

GENERAL ELECTRIC **Monogram**

JANUARY - FEBRUARY 1978

GE Centennial:
Programs for customers,
employees, communities,
share owners, the public



1978 Management Conference


Previews of Centennial attractions
highlight program for GE's top executives.

There they were, in Chairman Reg Jones' opening words, "from Acton to Zipkin, from Schenectady to Singapore," the 394 leaders of a Company "that celebrated its ninety-ninth year by earning better than a billion dollars in profits after taxes."

Meeting in Belleair, Florida, the first week of the new year, General Electric's top executives spent three days taking a look "at where we've been and where we're going."

The conferees heard Chairman Jones and Senior VP Robert R. Frederick take turns explaining the thinking that went into the Company's new organization structure and management system. Other significant reports:

- Vice Chairman Dave Dance's analysis of the Company's strategies for meeting "The Challenge for 1978."
- A survey of "International Perspectives" by Vice Chairman Jack Parker.

	
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Linn A. Weiss, <i>Editor</i> ; Richard J. Knoph, <i>Associate Editor</i> ; Donna R. Carpenter, <i>Editorial Assistant</i> ; Ron V. Taylor Associates, <i>Design</i> .	
<p>On the cover—three programs of a virtual panorama of special events planned for various audiences as part of General Electric's Centennial: actor Pat Hingle's one-man show as Tom Edison; the multimedia spectacular recalling the Company's first century; and members of one of three "Up With People" troupes that will add special songs and choreography to local Centennial programs.</p>	<p style="text-align: center;">Contents</p> <p>COMPANY2-13 1978 Management Conference—plus Centennial preview / Telling lighting's energy message / GE innovations revisited / New information service / Monographs</p> <p>TECHNOLOGY14-16 One third of Triad / Curbing workplace noise</p> <p>CENTENNIAL17-24 Developing the electrical system</p> <p>THE BUSINESSES25-27 To buy or not to buy? / Can't install it? Maintain it / Company 'best sellers'</p> <p>PEOPLE28-31 GE musicians / Organization changes</p> <p>INTERNATIONAL32-35 Power for Jeddah</p> <p>PERSPECTIVES36-39 Help for handicapped children / Leadership vs. cynicism</p>
<p>The Monogram's purpose is to keep its readers informed on General Electric activities so that they may more effectively represent the Company in its relationships with the public. It is published bi-monthly by Corporate Public Relations Operation—Douglas S. Moore, Vice President. Editorial supervision is by David W. Burke, Manager, Corporate Communications, and J. Hervie Haufler, Manager, Corporate Editorial Programs. Request permission to reprint articles from the Monogram Editor, Fairfield, Connecticut 06431. Copyright 1978, General Electric Company.</p>	



Previewed at GE's 1978 Management Conference: the combination of Corporate and operational programs that will give impact to the observance of GE's hundredth year. Shown: management audience

hearing special Centennial lyrics by "Up With People" troupe; Pat Hingle in midst of 25-minute play recreating Thomas A. Edison; and glimpse of fast-paced multimedia show recounting GE history.

- Reports from the Senior VPs and Sector Executives of five Sectors, following up on last year's in-depth report on the sixth Sector, Utah International.
- Reviews by other Senior VPs on the new approaches being taken to manage the Company's financial, human and technical resources.
- Thoughts on "Leadership" by retiring Senior VP Hershner Cross, summarized on pages 38-39.

In addition, with the Company already launched into its anniversary year, plans for observing the GE Centennial were given a prominent place on the conference agenda.

*"100 years of progress for people.
100 years of lighting the way.
It's General Electric, working for people
100 years from today."*

That's the refrain of the special GE Centennial song written by "Up With People" and presented to the conference by one of this entertainment organization's more attractive and enthusiastic troupes.

Reviewing the elements of the diverse program planned for the GE Centennial, Douglas S. Moore, VP—Corporate Public Relations, noted that during the six-week period beginning this coming Labor Day and building toward the

October 15th Anniversary Day three different "Up With People" troupes will appear before audiences in some 42 major GE plant cities across the country and in Canada. "Up With People" is just one of many special activities planned for GE's anniversary celebration, Moore explained.

As early as last spring, the Company began to organize for its observance of the hundredth year of the first of GE's predecessor companies—the Edison Electric Light Company—formed in 1878 to support Edison's lamp development.

Two groups of people have been directly involved, VP Moore pointed out. At the operating level, a Centennial Planning Committee, with an appointed representative from each business Group, has been at work to develop operating plans and programs and to mesh these with the Corporate support program elements. Corporate plans and programs have been reviewed and approved by a Centennial Review Committee chaired by Vice Chairman Dance.

From the first the aim has been to avoid merely a "topside" observance. "The main thrust for achieving our Centennial objectives will come from programs in operations," Moore told the conferees, "with our Corporate programs serving as an umbrella."

(continued next page)

"The letters GE are more than a trademark. They are an emblem of service, the initials of a friend, the symbol of a resolve that will make the next century, like the first, one hundred years of Progress for People!"

These words conclude a second major element of the Corporate Centennial program premiered at the conference: a 35-minute-long multimedia presentation designed to "plug into" operations programs at Company locations throughout the country. Mixing fast-paced slides and film clips with music and sound effects, this multimedia version of "100 Years of Progress for People" tells a story that, in the summation of Vice Chairman Parker, "gives us pride to be participating in this great Company of ours."

For the six-week peak celebration period, three units will be traveling the GE circuit, each with professional staging people to set up and operate the presentations.

"On a warm day I started to fan myself with an old bamboo fan. On a hunch, I cut away a strip of bamboo and studied it under the microscope. I was astounded. It had almost exactly the fibrous structure I'd been seeking for my lamp filament. We carbonized the strip. It worked, giving off a reddish light that lasted for more than a thousand hours. That strip made practical the first light bulb."

So reminisced Tom Edison, as personified by actor Pat Hingle in another principal element of the Corporate Centennial program: "Thomas A. Edison—Reflections of a Genius."

As premiered at GE's management conference, Hingle's one-man show runs for twenty-odd minutes and has Edison recalling incidents of his life from his boyhood discovery of the Detroit Free Library to his views on the future of invention.

Edison-Hingle will be an important added attraction at a series of some 28 regional Customer Dinners in 28 cities planned for next fall. For showings in locations Hingle can't visit personally, a filmed version is planned, including foreign-language versions for international locations.

VP Moore outlined other elements to be provided as parts of the Corporate umbrella:

- A Centennial Speaker's Resource Packet, containing text material and slides for use in internal and external presentations.
- Renewed sponsorship of Expo-Tech, the traveling van in which young people from minority groups learn about engineering careers.
- A Centennial Sculpture, designed by Steuben

Glass, with 100 trophy-size replicas to be apportioned throughout the Company as awards to outstanding employees.

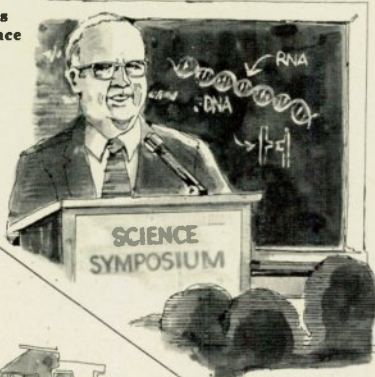
- Design of special travel packages to Walt Disney World as rewards for distinguished achievement. Centennial elements have been added to the GE Carousel show at WDW.
- A symposium on "Science, Invention and Social Change," to be sponsored September 20-21 by the Research and Development Center, with attendance including some 150 prominent scientists from around the world. The substance of these meetings will be communicated via special Corporate messages in *Scientific American*.
- A special issue of the General Electric *Investor* magazine distributed to share owners, themed to "100 Years of Progress in Technology." In addition, the GE 1978 Calendar has a Centennial theme.
- Centennial inserts in the *Monogram* during 1978; all six chapters will be published together in the form of a commemorative booklet to be made available at cost to operations prior to the October peak in Centennial observances.
- A special program of grants to universities, enabling graduate schools of business to put special emphasis on broadening academic understanding of multinational corporations.
- A 100th Anniversary Dinner, at which GE Directors will host key customers, to be held in the Grand Ballroom of the Waldorf-Astoria in New York on October 4.
- GE's 1978 Information Meeting for share owners, planned for October 5 in New York's Felt Forum at Madison Square Garden, themed to the Centennial.
- Corporate magazine advertising that includes an 8-page Centennial ad in the fall.
- A TV special in addition to GE's regular 1978 programming; work with the major networks is underway to develop an all-star special to commemorate the GE anniversary.

To carry the Centennial to the local level: Family Days, special symphony concerts, "Town Meetings on Tomorrow," Edison Energy Fairs.

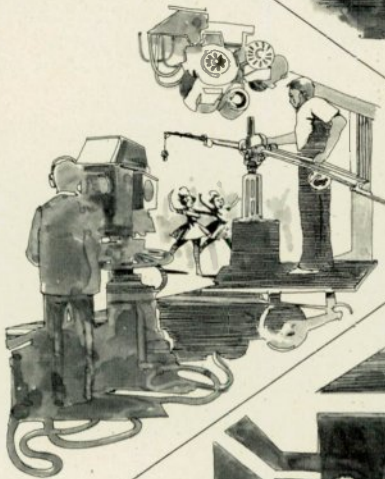
Under the Corporate umbrella of special events, operations are putting into place a diversity of local programs. Preliminary examples reported by Moore indicated the scope of this community-focused Centennial planning.

At one major GE city where three Sectors have plants, a local football stadium will be taken over for a joint Family Day—including the world's largest birthday cake, 27 feet tall.

Eminent scholars
address GE Science
Symposium



Centennial TV
gala features
top celebrities

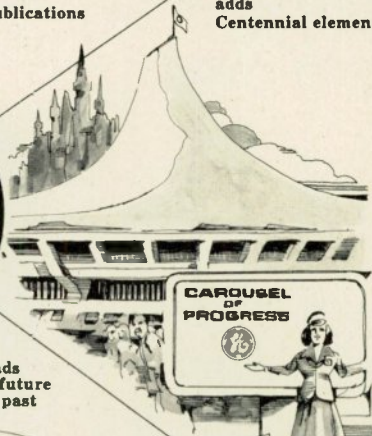


Expo-Tech van
tells youth of
Edison's legacy



Company's leadership
told in
Corporate publications

Carousel of Progress
adds
Centennial elements



Corporate ads
discuss GE future
through its past



To support and reinforce Centennial programs by GE operations: a variety of Corporate activities.

Special symphony concerts for GE audiences are scheduled by two different business Groups.

Eighteen different "Town Meetings on Tomorrow" are planned, bringing key community leaders together in discussions with GE people.

Special GE days at major sporting events will provide fun while also supplying the forum for recognition of employee contributions.

International affiliates are planning special programs, including reward packages of VIP trips to Walt Disney World.

An editorial seminar will bring together GE spokesmen and top editors of McGraw-Hill publications.

Edison Energy Fairs will be held in more than a dozen locations.

The combination of these local and Corporate programs, Doug Moore concluded, will bring

real substance to the commemoration of General Electric's hundred-year span of Progress for People.

Reg Jones brought the 1978 Management Conference to a close by pointing the attention of GE leaders not to the past but to the time ahead:

"As we head into our second century, let us resolve anew to make the monogram a symbol of excellence: business excellence, product excellence, moral excellence. If the system of private enterprise itself is in an historic period of challenge—and I believe it is—then let us set our hearts on making this Company a shining example of what free people can do, in voluntary association, to make a better world for humankind. This is our opportunity—and our mission—in our second century." **AW**

Spread the word— efficient lights save energy

Twelve GE mobile coaches are now traveling nationwide, carrying useful energy-saving lighting tips.



Nela Park's lamp people two years ago spotted a potential problem on the horizon. The Pacific Northwest—long a land of electrical plenty with its abundance of hydro energy—began experiencing a prolonged drought. The area media, believing there was no other energy-saving alternative, began a “turn-off-the-bulbs” campaign. It was urgent that General Electric's story on more efficient lamps be quickly told so people could observe the energy savings involved, and see how such lamps maintain the lighting needed for productivity and safety.

Lamp Marketing Department's response: a comprehensive “facts of light” program that, be-

ginning last April, was carried to the governors of Oregon, Washington, Idaho, Montana and Utah—as well as to the area's state legislators, energy conservation officials, businesses, universities, electrical contractors, distributors and utilities.

Observes Lamp's L. R. “Andy” Anderson, Western Sales Zone manager, who reviewed program strategy at December's Marketing Management Conference in Port St. Lucie, Fla.: “We traveled 10,000 miles during a 9-week tour, and spoke with more than 3,000 individuals.”

A key way that Lamp reached its audiences: using a 26-foot Progress Express mobile coach—custom-built to include energy-saving lighting



Aboard Lamp Progress Express: Washington Gov. Dixy Lee Ray converses with GE's Thomas Clark (c) and Don Voorhies.



In Idaho, Gov. John Evans and staff aides are briefed by Nela Park's Robert Dorsey on Idaho's energy-saving lighting potentials.



Oregon Gov. Robert Straub and state officials hear about cost-saving illumination from Lamp's Dorsey (l) and Rodger McAlister.

demonstrations, computer terminals and audio-visual equipment. "We carried 'the mountain to Mohammed,' and delivered our energy messages with optimum impact," remarks Anderson.

