

# THE MONOGRAM

MAR.  
1961



WILL HOTCAKES EVER SELL LIKE COMPUTERS?

*Your Defense Dollars Buy More . . . p. 4*

# LETTERS

## Another Winner!

EDITOR: I have just finished reading the article about Mike Cassinelli's completion of the EP Course (*The Monogram*, Feb. 1961, p. 20). We feel that the assumption, "he's one of the first hourly employees in General Electric to take the Course," is incorrect, since we held an EP Course involving hourly employees as early as 1956.

In the 1956 EP Class, in fact, was hourly-rated employee Herman E. Owens, who also won the speakers' competition. Not only that, but Mr. Owens has since advanced to the position of purchasing specialist here.

J. R. ALDRIDGE  
Distribution Assemblies Dept.  
Houston

## Do I Hear More?

EDITOR: On February 27 our Providence Plant maintenance department completed 5,000 consecutive days without a single lost-time accident. This record was achieved under three different foremen: the late Jim Short, Chet Kane, and George Binns.

The hazards inherent in the varied and frequently dangerous jobs performed by all maintenance people make this record one that we in Providence are very proud of. Can any other maintenance crew in the circuit top this record?

EDGAR J. STJOHN  
Wiring Device Dept.  
Providence

## Pittsfield People

EDITOR: Thought your readers might like to know about "The Story of General Electric in Pittsfield in 1960 . . . and a look ahead." It's probably one of the Company's first local annual reports.

We distributed the report to over 10,000 employees, and to local city officials and share owners in the Berkshire County area.

BRUCE H. BURNHAM  
Relations and Utilities  
Pittsfield

The object of THE MONOGRAM is to keep its readers better informed on General Electric activities and policies, so that they may more effectively represent the Company in its relations with the public.

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Keith H. Crandell, Editor

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GENERAL  ELECTRIC

## ORGANIZATION

### Bob Paxton Retiring

Robert Paxton, General Electric's sixth President and one of the top authorities in electrical manufacturing and engineering, is calling it a career. The 59-year-old executive had intended to retire at 60 (next January). His change in plans was precipitated by the needed period of convalescence ahead of him following

#### ROBERT PAXTON

*From test engineer to President.*



major surgery in January and the likelihood of further surgery some time later this year.

During his 37 years with General Electric, the Scottish-born R.P.I. graduate moved from a young test engineer to a succession of key jobs in the Company's headquarters. Over the past decade he has headed Manufacturing Services, served as a Group Executive, as Executive Vice President for all Company operations, as a member of the Board of Directors, and, since April, 1958, as Company President. (His presidential predecessors: Charles Coffin, Edwin W. Rice, Jr., Gerard Swope, Charles E. Wilson, and Ralph J. Cordiner.)

Mr. Cordiner praised Mr. Paxton's outstanding contributions to the success and growth of General Electric, and added, "everyone in the organization extends his sympathy and affection to Bob and appreciation for his contributions to the Company."

Mr. Cordiner will act as both Chairman of the Board and President until the Board of Directors elects Mr. Paxton's successor.

With this double work load impending, Mr. Cordiner announced his resignation as chairman of the Business Advisory Council, an organization of business leaders which advises the Department of Commerce on economic affairs. His resignation came despite a unanimous vote of the B.A.C. Executive Committee urging him to continue as chairman.

## Heading Off a Traffic Jam

Maybe you're among those who thought traffic problems would be solved once the vastness of outer space gave way to man's persistent efforts to put it to use. But the people who do the far-out thinking (both in terms of time and space) are already working to break up a potential traffic jam in outer space.

Focus of these efforts, in this country at least, is the Federal Communications Commission, which has asked for advice on how to allocate channels available for space communication. Radio, television, and microwave traffic lanes are limited way out there, much as they are here on Earth.

**Early this month** General Electric was among the 30 companies responding to the FCC's request. Our recommendation was based on more than three million man hours of work applied to space vehicle and communication technology over recent years. Most directly involved in the final study written up for FCC were scientists and engineers from Missile and Space Vehicle Department, Light and Heavy Military Equipment departments, the General Engineering Lab, and Communication Products Department.

Here's what they suggested:

- Future communication needs of underdeveloped nations of the world should be given equal consideration with the needs of more advanced nations;

- Allocation of radio frequencies for space must be based upon world-wide considerations, both technical and nontechnical;

- Priority should be given first to communication services involving safety, then to those which are needed for space mis-

sions, and finally to those improving use of the radio frequency bands:

- Space communications plans should consider the practical need to obtain international agreement.

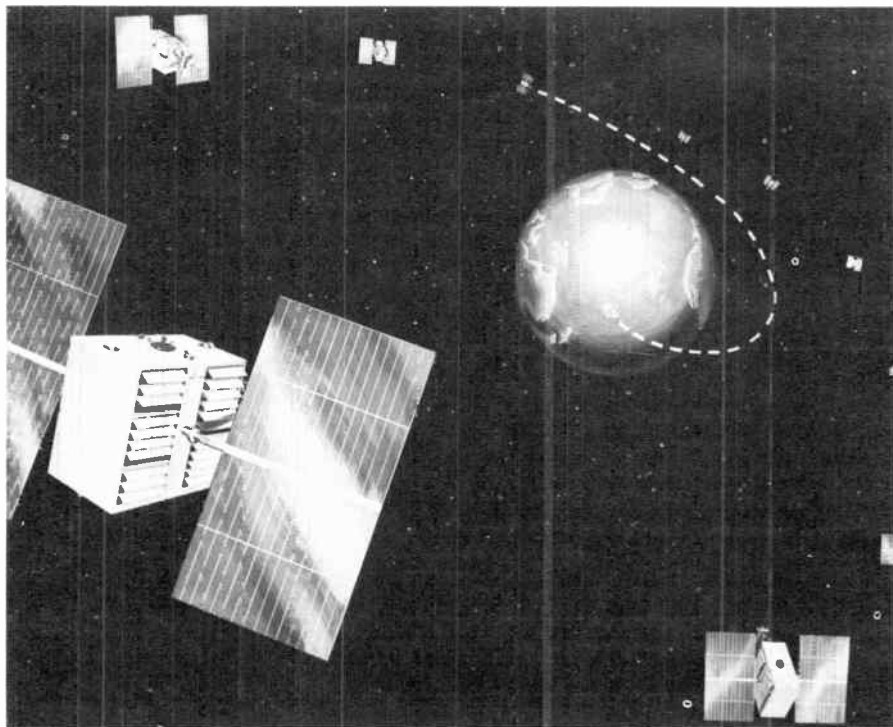
**In its statement**, which was delivered to the FCC by MSVD satellite and space vehicle engineer Bob Haviland (below), the Company study team released details of its plan for a world-wide satellite system for handling long-distance communications traffic. They outlined a global system based on earth-orbiting satellites, with provision for local, national or private ownership of ground terminals.

Operating as a "common carrier's carrier," the system would service existing communication companies. This would allow maximum growth opportunity for privately-owned U. S. telecommunication carriers, as well as for carriers operated by other countries, and the underdeveloped nations of the world.

