

THE MONOGRAM

OCTOBER-DECEMBER

1967



GENERAL ELECTRIC WARMS THE FIELD FOR THE GREEN BAY PACKERS

INSIDE: Information Meeting . . . Biosatellite . . . Electric Test Car
Computer Design . . . New Plants

LETTERS

Voice of Shemya

EDITOR: Your recent issue describing the lone outpost in the Aleutian Islands inhabited by employees of the Heavy Military Electronics Department might carry a postscript noting that their principal voice contact with home and family is by amateur (ham) radio.

I recently contacted Shemya Island via my amateur radio station and learned that they are anxious to hook up with other hams in New York State and the mid-west to arrange holiday greetings via telephone links on 10, 15, or 20 meters. Their call letters: KL7FRY, KL7FQS, KL7GAD, WA2MNB/KL7, WA9JPX/KL7, W8TZX/KL7, K8SQK/KL7. Their address is General Electric, APO, Seattle, Wash. 98736.

ROBERT H. JOHNSON, WA2VWI
Research and Development Center
Schenectady, New York

Fish Tale

EDITOR: The August-September *Monogram* noted that two wise fishermen caught Northern Pike by cleverly using a General Electric flashcube for a lure.

Well, thanks to a liberal GE pension, I winter fish each year in Florida, trolling exclusively with mammoth live Golden Shiners.

One day during said procedure, I noticed water agitation by a large fish in a position inaccessible. Having no artificial lures—in desperation I attached my GE lapel service button to the eye of the hook—made a cast and caught a record sixteen pound Largemouth Bass.

The Moral: "Even a fish will go for the General Electric long service lure."

NERLE G. PECK (Retiree)
Susquehanna, Pa.

Down Under

EDITOR: Your article in March issue of *Monogram* entitled "The Show Biz Sell," greatly interested us of the relatively new GE

(continued on inside back cover)

The object of *The Monogram* is to keep its readers informed on General Electric activities so they may contribute more effectively to General Electric progress on the job and better represent the Company in its relations with the public.

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Devere E. Logan, Editor

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GENERAL  ELECTRIC

THE COMPANY

Meeting in Cincinnati

Some 750 General Electric share owners gathered in Cincinnati's Taft Auditorium on October 18th, attending an information meeting designed to present a panoramic overview of the company's business operations.

The information meeting, an innovation in the Company, was being held, said Mr. Phillippe, because time limitations at the statutory share owners' meeting "do not allow us to present as full a story as we would like about the Company and its many operations."

The Queen City, which is the home of GE Directors Neil H. McElroy and Ralph Lazarus, has some 16,000 General Electric employees and about 7,300 Company share owners. The Evendale plant of the Flight Propulsion Division employs 14,500, and was the site of a business briefing for the Company's Board of Directors prior to the information meeting. The group inspected jet engine assembly and testing, a new altitude test facility, and got a spectacular view of the quenching of a red hot Minuteman rocket case.

Information: During the information meeting, President Fred J. Borch presented the outlook for the Company, indicating that while mixed patterns characterized the economy earlier this year, the Company's fourth quarter is expected

to be better than the same period last year. He indicated a need for stronger consumer buying.

He said that the Company generally supported reductions in government spending, and that he believed a tax increase was needed to stop inflation, "painful though that may be." The alternative to this, he added, is wage and price controls.

Our challenge, he said, is in maintaining our growth, and that this has historically come from new businesses—the "futures." But the job of sustaining such developing new businesses in the future (nuclear, computer and commercial jet engines) will continue to be that of the Company's older "core" businesses.

Overview: The Company's group executives presented a summary of business activities plus research and development, using a three-screen slide and motion picture system. An animated question-and-answer period followed, beginning with several questions on a rumored GE electric car.

Dr. Arthur M. Bueche, vice president in charge of the Research and Development Center, said that the Company did have an experimental electric vehicle in Schenectady, but that it was "purely experimental."

He said that the unit was built to test various electrical and electronic components and systems, and that while he wished some of the "wild rumors" about GE's electric car were true, that "we still

have a long way to go before we have a satisfactory vehicle for highway use."

The experimental vehicle under test was described by Dr. Bueche as small, seating two adults in front and two children in back, and having three doors. The frame is magnesium, with a fiberglass polyester body. The vehicle is battery-powered, weighs 2300 pounds, and has a top speed of 55 miles per hour. (*The Monogram interviews Dr. Bueche on the state of electric vehicle technology on page 12.*)

Defense Business: To the question "what would be the impact on the Company of a sudden end to the Vietnam War," Jack S. Parker, vice president and group executive, Aerospace and Defense Group, said the impact would be a loss of about ten percent of the Group's total sales; something on the order of \$150 to \$175-million in sales.

Consumer Products: Herman L. Weiss, vice president and group executive, Consumer Products Group, said that the Company would soon come out with a new television set chassis design "which will be, I think, the most reliable in the industry." But, he added: "Our current television sets, I can assure you, are topped by none."

The Company plans to produce some of the components it currently is buying, he said, in order to insure the quality of sets. He pointed out that a new facility for manufacturing color picture tubes has just been completed in Syracuse.

Major Appliances: Commenting on the growth of the major appliance industry, Mr. Weiss said that a facility study is being completed that indicates "we will be putting in place the equivalent of another Louisville within the next five years." The plans weren't crystallized as yet, he added.

OPERATING RESULTS

Third Quarter Report

The Company's sales in the first nine months of 1967 were \$5,566,331,000, up 8 percent over the same period last year.

The announcement of General Electric operating results—made on Columbus Day—also carried the news that net earnings were 8 percent below the record \$3.01 a share earned in the first three quarters of 1966. Net earnings were \$249,351,000 or \$2.77 per share for the first nine months of 1967.

Sales in the third quarter were \$1,853,560,000, slightly higher than 1966's \$1,831,258,000. Earnings for the quarter were \$80,689,000 or 90 cents a share, compared with \$1.10 a share in the third quarter of 1966.

President Fred J. Borch pointed to the decline of consumer product demands, coupled with higher material and component costs and higher wage rates in all areas of the Company's operations, as contributing to the lower earnings.

Three quarterly dividends of 65 cents each—the same rate as last year—were paid during the first nine months of 1967.

General Electric College Bowl

(NBC, Saturdays, 5:30 p.m. EST)

Participants: Nov. 11—University of Richmond (Va.); Nov. 18—University of Miami (Fla.); Nov. 25—Barnard College (N.Y.); Dec. 2—Niagara University (N.Y.); Dec. 9—Ohio State University; Dec. 16—Jackson College of Tufts University (Mass.); Dec. 23—University of Washington; Dec. 30—Pre-emption.

At Deadline . . .

History on Rails: The Transportation Systems Division has received an order from The Budd Company for propulsion and automatic speed regulation systems for 270 ultra-modern electric commuter cars to be used on the Long Island Railroad, the nation's busiest commuter railroad. The order is the largest ever placed for General Electric rail transit equipment.

Motor Plant: A new \$15-million motor production plant has been announced by the Small AC Motor and Generator Department, Schenectady. The 250,000-square-foot facility will be located in Sumner County, Tennessee, near Hendersonville. Construction will begin in May of 1968, with limited production scheduled for late 1969. The plant will house facilities for the design, development, production, testing and storage of electric motors and will be managed by Ellsworth J. Sohles.

Big Blank: The world's largest fused quartz astronomical telescope mirror blank has been completed by the Lamp Glass Department, Cleveland. The 15-ton mirror blank, 158 inches in diameter, will be installed in the giant reflecting telescope at the Kitt Peak National Observatory, Tucson, Arizona. The GE quartz mirror will enable astronomers to scan millions of light years of the universe with greater effectiveness than that of glass mirrors, which are subject to temperature distortions.

New Lab: A new \$4-million Materials Technology Laboratory has been dedicated by the Company at Pittsfield, Mass. The new facility will greatly increase capability for the development of materials and processes used in designing and manufacturing distribution, transmission and other electrical equipment.

Orbiting Space Zoo Two

Tucked away inside the General Electric Biosatellite II, a tiny crew of vinegar gnats, wasps, frog eggs, amoeba, wheat seedlings and pepper plants recently orbited the earth for two days to supply data on how weightlessness and radiation affect living organisms.

The Biosatellite was built by the Company's Re-entry Systems Department, Philadelphia, for NASA's Ames Research Center and was designed to orbit 13 experiments for three days.

