THE MONOGRAM

DECEMBER-JANUARY 1968-69

Cleveland's New Airport Link:
GE Powers the Way . . . p. 6

LETTERS

The Non-Voter

EDITOR: It may very well be true that "someone" once said that "bad officials are elected by good people who don't vote" (editorial, October). However, "someone" also said that "bad officials are elected by good people who have a bad choice."

The only desirable way to spur active participation by citizens in the electoral process is to afford them a meaningful choice on the issues that each individual considers pertinent to his circumstances.

For instance, many people considered the views of the candidates for the Presidential elections to be similar on issues which they as individuals were opposed to.

Due to the wide range of issues that a candidate for office has before him, the possibility of an elector not argeeing with any candidate is quite high. So do not criticize the elector who refuses to deceive and compromise his conscience by abstaining to vote. When politicians reject expediency in favor of sincerity the voter turnout will increase.

TONY FIELDHOUSE
Major Appliance and Hotpoint Division
Louisville, Ky.

A protest "non-vote" doesn't accomplish much in our opinion. When you drop out of the voting booth, you in effect give extra weight to the votes of your neighbors. You let them decide who will govern you. Perhaps if you expressed your feelings on the issues to the candidates it would accomplish more (and be personally rewarding) than simply staying away from the polls. Doing something is better than doing nothing.—Ed.

Like Clockwork

EDITOR: The article in the October issue regarding Mrs. Evelyn Meyer's 38-year-old GE Refrigerator reminded me that I have had a GE Telechron clock in service continuously since 1928 and that, for my money, is a superb record considering the fact that we have had at least a dozen and a half of these particular wall-type clocks along with some from practically every manufacturer in the country, but none has come through but the old reliable Telechron, still adorning the kitchen wall. The only trouble I have ever had with it over the forty years has been due to the "hour"

(Continued on inside back cover)

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

IN THIS ISSUE

Devere E. Logan, Editor

Edward A. Rogerwick,
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GENERAL ELECTRIC

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THE GENERAL ELECTRIC
MONOGRAM

DEC.-JAN., 1968-69

SPACE

Starry-Eyed Satellite

A massive 11-telescope space package, designed to unveil the most complete view of the heavens ever seen, was successfully boosted into orbit through a pre-dawn launch window last month from Cape Kennedy.

As the largest, heaviest, and most automated satellite in the U.S. inventory, the Orbiting Astronomical Observatory will attempt to obtain data on young hot stars hidden until now by the twinkling and filtering effects of the earth's atmosphere.

For hundreds of GE employees at Space Systems Organization in Valley Forge, where the satellite's critical stabilization and control subsystem was developed, as well as for those who contributed in Pittsfield and Utica, the perfect orbit achieved by OAO-A2 capped more than two years of work.

Heinz G. Klose, SSO's manager-stabilization and control programs, standing by at the National Aeronautics and Space Administration's Goddard Space Flight Center in Greenbelt, Maryland, where flight operations are controlled, reported all aspects of the flight were going according to plan.

Mr. Klose explained, at the heart of the stabilization and control system are six gimbaled star trackers, each programmed to lock on selected guide stars. As soon as the tracker zeros in on the prescribed star pattern, the satellite is properly oriented for ground controllers to activate either of two scientific experiment packages aboard.

Ordnance Systems, Pittsfield, was a contributor to OAO-A2 with an attitude control subsystem that can independently maintain coarse stabilization at various times during the flight.

Integrated into the Valley Forge-developed star tracker subsystem is a com-

MAPPING THE SKIES

plex 8500-part digital logic unit designed by the Aerospace Electronics Department in Utica.

"Our stabilization and control subsystem is working perfectly," Mr. Klose observed, shortly after the launch. "Initial stabilization of the spacecraft was achieved on schedule," and he added, "since then the star tracking system has been activated."

As an example of the system's pointing accuracy, Mr. Klose noted, the potential coarse pointing accuracy of the GE system for this mission is equivalent to selecting an eye of a person 500 feet away, then holding steady for up to an hour for a detailed study of its color and brightness.

The 4400-pound spacecraft, designed to unravel some of the deeper mysteries of outer space, carries two scientific experiments.

Optical data obtained from the Smithsonian experiment will be analyzed and converted with the aid of computers into photographs, new maps and catalogues of the celestial sphere.