Governors Robert Straub (Ore.), Dixy Lee Ray (Wash.), John V. Evans (Idaho), Thomas L. Judge (Mont.) and Scott M. Matheson (Utah) each visited Lamp Progress Express and heard facts developed on energy-saving lighting potentials for their specific states and regions.

Thousands of other persons saw, heard and read about the program through extensive radio, TV and newspaper coverage.

Most importantly, new energy guidelines issued by these states since the tour have not disrupted the lighting market—and, in fact, have increased GE sales of energy-efficient lamps and made new customers for the Company.

As this *Monogram* issue prepared to go to press in late January, a Progress Express coach was scheduled to visit Arizona Gov. Wesley H. Bolin during that state's Energy Week. "Trips to Missouri and Michigan are also on the winter agenda," states Lamp's Rodger L. McAlister, Manager-Energy Management Programs.

Energy-saving product innovations and an intensive follow-along communications program were Nela Park's response in 1974 to the Arab oil embargo and moves by various federal agencies to implement reduced lighting formulas. Such government moves had the best of intentions, but they overemphasized the actual amount of energy needed to provide modern lighting.

Nela Park saw it needed an energy strategy *fast*—one that would tell lighting's energy story to all levels of government as well as to consumers and


commercial and industrial users.

Lamp's mobile coaches—part of a half-million-dollar lighting education program to assist the entire lighting industry—were one answer. Thus far, this 8-coach fleet has traveled some 250,000 miles through 48 states and received more than 30,000 customers. A ninth coach is being readied for use.

Another GE component that is utilizing the mobile-coach education approach is Hendersonville's Lighting Systems Department. In 1975—faced with an economic recession in its industrial markets—LSD foresaw the sales potential in carrying its industrial relighting campaign to customers nationwide.

Since 1976, when the first of four LSD Conservation Coaches began operation, they have logged nearly 100,000 miles, and 10,000 customers have heard more than 1,600 presentations.

Typically, LSD audiences include industrial management prospects who are unable to leave their own locations. These include managers of smaller plants as well as engineering and maintenance personnel, and larger facilities' vice presidents and general managers.

Notes LSD's James C. Stone, communications and market development manager: "Our 1977 industrial sales budget was nearly 30% ahead of 1976—in no small measure due to our mobile sales demonstrations. Our mobile-coach logs are filled with on-the-spot sales, and our largest sales increase area is with customers who were exposed to the coach's lighting message some two or three months prior to their placing orders." 



On earlier Washington, D.C. tour, GE's Dorsey delivered lighting message to various officials, including U.S. Senator Charles Percy.



Aboard LSD Conservation Coach: Philadelphia customers and distributors receive briefing on economic and operational benefits of General Electric industrial lighting from Philadelphia's Art Simeone.



Update: some GE innovations revisited

Simmer cooking— new advance in temperature-control microwaving

Greater versatility has been added to microwave ovens in Major Appliance Business Group's GE JET 110 countertop microwave oven. Now even slow-simmered stews, delicate soufflés, and breads and pastries can be microwaved using GE's new automatic Simmer 'N Cook® setting.

This exclusive GE feature is a natural extension of temperature-control microwaving, introduced by the Group two years ago. Packed with every JET 110 is a special three-quart crockery dish, with an opening for an automatic temperature probe. One merely selects the Simmer 'N Cook setting, which controls the probe and cooks food slowly for whatever time the recipe specifies—even 10 hours.

Incidentally, *The Microwave Guide and Cookbook*—a new easy-to-read 272-page GE book containing more than 450 color photographs—provides useful “micro-lessons,” and is packed with all GE microwave ovens.



GE smoke detector—best in tests, says Ohio fire department

Which smoke alarm is best? That's what residents of East Palestine, Ohio, wanted to know—and what the East Palestine Fire Department resolved to tell them. Recalls Youngstown Lamp Plant's Perry Telford (l), an electrician and East Palestine firefighter: "We obtained more than 20 different alarm systems and tested their relative sensitivity, ease of installation and wiring safety."

Result? The fire department ranked Housewares and Audio

Business Division's battery-operated Home Sentry® smoke alarm highest.

Since no local retail outlet handled the GE product, the fire department later contacted General Electric and arranged to become a dealer. Observes Telford, "We've sold about 300 so far, and we keep the alarms and replacement batteries in stock. We don't make a profit—we just charge cost, postage and handling—and we install them free."

The 'people protectors'—preventing fatal electric shocks

Studies prove that ground faults occur most often in wet or damp areas in and around homes. Accordingly, the National Electrical Code requires ground fault protection in bathroom and outdoor receptacle circuits of all homes built since Jan. 1, 1975.

Since 1975, Circuit Protective Devices Department's GFCIs—ground fault circuit interrupters—have been heavily specified for new bathrooms, basements, kitch-

ens, laundry rooms, and outdoors and around pools. Standard fuses and circuit breakers don't do the job, as they're only designed to protect electrical wiring and appliances from overloads and short circuits.

GE's new CB3® ground fault circuit breakers are recommended for new home construction, and GTR® ground fault wall receptacles are used in and around existing older homes.



GE television wins coveted Emmy

The Emmy, television's highest honor, went to General Electric last year for the first use of the vertical interval reference (VIR) signal system in a television receiver. The National Academy of Television Arts and Sciences made the award.

All 22 of the Television Business Department's 1978 VIR "broadcast-controlled" color models also

include a light-dependent resistor (LDR) system which automatically varies picture brightness, contrast and color intensity according to room lighting conditions.

In addition, eight of the new large-screen television models feature 15-key remote-control electronic tuning which uses infrared light to trigger the TV set's functions.

Swedes to grow Geniponics® produce

Sweden's KemaNobel, a large chemical company, has become GE's first international customer for Geniponics technology, the Electronic Systems Products Division business that grows bumper crops in a nutrient solution, using GE high intensity discharge lighting systems, air conditioners and power distribution equipment.

Under license from GE, KemaNobel will build a Geniponics installation in northern Sweden,

with startup scheduled for this fall. The company plans to market salad vegetables, as well as seeds and seedlings, to customers in Sweden, Norway, Denmark, Finland and Iceland.

This winter, ESPD's Syracuse plant will begin full-scale local test marketing of fresh vegetables from a new 16,000-sq.-ft. facility. When operational, this facility will produce more than 1½ tons of tomatoes each week.



Offering world's largest computer slide art service

Orders for the Electronic Systems Products Division's computer-based Genigraphics® image generation system continue to multiply. Since 1974, 18 of these \$300,000-plus machines have been sold outright, and hundreds of other companies are keeping the Division's Genigraphics service centers busy.

In November, GE introduced the advanced Genigraphics 100B system, a second-generation system. Also just offered is a mini-terminal, targeted for remote lo-

cations with reduced graphics needs. An accessory for this terminal is a new electromagnetic tracing tablet which permits free-form tablet tracings to be automatically entered in a remote Genigraphics machine.

The Division recently opened a Genigraphics service center in Houston, and plans still others this year. GE people can obtain Genigraphics help by contacting Stamford's Advertising and Sales Promotion Operations office.

(continued next page)





GE mobile radio—the quality and price performer

Five years ago, Mobile Radio Products Department offered a few basic product lines. Today, it has one of the most extensive lines—and certainly the most technically advanced. Its hottest-selling offering, the Custom MVP® two-way FM radio, is the industry's quality and functional price leader.

How was the business expansion accomplished? In 1974 Mobile Radio changed to a modular manufacturing approach, to compress

production time and reduce costs. Top-of-the-line GE receiver and transmitter technologies were adapted for a broader commercial market for FM mobile products.

The Department also reduced the time needed to bring a product from conception to production. Result? Development of the Custom MVP radio took only 1 year from start to finish, and has received an outstanding sales reception because of its cost-and-benefit value.

New Energy Saver Motors—up to 27% better efficiency

The 1974 Arab oil embargo and resulting energy crisis accelerated desire for improved motor efficiencies. In 1975, Specialty Motor Department responded with its Energy Saver Motors which offered up to 20% efficiency improvements over previous standard models.

Since then, activities by industry associations and state and federal governments have indicated need for further breakthroughs.

Now, Specialty Motor's new "second generation" of Energy Saver Motors incorporate design innovations that boost efficiency as much as 27% over previous standard models.

This further breakthrough in the design and manufacture of highly-efficient fractional-horsepower motors saves consumers money—by saving energy in heating, air conditioning and refrigeration applications.



Finest CT diagnostic pictures with new body scanner

In 1975, Medical Systems Business Division introduced the first fan-beam whole-body scanner that could obtain a computerized tomography (CT) picture within the breath-holding time of most ill patients—5 seconds—compared to 2½ minutes for existing machines. A wave of excitement among radiologists spurred a surge of orders.

Even before production model deliveries began, this GE 5-second scanner gained a substantial share

of the U.S. whole-body unit market.

Medical Systems' new CT/T 8800 system with the X-2 detector, introduced in December, continues the Company's technological leadership in medical diagnostic imaging. Thanks to joint development efforts with Corporate R&D, the new equipment is being hailed as providing the sharpest images available, and GE is working to solidify its excellent position in whole-body scanners.

Energy breakthrough with low-wattage fluorescents

Credited with making possible the greatest boost in fluorescent lamp efficiency since the 1950s, a new phosphor co-invented by the R&D Center and the Lamp Components Division enables the new GE Watt-Miser® II fluorescent lamps to be the brightest energy-saving lamps on the market.

For example, Lamp Marketing Department's newly announced 60-watt fluorescent lamp on right is the first general lighting lamp

to produce 100 lumens per watt—almost as much light as a 75-watt fluorescent lamp—and uses 20% less electricity.

Lamp's 35-watt fluorescent lamp on left produces virtually the same amount of light as a 40-watt fluorescent lamp—and uses 14% less energy.

The R&D Center's Dr. William W. Piper, shown here, identified the blend of energy-saving phosphors needed for the new lamps.



Information, please

New bibliographic research services are being offered on a Company-wide basis by R&D Center's Whitney Library.



Need facts in a hurry? Librarians Maryde King (l) and Carolyn Warden can access over 70 databases around the country.

If you think of libraries only in terms of places where people gather in silence to study the published accretion of the world's wisdom, watched over by librarians whose knowledge is bounded by the Dewey decimal system, think again.

A more up-to-date picture is this: the librarian sits at a computer terminal conducting a dialogue with any of six different computerized data banks and receiving in a few minutes, by computer read-out, information that could once have taken weeks to assemble.

That's what's happening at the Research and Development Center's Whitney Library in Schenectady. Through its access to bibliographic on-line search services, the Whitney Library offers its clients direct access to over 70 different databases throughout the country.

The interesting point is that, today, the Whitney Library's clients aren't only GE people in the R&D Center.

"We're offering these services," says Maryde F. King, the library's manager, "to anyone in General Electric who needs help in literature searching. To GE people faced with deadlines on reports, proposals, contracts or publications, we say 'Save time by trying us. We can choose the database most appropriate to your subject area. A trained search analyst will work with you to develop the most effective search strategy for your request and execute the search on one of the available search systems.'"


To demonstrate how it works, Carolyn Warden, search librarian, moves to her computer terminal in a corner of the library. She types in

a question posed by one of her clients, who is working on a report on electric vehicles. How much, he needs to know, has been spent for R&D in this area over the last six months, and where? Beside Warden a TV-like display screen begins, almost instantly, to reply. The computer offers some 300 answers. That's far more than Warden's client needs. A more precise definition reduces the search to twenty titles—and from the read-out device flows a stream of paper supplying the reference information and abstracts of the selected articles.

The client may find that one of the abstracts contains all the data he requires. "But if he should need more information," says Warden, "we can go back to the terminal to get it."

The same type of service can be extended to a client in Fairfield, San Jose or elsewhere in the Company. By means of a conference-call telephone arrangement, GE employees far from the Whitney Library can talk to Warden as she conducts a search. Moreover, clients who have access to a print-out terminal can watch the procedure in their own locations.

Costs incurred for an information search, plus a minimal surcharge for strategy formulation, are billed back to the user. The average charge for a search is \$30 to \$50, but simple searches, Warden says, are often less expensive.

In addition to retrospective search services, such as the one described above, the Whitney Library also offers a Current Awareness Service that will provide regular updates on a particular topic to GE subscribers. 

Monographs



TV joint venture. To accelerate the forward thrust of their television operations, General Electric and Hitachi Ltd. of Japan have announced plans for a new jointly-owned company to engineer, manufacture and market television products.

Under the proposed agreement, the company will com-

bine General Electric and Hitachi technologies and produce GE, Hitachi and private-label brand TV sets. The new company will continue manufacturing operations in the Syracuse and Portsmouth TV plants.

"Hitachi is world-renowned for its technological leadership which will complement our

own technical capabilities," states Board Chairman Reginald H. Jones. "Establishing this new company is the most positive step we can take to maintain, and possibly increase, the 4,000 GE television jobs in this country."

GE and Hitachi will each own 50% of the new company's shares. Fred R. Wellner, now General Manager—Television Business Department, will be the new company's president and chief executive officer.

Attending the signing ceremony (1 to r): Senior VP Stanley C. Gault; Joseph Handros, General Operations Counsel; Chairman Jones; H. Yoshiyama, Hitachi President and Representative Director; Hitachi's K. (Jack) Miki; and M. Misu, Hitachi Executive Vice President and Director.



Man-made jaw. When Gregory Piekarz's upper jaw was completely demolished in a bone-crushing car accident two years ago, plastic surgeons feared that the teenager would never eat, talk or smile naturally again.