Despite the fact that the mission was shortened a day because of a tropical storm approaching the recovery area, it was rated a "completely successful flight" by NASA project director Charles A. Wilson.

A good mid-air recovery of the Biosatellite was made over the Pacific September 10th as the 280-pound experiments capsule parachuted earthward. Following the snare, the package was flown to NASA's temporary laboratory site at Hickham Air Force Base, Hawaii, for preliminary examination. From there, specimens were returned to individual laboratories for further analysis.

Making History: Mark Morton, general manager of the Re-entry Systems Department, noted that the flight was historic. "It's a 'first' in the world, to my knowledge," he said, "and is a noteworthy addition to our list of firsts in aerospace technology. This technically ambitious and extremely complicated program is now well on the way to answering vital questions about basic life processes, otherwise unanswerable, that will aid man on earth as well as when he ventures farther



RECOVERY CAPSULE of Biosatellite II is inspected by Re-entry Systems Department General Manager Mark Morton, left, and Biosatellite program manager Howard M. Wittner.

and longer into space."

Only two of the 13 experiments showed immediate results of the space ride, but one scientist said that he was so "shook up" after observing the pepper plants that he had to sit down. He remarked that, "We now have evidence that gravity really controls the orientation of a plant."

Wheat seedlings grew much faster during their weightless trip than they did on earth. Their roots grew upward and to the side, instead of down.

It will be some time before scientists complete their investigation of the experiments. In many cases the animal specimens will have to reproduce through at least three generations before the final effects of their space flight become known.

Complex: The three-day recoverable orbiter built by General Electric employees is considered to be as complicated as anything yet put into space in terms of the tasks it performs. The in-orbit attitude control system, for example, keeps vehicle motion so low, it causes no more than

half of one one-hundred-thousandth of a gravity. Compared to such an ultra-smooth ride, a drive across the Bonneville salt flats is like a trip on a square-wheeled rollercoaster.

The Biosatellite II is the second in a series of missions studying basic life processes with experiments ranging from single-celled organisms to monkeys. The first Biosatellite was launched into a three-day orbit in December, 1966 (*The Monogram*, Jan. '67), but after a near-perfect orbital operation the vehicle did not de-orbit and was never recovered.

"I am very gratified that all of the hard work, long hours and intense effort on the part of our RSD people have resulted in such rewarding achievements as the outstanding flight successes that we have accomplished during 1967," said Mr. Morton. "All RSD employees should feel a justifiable pride in these accomplishments—but a pride without complacency, because our real work is still ahead of us."

A 30-day mission is still ahead, with a 15-pound monkey among the passengers.

STADIUMS

Toasty Turf

When the husky world champion Green Bay Packers collide with the Pittsburgh Steelers on December 17th, they'll be making history on 14 miles of General Electric heating cable snuggled under the turf of Lambeau Field.

The game will be the latest regular season home game ever played by Green Bay. And, instead of a frozen field, the Wisconsin contest will be played on a green, soft, frost-free turf.

The source of the soft sod is a giant "heating pad" of electric heating cable from the Wiring Device Department that

covers 73,000 square feet of the field. Cable is laid in one-foot intervals from goal post to goal post about six inches under the ground.

"The heating cables will maintain September-like playing conditions throughout the season, and prevent frozen turf—a common cause of player injury in Wisconsin football," points out George J. Halas, sales engineer for the Company (see photo). "A serious injury could mean a million dollar loss to a professional football team."

If the name Halas sounds familiar—it should. Mr. Halas is the nephew of George "Papa" Halas, owner and coach of the Chicago Bears. The General Electric Halas is also an occasional scout for pro football teams.

Calling Signals: Selling the Green Bay Packers was a joint effort that also included Richard E. Wall, manager-system engineers, Agency and Distributor Sales Operation.

Mr. Wall and Mr. Halas presented the

WIRED IN: GE heating cable goes under the Green Bay field, checked by (from left) installer Elmer Cloud; Sal Soscia, application engineer for Wiring Device Department; George Halas, GE sales engineer.



General Electric Story to the Packers as well as AFL and NFL league officials. Reports Mr. Wall, "Enthusiasm for this approach is tremendous."

Cheering from the sidelines are other General Electric team members of the Green Bay heating huddle: Medium Transformer Department, Distribution Assemblies Department (including circuit breakers with contributions from Switchgear and Industrial Control Departments), Wire and Cable Department and Circuit Protective Devices Department.

Lighting, Too

Things were brightening up at other stadiums in Cleveland and Los Angeles, with General Electric supplying the lighting equipment to make possible quality night color telecasts.

Cleveland's 73,811-seat Municipal Stadium was equipped with 920 General Electric lamps and fixtures that doubled the light intensity while decreasing the total connected electrical energy load. The POWR[®]SPOT[®] floodlights and Multi-Vapor[®] lamps produce over one million peak beam candle power.

Lamp Division had some interesting "fan mail" from National Football League Commissioner Pete Rozelle, Los Angeles Rams owner Dan Reeves and others urging speedy delivery of a newly-announced 2,000 watt Quartz-line spotlight lamp for the first of several early season night football color telecasts.

With the pressure on, Lamp Division employees at Willoughby, Ohio, and Mattoon, Ill., wasted no time in the huddle before zipping along the order. The customer got the lamps on time, and CBS-TV went ahead with plans to televise a

night game between the Rams and the Dallas Cowboys.

INDUSTRIAL SALES

Record from Republic

Among the future plans of the Republic Steel Corporation is a new 84-inch hot strip mill. It also represents a \$17-million electrical contract for General Electric that's the largest single industrial order in the history of the Industrial Sales Division's East Central Region.

Some 20 General Electric product departments are represented in Republic's electrical package, including: Large Generator and Motor Department (seven main drive motors totaling 72,000 hp), Industry Control Department (computer control for the mill), Switchgear Department, Direct Current Motor & Generator Department (motors of 20,000 total hp), and Small AC Motor and Generator Department.

The mill has been in the planning stage for over five years. The order was handled by Jack Hopper, sales engineer, and Paul S. Hasler, application engineer, of the Cleveland ISD office.

OUTDOOR LIGHTING

How Grows the Okra?

From a verdant niche in the Outdoor Lighting Department's engineering section has popped something unusual in the way of work output: a crop of fresh tomatoes, radishes, bush beans and okra.

Hendersonville's summer salad originated in an experimental growth chamber that was built to find out if it's feasible

to grow plants under compact arc light sources.

General Electric mercury and Lucalox[®] lamps were the only "sun" the plants ever knew.

The experiment was a departure from previous approaches, which have used incandescent or fluorescent lighting, and falls in the scientific category of phytoillumination: controlling plant growth in research growth chambers.

A main advantage in using an indoor garden is to accelerate the growth rate of plants, since the lighting can duplicate mid-summer growing conditions the year around.

Cropping Up: After a two-month growing season, the experimental plants had pushed themselves high into the overhead light fixtures, and OLD engineers judged the experiment a success.

Before the harvest, horticulturists and plant physiologists from North Carolina State University visited the Department for a look-see. The group—including

one representative from Australia—also judged the test a complete success. Stan J. Noesen, manager of advanced engineering for the Outdoor Lighting Department, agreed. He had, in fact, literally tasted the fruits of his labor, and found them tasty.

"The technical feasibility of using compact arc light sources has been demonstrated," he said. "Compact arcs are proving to be very well suited to plant growth, since they have advantages over fluorescent sources."

Among the comparative advantages listed by Mr. Noesen: less input power per square foot of plant growth surface, lumen maintenance of compact arcs is superior to fluorescent, light source is smaller and easier to control and temperature limitations are less.

Green Market: Further experimentation with arc lighting as a stimulus for plant growth continues at North Carolina State University. In the meantime, Out-

EXPERIMENTAL plant lighting was supplied by fixtures, top left. Inside of the plant growth chamber with young plants sprouting early in the test is at left, while the heavy plant growth that resulted is seen below.



door Lighting Department is looking at the potential market for such applications of General Electric lighting.

A logical candidate is the greenhouse operator, who may presently be using some auxiliary lighting. Seed companies would also qualify, as would a number of educational and industrial research institutions working with growth chambers.

The Department isn't expecting a tall, green market to sprout under their feet immediately, but it does see horticultural lighting as a potential new product area that can contribute to man's well being.