Information gleaned from the overall Wisconsin experiment, scientists say, could lead to a revision of present theories of stellar origin and evolution.

FACILITIES

Space Race

Building, expanding, and unveiling was still much in evidence around the Company last month as Departments hustled to insure that facilities were adequate to handle customer demands.

In Murfreesboro, Tennessee, the Company announced a major expansion of its appliance motor plant that will mean an investment of $11-million in the city and state economy over the next two-and-a-half years. The planned expansion will increase usable office and factory floor space by over 60 percent, add significantly to capacity in terms of production volume, and equip the plant to produce a new-type appliance motor. Groundbreaking is scheduled for early January, 1969.

General Manager Bruce Roberts said during an announcement luncheon that the decision to expand at Murfreesboro was influenced to a great extent "by the favorable business climate . . . and by the character and reliability demonstrated by our employees over the years." The Company opened its present 143,000-square-foot plant in 1957 and presently has over 600 employees.

Engine Room: At Evendale, meanwhile, nearly a half-million square feet of floor space is being added to the plant to provide space for work on the General Electric engines being proposed for the Air Force F-15 (ex FX) and Navy VFX-2 aircraft programs.

The Company has a lease/buy arrangement in which it will move into facilities as they become available, eventually purchasing the property in 1971. The two facilities total 467,000 square feet of floor space and will mean about 700 jobs over the next several years.

At Lynn, the Aircraft Engine Group is also leasing a 33,000-square-foot building in order to add storage space and free up space for the T64 engine program.

Service Shop: A new General Electric service shop to replace the one in Buffalo that was built in 1926 will rise soon at Tonawanda, N.Y. Groundbreaking for the $2-million shop has already occurred, and when the 50,000-square-foot building opens its doors in June, it'll mean a new and larger facility serving western New

(continued on page four)

SPACE SCIENCES

Lasers Aim at Pollution

Employees at the Company's Space Sciences Laboratory at Valley Forge are going to build a mobile laser air pollution probe. It'll be able to detect pollutants in the air within a five-mile radius.

The contract to design and build such a unit was recently awarded the Company by the Appalachian Regional Commission through the Pennsylvania Department of Commerce. The $100,000 contract covers an 18-month program.

A trailer-mounted laser device will be built. If it's successful, the use of lasers in detecting and tracing pollutants could be far more efficient and rapid than present methods, which take substantial amounts of time and manpower.

SOCIAL SECURITY

Bigger Deductions

Social Security taxes go up again this month, resulting in higher payroll deductions for General Electric employees. The change also means the Company's payment toward employee retirement income increases by many millions.

Effective January 1, the Social Security tax goes from 4.4 percent to 4.8 percent of the first $7,800 of an employee's annual earnings. This means the maximum increase for an employee will be $31.20. For the Company, which must come up with a matching tax equal to the total paid by all employees, the total will be increased by an estimated $8 million.

For the individual, the tax will move from a maximum of $343.20 in 1968 to $374.40 in 1969. For General Electric, the tax goes from an estimated $92 million last year to an estimated $100 million in 1969.

Why? The tax boost is necessary because Congress has approved increased Social Security benefits over the years, including a recent 13 percent increase in benefits in 1967, including improved Medicare. In addition, they provide benefits for the greater number of individuals who will be receiving them.

EDUCATION

Scholarships Available

Sons of General Electric employees may qualify as candidates for the Richard H. Rice Memorial Scholarship Awards at Stevens Institute of Technology, or the Steinmetz Memorial Scholarship Awards at Union College.

The Rice Memorial Scholarship Fund was established in 1923 in memory of E. W. Rice, Jr., a Company pioneer who became President of General Electric Company in 1913. The Steinmetz Scholarship Fund was established in 1924, and bears the name of Charles P. Steinmetz, the mathematical genius who joined the Company in 1893 and later developed new methods of designing alternating current machinery.

Applications for both awards should be made directly to the respective institutions: Stevens at Hoboken, N.J., and Union at Schenectady, N.Y. Deadlines are February 1st.

The Rice Scholarship Awards are granted with preference for sons of Lynn Works employees due to Mr. Rice's association with that location. Steinmetz Scholarships are awarded to sons of GE employees or to sons of residents of Schenectady in the event there are no qualified applicants from the Company.

In Cleveland, Getting to the Airport's a Breeze!

"The problem of sufficient airport access capacity is plaguing every major airport in the world."