Primarily an international network, our proposed Telecommunication Satellite

**MSVD'S BOB HAVILAND**  
*Three-million man-hours of work.*





**TELECOMMUNICATION SATELLITE SYSTEM** described in Comany proposal to Federal Communications Commission involves ten space vehicles in controlled orbits about 6000 nautical miles above the equator, at equally-spaced intervals. System would act as a common carrier for communications companies here and carriers operated by other countries.

System could also provide communication service between areas on the same continent. But its primary purpose would be to provide world-wide interconnecting facilities for existing national telecommunications networks.

**We also offered** to develop technical and operational information needed for allocation of space communication frequencies, and to help set up related engineering standards.

The study also recommended that the United States experiment with temporary

frequency assignments on its own initiative and on a cooperative basis with other countries as a step toward permanent allocation.

What FCC is aiming at, eventually, is a plan to lay before the international body which handles such matters, in 1963. In many aspects, dividing up the communication traffic lanes in outer space is much like what was done with radio lanes when they started to get congested back in the 1920's. Next step: further written recommendations to FCC, then public hearings prior to the international meeting.

## Your Dollars Buy More

Even in times of inflation, nickels and dimes still add up to a dollar, if you have enough of them. And savings of defense dollars—some of them nickel-and-dime shavings by comparison with multi-million dollar contracts—have added up to \$130 million since 1958 in General Electric.

How does it add up? Compressor blades for the J79 turbojet power plant for the record-making B-58 bomber, for example, once cost \$3.77 apiece. This was trimmed to a unit cost of \$1.96. With 1012 blades in each engine, this brought about a \$7327 cut in the cost of each four-engined B-58. With a further 7 per cent reduction expected later this year, total cost reductions on Large Jet Engine Dept. J79's should reach almost \$20 million.

In another instance, cost-saving innovations of less than \$1000 apiece added up to another million dollars in just six months. And another \$17.7 million was whacked out of defense costs by some 2500 separate money-saving ideas.

"Cost reduction task forces have been analyzing every aspect of product design, manufacturing, distribution and delivery," according to Cramer W. LaPierre, vice president and group executive for the Electronics and Flight System Group.

He said that production contracts which reduced unit costs of equipment, as well as automated purchasing, manufacturing, and accounting procedures, value analysis techniques and employee suggestions were prime methods of achieving the economies. The Company has also been helping subcontractors and small businesses make similar reductions.

Here's a sample list of outstanding cost reduction results:

**Small Aircraft Engine Department:** An all-out effort to reduce the cost of T58 turbojet engines for Army and Navy helicopters by more than 20 per cent saved \$2.7 million, and they're still trimming.

**Aircraft Accessory Turbine Department:** Cost reductions ranging from 25 to 69 per cent have added up to \$8.7 million savings in production costs of constant speed drives and jet engine fuel controls for military aircraft.

**Light Military Electronics Department:** Responding to the Air Force's challenge to all contractors to turn out more F-105 fighter-bombers at lower costs, LMED value analyzed three million dollars out of armament and flight control equipment.

**Defense Systems Department:** Belt-tightening reductions in material, labor, overhead, and government contract requirements produced more than five million dollars in savings last year alone.

**Heavy Military Equipment Department:** Hard-hitting cost improvement programs, extensive use of value analysis growing out of Company-training sem-

**RALPH JOHNSON AND J79 BLADES**  
*Trimmed from \$3.77 to \$1.96 apiece.*





**U.S. AIR FORCE B-58, AND FOUR J79 TURBOJETS**  
*Cost reduction: about \$20 million.*

inars, careful subcontractor evaluations, and critical engineering modifications have trimmed a sizable \$11 million off of defense costs at HMED since 1958.

Ordnance Department: Results of cost reduction efforts, again based on extensive use of value analysis techniques, totaled more than \$10 million for work on

the Atlas missile tracker, the Polaris program, and other defense contracts.

Vice President LaPierre pointed out that money saved through these efforts has been used by the military to buy "more work, more weapons and more advanced equipment to meet the growing requirements of national defense."

**USAF ATLAS MISSILE AND THE NAVY'S POLARIS**  
*Savings of more than \$10 million.*



## UNION RELATIONS

### Aftermath of Violence

"You are going to create a blood bath!"

This, reports Philip D. Moore, was IUE President James B. Carey's response to the Company's announced determination to exercise its legal rights to try to operate during last fall's IUE strike. Mr. Moore, manager of the Company's Employee Relations Service, served as our chief negotiator.

Last week the Company charged the IUE with refusing to bargain and deliberately fostering violence during the strike. The charge was filed with the National Labor Relations Board in New York.

Mr. Moore said that Mr. Carey "threatened us with 'therapy,' told us that the only way we could get into our plants was if he went with us, and on one occasion stated that he had no objection to turning our cars over, or beating us over the head."

The NLRB has filed strike-violence complaints against locals in Schenectady, Syracuse, Pittsfield and Lynn, and strike-violence charges are also pending against IUE locals in Anniston, Bucyrus, and Philadelphia.

Said Mr. Moore: "It's clear that these IUE locals were acting as a part of an overall union strategy to illegally halt operations, and force us to give in to the unrealistic union demands. The inspiration for the violence that many employees suffered during the strike came from the IUE top officials."

Meanwhile, as *The Monogram* went to press, the NLRB was preparing to take a familiar IUE complaint about the Company's approach to collective bargaining to a hearing in New York. Mr. Moore

said he "welcomes" the hearing. He noted that the IUE had filed similar charges in 1954 and 1958 which did not go to hearings.

The charges seem to center around General Electric's long-established practice of putting its best foot forward with its proposal to the union and the Company's efforts to keep employees informed of its views during negotiations. (One count charges that the Company was critical of the IUE's leadership.)

Said Mr. Moore: "The whole thing boils down to a Carey demand that we should indulge in auction-type bargaining and keep employees in the dark about what is going on at the bargaining table.

"We are confident," he said, "that when all the facts are in, it will be shown that General Electric's approach to collective bargaining is in strict accord with both the letter and the spirit of the law.

"The record will show that in our 1960 collective bargaining with the IUE, we made our initial proposal after six full weeks of negotiations, that we made significant modifications in the proposal during subsequent negotiation sessions, and that we followed our usual practice of keeping our employees informed, as they wanted to be."

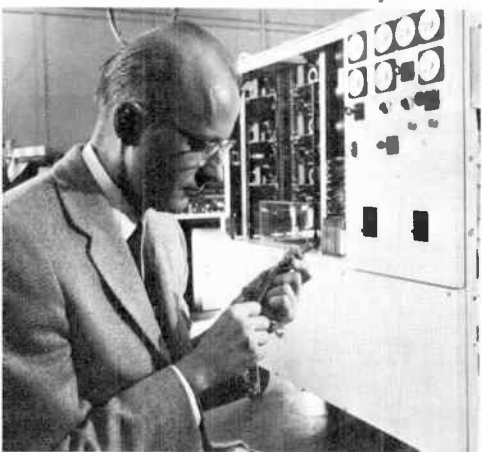
NLRB hearings on the cases will probably last several months.

## TECHNOLOGY

### Three More from GEL

After drawing international acclaim with an announcement of a new process for desalting sea water (*The Monogram*, Feb. 1961, p. 10), the General Engineering





**A NEW DC-AC INVERTER**  
Boosting capacity ten times.

Laboratory unveiled three more promising developments before last month was out.