But thanks to the deft work of Albany dentist Dr. William B. Smith, Jr. (1)—and to mag-

net experts at the Company's nearby R&D Center, including Russell E. Tompkins (c) and Dr. Luther Martin—the young music student today looks as fit as the bass fiddle he plays at a Boston music school.

Key to his recovery: a three-piece prosthetic device fitted to the inside of his mouth and held firmly in place by 14 of the world's strongest permanent magnets, each half the size of an aspirin tablet. The device—which Gregory can easily remove for cleaning after meals—consists of an upper denture and a two-piece artificial palate which replaces the upper jawbone.

The man-made jaw is believed to be unprecedented in the annals of dentistry, and may lead to revisions in many dental prosthetic procedures.



Acronym answers. In a world plagued by military, government and business abbreviations, countless hours are wasted by conscientious employees who are left muttering "phooey!" when trying to decipher initial-ridden messages.

Thankfully, Aircraft Engine Business Group's Mary M. Trivelli, Lynn Communications

editorial technician, is helping eliminate the possible confusion that can surround any such gobbledygook in the aircraft engine business. Trivelli now compiles the *Frequently Used Initials (FUI) Handbook*—or “phooey” handbook for short.

The result of an employee suggestion, the booklet was first published in 1975 and is updated yearly. Recently issued in its third edition, the 19-page handbook went like hotcakes to people wrestling with such job-related acronyms as DIPLAN, FINAC, JUSMAG and PPFRT.

The Steinmetz years. Now available from the Elfun Society is the second volume of its “Hall of History” series, *The Steinmetz Era*, which traces the Company’s growth from 1892 to Charles Steinmetz’s death in 1923. Included in this 75-page volume are 150 vintage photos, many of them being published for the first time.

Shown finishing the new

Engineers’ Bicentennial. Again this year, the week of Washington’s birthday, Feb. 19-25, has been designated National Engineers’ Week. A civil engineer by training, Washington in 1778 established the nation’s first engineering school at the Continental Army’s Valley Forge encampment. In 1802, the school was relocated to West Point where it became the foundation of the U.S. Military Academy, the nation’s first technical school.

This year’s theme, “Engineers . . . Strength in Crisis,” recalls how this country’s engineers have always solved societal problems by providing more reliable energy, better



South Africa school. Since 60% of South African General Electric’s black employees reside in the Daveyton community near Benoni, the Company in 1973 pledged to help the township provide improved school buildings. Result? Ceremonies were held recently at Daveyton’s Bantu-Batho second-

dary school to dedicate its new Edison General Electric Wing.

The fully-equipped wing includes a library, domestic science room and laboratory. Observes Thomas W. Tucker, S. A. General Electric president and general manager, who handed over the new wing: “This project represents only the latest among a number of local training and educational-advancement programs that we continue to support.”

Shown here, Urban Bantu Council chairman M. Mabona addresses the ceremony’s attendees. GE’s Tucker sits to his right.

volume: Bernard Gorowitz, Elfun publication committee chairman and editor-in-chief (1), and Donna J. McEathron, an R&D Center art designer. For copies, write to Mr. Gorowitz, R&D Center, Bldg. K-1, P.O. Box 8, Schenectady, N.Y. 12301. Cost: \$2.95 each, payable to the Elfun Society.

The Edison Era, the series’ first volume, is also available for \$2.95.



communications, more efficient transportation, more effective medical technology and a cleaner environment.

Throughout the week, GE plans numerous recognition activities to heighten public perception of engineering and to honor outstanding members among its 30,000 engineers.

Honors. For helping develop the ultra-centrifuge method of uranium enrichment, Dr. Karl P. Cohen, Chief Scientist at San Jose’s Nuclear Energy Business Group, has been named one of eight recipients of the 1977 Alfred Krupp von Bohlen und Halbach prize.

- The University of Missouri

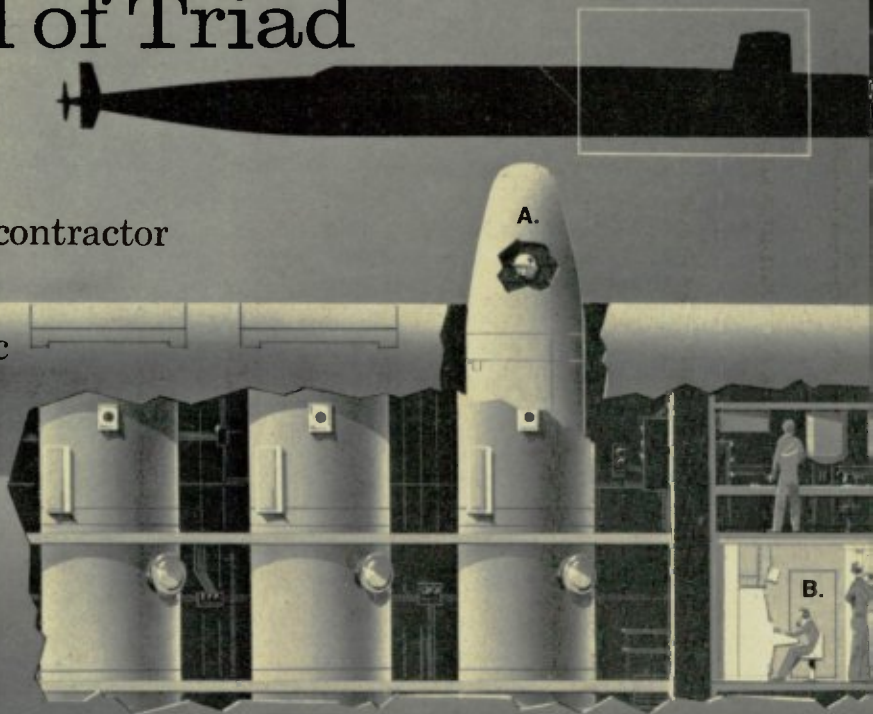
has presented Charles C. Thomas, VP and General Manager—Installation and Service Engineering Business Division, with its Honor Award for Distinguished Service in Engineering.

- Alfred H. McKinlay, with Schenectady’s Engineering and Manufacturing Engineering Department, was recently elected to a two-year presidency of the Society of Packaging and Handling Engineers.

- Based on his lighting work with highway agencies and utilities, Lighting Systems Department’s William S. Farrell, product planning specialist, has been appointed to the National Research Council-Transportation Research Board.

One third of Triad

For two decades, GE has been a prime contractor for the Navy's nuclear Fleet Ballistic Missile submarine fleet—one of this country's three strategic deterrent systems.



Of the U.S.'s "triad" of strategic deterrent systems—nuclear submarines, manned bombers and land-based missiles—submarines are the hardest to attack. They cruise silently beneath the world's oceans and, secretly submerged, can release missiles with long-range retaliatory fire power.

Continuously since 1957, Pittsfield's Ordnance Systems Products Department has been one of the nation's prime contractors for the Navy's Fleet Ballistic Missile (FBM) program—commonly known by its missiles, Polaris, Poseidon and Trident.

As such, General Electric has helped supply the "heart" and "brains"—the sub's fire control system and the missile's inertial guidance assembly—for three different generations of submarine/missile combinations.

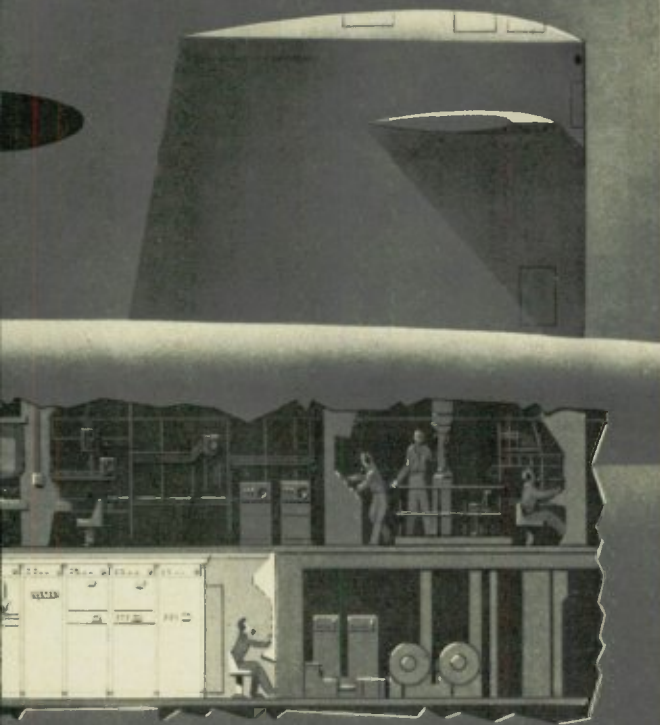
"By all measures, the Navy's FBM program has been a huge success," states Ordnance Systems general manager Gene R. Peterson. "The Navy has never aborted a sub patrol because of systems failure and has never failed to meet an

operational requirement. As for the GE role, few if any U.S. defense suppliers can surpass our 20 years of continuous service as a prime contractor to the same defense project."

Some 80% of Ordnance Systems' total efforts are directed to the Navy FBM program. Ordnance presently employs 750 engineers, probably the largest engineering force at department level within GE. More than 50 GE employees have been with the FBM program since its inception.

Notes program general manager Dale W. Parsons, Weapon Control Programs: "Pittsfield is the prime contractor for Trident's fire control. In guidance, the Charles Stark Draper Lab is the design agent, and GE is one of two prime industrial support companies providing the inertial measurement unit."

Ordnance's fire control system prepares missiles for launch, and also feeds data to the missile guidance systems up to the instant the missiles are fired. As a missile proceeds through its flight,



A. Trident's "brains": GE inertial measurement unit is examined by Ordnance's Roy Wiley.



B. Trident's "heart": Ordnance's Dennis Lenkowski (l) and Peter Stavrou man the GE fire control system.

the guidance computer (based on previous fire control directions) tells it how to get to its target, how to deploy MIRV (Multiple Independently-targeted Re-entry Vehicle) warheads, and in what sequence.

The Navy's Trident program is being developed in three parts. Part one: the 4,000-mile-range Trident missile, which is currently undergoing flight tests at Cape Canaveral where 100% of land-fired flight tests to date have succeeded.

The program's part two: the Trident submarine, now being constructed at Groton, Connecticut. Nearly as long as two football fields, the first of these behemoth vessels will be delivered in 1979, and each will house 24 Trident missiles.

Part three: A dedicated logistic support system which includes a Trident submarine support complex at Bangor, Washington. Observes Parsons, "Personnel requirements for operating and maintaining Trident's sophisticated and important defense system are extremely stringent, which makes personnel training a critical in-

redient. Pittsfield has played a major role in developing the Navy's advanced Trident Training Facility at Bangor."

The GE fire control system for Trident has some 2.5 million pieces of electronics and some 15,000 electronic modules. Ordnance is making contributions in microminiaturization, system integration, standard electronic modules, digital control and computer applications.

So far, approximately 100 GE fire control systems have been delivered to the Navy in GE's role as prime contractor for the Polaris, Poseidon and Trident programs.

In terms of ruggedness, Ordnance Systems' work on the FBM guidance assemblies has been equally demanding. Before delivery, each assembly's hundreds of precision parts are subjected to environmental testing. To date, GE has delivered more than 2,000 guidance assemblies for the Polaris and Poseidon programs and has begun delivery of Trident units. ▲

Shhhhh!

Company components are putting a lid on bothersome workplace noise.

You can't escape all factory noise. Clashing sheet metal, screeching machine tools, whining motors and compressors—all contribute to the industrial cacophony. Remedies for such noise? For years, General Electric has been devising new ways to alleviate the grinding, clanging and jarring sounds traditionally associated with factories.

It hasn't been an easy task.

For instance, gigantic high-speed punch presses—pounding metals ferociously at from 150 to 800 times per minute—can produce sheer bedlam. Like other U.S. manufacturers, GE operates many of these industry-essential machines—some 3,500 at last Company count.

What's being done to dampen the din? One example: Appliance Components Business Division, with 16 plants in 9 states—and 300 multi-ton punch presses. In 1972, it tackled a thorny noise problem involving 150 automatic-feed-lamination punch presses. A Noise Task Force attempted to:

- grind the die set so it "sliced" rather than punched the metals;
- cushion the impact by placing resilient material under the die;
- install vibration barriers;
- use special sound-dampening insulators;
- vary the speed of the machine itself.

These ideas all worked to *some* extent, but even collectively, noise reduction levels still weren't enough. To protect its employees from loud noise, the Division has elected to totally enclose each automatic-feed-lamination punch press.

Exposures to clangorous sound are steadily decreasing across the Company:

An Aircraft Engine Business Group plant has been built with broad tunnel-like work areas for forge press operators.

Parts bins in Major Appliance Manufacturing Division plants are lined with non-metallic sheets to soften material-handling clatter.

The Housewares and Audio Business Division has equipped certain machines with exhaust silencers to cut down manufacturing sounds.



Shielding Fort Wayne GE employees from loud workplace noises are sound-dampening enclosures for automatic-feed-lamination punch presses.