The complaint by weary air travelers that they "spend more time getting to the airport than in flight" is a common utterance today — but not in Cleveland, Ohio. Last month, the city opened the Western Hemisphere's first direct rapid transit line from downtown to the airport.

Now, when an air traveler picks up his luggage at Hopkins Airport, he can step into a comfortable General Electric-powered "Airporter" and zip into downtown Cleveland in 20 minutes for a 35-cent fare.

Completion of the Cleveland Rapid Transit line to the airport cost $18.6 million, and includes 20 specially-designed "Airporter" cars that seat 80 and whisk passengers over the rails at speeds up to 60 miles per hour. The air conditioned cars — built by Pullman-Standard — are powered by four GE 100-hp traction motors built by employees of the Company's Transportation Equipment Business, Erie.

Inauguration: Over 500 dignitaries and newsmen attended the official dedication and opening of the four-mile airport extension at the airport, with U. S. Department of Transportation Secretary Alan S. Boyd the main speaker.

"The problem of sufficient airport access capacity is plaguing every major airport in the world," said Mr. Boyd. "The line of cars waiting to get to Chicago's O'Hare Airport stretched five miles in last year's pre-Thanksgiving rush. Air traffic controllers trying to get to work at Miami International were stalled in line for two and one-half hours (last Christmas) trying to get from the entrance of the airport to the terminal," he said.

"And yet," he added, "Cleveland is the

first—and to date the only—city to provide a direct rapid transit line for its airport travelers. I congratulate you for your foresight."

Eyes on Cleveland: Robert D. Weeks, manager of Metropolitan Transportation Projects, with headquarters at the Erie plant, also joined in inaugurating the new service (shown "straphanging" in the photo with the seated Mr. Boyd).

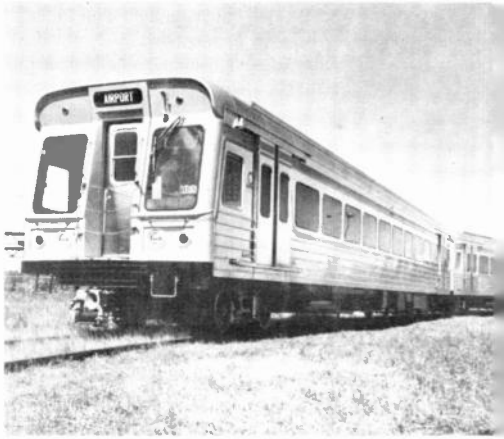
"Every city in the world with problems of ground access to its airport will be watching the Cleveland experiment," he said. "The contribution of Erie plant people to this project will be watched by transportation experts the world over."

The General Electric propulsion systems for the 20 new "Airporter" rapid transit cars combine high-performance, ease of maintenance and reliability.

Erie employees solved many of the complex design problems even before the first production equipment was built by simulating traction motor characteristics and system performance to pre-test the propulsion and braking control.

The traction equipment is designed to meet demanding requirements of CTS's rush-hour schedules.

CRT RIDERS WEEKS & BOYD
Now, getting there's half the fun.



GE-POWERED "AIRPORTER"

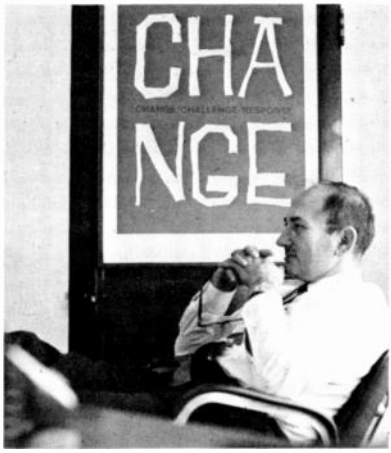
Partner: Bryce W. Wyman, Vice President and General Manager of the Company's Transportation Systems Division, said that General Electric is "proud to be a partner in helping the Cleveland Transit System provide America's first rail link to the jet age."

He said that in the future, with the arrival of jumbo jets and supersonic transports, the airport access problem "will become critical."

The future of air transportation, predicted Mr. Wyman, "will be limited in those cities that do not overcome this problem of airport access. Many other American cities must follow Cleveland's example or they will be by-passed by the jet age," he warned.

The history-making rapid transit extension to the Cleveland airport was jointly financed by the federal government and local bond issues.

