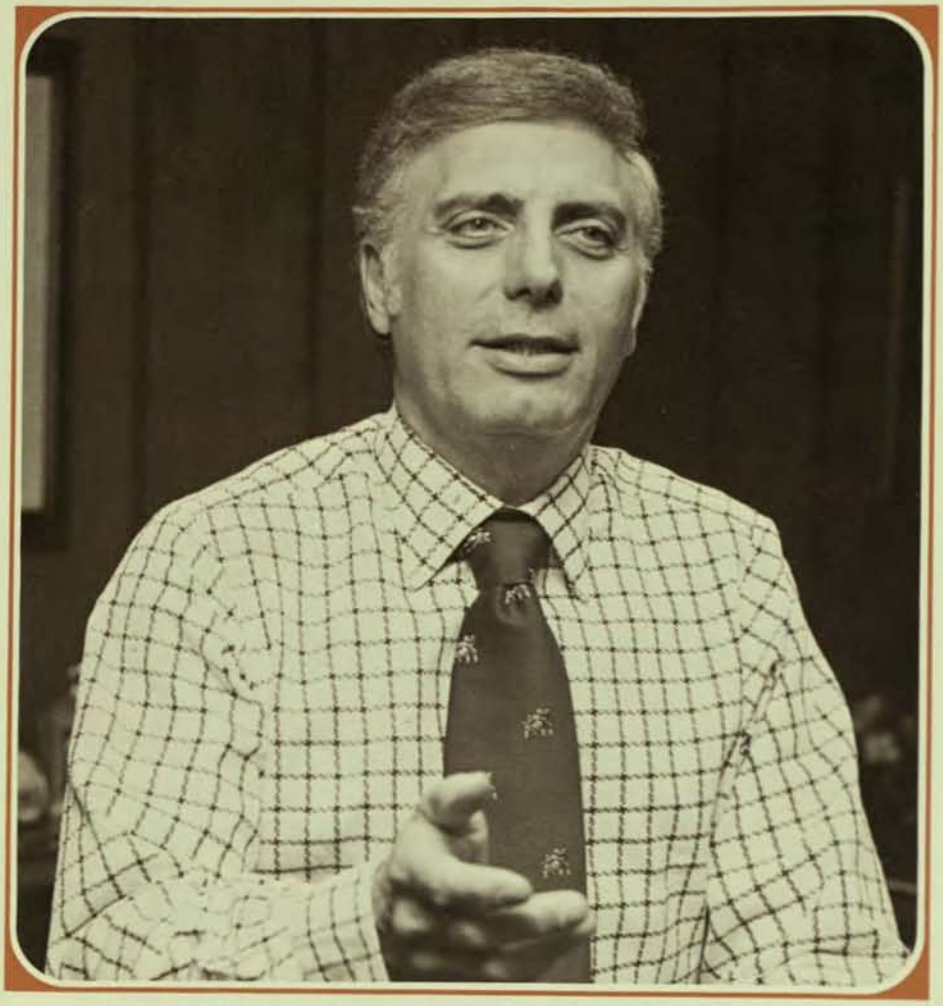
Digital circuit—an integrated circuit which operates at specific values of signal levels, such as high and low voltages, which represent "yes" or "no" information. One "yes" or "no" is called a "bit."

Analog circuit—an integrated circuit in which the input and output levels vary over a continuous range of values, as opposed to the fixed range of digital circuits.

Bit—abbreviation for binary digit, single character in a binary number and the simplest form of computer data.

Wafer—a thin slice of single-crystal silicon which is used as the basic material to fabricate transistors or integrated circuits in the form of many individual dice. Hundreds of integrated circuit dice can be processed simultaneously in a single wafer measuring two to four inches in diameter.

Die—a single transistor or a single integrated circuit separated from the wafer in which it was made (plural: dice). Also commonly referred to as chip or chips.



Lou Pighi, Vice President and General Manager, Federal Systems Group

From Early Lab to Mini CCD TV Camera

Lou Pighi Talks About the Growth of Electronics and His Leadership of the Federal Systems Group

by Ruth Miller
Public Relations Manager, Federal Systems Group

Louis H. Pighi, Vice President and General Manager of Fairchild's Federal Systems Group, has been part of the electronics industry since its early days. He has spent most of his career in engineering and management positions at the company's Syosset, New York, facility, located on Long Island.

Active in his profession and community, Lou is a member of IEEE, the Air Force Association, the Long Island Association of Commerce and Industry, the Alumni Board of New York University and annually supports the United Way campaign. He and his wife Anne are the parents of two college-age children and live in Plainview, New York.

In this interview, Lou discusses his career and the management style he has developed over the past 20 years.

In 1956, electronics was a challenging technology still in its infancy, and Lou Pighi recognized the tremendous potential it offered. When he was asked to help Fairchild get started in the electronics business, he was happy to accept the challenge.

Today, Lou is Vice President and General Manager of Fairchild's Federal Systems Group in Syosset, New York. Under his direction, the Space and Defense Systems and Imaging Systems Divisions and International Systems develop, manufacture and market some of the world's most advanced aerial cameras, imaging and data systems and electronic counter-measure systems serving military and industrial needs.

Today's systems are a far cry from the projects Lou worked on after earning a Masters degree in electrical engineering from New York University in 1955. "At that time, the business wasn't too refined," he recalls. "I had decided to pursue a career in electronics while studying at NYU. Things were much less specialized then—when I took my first job as an engineer at Teleregister Corporation in New York City, we did all our own drafting, soldering, designing and testing—if the system didn't work, we had no one to blame but ourselves."

While at Teleregister, Lou helped develop the first automatic airline reserva-

tion system for American Airlines—the system is now on display at the Smithsonian Institution in Washington, D.C.

When Lou joined Fairchild, he established a research laboratory and immediately started on projects including the telephone fault isolation system and voice recorder, instrumental in Fairchild's entry into the electronics business.

"Our people have made our success happen."

Following this early engineering work, Lou began developing managerial expertise during a ten-year stint as a reconnaissance and surveillance systems department manager at Airborne Instruments Laboratory on Long Island. He returned to Fairchild in 1968 as Director of Engineering for the Space and Defense Systems Division.

"I returned to Fairchild because the company offered more challenge and better prospects for promotion. Rapid advancement was a reality, rather than the cliche it is at some companies." Lou proved the truth of his contention a year later, when he was appointed Division General Manager. In 1971, when division reorganization formed the Federal Systems Group, Lou, who was a newly-named corporate vice president, was picked to head the group as Vice President and General Manager.

"My goal is to make Federal Systems a much larger entity within the Fairchild organization," says Lou. Federal Systems has been growing and expanding under Lou's administration. Product lines from the Long Island facility include aerial reconnaissance camera systems, radio-

"At Federal Systems, we are in the forefront of design and development."

frequency monitoring systems, CCD cameras, electronic timing and control systems and large closed-circuit television systems for surveillance uses.

Last year, the photographic systems department of the Space and Defense Systems Division was combined with the Electro-Optical Systems unit to form the new Imaging Systems Division. The key product introduced by the new division

Lou confers with (from left) Mike Pelle, Group Industrial Relations Manager, Chris Lay, Division Vice President and General Manager, Space and Defense Systems Division and Tom Egan, Group Controller.

was the third in a series of CCD (charge-coupled device) miniature television cameras, designed primarily for government and industrial applications. The CCD camera is finding its way into increasingly varied applications, including use by rescue teams that can lower the camera into a mine shaft to search for trapped miners.

Space and Defense Systems Division is a major supplier of large-scale radio frequency systems for the U.S. government and military. It is also heavily engaged in the development of secure communications systems and systems for support measures in electronic warfare.

The International Systems Operation is responsible for world-wide marketing of all Federal Systems Group products and systems.

While Lou's job requires a total commitment of time and energy, he finds it rewarding. "The dual challenges of making the Federal Systems business grow in size and profitability are the most demanding, yet stimulating parts of my job.

"At Federal Systems Group, we're in the forefront of design and development of new camera and communications systems. Much of the development of CCD applications has taken place here at Syosset—it's a dramatically-evolving product line that is just starting to be recognized.

"Perhaps our most significant recent accomplishment was the Lunar Mapping Camera, which photographed the surface of the moon on the NASA Apollo 15, 16 and 17 missions. The spectacular photos taken with our camera helped our scientists further understand space exploration."

"Along with our technological contributions, we've been able to build a business here at Federal Systems that has a consistent record of profitability. That's because of the many talented and dedicated people we have here.

"My personal management philosophy has always been to set overall goals and objectives in cooperation with my staff

"At Fairchild, rapid advancement was a reality, not a cliche."

members, then allow them a great deal of latitude in selecting the measures they want to use to reach their goals.

"I believe a manager can be most effective by establishing common goals with his staff, then letting his people use their own initiative and ideas to meet the goals. The essential ingredient in any organization is people—our people have made the success at Federal Systems Group happen."

Lou Pighi is indeed a man of purpose—dynamic, involved, creative and compassionate. He's a doer—with everything he tackles, his approach is "full throttle." He has earned the respect, loyalty and admiration of his associates at the Federal Systems Group and throughout Fairchild.

"Pighi on Pighi"

ON OPEN LINES OF COMMUNICATION:

"It's important to keep our employees informed about the company's performance, plans and general outlook. Everyone should have an idea of what his or her role is in meeting Fairchild's goals. Management's responsibility is to direct and guide people – keeping them informed of the way working conditions affect them. We should all be aware of such things as safety standards and opportunities Fairchild offers to broaden our skills and career goals."

ON DECISION MAKING:

"Talk to people. Listen carefully. Call on all your resources and make recommendations. Sometimes, you will make mistakes. Face them, and resolve them quickly and firmly. It's a tough and sometimes lonely process."

ON AMERICA'S ECONOMY:

"We're going to knock 'em dead! I honestly believe that there isn't any society like ours that can surpass us economically. Many countries have tried to emulate us, but very few have succeeded to any extent."

ON SUCCESSFUL MANAGEMENT:

"A successful manager motivates and inspires his people on the premise of doing one's best to get the job done. A good manager observes people and helps them develop their potential."

A keen competitor on the tennis court, Lou enjoys the sport because it requires stamina, concentration and discipline.

Lou and Anne, his wife of 27 years, on a recent vacation in Rhode Island.

"Associates on Pighi"

"Over the years, I've found Lou's most outstanding traits of leadership to be vitality, tenacity and meticulous follow-through. He has an uncanny perception of problems—either with a program, customer or in the plant. The modus operandi at Federal Systems is – if you're going to meet with Lou, you'd better have done your homework!"

"Lou provides direction on a task, then relies on me to use my judgment and ingenuity to get the job done. He's demanding—expecting 100 percent effort, but he always takes the time to listen. He's understanding, and has a great sense of fairness. Working for Lou Pighi is a real challenge, and the rewards are many."

The "So you always wanted to be one" reporter's course. Lesson #1.

One of the keys to being a good reporter is being a good observer, which is not as easy as it sounds. But there are certain exercises which can increase your observation skills. Like watching your lawn grow. Or water evaporate. Several months of these exercises should adequately prepare you for your first assignment. They should also adequately prepare you for an optometrist.

Of nearly equal importance with being observant is being able to record newsworthy observances quickly and accurately. An exclusive interview with the Pope is of little value to your readers if you can't remember what he had to say. Most seasoned reporters don't attempt to rely on their memories since most reporters have very bad memories. To compensate, reporters rely on a variety of modified shorthand or speedwriting techniques devised over the years. Because of the memory problem, however, the specifics of these shorthand techniques are sometimes forgotten from the time the notes are taken to the time the notes are read.

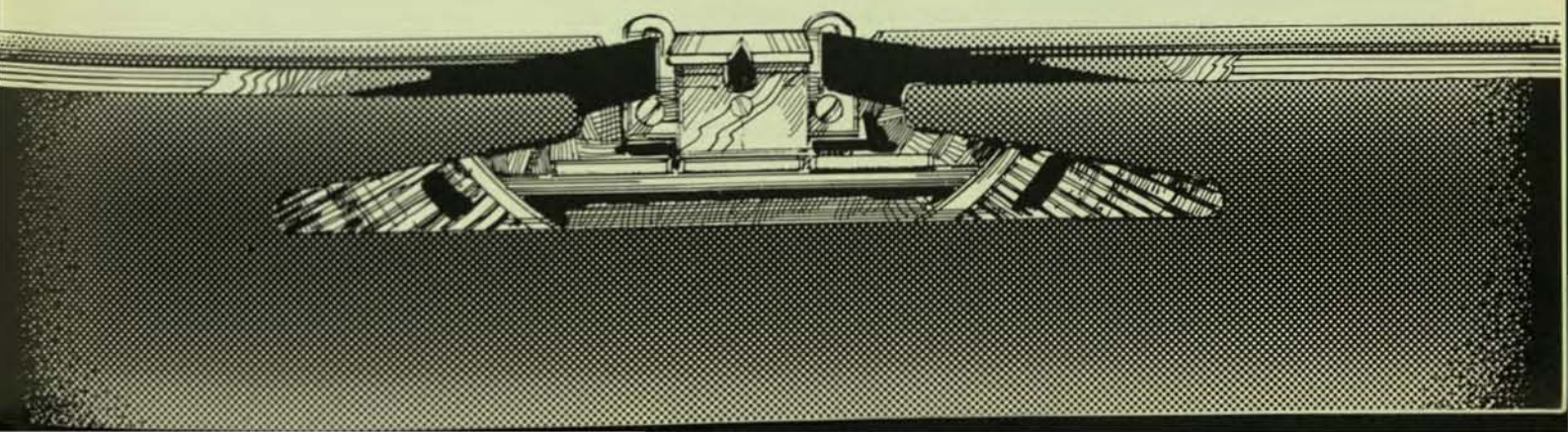
This isn't usually regarded as too much of a disaster since in much of today's printed media, fact is often transformed into typographical potpourri anyway (your own Horizons being an exception, of course).

In lesson # 2 we will cover other important subjects such as "Press card flashing" and "How to conceal a hip flask". In the meantime, however, we could use your rapidly growing journalistic abilities. We're interested in just about anything interesting or out of the ordinary that happens at Fairchild or to a Fairchild employee.

Use the space below or a separate sheet of paper to report the basic facts. Be sure to give us the names of the people involved and their location and phone number at work. We'll do the rest.

Your name _____ Location/Extension _____

Send to: Lyn Christenson, Editor
Horizons
MS 20-2260
Mountain View



CLOSEUPS

Dave Marriott

John Duffy

NEW PRODUCT GROUP FORMED

Fairchild has announced formation of the Large-Scale Integration (LSI) Group, to be headed by David J. Marriott, as Vice President and General Manager. Succeeding Dave as Vice President and General Manager - International Division will be John A. Duffy, previously Vice President - Commercial and Component Marketing Operations.

The new group consists of the Bipolar Memory–ECL Products Division and MOS/CCD Products Division and the Strategic Marketing Organization. The Bipolar and MOS groups had previously reported to Fairchild President Wilf Corrigan and the Strategic Marketing Organization to John Duffy.

The LSI Group will consolidate responsibilities for engineering, manufacturing and marketing of the company's full range of state-of-the-art memory and logic devices.

Formation of this group "reflects the importance of LSI products in our semiconductor business today, as well as the need to focus management and resources on this emerging market area," Wilf said. "Similarly, our Components divisions - representing the bulk of semiconductor volume today - demand closer liaison between operating management and the field sales force."

All existing International Division activities will now report to John. These include European marketing, Asia-Pacific marketing, Latin American operations and the TDK-Fairchild joint venture in Japan.

The domestic field sales force, previously within the central marketing organization, will now report to George Wells, Vice President and General Manager - Components Group.

Warren Bowles, Vice President–Industrial Relations, displays the medal recently given to Fairchild in recognition of the company's contributions to the city of Seoul, Korea.

NOT ALL GOLD MEDALS ARE GIVEN AT THE OLYMPICS

On a recent trip to Seoul, Korea, Warren Bowles, Vice President-Industrial Relations, accepted a gold medal of appreciation on behalf of Fairchild from Seoul Vice Mayor Kim Sung-bae.

The award recognized the employment opportunities Fairchild has provided for Korean citizens as well as the upgrading of the country's electronics manufacturing capability, thanks to the infusion of Fairchild technology.

Since the establishment of Fairchild Korea in 1966, Korean operations have progressed from assembling a few basic transistors to production of 37 different components.

Fairchild has also been active in promoting community growth in the Seoul area. Most recently, the company has been a leading participant in the Yongdungpo District Industrial New Community Movement Council, an organization of 35 firms promoting community and industrial growth. Also in conjunction with this Council, Fairchild has donated clothing, medical supplies, fuel and operating funds to Seoul's Shin Myong Orphanage.

In accepting the award for Fairchild, Warren commented, "Korean workers are diligent and highly motivated to work hard. Every time I come to Korea, I am impressed by our employees' strong sense of loyalty to our company. Seoul honors Fairchild with this award, and we will continue our active involvement with the community."

PEOPLE ON THE MOVE

BRIAN SEAR has been promoted to General Manager of the Systems Technology Division . . . Three appointments have been announced for the newly-formed Time Products Division of the Consumer Products Group . . . JOHN SUSSENBERGER has been named Division Vice President and General Manager of Time Products, and PHILIP CONKLIN has been appointed Marketing Director . . . JOHN DONATONI succeeds Phil as National Sales Manager, Consumer Products Group . . . CHARLES JACOBY has been named Marketing Director for Home Entertainment Systems for the Consumer Products Group . . . TRUMAN COLE has been named Controller, Hong Kong and JAMES McALLISTER has been appointed Operations Manager for that plant . . . JERRY JOYCE has assumed responsibility for the financial activities of Consumer Products Group Marketing . . . Replacing Jerry as Optoelectronics Division Controller is MICHAEL RODGERS . . . Assuming Mike's former duties as Exetron Division Controller is GARY SUTTON . . . JOHN SALAZAR, Director of Labor Relations, has assumed the additional post of Industrial Relations Manager for the Internation Division . . . Four Area Strategic Marketing Managers have been named to posts newly-created by Strategic Marketing Operations. They are ART MASSICOTT, Northeastern Area; PERRY CONSTANTINE, North Central Area; PHILLIPE DE MARCHIN, Southern Area and DAVID OKAMOTO, Western Area.

THEY CAME FROM ALL OVER THE

WORLD

. . . to attend the August International Sales and Marketing Conference. Twenty-eight area and regional sales managers and product marketing managers from Central and South America, Europe, Asia and Australia gathered at a conference center near Mountain View corporate headquarters to hear international sales presentations and divisional product marketing reports and attend technical workshop sessions on new products including the video game.

Old friendships were renewed and new ones made at a midweek barbecue and at a Friday night awards dinner in San Francisco. Fairchild President Wilf Corrigan addressed the gathering, which wrapped up the week's work. Highlighting the award's ceremoney preceding Wilf's speech was former International Division Vice President and General Manager Dave Marriott's presentation of the International Sales Support Award to Charlie Gray, Consumer Marketing Manager for Analog Products Division. Charlie was voted by the International area managers as the person most supportive of International Division's business objectives. He was called by one friend "the hardest-working, longest-traveling son-of-a-gun in Mountain View."

Bill Wirth, left, International Division Product Marketing Support Manager, sizes up a T-shirt with Nick Phillon, Southern Europe Marketing Manager, at the division's sales and marketing conference.

Former International Division Vice President and General Manager Dave Marriott presents a surprised Charlie Gray with the Division's Sales Support Award.

FOR OUTSTANDING

service

Thurston Hassell, a design specialist for Imaging Systems Division, Syosset, has been awarded the Secretary of Defense Medal for outstanding public service.

Thurston, who was cited by Secretary of Defense Donald Rumsfeld for his nearly 40 years of outstanding work in Fairchild aerial camera design, helped create camera systems including the Fairchild Lunar Mapping Camera used on Apollo 15, 16 and 17. His work has been instrumental in advancing the state of military photography.

Secretary Rumsfeld wrote, "Mr. Hassell's dedicated service, professional competence and exceptional performance have reflected great credit upon himself and significantly supported the Department of Defense."

New York Congressman John Wydler made the award presentation.

Thurston Hassell, second from right, accepts the Secretary of Defense Medal for outstanding public service from New York Congressman John Wydler, right. Observing the presentation are Mrs. Hassell and Tom Palamenghi, Divisional Vice President and General Manager, Imaging Systems Division.

Picnic

Picnics are for kids of all ages, as these pictures of the recent Fairchild picnic for Bay Area employees and their families show. The day's activities included, clockwise from bottom left, searching for $100 worth of coins in the sawdust, wheelbarrow racing with funny-looking wheelbarrows, filling up on steak, hamburgers and all the trimmings, sack races and softball.

It was a come one, come all day at the annual Fairchild Picnic, held last month at the Santa Clara, Calif., County Fairgrounds. A large crowd of employees and their families attended the annual event, which was highlighted by a steak barbecue, baseball contest and tournament of kids' games. Check these picnic pictures—you might find yourself making that home run!

INCENTIVE AWARDS

Fairchild employees authoring technical articles for presentations or publication in appropriate professional journals receive cash awards as part of the Technical Writing Incentive Award 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.

Beginning in this issue, Horizons will recognize recent recipients of incentive awards. Employees whose names appear below received incentive awards from April through June, 1976.

Analog Products Division

John F. Petrilla
"Satisfying EIA Standards RS-422 and RS-423" presented at IEEE IC Applications Conference

Bipolar Memory-ECL Products Division

Peter Alfke
"Very Fast ECL Opens Up New HF Instrumentation Areas"
Electronic Engineering Times

Jim Hively, H. H. Muller, W. K. Owens
"F100K, A Standard Family of Sub-nanosecond ECL"
Electronic Products

Instrumentation Unit

Ken Rinaldo
"Screened Outline Cuts PCB Assembly Time/Errors"
Circuits Manufacturing

Research and Development

Dr. Bruce E. Deal
"Identification of Integrated Circuit Process Areas Amenable to Diagnosis and Control by Analytical Beam Techniques" presented at ARPA/NBS Silicon Surface Analysis Workshop, April 23-24, 1975

Dr. Arthur Learn
"Evolution and Current Status of Aluminum Metallization"
Journal of the Electrochemical Society

Strategic Marketing

Phillippe De Marchin
"Multilevel Nesting of Subroutines In a One-level Microprocessor"
Computer Design

Systems Technology Division

James Campbell
"A New Real-Time Pattern Generation System for the Testing of Regular Arrays" presented at NEPCON, February, 1976.

James Healy
"Choosing an IC Test System"
Computer Design

"Evaluation of Microprocessor Testing Methods"
Computer Design

Brent Schusheim
"A Flexible Approach to Microprocessor Testing"
Computer Design

PATENTS

Fairchild's continuing technological leadership depends, to a great extent, on the creativity of its people. Beginning with this issue, Horizons is recognizing those employees recently awarded patents for their inventions. Patents appearing below were awarded during July, August and September, 1976.

Bipolar Memory-ECL Products Division

Richard B. Derickson and
Krishna Rallipalli
Universal first-in first-out memory device

James C. Murphy
Method for packing semiconductor devices

Digital Products Division

Eric Breeze and Peter Alfke
Electronic tuning control system for television

MOS/CCD Products Division

Robert L. Luce
Method of MOS transistor manufacture

Gregory Roberts and Roger Badertacher
Differential sense amplifier

Kamieshwar C. Gunsagar and
John P. Guadagna
Balanced differential capacitively decoupled charge sensor

Kenneth R. Stafford and
John P. Guadagna
Charge canceling structure and method for integrated circuits

Systems Technology Division

Yuk Bun Chau
Testing circuit

Horizons would like to hear from you, too. To tell us your views on the magazine, send a note to the Editor, Horizons, MS20-2260, Mountain View.

R.S.V.P.

Dear Editor:

I recently had the opportunity to read the new Horizons. I feel Horizons is one of the most meaningful industrial publications I have ever read. I'm very interested in reading this helpful company report. Please put me on your mailing list.
With best regards,

James Lee
Financial Manager
Fairchild Taiwan, Ltd.

Dear Editor:

Absolutely a dynamite issue—best ever! Keep it up.

Jack Ordway
Division Vice President and
National Sales Manager
Components Group

IN THIS ISSUE

FAIRCHILD
CAMERA AND INSTRUMENT CORPORATION

Fairchild Camera and Instrument Corporation
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HORIZONS SEPTEMBER/OCTOBER, 1976

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NOVEMBER/DECEMBER 1976

HORIZONS

COVER Fairchild gifts will be under a lot of trees this year, judging from the cargo Santa's stowing in his sack. We hope he brings you everything on your list. Happy Holidays!

BACK COVER Bill Latapolski from IPD prepares for a holiday visit to some hospitalized children on Long Island.

CONTENTS

DEPARTMENTS

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Lyn Christenson

CONTRIBUTING EDITOR
Neal Rosen

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East Coast: *IPD–Commack* — Peg Schinnerer; *South Portland* — Peter Wyberg; *Syosset* — Ruth Miller

Member, International Association of Business Communicators and Bay Area Society of Industrial Communicators.

HORIZONS is published six times a year for the employees of Fairchild Camera and Instrument Corporation. Address all correspondence to Horizons, Corporate Communications Department, M.S. 20-2260, Fairchild Camera and Instrument Corporation, 464 Ellis Street, Mountain View, CA 94042.

THIRD QUARTER POST RECORD SALES, HIGHER PROFITS

"Third quarter sales and profits improved despite the summer slowdown in the economy and in the rate of semiconductor industry growth," Wilf Corrigan, President, said. "Based on current trends, we believe the fourth quarter will reflect a further improvement in shipment levels for our industry.

"Fairchild's financial and technical posture remains strong. Working capital at the end of the period was $96,665,000 and shareholder's equity $173,311,000. Cash and short-term securities approximated $17,927,000. During the quarter we announced an expansion of our bank credit arrangements to $100 million."

Fairchild reported higher net income and record sales for the third quarter of 1976, on November 5.

Earnings rose 56 percent to $4,243,00, or 77 cents per share, from $2,717,000, or 50 cents per share, a year earlier. Sales reached an all-time quarterly high of $118,157,000, up 65 percent from $71,453,000 in the 1975 period.

NEWSCLIPS

FCC APPROVES VIDEO ELECTRONIC GAME

Fairchild's Video Home Entertainment System, a programmable TV game, was approved for sale by the Federal Communications Commission on October 20. The game, based on the company's F8™ microprocessor, uses semiconductor memory cartridges to reproduce game formats on the home television screen in full color and sound.

Shipments to retail outlets began in November, and limited quantities of the video game will be available in major retail outlets in time for holiday shopping.

Two "resident" games, tennis and hockey, are available through the system console. Add-on cartridges available by Christmas will include Tic-Tac-Toe, Shooting Gallery, Black Jack, Desert Fox and two tracing games.

FAIRCHILD MAKES EUROPEAN BOND OFFERING

F.C.I. International Finance, N.V., a wholly-owned financial subsidiary of Fairchild, is offering $20 million of convertible debentures in Europe. The debentures will be guaranteed by the corporation on a subordinated basis.

The debentures will not be registered with the Securities and Exchange Commission and no debentures will be offered or sold in the United States or to its residents or citizens. Net proceeds of the offering will be used by the company for general corporate purposes and to meet capital needs arising from current and anticipated sales growth.

The debentures will mature in 15 years without a sinking fund and are convertible on and after August 1, 1977 into Fairchild common stock.

$100 MILLION BANK CREDIT AGREEMENT REACHED

Company bank credit lines were expanded to $100 million to meet current and anticipated working capital requirements resulting from sales growth.

The financing program includes a two-year, $50 million line of domestic revolving credit with eight banks, convertible into a five-year term loan.

A one-year, $20 million credit line was also established with three banks for a wholly-owned finance subsidiary, formed to support the company's consumer products business.

With respect to international activities, Fairchild negotiated multicurrency lines of credit with several banks. Loans totaling $30 million may be made available to the company or foreign subsidiaries under this agreement.

FAIRCHILD TO PRODUCE MOTOROLA MPU, ROM, POSSIBLY ECL MPU

A semiconductor technology exchange and alternate source agreement has been reached between Fairchild and Motorola, Inc.

Fairchild will manufacture and market the Motorola MC6800 microprocessor family, with shipments expected to begin in early 1977. The company will also produce Motorola's 8000-bit ultraviolet-erasable read-only memory, and has the option to produce the MC10800 ECL 4-bit slice microprocessor family.

In exchange, Motorola will serve as an alternate source for Fairchild's low-power Schottky TTL logic family, and will also have the right to manufacture two Fairchild products now in development—the one-chip F8™ microcomputer and the 65,000-bit charge-coupled memory.

The two companies will exchange technical information on all products involved to assure full compatibility between devices supplied by each manufacturer.

CCD CAMERA IR-100 WINNER

A CCD television camera developed by Fairchild's Imaging Systems Division has been selected as one of the 100 most significant new technical products for 1976 in *Industrial Research* magazine's I-R 100 competition.

The Fairchild MV201 is one of a series of miniature TV cameras that use charge-coupled-device (CCD) sensors. The solid state camera measures 2 x 2½ x 3¼ inches and weighs 12 ounces.

John Stanfield, Marketing Manager for Imaging Systems, represented Lou Pighi, Vice President and General Manager, Federal Systems Group, at the award presentation at the Museum of Science and Industry in Chicago.

Advanced features of the MV201 make it adaptable to a wide range of applications in the military, commercial and industrial sectors including security and surveillance, law enforcement, reconnaissance, process control, scientific measurement and medical instrumentation.

Fairchild in

"The Fairchild Phenomenon," one magazine called it. Another headlined it the "Boom in Video Games." "The Smart Machine Revolution" was the term used by a third.

They were all talking about products that put Fairchild in the headlines in 1976. Company products both new and standard attracted the attention of major business, trade and consumer publications this year in large numbers, putting the Fairchild name before current and potential customers and consumers.

The Consumer Products Group's Video Entertainment System has probably attracted attention in the widest variety of publications. The game, which features a central console equipped with hockey and tennis plus Videocart™ game cartridges that will offer up to 34 games by Christmas, contains an F8™ microprocessor that pulls game information out of the cassette and sends it to a video processor chip, which puts the game on the TV screen.

Electronics called the video game "the generally acknowledged hit" at the June Consumer Electronics Show in Chicago, and said even competitors admitted it was a major attraction.

Business Week, in a cover story on "The Smart Machine Revolution" brought on by microprocessors, quoted Dr. C. Lester Hogan, Vice Chairman of the Board, as saying, "What will grow out of the game is more exciting than the game itself." Dr. Hogan believes the game will be the start of the home computer center, where the television set and the telephone can be combined with a microprocessor to form a rudimentary home computer.

Business Week also stated Fairchild is considering adding scientific calculator and educational modules to the Videocart library. Already in the works is a math quiz cartridge. *Newsweek*, commenting on the boom, said that video games could eventually graduate from an entertaining novelty to a powerful educational tool for the home. A $1 billion market for games by 1980 was predicted in the business and financial journal *Dun's Review*.

Pacific Southwest Airlines *California Magazine* spotlighted the way Fairchild "brought the price of digital watches down to earth."

Noting that Fairchild is the world's number one digital watch producer, *California Magazine* cited Fairchild's introduction of the Timeband™ LED and LCD series as one of the first industry efforts to make digitals available in all price ranges. "3.5 million digital watches worth $266 million were sold around the world during 1975, five times the 1974 total," the magazine said. Digitals currently represent 1.5 percent of total worldwide watch sales, but the PSA publication estimated they'll account for nearly 29 percent of sales by 1980.

"The Swiss and other European watchmakers have reluctantly joined the digital

the Headlines

game," the magazine said, "but paced by semiconductor manufacturers like Fairchild, watchmaking is returning to the United States, which presently dominates the digital market."

The "brains" of products such as digital watches and electronic games are found on tiny microprocessors, called computers-on-chips. A tiny silicon slice that is the arithmetic and logic heart of a computer, a microprocessor replaces hundreds of integrated circuits and other components, dramatically cutting manufacturing time and costs while increasing the capability of everything from postage scales to telephones.

MPU's and products they make possible attracted continuing attention in trade and technical publications, as well as being observed by the general business press.