One is a device that should give a major assist to application problems confronting engineers at work on new energy processes. One of their big problems: converting the direct current generated by most of these new processes (*The Monogram*, Jan. 1961, p. 11), to useful, alternating current. This is not too big a problem where low voltages are involved, as in the job done by transistors. But many applications of fuel cells and solar energy, for example, call for alternating current: output in situations where motor-generator sets might be unsuitable because of weight or maintenance.

GEL's answer: a high-capacity, electronic device for making the d.c.-a.c. conversion. About the size of a large home freezer (photo above, with Engineering Lab's Rudy Koehler), the new solid-state inverter carries a 50 kva rating—10 times the power-handling capacity of similar units previously available.

**This development** took place less than a month after GEL's John Spaulding reported his studies for a method of visually tracking a space vehicle all the way to the moon—a feat comparable to seeing a dime more than 2000 miles away. According to astronomer Spaulding, a high-powered telescope equipped with General Electric's Emmy-winning, image orthicon, see-in-the-dark television camera tube (*The Monogram*, July 1960, p. 7) could do the job. He points out that seeing, rather than hearing, space vehicles offers the inherent advantage of following them even if their transmitters are burned out or otherwise not operating.

**Where Else?** Hard-to-form metals like titanium, stainless steel and tungsten are yielding to the force of a new metal-forming process also under development—and where? At the General Engineering Laboratory again.

It's an under-water explosion technique, involving no TNT, dynamite or other chemical charges. It could save millions of dollars a year now spent in costly working of harder-than-steel metals. The explosions are induced through a build-up of electrical energy, presently at about 35,000 volts but which may go as high as 100,000 volts or even more. Released under water, the electrical blasts create high-intensity shock waves which are directed against the metal.

So far they've tried it out on titanium, niobium, beryllium-copper, and tougher grades of stainless steel. The Lab has formed pieces up to 10 inches in diameter and 3/32-inch thick with the new process and considers the forming of much larger pieces entirely feasible. Outlook: they're now exploring the possibility of forming pieces 10 feet or more in diameter and an inch or more thick.

## ANTITRUST

### The Preventive Actions

Before a management conference of the University of Chicago Graduate School of Business this month, Board Chairman Ralph J. Cordiner commented on the recent electrical antitrust cases and outlined actions General Electric is taking to see that such violations do not happen again.

Mr. Cordiner said that recent events "have brought embarrassment upon everyone associated with this industry, even though the overwhelming majority of the people in these companies were completely innocent, and were working diligently for electrical progress. Public indignation has understandably been high, but I hope and trust that in time cooler judgment will prevail, in recognition of the fine work these people are carrying forward and the high standards of conduct they have maintained."

Commenting on the future course of the electrical industry, Mr. Cordiner said, "Any objective study of the records must lead to the conclusion that the electrical manufacturing industry is one of the most dynamic sources of economic growth and industrial strength in the United States. And in recent years, as national security has come to depend on scientific and technical ingenuity, the electrical manufacturers, with their work on radar, flight propulsion, missiles and space vehicles, atomic energy, computers, and other advanced technologies, have become and will continue to be a bulwark of national defense."

Mr. Cordiner stated the hope that "we will be given an opportunity to prove ourselves once again, because we are convinced that a vital and growing electrical

industry is indispensable to the progress and security of our country."

The General Electric Chairman said that "this sorry experience has reaffirmed some familiar and fundamental lessons," among them the following:

"Each of us is finally responsible for his own acts, and when any of us makes a serious mistake, he hurts all the rest.

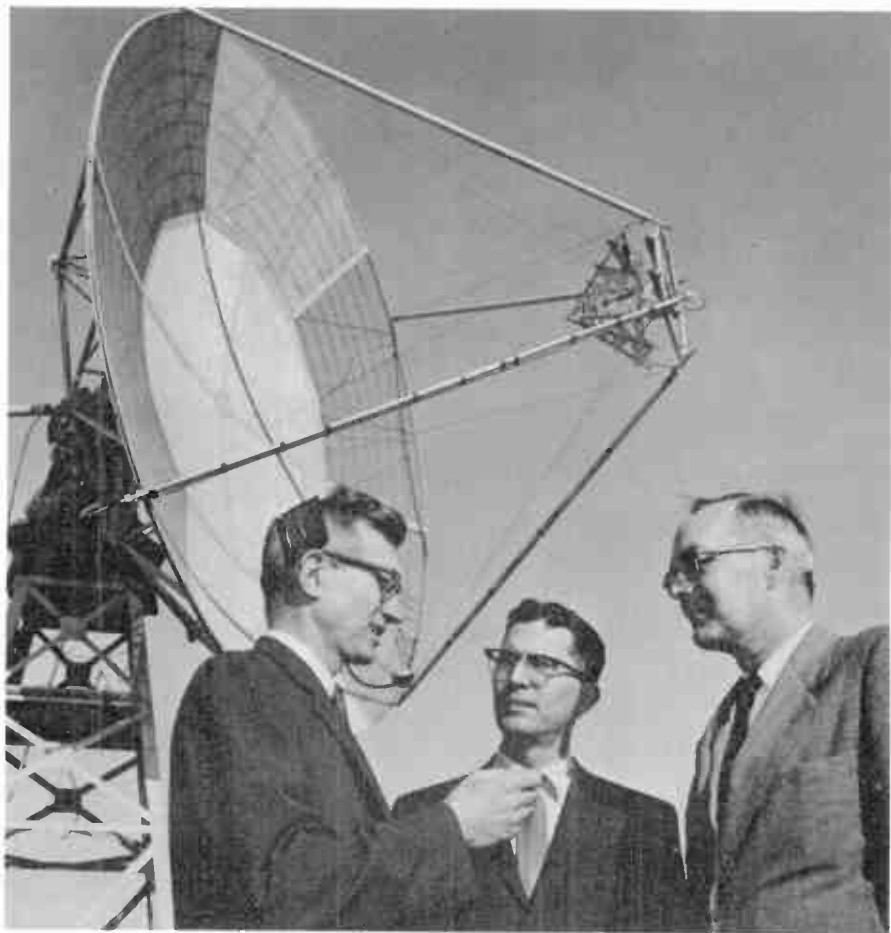
"Even the finest Company reputation for integrity is extremely fragile. The errors of a few can do great damage, and it will take patient effort to restore what has been lost.

"The only effective business strategy for the General Electric Company is a strategy of vigorous competition to produce outstanding values at the market places."

Mr. Cordiner stated: "Probably the strong example of the recent antitrust cases, and their consequences, will be the most effective deterrent against future violations. But in addition, there will be a more penetrating legal review of operations, new auditing techniques to identify possible clues, and more searching questions at executive business reviews."

He said that the practice of repeated issuance of its Directive Policy (20.5) on Compliance by the Company and its employees with the Antitrust Laws (originally issued in 1946) and signed evidence of agreement by employees will be continued.

"Legal Services, which has already done much teaching on the subject of antitrust through the years, is going to intensify its teaching activities at all levels and thus stimulate further management discussions," he continued. "Operating and Services Officers and Managers are being urged to develop methods by which they can more quickly identify situations which could lead to possible violations in their own particular industry, business or function."