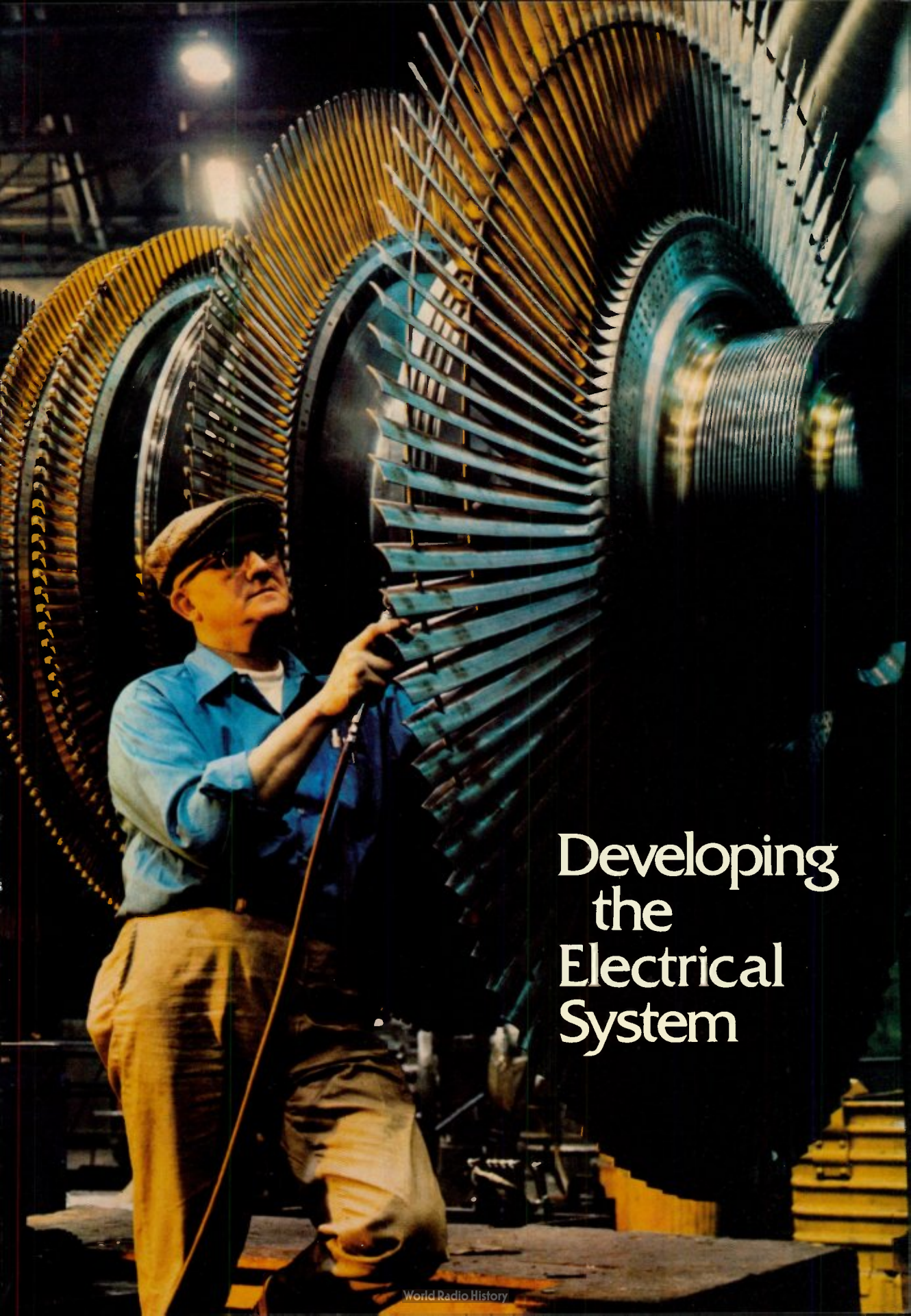
In the Gas Turbine Division, hard piping has been replaced by flexible material to help isolate hydraulic pumps' roar.

The list goes on. Naturally, the wearing of hearing protection devices in high-noise areas is encouraged throughout GE. And medically-supervised hearing conservation programs, including regular audiometric testing of employees, underscore the Company's concern.

Noise abatement has been targeted as one of nine environmental priorities by GE's Environmental Quality Project, formed in July 1976 under Senior VP Hershner Cross' direction. Observes Corporate Medical Operation's Dr. Herman D. Pocock, Jr., associate GE medical director of occupational medicine and environmental health: "Noise can be an insidious hazard because it often is unrecognized as a physical or emotional threat. It generally is considered the number one workplace health hazard in American industry today."

Persons exposed to sounds exceeding 90 decibels for eight hours per day over a period of time risk potential hearing loss, according to the Occupational Safety & Health Administration (OSHA). At 115 decibels—the sound level of a bulldozer—most people feel discomfort. At 130 decibels—the rough equivalent of a rock music concert—noise actually can induce pain.

Concludes GE's Jerome T. Coe, Environmental Quality Project task force chairman: "GE recognized and began working on the noise problem long ago, and has become increasingly vigilant about creating a 'quieter' company." ■



Developing the Electrical System

GE HISTORICAL HIGHLIGHTS

CHAPTER 2

The invention of a practical, commercial incandescent lamp was only the opening number of my program," observed Thomas A. Edison in 1926, "for upon my taking up the electric light problem in 1878, my concept was a *complete system* for the distribution of electric light in small units in the same general manner as gas."

The system envisioned by Edison would eventually be refined and expanded by several other creative inventors during the mid-1880s. One of them was young William Stanley of Great Barrington, Massachusetts, who, in March of 1886, unveiled a new lighting system that used alternating current (AC) rather than direct current (DC), and a newly-developed efficient transformer.

The success of Edison's lighting system was unquestionably the dramatic first step toward electrification of the nation. However, the Edison generating stations used low-voltage direct current, and this limited transmission areas to about 16 square miles. Such low voltages also resulted in high costs. In contrast, AC systems using transformers could send current economically for long distances, with lights and motors operating from the same circuit. And for a nation recognizing the value of AC motors for improved industrial productivity, the time was at hand for AC systems.

Alternating current technology had not escaped the attention of the Thomson-Houston Company. As early as 1885, Elihu Thomson had built an experimental system. Within two years he was marketing an AC dynamo. Yet the inventor was cautious in his entry into the field, emphasizing the need to develop devices that would protect customers from serious shock. The basic arc lighting business of Thomson-Houston provided solid growth through this period, and the company was serving 587 customers by 1890, with another 400 incandescent systems operating over 300,000 lights.

By the early 1890s, continued growth of the electrical industry was stymied by patent deadlocks. As businesses expanded, it became difficult for companies to produce complete electrical installations without infringing upon the patents of others. The patents held by Thomson-Houston, for example, covered AC equipment, arc lighting and the Van Depoele trolley, while those of Edison General

Electric included DC lighting, central station equipment and Sprague railway patents. The mood was right for consolidation.

In 1892 the two companies combined to form the General Electric Company. Charles A. Coffin, a former shoe manufacturer and entrepreneur who had been a dominant influence in Thomson-Houston, became president of the new company and guided its destiny for 30 years. Elihu Thomson, whose primary interest was in research, remained in Lynn to conduct further experiments. He would receive 700 patents for his inventions.

A year after the formation of General Electric, a major new market opportunity for AC equipment would appear in the nation's textile mills. A GE salesman, Sidney B. Paine, had worked in the mills as a youth and brought this knowledge with him to the Edison Electric Light Company in 1881. In 1893, a new textile plant in Columbia, South Carolina, asked for bids on electrical equipment, and Paine recommended poly-phase AC motors. These were superior to DC motors, were sparkless and ran at a more constant speed. In the lint-filled atmosphere of a cotton mill, sparkless operation was a decided safety advantage.

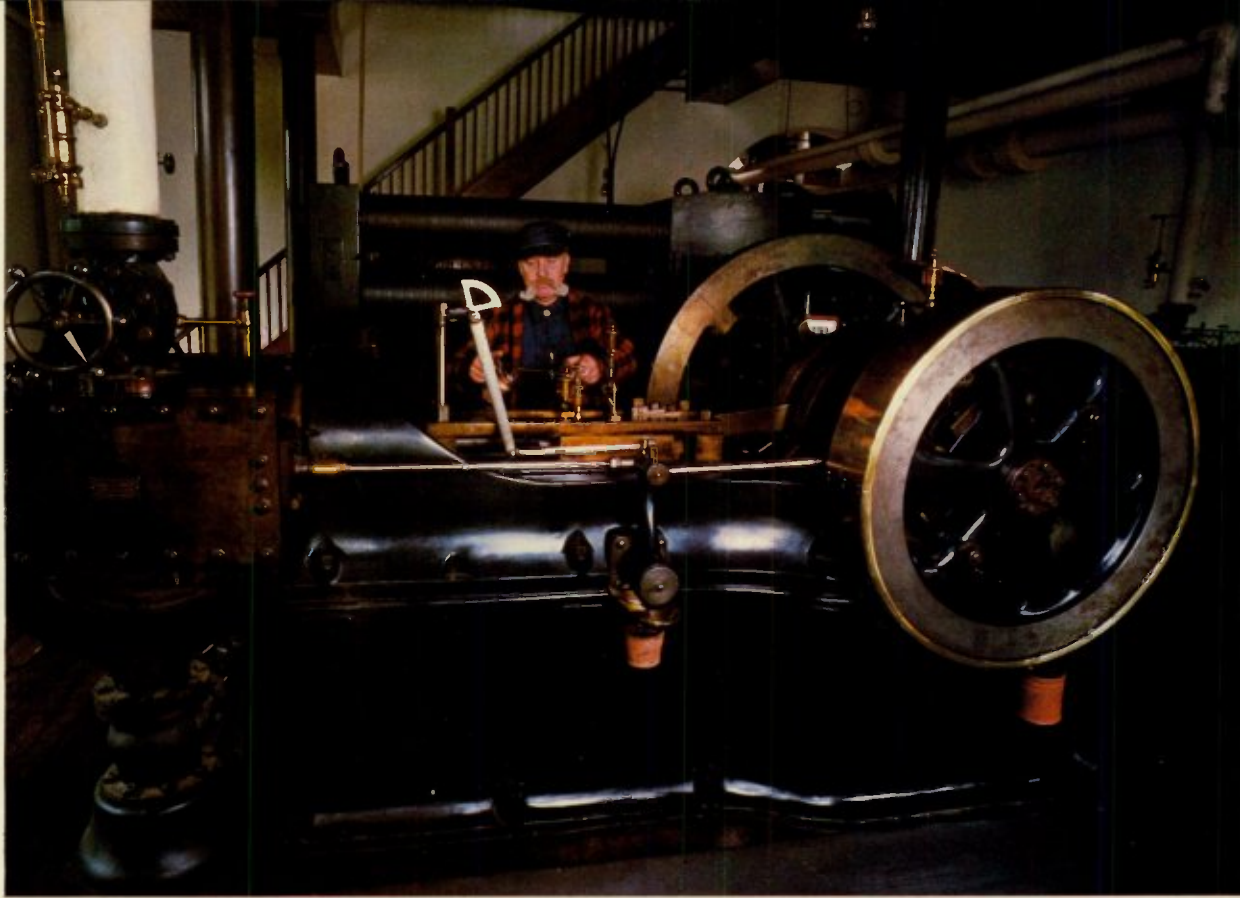
Paine's bid was a bold one. He not only advocated a new AC system, but also proposed to mount a series of 65-horsepower motors on the mill ceiling. President Coffin was concerned over the ability of the Company to fill the order. He wrote to Paine, reminding him that GE hadn't built an AC motor of over ten horsepower, and suggesting the use of DC motors instead. Paine persisted, explaining the need for alternating current. Coffin relented.

The motors began operating in April of 1894. Through the leadership of GE's head technical manager, E. W. Rice, Jr., and the calculations of mathematical wizard Charles P. Steinmetz, the motors delivered 85 horsepower rather than 65 and performed well. In fact, they worked so well that 30 years later they would still be in service.

Alternating current had met the test. Soon, poly-phase motors and AC drives would go to work in other industries — cement, paper, steel and printing. Also, in 1894, at Niagara Falls, GE would successfully produce a 26-mile-long, 10,000 volt transmission line to bring hydropower to Buffalo.



First AC transformer of Stanley



Edison jumbo dynamo, circa 1882, from the Pearl Street Station, was driven by a steam engine.



Edison Illuminating Company building replica of Detroit, Michigan station of 1886 as it may be seen today at Greenfield Village, Dearborn, Michigan.

“Long-waisted Mary Ann” was a popular name for the Edison bipolar dynamo, heart of the early electrical system. This 8.5-KW unit, patented in 1882, was built in Schenectady.



A new age of steam

The higher transmission voltages of the mid-1890s were placing an increasing burden on the slow-moving steam engines used to drive electric generators. The lumbering, 100-rpm behemoths limited the amount of electricity a central station could generate. Needed: a high-speed prime mover to spin the generators much faster.

In 1896, the answer came to Schenectady via inventor Charles G. Curtis. He proposed to build a wheel with a succession of steel blades, called buckets, around its rim. High-pressure steam striking these buckets would spin the wheel, rotating its shaft at high speed. Condensing steam would create a vacuum that would boost the total steam pressure.

Could the turbine be built? Or would it fly apart, as some engineers thought likely? GE's Rice took a gamble and began work on the machine. Curtis, assisted by former Edison associate John Kruesi, labored over two years, conducting test after test, but his turbine failed to match the performance of piston engines. The outlook was murky. Should further investments be made? Rice asked a young Lighting Department engineer, William LeRoy Emmet, to investigate the problem. Emmet, confident in the design, undertook several changes in the

arrangement of buckets and nozzles, together with a vertical shaft for reduced friction. These led to success. By 1901, a Curtis-Emmet turbine-generator rated at 500 kilowatts with a speed of 1200 rpm was operating successfully and put to work in Schenectady.