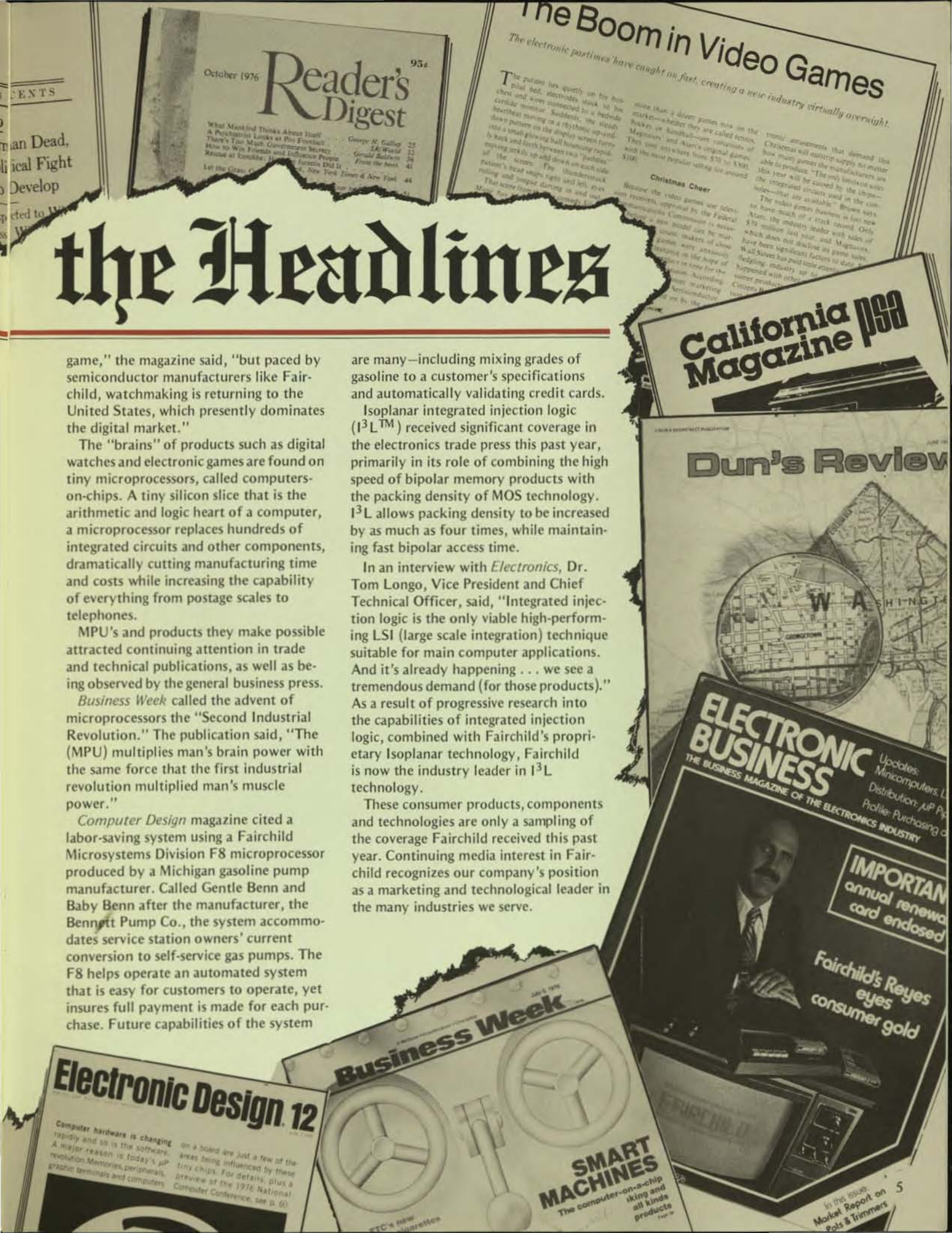
Business Week called the advent of microprocessors the "Second Industrial Revolution." The publication said, "The (MPU) multiplies man's brain power with the same force that the first industrial revolution multiplied man's muscle power."

Computer Design magazine cited a labor-saving system using a Fairchild Microsystems Division F8 microprocessor produced by a Michigan gasoline pump manufacturer. Called Gentle Benn and Baby Benn after the manufacturer, the Bennett Pump Co., the system accommodates service station owners' current conversion to self-service gas pumps. The F8 helps operate an automated system that is easy for customers to operate, yet insures full payment is made for each purchase. Future capabilities of the system are many—including mixing grades of gasoline to a customer's specifications and automatically validating credit cards.

Isoplanar integrated injection logic (I^3L^{TM}) received significant coverage in the electronics trade press this past year, primarily in its role of combining the high speed of bipolar memory products with the packing density of MOS technology. I^3L allows packing density to be increased by as much as four times, while maintaining fast bipolar access time.

In an interview with *Electronics*, Dr. Tom Longo, Vice President and Chief Technical Officer, said, "Integrated injection logic is the only viable high-performing LSI (large scale integration) technique suitable for main computer applications. And it's already happening . . . we see a tremendous demand (for those products)." As a result of progressive research into the capabilities of integrated injection logic, combined with Fairchild's proprietary Isoplanar technology, Fairchild is now the industry leader in I^3L technology.

These consumer products, components and technologies are only a sampling of the coverage Fairchild received this past year. Continuing media interest in Fairchild recognizes our company's position as a marketing and technological leader in the many industries we serve.



NO FRILLS EDUCATION AT THE MANAGEMENT AND CAREER DEVELOPMENT CENTER

B.M.O.C. You know the type. The Big Man on Campus was often a football player who drove a sports car and had a social calendar booked through Final Week. His counterpart, the Big Woman on Campus, might have been a cheerleader or student government officer with an equally jammed social life. Classes? Sure, they went—when they could fit them in.

But eventually, both these collegiate bigwigs had to join all those fans who had applauded them on Saturday afternoons in the search for a job—and hopefully, the right career. And getting ahead wasn't so easy anymore—keeping up was hard enough.

The B.M.O.C. and B.W.O.C. are certainly stereotypes, but there's probably a trace of them in each of us. Whether we floundered through several majors and finally picked one by throwing a dart, or knew our goals from the first day on campus and religiously attended every class, many of us later found high school and college hadn't fully prepared us for a business career.

The Fairchild Management and Career Development Center in Mountain View offers Fairchild people an excellent opportunity to change that. Through classes at the Center, a Fairchild employee can study subjects from management techniques to electronics technology, corporate finance to career planning. In cooperation with local school districts, colleges and universities, an employee may complete studies for a high school diploma or for college degrees through a Masters in business administration or electrical engineering.

Ron Miller, Director of Management and Career Development since 1975, recalls why the Career Center was established. "Initially, the focus was on management training. Fairchild didn't have a systematic approach to developing its people to their full potential. There was no organized way to identify candidates for promotion, or to train those who were promoted in management and supervisory skills. In addition, our people needed facilities to keep up with the rapid changes in both management techniques and electronics technology."

So the Career Center was opened in 1973 to provide Fairchild people with practical education and training and directed career counseling and advancement. (For a full list of Career Center offerings, see box on page 11.) While the initial emphasis was on management training, the Center's horizons soon expanded to provide co-op college degree programs.

"To offer Fairchild people the fullest possible career opportunities meant we needed to assist many of them in completing degrees," Ron says. "So it has been our goal to establish practical business and technological degree programs with schools near Fairchild sites. Current programs include associate, bachelors and masters degrees in business administration and electrical engineering. A high school equivalency program is also available in Mountain View.

In the Bay Area, employee-students take courses either on campus or at the Career Center. On the East Coast, employees take classes at selected area schools or periodically from the Career Center's "traveling professors" in Syosset and South Portland. Financial help is available through the company's Tuition Aid program (see page 11).

Operating on the theory that there's no better way to test a program than to try it out yourself, Ron was a member of the first class of Fairchild people to pursue a Masters in Business Administration degree in a pioneering venture with the University of Santa Clara, near corporate headquarters.

Ron Miller, Director of Management and Career Development, reviews Center activity reports in his Building 13 office.

Peter Gise, Manager of Technical Education, explains the structure of an atom to a recent Technology for Non-Technical Managers class.

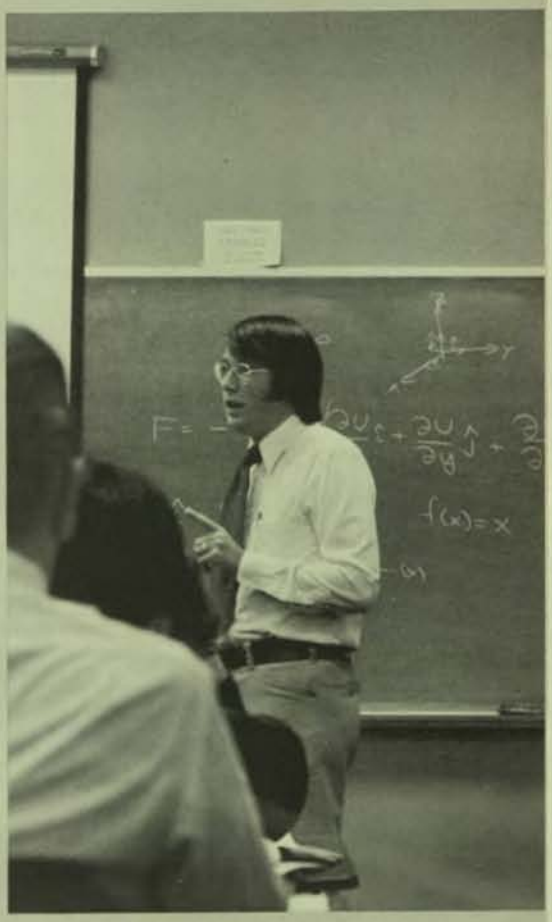
"We wanted to offer an MBA program to our people, but one more practical and applicable to Fairchild than the average program. So we developed a program with Santa Clara which included classes about Fairchild as a business, taught by company executives.

"As a final project, the class worked with a task force headed by Jim Unruh, Vice President—Treasury and Corporate Planning, to study potential acquisitions in the consumer electronics, industrial equipment and communications industries. After completing our research, we made presentations and recommendations to a panel of corporate and financial executives headed by Dr. Les Hogan. I'm happy to say the panel accepted for further study one of our recommendations on a potential acquisition."

This practical approach applies as much to the seminars offered internally as it does to the cooperative degree programs.

"We don't sit here and think of courses to offer," Ron explains. "There have been five major surveys in the last two years among our top managers to assess educational needs in our divisions. This isn't a 'frill' department—divisions are charged for the courses their people attend, so sessions offered must be what they need and are willing to pay for."

The much-in-demand "Finance for Non-Financial Managers" seminar is a good example. During Fairchild's educational surveys, it became clear there was a



Mike Powell, Transistor Division engineer, presents a lecture on p–n junctions to the Semiconductor Device Physics class. Mike is one of the many technical and managerial people here at Fairchild who teach Career Center classes.

Ron Miller, left, and Dr. George Parker, guest lecturer from Stanford University's School of Business, second from left, check course materials with Monique Cushman, Center secretary, while students sign in for the Finance for Non-Financial Managers course.

Charles Dirksen, left, Dean of the Graduate School of Business at the University of Santa Clara, receives a Fairchild watch from Warren Bowles, Vice President – Industrial Relations, for his efforts in helping set up the cooperative MBA program between Fairchild and Santa Clara.

company-wide need for some basic financial education for those people in operating posts or non-financial administrative positions. The result was the current three-day basic financial seminar, taught by Dr. George Parker of Stanford University's School of Business.

The cost savings to the company for getting better-educated managers is impressive. "This same program, run outside with a less capable instructor, could cost the company as much as seven times more per person, not including the employee's travel or living expenses during the session," Ron points out.

"Through a systematic evaluation of the need and the assessment of the best resources available to us in the Bay Area, we have developed an industrial finance program second to none in the country," Ron says. "One of the best measures of this is the large number of other companies that ask us to put the seminar on for them."

Similar sessions on semiconductor technology, management by objective techniques and management training through the Managerial Grid (see page 10) have equally long waiting lists.

To keep Fairchild engineers and technicians abreast of development in semiconductor technology, Peter Gise, Manager of Technical Education, has developed several excellent courses. Taught by Peter and divisional engineers, the courses cover basic techniques and state-of-the-art developments in semiconductor processing.

"We have an advantage over universities, because we can provide our people with the most recent technology, which they can't get from textbooks," says Peter, who joined Fairchild in 1973 from the faculty of the University of Santa Clara. "Engineers and technicians in our Device Physics and Semiconductor Device Processing classes benefit from one of the most relevant, up-to-date programs available, and can apply their knowledge right away."

One of the newest programs introduced by the Career Center, Fairchild Clerical Procedures, was developed in part through the efforts of Monique Cushman, Center secretary. "Many department secretaries said they needed a central catalog containing the many forms, procedures and miscellaneous information a secretary needs to know every day," says Monique. "So we developed a Clerical Procedures catalog in cooperation with a secretarial task force, and we will be holding seminars for company secretaries in the near future."

In addition to the many company-related sessions the Career Center offers, "planning for the rest of your life" workshops on career and life planning have recently been added. These include career evaluation and organization seminars and a pre-retirement planning workshop.

Outside professors, instructors and consultants are an extension of the Management Development Department staff. This extended staff enables the department to offer courses at Mountain View and most East Coast facilities. Component field sales people have recently begun benefitting from a joint Career Center–Components Group sales training program, run by a management consulting firm from Los Angeles. During two-and-a-half-day area seminars, field sales people have received training in sales psychology and personal motivation.

"I believe this is the first such program ever undertaken by Fairchild sales," Ron says. "Again it was a case of a manager recognizing a need and working with us to find an answer. Everything we do in Management Development is a direct result of such an assessment."

The Career Center in Building 13, Mountain View, was opened in 1973.

FULL-TIME EMPLOYEES PART-TIME STUDENTS COMBINE JOBS AND STUDIES FOR CAREER ADVANCEMENT

T.M. CHEN
Diode Division
San Rafael

When T. M. Chen completes his MBA work at the University of San Francisco next year, he'll have the education of two worlds—both vocationally and geographically.

T. M., a first-line supervisor at the Diode Division in San Rafael, has a B.S. in Chemical Engineering from the University of Taiwan. Completion of his studies here will help T. M. realize a goal he set for himself when he came to the United States two years ago.

"The next step in my future is one into management and the MBA will no doubt help me get there," he said.

In the process of advancing his career, T. M. has taken a step or two backwards, but on purpose. He was a supervising engineer at Fairchild's Hong Kong facility for three and a half years, before coming to San Rafael in 1974 as a senior engineer. "I felt it was important to get some production experience, so I went into production as a first line supervisor," T. M. said.

Taking advantage of Fairchild's tuition aid program means a lot of hard work for T. M. He spends four nights a week in classes and most of his free time is taken up by studying. Not having a family makes things "a little easier."

After receiving his MBA, T. M. hopes to go back to Fairchild's Hong Kong plant in a management position. Looking to the future, he said, "I think the engineering degree and the MBA will make a good combination and help advance my career."

BARBARA ESCANO
Consumer Products Group
Palo Alto

A solid endorsement for Fairchild's Management and Career Development Center comes from Barbara Escano, who has found the opportunity to enhance her education and the understanding of her job through a class at the Center.

Barbara, a supervisor of customer service for the Consumer Products Group, is enrolled in the Center's organizational behavior class.

She heard about the class through her supervisor. "He received some material on it and suggested I enroll," she said. "He felt it would help me better understand what motivates employees and make my job as a supervisor easier."

Taught by a professor from San Jose State, the class meets every three weeks for three hours. Most of the classwork centers around the independent research project each student must complete.

Barbara, who has a B.A. in psychology, says she spends about five hours a week outside of class on her project—studying what motivations affect employees' performance.

Although she's only halfway through the class, Barbara said she has found it both beneficial and closely related to her job activities.

"I'm sure by the time I'm through the class and my project, I'll have learned many things that will help me do a better job as supervisor," she said.

JOHN HESLIN
Industrial Products Division
Commack, N.Y.

For John Heslin, a technician at Fairchild's Industrial Products Division on Long Island, moving into a job with more challenge and variety is very important.

So important, in fact, that John has made a commitment to pursue a two-year degree in electrical technology. By taking two classes a term, John hopes to finish in three years—and he started in September of 1974.

John, who has been with Fairchild for over two years, is taking classes at State University of New York in Farmingdale, L.I.

"I want to get into a job that will offer more challenge than the assembly work I'm doing now and the degree will get me there," he said. "I'd like to get into production control or research and development and participate in the refining and improving of products."

John says he spends about 10 hours a week studying outside of class. His interest in electronics was sparked while he was in the Navy as a radar operator.

John's vision of his educational future does not end three years from now, however, and he sees himself taking advantage of Fairchild's tuition aid program to further his education.

"I'd like to pursue a Bachelor's degree in business and eventually move into some facet of marketing," he said.

REBECCA QUINN
Corporate
Mountain View

The traditional motivations of seeking a job that's more financially rewarding and has more responsibility have caused Rebecca Quinn to seek an Associate Arts degree at De Anza College in Cupertino, Calif.

Rebecca, an executive secretary in the Tax Department at corporate headquarters, began her work towards the A.A. in paralegal studies a year ago.

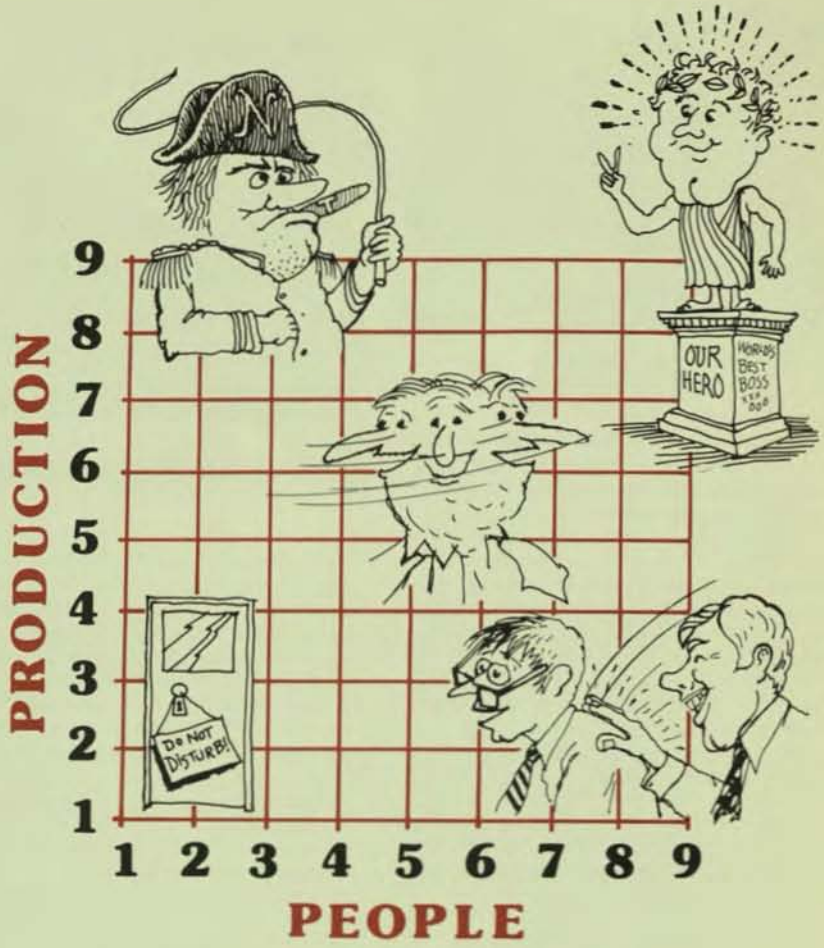
She takes two classes a quarter, which means four nights, or 10 hours, in class a week, plus another five hours of studying each week. The classes she takes cover such areas as business law and California state law.

When she receives her degree a year and a half from now, Rebecca hopes to eventually move into a position using her paralegal training.

Having had no previous college experience, Rebecca finds her class work at De Anza interesting. "I've always had an interest in law and naturally most of my classes are aligned with that interest."

"In addition," she said, "it makes the going a little easier knowing that the work will lead to a more responsible job."

MANAGERIAL GRID



Negative creativity could be preventing your department from being productive or effective. And you may not even know it's there.

Negative creativity simply means each of your subordinates may be *determined* to sell you his or her idea for solving a problem—regardless of which staff member may have the best solution. This means that the person with the best sales pitch may succeed in selling you the worst possible way to solve your problem.

As a manager, it's important to realize what you *don't* know. You must learn to evaluate and use all the resources available to you, and your best resource may be the shyest, quietest person on your staff.

Fairchilders attending the Managerial Grid® at the Career Center in California and at Syosset on the East Coast hear variations on that theme many times during the week-long concentrated management training session. More than 500 Fairchild managers have taken Grid training since the program's introduction at Fairchild in 1973. Most have gone away better managers for it, because they learn firsthand the value of running their departments as teams, and that team decisions are usually the best decisions.

The Grid is probably surrounded by more apprehension than any other course offered by the Career Center. Attendees, who were often volunteered to go by their bosses, walk in the first morning more than a little concerned. Many have heard "horror stories" of marathon all-night sessions, and all are thinking of the stacks of work they'll have facing them after being away from the office for a week. However, the nearly unanimous opinion among "graduates" is that the investment of time and energy is more than justified, both from a personal and professional standpoint.

The program consists of 60 concentrated hours over five days for the 20 some members of each Grid class. Named for a numeric grid with nine numbers on both the horizontal and vertical axes, the seminar examines management styles ranging from great concern for production and little concern for people (9, 1) through the reverse at 1, 9. Most people fall somewhere around the 5, 5 spot, medium concern for both. The ideal, and attitude toward which Grid students strive, is 9, 9—maximum concern for both the production expected from your department and the people who make it possible.

The key to reaching 9, 9 is the team approach—involving every member of your department in setting common

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*Copyright 1964 by Drs. Robert R. Blake and Jane S. Mouton. Scientific Methods, Inc., Austin, Texas.

goals, then mutually striving for their achievement.

But Grid students quickly find learning teamwork can be both tricky and laborious. Assigned at the crack of Monday morning to a six or seven member team made up of strangers, each person forms impressions of new associates in the first team meeting that will turn out to be about half right.

The talkative members will gradually listen more and the quieter ones will gradually contribute more as each team member accepts his or her responsibility for the team's production efficiency.

Production efficiency, or team scores vs. individual member scores on a particular test or project, is the primary quantitative yardstick used in measuring team effectiveness in Grid sessions.

As the week progresses, team sessions become longer and more frequent and group lectures shorter. Team efficiency becomes more critical. Low efficiency forces team members to evalute their teamwork methods, recognize the importance of setting common goals, and draw on every person in the team equally for contributions. (It can also be embarrassing, as scores from the three competing teams are posted periodically for comparison by the group.)

"We selected the Grid for managerial training," Ron Miller says, "because it provides a framework for measuring change. We knew there was a desire within the company to change the way we were working together. There are many vehicles for making change, but in order to be successful, the change had to be one everyone was willing to make because they recognized the benefit to the employees and the company.

"In the Grid, we talk about team decisions, and how good and bad teamwork relate to production efficiency, or the bottom line. When you measure the performance of two groups working with the same data for the same period of time, and how effectively each group used its members, you have a practical way of measuring management performance and change.

"This can translate back to your department or staff. As a manager, you don't know where your highest and lowest resources are. All you know is you have a group of people working with you, and it's your responsibility to motivate them to achieve the best results possible.

"1 + 1 can equal 3, or 1 + 1 can equal −3. It depends on you."

Your Career Center Offers you

DEGREE PROGRAMS

Associate Degree, Business Administration or Engineering: Foothill Community College (Los Altos Hills, Ca.)
B.A. in Business Administration: San Jose State University
B.A. in Business Administration: University of San Francisco
B.S. in Engineering Technology: Cogswell College (San Francisco, Ca.)
B.S. in Electrical Engineering Cooperative Program: Massachusetts Institute of Technology
M.S. in Electrical Engineering: University of Santa Clara and University of Maine
M.S. in Electrical Engineering Honors Cooperative Program: Stanford University
Masters in Business Administration: University of Santa Clara

INTERNAL PROGRAMS

Career and Life Planning
- Your Career: Self Evaluation and Self-Development
- Planning for the Rest of Your Life (a retirement planning seminar)

Clerical
- Clerical Procedures for Secretaries

Finance
- Finance for Non-Financial Managers

Management
- The Managerial Grid
- Total Performance Management (Management by Objectives)

Technology
- Technology for Non-Technical Managers (an introduction to semiconductor technology)
- Device Physics
- Semiconductor Device Processing
- Going Metric

Interested? To take advantage of the Career Center's educational opportunities, contact your Industrial Relations Manager.

TUITION AID

YOUR LEARNING PARTNERSHIP WITH FAIRCHILD

If the courses offered through the Management and Career Development Center intrigue you, there's an easy way to take advantage of them. Fairchild's Tuition Aid Program will pick up most of the cost of job-related courses you take, either through the Career Center or on your own.

Applications for job-related courses are available from your Industrial Relations Manager. They must be approved by your immediate supervisor 30 days prior to the start of class. After the successful completion of your course(s), you will be reimbursed for 90 percent of the cost of tuition, registration fees, lab fees, thesis expenses, graduation fees and books.

Classes at accredited trade schools, colleges and universities are covered under the Tuition Aid Program. Join the many other people who are expanding their skills and career horizons in partnership with Fairchild!

The "So you always wanted to be one" reporter's course. Lesson #2.

By now you probably realize that just about anyone can pass themselves off as a reporter simply by following a few of the suggestions in our earlier lesson. In this lesson, however, you'll learn the difference between *acting* like a reporter and *being* a reporter.

Anyone can write an informative, accurate and grammatically correct story. But only a *real* reporter must *look* like a reporter. In these days of mass-produced, overly-polished, college-educated communications professionals, the art of looking like a reporter is going the way of the inkwell. In the following paragraphs, we'll provide you with the final guidelines necessary to transform you into the reporter you've always wanted to be.

First, you must never wear anything that has been ironed. Ever. If all you own is PermaPress or double-knit, don't worry. By wadding them up and storing them beneath the cushions of your sofa, you'll assure yourself of a "fresh" change of clothes whenever you go out on an assignment. This un-ironed look gives you an important psychological advantage. It will be obvious to all that you're a person of dogged determination. After all, why would anyone look like you do unless you've been up for at least 72 hours working on a story?

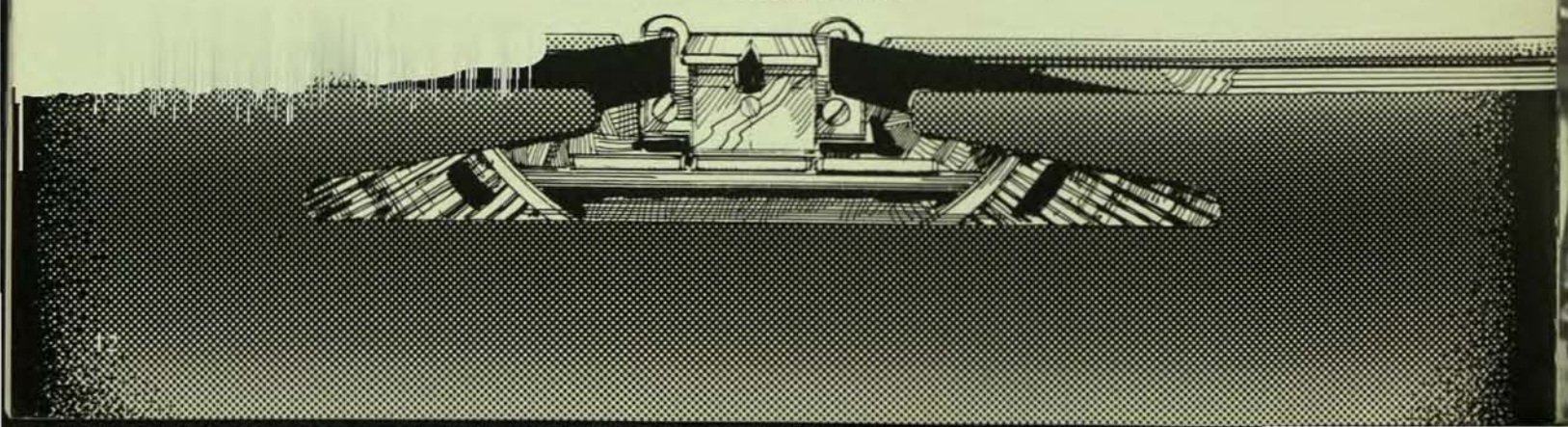
Of nearly equal importance are your shoes. The older the better. For the proper pair, check the trash bins behind a Goodwill store. Or if you're a do-it-yourselfer, borrow or buy a 3-week-old dog. Put shoes and dog together for seven days and they'll be ready for an assignment (the shoes, not the dog).

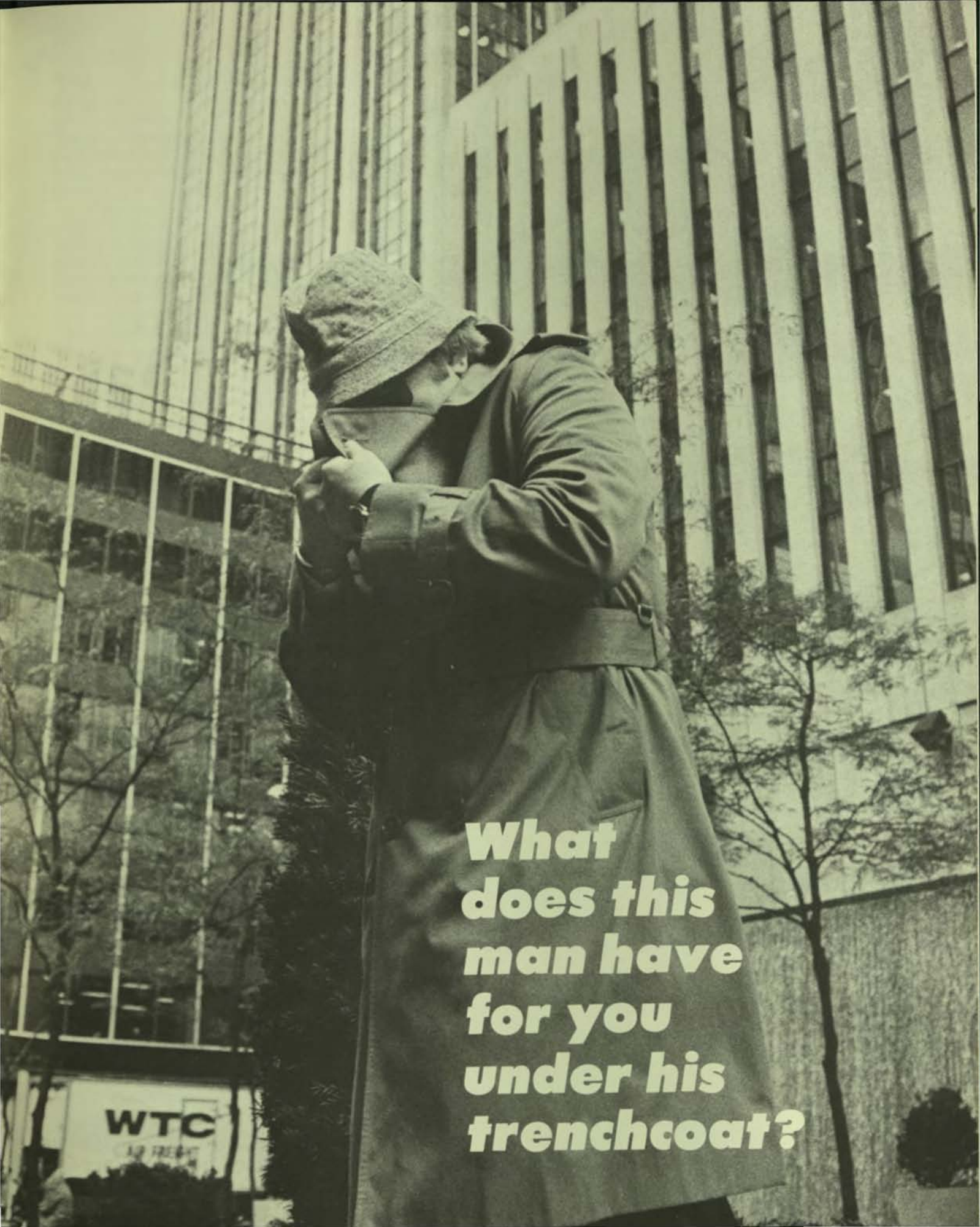
Finally, you'll need a trench coat. We're not sure why but every reporter we've ever known has owned a trench coat.