TIME-SHARING

Jolly Good Showing

Europe's first commercially-available computer time-sharing service has swung into action in Great Britain under the guiding

IN LONDON: J. Stanford Smith (below) addresses press conference, while GE time-sharing is sampled by Henri Desbrueres, seated, President of Bull General Electric. Standing are Walter G. Ward, Vice President and General Manager—Area Division Europe, Arthur E. Peltosalo, Deputy Division General Manager—International, Information Systems Division, and Victor A. Casebolt, managing director of De La Rue Bull.

hand of De La Rue Bull, the Company's computer subsidiary in England.

At a press conference in London's Dorchester Hotel, some 100 journalists heard J. Stanford Smith, vice president and general manager of the Information Systems Division, point out that time-sharing services are expected to account for at least half of the total world-wide information systems business by the 1970's.

"This means half of a market which by 1976 is expected to reach more than \$25 billion," he added.

The London opening brought to 24 the number of General Electric time-sharing centers around the world. Mr. Smith told the London gathering that "No other company in this severely competitive data processing industry comes even close to this record either in terms of areas served or in number of time-sharing programs available for customer user—in our case, a library of over 200 programs."

Signing Up: V. A. Casebolt, managing director of De La Rue Bull, told the group



that the Company is one of three suppliers in the United Kingdom who offer a complete line of equipment from punched card machines to very advanced computer systems. "De La Rue Bull's close association with General Electric has greatly increased our capacity to serve the British market," he said.

Some of the first customers of the new time-sharing centre (already in the black) were Ford Motor Company, London Institute of Computer Science, National Physical Lab. Vauxhall Motors, General Post Office and British Petroleum Trading Co. Ltd.

BUSINESS

Making Things Happen

Business management, so aggressive in product and service markets, must learn "how to make things happen in the social and economic field as well."

Vice President Virgil B. Day, addressing the 20th Annual Round Table Conference of the Edison Electric Institute's Industrial Relations Committee, also said that the most meaningful hope for progress in solving the problem of minority group employment lies in industry recognizing its own stake in the problem and taking the initiative in helping to solve it.

Mr. Day said that much has been done in eliminating barriers of discrimination and opening the doors of employment to all, but that aggressive business management is going to have to get far deeper into job training and education "and understand what is involved in motivating different kinds of employees."

He also listed manpower planning as one of the new avenues where management must take initiatives if businesses are to survive and flourish.

Subtleties: 'People problems' are really the tough issues confronting business management today, observed Mr. Day. "They all involve the subtle challenge of securing the voluntary acceptance and active support of people in programs essential to business success.

"There is an imperative need for management to initiate pressures of its own on the environment, and thereby 'make things happen' in the interests of a better-functioning economic and social system."

He said that other forces and trends in today's economy such as the young, the cities, the technologists, education, the public interest or the white collar group that sees itself as neither management nor union-oriented may very well grow into dominant forces and trends in the next generation.

"The challenge of organizing human resources, of securing acceptance and involvement of people is not only the central challenge of management, but also the central challenge of the nation today."

FLIGHT PROPULSION

Commercial Consolidation

The Company's Flight Propulsion Division, which has its eyes on the commercial engine market, has announced major organizational changes and a new commercial engine project designed to strengthen its position in the market.

Gerhard Neumann, Vice President and General Manager of the Division, announced corporate funding for development of a new commercial jet engine, the CF6 turbofan. He also announced that "We are consolidating all of GE's commercial aviation programs—CJ805 engines, helicopter engines, business jet engines, the SST engine, Aircraft Service

Shops, and our new CF6 engine—into a single business reporting directly to the Vice President.”

Edward E. Hood, Jr., formerly SST Project Manager, has been named General Manager—Commercial Engine Programs. Brian H. Rowe was named General Manager of the CF6 Project, reporting to Mr. Hood.

New Class: The CF6 is the General Electric entry for the important U.S. “Airbus” or intermediate-range transport competition. Mr. Neumann pointed out that the Company believes that the new aircraft represents the next “substantial market for General Electric commercial engines.” He said “We intend to pursue it with the same vigor demonstrated in the C-5A and SST competitions.”

Lockheed California Company was the first airframe manufacturer to announce its new luxury jetliner in the “Airbus” class. It said the L-1011 would fly 2,000 miles nonstop at 600 miles per hour, carrying 227 to 300 passengers. Propulsion would come from three engines producing about 100,000 pounds of thrust.

General Electric is competing for the L-1011 engine award with Pratt & Whitney Division of United Aircraft and Rolls-Royce, Ltd. of Great Britain.

Specs: Mr. Hood describes the new CF6 as “a new generation, high-bypass ratio, high performance turbofan” especially suited for Airbus-class and having rapid turn-around time.

“For this type of commercial service,” he points out, “we have designed the CF6 for low noise levels, long parts life, and a high degree of maintainability.” The CF6 will supply 34,000 pounds of thrust, weigh under 7,000 pounds, and is of modular design, allowing major components to be replaced individually on-wing or in the shop.

DEFENSE ELECTRONICS

Green Light for Nike-X

A recent announcement by Defense Secretary McNamara formally outlined the U.S. decision to build a limited defense against international ballistic missiles late this year.

The Nike-X system will cost about \$5 billion, and is designed as “a protection against an attack by the Chinese against our population, a possible attack by the Soviets against our Minute Man sites or against a missile fired accidentally at the U.S.,” according to Lt. Gen. Austin W. Betts, Chief of Research and Development for the Department of the Army.

Gen. Betts, who is also a Nike-X engineer, recently visited the Company in Syracuse. He described the Company’s role in the program:

“General Electric has the contract for design and development of the Perimeter Acquisition Radar, an essential element of the System, and it also has a very large part to play in the design and development of what we call the TACMAR, which is one of the big radars in the System.”

He commented on the “very high caliber of work of General Electric,” and the “very capable people” who are engaged in development work.

FOREIGN COMPETITION

Japanese Joust

Losing a chunk of business to Japanese competition was one of last year’s least memorable experiences for the Company’s Tube Department, Owensboro, Ky.

The lost order was from the Sarkes-



TUBE'S NEUMANN & COMPACTRONS

Era of out-think in the tube market.

Tarzien Company of Bloomington, Ind., which had decided to equip its TV and FM tuners and other electronic products with vacuum tubes from Nippon.

Disgruntled but undaunted, the Company's Tube Department rolled up its sleeves and unleashed a program earlier this year to recapture lost sales. High on the list was Sarkes-Tarzien.

Following thorough homework on the part of employees C. A. "Fritz" Neumann, manager of original equipment manufacturer sales; James N. Holeman, product sales manager; Gene R. Laughlin, district sales manager, Indianapolis, the Department again knocked on the customer's door.

What Sarkes-Tarzien heard was a triple threat GE proposal that stressed price, quality and service.

It liked what it heard.

Sarkes also placed an order for several million GE tubes.

"We were able to convince Sarkes," recalls Mr. Neumann, "that GE tubes offered greater value than Japanese products."

Exports: Following the turnabout at Sarkes-Tarzien, the Department sustained the momentum by competing successfully with the Japanese tube merchants in the international arena, including Italy and Canada.

"If we continue to out-think the Japanese," he said, "we will get a larger and larger piece of the world tube market." The Department recently revealed a television set design that requires only four compactrons plus miniature tube to perform all receiving functions except for the tuner and picture tube. (Mr. Neumann is shown holding a set using the new design and an 11-tube counterpart).

"But the minute we stop fighting—doing a good job in quality, cost control, and innovating—we will lose our number one U.S. exporter position."

INTERNATIONAL

Making a Mint

Mexico's mint, which has been stamping out pesos since it was built in 1842, is going to be replaced with a new model.

Main contractors in the \$3.5-million project include General Electric (U.S.A.) and General Electric, S.A. de C.V. (Mexico), plus E. W. Bliss Company of Canton, Ohio. GE will supply all the drive and automatic control equipment for the mint which will have facilities for processing metal and pressing the 5, 10, 25 and 50 centavo alloy coins and one peso silver pieces.

The order, secured by IGE Export Division, includes eight motors from the Small AC Motor and Generator Department, Schenectady, plus other General Electric components from Direct Current Motor and Generator Department, Erie; Industry Control Department, Salem, Va.

What We've Learned From Electric Car Tests



R&D GROUP: With GE's experimental electric vehicle are, from left, Charles M. Heiden, manager, NBDO; Dr. Peter J. Stewart; Bruce R. Laumeister.