GEL'S ROY ANDERSON, HMED'S WILLIAM JONES, AT&T'S GEORGE HANCHER  
*Unusual, and always tricky.*

CENTURY 21

## A Trip to the Moon

At Schenectady last month, General Electric engineers picked up voice signals from the moon, sped them on their

way to Seattle, and thereby lent a hand to the ground-breaking ceremonies for what will be one of the big attractions at the world-wide Century 21 Exposition when it opens next spring.

The voices were those of Washington's two United States senators, Warren G. Magnuson and Henry Jackson,

who were not on the moon, but in Washington, D. C.

A phone call from the two senators was transmitted to the moon from Bell Labs in Holmdel, N. J. The General Engineering Laboratory's tracking station and radio-optical observatory near Schenectady picked up the signal on its return to earth, and turned it over to AT&T for transmission to Seattle. Receipt of the call signalled the start of ground-breaking for the \$3.4 million U. S. Science Pavilion at the Exposition.

The trip from the District of Columbia to Seattle, with its half-million-mile detour, took 2½ seconds.

The GEL's Roy Anderson explains that the feat is rare but not unprecedented, and says that it is always tricky. The Schenectady observatory developed techniques for the tough relay job through studies in long-distance communication in conjunction with the Heavy Military Electronics Department and the Air Force.

## Meanwhile, Back on Earth

General Electric will also be helping get the public from downtown Seattle out to the Exposition grounds—a one-mile jaunt.

Two four-car trains traveling over an elevated monorail will provide the transportation, and the Locomotive & Car Equipment Department will supply the propulsion.

Each train will be powered by eight 100-hp high-speed traction motors made by L&CE, who will also supply control and auxiliary power supply equipment.

The exposition isn't to get underway until April, but the monorail should be in operation by Christmas. General Electric will ship the equipment for the first train in May and the second in August.

The builder is Alweg Rapid Transit Systems of Washington, Inc.

## 1960 RESULTS

### Biggest Payrolls

Final 1960 results show that while sales and earnings were dipping, the Company met its biggest payrolls. Total employee pay and benefits amounted to a new high of \$1.848 million, 44 percent of sales.

Average compensation per employee also reached a new peak, \$7,374, up from \$7,226 in 1959, including all Company costs of pensions, insurance, social security taxes, and employee benefits.

As reported in preliminary results in *The Monogram* last month, sales for the year were \$4,197,500,000, off three percent from the record \$4,349,500,000 in 1959. Earnings dropped 29 percent—from \$280,200,000 in 1959 to \$200,100,000 in 1960. Earnings amounted to 4.8 cents per dollar of sales.

### Big Year for Credit

The General Electric Credit Corporation, the Company's sales financing subsidiary, had a record-breaking 1960, according to figures released by President Charles G. Klock.

Volume of financing was up 16 percent over 1959, to \$757,000,000. Net income was \$7.3 million, about the same as for 1960, but deferred income representing gross earnings to be booked as collections are made in 1961 and 1962, rose to a record high of \$50 million.

Mr. Klock attributed a major part of the volume increase to GECC's push in commercial and industrial markets.

## WE'RE IN COMPUTERS TO GROW



CLAIR LASHER

**W**ILL THE COMPUTER Department double its business in 1961? It's done it every year since the Company's computer business was formed early in 1956, and General Manager Clair C. Lasher sees no reason for 1961 to be an exception.

Doubling the business is simply one item on Computer's jam-packed 1961 agenda. The Department is also pushing ahead on a new \$4-million addition to its Phoenix plant which will double manufacturing space, on the construction of a new \$1.5-million laboratory at Sunnyvale, and on the opening of the first information-processing centers across the country. It is also completing the installation of what Marketing Manager Lacy Goostree believes to be the biggest non-government electronic equipment order ever placed—the \$30-million order for 30 automated banking systems for the Bank of America.

### SECOND OF A SERIES

This is the second in a series of articles on the Company's growth technologies. The first, on energy conversion, appeared in the January *Monogram*.

Already this year, the Department has spun off one phase of its business, the process control business, which has been established as a product section in the Industry Control Department. (*The Monogram*, Feb. 1961, p. 4). Some of the Company's most important computer contributions have been in this field: computers for the first automated steel mill and work on computer-controlled power generating stations and cement mills.

General Electric has, of course, made computers for decades for special applications, and the Heavy Military and Light Military Electronics departments are still very much in the business of supplying computers for military systems. But the move of the Company into general purpose computer field came in 1956.

Now that the Company has five years of organized effort in the computer business under its belt, how does Mr. Lasher feel about the business?

"Great," he says, "we have been doing better than we expected, and we're in the business for keeps."

As recently as 1957, industry forecasters were looking to a \$1 billion computer market by 1966. Last year the market had already hit the \$1.5 billion

## Jobs That Computers Built

Computer employment has jumped from 1700 at beginning of 1960, to 2300, should hit 2800 by year's end. Computers also build jobs throughout Company. Biggest of many suppliers to Computer are Low Voltage Switchgear at Philadelphia (power supplies) and Semiconductors (Syracuse).

**WIRE WRAPPER:** Mrs. Roberta Matthews wires in logic on GE-210 computers, helps husband through night course in electronics.

**PROJECT ENGINEER:** Barker helped develop widely heralded computer. Current project floating-point arithmetic.

**ENGINEERING WRITERS** have diverse backgrounds. From left, Mrs. Joyce Horta had secretarial training, Mrs. Barbara Holady studied English, Mrs. Trudy Smith, engineering administration.



**MEMORY PLANE WINDER:** Training normally takes 10 weeks, Mrs. Pearl Harper learned it in two, though she'd been out of production work 15 years.



**EX-AM:** Katz gran izes

mark and the prospect is for a \$7 billion market by 1970.

Right now, General Electric is jockeying for third place in the field with RCA, running behind two companies who entered the computer business via the business-machines route, Remington Rand and the giant of the field, IBM.

Mr. Lasher obviously intends for General Electric to grow faster than his roughly 28 competitors. The drive now is to push ahead in specific areas in which General Electric can make a real con-

tribution. The first is banking, as exemplified by the ERMA computers for the Bank of America job. Last year, 14 additional banks across the country announced plans to automate their checking account procedures with General Electric computer systems. Within three years, Mr. Lasher confidently predicts, every major bank in the country will be using the American Banking Association-approved magnetic ink character recognition (MICR) system which General Electric developed. It permits computers to read the



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tion centers across the country is a major "software" move.

What's made computers move so fast? One spur has been in the improvement of computers themselves. In the last six years their value has jumped by 15 to 1. Quality, too, has been sharply increased. Mr. Lasher estimates that "up" time for new solid-state computers will be as high as 98 or 99 percent.

The other spur, of course, has been need. Mr. Lasher points out that a sixth of our Gross National Product is devoted to paper handling, and asserts that "we are becoming a society of paper shufflers." Electronic communications and computer systems are starting what he calls "the information handling revolution." And if our Gross National Product is to maintain its historic growth rate over the next decade, it will be increasing three times as fast as the work force. Computers will take up part of the gap.