Now that you've got the full scoop on being a professional reporter, we're ready for your first story. Use the space below or a separate sheet of paper to report the basic facts. Be sure to give us the names of the people involved and their location and phone number at work. We'll do the rest.

Your name _____ Location/Extension _____

Send to: Lyn Christenson, Editor
Horizons
MS 20-2260
Mountain View




WTC
What does this man have for you under his trenchcoat?

SELLING FAIRCHILD IN THE

New York City is not known as The Big Apple for nothing. One third of all the retail business in the country is transacted in New York and the surrounding states and much of it is directed from Manhattan's concrete canyons.

New York's retail influence can be nationwide. If a department store buyer in Peoria wants to check on a new supplier before committing tight buying dollars, he very likely will rely on the opinion of a New York City colleague.

"It's crucial to a consumer company's marketing effort to be located in New York," says Jay Hans, Eastern Regional Manager for Fairchild Consumer Products. "Retailers have to know you're here." So when Jay joined Fairchild this past summer, he moved Consumer's regional headquarters from New Jersey to a 19th floor office in Rockefeller Center. And his theory has proved correct—since the move, the New York office has opened nearly 80 new accounts, making Fairchild one of the top three consumer electronics companies in the East.

Some people sell watches this way on the sidewalks of New York, but not Jay Hans, Eastern Regional Manager for Consumer Products. Since the Consumer office moved into Manhattan earlier this year, nearly 80 new customers carry Fairchild products.

The Eastern region covers 12 states from the Canadian border through Virginia, and includes parts of West Virginia. Five sales representatives in addition to Jay currently cover this market. Stan Scott, Northeast Manager of National Accounts, and Marty Levine, Representative for the New York metropolitan area and part of Connecticut are based in the Rockefeller Center office. Frank Calderone is headquartered in Boston, Bob Schneider in Washington, D.C., and Stan Jacobs in Buffalo. Office Manager in New York is Helen Renaghan.

Displays of Fairchild watches and clocks from Fifth Avenue to the suburbs exemplify the excellent New York market acceptance of digital timepieces. Prestige jewelers such as Tiffany's and nationally-known retailers including Bloomingdales, Ohrbachs and Saks Fifth Avenue all report brisk sales of Fairchild lines.

Since Fairchild entered the consumer market as a virtual newcomer just a year ago, establishing a name among the strong competition in the New York jewelry business was the toughest first hurdle (after obtaining suitable mid-town Manhattan office space, that is). But all three men in the New York office were able to draw on extensive past Eastern consumer sales experience to establish Fairchild as a major digital watch supplier.

"We've had strong competition here," Jay says, "but the solution to that is to find places where you don't have business, then go out and get it. And we have another thing going for us, which the competition doesn't. We've discovered the name 'Fairchild' connotes a certain elegance. People like to say they're wearing a Fairchild."

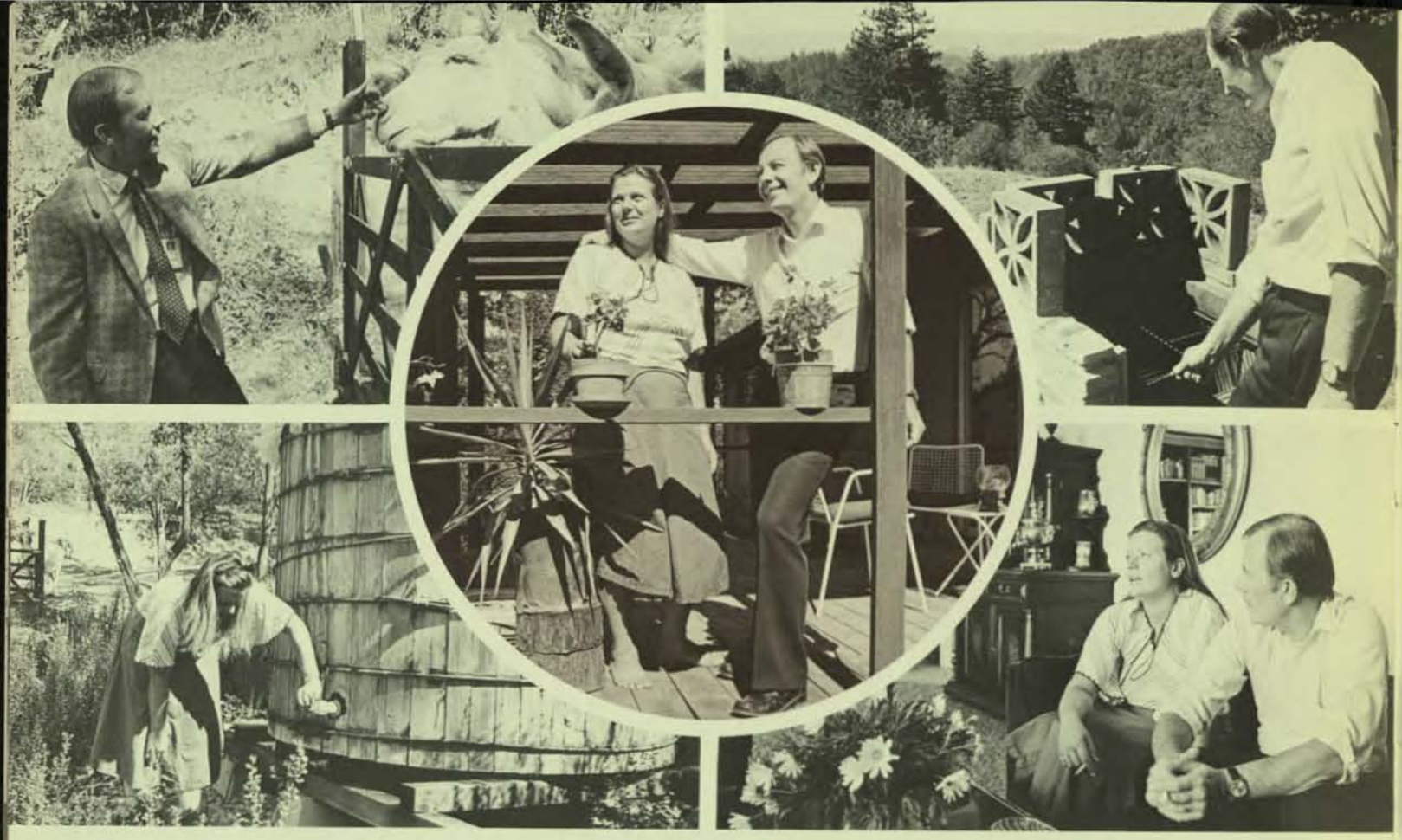
Office Manager Helen Renaghan starts a busy day by coordinating meeting and travel arrangements for an Eastern Region sales meeting.

BIG APPLE

Jay and Marty Levine, New York metropolitan representative, discuss some new watch models with Gabriel Lyon, owner of Gabriel Lyon's Time Center, and customer Linda Selverne. New York jewelry store owners and jewelry buyers have reported excellent acceptance of Fairchild LCD's since their introduction in June.

jewelry buyer for Ohrbach's department store, discusses holiday advertising plans with Jay and Marty. The Timeband™ display and other Fairchild time products are prominently located near the main entrance to Ohrbach's W. 34th St. store.

Stan Scott, Northeast Manager of Special Accounts, takes care of some correspondence before beginning a day of sales calls on New York area branches of nationwide retailers.



It's quite a change from Germany for Derrol and Uschi Jones, who are enjoying their back-porch view of the Santa Cruz mountains, center. Clockwise from top left, Derrol stops on the way up the drive after work to greet two new arrivals at the Jones' acreage. Top right, even if the hamburgers get burned, the view over the barbecue makes it worth it. Bottom right, antique furniture and mirrors hunted up in Europe add interest to the Jones' mountaintop home. Bottom left, it's not an old wine cask, but a water tank that Uschi is checking for proper operation. Two old wooden tanks flank the road leading from the highway to the Jones' house, but neither are currently in use.

International Division Travel and Transfers:

Keeping Up With The Joneses

Different parts of the world are becoming more the same. Finding a parking place in many cities in Europe is becoming as much of a trick as finding one in New York or San Francisco. But according to Derrol Jones, International Division, European people don't seem to worry so much about parking legally. So when Derrol was searching for a spot one night in Wiesbaden, Germany, he took the advice of a friend and parked where it said not to.

Since he planned to complete his assignment at Fairchild's Wiesbaden plant in a few weeks, he ignored the parking ticket that inevitably showed up under his windshield wiper. But when he unexpectedly returned to Wiesbaden several months later to take on another European assignment, it caught up with him.

"Non-residents are required to register with the police," he recalls, "so a few days after I registered, I got a notice in the mail reminding me I hadn't yet paid my parking ticket. And since six months had elapsed, I owed them interest! I may have never gone back to Germany, and they would have been checking that parking ticket for years every time an American registered."

Minor bureaucratic irritations aside, Derrol enjoyed his nearly six years of assignment to the International Division's plant at Wiesbaden. Currently a Systems Consultant at the Division's headquarters in Mountain View, Derrol spent most of his nine years with Fairchild as a systems analyst, improving information flow through devising computer applications to fit business systems.

Originally sent to Wiesbaden on a short-term project to determine data processing needs for Europe, Derrol returned to Germany only a few months after his first

assignment ended and ultimately stayed five years.

"The second assignment was supposed to last three weeks, and ended up lasting from September 1971 to July 1976. The European business was growing rapidly in 1971, and so was the need for data processing people. They needed someone with my experience, and I liked the country, so I was glad to stay."

Wiesbaden, a city of about 300,000, is in the heart of Germany's castle country—on the Rhine River just north of Frankfurt. The Fairchild plant, formerly European headquarters and the center of Central European operations, houses the marketing and customer service operations for middle Europe. Similar functions take place at the Northern area headquarters in London and in Milan, Italy, headquarters of the Southern region.

Traveling was, naturally enough, one of Derrol's favorite pastimes while on his European assignments. "The fact that you can experience a variety of different cultures in a small space of distance and time was the most appealing aspect of European living for me," Derrol recalls. "On a normal weekend, you can travel into four or five different countries, all with unique cultures. We don't experience those dramatic differences traveling through the United States.

"There were, of course, some adjustments to make. There's a certain lack of convenience in Europe, compared to what I was used to in California. In Germany, for instance, food market's hours of operation are extremely restructed. They're only open from eight a.m. to six p.m. during the week, and half a day on Saturday. It means you can't stop to pick up some milk on your way home from work—you have to plan ahead a lot more.

"And, of course, the bureaucracy does get in the way from time to time—registering for work permits, dealing with local tax and auto offices, things like that. I found that somewhat inconvenient at first, but it's just something you get used to."

Crossing the language and cultural barrier with European locals wasn't much of a problem after 1973, because he was able to rely on the native German of his new wife, Uschi. Uschi had worked at Fairchild in Germany since 1970, first at the Munich sales office and later in customer service at Wiesbaden. When she and Derrol were married she was an advertising and public relations liaison with Mountain View corporate headquarters. One of her many jobs was translating all incoming data sheets, catalogs and company literature into German—not an easy task when you consider the liberal sprinkling of Greek letters and such contained in electronics literature.

Uschi left her job when Derrol was transferred back to California, and is now taking advantage of her first opportunity in many years to do "just what I want." Right now, that means taking pottery and weaving classes and redecorating the Jones' new home set in the natural beauty of the Santa Cruz mountains south of corporate headquarters.

Because she wanted to see as much of the USA as she could during her move, and because she just couldn't leave her German Shepherd, Jessica, behind, Uschi took the slow route to California. She booked passage on a Russian passenger liner that brought her to New York after an eight-day voyage from Germany, met a relative and set out on a seven-week transcontinental camping trip.

"I knew taking that trip would be a chance I'd never have again," Uschi said. Most of her stops were in national parks, but bunking in a sleeping bag got a little tiresome even in those surroundings, so occasional stays in the homes of newly-acquired relatives were most welcome.

"The country was magnificent—even Texas, which many of my friends in Europe had said wasn't so hot," Uschi said. "I was disappointed in many of the towns, though—a lot of roads with nothing but used cars and junk food."

But whether the road was passing a used car lot or the Painted Desert, adjusting to U.S. driving rules took some concentration for both Derrol and Uschi.

"Since there is no speed limit in Germany, you have to adjust to two kinds of drivers—those who drive their Volkswagens at 80 kilometers an hour and those who drive their Porsches at 200 kilometers," Derrol says. "At the same time you have to learn to live with the strict rules they do have, such as no passing on the right."

Equally confusing is the existence of several unwritten laws of the German autobahn. "In California, for instance," Derrol comments, "you usually give way if there's any question in your mind about having the right of way. In Germany, if you hesitate, you'll confuse people and make them mad—that's not a good idea at 200 kilometers an hour! He who hesitates can be lost—literally!"

Derrol makes at least a token effort to hold up a column at the ruins of the ancient city of Ephesus, near the Turkish coast.

CLOSEUPS

PEOPLE ON THE MOVE

Six executives have been promoted to Division Vice President. They include JACK ORDWAY, National Sales Manager, Components Group; WILLIAM O'MEARA, Strategic Marketing Unit Manager, LSI Group; WILLIAM KIRKHAM, General Manager, Diode Division; EDWARD BROWDER, General Manager, Digital Products Division; MANUEL FERNANDEZ, General Manager, Transistor Division; and BRIAN SEAR, General Manager, Systems Technology Division . . . JERRY TAYLOR has joined Fairchild as Controller for International Operations . . . DENNIS PROUTY has been appointed Group Director–Industrial Relations for the LSI Group . . . JOSEPH CONSOLI has rejoined Fairchild as Analog Division Controller with overall responsibility for the Automotive and Analog operations. . . . WILLIAM BRASUELL has been promoted to Corporate Communications Manager, Management Information Systems . . . JUD MITCHELL has been appointed Group Controller for the LSI Group . . . MICK LIDDELL has been named National Sales and Marketing Manager for World Magnetics, a Fairchild subsidiary in Traverse City, Michigan.

A sign depicting the goals of the meeting appeared at the entrance to the Western Regional Black Engineering and Science Conference at an Oakland hotel.

ENGINEERING CAREER FAIR IN OAKLAND

Both products and employees of Fairchild were well represented at the Western Regional Black Engineering and Science Conference, held in Oakland, Calif., in mid-October.

Bruce Williams, an Analog Division products engineer, and Bill Harris, a Digital Division engineer, manned a booth featuring such Fairchild products as an F8™ microprocessor, an integrated circuit board and stereo and radio components.

In addition to the exhibits, the conference featured workshops on education and technical training for black students and science and black society.

The main thrust of the conference, according to Bruce, was to expose black students to engineering. "Many of the programs were aimed at graduating high school students in an attempt to make them aware of the employment opportunities in engineering."

Bruce Williams, Analog Division, answers questions on Fairchild and its products at the company's conference booth.

NEW HOME FOR CONSUMER PRODUCTS

The Consumer Products Group's new headquarters in Santa Clara is shown in an artist's conception. The building will be located in an industrial park a short distance from corporate headquarters. Occupancy is expected next year.

Ground was broken Nov. 8 in Santa Clara, Calif., for a new 150,000-square-foot home for the Consumer Products Group.

The administrative offices, finished product inventory and some manufacturing operations will be housed in the two-story Spanish style building on a 15-acre site in Oakmead Business Park. Occupancy is expected in 1977.

The Optoelectronics Division, which currently shares Palo Alto facilities with Consumer Products, will take over most of the space vacated by the Consumer move.

LEHIGH UNIVERSITY DEDICATES FAIRCHILD LAB

The Sherman Fairchild Laboratory, made possible by a grant from the Sherman Fairchild Foundation, was dedicated at Lehigh University in Bethlehem, Pa., on October 5.

The 16,800-square-foot facility consists of 12 labs, a classroom, an advanced undergraduate lab for special projects, 12 offices, a conference room and a computation room.

In addition to the laboratory, a grant from the foundation to Lehigh provides a substantial endowment for two faculty chairs in solid state studies, graduate fellowships, undergraduate scholarships, scientific equipment and a maintenance fund.

Representing the foundation at the dedication were Walter Burke, president of the foundation; Dr. C. Lester Hogan, Fairchild's Vice Chairman of the Board and a foundation trustee; and Melvin Steen, secretary and a trustee of the foundation.

Melvin said the foundation trustees approved the grant because of the completeness of the Lehigh program—including the professorships, endowments and scholarships—and because the program called for interdisciplinary activity.

"We at the Foundation feel that this laboratory becomes a fitting part of the overall memorial to Sherman Fairchild, constituted by the other buildings bearing his name at major institutions around the country," he said.

The 16,800-square foot Sherman Fairchild Laboratory for Solid State Studies was dedicated Oct. 15. Attending the dedication were Dr. C. Lester Hogan, Vice Chairman of the Board, Walter Burke, President of the Fairchild Foundation and Melvin Steen, Secretary and a trustee of the Foundation.

It may look like a pajama party, but these International Division people are at work providing customer service to overseas customers. The not-so-sleepy-heads are, left to right, Jean Windham, Erna Pena, Helen Nichols, Gerry Romano, Mickey Siemsen, Ramona Nogales, Edie Hamilton, Dorris Head and Betty Barber.

YES, WE HAVE OUR PAJAMAS

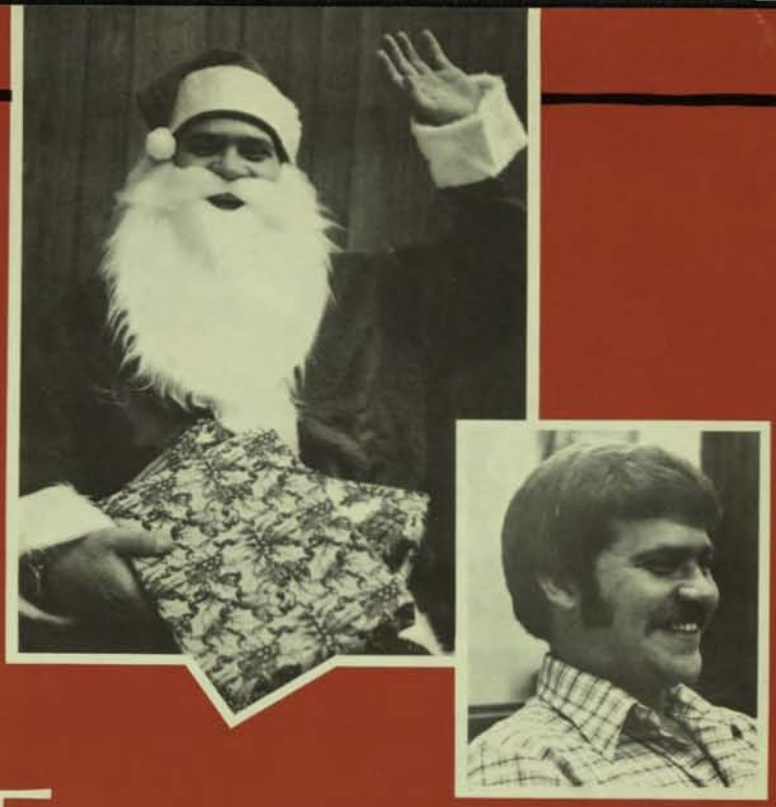
Should there be any early birds out catching the worms near Building 14 in Mountain View on a weekday morning, they're likely to bump into nine Fairchild employees beginning their work day.

The nine make up Fairchild's International Customer Service (Europe) Division, and their work day starts at 4:30 a.m., ending at 1 p.m. They work the odd hours to better service European sales offices. When they start their day here, it's 12:30 p.m. in Europe. Should the division start at a normal hour, the European offices would be closed.

The division helps with complaints and logistics from each of the regions, explains division supervisor Mickey Siemsen. "If there's a problem in terms of filling or shipping an order, we get behind the department involved and help solve the problem," she said.

Of course, the earlier start means an earlier lunch hour, but members of the division enjoy Mexican food, hamburgers and the like for lunch—even if lunch is at 6:30 in the morning.

The group's been working the early shift since may, and "we all love it," Mickey says. "It gives us better opportunities to shop, do more with our children and better pursue hobbies and outside interests," she said.



Bill Latapolski, IPD, prepares for his holiday rounds. (Inset, Bill before suiting up.)

THE SPIRIT OF GIVING encompasses all observances during this holiday season. Whatever specific customs we follow, we all share the holidays through gifts and gatherings with close relatives and friends.

Also at this time of year, many organized groups sponsor generous donations to people less fortunate than they. And the most gratifying holiday gestures often seem to be those that help children.

Bill Latapolski from Industrial Products Division in Commack, N.Y., is part of such an effort. In his spare time, Bill, who works in Receiving at IPD, is a volunteer fireman. Five years ago, Bill's volunteer group began visiting kids at three Long Island hospitals on Christmas Day. For Bill, who plays Santa Claus, it has become a tradition.

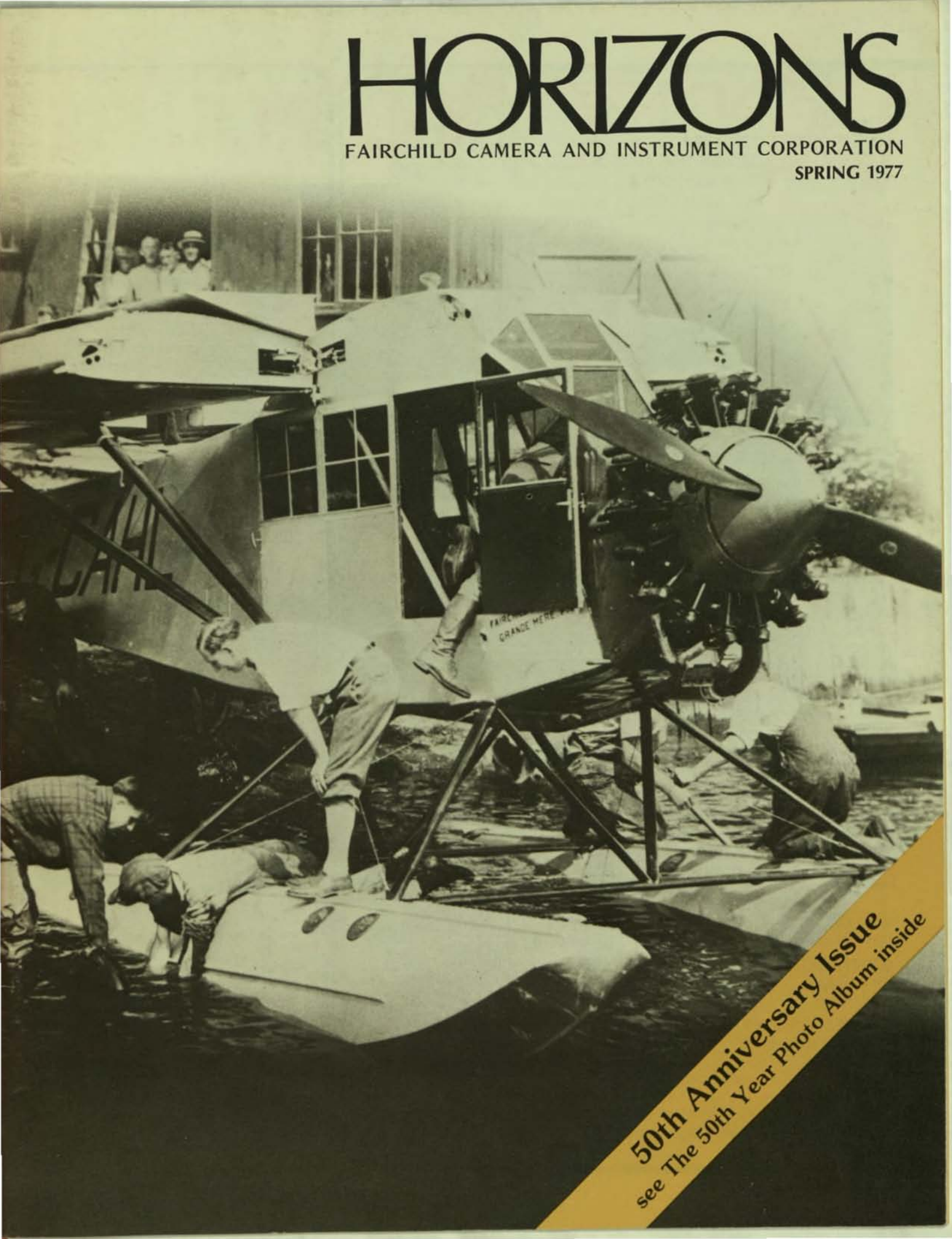
"We have a ball," Bill says. "Last year, we visited 47 kids. I don't know if they believe we're really Santa and his helpers – they're just happy to have someone come to visit."

The volunteer firemen hold fundraising drives so they can buy toys and candy canes for their young audiences. "The kids are unlucky enough to be in the hospital on Christmas Day," Bill says. "It's really sad to see them there, but our visit makes them happy for a little while. That's why I do it."

HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

SPRING 1977



50th Anniversary Issue

see The 50th Year Photo Album inside

HORIZONS

SPRING 1977

Airplanes, particularly those that could land on water, were a phenomenal sight in the Canadian bush country in the 1920s. Sherman Fairchild, founder of Fairchild Camera and Instrument, built the first plane that could navigate such harsh conditions. One of Fairchild's earliest airplanes is on display at the Smithsonian Institution's new Air and Space Museum in Washington, D.C. A story on that plane is part of this issue's 50th Year Photo Album, found following page 8, which commemorates our company's fiftieth anniversary.

Photo Credits: Photo, page 11 courtesy *The New York Times.* Photos, pages 9 and 11, Anniversary Section courtesy The Smithsonian Institution.

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Contents:

Departments

FAIRCHILD
CAMERA AND INSTRUMENT
CORPORATION

HORIZONS is published four times a year for the employees of Fairchild Camera and Instrument Corporation. Address all correspondence to Horizons, Corporate Communications Department, M.S. 20-2260, Fairchild Camera and Instrument Corporation, 464 Ellis Street, Mountain View, CA 94042.

Member, International Association of Business Communicators and Bay Area Society of Industrial Communicators.

RECORD SALES IN 1976

Fairchild reported its 1976 earnings Jan. 27, which included record sales and improved operating profits.

Sales rose 52 percent to $442,221,000, from the previous year's total of $291,542,000. Net income amounted to $12,456,000, or $2.27 per share, compared with $10,424,000, or $1.94 per share, posted in 1975 prior to an accounting change.

In 1975, the company reported additional income of $2,649,000, or 51 cents per share, as the result of a change in accounting method. This brought total earnings to $13,073,000, or $2.45 per share in 1975.

Fourth quarter earnings rose significantly over performance in the comparable 1975 period. Net income was $5,158,000, or 94 cents per share, up from year-earlier income of $1,165,000 or 21 cents per share.

Sales in the fourth quarter climbed 46 percent to a quarterly high of $118,687,000, compared with $81,368,000 in the 1975 quarter.

Fairchild achieved improved operating profits despite the softening of the economic growth rate which affected company markets during the second half, according to Wilfred J. Corrigan, President.

"We expect 1977 to be a good year for all major product categories," he said. "In line with industry projections, we believe demand will resume its uptrend in the spring."

NEWSCLIPS

GILPATRIC TO RETIRE, CORRIGAN TO BECOME BOARD CHAIRMAN

Roswell L. Gilpatric has announced his intention to retire as Chairman of the Fairchild Board of Directors after the annual shareholders' meeting May 6. He will be succeeded by Wilfred J. Corrigan, President and Chief Executive Officer, who will retain his present title. Mr. Gilpatric, who became Chairman in 1975, will continue to serve as a company director. A former Deputy Secretary of Defense, (1961-1964), he is managing partner of the New York law firm of Cravath, Swaine and Moore.

STOCK LISTED ON LONDON EXCHANGE

Fairchild common stock was approved Feb. 2 for trading on the London Stock Exchange. Actual trading began Feb. 3.

"Listing of our stock on the London Exchange reflects both the strong interest in our company in Europe and the rapid growth of our international business during the past five years," said Fairchild President Wilfred J. Corrigan. European sales in 1976 were $72,294,000, 16 percent of the company's total sales for the year.

Fairchild stock is listed on the New York Stock Exchange and traded on regional U.S. exchanges. There are approximately 5,350,000 shares of Fairchild common stock outstanding, held by some 10,500 investors.

FEDERAL SYSTEMS RECOGNIZED FOR INDUSTRIAL SECURITY

Fairchild's Federal Systems Group, Syosset, N.Y., has won the Defense Department's James S. Cogswell Industrial Security Award, given in recognition of sustained outstanding performance in administration of government security standards.

The selection was made from a total of more than 11,500 industrial firms working on Defense Department contracts. Firms are judged on security consciousness, employee security education and security practices. Fairchild previously received Cogswell awards in 1968 and 1973.

Gerald A. Sweeney is Director of Security and Safety at FSG. He is assisted by Ruth Baumgardt and Pat Landrigan.

FAIRCHILD RECOGNIZED FOR EEO, SAFETY PERFORMANCE

Dreyfus Third Century Fund, a New York City-based investment firm, has rated Fairchild first in equal employment opportunity and second in job safety of 22 instrument and electrical equipment companies evaluated. As such, Fairchild is now an approved investment for mutual fund customers in the Third Century Fund.

In notifying Fairchild of the action, Dreyfus said, "It is always a pleasure to inform a company that it is a top performer in its industry."

4K DYNAMIC BIPOLAR RAM ANNOUNCED

A new dynamic bipolar 4,096-bit random access memory faster than the highest speed MOS 4K memory has been announced by the LSI Group. The new RAM is designed to meet high-performance low-cost memory requirements using a single five-volt power supply. Prices are competitive with MOS memories.

The design uses Fairchild's exclusive Isoplanar Integrated Injection Logic (I^3L™), and is a direct lead-in to a 16K bit bipolar memory, according to Dr. Thomas Longo, Vice President and Chief Technical Officer. The 16K RAM will be available during the second half of 1977.

DATA WORKS INSTRUMENTATION JOINS FAIRCHILD

Fairchild has announced the acquisition of Data Works Instrumentation, Chatsworth, Calif. The company manufactures microprocessor-based data acquisition and analysis instruments used in solar, environmental and process industries.

Data Works has been renamed Fairchild Instrumentation and will be part of the Instrumentation Unit, Instrumentation & Systems Group.

IN MEMORIAM

Friends and associates of Raul Pitchon were saddened to learn of his death January 6. Raul joined Fairchild in 1975 as Assistant Treasurer, and later that year was elected Treasurer, reporting to James A. Unruh, Vice President - Treasury and Corporate Planning.

He was a graduate of the University of Buenos Aires, and held a master's degree in business administration from Stanford University. Raul is survived by his wife, Marjorie, and two children.

Banking from a Grocery Cart

TRW's EFT Terminals use Fairchild Chips, Displays

Elsie Williams, Glendale Federal Savings customer, waits with identification card in hand to electronically charge groceries to her Glendale account. While a checker scans her card and records the transaction, Elsie will punch a secret code number on the EFT terminal.

When is your supermarket not a supermarket? When it's your bank or savings and loan.

Before long, you may be depositing money, making withdrawals and paying bills as well as buying groceries at your neighborhood market. Your financial transactions will be as simple as E F T . . . electronic funds transfer, the latest development in the trend toward a cashless society.

Banks have been handling money electronically among themselves for years, but the idea is just now being introduced to the consumer by companies such as TRW Data Systems, Hawthorne, Calif., a longtime customer of Fairchild.