With the new steam turbine ready for sale, the Company received its first order from the Commonwealth Edison Company of Chicago. The utility agreed to buy two 5000-kilowatt turbines for its Fisk Street station, planned for operation in 1903.

The units would equal the capacity of the largest steam engine, yet require only one-tenth the space, weigh one-eighth as much and cost one-third as much as a piston-engine generator of equivalent power.

It was a big order. The inexperienced Schenectady shop moved ahead on the turbines, but work was slow and difficult. In February of 1903, the first turbine was still unassembled, and its completion date was only a month away. A vote of plant superintendents identified Billy Madigan as the one foreman most likely to complete the work on time, and he accepted the challenge. Madigan led an all-out effort of around-the-clock work on the turbines, and three days before the promised date, gave the word



GE's Key Dates in History

1893—GE transmission line work begins with opening of Redlands-Mill Creek power line in California.
 1894—Elihu Thomson patents first resistance furnace. 1895—GE builds world's largest electric locomotives (90 tons) and transformers (800 KW). 1896—Curtis begins development of turbine at Schenectady. 1897—Development begins on oil circuit breaker to control large quantities of power. 1900—GE Research Laboratory is established, headed by Dr. Willis R. Whitney.





The 5,000-KW Curtis steam turbine of 1903 on display at Schenectady-GE. A national historic engineering landmark, it was viewed by Edison, Steinmetz and Rice in 1922 (inset).

to let in steam. On March 7th, with the customer on hand, the turbine was successfully tested. Madigan's feat would become a legend.

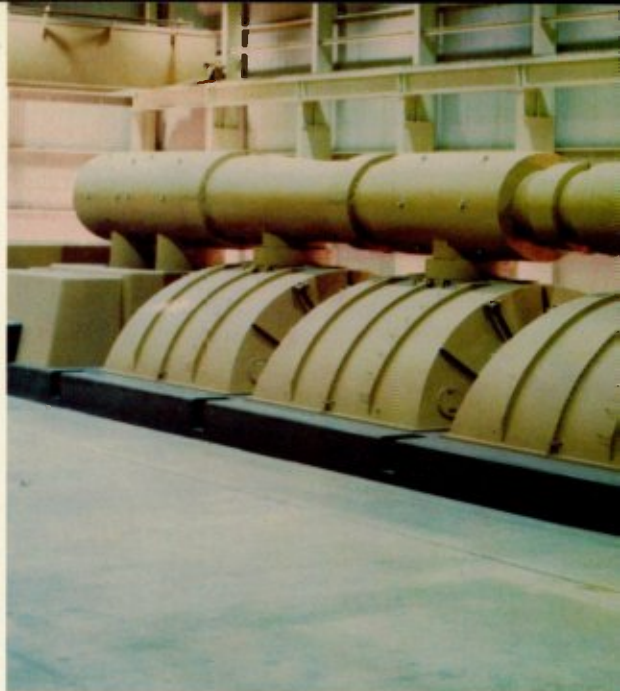
In only six years, the Fisk Street turbines were obsolete. In 1909 they were replaced by new units over twice as powerful, yet installed on the original foundations. One of the original units was returned to Schenectady, where it stands today in front of the Turbine-Generator Development Laboratory — a monument to the courage of those who built it.

The success of the Fisk Street turbines contributed greatly to the early rapid growth of General Electric. The Schenectady shops became increasingly busy, and GE engineers designed progressively more efficient machines at higher ratings. By 1910 the volume of the Company's turbine-generator business had tripled, with nearly a million kilowatts of capacity sold. Over the years, kilowatt ratings of units grew larger, from 225,000 in 1955 to 1,300,000 kilowatts in 1978. Today, a single unit can supply the electrical needs of a city of over a million persons.

The gas turbine

Another approach to turbine design — using gas instead of steam — was proposed in 1905 by Dr. Sanford Moss while a student at Cornell. Later, with General Electric, his experiments would contribute to the first flight, in 1919, of an airplane with a turbine-powered supercharger. During World War II, the engineering and manufacturing skills of the Company were focused on jet engine development, with the result that in 1945, GE would develop the first turboprop aircraft gas engine to fly in the nation. After the war, serious development began on a gas turbine suitable for industrial and utility use.

By blending jet engine and steam turbine design with new high-temperature materials and turbine



1900—GE trademark is registered. 1902—Sprague Electric Company acquired by GE. 1903—Curtis Steam Turbine line introduced. GE acquires Stanley Electric Manufacturing Company. 1904—Alexander develops single-phase railway motor. 1905—GEM metalized-carbon filament lamp is introduced. Steinmetz invents high-voltage rectifier. GE organizes Electric Bond and Share Company to aid small utilities. 1906—Alexander produces high-frequency alternator.





Modern General Electric large steam turbine-generator rated 980,000 KVA installed at Possum Point Station of Virginia Electric Power Company.

◀ **Ultra-high voltage transmission lines of the future are researched at this GE site near Lenox, Mass., at voltages to 1500 KV.**



Giant bushings dominate the valve hall of the nation's first solid-state HVDC system in Duluth, Minn., built by GE.

1906—The GE Tantalum filament lamp introduced. 1908—William D. Coolidge renders tungsten ductile, paving the way for modern lighting. 1910—George A. Hughes, founder of Hotpoint, begins manufacture of first practical electric range. 1912—The GE Pension Plan is established. GE powers first electrically-propelled ship for the U.S. Navy. 1913—Coolidge demonstrates first practical x-ray tube. Dr. Irving Langmuir's gas-filled incandescent lamp is introduced.



wheels, the Company successfully produced a commercial product by 1949 when it shipped a 3500-kilowatt gas turbine for power generation. In 1952, the first two-shaft, regenerative cycle gas turbine was put into pipeline service, and in 1961 an MS 5000 heavy-duty unit — the first package power plant in the U.S. — was installed.

An alternative to the coal-fired steam boiler came with the development of nuclear energy. In 1940, physicists of GE's Research Laboratory were among those separating U-235 from natural uranium, and by 1946 the Company would be developing nuclear powerplants for U.S. Navy vessels. General Electric's entry into the commercial boiling water reactor field was marked on August 31, 1957, when the U.S. granted Power Reactor License Number One to the 5000-kilowatt Vallecitos boiling water reactor — the nation's first privately-owned nuclear generating facility.

The future of electrical systems

When electric power generation doubles by the end of the 1980s, 80% of the additions will utilize conventional steam cycles, either from nuclear or fossil energy. That's the outlook according to Charles W. Elston, manager of turbine strategic planning in Schenectady, N.Y.

"Even following 1990, it's highly likely that the steam turbine-generator will continue to play an important role, because most of the advanced cycles perceived today involve it in one form or another," says Elston. "Recent studies indicate that the GE STAG® combined gas turbine-steam turbine cycle powerplant is a very favorable alternative for achieving higher efficiency economically, providing

a way can be found to use coal in the gas turbine."

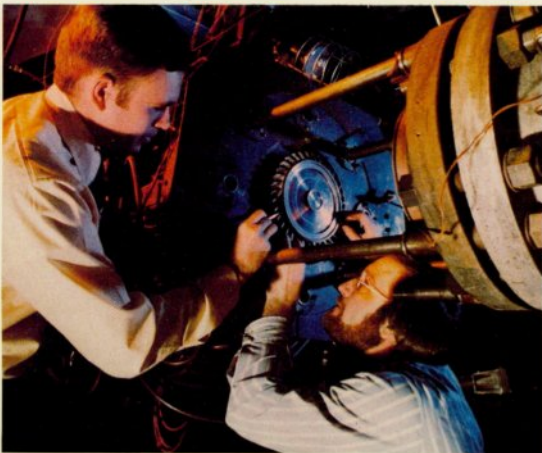
Another intriguing long-range possibility mentioned is the superconducting electric generator, chilled to -452°F by liquid helium, that could produce as much electricity as a conventional machine twice its size. An experimental model is being built by the Company.

The trends in transmission technology, meanwhile, suggest that the direct current of Edison's era — now in high-voltage DC systems (HVDC) — will undoubtedly play a crucial role in helping the nation cope with its energy problems.

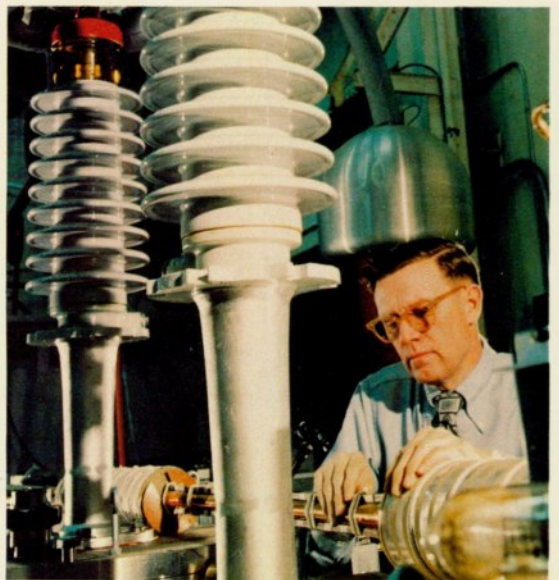
According to John Anderson, manager of the Company's High Voltage Laboratory in Pittsfield, Mass., HVDC may be increasingly used to haul energy long distances from source to use. For example, a generating plant at the mouth of a coal mine can produce electricity which is then transmitted hundreds of miles by HVDC wire to its eventual use in a populated or industrial location. GE supplied electrical equipment for the first such "coal by wire" project, transmitting HVDC power from lignite fields in North Dakota to Duluth, Minn., 456 miles away. This line was energized in early 1977.

Among trends in the high-voltage field, Anderson mentions the following: more gas insulation in electrical equipment and more detailed knowledge of the effect of lightning on power systems — research that dates from Charles Steinmetz — together with tailoring the molecular structure of insulation to fit requirements, and more work on underground high-voltage transmission.

Developments such as these keep the electrical system changing and growing — still young, despite its birth in Edison's day.



Future power systems are being shaped by current research projects at the GE R&D Center, including, above, development of a water-cooled gas turbine and, right, supercooled electric power cables.



THE BUSINESSES

To buy or not to buy?

GE in the rental business? It's an attractive way to satisfy equipment needs without major capital outlays.



GE rental business fills customers' short-time instrument needs.

A leading U.S. fast-food restaurant chain ensures that its cooking and frying applications remain standard nationwide—thanks to temperature recorders *rented* from GE.

A Southern utility company underscores the reliability of its nuclear power plants by measuring the thermal stress on piping and containment vessel pressure systems—with strain-gauge systems *rented* from GE.

Even General Electric's own operations end up as rental clients. The GE Medical Systems Business Division, for example, makes certain that its computerized body scanners are performing exacting measurements in the nation's hospitals—with oscilloscopes and voltmeters *rented* from GE.

When the rental boom hit, GE was ready. Established in 1964, Apparatus Service Business Division's instrument rental business is the country's oldest of six major instrument rental firms. Quick•rental® instrument service from GE is today a leading supplier in a \$70 million industry that is growing by an impressive 25% to 35% a year.

In "buy vs. rent" decisions, "rent" is increasingly winning. By the early 1970s, many purchasing managers had become painfully aware of skyrocketing capitalization costs. Their budgetary belt-tightening quickly gave rise to the popularity of instrument rentals, hailed as a sensible money-management tool for companies large and small.

Explains C. H. "Bud" Orndorff, Jr., manager of the Division's Instrument & Communication Rental Services: "If an instrument is needed only temporarily, its associated costs end when it's returned to the rental firm. Pride of ownership is waning for expensive, sophisticated pieces of equipment. Rapid technological obsolescence, limited project duration and immediate need are key reasons for renting."

Adding to its inventory virtually every week, Quick•rental instrument service now offers more than 14,000 items of equipment, which include measurement systems, industrial instruments, electrical and electronic test instruments and selected items of data communications equipment. Customers have a wide selection of top names from which to choose, as less than 5% of the equipment is manufactured by GE.

The greatest sales vehicle for the Company's rental business is its colorful 64-page catalog sent on request to interested users. Orndorff notes that "our instrumentation vendors may also serve as our salesmen. If one of their potential customers finds the cost of buying certain equipment prohibitive, the vendors may recommend renting it from GE. A lot of people want to 'try before they buy,' and that's fine with us."

GE has a network of 38 Rental Sale/Service Shops across the country and in Puerto Rico, which are supported by six major Instrument Rental Inventory Centers. In addition to usually providing "same-day shipment," these outlets have a ready supply of application talent. ■

'If you can't install it—maintain it'

Domestic installation activities may have slowed, but I&SE has found new ways to continue its growth.

The mid-1970s have shown a downturn in U.S. orders for capital equipment, with a corresponding slowdown in installation business in the utility, industrial and marine markets. But the Schenectady-based Installation and Service Engineering Business Division (I&SE) continues to thrive—by offering a wide range of diagnostic, management and field engineering services to meet the increased maintenance demand.

Since 1974, the ratio of I&SE installation-to-maintenance business has “flipfopped.” Three years ago, *installation* services comprised 70% of I&SE's business, while today

maintenance services represent 70%.

Shown here are various examples of I&SE's complete range of “on-site” engineering support services for mechanical and nuclear, as well as electrical and electronic, equipment and systems. With some 150 field service locations worldwide, I&SE has a proven capability to prevent forced outages, save costly downtime and contribute to improved maintenance planning.