Looking ahead, Mr. Lasher believes that during the Sixties, 80 percent of all computers sold will be used in new applications untried today. Perhaps their greatest contribution will be not in speed or cost savings but in the acquisition of new knowledge for man. Mr. Lasher points out that efforts are now being made to create tremendous mathematical models of an entire company which would enable the businessman to test out his "what if" questions by shifting one element of the model. And Computer's engineering manager, Robert Johnson, sees computers providing the means to firm up such controversial disciplines as economics and psychology. He even sees the possibility of parents of the future using a home computer as an aid in raising their youngsters.

All in all, says Mr. Lasher, computers look like "a good business for the future General Electric Company."



MATH-TEACHER Charles  
: is monoger of pro-  
nning reseorch. Special-  
in computer language.



TRAINEE: Jim Page is on  
two-year Quality Control  
Training Program, will be-  
come technician.

same Arabic numbers that humans use.

Which area next? Perhaps utility billing.

Other ventures for the Department in the offing include the business of supplementary equipment (encoders, card sorters, readers, and the like), and the "software" business, which Mr. Lasher believes is already as important as the hardware itself. The field includes programming, programming research, new systems applications, computer languages. The establishment of the new informa-



**OVERSEAS BOOM** for computers? Business Planning Manager Ken Geiser thinks so, is studying Far East, believes 1970 off-shore computer market may equal domestic.



**WHAT STRATEGY** in an expanding market? Marketing Manager Lacy Goostree must pick areas for concentration that will bring maximum return. First big success: banking.



**HOW CAN CUSTOMERS** use computers most effectively? Applications Manager Helmut Sassenfeld sees room for improvement. He'll head start-up of 11 computer centers.

## COMPUTERS: THEIR CHALLENGE TO MANAGERS



**WHAT NEW TECHNOLOGY** can be used to improve computer capabilities? Engineering Manager Robert Jahnsen is studying potentials in cryogenics, thin magnetic film, thermoplastic tape.

**RAPID GROWTH OF BUSINESS** taxes the resources of computer plant and Manufacturing Manager Ray Barclay's production team. Current plant expansion will provide elbow room.

**MARSHALLING SKILLED MANPOWER** is one of Employee Relations Manager Art Newman's challenges. He has three fulltime recruiters on the road seeking qualified job candidates.





## NEW BUSINESS

### In Just One Week

Where will the new business come from that will enable General Electric to double its sales in the next decade? Much of it will come from businesses which are only in their infancy. In just one week during the past month, three General Electric departments put new organizations in place to move ahead in promising growth areas.

### Direct Energy Conversion

The Aircraft Accessory Turbine Department, with an eye on a field which involves both great risk and great opportunity, established a new Direct Energy Conversion Project at Lynn.

General Manager Walter C. O'Connell said that the new component will move ahead with the development, production, and sale of fuel cells. AAT is already testing out a portable fuel-cell powerpack for the Navy (*The Monogram*, Jan. 1961, p. 13). In addition, the new Project will also explore thermoelectric and thermionic conversion systems.

Several other Company components are working on various phases of the direct energy conversion area, and the charter of the new AAT Project specifies integration with other Company efforts.

### Nuclear Instrumentation

Nuclear instrumentation is already a healthy business within the Atomic Power Equipment Department, but as far as General Manager George White is concerned, it ought to get even better.

He announced establishment of a new Nuclear Electronic Products Section at San Jose. The new section will go after a nuclear electronics market that is expected to rise from a total of \$60 million annually now to about \$200 million per year by 1970.

Already, General Electric nuclear instrumentation has been specified for 24 nuclear reactors.

### Educational Electronics

Dr. George L. Haller, Company vice president and general manager of the Defense Electronics Division and a onetime educator himself, believes that General Electric can make a big technical contribution to education.

He announced the establishment at Syracuse of a new Educational Technology and Products Project within the Technical Products Operation of DED's Communication Products Department, with Robert G. Frick as manager.

The aim is to design and produce electronic and electromechanical devices and systems for educational and training uses in schools, industry, government and the military. Among the areas now being studied: teaching machines, language and learning laboratories, school communication systems, educational business machines, and educational television.

Another facet: working with other General Electric departments on military and industrial education and training devices programs, and systems. The Project's services are now available to any department, said Mr. Frick.

The Project's activities will complement those of the Radio and Television Division, which just announced plans for a line of educational aids and science kits. (*The Monogram*, Feb. 1961, p. 3.)

## The Missing Link

With a bold, big-as-all-outdoors perspective, General Manager J. Herbert Hollomon is adding a new dimension to the celebrated work of the General Engineering Laboratory, which has been at the forefront of General Electric's technical progress since way back in 1892.

GEL is setting out to engineer entirely new businesses into being. Dr. Hollomon states the concept simply: "Every time our engineers link science to human needs, they create new business opportunities for General Electric."

Engineering innovations have come from GEL in a steady stream for more than 60 years, but chiefly as by-products of its service engineering work.

Now, Herb Hollomon, in his post for just over a year, is stirring the pot vigorously, seeking to orient the Laboratory toward bird-dogging new businesses for the whole Company.

A business, Dr. Hollomon explains—fast-chalking on the ever-present blackboard—involves three things:

1. Knowing the needs and wants of people, including those brought about by expanding populations, crowded schools and hospitals, water shortages, urban transport tieups, and substandard living conditions in much of the world.

2. Devising new ways to meet these needs. This is engineering—in the highest sense, using scientific knowledge, traditional engineering disciplines, and practical arts, all with a careful eye on economics and psychology. It means not only designing new products and creating new materials but also integrating them into new systems.

3. Finding ways to bring together the



GEL'S HOLLOMON

"Tying together the what and the how..."

human needs and the innovations that will satisfy those needs.

**A marketing approach** to engineering? "Sure," says Dr. Hollomon. "We've been working closely with Marketing Services, and with market development and research people in product departments. Engineers should think of the problem in terms of tying together the *what* of customer needs and the *how* to satisfy them."

Doing this, he says, takes a concentration or combination of new technical abilities working together, and commands full use of the engineers' knowledge and skill. Its scope is suggested by some of the technical abilities they're using to put the idea to work: thermoplastic recording, space

communication and observation, water purification, solid-state power conversion, cryogenics, thin-film electronics, and new electric-power conversion techniques, to name a few.

In shifting the emphasis of the laboratory Dr. Hollomon is building on a solid foundation of skilled and talented people, intimately acquainted with the Company's varied businesses.

"We look to the Research Laboratory and to other scientists throughout the world to furnish the knowledge on which engineering innovation is based," he says. "We look to the highly competent individuals in our organization to link this knowledge to human needs."

As an organizational catalyst for the new-business aim of the laboratory, Dr. Hollomon brought Dr. Thomas O. Paine with him from the Research Laboratory a year ago. Dr. Paine heads a small technical and economic analysis group, charged with this kind of thinking: discovering and analyzing basic human needs, to see where there are potential customers not now served by General Electric.

**Where does this lead?** One area is what Tom Paine calls "labor intensive" sectors of the economy—where the job at hand has been done in much the same way, sometimes for decades, in the face of new population needs and broad technical advances. Examples: retailing (more broadly, the whole distribution process of getting goods from the factory door into the customer's home), and application of health sciences in the hospital-medical systems.

Dr. Paine points out that even though we have made enormous strides in the basic knowledge of health sciences, we haven't come too far *in the way in which* this knowledge is applied to human needs.