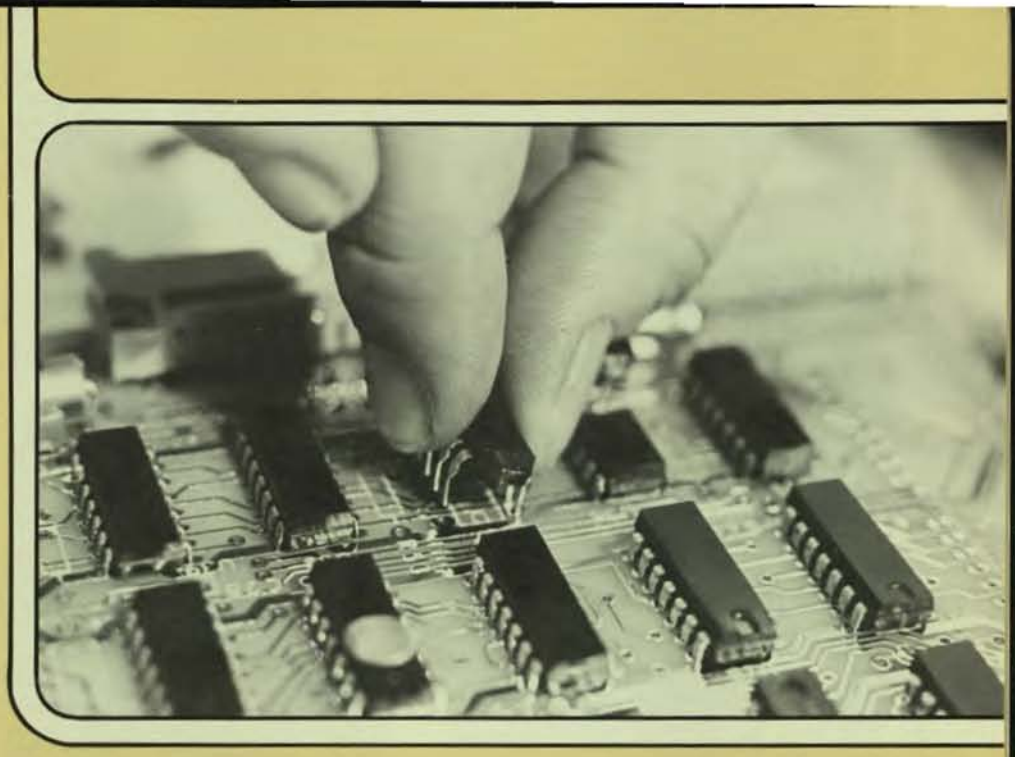
TRW Data, has been a leader in credit verification systems, those handy computers that say yes or no to checks and credit cards in a matter of seconds. The company has now developed a point-of-sale terminal which replaces the familiar clang of the cash drawer with soft electronic beeps as it records sales transactions, instructs clerks via video screen, prints receipts and records information for inventory control.

EFT is the most recent outgrowth of TRW's expertise in the retail/financial hardware that brings customer, store and bank together at the same instant. But if that conjures up visions of flashing lights and "mad scientist" controls, TRW's electronic funds transfer terminal will be a disappointment. It's about as flashy as a bread box and about the same size. There's a small customer keyboard on one side and another on the checker's side, with a digital read-out.

The excitement is *inside* the terminal, with its seven circuit boards and hundreds of electronic components, including Fairchild's TTL logic chips and LED digital displays.

TTL (transistor-transistor logic) chips, made by Digital Products Division, Mountain View, control the calculations and record-keeping functions of the terminal. They are capable of making a "yes-no" decision in five billionths of a second.

The Optoelectronics Division located in Palo Alto, produces solid state Light Emitting Diode (LED) seven-segment displays. These LED displays emit light when an electric



The TTL logic circuit is a tiny element with a big job. Here, it's being inserted into the terminal's Magnetic Stripe Card Reader assembly, where it will help check a customer's I.D. card before approving a transaction.

current of only a few milliamps is applied to it. By selectively lighting up the seven segments, the numbers 0 to 9 may be displayed. Solid state technology, coupled with volume production, produces a display with theoretical lifetimes in excess of one million hours at extremely low cost.

"We've used Fairchild components in most of our electronic financial hardware," says Bill Ryan, TRW Data's director of production operations. "Fairchild's performance has been good. They're one of the top semiconductor houses and, of course, they're price competitive. But more than that, they always work with us to solve problems. You can't put a price on that kind of relationship."

Because of that relationship, there's a little bit of Fairchild at Smith's Food King supermarket in Manhattan Beach, Calif. where Glendale (Calif.) Federal Savings has installed TRW's first EFT supermarket terminals.

Before terminal installation in 1976, Glendale issued special identification cards to its customers. Each customer also chose a four-digit code number or word. At Smith's, the customer presents the Glendale card to the checker and punches a secret code word or number on the terminal's private customer keyboard. The checker passes the card through a magnetic scan at the bottom of the terminal and enters the amount of the transaction.

The whole thing takes a few seconds. In that time, the customer may deposit savings to his Glendale account, cash a check or simply credit the grocery bill against the account with no money changing hands.

EFT offers benefits to everyone concerned. It eliminates credit risk and bouncing checks for the store. It helps the bank or savings and loan attract customers and begin to burrow out from under the avalanche of checks handled by U.S. banks every year—there were 36 billion processed in 1976 alone.

Customers enjoy convenience, 24-hour banking and a greater sense of security, since the probability of someone stealing an EFT identification card and guessing the right code word is negligible.

Elsie Williams, a Smith's customer and EFT cardholder, has used the system for about four months. "It's very convenient and I feel safer not having to carry cash," she said. "But after seeing the story on these systems on 60 Minutes (the CBS television show), I worry about my privacy. Those computers can find out everything about you . . . nothing's secret anymore."

Mrs. Williams is not alone in her concern. An electronic invasion of privacy is a growing issue as more and more personal financial information is pumped into . . . and out of . . . computers each year. Financial institutions installing EFT systems are attempting to design use procedures that will safeguard customer privacy.

The privacy problem is just one that may impede the rapid expansion of EFT systems. Another is the lack of float time between transaction and actual payment of funds. EFT works in real time . . . payment is instantaneous. There's no grace period to "get to the bank" or "make it to payday."

EFT systems have run into legal difficulties, too. In many areas, banks have installed automatic teller machines which offer many of the bank's services 'round the clock. The idea is to offer the convenience of branch banking without the additional branches. But courts in several states have said a branch by any other name is still the same . . . and subject to rigorous location restrictions. The Continental Bank of Chicago recently closed down a group of automated teller machines after they were declared illegal branches under Illinois law.

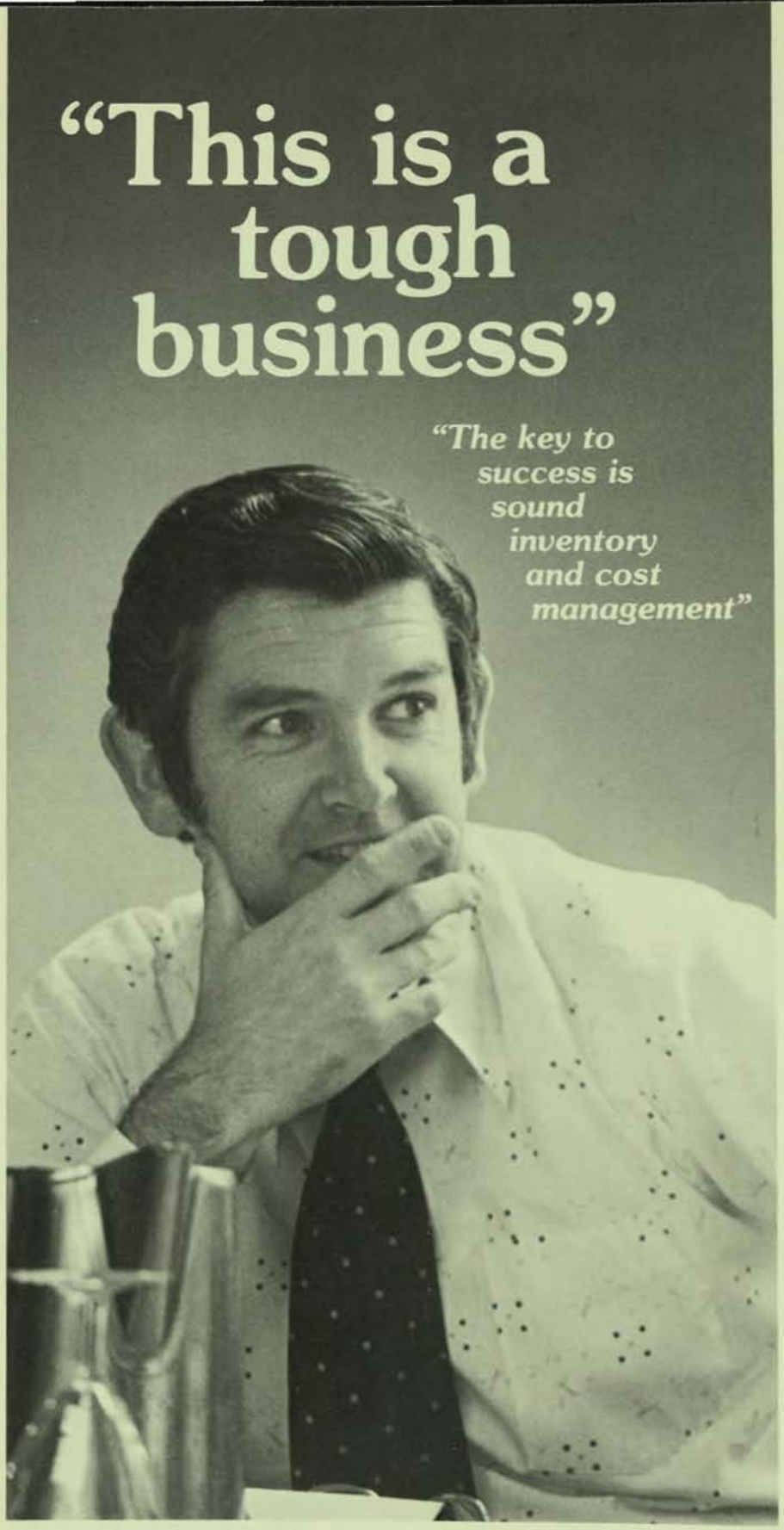
Still another problem, at least in the introductory phase of EFT systems, is expense. The Bank of America recently reported that the cost per transaction with a network of automated teller machines would be $1.25, compared to 40¢ per transaction with "real people" tellers.

But the people at TRW feel that the problems with EFT are like those of introducing any new concept and that legal barriers and consumer concern over privacy will soon be resolved.

"Now that the technology's here, acceptance won't be far behind," Bill said. "After all, just 15 years ago, everybody was worried about bank credit cards!"

So watch for EFT in your local supermarket . . . and get ready to write a new kind of grocery list: "Eggs, milk, bread, savings deposit . . ."

"This is a tough business"



When George Wells picked up the paper one Sunday in 1960 and saw that a large U.S. electronics company was interviewing in London for engineers, he jumped on the next train there from Glasgow, Scotland, got to the interview and was hired in ten minutes.

That was the beginning of a career in electronics that eventually brought George to the helm of Fairchild's Components Group. George came to Fairchild from Sylvania in 1969, and served as General Manager of the Transistor and Diode Divisions and the Analog and Discrete Products Group before assuming his present position as Vice President and General Manager of the Components Group in 1975.

A native of Scotland, George says he came to the United States in search of better research opportunities in crystal physics. He was working on a Ph.D. in nuclear physics at Glasgow University at the time of his transatlantic move. Eventually, he became involved in manufacturing, and came to Fairchild in 1969 as a product manager in the Transistor Division.

In this interview George discusses the performance of the Components Group, its growth and problem areas, and his outlook for 1977.

Was 1976 a good year for the Components Group?

It has been a healthy year for us. The group exceeded overall 1976 industry growth performance.

We've had excellent growth in the Analog Division, particularly in Europe where we are the major U.S. supplier of PAL television circuits, the primary broadcast circuits used in most of the world outside this country. The voltage regulator business has also been strong, partially due to demand from CB radio manufacturers. In another area, our Automotive Unit did a superb job of boosting our sales in the key electronic ignition customer market segment.

In the Transistor Division, power transistors have shown good growth,

George Wells Talks About the Ups and

and our market position in Diode Division products across the board continued to show significant improvements this year. In each of those divisions, we have beaten the industry figures.

It's been a year of great personal satisfaction for me, because the product divisions and Manufacturing Services all cooperated to meet our specific and overall goals. This is a tough business, so I'm delighted to have exceeded the industry norm.

Unfortunately, one of our cylinders —the Digital Division—is misfiring. After operating to planned profit projections in the second quarter, the general economic lull affected sales, and we missed our profit targets in the second half.

What are your plans to improve Digital Division performance?

It's a case of being able to take full advantage of product superiority and gearing ourselves to a level where we can continue to be sufficiently profitable regardless of what the world economy can throw at us.

We have the best reliability in the industry in our CMOS parts (complementary metal-oxide semiconductor parts). Our low-power Schottky chips are also the fastest devices on the market for logic applications (for computers and related equipment).

Our major effort in digital this year is to achieve necessary cost reduction. I'm optimistic about the outcome, because we're attacking the cost problem the same way we handled a similar situation in the Transistor Division two years ago. We went to work on high costs and quality, and today we're back gaining market position with our transistors. That's what we are going to do with Digital.

George was a Ph.D. candidate in nuclear physics when he left his native Scotland in 1960 to pursue his career in the United States. He recalls that it was just by chance he picked up a newspaper announcing job interviews by the company that hired him shortly thereafter.

A semiconductor executive recently described the last year's first quarter bulge in sales followed by less demand later in the year as an "if you think you can get parts, you don't want them" attitude. Do you agree?

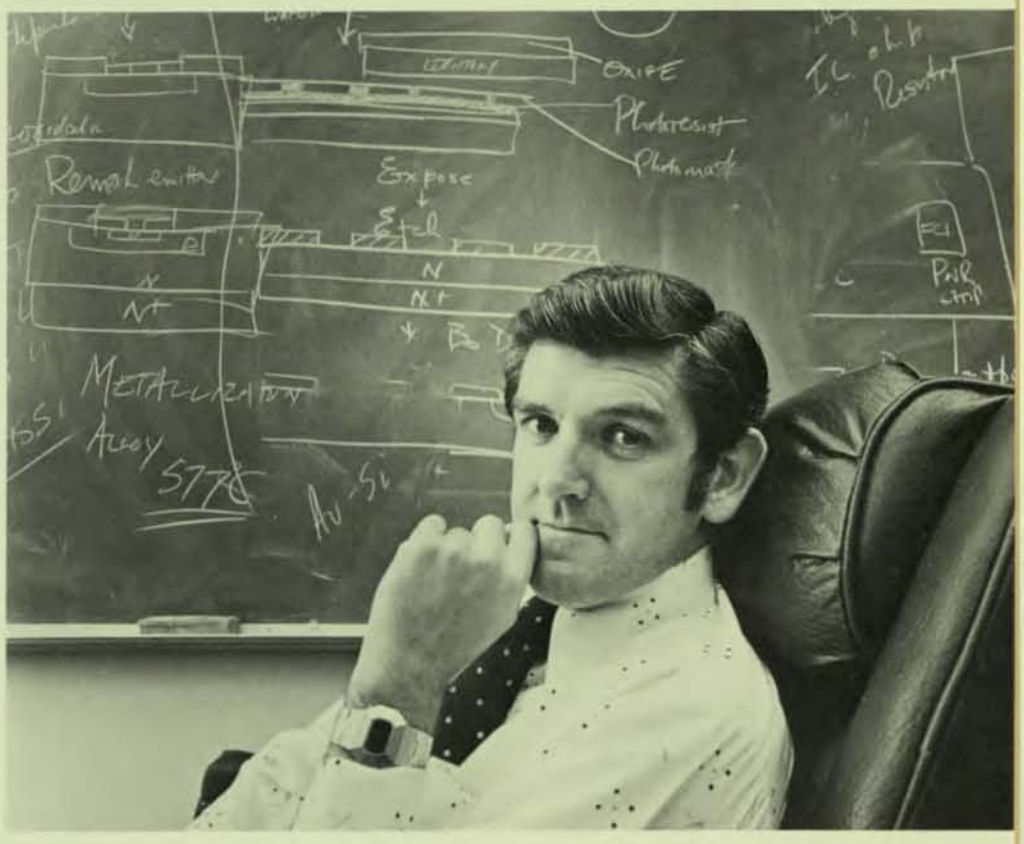
There's no question about it. The attitude early in the year was "happy days are here again." Our sales jumped a phenomenal 20 percent from the fourth quarter of 1975 to the first quarter last year. Distributors remembered how difficult it was to get parts during the last period of high demand, so they started placing a lot of orders.

The OEM's (original equipment manufacturers) were a bit more cautious. They decided not to double and triple order, but to get most of the products they needed through distributors. As a result, the tidal wave that was supposed to happen in the last half of the year was a mere ripple on the pond.

What can you do to improve shipments when there is a slow growth in demand?

If the market is growing, as it is with the Analog business, and you have a reputation as a good supplier, you invest money in ongoing new product development and your business will grow as the market grows—particularly if you can offer a technically superior product.

If you're dealing with a mature product line, or one that is declining, you must constantly reduce costs to maintain or build up your level of business. A good example is the diode market—its growth has leveled off, but our Diode Division just keeps getting more and more of the market every year, because we know how to build the product reliably and we can continue to keep our costs in line.



Downs of the Components Business.

The Global Logistics Program was instituted last year. Why was it started, and what have the results been?

The key to success in the components business is sound inventory management combined with stringent cost reductions. This is assuming of course that quality and service are competitive. We started the GLP to get products out the door faster, and we doubled our inventory turns last year. (Inventory turns are determined by measuring total products in inventory on a given date, then determining how long it takes to sell that volume of products.)

A major portion of this improvement was achieved by consolidating our distribution areas. Products now are shipped from Mountain View and two final test locations in the Far East—Hong Kong and Singapore. Previously, testing and shipment were done at separate locations for some products, which meant we had a lot of inventory in the air going between Fairchild locations instead of going to the customer.

Hong Kong functions as the collection and distribution point for discrete products, and Singapore for integrated circuits. We serve U.S. distributors through our Mountain View center.

The Global Logistics Program is part of the Manufacturing Services Division, and I can't talk about the Components Group's success without giving this division a large share of the credit.

After all, without silicon fabrication, plating and our Far East assembly plants, our other divisions couldn't function as profitably as they do.

The "after market," or consumer part of the ignition system business was sold late last year. How will this affect Fairchild's position in this market?

It will help it. Every year, we sit down and ask, "What are the new products going to be this year?" I think it's also important to ask what products aren't pulling their weight, and are using resources and staff support that could be applied elsewhere.

That's what happened with the end-product ignition system we had. We had not been successful at marketing the product, although we had tried a number of channels. When we sold it, we also got a new customer. Mallory Electric, the new owners, now want us to supply them with the semiconductor components that go in the system. On top of this, our engineering and manufacturing people gained a great deal of experience that we can now channel into the remaining product lines.

This has put the Automotive Unit in a better position to perform their primary function—supplying ignition systems to major automobile manufacturers. This market has shown excellent growth, and it could really balloon.

How do you feel about the new emphasis at Fairchild on consumer products?

I think the more vertical integration into end products that we do, the better. First, it provides more business for the Components Group. The Consumer Products Group peak demand period for our products comes in the summer and early fall, usually a slow time for us. That same principle applies to our customers. Our slow sales periods are typically times of higher demand by Consumer's customers. Secondly, we can enjoy a higher markup on the end product than on the component.

The basis for our success in the consumer area is our strength in semiconductor technology. We've stayed in the consumer business, when some of our competitors have retired from the scene primarily because of Fairchild's excellent marketing effort. Nevertheless, without our semiconductor technology and low-cost assembly capability, I doubt that Fairchild could have emerged as one of the world's leading digital watch manufacturers within one year of startup.

Showing top form, George assists his teammates on the Aftershocks, a booster club group for the San Jose (Calif.) Earthquakes soccer team, in a hard-fought match.

FAIRCHILD

The 50th Year

PHOTO ALBUM

50 Years at Fairchild

Sherman Fairchild's between-the-lens shutter made aerial photography practical for the first time, but he couldn't interest anyone in manufacturing it. So in 1919, he opened his own camera manufacturing operation in the loft of a garment factory on New York's East Side.

IT WAS A CLASSIC CASE OF THE CHICKEN AND THE EGG. In 1919, Sherman Fairchild had invented a fast, efficient between-the-lens shutter and timing mechanism for handling roll film, making accurate aerial photography possible for the first time. Since aircraft of the day weren't sophisticated enough to use the full capabilities of his new aerial camera, Fairchild designed his own airplane. Just eight years later, the Fairchild Aerial Camera Company and Fairchild Aviation became The Fairchild Aviation Corporation. The year was 1927. This year, that company, which was later renamed Fairchild Camera and Instrument Corporation, celebrates its fiftieth birthday.

In this anniversary photo album, we're recalling some of the highlights of our company's evolution from the barnstorming days of aviation to the forefront of the second industrial revolution. Join us!

The winged horse dominated Fairchild's first logo.

COMPANY HISTORY

Fairchild Camera and Instrument Corporation's history represents more than a half century of technical and business innovation.

In both size and product mix, Fairchild has dramatically changed from its origins as a supplier of aerial cameras and aviation equipment. Fairchild has grown from the manufacturer of a single product—an aerial camera—to a multi-division corporation. Although some of the company's product lines still retain strong links with the past, approximately 70 percent of the corporation's sales today is derived from semiconductor components.

Not exactly as easy to handle as today's pocket camera, the early aerial camera worked because it combined a long enough focal length with Fairchild's new shutter, capable of a shutter speed of $^{1}/_{1000}$ of a second.

Aerial Cameras

Where It All Began . . .

Fairchild's flagship product, the aerial camera, has made quiet, but nonetheless spectacular progress since its inaugural flight in the twenties. Ninety percent of all aerial cameras used by the Allies in World War II were of Fairchild design or manufacture. When the United States set out to explore the moon in the early 1970's, the Fairchild aerial camera was there to record it.

Still the leaders in the military reconnaissance market, most Fairchild cameras of today photograph from horizon to horizon at high aircraft speeds. They produce high quality imagery from a range of a few hundred feet to several miles.

Early aerial cameras operated on basically the same principle as does your family camera—they recorded a small scene with fixed optics. Major advances have occurred since that time in film, lenses and equipment designs.

Sherman Fairchild, right, readies one of his first cameras for a flight.

This jovial flight crew had more cabin room and a smoother ride in Fairchild planes than in earlier aircraft. Airplane stability also eliminated most of the picture distortions caused by rocky rides in less sophisticated aircraft.

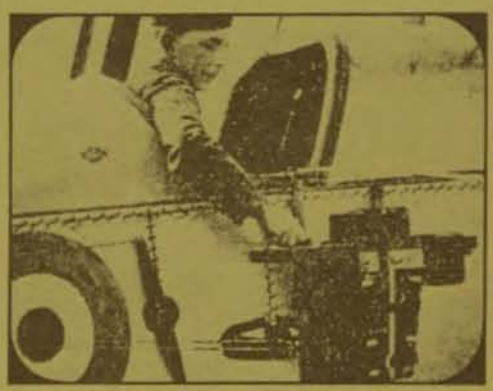
A significant innovation in camera design occurred in the early 1960's with the introduction of the panoramic camera principle in which a rotating optical prism was mounted in front of the lens and the film moved in synchronization with the image during picture taking. This made it possible to obtain 180 degree—horizon-to-horizon photography at the rate of six photographs per second.

The camera is compact and lightweight and its inherent features permit much better performance and coverage than the previous frame cameras. This type of camera was developed just before the Cuban missile crisis, and provided the military services with valuable information during that period.

Al Arena, Manager of Photo Systems for the Imaging Systems Division in Syosset, has been a part of the development of aerial camera technology at Fairchild. One of the company's longest-service employees, Al joined the company forty years ago when the primary business was manufacturing cameras. Though Fairchild grew into a multi-division company with a wide variety of products, Al elected to stay with camera development, which he now heads.

"With the panoramic camera," Al points out, "we get excellent photography with tremendous coverage at high speed. Reconnaissance photos are able to cover a large area with a lot less film and in a lot less time than with framing cameras. In a military situation, where photographing the target on the first pass is critical, the advantage of the panoramic photograph is obvious."

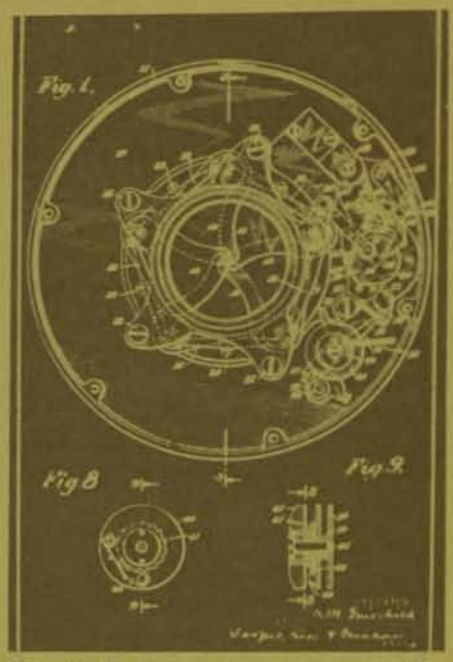
Rented planes such as this were used for early aerial survey flights. Because aircraft of the day couldn't take full advantage of his camera's capabilities, Sherman Fairchild began designing his own in 1924.



Fairchild cameras first saw military duty in World War I. The camera was mounted on the outside of the fuselage so it could be operated by the pilot.

50 Years at Fairchild

A millionaire in his early twenties because of his father's early ownership of the fledgling IBM, Sherman Fairchild turned several of his inventions into successful business ventures of his own.



Fairchild's first major success was the between-the-lens shutter, which could take a picture in 1/1000 of a second. It was the first shutter to operate fast enough to take good aerial photographs without destroying the camera. The patent Fairchild received on this invention was the first of more than 30 patents he received during his life.

One basic characteristic instilled by the company's founder, the late Sherman Mills Fairchild, remains: Fairchild Camera has traditionally and consistently been at the forefront of technically-oriented endeavors.

Sherman Fairchild's first independent corporate undertaking—from which Fairchild Camera and Instrument Corporation evolved—occurred in 1920 with the incorporation in New York of Fairchild Aerial Camera Corporation.

The company's original business primarily involved developments based on Sherman Fairchild inventions. Foremost among these were the between-the-lens camera shutter, which made aerial photography practicable; the closed-cabin airplane; the folding-wing airplane; and hydraulically operated aircraft brakes and landing gear.

The various businesses which were the outgrowth of Fairchild Aerial Camera Corporation were incorporated in November of 1927 as Fairchild Aviation Corporation.

As the business continued to grow, Sherman Fairchild in 1936 spun off the aircraft and engine manufacturing operations into a separate company, now known as Fairchild Industries (previously Fairchild-Hiller Corp.).

The aerial camera and other electronics-oriented segments of the business continued as a separate entity, and in 1944 were renamed Fairchild Camera and Instrument Corporation.

Although based in New York at the time, what is probably Fairchild Camera's most historic business development occurred in California in 1957 when the company sponsored a group of young scientists involved in solid-state electronics. This group became the nucleus of Fairchild Semiconductor.

Aerial Cameras

Where It All Began . . .

Fairchild Camera and Instrument Corporation designed or manufactured ninety percent of all the aerial cameras used by the Allies during the second world war.

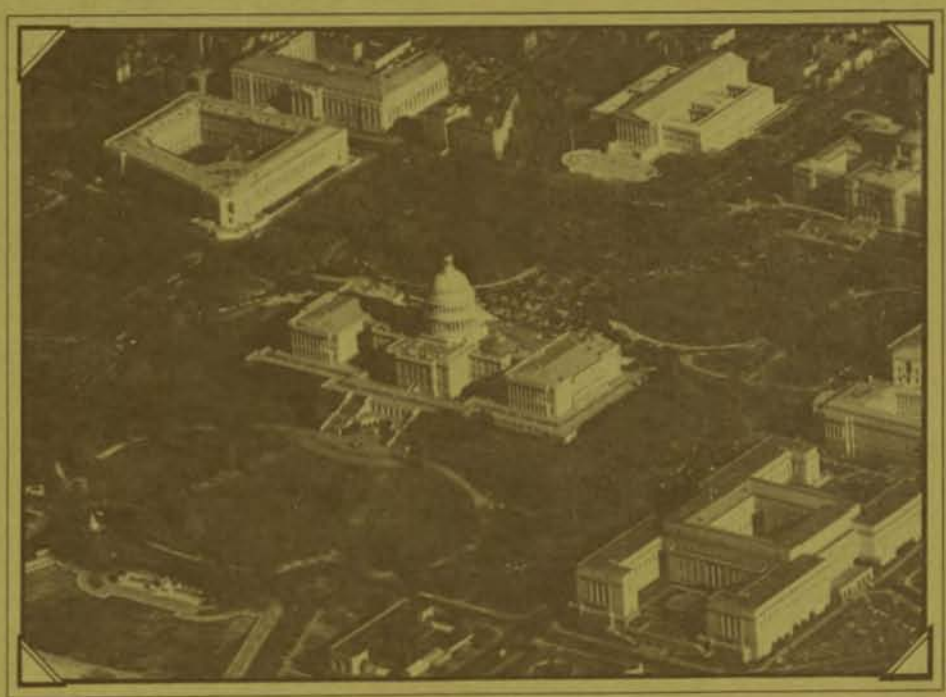
Unlike the hand-held model Sherman Fairchild first exhibited, modern-day aerial panoramic cameras can weigh as much as several hundred pounds depending on the focal length and film capacity. Lens focal lengths have typically been relatively short, averaging three to nine inches for low altitude missions and 24 inches to 48 inches for high altitude missions. Currently, however, the emphasis is on developing even longer focal length cameras which will enable the user to photograph fine detail at long "stand-off" distances from the aircraft.

"We're developing what we call Long Range Aerial Photography (LORAP), which will include a lens with a focal length of up to 72 inches," Al says. "The challenge in aerial photography is to design equipment that can accurately photograph the earth at the highest possible altitude."

Imaging Systems still manufactures the original framing-type camera for some applications, and it was this camera that went to the moon. Three Lunar Mappers, as the cameras were called, made various Apollo program flights.

More compact and lightweight than its forerunner, today's aerial camera can capture horizon-to-horizon shots at six photographs per second. Al Arena, Manager of Photo Systems for Imaging Systems Division, has been developing aerial camera technology for nearly all of his forty years at Fairchild.

This 1921 picture of the New Jersey shore was the first aerial photograph ever sold by the Fairchild Aerial Camera Corporation. The camera's altitude (about 1,000 feet) and grainy photo appearance are in sharp contrast to the 1975 photo shown below.



Capitol Hill and the surrounding Federal buildings are sharply defined in this 1975 aerial photo, even though the picture was shot from an altitude of 10,000 feet and a slant range of 4¼ miles.

"NASA needed a metric camera system that could photograph the moon from space and also take a position reference with the stars," Al says. "So we developed essentially two cameras in one, which simultaneously photographed the moon and surrounding star field, enabling NASA to precisely locate moon features in the photographs through time measurements and star positions. We sent three cameras up, and they all were successful."

Breaking new ground is never without its snags, of course, and one of Al's recollections of Sherman Fairchild involved an unsuccessful attempt to ignore one of these snags.

"He was a very bright guy," Al recalls, "and it was tough to get imperfections past him. Once we were giving him a review of our products, and I had included a photo taken by one of the first panoramic cameras. There were some markings in the photo because the film hadn't been properly synchronized with the optics, but it was the only example of the camera's photography on hand, so I showed it anyway. I tried to play it down, but he took one look at it and told me what the problem was. He was very capable that way."

Irving Doyle, recently-retired Federal Systems Group Technical Director, echoes Al's recollections. Irving, who was with Fairchild 41 years and holds numerous patents for his work in aerial photography, recalls that he and Sherman Fairchild "were both impatient when the technology of the day didn't provide the instrumentation necessary to carry out our ideas. What started as gadgets sometimes resulted in technological breakthroughs."