Transportation: Thoughts From Our Think Tank



"We cannot lose sight of the fact that breakdown of a city's transportation network could lead to the demise of the entire city."

"Urban transportation is the crucial transportation problem of the United States," reads a report from TEMPO, the Company's Center for Advanced Studies in Santa Barbara, California.

"This is due to the great concentration of people in these areas and to the fact that all the interfaces between transportation modes occur in urban areas."

These thoughts, plus appropriate mention of Cleveland's new airport rapid transit covered in the previous story, are from one Max L. Feldman, (shown above) member of TEMPO's 365-man staff. He prepared his comments for the American Institute of Planners, which has since included them in a book, *Environment and Policy; The Next 50 Years.*

In spite of federal emphasis on many aspects of transportation such as the development and improvement of aircraft and flight control equipment, subsidizing of merchant vessels, and building limited access highways, observes Mr. Feldman's report, we've missed the real problem areas.

"We have given inadequate attention to problems such as getting the traveler to the airport, loading and unloading a modern, automated freighter, and handling the cars that pour off a limited access highway into the downtown area of a city," says the report.

The Future: In the next 50 years, the U.S. population will increase to about 390 million, and projections indicate that by the year 2020, there will be about 158 million additional autos in urban America—almost as many more cars as people.

"Serving the transportation needs and wants of this many people and providing for this number of automobiles will require more than skillful juggling," says Mr. Feldman. "This growing horde of people combined with each one's desire for the full flexibility of individual transportation is frightening."

In discussing the means of dealing

with the awesome implications ahead, the TEMPO report covers some six related areas in the picture ranging from congestion and air pollution to changing aesthetic and moral values. Here are some of the highlights:

Congestion: Urban snarls will eventually affect currently accepted values relative to freedom of movement. Hopping in a car and driving where we want to go "will eventually have to be limited in order to prevent the complete collapse of urban circulating systems and to save the cities themselves."

Automobiles have caused congestion, but so too have they made incessant demands on cities for additional rights-of-way. Urban expressways can cost up to $50-million a mile; they gobble up land, reduce the taxable real estate, and displace people.

Air Pollution: "When the American public becomes sincerely concerned about the effects that the exhausts from internal combustion engines have on its health," continues the report, "it will support the imposition of restrictions on [their] use within and near congested areas."

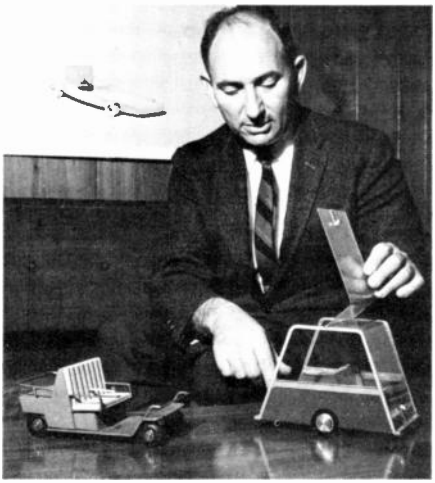
Changing Values: The transportation planning process must consider changing moral and economic values in addition to developing technology and emerging national goals. For example, recognizing the role that mobility plays regarding poverty and the concentration of minority groups in deteriorating urban areas, observes the report, "adds a degree of urgency to the necessity for making striking improvements in urban transportation.

"The automobile has had a far greater impact on the lives of people than most realize. It shaped some cities—Los Angeles is the classic example." The report also notes that the automobile "has also contributed to the deterioration of public transit."

Studies: Some beginnings of progress are being seen in urban transportation, the report continues, in study contracts led by the federal Housing and Urban Development Department. The recommendations resulting may lead to development of high density, low-cost-per-ride urban distribution systems, and for the future of the large U.S. central cities "a great deal hinges on the outcome of these studies.

"In general," summarizes the report, "the next 50 years will see great changes in the urban-suburban regional transportation field. The way will be led by the federal government.... Private industry will build and develop components for systems and will vie for contracts to build systems." The development costs will be borne by the government—almost a certainty because developing new transpor-

TEMPO'S MAX FELDMAN
Models for the future?



tation modes can be costly and there's no guarantee that a system developed will be accepted.

Alternatives: "The automobile as we know it now will remain with us for a long time," notes an appendix to the report. Pressure to reduce air pollution from internal combustion types may yield some progress in the future, possibly eliminating 70 to 80 percent of total emissions.