Last month a group of scientists and engineers at the Company's Research and Development Center in Schenectady heard a preliminary report on tests conducted on the latest in a series of vehicles used to test electrical and electronic components. The report was made by the New Businesses Development Operation, which seeks opportunities for GE in developing vehicle components. The topic was also discussed at the Company's information meeting for shareowners in Cincinnati, Ohio. *The Monogram* asked Dr. Arthur M. Bueche, Vice President in charge of the Research and Development Center, about the current status of our electric vehicle technology:

Q: *Dr. Bueche, now that you've had a look at some early test results from your electric test vehicle, how would you evaluate the outlook for electric vehicles?*

A: I'm optimistic about the improvement of electric vehicles for lift trucks, golf carts and other specialty applications, and I'm not really pessimistic about the long-term future of electric transportation for general highway use. From a standpoint of quietness, cleanliness, convenience, economy and safety, electric vehicles offer many potential advantages. But there are still many unsolved problems, and a great deal of research and development remains to be done.

Q: *What are some of these problems?*

A: Well, in any car you've got to consider

a balance of factors, such as initial cost, range, passenger capacity, speed and efficiency. You need an optimum combination for the vehicle to be competitive. Our research suggests that there's still a lot to be done. We're presently working on improving the economics and performance of batteries, solid-state controls and motors.

Q: *You mention speed and range. What kind of results have your tests yielded? Is there a limit to present range?*

A: Our present tests have concentrated on balancing speed and range. At 55 miles per hour, our vehicle didn't go very far, but when we drove it at 30 to 35, and stayed on flat terrain, the range was about 100 to 120 miles per charge. So the range can be extended.

but only at the expense of some other characteristic such as speed. If we dropped down to low speeds of say 8 to 10 miles per hour, our calculations show that the range might extend to several hundred miles. We could also add more batteries in the passenger spaces, but you would soon reach a limit of the trade-off.

Q: *Then what do you see as the answer to the problem?*

A: Well, we didn't mention the critical factor of energy density. We need to pack more kilowatt hours of electricity into each pound of battery — or each cubic foot — and still keep costs under control. There's also the question of re-charging time. There are physical limits to the rate at which you can charge batteries. The batteries we're using in our experimental vehicle require about eight hours to charge by plugging into a standard household outlet.

Q: *Then a fast-charge battery is one of the needs. Didn't the company recently announce two new types of batteries that fill the bill?*

A: We've made strides. The new General Electric three-electrode battery, for example, can be charged in less than an hour. But this is a special-purpose battery intended mainly for space and defense uses. There is also a new magnesium-air battery that is not rechargeable in the ordinary sense. It's recharged by replacing the consumable magnesium electrode. But its cost is also prohibitive for all but the most specialized applications, such as reducing the load that must be carried by combat troops in Vietnam.

Q: *Dr. Bueche, I noticed that you didn't mention the fuel cell. Couldn't a fuel cell power an electric car?*

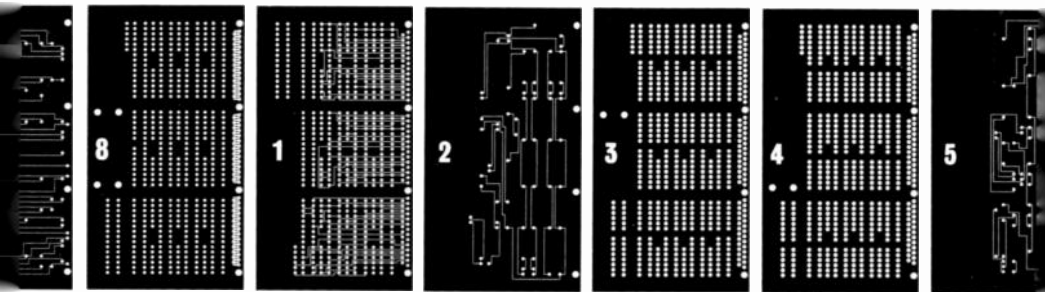
A: Our fuel cells used in the Gemini flights did prove that they could do *that* job better than anything else, but there were unique weight and long-life requirements for on-board spacecraft use. A pair of GE fuel cell units, weighing a total of 140 pounds, supplied as much power as a ton of batteries. But even such advanced devices don't rate as high as we'd like in terms of power per cubic foot. We'd need at least a half dozen such units to power our test vehicle, but we simply couldn't squeeze them into our present unit and we just couldn't afford to use them for this purpose. Other types of fuel cells produce better power per unit volume and promise lower cost, but these require much more research, development and engineering before they can compete with present auto engines.

Q: *There is also the problem of coming up with some kind of eventual system that will be competitively priced, right?*

A: Yes, and our rough estimates of what our present test vehicle — which is a rather utilitarian unit — might cost more than what people now pay for a full-sized, full-powered luxury sedan. And certainly with its low speed and range limitations it couldn't compete with today's automobiles.

Q: *Dr. Bueche, are there any breakthroughs in technology around the corner?*

A: I hope so, because General Electric is as anxious as anyone to see the day when the electric vehicle is competitive. But I wouldn't want to kid anyone by claiming that we've solved the problems, or developed a car that will meet today's needs. We will continue our work and we'll probably put together other test vehicles.



COMPUTER, DESIGN THYSELF

THE DAY may not be far off when one computer designs another.

Such cybernetic signs are bubbling forth from the Company's Electronics Laboratory, Syracuse, N.Y., which is using design automation to develop future computers that will be faster and more complex than present generations.

Harry F. Mayer, manager of the Laboratory, recalls that the need for design automation popped up several years ago when the Laboratory was building an arithmetic processor using very high speed circuits. (The processor is the heart of a computer, performing addition, subtraction, multiplication, division and integration.)

"After a month or so of running up blind alleys in the design work, it became obvious that we simply couldn't do the job by conventional design techniques.

"We decided to let a computer have a crack at designing the layout of the equipment," he said. "The computer completed in a few hours what would have taken a man years to do—if he could have done it at all."

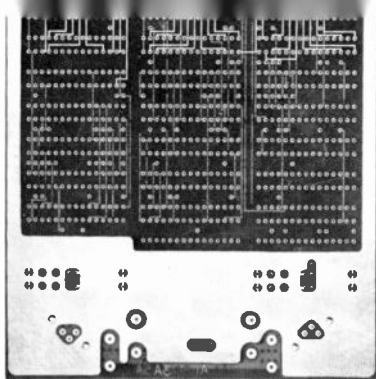
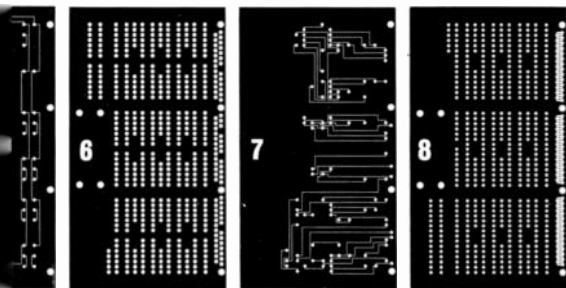
By Design: Designing a computer is a formidable job. Its impeccable logic re-

sults from a sophisticated electronic network that can include (as in the GE 625) 1.5 million components and 1,750,000 connections.

Design automation is a necessity, points out Mr. Mayer, because the design of some parts of new computers is simply too complicated for the human mind to solve in a reasonable amount of time. "It's also a boon because it will allow us to do things faster and more economically and, therefore, improve our competitive position."

Module-ation: One of the toughest jobs facing a computer designer is mapping out the precise placement of hundreds of tiny microcircuit modules and the maze of wiring that interconnects them. To this seemingly endless task, the automated design technique has brought relief.

The designer uses a computer program incorporating the basic "rules" that apply to module placement: the logic used, maximum wire length, timing, heat dissipation, pin connections, and fabrication of the circuit boards upon which the modules are placed. Several such boards may be stacked in layers, producing a kind of electronic Dagwood



sandwich. How, the "ingredients" are wired together is calculated by the design computer.

After the designer feeds his requirements into the computer, he waits for a print-out. This is a kind of electronic road map (see photo) showing where each module is placed, how the pin connections are made, and where the wiring goes from board to board. In the circuit design code of the computer, P stands for pin, B for barrier and either I for vertical or — for horizontal connections.

The computer's output can be used to work up a wiring layout or, as done by the Information Systems Division, patched into an automatic plotter that could prepare the design of a printed circuit board.

Megabits: The computers being de-

signed now by the Electronics Laboratory techniques won't be around for years, but when they arrive, their generation will be a fast one. Present computers handle one or two million bits a second (a bit is a binary 1 or 0), but the units being designed for the future will operate about 100 times that speed.