50 Years at Fairchild

Fairchild Semiconductor, like its parent corporation, also was founded on the basis of a technological breakthrough. In 1957, a group of scientists and engineers developed a method of mass-producing silicon transistors using a double diffusion technique and a chemical etching system called the "mesa" process. Enormous business potential existed, but financial backing was needed. Fairchild Camera and Instrument was willing to invest, and Fairchild Semiconductor was born.

The new company, profitable in only six months, has continued since its inception to be a leader in technology. In fact, Fairchild Semiconductor, now the Components and LSI Groups, has been the spawning ground for much of today's semiconductor industry.

In 1959, Fairchild announced the development of the Planar* process, in which all diffusions are made under layers of pure silicon dioxide, ensuring that critical semiconductor junctions are never exposed to surface contamination. As a result, all semiconductor electrical characteristics that are sensitive to surface conditions are stabilized and improved.

Fairchild's Planar process paved the way for such technological advances as the integrated circuit. Today, almost all semiconductor devices are manufactured by the Planar process under licensing agreements with Fairchild.

Fairchild holds numerous patents in every field of semiconductor technology, and has never lost the leadership established by the development of the Planar process. Among other significant developments, Fairchild was the first to develop the use of diffusion techniques for isolating integrated circuit components on a circuit chip. The company also holds the basic patents on the metal-oxide-semiconductor (MOS) process for making transistors and integrated circuits, and developed

This digital watch advertisement was one of the first to introduce Fairchild consumer products in 1975. The Consumer Products Group brought out men's and ladies' LED watches that year, and has since added LCD watches, a programmable television game and digital clocks.

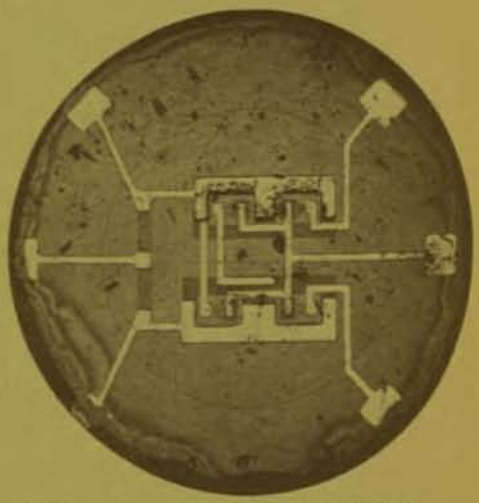
*Planar is a patented process of Fairchild Camera and Instrument Corporation.

Since its entry into the semiconductor industry Fairchild has been an undisputed technological leader. The very origin of the semiconductor operation was based on a technical development—the mesa process for mass-producing silicon transistors. Soon after entering the infant semiconductor industry Fairchild scientists invented and perfected the Planar process—still the basic process used for making the majority of semiconductor devices.

Over the years Fairchild has contributed many technical breakthroughs, and this leadership continues today. Just recently Fairchild introduced a combination of its Isoplanar processing techniques with integrated injection logic that is already being used in the world's fastest high-density memory—a 4,096-bit bipolar memory based on this process, called I²L.™

Semiconductors

An Electronic Revolution . . .



This resistor-transistor logic (RTL) product, introduced in 1961, was the semiconductor industry's first integrated circuit available as a monolithic chip.

In the consumer market, Fairchild quickly established itself as one of the world's leading suppliers of solid-state watches, and is now supplementing that effort with the introduction of the world's first programmable home video game.

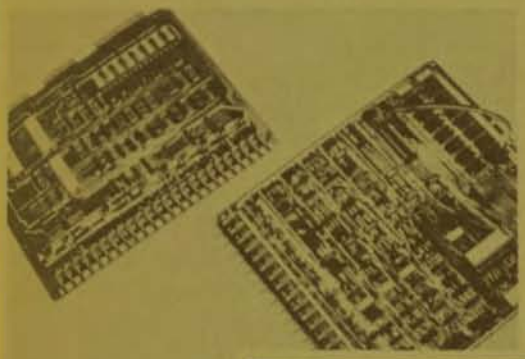
The internal structure of a digital watch is a good example of the power of solid-state technology to simplify and increase the reliability of a countless range of products that previously were based on mechanical components or combinations of electrical and mechanical parts. After 2½ centuries of development and refinement, the mechanical watch today remains a complex assembly of numerous finely machined parts compared with the simplicity of the electronic model.

It is this type of simplification of design, with the related increase in reliability and decrease in cost, that enabled the semiconductor industry to grow from infancy to a multibillion dollar worldwide industry in less than two decades.

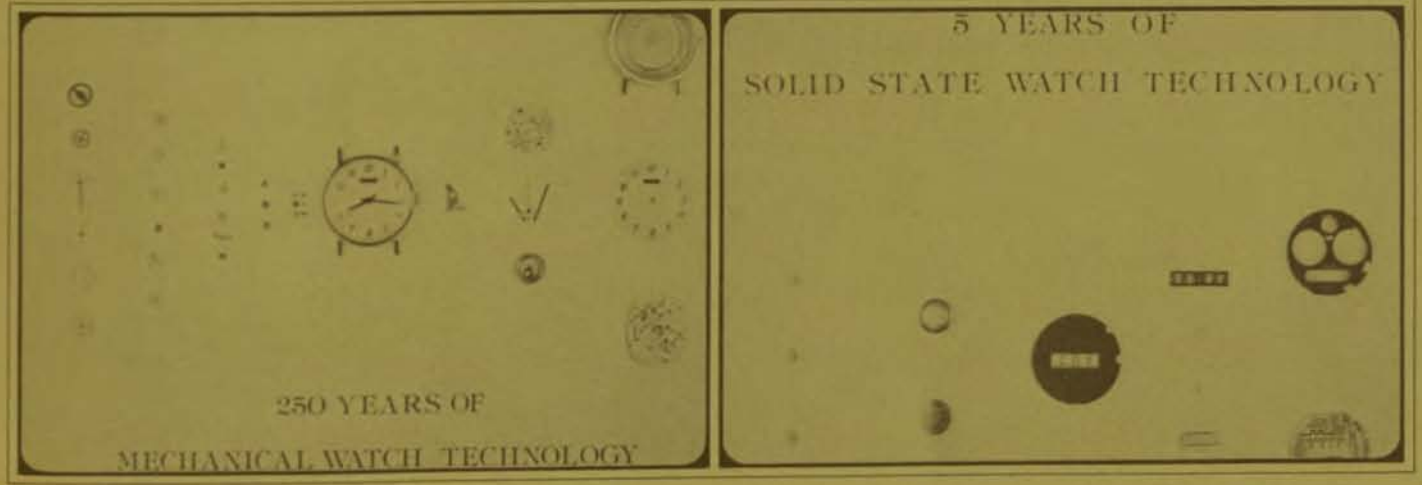
For the last year or so, much of the development effort in the industry has centered on a "mysterious" group of products known collectively as the microprocessor. Essentially, all a microprocessor really amounts to is a small but powerful computer system built into one or more tiny "chips" of silicon. Yet, for the first time, these highly complex integrated circuits offer users a solution to a wide range of equipment requirements, using solid state devices that are extremely low in cost.

They are inexpensive because they can be built in very high volume to meet a wide range of needs simply by changing the programming information stored in other memory circuits associated with the microprocessor or "microcomputer" chips.

Fairchild has established a strong position in this new field with its F8™ microprocessor design, which offers a very low cost



The IBM 701, below, was the world's first commercially available computer. Introduced in the mid-1950's, it sold for $1 million. Fairchild's F8 microprocessor, shown at left in a two-board configuration, has the same information handling capabilities as the entire 701 system. The F8 was introduced in 1975.



Though conventional mechanical watches have been around for hundreds of years, they still contain the numerous complicated parts shown at the left. The digital watch components at the right show the capability of solid state technology to simplify products previously based on electrical or mechanical parts.

50 Years at Fairchild

the silicon gate technique for making MOS devices smaller, faster and more economical. Today, the company ranks as the third largest U.S. supplier of semiconductor devices.

In 1975, Fairchild entered the consumer electronics field with the formation of the Consumer Products Group and the subsequent introduction of a full line of electronic digital watches. By 1976, Fairchild had become one of the largest digital watch companies in the world, and had expanded the consumer line to include digital clocks and the first programmable electronic television game.

As the pervasiveness of electronics, particularly semiconductor technologies, has increased during recent years, Fairchild Camera has steadily adjusted its operations to serve growing computer, industrial and consumer markets.

The company has manufacturing facilities in five states and nine foreign nations, plus a worldwide sales and distribution network. Fairchild manufacturing and sales activities are divided among seven domestic and foreign groups and divisions.

In 1968, Fairchild's corporate headquarters was moved to Mountain View, California from Syosset, New York.

answer to many designers of industrial, commercial and consumer systems. In fact, the F8 microprocessor is the heart of Fairchild's own video game system.

The cost of the microprocessor is so low that it can even be used in home appliances such as washing machines and ovens. The illustration of a typical washing machine control panel may be familiar to any "do-it-yourself" repairman who has encountered trouble with such a system. Yet all of these complex mechanical timers and relays, with their associated knobs and switches,

Semiconductors

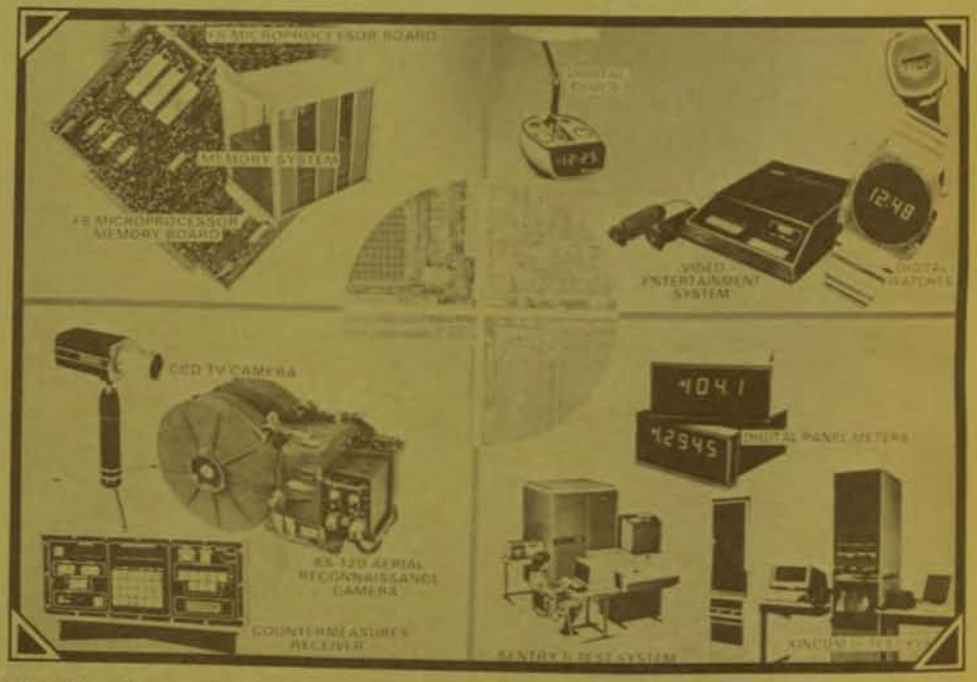
An Electronic Revolution . . .

can now be replaced by one F8 circuit and a few other semiconductor components. And, since all of these parts are solid-state devices, there is nothing to wear out, clog up or get out of adjustment.

Perhaps the most dramatic example of the impact of semiconductor technology on our society is the illustration of the IBM 701, the world's first commercially available computer.

This machine, introduced in the mid 1950's, just about the time Fairchild was entering the semiconductor business, sold then for $1 million. Yet it represents about the same information handling capabilities as today's F8 in the board configuration shown. This F8 system sells for about $300. The other principal difference is that the F8 can execute a computer instruction in about 1/10 the time it took the IBM 701.

The complicated workings of a conventional washing machine control panel can now be replaced by a Fairchild F8 microprocessor and a few related parts.



This "family portrait" of products based on innovative Fairchild technologies includes, bottom left, products from the Federal Systems Group, top left and bottom right, from the Instrumentation & Systems Group, and top right, the Consumer Products Group. Products manufactured by the Components Group are used in all the systems and end products shown.

Smithsonian AIR AND SPACE MUSEUM

AN EARLY FAIRCHILD AIRPLANE IN GOOD COMPANY . . . .

Editor's Note:

If you're a sucker for American history like I am, Washington, D.C. can give you a real high. Imagine the likes of the genuine Declaration of Independence (a little the worse for wear) or the original Star-Spangled Banner, within walking distance of each other. So, as we set out for the Smithsonian Institution's new Air and Space Museum one day, I was making secret plans to dash through the place (just a bunch of old airplanes, said I—you've seen one...), leave my companions and head for the National Archives or the National Gallery of Art.

They both had to wait until another day.

The National Air and Space Museum is magnificent. The air and space craft visible through five-story tinted windows draw you in from Independence Avenue on the Federal Mall like a magnet. Inside, there are two display levels stuffed full of artifacts commemorating the history of flight.

Aircraft dominate the skylighted ceilings of three floor-to-roof exhibit halls. In the corner of one of them hangs a small airplane that made the first international airmail flight in 1927. That plane was built by Sherman Fairchild.

Walter Boyne, Curator of Aeronautics, was the man in charge of "choreographing" the hanging of all the aircraft on display at the museum. He's also an early airplane buff and an authority on early Fairchild aircraft. Recently, he shared the story of the museum and the Fairchild FC-2 with me.

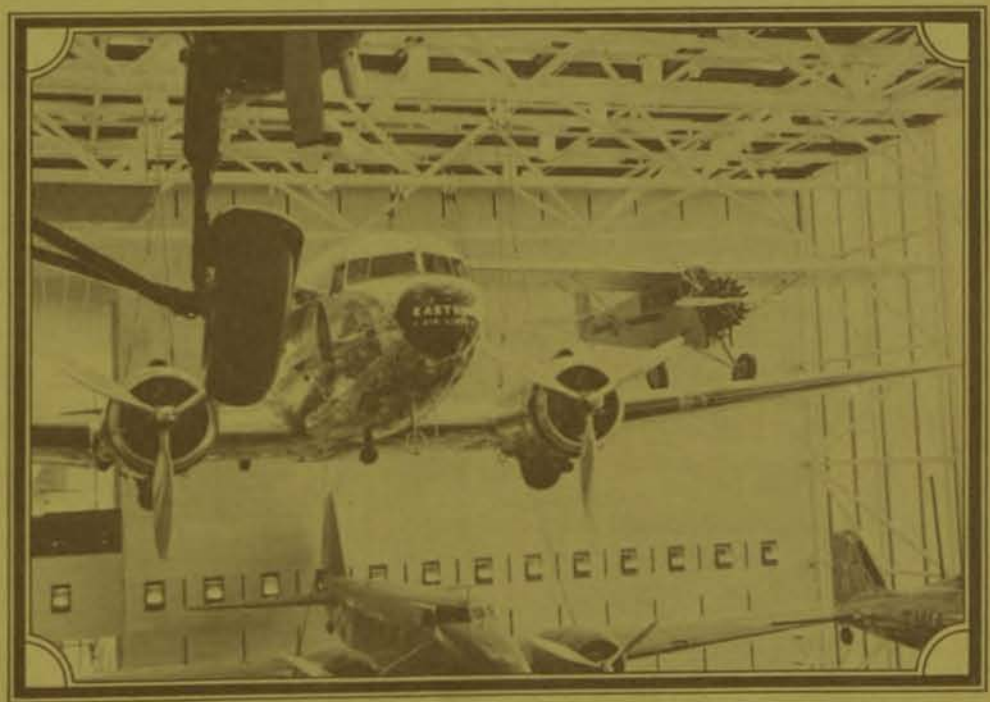
Although Fairchild Camera and Instrument and Fairchild Industries, which makes aircraft, have long been separate companies, it was an honor to see something developed by the founder of our company displayed in such prestigious surroundings. And right next door to the Spirit of St. Louis.

Three million people came through the door of the National Air and Space Museum in Washington, D.C., in the first three weeks of its operation last summer. Over Labor Day weekend alone, attendance topped one million. On a heavy day, the crowd has matched attendance at the Super Bowl.

Officials at the Smithsonian Institution's newest attraction have been pleasantly surprised by all this, considering their original projections of seven million visitors per year. But the main attractions are guaranteed to bring at least a patriotic twinge to every visiting American.

Crowds have been pouring through the doors of the National Air and Space Museum at record rates since the July, 1976 Bicentennial opening. The idea for the museum was first conceived in 1946, when Congress passed a law establishing a place to "memorialize the national development of aviation."

A visitor to the Air and Space Museum buildings captures the imposing exterior on film. The museum dominates a section of the Federal Mall leading to the Capitol.



Progress in passenger, mail and cargo aircraft is evident in the Gallery of Air Transportation. As the first closed-cabin airplane, the Fairchild, upper right, was the forerunner of larger aircraft to come, including the Eastern Airlines DC-3 shown center. The DC-3 is the largest airplane suspended in the museum.

50 Years at Fairchild

The Components Group, with plants in Mountain View, San Jose, San Rafael and Healdsburg, California, South Portland, Maine and Hong Kong, Korea, Singapore and Indonesia, manufactures semiconductor devices for the computer, industrial, automotive and consumer markets.

The LSI Group supplies memory and logic circuits and charge-coupled device products to computer, consumer and broadcasting markets. LSI operates plants in Mountain View and Palo Alto, California and Wappinger Falls, New York.

Consumer products and related components are made by the Consumer Products Group, with plants in Palo Alto and Santa Clara, California, Frankfurt, Germany and Sydney, Australia.

Government products and industrial systems are produced in two facilities headquartered in New York. The Federal Systems Group, Syosset, New York, produces space and defense systems and products for the federal government.

The Industrial Products Division, with manufacturing facilities in Commack, New York and a subsidiary in Traverse City, Michigan, produces audio-visual and aviation products for commercial, industrial, educational and government customers.

Plants in San Jose and Chatsworth, California, manufacture the products of the Instrumentation and Systems Group. This group markets semiconductor test systems and microprocessors to component and original equipment manufacturers.

Fairchild's International Division directs marketing and sales of company products throughout Central and South America, Europe, and the Pacific region.

In October, 1972, the company joined with TDK Electronics, Ltd. of Japan to form a joint venture company, designated TDK-Fairchild Corporation, which markets semiconductor products in that country.

In 1975, Fairchild and Applied Materials, Inc., Santa Clara, California, formed Great Western Silicon Corporation. The joint venture will supply semiconductor grade polysilicon from a plant in Chandler, Arizona.

Fairchild Camera is committed to remaining a company of innovation, but a corporation in which new business directions are pursued only if they are complementary to the company's long-range goals.

The Stars and Stripes, probably the most famous FC-2, was selected by Commander Robert Byrd to make the first flight into Antarctica in January, 1929. This plane is currently in storage at the Smithsonian.

Smithsonian

Spanning the brief but phenomenal history of flight in America, the main "Milestones of Flight" gallery exhibits the Wright Flyer, the Spirit of St. Louis (personally donated by Charles Lindbergh), and the first Gemini capsule to orbit the earth. Down the hall towards the U.S. Capitol stand the Skylab Orbital Workshop and the back-up units of the Apollo Lunar Module and Orbiter. Smaller areas surrounding the three main halls are devoted to everything from balloon flight to Apollo spaceshots.

The impact of the museum comes not only from its displays, but also from its architecture. Illuminated primarily with natural light, the three main display halls are as high as the building (nearly 90 feet) and covered with a roof resembling small glass bubbles, designed to make the aircraft suspended beneath them appear to move.

Cobwebbing the ceiling are slim steel pipes and cables strong enough to support twice the weight they hold, but structured so they fit unobtrusively into the building's design.

To prevent damage to their many irreplaceable aviation artifacts, the staff of the Air and Space Museum choreographed and rehearsed each aircraft hanging twice before the actual hoisting was done. Left, the crew readies the Fairchild for suspension. The FC-2 carries the name Panagra, *which was part of Pan American World Airways in the twenties. Charles Lindbergh once flew a Fairchild plane around the country and an FC-2 accompanied Lindbergh and the Spirit of St. Louis on a nationwide tour after his transatlantic flight.*

The FC series had a great impact on transportation in the Canadian bush country, because of its good performance on floats and skis. Many areas previously inaccessible by air were opened up by the Fairchild planes.

Hanging just above the museum's largest airplane, a DC-3, in the skylit Air Transportation Gallery is the Fairchild FC-2, one of the first airplanes built by Sherman Fairchild. The FC-1, built in 1926, and the FC-2, built the next year, were developed to be efficient aerial camera planes, cruising long distances at high altitudes.

The FC-1 made history—it was the first aircraft with a closed cabin, folding wings and flaps for greater stability. More innovations came with the FC-2, which was the first plane equipped with hydraulic landing gear and brakes.

The basic design of the Fairchild plane was so good that it soon was being used to carry passengers and speed mail delivery. The FC-2 on display made the first scheduled passenger flight in South America in 1927. That same year, it carried the first international airmail from Key West, Florida to Havana, Cuba.

"Because the Fairchild plane has great technological and historic significance in aviation's development, it was a foregone conclusion that it would be part of the new museum," says Walter Boyne, Curator of Aeronautics. "By developing a closed-cabin, fabric-covered steel plane, Sherman Fairchild took the first step forward from the fabric-covered open cockpit biplane we associate with the Wright Brothers.

"It's not generally known, but Fairchild went from zero production to being the second largest commercial aircraft producer in the world in about nine months with his new aircraft, because it offered things other contemporary airplanes didn't. It could seat five people including the pilot, had folding wings, and was basically a strong, safe airplane."

The Smithsonian's FC-2 carries the name "Panagra," which was an early offshoot of Pan American World Airways and later became the parent company of Braniff Airlines. It was donated to the museum by Braniff, and Walt recalls "was just tucked inside a jumbo jet and flown up here."

Later notable FC-2 models included the one chosen by the Department of Commerce to accompany "Lone Eagle" Charles Lindbergh on his triumphant cross-country tour following his 1927 transatlantic flight.

But perhaps the most famous is the FC-2 called "Stars and Stripes," which made the first flight into Antarctica in January, 1929, with the Robert Byrd expedition. That airplane is now in storage at the Air and Space Museum's Silver Hill, Maryland restoration facility.

Though he never met Sherman Fairchild, Walt has formed an image of the man through his Smithsonian work and independent research for an *Aviation Quarterly* series on early Fairchild aircraft.

"It seems to me he was a classic American entrepreneur. He wasn't afraid to put up money for a venture he believed in—and he believed in the future of aviation. He also had the ability to pick out good people—people who could do the job well—then let them do it. Fairchild fostered the careers of some of the great minds of early aviation. I would have been honored to have known him."

MILESTONES IN Fairchild HISTORY

1920

Fairchild Aerial Camera Corporation is formed in the state of New York.

1927

Fairchild Aviation Corporation (later renamed Fairchild Camera and Instrument Corporation) incorporated in Delaware.

1936

Aircraft and engine manufacturing operations spun-off into a separate company, now known as Fairchild Industries (formerly Fairchild-Hiller).

1944

Fairchild Aviation Corporation adopted the present name of Fairchild Camera and Instrument Corporation.

1957

The corporation sponsored the formation of Fairchild Semiconductor Corporation at Palo Alto, California, for the development and production of silicon diffused transistors and other semiconductor devices. It became a wholly-owned subsidiary in 1959, and in 1961 became the Semiconductor Division.

1960

Planar process for semiconductor device manufacturing introduced.

1961

Fairchild introduces the world's first monolithic integrated circuit.

1968

Corporate headquarters is moved from Syosset, N.Y. to Mountain View, California. Federal Systems Group and Industrial Products Division remain in New York.

1971

Death of Sherman Mills Fairchild, founder of the company.

1971

Isoplanar process for semiconductor manufacturing introduced.

1975

Fairchild announces entry into the consumer products field with a line of men's and ladies' digital watches. Consumer Products Group formed.

F8 microprocessor announced.

1976

Introduction of the Video Entertainment System, a programmable television game, Fairchild's first consumer end product based on its F8 microprocessor.

FAIRCHILD
CAMERA AND INSTRUMENT
CORPORATION

464 Ellis Street, Mountain View, California 94042 (415) 962-5011

Need to let off some steam?

If something about your job is bugging you or you have a question about your working environment, (it happens to everybody once in a while) you should know about Fairchild's Appeals Procedure. The informal and formal steps in this program were created to help find solutions to the questions, misunderstandings and problems that arise occasionally in every working situation.

THE INFORMAL PROCEDURE

First, discuss the matter with your supervisor. If this doesn't produce a satisfactory solution, present the matter in writing through your supervisor to your Industrial Relations Manager. The IR Manager will hold a meeting with all parties concerned and attempt to resolve the situation. If you are not satisfied with the results of that discussion, you may file for further review of the issue through the Formal Appeals Procedure.

THE FORMAL APPEALS PROCEDURE

Step One. You and your IR Manager will complete a report covering the nature of the issue and the discussions already held, and the IR Manager will recommend a course of action. This report will be given to you within five working days of the time you started action under Step One. In the event the action recommended is not satisfactory to you, you may submit a written request for review at the second step.

Step Two. The Industrial Relations Manager will hold a meeting with you and your department manager. Every effort will be made to resolve the issue in a manner compatible with your interests and consistent with the company's policies. The department manager will furnish a written report of the outcome of this meeting within five working days. If you do not feel the decision rendered is equitable, you may submit a written request to proceed to the third step for further consideration.

Step Three. The IR Manager will arrange a meeting with you, the Group Industrial Relations Manager and all other concerned parties. The entire matter will be reviewed and a written decision presented within five working days. If you still are not satisfied with the results, you may ask in writing to have it reviewed at the fourth step.

Step Four. The Group IR Manager will present your issue to the Group Vice President in written form. The Group Vice President will review the decisions made at previous steps, and may, at his discretion, discuss the matter with any party involved. He will render a final written decision within five working days.

Any employee who loses time from a regular day's work as a result of the presentation and discussion of an issue shall suffer no loss of earnings.

It's unlikely you'll ever encounter a situation at Fairchild that will require you to go through each step of the Formal Appeals Procedure. However, the program was established to provide everyone at Fairchild with a way to raise an issue and have it resolved fairly. The program is there for you to use if you need it.

Communicating Without Commuting

In New York, Ed Piller, Federal Systems, is Pioneering Amateur Television

"More than 600,000 people a month have been applying for citizens band radio licenses," says Ed Piller, senior staff engineer for Space and Defense Systems in Syosset. "Sooner or later, some of them are going to start thinking of what's beyond CB . . . ham radio and amateur TV is the answer."

Amateur television has already arrived for Ed and a few associates from the Long Island Mobile Amateur Radio Club (LIMARC). Last August, they completed work on the first amateur TV "repeater," or rebroadcasting station in the New York area.

Last month, the new "network" began teaching over the air. Classes in amateur radio and basic electronics originating from three Syosset school system amateur radio TV terminals will broadcast interactive lectures via UHF transmissions for the first time.

Basically an upgraded offshoot of the popular ham radio, amateur television uses a TV transmitter and receiver, a TV camera and a regular television set with a special converter attachment. The operator can broadcast his voice and a television picture of whatever is in front of the camera to another ATV operator.

Because of typically weak signals from the unsophisticated home equipment, contact between operators has been limited to an operator's local area. But with the construction of the new repeater station in Plainview, N.Y., a few miles from Fairchild's Syosset plant, Ed expects a boom of new operators able to transmit pictures as far as 80 miles.

"The repeater will receive the weak signals from home transmitters and rebroadcast them," Ed says. "More ATV operators will then be able to broadcast pictures back and forth with better reception due to increased signal strength, created by the height of the station tower (320 feet). The picture should be as sharp as a commercial television broadcast."

Left, Ed, a senior staff engineer at Federal Systems, in his Syosset lab. Below, he prepares a broadcast demonstration on the transmitting equipment he has built in the basement of his home. Members of LIMARC can now beam pictures, as well as sound, within a 20-mile radius of their central "repeater" radio tower.

Ed, who joined Fairchild in 1969, has been an active ham operator since 1937 and is one of the founders of LIMARC. His professional accomplishments in communications include supervision of the installation of NBC television and antenna equipment on the Empire State Building and work on the team responsible for engineering the first UHF-TV station.

Now a senior engineer and advanced development specialist at Space and Defense Systems Division, Ed has been one of the major forces behind establishment of amateur television on Long Island.

"In the early sixties, I was spending about two hours a day commuting, and I felt that rather than just waste that time, I could be talking with other people while I drove. When I installed a mobile amateur radio in my car, I discovered a group of people—primarily engineers and technicians—with similar interests. In 1965, we formed LIMARC." (Ed notes that amateur radio is different from Citizens Band radio, the current craze. CB sets have limited range and operate on fewer frequencies.)

"We now have over 550 members on Long Island, and through five club-

Much of Ed's spare time is spent in his basement workshop, constructing and testing ATV equipment. Experimental repeaters take the weak signals sent out by home transmitters and rebroadcast them on a slightly lower and stronger frequency. Once the Long Island system is fully operational, Ed says the picture transmitted will be as sharp and clear as a commercial television broadcast.

sponsored repeater stations can cover most of the area within a 40-mile radius of Nassau County with mobile-to-mobile or base station communications.

In June 1975, some of us started 'a technical net,' in which we presented a speaker on a selected frequency once a week. The speaker makes a presentation, then other members listening on their own equipment can either ask questions and participate in the discussion, or just listen to the forum.

"We soon found we needed a visual medium to effectively present technical information. So I volunteered to become Chairman of the Amateur TV Committee. We gathered interested engineers, technicans and teachers together and constructed the first repeater station, which began operation last August."

Electronics enthusiasts with the inclination to construct a home amateur TV station might spend a lot less than they would expect. A simple ATV system, according to Ed, could be constructed for about $200. Through a combination of members' electronic know-how, equipment donations from local industry and proceeds from semi-annual "electronic flea markets," the amateur television group put the first pilot repeater system together for about $2000. Ed estimates that a similar set-up, built with new equipment, would cost $100,000.

All amateur radio operators must be licensed by the Federal Communications Commission. The FCC's amateur radio division says there is no possibility of interference with commercial TV because amateur and commercial frequencies are so far apart.

One of the first practical uses of the new ATV systems began last month when the Syosset school system incorporated the LIMARC system into its basic electronics courses. By teaching students how the equipment works, amateur licensed industrial technology instructors hope to motivate CB-toting students to further their knowledge of electronics. If several schools hook up with the system, students could listen to a lecture at a different school and participate in the class discussion.

"It's communicating instead of commuting," says Ed, who was instrumental in selling the system to the Syosset schools. "Why do people have to travel to a university campus for advanced classes, or rely on the limited courses available through commercial television? With interactive television, people could stay home or go to a communication room in a local library or community center and get the same information. This type of system is feasible with our current ATV setup on Long Island.

"We intend to petition the FCC for an allocation of suitable frequencies which can be used for the establishment of regional 'communicasting' nets. It's possible to bring information and advanced education to people all over the country . . . a cost-effective nationwide classroom without walls—all electronically."

CLOSEUPS

People on the Move

RONALD MILLER has been named Industrial Relations Manager for the Components Group . . . **JOHN BERCZUK** has been promoted to Director of Group Operations, Federal Systems Group . . . **Y.H. YEO** has been appointed acting Plant Controller for Fairchild Singapore . . . **BRUCE STROMSTAD** has been named Operations Manager for the Singapore plant . . . **ROGER GERARD** has joined the International Division as Industrial Relations Manager for Europe and Latin America . . . **JAMES McALLISTER** has been named K-1 Plant Manager in Seoul, Korea . . . **PATRICK HEFFERNAN** has been appointed Manager of Financial Planning and Reporting for International Operations . . . **HOWARD BAIN** has been named Transistor Division Controller . . . South Portland's newly-appointed Plant Controller is **ROBERT McCLELLAND** . . . **JACK BRADLEY** has been appointed Controller for Manufacturing Services Division . . . **JOSEPH PROCTOR** has been named Group Manager of Management Information Systems for the Instrumentation and Systems Group.