"Since these efforts will fall short of 'solving' the problem, it is expected that alternative automotive propulsion systems will also play a role in reducing smog emissions. These should include the gas turbine engine and battery propulsion systems."

However, pressures restricting the automobile in cities don't exist over 95 percent of the U.S. land area, and here it's possible that "significant progress toward electronic highways will occur over the next quarter century."

Electrics: The internal combustion automobile, as presently designed, isn't intended to function optimally in congested urban areas with low speeds and frequent stops. "The automobile may be vulnerable to competition [in this field] from a vehicle designed specifically for this service."

Mr. Feldman's report suggests that a small two-passenger electric vehicle with a range of 30-50 miles and speed of 20-30 mph is likely to be developed and "marketed in volume" in the next ten years.

The car could be serviced "by conveniently-located battery stations where batteries could be charged in a matter of seconds for a nominal fee."

Individualization: The introduction of small electric vehicles will stimulate the next evolutionary step: development of individualized urban transportation systems. "These," suggests Mr. Feldman, "are systems involving electric vehicles operating on roadways where power is fed to the vehicles and their speed, entry, and exit is controlled by the system.

"This approach was first proposed by GE in about 1960. Within the next 25 years this type of system should be widely used for intra-airport transportation, downtown distribution, transit in moderate sized communities and around large shopping centers."

NEW BUSINESS

Selling the Spin-Off

As holder of the world's largest portfolio of unexpired patents—12,000 at present—the Company's large volume of innovations has produced a cerebral surplus in some areas where there are no operating departments.

What to do with such spin-off?

An answer came recently with the announcement that a new "Business Opportunities Service" would be established. Its objective: working out licensing agreements that will enable other companies to acquire the rights to certain GE processes, products, machines, tools and instruments that have been carefully evaluated for business potential.

The new component is an outgrowth of the New Businesses Development Operation, Schenectady, and according to its Manager, Charles M. Heiden, the new service should be extremely valuable for small, growing companies interested in enhancing their present market position or in entering new markets.

Many small or medium-sized companies are equipped to develop new products or

NBDO'S FRONKO & HEIDEN
Licenses for some of our good ideas.

processes into thriving businesses, he says, but they seldom can afford to finance the research and development needed to develop them in the first place.

Mr. Heiden hastens to add that large firms with established market positions also are expected to find profitable opportunities in the new licensing service.

The Patent and Technology Marketing Operation will administer the new service. Manager Edward G. Fronko says that the service is unique in industry because it provides a package of know-how along with the product or process being licensed.

Publishing: Beginning with a January, 1969 issue, at least ten new business opportunities will be described in a bimonthly publication issued by the service. Subscription cost will be $150 per year.

The publication will describe the product or process, its advantages, suggest possible applications and market potential, outline the scope and amount of additional information available, and give general terms of availability for licensing.

More Big Ones

It was a hefty suggestion check of $3,500 that went to Ashland, Mass., employees Don Dion and Ken Chapman, although it was but one of several sizable awards that were being presented around the Company.

The two Housewares Division employees each shared in what was the biggest suggestion award in the history of the Ashland plant. Their idea involved installing a stacking cylinder on a burr and burnishing machine, eliminating the handling of plates before and after degreasing and restacking, and producing "a tremendous savings in time and labor," according to one plant spokesman.

At Hickory, N.C., meanwhile, the second largest suggestion award ever given by the Residential Distribution Transformer Department plant went to George Fite. The award left him with an ample $2,326 in suggestion money.

His idea? Using a wire conductor →

BIG MONEY FOR GEORGE FITE
Congrats from the GM & engineering, too.

rather than more expensive tinned copper strip leads on transformers.

"The original intent of the suggestion was to make my job easier," says Mr. Fite with candor. "Then there was the matter of the dollars involved. I figured it would save the Company some money and perhaps be worth something to me. I just didn't realize how much."

At Utica, a $2,005 suggestion award went to Phil Sears. The sharp-thinking employee has received several previous awards, and this one brought his total to over $9,000.

Mr. Sears' idea involved a change in tuning shafts for several radio models manufactured by the Radio Receiver Department where he works. He joined the Company in 1964 as a draftsman, and was recently promoted to specialist-component evaluation.

His suggestion money is expected to help out with a forthcoming winter skiing trip to Canada with the GE Ski Club.