It is this high speed capability that forces ultra-rigid design requirements. A million bits of information per second is still rather slow compared to the flow of electrons in a computer circuit; they move near the speed of light.

But as computer speed moves higher and higher, the amount of time in which electrical signals can move from place to place becomes relatively less and less. The length of a connecting wire moves from a casual design consideration to a critical one. This is why the Laboratory has written design programs restricting wire lengths.

It was the demand for higher speeds in computers that stimulated the design automation program, and without such an assist, chances are the evolution of the computer might have been stunted.

The Electronics Laboratory is now working toward the ultimate goal of developing a complete set of computer programs to aid in the overall design of new digital computers and other electronic equipment.

Mr. Mayer, left, and S. B. Akers, consulting mathematician, check a computer board design.





ERIE'S MR. ESTES

Stick 'em fun from a good idea.

BENEFITS

We Give Green Stamps

In an age of superheroes, Leo E. Estes of the Locomotive and Parts Department, Erie, Pa., should qualify as a candidate.

Mr. Estes, who is a welder-assembler, recently collected the biggest suggestion award in the history of the Transportation Systems Division: \$2,915.00. Not only that, but he also won a "Go For Improvement" bonus worth \$1,457.00 to make a total award of \$4,372.00 for his good idea.

The bonus was a wheelbarrow loaded with 530,000 S&H Green Stamps (see photo).

His green letter day was marked by a handshake and congratulatory pass of the check from Department General Manager Olaf F. Vea. Behind the award was an idea by Mr. Estes for fabricating units in the plant that previously had been purchased from a vendor.

Mr. Estes, who said he "just jumped" when told he had won the large award, happily took his wife and five children on a trip to a local Green Stamp redemption center.

Said Mrs. Estes: "The children and I are just so proud of Leo. We couldn't be any prouder."

History at Morrison: Another good idea was recognized at the Appliance Control Department, Morrison, Ill., as Dave F. Gibson stepped up and received a \$4,200.00 suggestion award that was the highest ever paid there.

Mr. Gibson, who was a laboratory technician when he submitted his suggestion, is now a specialist-product evaluation. His idea covered a design change in a gas igniter. The Department also filed a patent application covering his idea.

Another One: Record awards seemed to be epidemic, as Ordnance Department announced that a \$3,000 award had been given to Mrs. Helga Knappe—the largest Suggestion Plan check in the 26-year history of the Department.

Mrs. Knappe, a wireman, had recommended a change in electronic module assembly that will yield considerable savings in time.

Her plans: "The money will help put my three children through college," she said.

Everett, Too: Another hefty suggestion award of \$2,025 was presented to George Scourtas of the Flight Propulsion Division's Everett, Mass. plant. It was the largest suggestion award ever given at Everett.

"I never expected this much of a payoff when I submitted my idea," remarked Mr. Scourtas, who had come up with a technique for checking the hardness of J79-10 flaps and improving quality.

He wisely put most of the award money into the bank to help with his son's education, but did keep "a little money with which to buy a GE color television set."

STEAM TURBINE-GENERATORS

Choosing Charleston

The Large Steam Turbine-Generator Department has announced that it will build an ultra-modern "multi-million-dollar facility" for production of turbine exhaust hoods on a 325-acre site near Charleston, S.C.

The 340,000-square-foot plant is actually the second large facility for increased production to be announced by the Department this year. Late this summer the Company exercised its option to establish a new heat transfer operation at Portland, Maine, and announced Paul G. LaHaye as plant manager.

Major renovations and additions of new equipment totaling some \$50 million are also underway currently at Schenectady.

PLANNING FOR CHARLESTON

Powermen Scholz (standing), LaHaye, Sutton.



Groundbreaking at Charleston is scheduled for late this year and production will start in 1969. Recruiting and training of employees is expected to start shortly. Herbert J. Scholz, Jr. will be plant manager.

DISTRIBUTION TRANSFORMER

New Plant in Shreveport

The Company's Distribution Transformer Department has confirmed plans to build a new plant at Shreveport, La.

The \$30-million facility will be used to manufacture underground distribution transformers to supply growing southern markets. Manufacturing area of the plant will total over 400,000 square feet plus 32,000 additional square feet in office area.

Employment of the new plant is expected to approach 800 persons when production reaches full capacity in the mid-1970's. Operations will begin in mid-1969.

Anthony J. Gizzi, general manager of the Department, said that the expansion at Shreveport is another step in the Department's expansion program that began with the construction of its \$20-million Hickory, N.C., plant in 1965. The Department recently dedicated its Merced, Calif., plant following a \$6-million renovation project. (Other Distribution Transformer plants are at Pittsfield, Mass., and Oakland, Calif.)

"Spreading our plants out lets us place manufacturing facilities nearer our customers," said Mr. Gizzi.

Pelican Staters were pleased to see General Electric choose Shreveport. Mayor Clyde Fant said that to the best of his knowledge, "General Electric in Shreveport will be the first electric industry to be located in the state of Louisiana.

URBAN PROBLEMS

Postscript to Newark

A short 200 yards from the Company's Newark (N.J.) Lamp Plant, a crowd gathered at the steps of the Fourth Precinct Police Station on a muggy evening last July protesting the arrest of a Negro cab driver.

A short time later, the Newark riots began.

When the violence had subsided a few days and nights later, the toll would include over 20 dead, 1,200 injuries, 1,600 arrests, and millions of dollars in losses from fires and looting.

How the riot affected the Company's operations in Newark was summarized for *The Monogram* by M. E. "Pat" Patterson, plant manager.

Historic Spot: The Newark Lamp Plant is a four-story, 500,000-square-foot plant built by Edison in 1905. It is up to date, well-lit, clean, and manufactures incandescent lamps for the eastern U.S. market. Some 500 employees work in the lamp plant, which is also headquarters of the Newark Service District. A large percentage of the employees are Negroes. Through the years the composition of the neighborhood has changed, and today the plant sits in the heart of the Negro ghetto.

Although the riots raged immediately outside the plant gates, no one got by a beefed up guard force. Some employees were stopped by rioters during the early hours of the disturbance on their way to and from the plant, and one employee's car was burned. Other employees were robbed or assaulted.

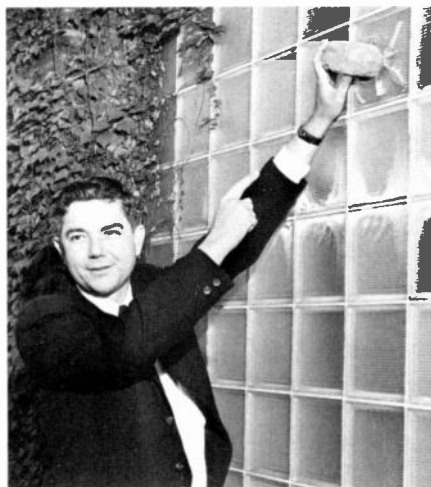
"When it became evident that things were getting out of hand," recalls Mr. Patterson, "we gave employees the option

of going home although many wanted to work. Later we had to close down our lines completely. (A Company station wagon was used to escort groups through the riots, and police escorts were requested). Snipers were holed up in the apartment building across from the plant, mobs surged through the streets, and we were being pelted by bricks and rocks to the tune of about \$5,000 in damages."

Siege: For five days, Mr. Patterson stayed on top of the situation, aided by a group of employees who, in his words, "went way beyond the call of duty." There was little rest, and for one stretch of 36 hours, Mr. Patterson stayed inside the beleaguered plant, keeping in touch with the Lamp Division and Corporate Headquarters in New York.

"We're going to get GE tonight," was passed among some rioters. The ominous report was brought back to the plant by shipping foreman Charles F. Garland, a former president of IUE Local 492 and

LAMP'S PATTERSON & MISSILE
Riots plus rocks equal \$5,000.00.



a Negro. He had told the rioters that they wouldn't find anything in the plant "but light bulbs."

Troopers and National Guardsmen arrived on the scene and promptly sealed off the riot area — including the plant. A tank rumbled up the street, and two truckloads of troops took up positions near the cyclone fence at the front of the plant.

Inside the sealed plant, the operations of the Newark Service District had been transferred to other points (E. Orange, N.J. and New York City) by Manager Jack A. Ampert and trucks on the road returning to the plant were told to stay away. Mr. Patterson, living on sandwiches from the plant's new automated cafeteria, borrowed a walkie-talkie from the employee store and was surprised to hear the voices of some of the rioters in the area.