He says use of existing technology—a diagnostic computer, perhaps—could help meet the present need.

The breadth of this process is suggested if you think of bootstrap operations for underdeveloped economies, or the complex transportation problems of our own urban centers. All these require an integrated approach: the engineering of systems as well as products. And GEL is tackling them.

**This basic application** of presently known technical abilities to prevalent human needs is the keystone to Dr. Hollomon's approach to managing the work of GEL's 370 engineers (more than 60 Ph.D.s among them).

Last month he had put in place the organization he's counting on to carry out this business-building formula. To the former Electrical, Materials, and Mechanical Engineering Laboratories within GEL, he has added a fourth, Information Engineering. They're headed, respectively, by Pier A. Abetti, John F. Flagg, Stanford Neal, and Lloyd C. Harriott. The new Information Engineering lab will unite all GEL work in control, communication, and computing—the three C's which Hollomon expects will become a multi-billion dollar business in the next decade.

These groups continue to offer their varied engineering abilities to the Company's operating components. Their efforts may result in anything from improved gears and drive systems for home laundry equipment to MHD power for utility plants or space vehicles.

But while they're doing this traditional work, GEL engineers are on the lookout for new ways to do things that may or may not be related to the specific job at hand. For General Electric this will mean new product sections, even new departments and divisions, in the years to come.

## Two-Year Savings and Security Report

(1) Annual Earnings	(2) Payroll Deduction Savings	(3) Proportionate Company Payment	For Those Investing the Maximum in Stock			For Those Investing the Maximum in Bonds		
			(4) Value of Columns (2) & (3) <small>(Market Value as of 12/31/60 Plus Dividends, Interest and Annual Credit But Excluding Prompt Enrollment Incentive)</small>	(5) Prompt Enrollment Incentive <small>(Value Credited to You Under This Feature As of 12/31/60 Plus Dividends)</small>	(6) Total Value of Your Account <small>(As of 12/31/60)</small>	(7) Value of Columns (2) & (3) <small>(Including Interest and Annual Credit But Excluding Prompt Enrollment Incentive)</small>	(8) Prompt Enrollment Incentive <small>(Value Credited to You Under This Feature As of 12/31/60 Plus Dividends)</small>	(9) Total Value of Your Account <small>(As of 12/31/60)</small>
\$3,500	\$420.00	\$210.00	\$599.63	\$76.72	\$676.35	\$641.53	\$76.72	\$718.25
4,000	480.00	240.00	685.38	76.72	762.10	733.16	76.72	809.88
5,000	600.00	300.00	856.80	76.72	933.52	916.91	76.72	993.63
6,000	720.00	360.00	1,027.73	76.72	1,104.45	1,099.42	76.72	1,176.14
7,000	840.00	420.00	1,199.30	76.72	1,276.02	1,283.06	76.72	1,359.78
8,000	960.00	480.00	1,370.41	76.72	1,447.13	1,465.96	76.72	1,542.68
9,000	1,080.00	540.00	1,541.88	76.72	1,618.60	1,649.34	76.72	1,726.06
10,000	1,200.00	600.00	1,713.47	76.72	1,790.19	1,833.13	76.72	1,909.85
11,000	1,320.00	660.00	1,884.34	76.72	1,961.06	2,015.86	76.72	2,092.58
12,000	1,440.00	720.00	2,055.78	76.72	2,132.50	2,199.08	76.72	2,275.80
13,000	1,560.00	780.00	2,227.14	76.72	2,303.86	2,382.30	76.72	2,459.02
14,000	1,680.00	840.00	2,398.44	76.72	2,475.16	2,565.72	76.72	2,642.44
15,000	1,800.00	900.00	2,569.67	76.72	2,646.39	2,748.66	76.72	2,825.38

**This table** is intended to help participants estimate about where they stood in the Savings and Security Program after two years. It doesn't fit each individual situation, but gives a general idea of how savings have accumulated since Jan. 1, 1959.

The most popular rate of saving—6%—is used. The table also assumes participation since Jan. 1, 1959. Those who have saved at a lower rate than 6%—or for less than two years—should make appropriate adjustments in the figures above.

The table presents figures applying to two methods of participation: (1) the employee who has directed that 50% of his Payroll Deduction Savings and all of the Proportionate Company Payment be invested in General Electric common stock; (2) the employee who has directed that all his account be invested in Savings Bonds.

The closing market price of General Electric stock on Dec. 30, 1960 (the last trading day of that month) was used in the valuation of stock. Dividends paid on the stock through October, 1960, have been included in each example as well as the Annual Credit from Other Investments by the Trustees, as described in the Prospectus. Bonds are included in each case at redemption value as of Dec. 31, 1960.

Those investing should remember that stock or bonds, like any investment, have their advantages and disadvantages. Stock may increase in value, or it may decrease in value even to less than the purchase price. Bonds, which have a stated cash value, may be more helpful in times of deflation, less helpful when inflation raises prices and depreciates the value of investments with stated cash values.

## WHAT'S NEW

**International:** In Mexico, International General Electric will install the nation's **largest power-generating unit**, a 150,000-kw steam turbine generator unit purchased by the Mexican federal power commission for installation *near Mexico City*. The \$15-million contract was signed last month . . . **In Taiwan**, the Atomic Energy Commission has just delivered the first nuclear fuel for free China's **first nuclear reactor**. The 35 reactor fuel elements were fabricated by General Electric's Atomic Power Equipment Department for use at the General Electric-built, 1000-kw research reactor at National Tsing-Hua University.

**Toppers:** Passengers on the TWA jet flight from San Francisco to Chicago on February 15 never had it so fast. The General Electric-powered Convair 880 set

a new **commercial speed record** of 3 hours and five minutes, whacking a half hour off the previous mark. Top speed: 715 mph . . . **New England's tallest** total-electric apartment building, the Carlton Towers (13 stories, 173 units) gets underway in Springfield, Mass., this spring. **Yes, General Electric appliances.**

**Plants:** The Foundry Department is closing up its money-losing Everett operation and moving the work *into Schenectady*, adding about 140 new jobs there. Many of the Everett employees are expected to be placed in other Everett-Lynn departments . . . Gear Motor and Transmission Components **opened up** a new 30,000-sq.-ft. facility in Fair Lawn, N. J., for machining fhp gear-motor parts.

**Communication:** The Communication Products Department won the biggest (\$816,000) order ever placed for transistorized **two-way radios**. The contract with New York State Electric Gas Corp. also covers maintenance for the next decade . . . More than 500 General Electric men have now received their diplomas from **Limitamp® College**, a highly irregular college founded by the Industry Control Department to recognize what they call "**the thinking man's medium-voltage motor control.**" District sales and engineering specialists earned their diplomas by completing a 10-lesson mail course of study of Limitamps.

**Recognition:** The Smithsonian Institution has **enshrined the space camera** which took the first photos of the earth from 300 miles out. It's the fifth space item presented by General Electric. . . . **In Tyler, Tex.**, employees completed a million man-hours worked without a lost-time accident, marked the occasion by chomping down a Texas-sized, 24-square-foot "safety cake." (Left. Tyler secretaries Juawiece Campbell and Ruth Ann Young dish it out.)