Santa Clara County Junior Achievement officers Ray Olson and Diane Fulmer show Dr. Hogan products their student-run companies will offer for sale this year.

HOGAN HEADS JA DRIVE

Junior Achievement in Santa Clara County may soon hit the 100-company mark. At a campaign kick-off breakfast in January, Dr. C. Lester Hogan, Fairchild's Vice-Chairman of the Board and 1977 JA campaign chairman, announced a drive goal of $154,000. If that goal is met, Junior Achievement will be able to expand to 100 student-run businesses involving 2500 teenagers, up from the current 2300.

JA is a nationwide program teaching students the principles of business and economics through establishment of their own industry-sponsored companies. Student businesses typically run the length of the school year, and market products of the students' own design and manufacture. Sponsoring companies provide "faculty" advisers.

Dr. Hogan said the drive will be divided between a group of the county's 200 largest firms and another group representing nearly 2000 other area firms.

South Portland Aims for JA Honors

Faircrafts, a JA company at Fairchild's South Portland, Maine, Digital Products plant, is out to win back "Company of the Year" honors marketing its line of dried flower arrangements and candy. In 1975, South Portland's JA company won the top company prize, and last year was recognized for highest overall sales and the best product.

Barbara Cook, Industrial Relations Assistant and Jerry Howard, Mechanical Maintenance Supervisor, are staff advisers for Faircrafts, with Pete Wyberg, Industrial Relations, acting as coordinator. Advisers and Faircraft "employees" from several area high schools meet weekly to manufacture their product and keep abreast of sales and financial activities. They have already held one sale at the South Portland plant, and have sales exceeding $500.

Dr. [illegible] Visual Marketing Manager, left, explains the capabilities of the new projection equipment to a customer at the NAVA show, held in January in Anaheim, Calif.

IPD ATTRACTS NAVA CROWDS

The newly-introduced Synchro-Slide 35mm slide/sound projector drew heavy attention at Industrial Product Division's booth at the National Audio-Visual Association Show, held in Anaheim, Calif., in January.

The annual NAVA show attracted over 5,000 manufacturers and dealers of audio-visual equipment.

The Synchro-Slide 35 offers front/rear projection capabilities and includes such features as Fairchild's Lamp Saver Switch, storage space for an extra slide tray, two remote control options and can be used in horizontal or vertical slide presentations.

IPD also introduced a new series of Super 8 rear screen movie projectors—the Galaxy Series. The new Galaxy Series includes four models, all using standard Fairchild 8mm snap-in cartridges.

Prior to the opening of the show, IPD held a dealers' breakfast at which over 300 Fairchild dealers and representatives learned about new products and advertising plans for 1977.

Things **have** *come a long way, say visitors Revere Sanders, Bob Draghi and Fred Lutz as they receive Fairchild watches from Lou Pighi, Federal Systems, left. Observing the presentation is Ray Hennessey.*

Those Were the Good Old Days

Three former Fairchild Vice Presidents visited their old stomping grounds at Federal Systems Group in Syosset recently, and both old-timers and newcomers enjoyed the day's tour, luncheon and informal chats.

Fred Lutz, Revere (Sandy) Sanders and Bob Draghi, all executives of Fairchild when the company was headquartered in New York, came to learn about FSG's current products and renew old friendships at the invitation of Lou Pighi, Vice President and Group General Manager.

The three men's recollections of the company covered much of the early years - from the days of 10 or 12 employees and a few products to the bustle of wartime production, when employment had jumped to 5000.

Fred, formerly Vice President and General Manager, was with Fairchild from 1921 to 1938. Sandy served as Vice President of Marketing, and was with the company from 1935 to 1954. Bob, a former Vice President of Manufacturing, was with Fairchild from 1921 to 1955. Sandy summed up the feelings of all three visitors in a letter to Lou, saying that although the three men had all been away from Fairchild a number of years, they appreciated that "the company thought enough of our past contributions to do us a great honor."

IN MEMORIAM

Associates of Bob Draghi were saddened to hear of his death shortly after his visit to Fairchild. Friends from Federal Systems said he would be missed by all who knew him.

NBC reporter Frank Bourgholtzer, foreground, questions Greg Reyes, Vice President and General Manager, Consumer Products Group, left, about circuitry in the Fairchild television game during filming of a report for NBC Nightly News. At right are soundman Don Miller, standing, and cameraman Houston Hall.

Fairchild Game NBC Star

What were people buying for Christmas last year? Home television games in large numbers, according to an NBC Nightly News report in late December which featured Fairchild's programmable Video Entertainment System.

In a segment on several television games popular with consumers shopping for holiday gifts, NBC correspondent Frank Bourgholtzer discussed the current technology of electronic games and the versatility of the programmable models.

Fairchild President Wilf Corrigan was interviewed about the games market during the segment, and several games available on Fairchild's Videocart™ game cartridges were shown.

Correspondent Bourgholtzer and NBC crew spent several hours at Exetron in Santa Clara filming the report and trying their luck at video Blackjack. It must have been good, because all three NBC visitors bought games before they left.

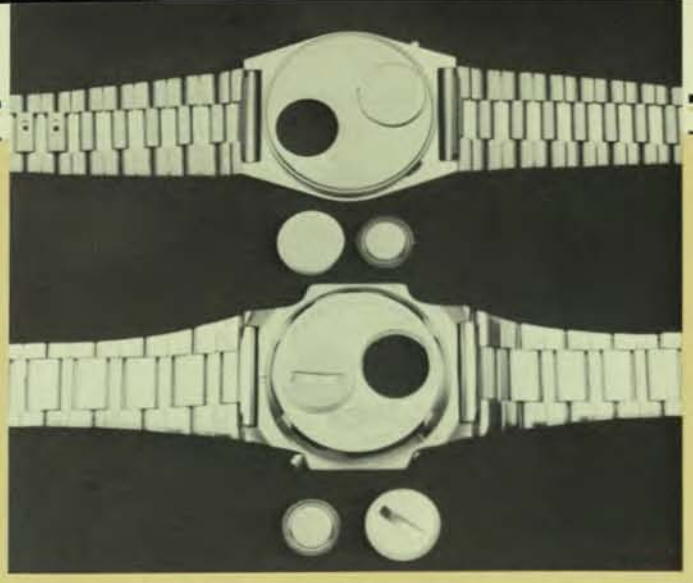
Taking Stock In London

Some 50 members of the British financial and trade press attended a press conference, exhibit and buffet lunch announcing Fairchild's listing on the London Stock Exchange Feb. 2 at London's Waldorf Hotel.

Addressing the newspeople above is Wilf Corrigan, President and Chief Executive Officer. Also present were, from left, John Duffy, Vice President and General Manager—International Division, Doug Norby, Vice President—Finance and Fred Hoar, Vice President—Communications.

Following the news media announcement, presentations were made to London financial analysts and investment managers.

CHICAGO CONSUMER SHOWGOERS PLAY SPITFIRE, SPACE WAR



The new hatchback feature, shown above on the Timeband watch, top and the Fairchild watch, bottom, allows the customer to change batteries. Hatchbacks are part of all new Fairchild and Timeband models. They were introduced at CES along with three new Videocart cartridges.

The introduction of three new Videocart™ cartridges, the 1977 lines of Fairchild and Timeband™ digital watches and two new digital alarm clocks highlighted Fairchild's participation in the Winter Consumer Electronics Show, held in Chicago in mid-January.

Over 300 manufacturers of consumer electronics exhibited their new products at the show and, as at last year's show, Fairchild's Video Entertainment System—the only programmable video game currently on the market—drew large crowds.

The three new Videocart cartridges—Nos. 4, 5 and 6—are Spitfire, Space War and Math Quiz. The Fairchild system now has a capability of 11 games or game versions. The first three Video cartridges feature Tic-Tac-Toe, Shooting Gallery, Doodle, Quadra Doodle, Desert Fox and Blackjack. Tennis and Hockey are already in the system's console.

New features in both lines of watches are the hatchback, which allows for easy battery replacement by the consumer, and a battery replacement program in which the customer receives a coupon for free replacement batteries with the purchase of a Fairchild or Timeband watch.

The two new digital alarm clocks include one Timeband model and one Fairchild model. Four digital clocks are now offered by the company. Both models display seconds on command and feature a doze button that periodically sounds up to six times an hour.

Components Sales Taps Top Two

Components Group Sales has selected Steve Borochoff, Los Angeles District Sales Manager and Duncan Loop, Business Development, Mountain View, the Group's outstanding outside and inside sales people, respectively, for 1976.

Steve, recipient of the Sherman Fairchild Annual Award for Professionalism in Sales, joined Fairchild in 1972 and worked in a number of product marketing areas before transferring to southern California in 1973. Shortly after his transfer, he completed a Dale Carnegie sales class and immediately put his new knowledge to work by booking a $265,000 order at a new account.

Steve's major customers in Los Angeles include Pathcom, manufacturers of Pace citizens' band radios, and TRW Data Systems (see page 4).

The Sales Professionalism Award goes each year to the outside sales person most effective in customer relations and total representation of Fairchild in the marketplace.

Duncan, a 14-year Fairchild veteran, received the Sherman Fairchild Award for Sales Support, which recognizes his contribution to inside sales support and customer service.

He has spent much of his career with Fairchild managing sales programs and customer service. For the past several years, he's been directing business development with such major aerospace and defense customers as Hughes Aircraft and Bendix Corp. Jack Ordway, Division Vice President and Components National Sales Manager, estimates that Duncan has been instrumental in obtaining nearly $70 million worth of business since he joined Fairchild in 1963.

The Sales Support Award is given annually to the person the outside sales force judges most responsive to field sales and customer needs and best in directing sales programs.

Steve Borochoff

Duncan Loop

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-December, 1976.

Analog Products Division

Russell J. Apfel and Donald Smith
"New Developments in Power Operational Amplifiers" *Electronic Engineering Times* ICA Conference

"Power IC Operational Amplifiers: An Evolution Picking Up Momentum" *Electronic Engineering Times*

Jerry Freeman
"An Integrated Circuit for Motor Speed Control" *Electronic Engineering Times* ICA Conference

Robert Frostholm
"IC Voltage Regulators—Why and How to Use Them" *Machine Design*

Bipolar Memory—ECL Products Division

Richard E. Crippen, David O'Brien, Krishna Rallapalli, Peter Verhofstadt
"Microprogram Sequencer Utilizing I^3L Technology" *1976 IEEE International Solid-State Circuits Conference Digest of Technical Papers*

Krishna Rallapalli and Dan Wilnai
"Programmed Logic: A Valuable Hardware Design Tool" COMPCON 76 Conference Digest

Krishna Rallapalli and Peter Verhofstadt
"Macrologic: Versatile Functional Blocks for High Performance Digital Systems" National Computer Conference

Wendell B. Sander, William H. Shepherd, and Richard D. Schinella "A 4K Bipolar Dynamic RAM" *Electronics*

Peter Verhofstadt
"Evaluation of Technology Options for LSI Proceeding Elements" IEEE Proceedings

"Macrologic: A Way to Implement Microprocessors with Bipolar or CMOS LSI" *Computer*

"Technology Constraints, Present and Future" *Computer*

"Technology for Microprocessor Hardware" COMPCON 76 Conference Digest

Robert Bashe, Michael Vicars-Harris, Ernest Ohloff (Picatinny Arsenal)
"Artillery Launched Television" SPIE/SPSE Technical Symposium East

Bill Gaddy
"The KA-99 Panoramic Camera" SPIE/SPSE Technical Symposium Proceedings

Norman M. Gutlove
"CCD Strip Mode Imaging Systems" EASCON '76

Michael Vicars-Harris
"A CCD Viewfinder as an Adjunct to Aerial Reconnaissance Systems" SPIE/SPSE Technical Symposium East

Irving Hirschberg and Harvey Balopole
"The CCD Modular Camera Program" EASCON '76

Kenneth Hoagland
"Low Light Level Performance Analysis for CCD-TV Camera" SPIE/SPSE Technical Symposium East

"TV Applications of Interline-Transfer CCD Arrays" NASA/JPL Conference on Charge Coupled Device Technology and Applications

Ruth Lyon, Irving Doyle, Robert Othmer
"Computerized Performance Predictions for a Solid-State Reconnaissance Camera" SPIE/SPSE Technical Symposium Proceedings

Arthur Roberts
"A Light Weight Solid-State TV Camera" Aerospace and Electronics System Society of the IEEE

Henry Sadowski
"A CCD Laser Homing and Warning System" International Countermeasures Conference

Microsystems Divisions

Anthony R. Beccia
"A Microcomputer with a Push-Button Self-Test Diagnostic" The Milwaukee Symposium

Suresh Vasa
"Calculating and Error Checking Character in Software" *Computer 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 October-December, 1976 appear below.

Analog Products Division

Fred L. Eatock
High-gain differential input comparator with emitter feedback input hysteresis

Bipolar Memory-ECL Products Division

Charles Erickson, Krishna Rallapalli and Peter Verhofstadt
Expandable digital arithmetic logic register stack

Exetron Division

Nilson Brent
Casing for an electronic watch or the like

Richard L. Sirocka and David F. Broxterman
Electronic watch

Research and Development

Gilbert F. Amelio
Transfer gate-less photosensor configuration

Brooks Cowart
Parametric tester for semiconductor devices

James M. Early
Charge coupled amplifier

David O'Brien
Combined method for fabricating oxide-isolated vertical bipolar transistors and complementary oxide-isolated lateral bipolar transistors and the resulting structures

Optoelectronics Division

Douglas Schmieskors
"Low-Cost Digital Clock" *Ham Radio*

Research and Development

Arthur J. Learn and Dennis W. Hess
"MOS Electrode Size Effects" *Thin Solid Films*

Systems Technology Division

William H. Howe
"Data Analysis and Correlation - The Four Dimension in Testing" WESCON '76

Above, Sheryl winds up for an attempt at a goal. Inset, Sheryl shows Jim where her sights are set—Moscow and the 1980 Olympics.

AN OLYMPIC FIRST

The 1980 Moscow Olympics will have the first women's field hockey team ever to see Olympic competition. Sheryl Johnson wants to be there.

Sheryl, daughter of Jim Johnson, Component Sales, will probably make it. Selected the outstanding rookie at a national field hockey tournament last summer in Philadelphia, Sheryl, 19, is bound this summer for a United States Team training camp in Washington state. If she makes the cut, she'll win a place on the U.S. team and a shot at a 1980 Olympic berth.

"I've wanted to compete in the Olympics ever since I was little," Sheryl says. A Dean's list student at DeAnza College, a junior college near Mountain View headquarters, Sheryl has been playing hockey for six years, and currently competes on a DeAnza team. Field hockey, which has been a recognized Olympic sport for men for some time, is similar to soccer, but is played with a stick—a player's feet can't touch the ball. Eleven-member teams play two 35-minute periods with *no* time-outs.

Two-hour daily workouts for both field hockey and the school basketball team keep her in condition, and have also resulted in a number of sports awards. She hopes to earn a degree in physical education, and has had scholarship offers from several universities.

Look for her on the playing field and the victory stand in 1980.

A SPECIAL SUPPLEMENT
TO DETACH & SAVE

In the past months, you've probably noticed that additional employee benefits have been initiated at Fairchild, and that several of our existing benefits have been significantly improved.

Your benefits 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.

Categories listed are:

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.

These benefits apply to all full-time permanent employees, and to part-time permanent employees where noted, who are not subject to a collective bargaining agreement. 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.

THE 1977 EMPLOYEE BENEFIT CHART

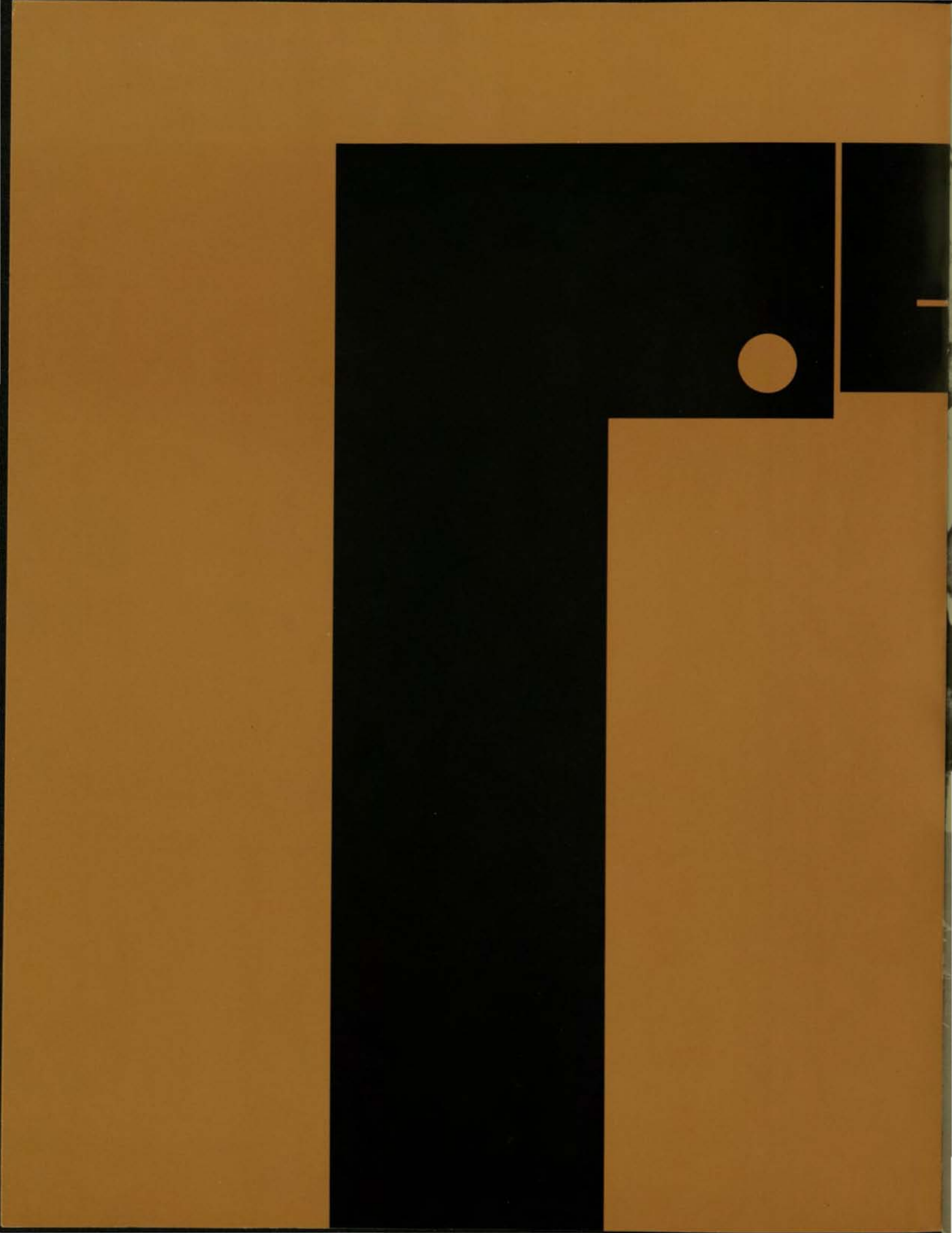
THE PAYCHECK YOU DON'T GET UNTIL YOU REALLY NEED IT

BENEFIT	WHEN ELIGIBLE	WHO PAYS	WHAT IT MEANS TO YOU
INCOME PROTECTION			
COMPREHENSIVE MEDICAL/DENTAL PLAN*	Medical/1 month Dental/6 months	Medical: Fairchild 50% to 100% for employee	For the employee, Fairchild pays 50% to 100% of hospital and medical costs, depending on type of service. Deductible applies to non-hospital costs.
		Employee	Remaining basic cost. Can purchase optional dependent coverage.
		Dental: Fairchild 50% to 80%	For the employee, Fairchild pays 50% to 80% of normal dental costs. Deductible applies. Orthodontic work not covered.
		Employee	Remaining basic cost. Can purchase optional dependent coverage.
PRESCRIPTION DRUG PLAN	1 month	Employee—$2.00 deductible for each prescription. Fairchild—remainder	Any covered medication prescribed by a doctor or dentist.
BASIC LIFE INSURANCE *$5000 coverage for part-time employees	1 month	Fairchild	Coverage equal to amount of basic annual earnings Service / Coverage Less than 1 year / Equals basic annual earning 1-3 years / Equals 1½ time basic annual earnings More than 3 years / Equals 2 times basic annual earnings
SUPPLEMENTAL LIFE INSURANCE	1 month	Employee	Amount equal to 1½ times basic annual earnings
DEPENDENT LIFE INSURANCE	1 month with evidence of insurability	Employee	$10,000 spouse/$2000 each covered child
SHORT-TERM DISABILITY INSURANCE	1 month	Employee pays for coverage in California, New Jersey, New Mexico and Hawaii. Other states, an insured plan is provided by Fairchild.	Pays percentage of income if employee is injured or ill.
LONG-TERM DISABILITY	1 year	Fairchild—Basic Amount	Pays 60% of employee's insured income up to $400 after 6 months of total disability.
		Employee	Can purchase optional income protection for wages over $400 per month.
WORKER'S COMPENSATION	Immediately	Fairchild	Coverage for medical expenses incurred as a result of illness or injury incurred on the job.
ACCIDENTAL DEATH AND DISMEMBERMENT*	1 month	Employee	Financial help if employee or covered family member is killed or suffers accidental loss of sight or limb.
SOCIAL SECURITY*	Immediately	Fairchild 50% Employee 50%	Fairchild and the employee contribute equal amounts to Social Security.
BUSINESS TRAVEL INSURANCE	Immediately	Fairchild	Insurance protection while traveling on company business.
PENSION PLAN	Hourly—immediately Salaried—1 year	Hourly—Fairchild Salaried—Fairchild & Employee	Lifetime income upon retirement. 50% vested after 5 years of employment over the age of 22, 100% after 10 years over the age of 22.
PROFIT SHARING	1 year	Fairchild	When profit level warrants, company contributes to employee's profit sharing account a percentage of pre-tax profits designated by Board of Directors.

*Applies to permanent, part-time employees.

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 11-20 days from 6-20 years.
HOLIDAYS	Immediately	Fairchild	9 paid holidays annually
PAID PERSONAL ABSENCE DAYS (PPA)	1 month	Fairchild	Paid days off for illness or personal reasons. Amount increases with length of service.
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
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	Two 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.

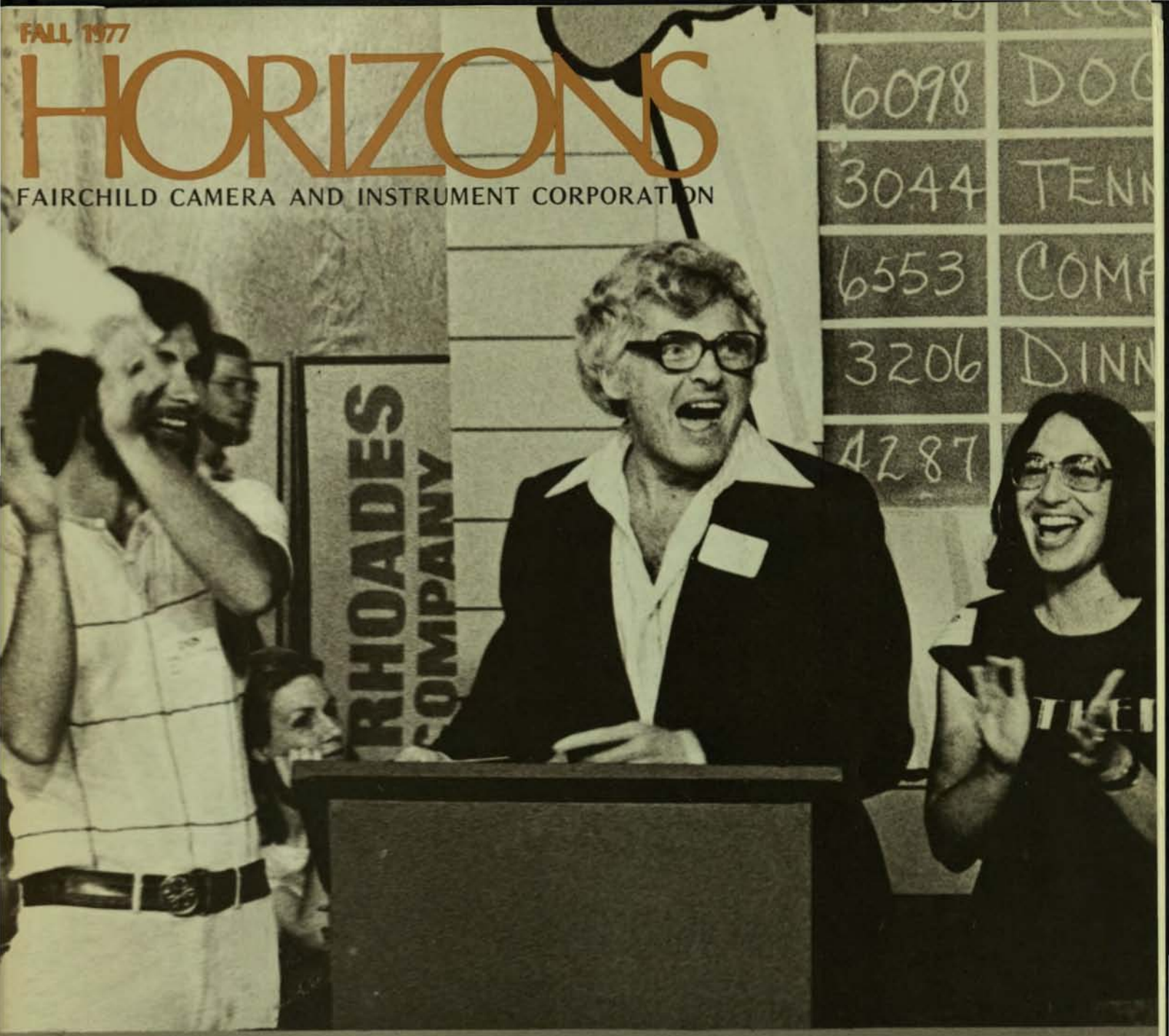
*Applies to permanent, part-time employees.



FALL 1977

HORIZONS

FAIRCHILD CAMERA AND INSTRUMENT CORPORATION



a benefits reference guide

community boosters

catching home fires

coping with 'middlescence'

FAIR

FALL 1977

HORIZONS

Cover: Dr. Harry Sello, center, successfully closes bidding on another item at public television station KQED's annual fund raising auction in San Francisco. Harry and four other community boosters talk about how and why they help their communities in *Giving Something Back*, beginning on page 10.

Photo Credits: Auction photos cover and page 10, courtesy KQED-TV. Photo page 16 courtesy General Electric. Hospital photo page 22 courtesy American Kor-Asian Foundation.

Contents

Departments

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Lyn Christenson

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West Coast: *Healdsburg*—George Coppinger; *Palo Alto*—Greg Klein
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South Portland—Peter Wyberg;
Syosset—Ruth Miller;
Wappingers Falls—Dick Feeney

HORIZONS is published four times a year for the employees of Fairchild Camera and Instrument Corporation. Address all correspondence to Horizons, Corporate Communications Department, M.S. 20-2260, Fairchild Camera and Instrument Corporation, 464 Ellis St., Mountain View, CA 94042.
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FAIRCHILD REPORTS SECOND QUARTER, FIRST HALF RESULTS

Second quarter earnings of $1,571,000, or 29 cents per share, compared with earnings of $2,858,000, or 52 cents per share a year earlier, were reported by the company July 28.

Net sales for the quarter increased to $115,581,000 from $111,753,000 in the comparable 1976 quarter.

For the first half, Fairchild earned $3,800,000, or 70 cents per share, compared with $3,055,000, or 56 cents per share in the prior year. Net sales for the first half rose to $230,569,000 from $206,377,000 in the same period last year.

Wilfred J. Corrigan, Chairman and President, said. "While the balance of our operations improved during the quarter, we saw increased adverse effects from the first half sales slowdown and rapid price attrition in the LED watch sector."

Inventory values and manufacturing rates have been adjusted downward, he said, and emphasis shifted to LCD watches, in line with customer preferences. He added that acceptance of Fairchild's programmable video games continued to be excellent.

"Our semiconductor business, the central core of the company, remained strong through the second quarter, both in the Components and LSI product groups," he said. "Sales of LSI test systems through the Instrumentation and Systems Group also expanded.

"Federal Systems and Industrial Products Operations showed healthy improvement in their various camera, defense electronics and audio-visual markets."

NEWSCLIPS

During the quarter, Fairchild installed one of the first electron beam mask-making machines in the semiconductor industry. The machine will significantly shorten product development schedules, particularly on high density structures.

"We believe that, with a reasonale economic climate in the second half, the company should achieve both sales and profit gains," Wilf said.

FAIRCHILD, MOSTEK SIGN MICROCOMPUTER AGREEMENT

Fairchild has announced an agreement with Mostek Corporation to second source the Mostek 3870 single-chip microcomputer and the 3871 peripheral input/output circuit. The devices are intended for high-volume controller applications in the automotive, appliance, telephone and television markets.

The agreement enables Fairchild to serve as a completely interchangeable source for the two Mostek circuits. The company will receive mask sets, technical data and documentation relating to the 3870 and 3871.

"Multiple sources are an absolute necessity in the high-volume controller market," said Alan Gregory, Division Vice President and General Manager, MOS/CCD Division, which will make the devices. "We expect these circuits to become the industry standards."

LINEAR CIRCUIT GENERATES MUSICAL SCALE

Linear Division has introduced a seven-stage counter integrated circuit designed to generate all tones of the chromatic scale across eight octaves of the musical spectrum.

Based on the primary chromatic scale, the device will generate each of the 12 sharps, flats and natural notes of the seven additional primary scale octaves. Producing the entire musical spectrum requires 12 circuits.

CB TRANSCEIVER CIRCUIT FROM EXETRON

An integrated circuit citizens band radio controller combining channel selection with automatic scanning has been developed by the Exetron Division. The circuit is also capable of driving a seven-segment display.

The new circuit is programmable for use with domestic 40-channel CB transceivers, or for German equipment. It provides externally selectable search and scan, as well as immediate reception on Emergency Channel 9. Transmitting on Channel 9 is inhibited, however, unless specifically selected.

SPACE SHUTTLE SYSTEM CONTRACT TO IMAGING SYSTEMS

The NASA Goddard Space Flight Center at Greenbelt, Maryland, has selected Fairchild's Imaging Systems Division to perform an engineering design study assessing the possible use of Fairchild lunar mapping cameras on Space Shuttle test flights.

The study involves adapting the lunar mapping camera and a laser altimeter to the Space Shuttle transport system pallet which permits experiments probing the earth's atmosphere from space.

CONSUMER PRODUCTS RESTRUCTURING ANNOUNCED

Fairchild Chairman and President Wilfred J. Corrigan has announced a reorganization of the company's Consumer Products divisions.

Greg Reyes will head the newly-created Video Products Division as Vice President and General Manager. He will have responsibility for all games manufacturing and marketing operations, including assembly facilities in Santa Clara, California and Singapore.