Inventory: When the situation was brought under control, and things cooled down in the neighborhood a few days later, the plant took inventory. Lost lamp production had totaled over a half-million units, but a scheduled vacation shut-down had saved further losses from occurring. Dozens of broken windows were being replaced with LEXAN® polycarbonate sheet and wire mesh screens, and additional fire equipment was installed (During the riots, all available fire equipment was in use).

Manager Patterson was warm in his praise of employees who pitched in during the siege, volunteering to help the guards, position fire equipment, and circulate among the rioters to evaluate the situation. In a kind of Newark Honor Roll, he recalled George Koehler, George Kunz, foreman Ed Swaszek, Bill Hock and Ted Aurnhammer, engineers Joe Pekar, Russ Ackerman, Jack Russo and

Mike Hayes and supervisors Walt Adamczyk and Nick Maluso.

"I am happy to report," wrote Mr. Patterson in a letter to employees, "that due to a lot of personal bravery, sacrifice, unselfish involvement and outstanding efforts on the part of General Electric employees, our plant is still intact. All groups banded together to solve a common problem, and in this effort they proved teamwork was the only solution.

"Newark Lamp has demonstrated over the years that people from all walks of life regardless of race, creed, or color can and do work together toward common goals."

While there were employee fears expressed over the plant's future, not one supervisor believes the Company should move the operation.

"Most ask the question," says Mr. Patterson, "What can we do to make this a better operation?"

COLLEGE BOWL

10th Anniversary

One of television's brightest spots also becomes one of the most durable as the General Electric College Bowl swings into its tenth season on TV.

In the past decade, the program has had 1,357 stars: the students who have had to field some 10,783 questions before nationwide audiences. College Bowl has been host to teams from 310 schools.

During the tenth anniversary season, Robert Earle continues as moderator.

The series will continue to be seen on NBC-TV Saturday afternoons at 5:30 Eastern time, but moves to Sundays at 6:00 after the New Year.

Housewares: General Electric has entered the blender market with the introduction of a solid state model with eight pushbutton speeds and a momentary on-off switch. The model BL-3 blender has a three cup capacity, and retains any of eight pre-selected speeds regardless of the density of food or liquid being blended. Suggested retail price is \$49.98. The Division also announces a new 18-roller hair curler (\$34.98), new rechargeable automatic toothbrush with choice of either up-and-down or back-and-forth motions on the same handle (\$22.98), and a new portable mixer, including one with variable speed control (model M-68, \$19.98).

Metering: A new, single-phase watt-hour meter has been introduced by the Meter Department, Somersworth, N.H. The unit is the first completely new single-phase type to be developed in a decade. The 1-70 meter features improved appearance and performance in accuracy, stability and operating efficiency. The Department also announces a new line of current transformers for EHV applications. The type KGC units are available in ratings from 1175 kv BIL to 1800 kv.

Baker's Helpers: Hotpoint now makes it possible to replace built-in kitchen wall ovens and surface sections through local retail outlets. Newly introduced: three self-cleaning built-in ovens, two new 36-inch Four Season Surface cooking units, and four trim kits. Hotpoint also introduces new black glass doors on all new 24 and 30-inch built-in ovens and drop-in ranges. The black glass is opaque until the oven's interior light is on.

Long-life Lamps: Lamp division has announced that early in 1968 it will offer

a new line of longer-life household bulbs as a supplement to present standard life types. While designed to last longer, they will have lower light out-

put. The new line will include inside-frost bulbs in 60, 100 and 150 watts with a rated life of 1500 hours compared with the 1000 or 750-hour life for the higher light output standard bulbs. (A standard inside-frost 100-watt lamp supplies 1,750 lumens, while the long-life lamp will provide 1,575.)

Sunrise Selling: The Personal Television Department, Portsmouth, Va., is introducing its new "Bedtime" Porta Color*

PRODUCTS



New GE blender is on far left. Showing new meter and Show 'n Tell presentation is William S. Smith, left, marketing manager, Meter Department and Thomas J. McLaren, manager of advertising and sales promotion.

television set to breakfasting Americans via boxes of Kellogg cereals. Three hundred of the new color portables are among 1001 General Electric television sets to be awarded as prizes in Kellogg's Family "Funtest" game. It's believed to mark the first national introduction of a major new TV model conducted entirely through a package goods promotion.

Medical Monitor: A new Patient Monitoring System incorporating solid-state modules that automatically detect and display body temperature, blood pressure, arterial pressure, heart beat rate and rhythm has been introduced by the X-Ray Department, Milwaukee. The System is designed to detect physiological abnormalities and provide warning signals to attending physicians or nurses.

Flashy Sound: A rechargeable radio-flashlight combining a solid-state AM radio with a flashlight in a single high-impact polystyrene case has been announced by the Radio Receiver Department, Utica, N.Y. The radio operates up to seven hours without recharging; the flashlight up to 40 minutes. Suggested retail price, including recharger unit, is \$14.95. Another new "youth electronics" product is a cassette tape player with a selection of pre-recorded tapes. The battery-operated

unit plays up to 30 minutes of music per cassette (selections included Sound of Music, the Beach Boys' Song Book, West Side Story, etc., at \$3.49 each). Suggested retail price is \$27.95.

DigiNet: A broad new line of data communications equipment is being introduced by the Communication Products Department, Lynchburg, Va. The DigiNet series includes options and modifications that will allow GE to provide a data set for virtually any business machine application. The line includes equipment that gets digital signals on and off conventional analog or voice channels, either microwave or cable.

Side By Side: The first product to be manufactured by the Company's Bloomington, Ind., plant is the new Hotpoint Food Center 24 Refrigerator-Freezer, a side-by-side unit of 24 cubic feet in a cabinet only 35³/₄ inches wide (Shown in photo with Phil J. Drieci, left, manager, Hotpoint Household Refrigerator Business Section and Donald E. Smyzer, Section marketing manager). The new unit offers more cubic feet of storage space than any other refrigerator-freezer now made in a cabinet under a yard wide. Employee discount is \$70.00.

**Trademark of the General Electric Co.*

New GE Tape Player, left, radio-flashlight, below, and side-by-side refrigerator, right.



TALKING POINTS

Canyon Cook-in

Deep down in the Grand Canyon, 5,000 feet over the south rim, is The Phantom Ranch, a lodge and dining room operated by Fred Harvey. It's a remote spot for a resort area since entry into the Canyon must be made by foot or by burro (three hours) or by shooting the rapids of the Colorado River.

Recently the Commercial Equipment Department made a far-from-routine delivery of its GE Food Service Equipment. No one shot the rapids, but it took a helicopter to deliver the product.

Members of CED point out that the customer's selection of General Electric equipment is quite an endorsement, since the Grand Canyon location means a high premium is placed on reliability.

A repairman's "house call" in the Grand Canyon is \$150.00. Parts are extra.

A GE CANYON DELIVERY

Food service, 5,000 feet down.



SAN JOSE'S 3-D TIC TAC TOE

Tic Tac Toe

A three-dimensional version of Tic Tac Toe was designed by the Better Business Operations and Relations Class at San Jose. The game was developed as a sound—if theoretical—product venture to appeal to the growing 15 to 25-year-old age group. The Class is designed to assist employees gain a broader understanding of business and relations. Pictured with their class product is James Boyden, Atomic Power Equipment Department engineer, and Paul Smith, technical recruiter.

Nuts

A customer of the Outdoor Lighting Department recently complained that a GE photoelectric control unit it had just didn't work. The Department asked to take a look at the unit, and the customer sent it to Hendersonville for a check-out.

It quickly became apparent why the unit had stopped working. A squirrel had chosen the unit as a convenient storage spot and stuffed it full of nuts!

Note From School

A supply of General Electric publications (progress posters, maps of mars and the moon, educational booklets) that was sent to Robert Boyd, Peace Corps volunteer in Andhra Pradesh, India, brought a warm letter of thanks to John Caldwell, Educational Relations Programs:

"I only wish you could have been present in the small, crowded office of the school I'm working with when I showed the different things to my Indian teacher-friend. If ever General Electric made a contribution to expanding the knowledge of students and helped make friends for our country it did so this morning. Even the head master who was trying to arrange admission of a new student had to briefly stop his work.

"There is no way in words to convey the feelings of thanks my friends and I have at receiving these fine educational materials."

Ladies From Vassar

Back in 1917, with World War I depleting the Company's male technical work force, a group of Vassar graduates joined the Schenectady Switchboard Sales Department as "a decided innovation brought about by the war." They spent an hour a day in the classroom training and seven hours doing commercial engineering work.