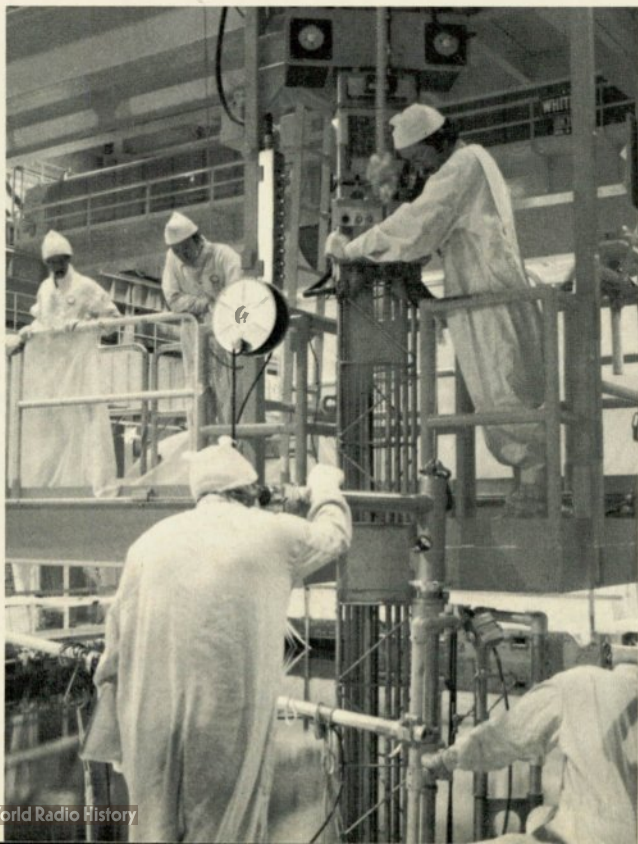
Observes I&SE's Charles C. “Tip” Thomas, VP and General Manager: “I&SE's sales and earnings were up more than one-third last year, and the Division remains one of GE's fastest-

growing businesses. As the penalties for downtime increase, our customers are relying more and more on I&SE to plan, manage and perform their maintenance requirements.”

Thomas emphasizes that the most important ingredient in I&SE's ability to respond to this demand is its field engineers—“problem solvers who know how to trouble-shoot systems, interpret results and maintain sophisticated apparatus.” I&SE is now the Company's largest recruiter of engineering graduates. Moreover, it graduated its largest field-engineer class ever in 1977, and plans an even larger class for 1978. ■

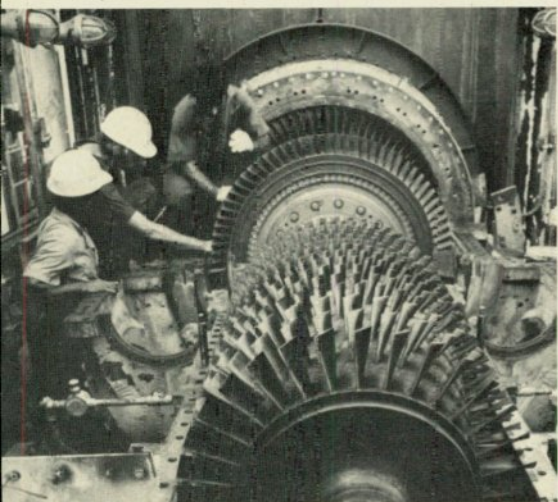


To provide customers with timely turbine maintenance, I&SE monitors turbine operations (above) using new eddy current inspection procedure. I&SE personnel (right) rebuild irradiated control rod drive units during nuclear plant refueling outage.





I&SE project manager (top) applies numerous technical skills to handle utility's electrical and electronic maintenance program. GE computer numerical control (above) is maintained by I&SE machine tool technicians.



Atop Persian Gulf offshore oil platform, I&SE personnel perform maintenance outage service on GE gas turbine used for platform pumping and compression.



GE data become best sellers: Business Growth Services' Roy H. Roecker (c) works with authors Deborah A. Kaminski and Dr. William G. Moffatt.

Company 'best sellers'

Much non-proprietary General Electric technical information can be profitably marketed outside the Company. Case in point: Schenectady's Technology Marketing Operation's library-shelf-full of technical handbooks and manuals which presently provide six-figure earnings for TMO each year. Profits from these "best sellers" are growing at 35% a year.

"The Company is loaded with valuable information that is of interest to others," notes TMO's Roy H. Roecker, Manager-Business Growth Services. "TMO ferrets out the publication, encourages submissions of material, gives the authors credit—and pays royalties higher than those a regular publisher would pay."

TMO's best sellers offer readers an unprecedented compilation of technical information, including books on metallurgy, energy, electronics, heat transfer, fluid flow and other subjects. One TMO publication, *Selected Business Ventures*, is a monthly periodical that enables subscribers to acquire manufacturing and marketing rights to new and established products (see *Monogram*, Nov./Dec. 1977). The service describes licensable business ventures, both in GE and from more than 100 other companies and individuals.

Sums up TMO manager Edward G. Fronko: "The periodical's profits more than pay for publication costs—while its contents enhance the Company's image among customers and give GE a steady input of market intelligence." ■

PEOPLE



Johnston, Cundiff and the sounds of 'swing'

During big bands' heyday, Philadelphia's Leonard B. Johnston, on drums, and tenor saxophonist Gerald A. Cundiff (right) played along.

Johnston, a Switchgear Products expeditor, and Cundiff, an Aircraft Engine Field Programs Operation office manager, today share their talents with "The Big Band," an 18-piece group which keeps the Peabody and Shag dances alive at local Elfun chapter social gatherings and civic club get-togethers.

Their performing histories revolve around the Glenn Miller and Benny Goodman sounds. Before joining General Electric, Johnston worked "on the road" with swing composer Isham Jones—*We're in the Army Now* and *The One I Love Belongs to Somebody Else*—in countless dime-a-dance halls across the country.

For Cundiff, the sax led to his own college dance band, and later, to a military band in officer training—"because it got me out of scrubbing floors."



Roxane Maliszewski's 'easy listening' sounds

Already a professional entertainer at age 23, with nine music competition trophies and a string of performing engagements to her credit, Louisville's Roxane Maliszewski, a Major Appliance Business Group apprentice tool and die maker, plays guitar and sings "folk and light rock" in many area nightclubs and at the Fort Knox USO Club.

On stage many evenings and on weekends, she admits, "I don't get many hours of sleep." But tireless ambition is paying off. "I now can play almost anywhere in the Louisville area, and people come because they really want to hear me."

Her greatest professional hurdle has been building her name as a recognized artist. Billed simply as "Roxane" at cocktail lounges, she notes that many of the compositions she plays are her own, and that she wants to be known as a songwriter as well as performer. "I'm hoping eventually to produce a record album featuring my own music."



Robert Williamson: masterful devotee of classical music

Now president-elect of the Erie Philharmonic, a nationally-recognized symphony orchestra, 1969 Erie pensioner Robert A. Williamson has been a professional concert cellist for more than a half-century—even longer than his 42 years spent with the Company.

Today at age 73, the Transportation Systems Business Division's former export and industrial locomotive sales manager is looking forward to another September-to-June symphony season, during which he will appear 75 to 80 times in a busy combination of rehearsals and performances. He maintains this schedule, in addition to an active involvement in the GE Elfun Society and the Arts Council of Erie.

"When I first started playing, I didn't know the difference between a cello and a trolley car," he admits. "But I had a good teacher, and after 13 lessons I joined a musician's union." His favorite composers? "The three Bs—Bach, Brahms and Beethoven."

The GE musical world



Organist Donald Robinson—
in *Who's Who in the East*

Ranked as one of New York State's top organists, Utica's Donald P. Robinson didn't learn to play the complex instrument until some 20 years ago, just after he joined the Aerospace Electronic Systems Department. Now, the engineering technician has earned a place in the 1977-78 edition of *Who's Who in the East*.

Robinson serves as dean of the Central New York Chapter of the American Guild of Organists; pipe organ consultant to the American Theatre Organ Society; producer and host of "The Organ Loft," a one-hour radio program now in its 15th year; organist for the Knights of Columbus Utica Council; and music director and organist for both a Roman Catholic and Baptist church.

"My two church activities keep me the busiest," he observes, "but their services haven't conflicted in the 10 years I've been doing them. Despite their different faiths, the hymnology for the services is quite similar."



Emmett Wiley plays
yesteryear's jazz

"When I was a youth back home in east Texas, nobody spent much money on entertainment in our 'dry' county," recalls Cleveland's Emmett H. Wiley, "so I used to cross the state line and play my trombone in a Louisiana honky-tonk for \$20 a night—at a time when people were picking cotton all day for five bucks."

Now, the Photo Lamp Department physicist gets toes tapping at frequent area "gigs" with his "Paradise Jazz Band."

In the early 1960s, after letting his musical talents lay dormant for 17 years, Wiley resurrected his love of blues and old-time jazz. "At first, we were just a bunch of guys who got together on Friday nights to tell jokes, drink beer and get rid of the week's headaches by tackling tunes. Before we realized it, we'd become a pretty good combo."

Each June, Wiley attends the St. Louis Ragtime Festival—a one-week "high" for jazz buffs. "Music is like fishing—the time can't be counted against you."



Two Grammys
to their credit

In 1975 and '76, four Cleveland lampmakers helped the Cleveland Orchestra Chorus win two coveted Grammy Awards—a recording business achievement comparable to the motion picture industry's Oscar. Lighting Business Group choral members (l to r): first tenor James E. Bonivert, second tenor John E. Cridland, second soprano Nancy L. Durst and second bass Donald E. Magai.

The chorus' first Grammy was for *Carmina Burana*, voted best choral recording; the second, for George Gershwin's *Porgy and Bess*, proclaimed the year's best opera recording. The National Academy of Recording Arts and Sciences makes the awards.

The singers' biggest challenge? Remarks Magai, a 17-year veteran of the chorus: "Bringing our music to a level of professional excellence is a grueling task. We work hard to meet people's high expectations. Countless hours of rehearsals are involved, and personal sacrifices are often necessary."

(continued next page)

From Grammy Award winners to harpsichord makers, the Company employs numerous gifted musicians with a flair for after-hours creativity.



The gospel evangelism of Vernell Walker

Professional alto soloist Vernell D. Walker has helped bring the gospel to Spain, the Virgin Islands and some 20 American states. "I don't sing for form or fashion," explains the Philadelphia Special Programs executive secretary. "I want people to find happiness and hope through the special messages in song."

In Walker's 13 years as a concert-tour vocalist, two appearances for her were especially memorable. Last year at the Valley Forge Music Center, she and her Victory Choral Ensemble partners performed in an evangelical program hosted by Art Linkletter and Chuck Colson. The other: in St. Thomas, where a concert drew a seemingly spontaneous audience of people who left their jobs and classrooms to hear the group sing.

Walker's ensemble has cut 10 albums and in June will be honored on its 20th anniversary by the Philadelphia Academy of Music.



John Germer has built 13 baroque instruments

Sunnyvale's John H. Germer wanted a harpsichord, a 17th-century instrument which, in 1960, wasn't exactly an off-the-shelf item. Unable to buy it, he built one.

A Fast Breeder Reactor Products Department mechanical engineer, Germer also is a former Schenectady Symphony cellist. Embodying his appreciation of the classics, in his home today are 13 homemade baroque musical instruments, including two harpsichords, a clavichord and a viola da gamba. Power tools help him complete an instrument "rather quickly—in less than a year," he notes, though he adds that "most of the modifications I've made are actually a step backward. The old ways are simple, and usually best."

Germer does make some substitutions, though: "Nylon fishing line works just as well as boar bristles for instrument springs, and to pluck the strings, plastic easily replaces crow quills."



Joseph Taylor: his C&W music goes way back

In 1949, two weeks after his first song's release, Fort Wayne Wire Mill's Joseph C. Taylor (c) received a \$608 royalty check for *He's a Cowboy Auctioneer*, sung by Tex Ritter. The royalty agreement: one-half cent per record sold.

Today—22 singles and an album later—"Joe Taylor and His Indiana Red Birds" are planning to celebrate the group's 30th anniversary in September. Wherever they play, avid Country-and-Western fans throng to hear them.

Taylor eagerly reminisces about his former Saturday radio show, broadcast live for 20 years. Other recollections: working with Gene Autry, the Lennon Sisters and Johnny Cash; "backing up" Jimmy Dean, Bill Anderson and other stars; and traveling each Friday night during the 1950s and 60s to perform in Nashville. "We've played at least once in 154 towns in seven states."

James Thrall 'lays down' commercial pop

In the 1960s when Syracuse's James M. Thrall joined the Air Force, his fingers were covered with guitar callouses that lasted for three of his four years of duty. Observes the Electronics Laboratory technician: "At age 16, I began earning money as a rock-and-roll musician for teen dances—

back in the 'doo-wah-doo-wah' era." Now it's "commercial pop" that



Thrall enjoys playing on weekends at a local popular nightspot. Attracting a 30s-to-50s crowd, the Tony Lombardo Trio—in which the GE employee plays electric guitar, bass guitar and banjo—offers a wide variety of music, much of it audience requests.

Currently in its fourth season, the trio keeps things moving with "the standards," light rock and even some Gay Nineties tunes.

Organization Changes

Announcement of the Company's new Management System has brought with it an added number of component name and position title changes. Additional changes will be published in the next issue.