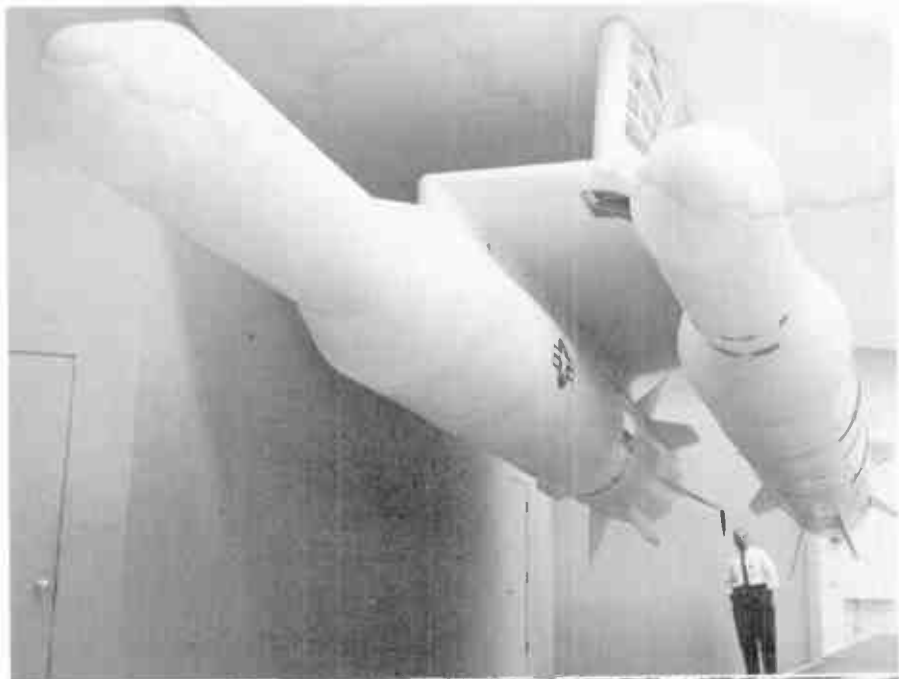
TYLER TAKES THE CAKE



## ON CAMERA

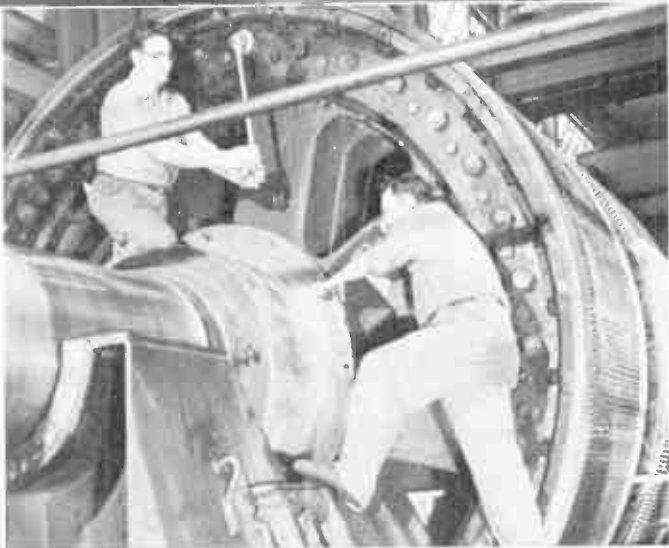


**WHAT A WINTER!** This unique glass-enclosed swimming pool near Ligonier, Pa., is heated solely by 100 General Electric heat and sun lamps which bring the pool-side to summery temperatures within three minutes after they're turned on, even in frigid weather. Lamp Division thinks the idea will catch on.



AT PHILADELPHIA'S Missile & Space Vehicle Department, they are working on nose cones for air-launched Skybolt missiles, one of big nose-cone contracts of 1960. This is first photo of Skybolts as they will hang from the wing of jet plane.

AND DOWN THE ROAD, at the Philadelphia Service Shop they're working on a 10-week overhaul job on a 132-ton, 7000-hp armature, the biggest piece of equipment ever to enter any General Electric service shop for repair.





**BEN  
PARRAN**



**GERRY  
HOYT**

OUTSTANDING PERFORMANCE on the Polaris missile program won a U.S. Navy Certificate of Merit for 4000 employees of Pittsfield's Ordnance Department, received here by Department General Manager Gene Peterson from Rear Admiral Carl F. Espe, First Naval District Commandant.

## PEOPLE

From the Secretary of the Navy to the First Naval District Commandant in Boston went four U. S. Navy citations, honoring more than 4000 General Electric people for their work on the Polaris missile program (*The Monogram*, August 1960, p. 8). In a brief ceremony in Boston last month, Rear Admiral Carl F. Espe presented individual awards to Gerry Hoyt and Ben Parran, and to Gene Peterson, who also accepted a citation on behalf of all employees at Pittsfield's Ordnance Department.

Mr. Hoyt, now General Manager of the Power Transformer Department, received the Navy's highest civilian award, the Navy Distinguished Public Service Award, for his "tireless pursuit of solutions to complicated development and

test problems." during the three years he was Ordnance Department General Manager.

Present Ordnance General Manager Peterson, and Ben Parran, Polaris program manager, received Meritorious Public Service Citations. General Manager Peterson was cited for "his skillful planning and designation of objectives" in meeting delivery and performance requirements of the Polaris program. Mr. Parran was honored for planning and coordinating Ordnance Department efforts in producing fire control and guidance systems for the Polaris.

The Navy's Certificate of Merit went to all employees at Ordnance Department for operating under a stringent time schedule to produce the Mark 80 fire control system, first of its kind, and critically important to the success of the Polaris program. "Best of all," General Manager Peterson told Ordnance De-



partment employees. "these awards add a bit of luster to your growing reputation for top-grade work."

Just how good is that reputation? The Department received word this month that another \$20 million has been added to a \$34 million contract received last December for continuing work on advanced versions of the Polaris fire control system.

**Hats Off:** Forty-four years of selling

General Electric products throughout New England didn't tire Jim Dolan. He went out and sold 100 television receivers to a Boston department store during his last day on the job.

**Job transfers** got you running? Better get the formula from Joseph Moros, who completed 51 years with the Company—all in two locations just 17 miles apart. He started in Schenectady back in 1910, finished up in the Albany office.

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**The sixty-three participants** of AMC 61-II, which convened at Crotonville March 14 and continues through May 11, are:

**ATOMIC PRODUCTS DIVISION:** Eugene R. Astley, Rial O. Herreman, Jr., Paul R. McMurray, Raymond L. Moran, Vaughn N. Nixon.

**CANADIAN GENERAL ELECTRIC CO., LTD.:** Raymond A. Eckersley.

**CHEMICAL AND METALLURGICAL DIVISION:** Donald O. Cady, John J. Gensheimer, Richard W. Kinnard.

**COMPONENT PRODUCTS DIVISION:** Stephen R. Capps, David C. Hanson.

**DEFENSE ELECTRONICS DIVISION:** Raymond E. Baker, William J. Kuehl, Mark Morton, Frank W. Thoubboron.

**ELECTRIC UTILITY ENGINEERING OPERATION:** J. J. William Brown, Leon K. Kirchmayer.

**ELECTRIC UTILITY SALES OPERATION:** Chalmers A. Daniel, Harold R. McCannel.

**ELECTRONIC COMPONENTS DIVISION:** William H. Hall, Edward F. Roache.

**ENGINEERING SERVICES:** Albert M. Demont.

**FLIGHT PROPULSION DIVISION:** Bruce Deem, Ieston E. Goodding, George E. Grega, Paul E. Lowe, Paul F. Mosher, Louis R. Travis, John M. Waldron.