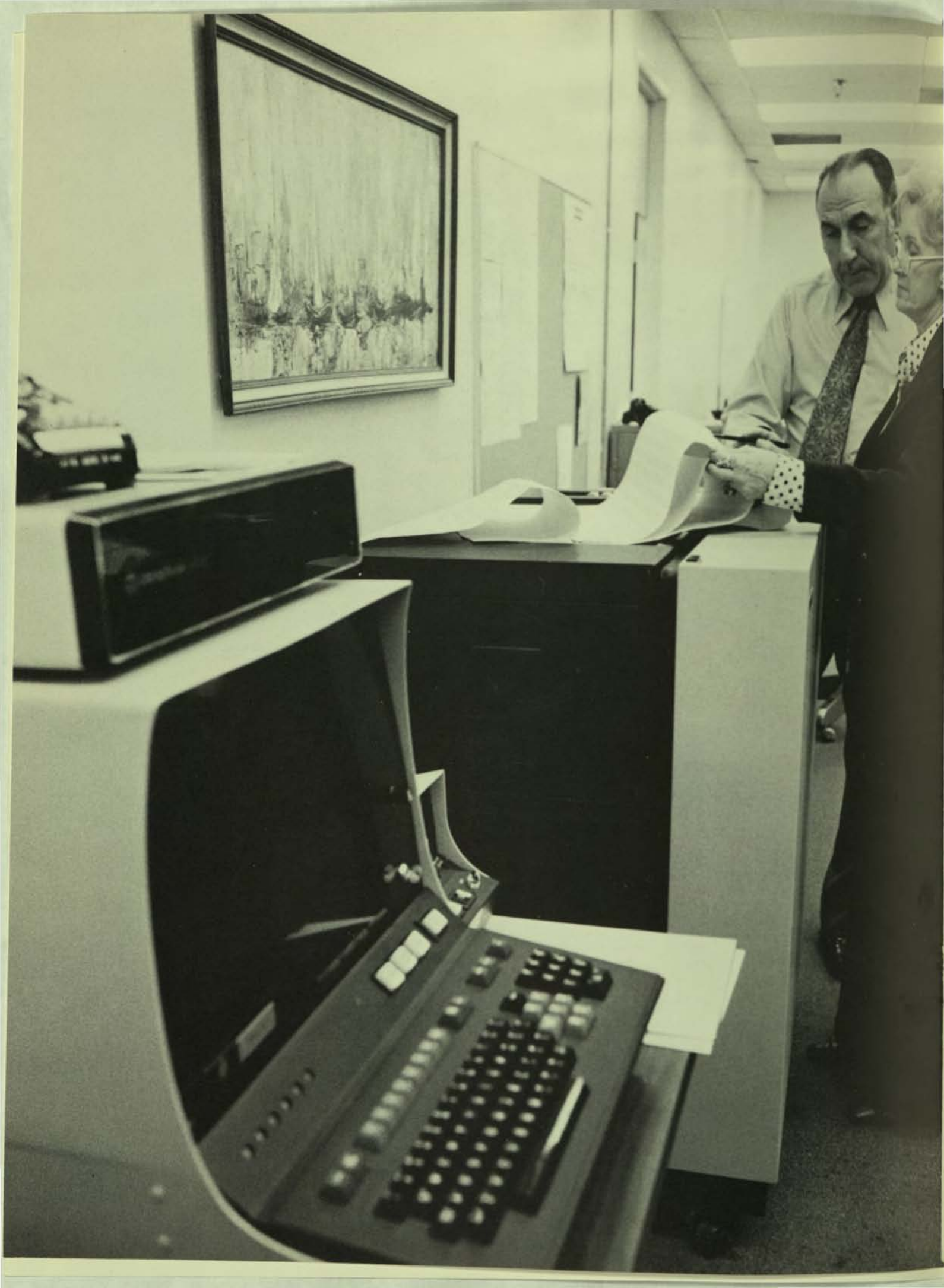
Continuing as Division Vice President and General Manager of the Time Products Division is John Sussenberger. Both divisions report directly to Wilf Corrigan.

The Exetron Division, under Division Vice President and General Manager Don Brown, will be part of the LSI Group, reporting to David Marriott, Vice President and General Manager. Exetron will have primary responsibility for fabrication of semiconductor components used in consumer end products.

LONG-TERM DEBT AGREEMENT ANNOUNCED

Fairchild has concluded a new $20-million long-term debt agreement with the Prudential Insurance Company of America. This replaces an existing $13 million note scheduled to mature in 1980.

Net proceeds will be used for general corporate purposes and to meet capital needs arising from current and anticipated sales growth.



FIRST TO THE FINISH LINE

In the not-so-old days, order processing in the Components and LSI Groups resembled the story told at a cocktail party—the more it was repeated, the more it became distorted. Orders came in by phone, TWX or scribbled on a torn piece of paper. Lack of standard order input, plus numerous processing steps, complicated the situation.

That all changed in early 1976 when Fairchild introduced an automated order processing system. In its first year of operation, it cut processing of most of the average of 11,000 orders received each month from a week to one day, reduced the cost of printing product price books by two-thirds, and dramatically improved the company's reputation for customer service.

The system combines Fairchild software with a worldwide General Electric computer network, accessible from terminals at any Fairchild sales location.

These automated systems are amazingly rare in electronics companies, where you would expect internal departments to take advantage of advanced computer technology. Fairchild's system, located at Mountain View, is currently one of the most advanced in the industry—so fast and efficient, in fact, that several other leading semiconductor manufacturers have become interested in obtaining licensing rights to use it.

Opposite page, Bill Neubauer, Manager of Order Administration, checks new orders coming off a high-speed printer with Wanda Edgemon, Coordinator of Order Entry.

Faster service, lower costs from our new Order Processor System

"If our competitors are willing to pay us for what we've developed, I guess that's the ultimate compliment," says Tom Simmons, who managed development of the system. Formerly Director of Customer Service, Tom is now Consumer Products Director of Customer Service.

Order Processing has now become part of the Manufacturing Services Division, where Travis White directs operations of both order entry and the domestic Standard Products Operation, also located in Mountain View. Manager of Order Administration Bill Neubauer oversees operations of the system. Programmer Jane Ward and analyst Sharon Casey, who both were instrumental in developing and implementing the new system, have recently formed a project systems development team, responsible for expanding the system's capabilities and uses.

Travis White, Manufacturing Services Division, directs order entry and processing operations.

The concept for a new order entry system was developed in 1975 with two goals in mind—to standardize the way orders were placed by field sales, reps and distributors and to streamline and automate the editing process an order must go through before it can be entered in the backlog for shipment to the customer.

"The old system was manual in both order entry and the visual inspection, or editing, that took place," Tom recalls, "and I might add that this is typical of the industry. The procedure could take a week, or more, and no acknowledgement was sent to the customer until it was completed. The paper work involved was mountainous, and our reputation for customer service was understandably not the best."

The key to faster turnaround was getting correct, current information at the source—the person placing the order. Working with General Electric, a system based on Fairchild's product and customer master files was developed. Orders from Fairchild field sales, or reps, and most distributors are now entered via terminals in sales locations which enable the sales force to communicate directly with the General Electric computer center in Rockville, Maryland.

The center maintains master customer files with background information, including billing and shipping addresses, and product master files indicating current products by part number and description. Security

measures governing control of Fairchild's data files and use of the system are quite elaborate and ensure confidentiality of the data while preventing unauthorized access to the system.

Sales people entering orders must now provide the computer with correct customer and product coding, plus price and delivery information supplied by divisional product marketing engineers, before the computer will accept the order. Override capability is provided for special situations, and some manual review is necessary occasionally. However, the majority of the "editing" required of the order processing staff before implementation of the system has been shifted to the computer and the person actually placing the order.

"Essentially, our sales force is talking to the computer," Travis explains. "There's editing going on while the order is being entered. If an error is made, such as entry of an incorrect product code, the computer rejects that on the spot and it must be corrected before the order can be entered. The old system took anything, because we had no automatic check-and-balance system.

"At times, if there was a lot of noise on the TWX line, we might get an order so garbled that we couldn't

Systems analyst Sharon Casey, right, demonstrates the capabilities of the new system to Judy Thomas of the Santa Clara, Calif. sales office.

Checking system performance, opposite, is programmer Jane Ward. Jane, who wrote the software that makes the system go, has recently teamed with Sharon Casey in a task force charged with expanding its capabilities and uses.

even tell where the order had originated, much less the product or customer. The originator of the order assumed the order was transmitted successfully, so it was our problem in Mountain View to locate the sender and correct the order input—a costly and time consuming process."

Orders are now taken off a high-speed printer at Mountain View every hour, logged in and checked by the order processing staff. Each evening, the GE computer center transfers the day's orders into Fairchild's internal data processing system, which gives each division printouts of the day's orders the next morning.

With the incorporation of the new Finished Quote System (where product divisions quote to allow automatic editing at order entry), customers now receive an order acknowledgement as soon as their order enters the backlog. If the product ordered is on the shelf, shipment can be made within 48 hours.

Inauguration of the order entry system took place in January, 1976 at the Components Sales Office in Los Angeles. Since then, all direct Fairchild sales offices and reps have been brought into the system, using either existing Teletype-compatible terminals or specially-installed equipment. About 40 percent of all Fairchild distributor locations have been added, with most of the remainder scheduled to be added this year. Ultimately, the basic system could be in operation at every location selling Fairchild semiconductor components worldwide.

"Currently, the Components and LSI Groups use this system, but it doesn't have to be restricted," Travis says. "It can be used by any Fairchild group." Other company product groups are presently evaluating a switch to the new system.

Bill Neubauer helped develop the new system and headed the team responsible for initially implementing the program in the field. It wasn't an easy task, since the system's success depended on greatly increased information input from the field.

"At first, it was a little chaotic," Bill says. "I think people were nervous about it, and tended to resist the change because it required a lot of discipline and the previous method didn't. We spent an average of one full day training in each field location, and we didn't leave until we were sure people there could use the system. Once they began to see how much faster their customer's orders were acknowledged and filled, they became believers. Now, their only complaint is that we're not adding new features fast enough!"

System updates and additions are constantly being evaluated. Currently, Order Administration is looking at the possible addition of an inventory feature, which could tell a sales rep the stock status of a part at a glance.

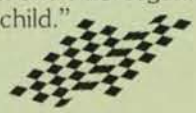
Improvements in processing turnaround time and customer service were the primary goals of the revised order entry system, but cost effectiveness was also an important consideration.

"Our staff size has stayed about the same, but by turning a lot of the work over to the computer, our people are now concentrating on problem areas and even faster processing of the substantial increase we've had in the volume of orders since early 1976," Travis says.

"In addition, cost reductions are a primary goal of our new project development and implementation team. In the few months they've been at it, Jane and Sharon have already found ways to save significant amounts of money."

Field locations are using existing terminals wherever possible. "By using our software and the GE computer network," Travis comments, "we've saved the cost of purchasing new computer equipment and leasing our own lines. Development of the system was achieved in record time by Tom Simmons and his team. The real strength of the GE system is that we could adapt it so each sales location worldwide can place orders through a local call.

"This project has been successful due to the combined efforts of many talented people in the Order Administration and MIS organizations at Fairchild."



We Save Lives for A Living

That's the motto at BRK Electronics, where Fairchild components go into the world's largest selling smoke detectors

"This one's ruined. Can I get another one?"

Rich Schwarzbach looked at the sticky smoke detector another employee of BRK Electronics had just handed him. The woman explained that her son had gotten up during the previous night for a snack, and had stuck a candle in a piece of styrofoam for some light. He had fallen asleep before blowing out the candle, which burned down through the styrofoam and was about to catch the drapes on fire when the BRK prototype smoke detector she was testing in her home went off. In her husband's haste to put out the fire, she said, he had gotten fire extinguisher spray all over the smoke detector, too.

BRK has files full of similar stories. Headquartered in a small building in rural Aurora, Illinois, outside Chicago, the company has suddenly found itself in the midst of a boom, brought on by recently-changed government policies regulating home smoke alarms. Eight million home smoke detectors were produced last year, quadruple the 1975 production rate. Some observers predict the industry will produce a million of the small plastic-cased alarms every month this year.

This skyrocketing demand has elevated BRK, a division of Pittway Corporation, from market obscurity to the lead among U.S. smoke detector manufacturers. Company president Fred Conforti describes the firm's product line as "the broadest in the world." Fairchild components are playing important roles in the performance of these life-saving products, currently some of the hottest consumer electronic products since pocket calculators.

Fire is the third leading cause of accidental death in the United States. Residential fires, most occurring during sleeping hours, are responsible for 12,000 deaths and 300,000 injuries annually. Very few people actually burn to death—most fatalities are caused by suffocation from smoke inhalation, even while a person is still asleep. These fires also destroy almost $3 billion worth of property every year.

This grim situation was reported in 1973 by the National Commission on Fire Prevention and Control, established by Congress in 1968 to investigate fire-caused deaths, injuries and property damage. The National Fire Prevention and Control Administration was formed in 1974 as a result of the commission's report, and was charged with reducing the loss of life and property by fire by 50 percent within a generation.

Top, LED indicator lamps from the Optoelectronics Division let homeowners know their BRK detector is on the job.

Bottom, Chicago area shoppers inspect the construction of a First Alert detector.

Early-warning systems appeared the most effective means of reducing life and fire loss. The Department of Housing and Urban Development quickly mandated smoke detectors into most new FHA-financed homes, and the Veteran's Administration followed suit. All new mobile homes, and most pre-fabricated homes also began to come with smoke detectors. Minneapolis recently enacted an ordinance mandating installation of smoke detectors in all existing residences within five years. Other cities, as well as some states, are considering similar action.

Home smoke and fire alarm systems had been on the market for decades, but had been very expensive, both to produce and purchase. To overcome this, the federal government, in cooperation with independent test laboratories such as Underwriters' Labs, worked to revise the standards so detectors could be mass-produced and attract more buyers.

The standards revision was the first major turning point at BRK. "The present standards are still excellent," says Fred Conforti, "but the NFPA's action allowed us to take some features out of home detectors that were expensive and weren't necessary to do a good job."

Standards changes brought the price down, and demand was given a further boost when, as Fred describes it, "Somebody had the courage to start advertising smoke detectors on television in 1975." BRK soon joined the TV ranks with advertisements featuring television star William Conrad. Some of their current commercials are based on actual incidents involving homeowners warned of fires by BRK detectors.

Smoke alarms have sensing devices that set off a piercing wail when they detect smoke. They are preferable to heat alarms, since smoke is typically given off in the early stages of a fire, before enough heat is generated to trigger a heat-sensitive alarm.

BRK produces an ionization type detector, in which smoke reduces the flow of current through ionized air (transformed into a conductor of electricity by an ionizing source), setting off the alarm. Ionization detectors, along with the photoelectric type, which is triggered when smoke scatters light from a bulb onto a photocell, are the two most popular home systems. The ionization detector is preferred, according to Fred because of its ability to detect flaming fires more readily than the photoelectric detector. In addition, ionization detectors operate on batteries, as opposed to household current for most photoelectrics, and give off warning beeps when it's time for battery replacement.

Fairchild's LED (light-emitting diode) indicator lamps, produced by the Optoelectronics Division, perform a vital testing function for owners of BRK First Alert systems. If the light glows, homeowners know the detector has power applied. Also in use at BRK are zener diodes, from the Diode Division in San Rafael, which help detect a low battery level. The firm is currently sampling a CMOS circuit from Mountain View's Digital Division, which acts as part of the detector's smoke-sensing unit.

Fred has been doing business with Fairchild for most of his seven years with BRK, and reports developing a good relationship with our company during that time. "We've gotten good pricing, delivery and service from Fairchild, which have certainly been important to us during the rapid growth of the past three years."

Overcoming public apathy to the danger of home fires was seen as a major problem when the NFPA started its awareness campaign in 1974. However, BRK thinks that apathy was misinterpreted.

"The biggest reason for 'apathy' has been cost," Fred says. "There are key price points in all markets, and once advertising made people aware that home detectors were available for $30 to $40, a lot more people started buying. Advertising has also made people aware of the high incidence of residential fires, and how relatively easy it now is to protect themselves.

"There are going to be some people who won't be swayed by the advertising," he adds, "but sooner or later they are either going to be hit by a fire or know someone who was. They'll realize it could have been worse, or it could have happened to them, and then they'll install a smoke detector."

Top left, with Harry Sello in charge, fast-paced bidding was the name of the game at the Fairchild KQED auction table.

Top center, Jennie Ortega, who regularly fills in at her building's security desk, fills her after-hours time with many volunteer activities.

Top right, Norm Miller, foreground, introduces a friend to backpacking on a Sierra Club trip to Wisconsin.

Bottom center, Bob Durso hopes to interest many of his friends at Fairchild and other companies in Wappingers Falls in helping with the Special Olympics.

Bottom right, Jan Dahlin shares her views on a proposed training program with fellow board members at Goodwill Industries.

Harry Sello Mountain View

He'd (Sell) You The Shirt Off His Back—But It's Against The Rules

About 23 years ago, KQED, San Francisco's public television station, hit upon an auction as the ideal annual fundraiser for the publicly-supported station. Items donated by local businesses and individuals would be shown on the air, then viewers call in with bids. The first one ran for two days and brought in $6000. The 1977 auction, held this past June, occupied the air for two weeks and broke the financial record by raising $700,000.

Veteran auctioneer Dr. Harry Sello has been there through it all. Harry, an 18-year Fairchild veteran and now Technical Director for the International Division, volunteers several evenings during each year's auction to sell everything from fine art to pizzas. It's a sought-after assignment—fellow auctioneers include senators and local television personalities. For Harry, it's a chance to indulge his natural flair for humor and drama, as well as to raise funds for what he calls "some of the most excellent programming on any television station in the country."

Harry's assistance to KQED goes back even before the auction began in 1954. As an early day "Mr. Wizard," Harry created and taught "Tempest in a Test Tube," a popular science show for youngsters, for two years in the 1950's. This was followed by a series of "Science in the News" shows Harry developed with a local newspaper science editor. "KQED was probably one of the first stations in the country to launch science programs for kids," he recalls. The "Tempest" programs eventually became a nationwide public television series, and educational movies were made based on the series.

Harry's success as creator and instructor of these programs attracted the attention of the auction committee, and he was asked to assist with the first fundraiser. "Hurricane Harry," as he became known on the air, quickly learned that "auctioneering tests your ability to think and talk fast, while

GIVING SOMETHING BACK

These five people typify the many Fairchild men and women who help make their communities work

encouraging viewers to call in and bid on items they never knew they wanted before."

Viewers don't hesitate to get involved, either. Several years ago, Harry was auctioning items from the "big board," where the most expensive items are listed. He had successfully (he thought) concluded bidding on a $20,000 videotape system when he got caught in a domestic quarrel by telephone—an angry wife disagreed with her husband's decision to buy the system, and she wanted Harry to settle it. To keep peace all around, Harry finally reopened bidding on the equipment.

In the early days of the auction, auctioneers frequently got bids for clothes they were wearing. A tie or a hat seemed all right to station management, but the practice was stopped when one hawker got practically down to his underwear. More recently, Harry recalls getting an offer of $10 from a viewer if "you'll just get that Harry Sello off the air." But Harry's learned to take just about everything in stride, including a shaving cream pie-in-the-face two years ago. "Delicious," he claimed as the camera zoomed in.

Partly as a result of Harry's long interest in KQED, Fairchild underwrote one of the four display tables for one day at this year's auction. To thank the company for its contribution, the station identified the table with a large Fairchild sign, and made numerous promotional announcements during the televised auction session that day.

"Working the auction is a lot of hard, tense work," Harry says, "although I don't notice it while I'm doing it. On the final night, which is the hottest, we go until we stop—this year it was 4 a.m. But, it's great fun and something that really needs doing. Plus, I must admit that I'm a little bit of a ham at heart."

Jan Dahlin San Jose

Without Industry Feedback, They're Not In The Real World

When Kevin David, who is confined to a wheelchair, was asked at a Goodwill Industries panel what his major obstacle to getting a job was, he responded, "I didn't have to go looking for a job. Jan came looking for me."

Jan Dahlin, Industrial Relations Specialist for the Instrumentation and Systems Group, San Jose, had indeed gone to Goodwill last year when she discovered the Systems Technology Division had a job that could be done by someone in a wheelchair. Goodwill Industries, a nationwide group perhaps best known for thrift stores, also has

an extensive program for training handicapped employees in useful job skills.

Kevin, a recent graduate of Goodwill's electronic assembly training program, was sent. His success at Fairchild made him the runner-up in Goodwill's Handicapped Worker of the Year competition. Because she was so impressed with Goodwill's training programs, Jan began turning to Goodwill for other trainees. Her interest in the group resulted a year ago in an invitation to be on the group's industrial advisory board.

"Our function is to advise them of industry needs," Jan explains. "Without direct critique of their curriculums, they can't offer the training people need for the real world." Keeping up with changing times is especially difficult in the fast-paced electronics industry, which dominates the San Jose-Mountain View area. At their board's recommendation, Jan says, Goodwill has recently added an electronic technician program, because they recognize a great local demand for that training.

Working with groups training minority and handicapped potential employees has become something of an avocation for Jan. She is also a board member at northern California's Center for Employment Training, a group providing job skills training to the financially disadvantaged in areas including office and clerical practices, electronic assembly and janitorial procedures.

"CET operates on a no-frills basis," Jan says. "Operating with minimum facilities, they put their money where it can do the most good—into developing training programs that fill the needs of local employers. The advisory board at both CET and Goodwill have much the same functions—they provide feedback and curriculum advice. Their training programs are very effective—they've provided an excellent source of assembly trainees for us at Systems."

Jan, with Fairchild since 1968, is also a member of the California Governor's Committee on employment of the handicapped. Recently, she was one of two Fairchild representatives attending a national conference on that subject in Washington, D.C. The state committee is currently involved in drafting regulations requiring elevator controls to be duplicated in Braille, which will permit blind people to use elevators unassisted for the first time.

"I first became involved with these organizations because I really felt industry should do more to provide handicapped and disadvantaged people with job opportunities. In the past several years, Fairchild has developed an excellent handicapped employment program, which has eased access to jobs for current employees and actively recruited new employees who had disabilities. We've received national recognition for this from the President's Committee on Employment of the Handicapped and the Mental Health Association. When we hired Kevin, for example, we only had to make a minor adjustment in our building to give him needed access.

"The more I work with these groups, the more personally rewarding it becomes, because they are filling a very obvious need. In the CET annual report last year, it showed the savings to the community in terms of the number of people CET training had taken off the welfare rolls—nearly all their students had been on welfare. That, to me, summed it up."

Norm Miller Chicago

On-The-Trail Training With The Sierra Club

When Norm Miller accompanied some county commissioners and newspaper reporters on a canoe trip up the Des Plaines River near Chicago last spring, his guests were in for quite a surprise. A few miles up the river, they witnessed nearly raw sewage being dumped into the river from a disposal plant. Not too far away, a dairy was dumping raw milk—an excellent food source for bacteria—into the water. As a result of the trip, some river clean-up operations have begun.

Increasing public awareness of the importance of protecting our natural resources is a primary objective of the Sierra Club, a national group formed in the early 1900's to promote conservation.

Norm, an Account Executive in the Chicago Components Sales Office for the past two years, has been active in Sierra Club activities in suburban Chicago since 1969. "I actually joined for a very selfish reason," he says. "It was an excellent way to meet people who liked the outdoors."

Norm's favorite pastime, hands down, he says, is backpacking. So it followed that in addition to his work on the Clean Water Committee, he would spearhead his club's Outings Committee. This group leads day or weekend backpacking trips through the parks of Illinois and Wisconsin, and has proved to be one of the most successful ways to introduce "tenderfeet" to the beauties of the outdoors and the importance of preserving it.

"Probably 75 percent of the people I lead on trips have never been backpacking before," Norm says. "Usually, they start out complaining and wondering how they got talked into this. But by the end of the trip they want to know when the next trip is scheduled." Before the hike, Norm sends a letter to the beginners suggesting equipment to bring and appropriate clothes. "Once the trip starts, it's pretty much on-site training in watching out for poison ivy and poison oak."

"It's hard for me to believe," Norm comments, "but a lot of people raised in cities have spent very little time enjoying the outdoors. Most of their outings consisted of drives to a crowded beach or a walk through a forest preserve with a few thousand people behind them."

"The more people we introduce to real enjoyment of the outdoors, the more people we have interested in protecting it. If I take ten people on a trip who have never been out before, and they like the experience, maybe they'll write their senator the next time an environmental bill needs support. We don't evangelize every minute, though—the key is making people aware of what we have."

Any organization as vocal in defense of the environment as the Sierra Club has been is probably bound to be labeled by some as a group of fanatics. "People who say this don't really know what the Sierra Club is all about," Norm contends. "If you have a cause you believe is worthwhile, you sometimes must yell a little louder than the other guy just to get your point across."

"I read recently that more than 40 species of wildlife have become extinct in the United States in the last 100 years. I think the most important contribution of the Sierra Club is to bring things like this to public attention. As we've all been told, we have to conserve oil, because we can't make any more. It's the same way with wildlife and the environment. Once

the damage is done, it can be impossible to undo."

Jennie Ortega Mountain View

"If You Have A Chance To Help Someone Else, I Think You Should Do It."

"I just wish I could do more."

People who know about Jennie Ortega's considerable involvement in service to the Mexican-American community near her San Jose, Calif. home would be surprised by that statement.

Jennie's name appears on the fundraisers and volunteers lists of numerous community groups. It's hard to see how she could squeeze even one more thing into an already full schedule which includes working, taking care of her family of seven, attending adult education classes, raising scholarship money and donating homemade enchiladas to church fundraising dinners. A 15-year Fairchild employee, Jennie works today as a mask-making specialist in Mountain View's Mask Shop, part of Research and Development.

Next spring, a Mexican-American student from Santa Clara County will be the first recipient of a scholarship started this year by the San Jose's Mexican-American golf association women's auxiliary, of which Jennie is a member. The auxiliary is currently raising money by selling chances for donated gifts and services. "At each golf tournament, Jennie explains, the golfers buy chances for the donated prizes. We started with only $50, but by now we've raised several hundred towards our goal of $1,000." At present the scholarship drive is limited to California, but Jennie says the association hopes to make it a nationwide project in the near future.

Election days are also busy for Jennie. For the past several years, she has worked at a polling place near her home, usually as a voting inspector. "I'm responsible for seeing that all the voting is done according to the law, and most importantly, for seeing that the vote and voter tallies at the end of the day agree."

Although Jennie is paid a small fee for acting as an election assistant, she says she would feel an obligation to be there with or without compensation. "A lot of people in that area feel more comfortable speaking Spanish than English. Over the years, I've found I'm frequently asked to help with Spanish-speaking voters. I can't tell them how to vote, but they feel more comfortable coming in, knowing someone will be there to help them with instructions and procedures."

Jennie's interest in helping out in her community seems to have rubbed off on her seven children, who, Jennie says, "always keep my house full" of people they have befriended. Eventually, Jennie says, she might like to help out local schools on an informal basis, perhaps as a liaison for the Spanish speaking community or as a teacher's aide.

But that's all in the future. Right now, she's concentrating on boosting that scholarship fund, the schedule for the next election, and making enough enchiladas to donate to the church and feed her hungry family, too!

Bob Durso Wappingers Falls

"These Kids Have Been Kept On The Sidelines Too Long"

At the New York State Special Olympics competition last year, the 30 entrants from Dutchess County, about 60 miles north of New York City, brought home nearly 40 medals. One of the people proudest of the accomplishment was Bob Durso.

Bob, a production supervisor at Fairchild's MOS Division plant in Wappingers Falls, N. Y., had served as the 1976 co-chairman of the Mid-Hudson Special Olympics, part of a national program sponsoring athletic competition for mentally handicapped children, ages 6 to 21.

"These kids have been kept on the sidelines of athletic competition for too many years. They *can* participate in sports and benefit from them. They just needed a chance to prove it—that's what the Special Olympics have given them."

The program was established nationally by the John F. Kennedy Foundation, with each local sponsoring group responsible for raising its own funds and running its own competition. 10,000 students, all enrolled in state special education classes, competed throughout New York last year.

Swimming, gymnastics, bowling and track and field comprise the annual spring tournament which is now in its seventh year in the Dutchess County area. Fundraising by local Jaycees and New York State Teachers for the Mentally Handicapped, who sponsor the event, goes on year-round. Bob first became interested in the Special Olympics through his membership in the Jaycees, and has been working with the program for four years.

"A once-a-year 'radiothon' is our major fundraiser," Bob says. "A local station generously donates 30 hours of airtime, and we man the phones. Last year, we raised $8000, which was most of the money we needed. That was supplemented by funds we raised holding a simultaneous dancethon."

About 500 participants annually prepare for the final competition in a series of "mini-meets" which group contestants with others of comparable age and skill. Community volunteers act as "buddies" to the participants, providing a cheering section as well as assisting them with tournament logistics. Winners in each Special Olympics category go on to state competition, and every four years state winners compete in an international meet.

"I'm proud to say our program is now expanding," Bob says. "This year, we had over-21 competition for the first time, and next year we're planning to add a tournament for mentally handicapped people confined to wheelchairs or on crutches."

Bob's assignment for 1977 has been publicity chairman, which he has enjoyed. Appearing on a variety of area radio and television talk shows has helped achieve one of Bob's personal goals—to get a lot of new community people behind the program.

"One of the most fantastic things about the Special Olympics is the way it gets people involved. I've participated in sports all my life, and I think it's very important that our community can give these kids a chance to learn the feeling and value of competition."

Just when everything's coming together, everything falls apart

When Jack was 42, it was a very good year. He was in line for a promotion. He spent a little too much time at work, but his understanding wife always kept dinner warm for him. His kids could pretty much take care of themselves now. He had a house, a boat, and was making a comfortable living.

Everything was coming together for Jack. Then, suddenly, everything fell apart. A close friend died of a heart attack at 50 and Jack began to think about his own mortality. His wife went back to school and left cooking instructions instead of warm meals. His kids didn't have time for him. He began to feel those extra pounds and the loss of every single hair. And his career began to feel more and more like just a job.

What happened? Jack (a fictitious name) had entered "middlescence," a painful period of "taking stock" which is also called the mid-life crisis. It can happen at 35. Or 41. Or 50. It usually happens when you least expect it. No alarms go off, no bells ring and its arrival may be signaled by anything from an actual physical loss of balance to a vague feeling of discontent. But it happens to everybody.

We've long heard of the Terrible Twos and Noisy Nines. We've been told of the agonies of adolescence and the emptiness of old age. But until recently, if you were between 18 and 50, you were pretty much on your own in trying to understand yourself. Views toward adult development are changing though, thanks to people like Professor Erik Erikson of Harvard University and Gail Sheehy, author of the bestseller *Passages*.

Erikson has described three distinct adult life stages: the first, which occurs in the 20's and 30's, is described as Intimacy vs. Isolation. These are the marrying/status building years when an individual can fuse his identity with someone else's without fear of losing himself.

The second adult life stage, Generativity vs. Stagnation, is a busy one during which we sustain our civilization by generating children, products, ideas, works of art, and so on.

The third life stage, Integration vs. Despair, is the kicker. During this period we should be integrating everything we've done and learned in our previous stages into the "grand finale" of our lives. It is a time of deep introspection. We begin to think of our lives from the time of our death instead of from birth. We ask questions like "Is this all there is?", "What does it all mean?", "What happened to all our dreams?", "What'll I do when the kids are gone?" and "Is my work really worth it?"

This third stage, "middlescence," finds us quite alone. Our parents become like children. Our children leave home. Many of our old support systems disappear and we must take responsibility for ourselves.

During this period, many marriages fall apart as husbands and wives grow in different directions, continuing an out-of-sync development that has been occurring from 18 on.

Middlescence

by O.B. Dickerson M.D., Medical Director

As Gail Sheehy says in *Passages*, "Males and females are most alike before they are born, at 18 and over 60. In between, they move toward opposite poles that reach an extreme at about 40."

At that point, many women are champing at the bit to get out and do all the things they missed during the child-rearing years. Others feel useless, undervalued, worried about filling empty nests and long empty hours.

Men, on the other hand, begin thinking that time is running out. It's now or never at work . . . and at home. They begin to value family life more during this stage, regretting all those hours they didn't spend with their kids when they were growing up. But just as this new closeness is blossoming, the kids are demanding distance and the wife a life of her own. Too many "Daddy's busy's" and trips have taken their toll.

Biology takes its toll during this period, too. Wrinkles appear. Waistlines expand. Hairlines retreat. As Author Barbara Fried says, "The 40's are when everything is turning grey, drying up or leaving home."

Once middlescence hits, what do you do about it? Some folks deny it. They throw themselves into work or throw another party, ignoring the real changes that are taking place. Other people, unable to look inside themselves, blame real or imagined shortcomings on other people or their surroundings. "If she hadn't held me back I'd have it made today." "If it hadn't been for the kids, I could've made it to Broadway."