CORPORATE

John B. McKittrick, Vice President—Corporate Development

CONSUMER PRODUCTS AND SERVICES SECTOR

Philip J. Drieci elected a Vice President
Wayman O. Leftwich, Jr. elected a Vice President

Ralph D. Ketchum, VP and General Manager—Lamp Products Division
Paul L. Dawson, General Manager—Lamp Components Division
Richard T. Gralton, General Manager—Major Appliance Product Management Division

INDUSTRIAL PRODUCTS AND COMPONENTS SECTOR

Ralph B. Glotzbach, VP—Industrial Products and Components Customer and Industry Relations Operation
James P. Curley, VP and Group Executive—Industrial Products Group
Van W. Williams, VP and Group Executive—Component Products Group
George B. Farnsworth, VP and General Manager—Appliance Components Business Division
Erwin M. Koeritz, VP and General Manager—Electronic Components Business Division
Robert J. Rodwell, VP and General Manager—Contractor Equipment Business Division
Eugene J. Kovarik, General Manager—Motors and Drives Business Division
William Longstreet, General Manager—Apparatus Distribution Sales Division
Robert W. Baeder, Staff Executive—Industrial Products and Components Strategic Planning and Development Operation

William T. Luedke, Staff Executive—Industrial Products and Components Finance Operation

INTERNATIONAL SECTOR

Edward F. Roache, VP and General Manager—International Construction Business Division
George J. Stathakis, VP and General Manager—International Trading Services Operation
Dale F. Frey, Staff Executive—International Finance Operation
Robert F. Smith, Staff Executive—International Strategic Planning and Development Operation

POWER SYSTEMS SECTOR

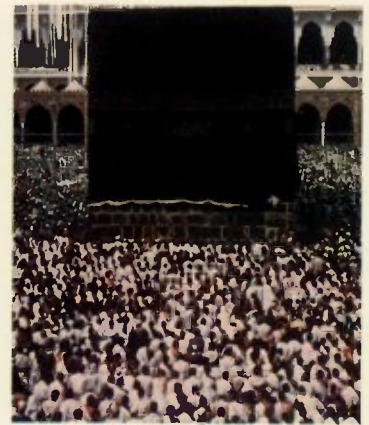
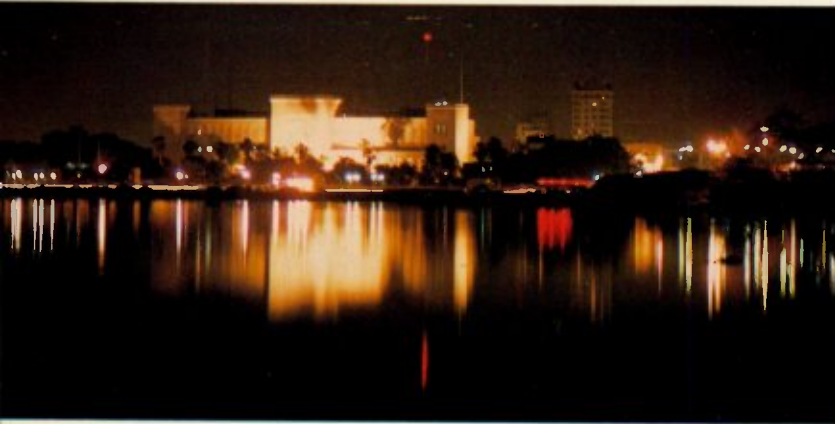
Roy H. Beaton, VP and Group Executive—Nuclear Energy Business Group
Herman R. Hill, VP and Group Executive—Turbine Business Group
Edward C. Clark, General Manager—Industrial and Marine Steam Turbine Division
George B. Cox, General Manager—Large Steam Turbine-Generator Division
Fritz F. Heimann, Staff Executive—Power Systems Legal Operation
Thomas H. Lee, Staff Executive—Power Systems Strategic Planning and Development Operation
Charles V. Sheehan, Staff Executive—Power Systems Finance Operation

TECHNICAL SYSTEMS AND MATERIALS SECTOR

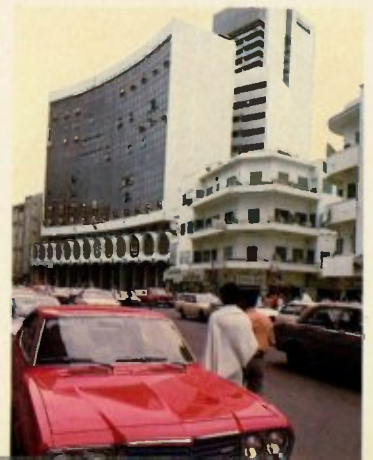
Charles R. Carson, VP and Group Executive—Engineered Materials Group
Daniel J. Fink, VP and Group Executive—Aerospace Business Group
Christopher T. Kastner, VP and General Manager—Mobile Communications Business Division
Lee L. Farnham, General Manager—Space Division
Donald K. Grierson, General Manager—Metallurgical Business Division

Power for Jeddah

Keeping this fast-growing pilgrimage city abreast of soaring electric power needs is the kind of task that GE's International Projects Department takes in stride.



Problem : soaring electrical demand for the city of Jeddah, which serves as arrival point for pilgrims en route to Mecca and to its revered Kaaba (top right)—the building containing the Black Stone said to have been given by Gabriel to Abraham.





Solution: GE gas turbine complexes such as Jeddah I, shown here, with similar Jeddah II complex underway.

The *hadj*, or pilgrimage to Mecca, where Mohammed was born, continues to be the dream of Moslems the world over. But today the numbers of believers who make the trip have grown enormously.

One main beneficiary of this influx is the town of Jeddah, nearby on the Red Sea coast. With a heritage that goes back to the dawn of time (legend has it that Eve was buried here), Jeddah is today a modern city, with an international airport, a good harbor for shipping and comfortable hotels. Many a modern pilgrim arrives by jet or passenger ship at Jeddah and then continues the trek to the holy city itself.

Along with the city's increasing industrialization, the *hadj* has made Jeddah one of the world's fastest-growing urban centers—including a gnawing

appetite for electricity. To meet this need, the Saudi National Company Ltd. for Electric Power (SNEC) is relying on the same solution that has enabled other fast-growth areas to keep up with electrical demand: General Electric gas turbines.

But SNEC didn't want just the units themselves; its need was for the complete generating station—a "turnkey" plant including all the elements from preparing the ground to completing the buildings and assistance in training the operating crew.

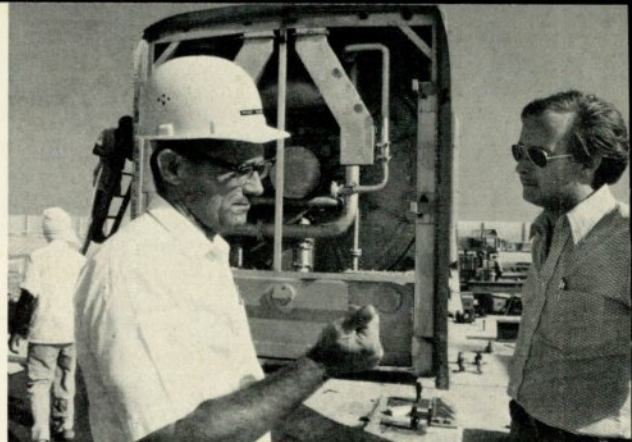
That's the kind of task that falls—many times each year—to the International Projects Department (IPD) within the Company's International Sector.

"IPD was established two-and-a-half years ago," explains the Department's manager,

James H. Sweeney, "specifically to provide international customers with 'extended scope' services. Extended scope—those words are the key to understanding our assignment. There are many projects whose GE content is 20% to 40%, but the Company can't really participate without taking on the whole responsibility. That's where we, with our expanded scope charter, come in: to take on those projects where the customer doesn't want just a single piece of equipment or one type of service, but an entire integrated system. We supply this by working very closely with product and service components, particularly within the Power Systems Sector."

Sweeney sees IPD's work encompassing three types of projects:

- Comprehensive turnkey jobs
(continued next page)



New generating capacity in the form of GE gas turbines built in Greenville, S.C. goes in at Jeddah II. Above: GE site project manager Ralph Franklin (l) with technical advisor Robert Skorupski.

where IPD takes on responsibility for the whole task: the system's design; supply of all materials, products and services designed to operate with GE products as a system; plant erection and construction; and system startup and test.

- Installed engineered packages—including all the above responsibilities except for civil construction.
- Engineered packages—the whole task but excluding both the erection of the plant and civil construction.

"IPD makes its profit,"

Sweeney explains, "from the added values we provide. Profits on the GE products involved accrue to the product businesses, so in order to earn our way we have to contribute other services and management skills the customer will pay for. We've proved it's a viable concept—as shown by the profitable orders we've taken and implemented."

Certainly IPD's approach has been successful in Saudi Arabia. The original turnkey order, for Jeddah I, called for a gas turbine complex coordinating four large-scale frame-7 units.

Says Daniel J. Walsh, IPD's Manager—Projects Operation: "We completed Jeddah I on schedule this past May even

though one of the control cabs was swept overboard and lost at sea, causing a 16-week delay. Great cooperation from the Gas Turbine Division and the Industrial Control Department helped us make our completion date with four days to spare."

In April 1977, IPD and Gas Turbine Division jointly won the order for Jeddah II, which will bring seven more heavy-duty GE gas turbines on line. "Our scope on this plant," says David M. Brown, IPD's Manager of Gas Turbine Power Projects, "also includes a water-treatment facility, additional fuel tank farms, warehouses, a mobile fire protection system, and additional administrative facilities."

Since then, more gas turbine orders have come in: a three-unit complex for Jeddah City—the special community that is being built adjacent to the airport—and a four-unit plant that will go in on the outskirts of Mecca itself.

These orders are good news, Sweeney points out, not only for IPD but for GE's gas turbine plant in Greenville, S.C., the generator plant in Durham, N.C., industry control operations in Salem, Va., and other GE facilities making lesser con-

tributions to the project. "All in all," Sweeney says, "the Saudi projects total well over \$100 million, with a good share of this flowing back to GE domestic operations. And it's business the Company could not have gotten if IPD hadn't been prepared to do the entire job."

The Jeddah complexes bring into play another GE component—the SADE/SADEMI construction operations that are now an affiliate of the International Construction Business Division. A talk with the construction component's Managing Director, Vittorio Orsi, makes this relationship clear:

"International Projects Department needs a team they can count on to handle the construction phases of projects such as those at Jeddah. They contracted with us. We have the skilled supervisors who can organize local people to prepare the terrain, make the excavations, put in the foundations, receive the machines and erect them under the technical advisors' guidance, and deliver the whole facility to the customer on time."

SADE/SADEMI handles similar projects all over the world. "We've been in the construction business for years," recalls Orsi. "We joined



Preparing the site for more gas turbines: Stan Boraski (l), logistics manager, checks with Chuck Lee, site project manager. Completed Jeddah I (r) shows shape of things to come.



COGENEL [the GE Italian affiliate] in 1958 and so became a part of General Electric when GE acquired the Italian company. We continue to operate as a profit-making worldwide construction company and are particularly happy when we can contribute to a GE project such as these gas turbine installations in Saudi Arabia.”

Where next for IPD? “After a slow period for new orders, we’ve had a rush during the last few months,” Jim Sweeney notes. “The projects we have on our schedules today cover the range from gas, steam and combined-cycle STAG® power generation facilities to electric transmission and distribution systems, oil and gas pipelines and processing plants, and airport lighting systems.”

How does IPD avoid the pit-

falls sometimes associated with “turnkey” contracts? “The turnkey projects we take on,” Sweeney sums up, “are for a shorter time span and don’t involve the many unpredictable variables that plagued those earlier projects. We have our problems, of course, but today we have greatly improved methods for systematic analysis and control of the factors that shape a specific project. Beyond this, we use an advanced project measurement system that warns us to avoid or correct problems before it is too late. The best tribute I can pay to our IPD people is that every project sold since IPD was formed in 1975 is on target and is profitable.”

The summation of IPD’s contribution comes from VP Edward F. Roache, General Manager of the International Con-

struction Business Division, of which IPD is a part:

“In many developing countries of the world, the most pressing priority is to accelerate development of their infrastructures—such as power generation, power transmission and petrochemical processing. Because such countries often do not have sufficient technical manpower to manage all of these projects, they frequently want to assign the responsibility for an entire project to a single contractor. This represents a major field of opportunity for General Electric and it requires us to put together our capabilities in ways which are attractive to our customers and profitable to us. We are very selective as to what we take on, and IPD is proving itself quite capable in this kind of demanding management.”



Overall direction for IPD projects comes from (l to r): General Manager Jim Sweeney; Dan Walsh, projects operation manager; and Dave Brown, gas turbine projects manager. Vittorio Orsi (r) heads SADE/SADEMI.

'For those with handicapped children, today's situation is different'

by Dr. Philip M. Lewis, Manager
Information Science Branch
Research and Development Center

It's still common for people to feel a sense of guilt or embarrassment, as well as great disappointment, because they are the parents of what psychologists call "developmentally disabled children"—children who have handicaps such as mental retardation, cerebral palsy, epilepsy or autism. The tendency is not to talk about such things. In the past, people often-times sent these "different" children away to distant institutions and tried to forget their existence.

Fortunately, this whole situation has changed and is changing. It's becoming more widely recognized that the birth of a handicapped child is something that can happen in any family. And the plight of the children themselves has improved considerably in recent years, culminating this past October 1, when PL 94-142, the Education for All Handicapped Children Act of 1975, went into effect, requiring schools to make special education available to these children.