Recently GE's "lady engineers" celebrated their 50th class anniversary at Vassar in Poughkeepsie, N.Y., and were invited to a luncheon and Company tour at Schenectady. The four ladies were guests of Vice Presidents Donald E. Craig and Dr. Arthur M. Bueche. The Company appropriately announced that it was donating \$10,000 worth of scientific equipment to Vassar.

One of the group, Mrs. Marie Gregory Riley, expressed thanks in a letter to President Borch: "Surely the fact that a great corporation such as General Electric would take the trouble to plan such an occasion must be rare in the annals of business and industry," she wrote. "We deeply appreciate all that was done for us and it just reinforces our feeling that GE still means the 'initials of a friend.'"

A Cool Salute

James L. Smythe of Darien, Conn., recently sent an interesting photograph to the Company showing how he painted a vintage model 1934 monitor top GE refrigerator at the family farm in Virginia (see photo).

"We painted it as you see," said Mr. Smythe, "and call him 'General' Electric."

Quipped one Louisville employee: "His most important officer must be 'Major' Appliance."

"GENERAL" ELECTRIC AT ATTENTION

After 33 years, cooler with a snappy paint job.



ON CAMERA



BLIMP-EYE: Look sharp and you'll spot a General Electric PE-250 color television camera poking its lens out the door of the Goodyear blimp. The camera, from the Visual Communications Products Department, Syracuse, was recommended by TV networks for top quality airborne shots of major sports and news events.

HEER'S JOHNNY: Nela Park's Lighting Institute recently played host to television star Johnny Carson, who was in Cleveland for a personal appearance. Mr. Carson is shown an application of a laser by Dr. Robert Hansler, left, Lighting Laboratory research physicist. At right is Mr. Carson's son Ricky, while Lady of Light Kathy Burns and Donald C. Nichols of press relations look on.

MISS UNIVERSE: Sylvia Hitchcock, the current Miss Universe, appeared to be a qualified candidate for an honorary Zero Defects Award during a visit to the Company's Avionic Controls Department, Binghamton, N.Y. Presenting the award is General Manager William J. Kuehl, left, and Air Force Major Ross Minge.



AROUND THE COMPANY

Hurricane: Shortly after the massive destruction of Hurricane Beulah hit Brownsville, Texas, GE swung into action. The Corpus Christi Service Shop set up a field office in the disaster area, flying in employees who couldn't make it through roads flooded by five feet of water. The portable shop worked around the clock. Among the jobs: repaired motors for crude oil shipment, helped a shrimp boat get 10,000 pounds of shrimp unloaded through supply of emergency generator and repaired motors, and helped Civil Defense radio units get back on the air. Electric Utility Sales, FASO, Distribution Transformer Department and General Electric Supply scrambled to get 100 transformers into the disaster area from as far away as Seattle within three days.

Whoppers: The largest Disposall® order ever shipped—3500 units—has been delivered by the Dishwasher and Disposall Department, Louisville, to the Familian Pipe and Supply Co., Van Nuys, Calif. . . . The Power Transformer Department, Pittsfield, has shipped the highest capacity power transformer in the world—a 952 MVA generator step-up type—to Commonwealth Edison Co., Chicago. . . . Not to be outdone, Pennsylvania Power and Light Co. can also claim the world's highest capacity generator step-up transformer—810,000 kva—that was recently shipped by the Company.

Orders: The Instrument Department, W. Lynn, Mass., has been given a major contract to supply all engine instrumentation for the Boeing Company's new 747 jumbo passenger aircraft. . . . Western Electric has ordered a GE/PAC 4020 process com-

puter for its new Phoenix cable plant. . . . Locomotive and Parts Department, Erie, has received orders for diesel locomotives from the Portuguese Province of Angola (30 U20C locomotives) and Spain's RENFE (Red Nacional de los Ferrocarriles Españoles) of Madrid for 12 UM-10B locomotives.

Mill-tally: Ordnance Department employees have reached a total of five million manhours worked safely. Their Go For Improvement goal is seven million. . . . The Armed Forces Management Association has presented its service award to the Company for its publication *Aerospace Management*, a magazine by the Missile and Space Division. . . . Armament Department has displayed its Vulcan Air Defense System in Washington. Built for the Army, it gives field commanders a new, low-altitude air defense in forward battle areas. The new system is designed for use with the Chapparral missile system produced by the Aerospace Electronics Department.

At MSD: Victor Reisell, syndicated writer, visited the Valley Forge Space Technology Center recently and was "mighty impressed with the work GE is doing in the aerospace field." Mr. Reisell visited the solar environmental simulator, Nimbus ground station and anechoic chamber.

Teacher Tie-in: A 97-seat lecture hall at Syracuse University has been equipped with an electronic "student response system" developed by the Company's Research and Development Center. The Syracuse hall is tied directly to the GE-265 time-sharing computer in Schenectady, and analyzes the responses of students to multiple-choice questions during pauses in a lecture.

PEOPLE

NICB: Board Chairman Gerald L. Phillippe has been elected to a second term as co-chairman of the National Industrial Conference Board. . . . Mr. Phillippe is also serving as a member of the Urban Coalition, a national alliance of business, labor, municipal, religious and civil rights leaders formed to help communities attack slum problems.

Lending a Hand: During the Detroit riots last July, Robert T. Allen, technician draftsman at the Metallurgical Products Department's diamond business section, volunteered to help the ambulance division of Detroit General Hospital. In a recent letter to President Borch, Hospital Administrator E. P. Henry commended the work of Mr. Allen.

"He worked heroically through that period," wrote Mr. Henry. "Mr. Allen drove ambulances both day and night without police escort, through streets and avenues of the City of Detroit under gunfire and other immediate dangers. The interest, energy and sophisticated coolness of Mr. Allen under extreme conditions was recognized by all associates during that week."

Some Sons: Understandable pride is shared by two paternal employees of the Company who have seen their sons receive rare honors. Chuck Clanton, son of C. H. Clanton, Jr., Communication Products Department District Sales Manager, was recently named by President Johnson as a Presidential Scholar. The award recognizes American youth of high academic ability. One of the rewards: meeting the President. . . . Soap Box Derby builder Rick Plavidal, son of Louis Plavidal, sales

engineer with the Electric Utility Sales Division, also did his dad proud by placing 5th in the National Soap Box Derby at Akron. Young Plavidal received a \$3,000 scholarship and a trophy for his good showing.

Notable: Dr. W. Kermit Anderson of the Knolls Atomic Power Laboratory has been named a Fellow of the American Nuclear Society. . . . Walter R. Wilson, senior consulting engineer, Power Circuit Breaker Department, was presented a University of Michigan Sesquicentennial Award. . . . Cleatis A. Beaubien, sales manager for Carboloy® cemented carbide

In Crotonville: The seventh General Management course is underway at Crotonville, with the following participants:

Area Division-Latin America: *R. P. Woolery; A. R. Lloyd.*

Area Division-Mediterranean: *G. Camatini.*
Canadian General Electric: *R. T. E. Gillespie; K. A. Blatherwick.*

Chemical & Metallurgical Division: *W. L. Robb.*

Component Products Division: *J. R. Gerichs; D. R. Kearns.*

Construction Industries Division: *W. S. McIntosh; R. E. Sessions.*

Consumer Electronics Division: *G. K. Mason; A. D. Faust; E. G. Schatz; P. D. Brooks.*

Defense Electronics Division: *N. N. Feldman; H. J. Kindl; R. W. Mayer.*

Defense Programs Division: *G. B. Holloway.*

Electric Utility Sales Division: *J. A. Smith; A. J. Clay; W. H. Prentice.*

Electronic Components Division: *S. A. Gorski; G. E. Lewis.*

Engineering Services: *C. Mannal.*

General Electric Credit Corporation: *C. S. LaDow.*

General Electric Supply Company Division: *R. J. Kalember; T. P. Segerson; R. W. Field; D. M. Engelman.*

products in Michigan, has been named to participate in an International Trade Mission to Europe sponsored by U.S. and State Commerce Departments.

Dorsey Duo: Robert S. Dorsey, senior reliability engineer with the Flight Propulsion Division in Evendale, has received the annual Ohio State University Distinguished Football Alumnus Award. Mr. Dorsey played end with the 1949 Buckeye team, and now specializes in jet engine reliability. . . . Robert T. Dorsey, manager of lighting development at Nela Park, has been elected director of the Illuminating Engineering Society.