**GENERAL ELECTRIC CREDIT CORPORATION:** Walter E. Sigler.

**GENERAL ELECTRIC SUPPLY CO. DIVISION:** Samuel H. Allen.

**HOTPOINT DIVISION:** Clarence H. Roberts.

**HOUSEWARES AND COMMERCIAL EQUIPMENT DIVISION:** Girard W. Rudolph, Wilbur A. Schmall.

**INDUSTRIAL ELECTRONICS DIVISION:** Leo P. Hannaway.

**INDUSTRIAL SALES OPERATION:** Benjamin D. Casey, Jr.

**INTERNATIONAL GENERAL ELECTRIC CO. DIVISION:** Fortunato Antich, Trevor H. Corniliac, Henri DuBois.

**LAMP DIVISION:** Everett C. Agee, William R. Buchanan.

**MAJOR APPLIANCE DIVISION:** Richard A. Charron, George W. Schroeder, Frederick S. Suhler.

**MANAGEMENT CONSULTATION SERVICE:** David G. Donovan.

**MANUFACTURING SERVICES:** Eugene M. Beattie, Willard H. Connor, Donald C. Miller, James H. Wilson.

**MARKETING SERVICES:** Donald J. Watson.

**MOTOR AND GENERATOR DIVISION:** Marvin A. Baker, Edward G. Fronko.

**RELATIONS SERVICES:** Edwin C. Kepler.

**SWITCHGEAR AND CONTROL DIVISION:** R. William Ayres, Jr., Sanford H. Barber, Jr., Benjamin S. Beall, III, Richmond D. Moot, Jr., Grady L. Roark.

**TRANSFORMER DIVISION:** N. Eugene Dillow, Gerard G. Keogh.

**TREASURY SERVICES:** James M. Whelan.

**TURBINE DIVISION:** Robert J. Buckley, Arthur I. Strang.

## PRODUCTS

**What do you do** if you want to give someone a General Electric baby food warmer before the baby arrives, with only pink and blue to choose from? Answer: you give the mother-to-be a yellow one, added to the line late last month by Portable Appliance Dept.

**Who'd pay a premium** for a television receiver with no sound? Maybe lots of program critics—who seem to be many in number. But the big market for sets with this feature is in closed circuit installations. Seen below with Electronics Park's Marion Piani is part of a new line of closed circuit receivers especially engineered by Technical Products Operation for super-sharp pictures, low-cost maintenance, and easy operation.

**Roll 'em:** The fast-growing popularity of home movies owes a lot to improvements in indoor lighting techniques. Latest: Photo Lamp's Uniflood auto-head-light-like lamp for home movies, shown

### ONE FEATURE: BETTER PICTURES



### NEW FOR HOME-MOVIE MAGIC

above with engineer-inventor Emmett Wiley. It'll beam enough light to cover everything within view of all standard and most wide-angle 8 mm lenses. It'll appear in camera attachments later this year.

## ORGANIZATION

### Industrial Sales Operation

George A. Horch has been appointed Manager of the Finance and Service Operation, a pooled component also servicing the Electric Utility Engineering, and Electric Utility Sales operations.

### Herbert O. Riegelman

Herbert O. Riegelman, 56, General Manager of the Television Receiver Department at Syracuse for nearly eight years, died March 11, after an extended illness.

## AROUND THE COMPANY

**A screen classic** comes to the General Electric Television Theater on Sunday evening, April 2, when the prize-winning film fantasy "The Red Balloon" makes its televised debut. It's been honored as an Academy Award winner in this country and at the Cannes Film Festival abroad.

**Power Booster:** The intense heat of a nuclear reaction (in the 4,500° F. range) is being used at Atomic Power Equipment Department's Vallecitos Laboratory to boil electrons off a hot metal plate, producing electricity directly by thermionic conversion. Looking five to ten years ahead, they're working toward a sizable boost in the electrical output of nuclear power stations, with only a slight increase in operating costs.

**Current issue** of the General Electric *Defense Quarterly* carries a concise compilation of President John F. Kennedy's peace plans, and features an illustration of the new Chief Executive on its cover. This and other timely articles, including a panel discussion on arms control, have boosted the *Quarterly's* press run from 20,000 to 50,000 copies.

**Recommended reading** on San Francisco's plans for a coordinated rapid-transit plan: *Holiday* magazine's current San Francisco special-issue which carries a two-page General Electric message highlighting the Bay Area's urban transit ideas. These and plans of other major cities could bring General Electric upwards of \$36 million per year in orders for car propulsion equipment, generating units, transformers, rectifiers, and eventually advanced-concept automatic train control systems.

## GENERAL ELECTRIC ON TV

General Electric Theater

(CBS, Sundays, 9 p.m., EST)



March 19—"Love Is a Lion's Roar," starring Suzanne Pleshette.



March 26 — "Labor of Love," starring Jane Wyatt.



April 2 — "The Red Balloon," starring Pascal Lamorisse.



April 9—"Father's Day," starring Audrey Meadows.

### General Electric College Bowl

(CBS, Sundays, 5:30 p.m., EST)

Participants: March 19—Fisk University; March 26—Fordham University; April 2—Grinnell College; April 9—University of Connecticut; April 16—Miami University.

### Leave It to Beaver

(ABC, Saturdays, 8:30 p.m., EST)

## EDITORIAL

# Six Strengths for New Growth

**D**ESPITE the short term pressures of 1960, General Electric continued to accelerate its research and development of new and difficult technologies of great promise. Computers, discussed in a *Monogram* report on page 11, have required substantial investment. So have such areas as atomic power plants and other new energy conversion processes, commercial jet engines, gas turbines, industrial automation and space.

The Company continues to invest, of course, in the improvement of present products and their related facilities. But most of the Company's added R&D expenditures have gone into the dramatic new technologies which extend beyond the Company's long-established business.

As we extend the Company into these exciting new fields, there are important elements of strength on which to build. Board Chairman Ralph J. Cordiner cited these this month in the Annual Report:

- "General Electric's resources of trained manpower, working within a decentralized organization designed to develop the most highly qualified people for professional leadership of im-

portant businesses, remain unexcelled in industry;

- "Sound contracts with unions offer three further years of opportunity for peaceful progress and continuing good relationships with employees;

- "The adequate capital structure of the Company provides the resources for operating managers who are pushing aggressively for further growth:

- "Increased expenditures on facilities in 1960, and a planned further advance in these expenditures in 1961, with primary emphasis on facilities for new areas of technology and on reducing costs through improving manufacturing equipment, provide a productive capability that is both ample in scope and highly competitive in efficiency;

- "The Company enters 1961 with an increased rate of incoming orders and a higher back-order position;

- "The Company's building of world wide markets is based on decades of experience in international business."

With these and other strengths we will be establishing what Mr. Cordiner has described as "a new General Electric."