My wife and I know about these developments at first hand because we are the parents of an autistic son—that is, a child who has great difficulty communicating his thoughts to others and often appears to be living in his own fantasy world. Our Mike is now twenty. He is still in high school. But he has reached the encouraging point where he participates in some regular classroom work, in addition to special classes.

Problems, however, still lie before us. Next year, Mike will be too old for high school. The only schooling left to him will be nine months of vocational training provided by the Office of Vocational Rehabilitation.



What comes after that? The answers are unclear. But my wife and I are activists on that front, as we have been activists on all the other fronts that have had to be overcome in bringing Mike to this point in his development.

Mike was four years old before a psychiatrist diagnosed his trouble and told us he was autistic. The signals had been there from the beginning. If we had known as much about this condition at that time as we do now, we would have recognized Mike's problem immediately.

For instance, as an infant Mike would become rigid when we held him. He didn't want to be touched. Even when he had a bottle he didn't want to be held.

When Mike was learning to speak, he didn't learn as normal children do. If I would say, "Do you want a cookie?" to him, he would repeat the sentence after me. Later on, if he really did want a cookie, he would ask for it by saying, "Do you want a cookie?"

Even after he learned not to just echo what was said to him, Mike had great difficulty understanding the distinction between the word "I" and the word "you." In computer terms, his central processor wasn't working correctly. Although he could hear words, remember them and then speak them later, he had difficulty processing the meaning of those words and communicating what he wanted to say.

His frustration at not being able to communicate led to all sorts of behavior problems. Now, at age 20, Mike can communicate much better, but at times still has some difficulties expressing himself.

A key advance that has come in education in the last twenty years or so is awareness that it is unproductive for schools to use labels such as

“retarded,” “brain-injured” and “emotionally disturbed.” The fact is—every child can learn something. The ideal is to approach each child individually, based on his needs and not his label, and to prescribe educational methods, normal or special, that will develop his abilities to the fullest extent possible. Today, with the passage of PL 94-142, that philosophy is the law of the land.

But Mike’s case preceded all this. As far as school was concerned, he was a problem from the beginning. His first nursery school quickly asked us to take him out. My wife and I had to decide what course we would follow—passive acceptance or active participation.

We became activists. In a poor neighborhood of town we found a school where the teacher and the children were more tolerant. Mike went to school.

In 1966, when the National Society for Autistic Children was founded and a local chapter was established in our area, my wife and I were charter members. I served as president of the chapter when it set up a special summer day camp for autistic children. Later, my wife and I helped arrange joint programs between the Capital District chapters of the New York Association for the Learning Disabled and the National Society for Autistic Children. We fought to get special education programs for exceptional children established and then strengthened in the schools.

Experience has shown that with special help many of these children can be “mainstreamed”—that is, enrolled in regular classes rather than segregated into special classes.

As we have struggled to get various new programs established, Mike has invariably been the first child in each of them as they have come along. By the time most of the bugs have been worked out of a given program, Mike has graduated into a new one and we’ve had to start over.

It’s the same today. I’ve indicated our present concern: what’s to happen to people like Mike when it’s time to pass beyond schooling? One problem is employment. We would like Mike to be able to work at a real job, maybe even at GE. To do that he needs more training and help from a potential employer. For the longer term, he may want some alternate living arrangement, perhaps in a hostel where a small group of handicapped adults can live under limited supervision.

Our case history comes down to a couple of main points:

One, I hope that any GE person who is encountering similar problems will see that he is not alone—there are many more of us than is commonly supposed and we are organizing to help each other. My wife and I have become intensively involved in many stages of care for handicapped children—in schooling, recreational facilities and now in the fields of housing and employment opportunities for handicapped adults. My wife attended school part-time for four years to get a degree in social work and now works as a full-time advocate, helping other parents of handicapped children. It’s even carried over to our daughter, who’s planning a college career in “the helping professions.”

Second, I’d make this point to GE people who have the good fortune to be outside these ranks: the problems facing handicapped children and adults cannot be solved exclusively by professional workers and the parents of the handicapped. Everyone in the community can help by accepting these children and future adults as neighbors, fellow employees and fellow human beings. ▲



To learn behavioral skills needed to hold a job, Mike Lewis (shown with father) works in school cafeteria.

'Leadership in an age of cynicism'

by Hershner Cross,
Senior Vice President

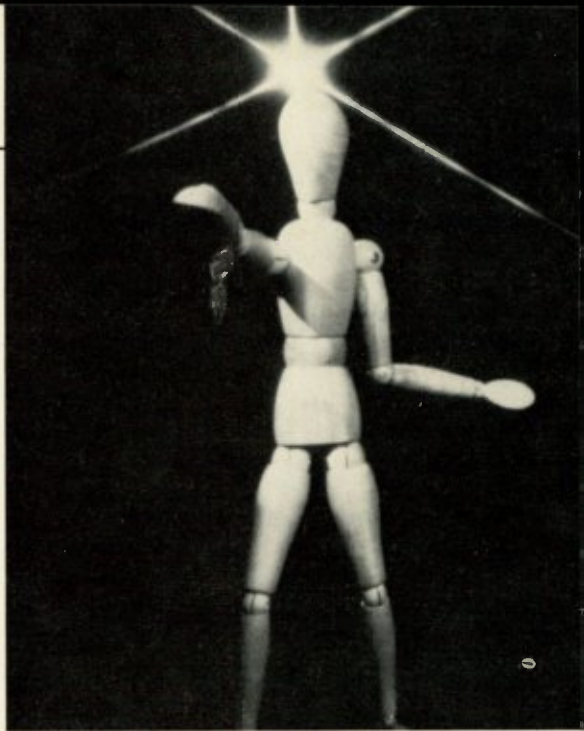


from a speech
delivered at
the recent
GE Management
Conference

We don't need psychologists to tell us that many people feel alienated, isolated and boxed-in by systems and structures. Our own children can give us that message. As polls confirm, the young feel distant and mistrustful of managers of large organizations—especially big universities, big businesses and big government.

The tasks and obligations of leadership are getting tougher every day. Forces acting both on the leaders and the led are responsible.

Alienation is, for successful organizations, *bad news*. At its heart is meaninglessness. John Donne said in a famous sermon that no man is an island. But forces as great as a geological fault are splitting people off from the



mainland of the work-centered activities of organizations.

Today's specialization of work, whether manual or mental, isolates people from each other. Competitive pressures constantly dictate more complex mechanization and automation in factories. It gets harder and harder to see a grand design, a common purpose, something larger than oneself. People are losing their sense of connectedness.

Incredible advances in techniques to improve productivity have been made in recent decades. Twenty to thirty years ago, people were willing and able to perceive a relationship between their paychecks and these productivity improvements. But, with increased material well-being, techniques seem to be losing their magic—just as people seem to be losing something, too. Can this something be a sense of belonging? Of feeling that someone gives a damn?

History provides ample proof that people need leadership. Leaders *define the purpose of an activity* and the effort needed to achieve its goals. They act with conviction—and because they do, they inspire belief.

The 1960s created a vast new intelligentsia whose representatives are now the younger people in government, business and the professions. Warren Bennis, President of the University of

Cincinnati, says that these young professionals are continuing to define themselves as critics, as devil's advocates and as radical reformers.

Today's alienation extends into religion, family relationships and social attitudes. People are frantically searching for leaders with style and conviction.

People have to believe in *something*. They have to feel warm and enthusiastic about some belief. They may or may not believe in God. They may believe in the benevolent social purposes of an organization, or be captivated by a project. The alternative is what Joseph Conrad called "The Heart of Darkness." It starts with alienation and apathy, but at its extremes can lead to energetic action fueled by hate. I need only cite the Third Reich, the Manson atrocities and today's terrorism.

Even today's children reflect the cynical mood of the times. Their newest game is not to play "doctor," but "doctor and lawyer." One kid operates, the other sues.

The real life situation isn't a joke, of course. Rates for malpractice insurance rose to the point a year ago where hundreds of California doctors stopped all but emergency work to protest rate rises several times higher than those of 1975.

Some of the deepest public cynicism is reserved for the oil companies. Two years ago, the public wanted to see them torn apart. That impulse has subsided somewhat, but cynicism remains. Today, the American people finally believe that the energy problem is serious, but they refuse to believe that the cause is a fuel shortage. They define the crisis as one of high prices linked to the misbehavior of corporations.

That's cynicism.

Despite all the recent good news about prices, retail sales and the index of leading economic indicators, many people insist that things have gotten worse and will continue getting worse.

Cynicism is fed by the media—though I don't want this taken as a blanket indictment. It took 200 years of history for us to learn that George Washington padded his expense account. But now we learn overnight of scandals in government, business, military academies and intelligence agencies.

A human condition, now becoming wide-

spread, is labeled the "Psychology of Entitlement." It means, to some, "You've got yours, Jack. Now I want mine!" Everybody is to be present—not at the creation—but at the distribution. And the shares are to be equal.

Wherever we look, we find "Balkanization"—by ethnic groups, regions, sex, age and religion. Pressure groups are calling for their equal rights by legislation, constitutional amendment or boycott pressure.

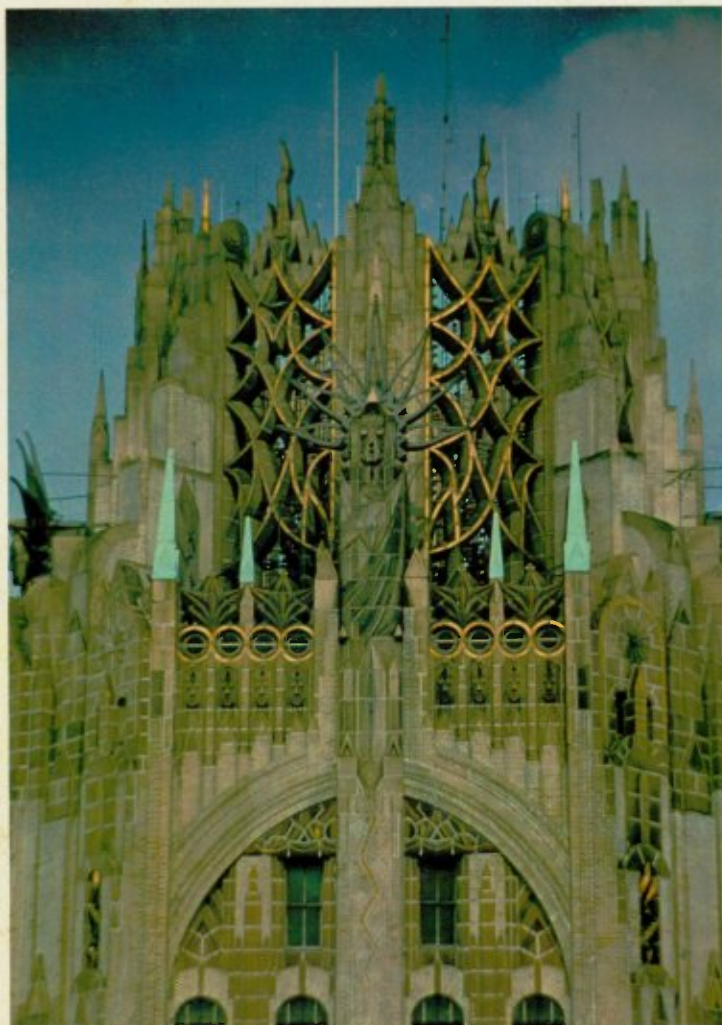
Self is being placed above *community*, and our cynicism regarding institutions is hobbling leadership, undermining our faith in each other and our common purposes, and curbing the orchestrated actions of our citizenry.

Today's crisis of leadership can be overcome. Leaders with enthusiasm and purpose are always in demand. History is replete with periods of cynicism and disillusionment that have been resolved when leaders have come forward to turn the isolated, festering energies of individuals into a strong river that flows in a definite direction.

General Electric, for example, includes men and women who—given encouragement—can lift others above daily problems by virtue of their contagious beliefs, convictions, integrity, humanity and style.

For their part, managers and supervisors must not permit the complexities and the pressures of events to screen out concern for people. They must do all they can to become generalists as far as *people* are concerned. Time must be set aside to meet in eye-to-eye contact with employees. Men and women at *all* levels of the organization must be encouraged to develop leadership skills. Performance appraisals and compensation should recognize leadership of people.

From the point of view of our orderly industrial life, alienation and cynicism are dangerous to the goals and processes that have been so carefully devised for our own Company. We must continually seek among our managers those who are willing and able to lead people by lifting them above their own problems, their loneliness, their cynicism—by virtue of contagious beliefs, convictions, enthusiasms, style and humanity. ▲



MANHATTAN LANDMARK. Increased interest in the Company's history, occasioned by this year's Centennial, focuses the spotlight on "things historical." Case in point: New York's General Electric Building at 570 Lexington Avenue, now prescribed viewing for numerous college art classes on a tour of the Big Apple's Art Deco architecture.

Manhattan's distinctive structures—with the Chrysler and Empire State Buildings, Radio City Music Hall and "570"—include many examples of this Paris-inspired art style of the 1920s and 30s.

Various "570" closeups shown: the cathedral-like 60-foot crown atop the 50th floor (left), symbolizing electrical energy; symbolic people (top right), electrical science's beneficiaries; and radio-wave zigzags located at many points on the 623-foot edifice.

During Art Deco's heyday, a feast of Hollywood-on-the-Nile fantasy spread throughout the city. Building entrances were embellished with molded and colored tile, sculptured metal, and brick and ceramic mosaics. Surface ornamentation could be found everywhere—on doors, spirals, mail boxes and in elevators.