Housewares Division: *R. Igoe; R. R. Gehrett, Jr.; R. G. Roten.*

Industrial Drives Systems Division: *V. J. Loscalzo.*

Industrial Process Control Division: *R. C. Mark; E. A. Ebner.*

Industrial Sales Division: *W. W. Hamilton; D. P. Patterson.*

Information Systems Division: *J. C. Croyle; R. Ketchum; R. B. Byrn, Jr.*

IGE Export Division: *W. M. Luper; A. F. Knauer.*

Lamp Division: *C. A. Brown; R. J. Smith; E. F. Apple; W. E. Tragert.*

Major Appliance and Hotpoint Division: *R. O. Donegan; W. G. Spiegelhalter; E. J. Zirkle.*

Manufacturing Services: *W. F. Reardon.*

Marketing and Public Relations Services: *J. W. Blake.*

Missile and Space Division: *J. P. May; J. R. Picard.*

Power Distribution Division: *M. W. Hellar; J. C. Farris; G. E. Collins.*

Power Generation Division: *A. N. Misterman; F. H. Kindl.*

Power Transmission Division: *K. G. Adack.*
Research and Development Center: *N. J. Dam.*

Transportation Systems Division: *C. W. Steenberge.*

Honors: Dr. Roy H. Beaton, general manager of the Apollo Support Department, has received the honorary degree of Doctor of Science from Northeastern University, Boston, Mass. . . . Laurence I. Wood, vice president, Washington Services, has received an honorary Doctor of Laws from De Pauw University. . . . Bryce W. Wyman, general manager of the Transportation Systems Division, has received the Notable Nebraskan Award from the Nebraska State Centennial Commission. (The Cornhusker State similarly honored TV's Johnny Carson and actor Henry Fonda). . . . Sylvester K. Guth, manager of the Radiant Energy Effects Laboratory, Nela Park, has received the 1967 Gold Medal Award of the Illuminating Engineering Society. . . . Regional Vice President Charles J. Miller has been named recipient of the Executive Order of Ohio Commodore Award.

Flooded In: When Mel Schultz, mechanical and nuclear field service engineer for Installation and Service Engineering's Seattle Office, had to take a trip to Alaska to inspect GE turbine generators, he decided to take his family along and vacation there after the job was done. He didn't figure on being caught in the Fairbanks flood. Fortunately, the motel in which the Schultzes were staying was high enough to escape major flooding, but over 200 people moved in from nearby evacuation points. There was no food, water, heat or lights. Mrs. Schultz set up a nursery for refugee children, and Mr. Schultz rented a boat in search of milk, baby food and supplies. Later, summoned by Civil Defense officials after power failure plagued Fairbanks, Mr. Schultz aided in getting a powerhouse back in operation while Mrs. Schultz helped the State Patrol Office by taking messages from persons stranded and needing help. After a week,

the flood waters began to recede, and the Schultz family headed home after an unusual week of "vacation."

Seeing Samoa: "For quite some time," said Flight Propulsion Division employee Dick Eccles, "we've wanted to do something that would contribute directly to our society on a person-to-person basis." So, Mr. Eccles, along with his wife and six children have left the West Lynn area for a three-year stay in Western Samoa where he'll serve as a Deputy Director of the Peace Corps. Mr. Eccles was manager-business T58 project prior to his Peace Corps tour, and is a former teacher.

ORGANIZATION

Components and Construction Materials

William A. Rutledge has been appointed General Manager of the Specialty Motor Department.

Defense Electronics

H. Brainard Fancher has been appointed Manager of the Advanced Systems and Requirements Operation.

Flight Propulsion

The commercial engine businesses have been consolidated under Commercial Engine Programs, with Edward E. Hood, Jr., appointed General Manager. Mr. Hood continues as Acting General Manager — SST Project.

A CF6 Project is established, with Brian H. Rowe appointed General Manager.

The personnel and facilities of the Aviation Products and Service Department have been transferred to the Aviation Products Department with the exception of Overhaul Service Shops. Richard B. Smith is appointed General Manager.

An Aviation Service Department is established, and Bruce O. Roberts is appointed General Manager.

An Advanced Engine Products Department is established, with Fred W. Garry as Acting General Manager. The Department is assigned the personnel and resources of the Advanced Engine Programs Operation and of Engineering — Advanced Engines Operation. A US/FRG Project is established, and James E. Worsham is appointed Manager.

John W. Blanton is appointed General Manager of the Advanced Technology Department which is elevated to Department level from its previous status of Advanced Component Technology Operation.

The Materials Development Laboratory Operation is elevated to Department level, with Louis P. Jahnke appointed Manager.

Mr. Robert Rowe is appointed Manager. Engineering — Commercial Engines, a new department-level organization.

Martin C. Hemsworth is appointed Manager. Engineering — Military Engines.

Spiridon N. Suciu is appointed Manager — Design Technology Operation.

Industrial Sales

An Instrumentation and Control Service Business Section is established in the Service Shops Department, with Robert L. Hirsch appointed Manager.

WILLIAM A. RUTLEDGE BRUCE O. ROBERTS





BRIAN H. ROWE



JOHN W. BLANTON

Information Systems

John W. Haanstra is appointed Consultant for the Information Systems Division.

Jean-Pierre Brule has been appointed Deputy Department General Manager for Operations by Bull-General Electric.

Marketing and Public Relations Services

An Urban Affairs Service is established, integrating the Company's participation in urban affairs, and W. Blake Miller is appointed Manager

Power Generation

A Facilities and Equipment Planning Operation is established with Stephen B. Fuerst as Manager.

Research and Development

A Specialty Fluidics Project is established in the New Businesses Development Operation with Hansjoerg Stern as Manager.

RICHARD B. SMITH

W. BLAKE MILLER



LETTERS

(Continued from inside front cover)

Housewares unit, down here in Australia, since it came to us just after we had successfully presented a series of new products to our sales force, using the skit approach for the first time.

Your U.S. readers will probably be interested to know that such approaches to sales meetings have been regarded rather skeptically in Australia, as "high-pressure Yankee stuff" that would not go down with the locals. However, after being privileged to attend the 1966 Housewares Sales Conference at Florida, and being enthralled by the professional approach to product presentation, the writer was determined "to give it a go"!

The result—a real knock-out! The Sales Team is still talking about it, three months later. You may rest assured that future presentations will be in the same vein, because we are convinced the message is stronger, louder and ever so more lasting, when this method is used.

J. V. PARNELL

Australian GE (Appliances)
Pty. Limited
Victoria, Australia

Vidicomment

EDITOR: The Tiny TV described and pictured on page 18 of the August-September 1967 *Monogram* is truly a remarkable television camera, both in terms of performance and construction.

It might interest your readers to know that this achievement was made possible by a new vidicon camera tube which was invented and developed in the Pickup Tube Operation of the General Electric Tube Department, located in Syracuse. I think Dr. Schlesinger, Tom Saldi and the other engineers of PTO responsible for devising this new tube, deserve recognition in the *Monogram*!

G. W. ILER

Pickup Tube Operation
Syracuse, N. Y.

EDITORIAL

Our Share of the Load

THE PROBLEMS of America's cities, long neglected, are mounting up to crisis proportions, observed Board Chairman Phillippe in a recent message to General Electric employees. He said that social disintegration, frustrations of the poor and the crisis of the cities call for still more local and private initiatives, "and General Electric, as one of the country's most important private institutions, has to carry its share of the load."

Mr. Phillippe, himself, has joined with some of America's leaders in an Urban Coalition to generate more local and private sector action. Object: solving problems of the cities. He's also serving as co-chairman of the Task Force on Private Employment, a group concentrating on problems of the hardcore unemployed. Within the Company, he has established a new Urban Affairs Service.

"I want to be sure that we in General Electric—as a Company and as private individuals—set an increasingly productive example," said Mr. Phillippe. While the Company has been among the leaders in reducing the barriers of discrimination, and pursued progressive employment practices, we must do more, he points out, because of our almost unique position as an employer with plants in 129 American cities and sales and service facilities in hundreds more.

The problem is not for management alone. General Electric employees can help, he says, through their personal example: their attitude of tolerance and helpfulness; their patience with difficulties; their citizenship in voting for constructive leadership.

The challenge facing us provides an opportunity to "demonstrate the kind of leadership and citizenship that will add vitality to our cities and tremendous satisfaction to our personal lives. Our response will have lasting effect on the kind of country we live in and hand on to our children."