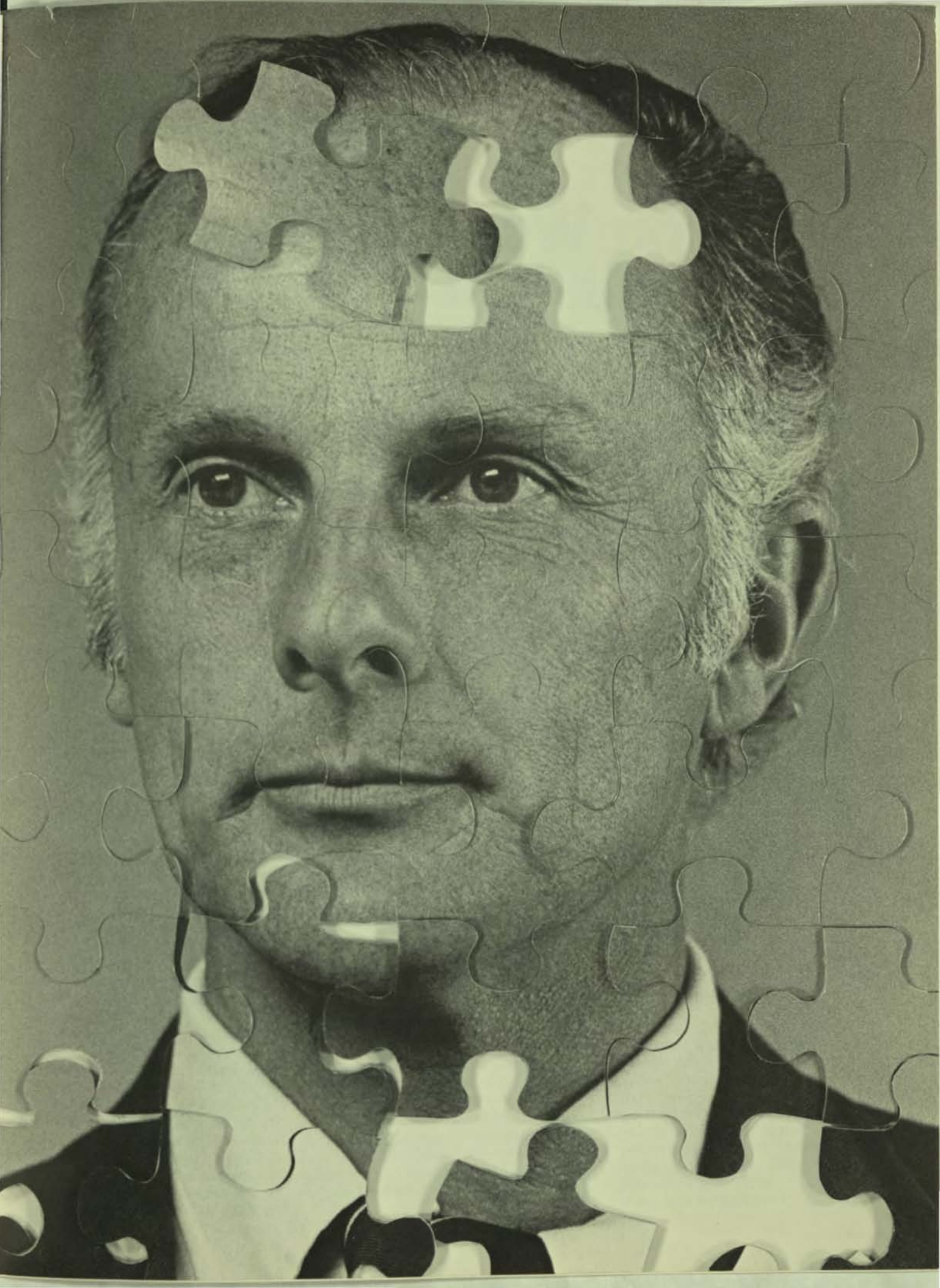
Many people lift faces and hemlines, take up a strenuous sport, date people half their age, have another baby or one last fling. Sadly, many people retreat into bottles of booze or pills. The cost of alcohol and drug abuse to the American economy is estimated at $20—30 billion annually. And the human cost is immeasurable. All because nobody recognized or talked about some painful problems that are perfectly normal and predictable.

But now that we know middlescence is coming, we can lessen its impact—with periodic reevaluation of our families, ourselves, our values and our jobs. We can avoid putting all our eggs in one basket, developing interests outside our careers and kids.

We can keep our sense of adventure and "newness" alive by doing things we always wanted to . . . or never dreamed we would. Like taking a class in creative writing. Joining the volunteer fire department. Taking a river raft trip. Enjoying the small pleasures that each day brings. One of the best things we can do to help ourselves and others through middlescence is to talk it out and over and through. Confide in someone close or a qualified professional counselor. Shared problems are smaller ones.

The most important thing is mid-life is to experience the changes and not be afraid of them. As *Passages* says, "Let it happen to you. Let it happen to your partner. Let the feelings and changes happen." Because out of the crucible of middlescence can come new strengths and self-awareness, better relationships and deeper personal happiness.

It is no accident that the Chinese symbol for crisis contains the characters for extreme danger and opportunity. It is possible to take the panic out of the mid-life crisis just by understanding the dangers. And it's even more possible, with caring and planning, to embrace the opportunity to make your "second season" the most significant and rewarding of your life.



Fairchild helps General Electric Prove:

"You Won't Believe It Until You See It"

Jimmy Carter and Gerald Ford weren't the only ones who made television history during last fall's presidential debate in Williamsburg. General Electric was also present, with thirty of its innovative new VIR television sets. And Fairchild was there too, furnishing the all-important semiconductor technology behind the first truly automatic color picture.

No one in the press box saw greenish faces or purple-tinged hands that night. And relaxing in their hotel rooms afterwards, neither Carter nor Ford had to get up to adjust the color on his GE set. The reason was VIR, "Broadcast Controlled Color", one of the biggest technological breakthroughs since color television itself.

To hear General Electric engineers explain it, "Broadcast-Controlled Color" is a relatively simple business. In 1972, after several years of research, the FCC reserved the 19th line (out of 525 horizontal lines which compose a TV picture) for a specific "vertical interval reference" signal (VIR). The reference signal includes the color and tint levels set by the broadcaster. But it took solid-state technology to complete the chain from studio to home.

Television pictures are adjusted to the proper levels of tint, color and brightness in the broadcast studio. However, for many reasons, one being how a home television set is adjusted, the quality of the picture on the home screen is not up to that of the picture transmitted from the studio. The end result in many cases is a degrading of skin tones and background colors, which is not the way the program director intended the picture to be seen.

This single modular circuit board decodes the VIR signal and automatically adjusts the picture.

Provided VIR information is available on the transmitted program signal, the VIR circuitry in a GE television set continuously compares the color and tint signals as processed within the receiver to those in the transmitted signal and makes the necessary corrections. Thus, the picture on the home screen has taken a significant step toward studio quality.

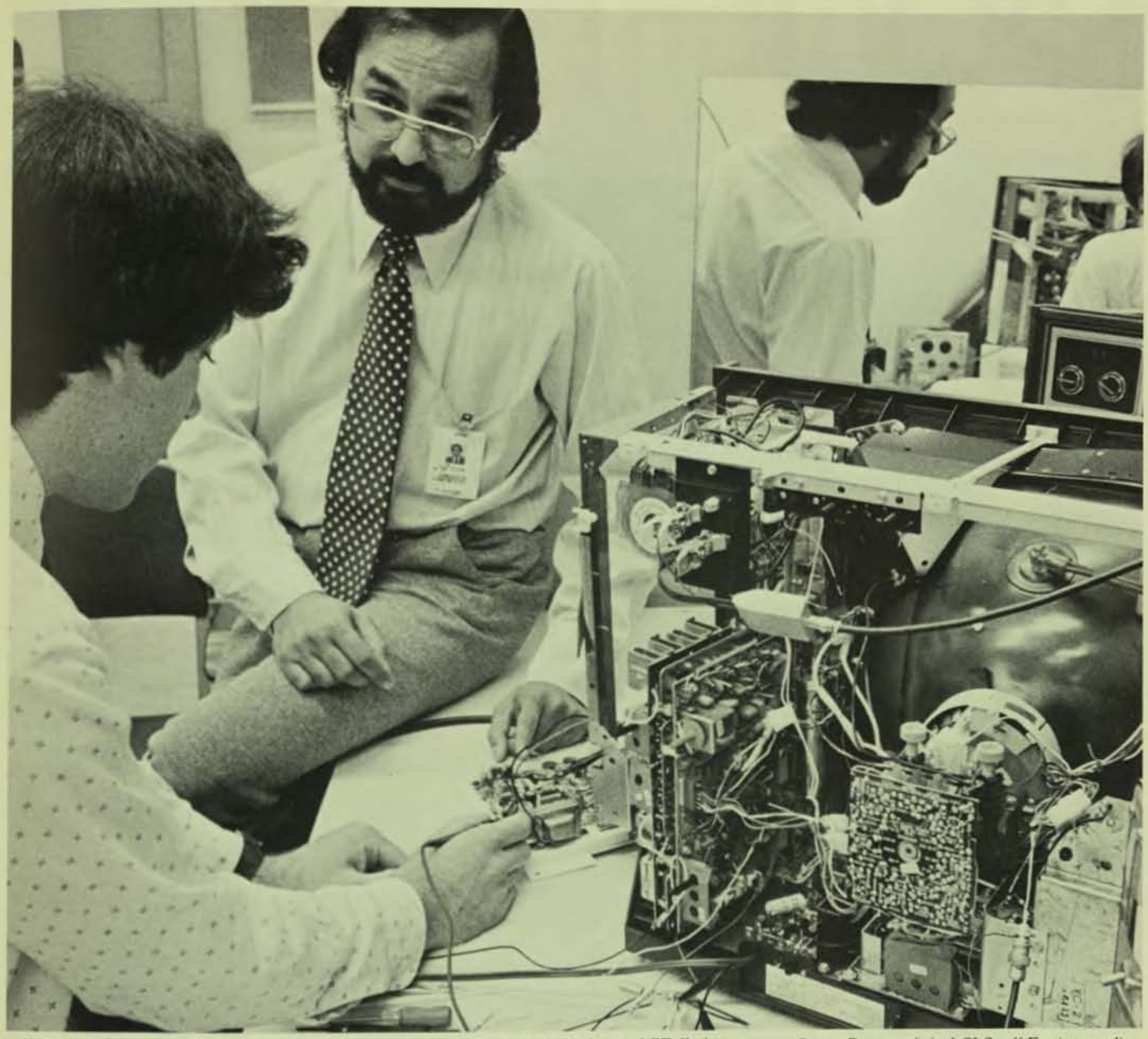
In the spring of 1976, GE introduced 19-inch and 25-inch TV's, which can decode color and tint information from the transmitted signal and automatically adjust the color to eliminate distortions. In areas where VIR signals are transmitted, results have been so successful that General Electric is now in the process of patenting their VIR technology.

When did Fairchild come into the picture? Almost from the very beginning. "After all," says Dick Wilson, Manager of GE's Semiconductor Applications, "Fairchild and GE go back a long way. Our first transistorized monochrome TV, introduced back in '63, used Fairchild small-signal transistors."

But it takes more than tradition to sell circuitry. "Specifically, we looked for availability, reliability and price," says Semiconductor Buyer Nelson Rose. "Fairchild is one of our leading IC suppliers."

At present, GE uses four Fairchild digital integrated circuits in the VIR. One IC counts down the number of lines on the picture to arrive at line 19. Then, if the broadcasting station is transmitting the VIR signal, other integrated circuits are activated to provide various pulses needed for color comparison and correction. The VIR system also makes use of about 30 transistors, which perform switching functions and amplify video signal information.

The Federal Communications Commission does not require TV stations to broadcast the VIR-type signal, but according to a GE survey, about 85 percent of the U.S. stations currently have it. GE officials expect that, due to the marked improvement in color possible with the VIR system, all U.S. stations will eventually switch to VIR transmission and other manufacturers will enter the market. They compare the introduction of VIR to the transition from black and white to color television—once demand for color sets was great enough,



Steve Barton, left, LSI Staff Engineer, discusses GE television system development with Sid Bagwe, LSI Consumer Market Development Manager. The LSI Group has worked closely with General Electric in developing advanced circuitry for the VIR system.

television stations switched to color transmissions.

"The VIR system simplifies life for the local broadcaster as well as the home viewer," Dick says. "Once the signal is added, necessary color monitoring and adjustments at the station are greatly reduced."

Last year over 150,000 Fairchild digital circuits were shipped from California to GE's television headquarters in Portsmouth, Virginia. Because the ICs are so small, a single well-packed carton can supply GE's VIR needs for an entire month, at least for the present. But, VIR has far exceeded market predictions. And no wonder:

Deep within a GE lab crowded with partially-assembled sets, Sanjar Ghaem stands in front of a large TV. The flesh tones have a definite purple cast. "A local ad with no VIR," the engineer explains. Then, as the network show returns, a small red light on the TV set blinks on. For a brief instant, the picture seems to dissolve and suddenly a crisp, perfectly adjusted color image takes it place. As their advertising slogan says, "You won't believe it until you see it."

In fact, if the GE building didn't bristle with "enough antennas to pull Alaska" and if you hadn't just watched Fairchild circuitry being fitted into a VIR set—you might be tempted to believe in magic.

But not Sanjar. He followed VIR from the sketchpad to the marketplace, and now he's at work on something else. "No, not another special project," he smiles, "just the next generation of TV sets."

SPOTLIGHT

A new section featuring people and happenings at Fairchild.

E BEAM SPEEDS LSI DEVELOPMENT

Housed in a carefully light-and-temperature-controlled section of the Mask Shop in Mountain View is Fairchild's newest tool for meeting the exploding market demand for large scale integration devices—the Electron Beam machine.

Through electron optics techniques, the E Beam machine can prepare masks for printing onto silicon wafers in a fraction of the time required by conventional light optics methods. At full capacity, the E Beam machine can produce in one week masks that now take three or four weeks to complete.

Masks, normally thin sheets of material containing integrated circuitry patterns, are laid down on coated silicon wafers to produce finished semiconductor devices. The mask is laid down through repeated ultra-violet photographic exposures, followed by etching away of unnecessary material. E Beam technology makes it possible to "write" the circuit pattern on the mask with a controlled beam of electrons.

E Beam speed is achieved because the machine does the job of many mask pattern generators and step-repeater cameras, which must perform numerous multi-step repetitions to complete one mask.

The E Beam machine has been in operation since June, under the watchful eyes of Skip Chase and Howard Short, the two supervising process engineers who have been with the E Beam project since the first machine specifications were written in 1974. The machine has already been used to help develop Fairchild's recently-introduced 65K CCD memory.

Operator Ruby Culbertson, left, prepares the next load of plates for the electron beam machine. Technician Lura Metcalf, right, notes information at the console of the computer which controls the E Beam system. Special protective "clean room" clothing is required in the E Beam area.

"This is the first electron beam machine to be used in a commercial non-captive (internal-only) market," says Dr. Thomas A. Longo, Vice President and Chief Technical Officer. "It will improve Fairchild's capability to make complex VLSI (very large scale integration) devices, and will appreciably shorten our product development schedules, so that we can react faster to market demands."

SUMMER EMPLOYEES LEARN AS THEY WORK

Denice Ghilotti, 16, smiles from her receptionist's desk as she recalls letting a cat out of the door at the Diode Division in San Rafael. "Somebody brought kittens to work. They started scratching me and I accidentally let one escape."

And Mahamood Baporia, 18, who will enter San Francisco State University in the fall, shyly admits that "working at Fairchild this summer may help me decide whether or not to major in electrical engineering."

These teenagers and eight more like them spent eight weeks this summer working in the San Rafael plant in a Vocational Exploration Program (VEP) federally funded by The Comprehensive Employment and Training Act (CETA). The program is sponsored by the National Alliance of Businessmen and the Human Resources Development Institute.

The goal of the program, says Joe Turner, Industrial Relations Manager, is to "give economically disadvantaged kids a chance to have real world working experience. All of our staff members are committed to it. Our department managers make up the lesson plans for the teenagers as they rotate from department to department.

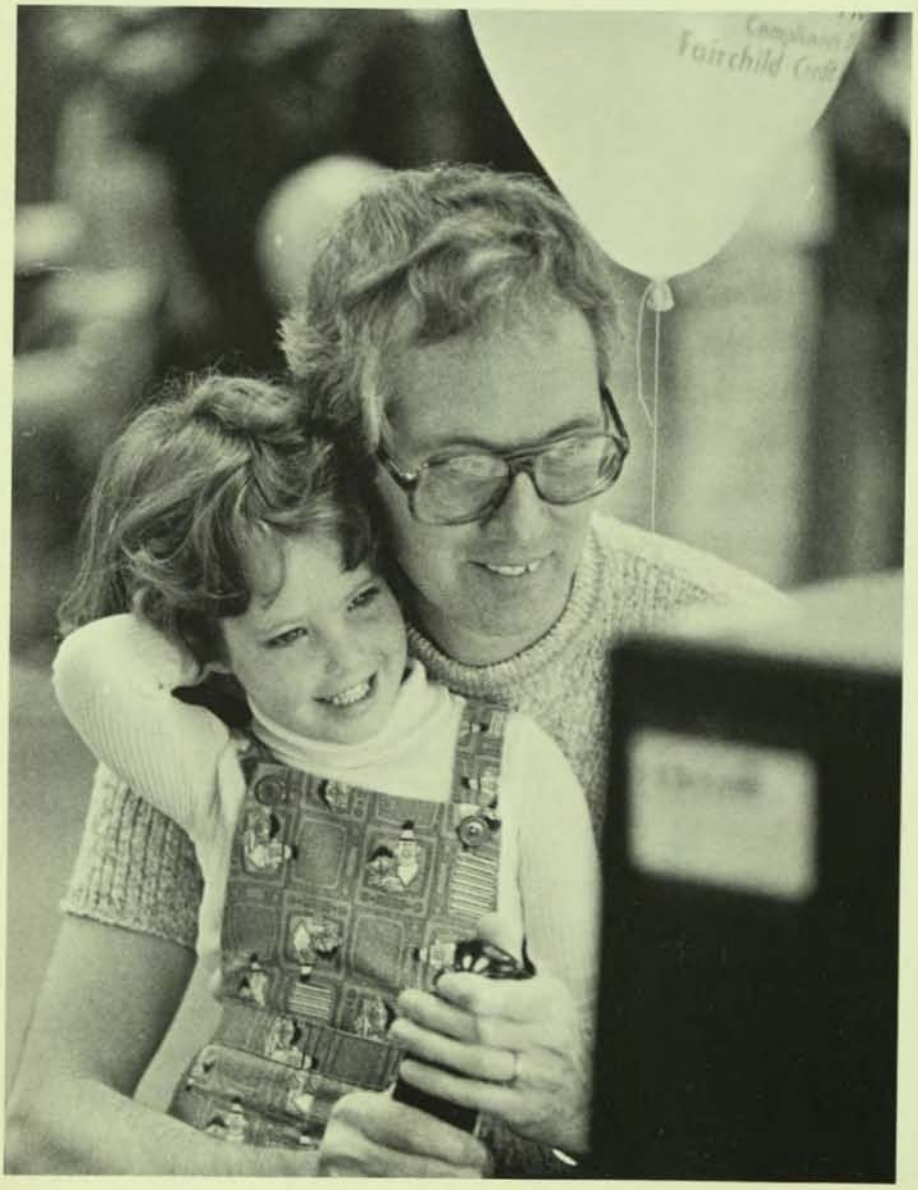
"The kids follow all employee rules, fill out time cards, and meet every Friday for informal rap sessions. They have no special privileges—excessive absenteeism is *not* excused—but we're generally flexible in working with them. We want them to like what they're doing."

Art Padilla, NAB representative in San Francisco, worked with Joe to establish the Fairchild program, assuring that the summer employees were a supplement, not a replacement to regular employees. And Rob Bussell, San Rafael employee relations specialist and a real "father to the kids," as Joe puts it, is a combined guidance counselor, administrator, and directory of "who's who in VEP." "This program has continued Fairchild's strong commitment to community involvement." Rob says.

"Generally, VEP has been highly successful for both the summer employees and Fairchild's permanent employees. Suddenly our permanent employees are being called upon to explain what they do—and that makes what they do all the more important."

Annette Perkins, left, and Phil Caruso worked at San Rafael this past summer as part of the new Vocational Employment Program.

CLOSEUPS



IT NEVER RAINS IN SOUTH(ERN) PORTLAND?

A heavy, cold downpour didn't do much to diminish the enthusiastic crowds attending the Fairchild South Portland double anniversary open house in June. Even though the Digital Division facility's planning committee had discounted the local forecast of rain, they'd erected a "just-in-case" tent in the parking lot which was pressed into service as 1400 employees, families and community guests ignored the rain and came to help celebrate the plant's fifteenth anniversary and concurrently observe the corporation's fiftieth year.

Guests examined product and manufacturing displays, tried their luck with the Fairchild Channel F™ video game, and followed volunteer FEAA guides through the plant, where representatives of the main manufacturing areas gave production demonstrations. As the day progressed

Above, Debbie Johnson, Marketing, shows a Fairchild watch to an Open House guest.

Top left, Aaron Dries finds that microscope just as interesting as his dad, South Portland Process Engineer Rolf Dries.

Left, the 'Channel F' video game got the undivided attention of David Childress, DC Supervisor, and his daughter, Alison.

and crowds got larger, every available person, including plant manager Cy Hannon, became a tour guide. Cy had a chance at a dress rehearsal the day before the open house, when the Governor of Maine stopped by for an advance tour.

Peter Wyberg, Industrial Relations, says, "An open house sounds easy. All you need is good weather, superb displays, a tour route set up so people don't get lost, short enough so that kids don't get bored and varied enough so everyone says 'gee whiz.'"

Posters feared lost in Denver showed up at the last minute, and even considering the weather, the event was considered a huge success. Still, Peter wonders, what if they'd *really* advertised . . .

Top, Phyllis Van Deventer, Assembly Work Leader, front, and Bob Fowler, Aerospace and Defense Project Manager, explain South Portland production operations to Open House guests.

Bottom, display terminals proved a big attraction to some younger visitors.

NEWSMAKERS

A. JAMES HAZLE has been named Vice President—Finance for Fairchild. . . **RONALD ALESSIO** has joined Fairchild as Assistant Treasurer. . .**JOE CONSOLI** has been named Components Group Finance Manager . . **JOHN EDWARDS** has been appointed Manager, Federal Taxes. . . **EDMUND KELLIHER** has joined the Treasury Department as Manager of International Banking . . . **GORDON DAGGY** has assumed the newly-created position of Director of Advertising and Promotion . . . **JOHN WYATT,** Manager of Equal Opportunity Programs, has been elected chairman of the Santa Clara (Ca.) Valley Affirmative Action Council . . . **GEORGE URBANI** has been named MOS Division Marketing Manager . . . **TREVOR SMITH** has become Plant Manager at the Tuen Muen plant in Hong Kong . . . **THOMAS LOWE, JR.** has been named Plant Manager in Korea . . . the new Plant Manager at Fairchild Singapore is **BRUCE STROMSTAD** . . . Systems Technology Division has named **HARRY BRINKER,** Chicago, Salesman of the Year. . . Federal Systems Group has appointed **JOHN BERCZUK** Operations Director and **PATRICK CUSACK** Employment Manager . . . The Space and Defense Systems Division has named **FRANK SMEAD** Product Development Manager for RF Systems. . . **JAMES SZCZEPEK** has been appointed Midwest District Sales Manger for the Industrial Products Division . . . International Division has named **EMILE DALLE** General Manager, French Sales and Marketing . . . **AL LEMELIN** has rejoined Fairchild as International Division Credit Manager.

Horizons, Other Fairchild Publications Honored

Industrial Graphics International, at its recent convention in San Jose, Calif., presented awards of merit to publications produced by Fairchild. Honored for design excellence were the Spring 1977 issue of *Horizons*, featuring the *50th Year Photo Album* commemorating Fairchild's anniversary, and the corporate brochure *Facts About Fairchild.* Both publications are produced by Corporate Communications.

Also recognized for excellence in design were eight publications from the Advertising and Promotion Department. Included in this group were product prochures for the F8™ microprocessor, ECL devices, optoelectronics products and power and small signal transistors. Also honored were three issues of Fairchild's semiconductor magazine, *Progress.*

Fairchild has also been recognized for the design and effectiveness of a number of semiconductor and Instrumentation & Systems advertisements placed during the past year. Organizations making awards to Fairchild include the Business Professional Advertising Association, the Art Directors and Copy Club of New York, and the publication *Electronic Engineering Times.*

MORE CLOSEUPS

SHOW BIZ

Three Fairchild product groups showed their wares at industry trade shows this past summer, attracting large crowds that came to see the latest in test systems, consumer products and LSI devices.

CES

Four new Videocart™ cartridges for Fairchild's "Channel F"™ Video Entertainment System, plus five ladies' LCD watches and $19.95 metal LED and LCD men's watches, highlighted our product introductions at the summer Consumer Electronics Show in Chicago. The new cartridges include Magic Numbers, Drag Strip, Maze, and Baseball.

IEEE CONSUMER SHOW

Fairchild's LSI Group exhibited some of its latest developments at another Chicago summer event, the IEEE Consumer Show. The popularity of CB radios was reflected in the display of Fairchild CB synthesizer and controller chips. The future of large scale integration devices in automobiles was also apparent in the display of a hybrid automobile radio tuner which can store 16 tuning frequencies, and a dashboard computer based on the Fairchild F8™ microprocessor.

SEMICON

The Instrumentation and Systems Group announced two new test systems at Semicon, held in San Mateo, Ca. The Quad tester, made by the Systems Technology Division, performs four-at-a-time testing of 16K devices at high speed. Also from Systems Tech came the new Sentry™ V, a production test system capable of reducing per-unit testing cost by increasing throughput as much as 200 percent.

Left top, Fairchild timepieces and the 'Channel F' Video Entertainment System attracted large crowds at the summer Consumer Electronics show in Chicago.

Top, Bob Carlsted, Systems Technology Division, demonstrates capabilities of new Instrumentation and Systems Group test systems at the Semicon Show.

Center, Fairchild microprocessors were among products featured at the LSI Group booth at the IEEE Consumer Show, held last summer in Chicago.

Bottom, Dick Feeney addresses a session of Wappingers Falls first supervisory training course. Attending last summer's course were 24 supervisors and staff members.

Right top, Oh Bun Hung, a Fairchild employee in Seoul, Korea, receives kidney dialysis treatments at Seoul's Mercy Hospital, thanks to a donation from Fairchild.

KIDNEY MACHINE TO KOREAN HOSPITAL

Sacred Heart Mercy Hospital in Seoul, Korea, has purchased a kidney hemodialysis unit thanks to a gift made by Fairchild to the American Kor-Asian Foundation. Patients with kidney failure must depend on a dialysis machine at least twice a week to clean impurities from the blood. Treatment can cost as much as $800 a month, and machines are scarce in Asian countries.

The unit purchased by the Seoul hospital will provide at least 900 treatments each year. One patient benefitting from the new machine in Oh Bun Ung, a section chief at Fairchild in Seoul and a nine-year Fairchild employee.

WAPPINGERS FALLS TRAINS SUPERVISORS

Time management, delegation, performance appraisals, interviewing and managing the profit and loss statement were among the topics covered by 24 supervisors and staff members in Wappingers Falls' first supervisory training course.

In twice weekly sessions running through the summer, the New York MOS Division facility's supervisors heard lectures, watched films and participated in group discussions on nine phases of management. The program was developed by Industrial Relations Manager Dick Feeney. Dick taught several training sessions, as did Plant Manager Jack Higbee.

"We saw a great potential in our supervisors," Dick said, "and they really cared about becoming better at this phase of their jobs. Our program, which was developed with the assistance of the Career Center in Mountain View, introduced some management concepts new to our class members, as well as reinforced some common sense ideas they already had."

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, 1977.

Analog Division
Andy Adamian
"A Simple Approach to Cooling Hot ICs with Heat Sinks"
Machine Design

Bipolar Memory—ECL Products Division
Vernon Coleman, Chuck Erickson, Krishna Rallapalli
"A Versatile Raster Scan CRT Terminal Controller Chip"
COMPCON 77

Chuck Erickson, Hemraj Hingarh, Robert Moeckel, Dan Wilnai
"A 16 Bit Monolithic I^2L Processor"
ISSCC, 1977

Joseph A. Ferro
"An Accelerated Method for Effective Process Control of PROMs"
1977 IEEE Reliability Physics Symposium

Krishna Rallapalli
"Bit Slice Approach for Implementing the DES"
Conference on Computer Security and Data Encryption Standards

"Programmable Bit-Rate Generator"
Computer Hobby

Peter W. J. Verhofstadt
"Comparison of Microprocessor Architectures in Perspective"
International Microelectronics Conference

Dan Wilnai
"LSI Elements Using I^2L Technology"
COMPCON 77

Imaging Systems Division
David Goldstein
"Study of a High Speed Automated Assembly System"
1977 Fuze Annual Meeting

Ralph Wight
"Low Contrast Imaging"
SPIE Symposium East

Instruments and Controls Division
John J. Katsaros
"Microcomputers and Process Control: Where's the Missing Link"
Instrument Society of America Conference

MOS/CCD Products Division
Bruce Threewitt
"Characteristics of CCD Memories with Applications to Communications Systems"
IEEE Communications Society

Research and Development
Bruce E. Deal
"Charge Effects and Other Properties of the Si-SiO_2 Interface: The Current Understanding"
Silicon Symposium Proceedings

"New Developments in Materials and Processing Aspects of Silicon Device Technology"
Proceedings of the Conference on Solid State Devices

Dennis W. Hess
"Effect of Chlorine on the Negative Bias Instability in MOS Structures"
Journal of the Electrochemical Society

Dennis W. Hess and Bruce E. Deal
"Kinetics of the Thermal Oxidation of Silicon in O_2/HCl Mixtures"
Journal of the Electrochemical Society

David K. Myers
"Ionizing Radiation Effects on NMOS Microprocessors"
IEEE GNS Group Proceedings

PATENTS

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

Bipolar Memory—ECL Products Division
George Brown
Asymmetrical Memory Cell Arrangement

William H. Herndon
An improved semiconductor memory cell circuit and structure

Peter R. Smith
Process for simultaneously fabricating epitaxial resistors, base resistors, and vertical transistor bases

Digital Division
Peter H. Alfke, Charles H. Alford, Eric G. Breeze
Phase-locked Looped Frequency Synthesizer

Barry J. Robinson
High speed complementary output exclusive OR/NOR circuit

MOS/CCD Products Division
Gilbert F. Amelio, Kamleshwar C. Gunsagar
Line-addressable Random Access Memory

Kamleshwar C. Gunsagar, Gilbert F. Amelio
Device for introducing charge

Robert L. Luce, Joseph P. Perry, James D. Sansburry
Method of MOS circuit fabrication

Research and Development
Bruce E. Deal, Daniel C. Hu
Complementary insulated gate field effect transistor structure and process for fabricating the structure

Harry Peterson
Memory cell circuit and semiconductor structure therefore

Systems Technology Division
Arthur J. Winter
Voltage converter
Analog-to-digital converter employing common mode rejection circuit

It was only natural that 12-year-old Rayna Oakley would want to be a Girl Scout. She loves the outdoors and camping, and she likes to work toward goals and earn recognition.

Rayna, born with Down's Syndrome (formerly called Mongolism), joined a special Girl Scout unit for the handicapped last year. The unit, sponsored by the Santa Clara County, California Girl Scout Council, a United Way agency, has given Rayna a chance to belong, and to share good times with Margaret McConnell, 13, a Girl Scout who volunteers her time each week to help with activities of Rayna's troop. "These girls are really special," she says.

Fairchild locations nationwide will be holding their annual United Way drives in September and October. Your support helps your community's United Way provide services ranging from Rayna's special Girl Scout troop to medical research. Thanks to you, it works for all of us.

Thanks to you it works for all of us. The United Way.