Another biggie was chalked up by the Cincinnati plant of the Distribution Assemblies Department as it presented $1,726 to Donald F. Kauffman. It was the highest suggestion pay-out in the history of the Department.

Binghamton's Anniversary: A Time to Reflect

For employees marking the 20th anniversary of Avionic Controls Department, the return of two GE aviation pioneers was like a flashback to the opening of the Binghamton, N. Y., plant in 1948.

For the observance of Heritage Day and the Department's 20 years at the Binghamton facility, retirees Dr. Charles F. Green and Howard I. Becker returned and were honored for their work on the Company's first "Automatic Aircraft Steering Device" in 1931.

Forerunner: This development, it turned out, was the forerunner of flight control systems the Department presently manufactures for supersonic aircraft including the F-105, F-4 and F-111.

William J. Kuehl, Department general manager, commenting on the significance of the pioneering role played by the two visitors said that "Dr. Green and Mr. Becker . . . were the first of a new breed of flying scientists who developed and flight-tested an amazing variety of electronic and electro-mechanical devices which have contributed directly to our Department."

Since the plant first opened in 1948 to work on the B-36 intercontinental bomber, Avionic Controls Department has become the world's largest supplier of flight controls for supersonic aircraft. While staving off a field of over 200 competitors, the Department also broadened its work scope to encompass weapon control systems for high performance aircraft, helicopters, and the Vulcan Air Defense Program, among others.

Another dramatic change has been the increase of the work force from an original seven employees to the present 3200.

To all concerned, observing ACD's 20th anniversary by bringing back Dr. Green and Mr. Becker was a fitting way to remind employees how it all began.

Teacher's New Pet?

Computers are becoming as commonplace in the classroom as well-polished apples, and some recent reports from around the Company indicate that General Electric is becoming equally known on campus.

At Bloomington, Illinois, the General Purpose Control Department is donating nearly one third of the capacity of its new GE-255 timesharing computer to two local universities: Illinois State and Illinois Wesleyan. The Department claims to be the first Company component to do so.

The system includes teletypewriters on both campuses connected via telephone lines to the computer at the GE plant. The schools began preparation for the program in September with an eight-hour course at the General Purpose Control Department. Some 15 representatives from each university—from presidents to students—attended sessions on how to use the computers and how to teach others.

Report Card: The timesharing plan, according to Illinois Wesleyan President Dr. Robert S. Eckley, gets the University to an introductory point in computer education two years ahead of the time it might otherwise arrive.

And, Illinois State University President Dr. Samuel Braden says, "The computer can be integrated into certain courses to the extent that students must use it to pass. They can be given problems that couldn't be solved any other way."

Europe, too: Computer timesharing has also moved into the European classroom on a large scale. Ten Bull-GE terminals have been installed at the Faculté des Sciences at Lille, France, to teach engineering students the use of the computer. The terminals will be connected by telephone lines to B-GE's Paris headquarters.

Meanwhile, in Altoona: A new technique for using visual display equipment in computer-assisted instruction is being developed by students at Altoona (Pa.) Area High School.

District superintendent Dr. Thomas R. Heslep says the students may set a pattern for years to come in the use of TV-like screens in classrooms for "flashing answers" to science and mathematics problems from a computer miles away. In fact, the educator suggests that "techniques developed here may even find widespread use in industry."

Videokeys: The visual display unit being used by students—a General Electric DATANET® 760—resembles a 14-inch TV set with a typewriter keyboard attached. It's one of 18 remote terminals linked to the school district's GE-255 timesharing computer system.

That system serves some 4,000 students in 16 public and parochial high schools across five central Pennsylvania counties, and school officials claim that it's "as extensive as that of any secondary school in the country."

The visual impact of the DATANET 760, points out the Information Devices Department which manufactures it, is that it adds a new dimension to the computer by permitting users to utilize words, designs and symbols in communication with the computer.

The Altoona school district also intends to use the DATANET 760 to combine the capabilities of the computer and the District's television broadcasting system for a refined simulated face-to-face computer-assisted instruction program.

Management Manpower Development; An Interview with Roy L. Johnson

Roy L. Johnson, Vice President in charge of the Company's Management Manpower Development, is the man responsible for our efforts to cope with fast-growing needs for professional talent in depth. He joined the Company as an accountant and later became a manager of finance in the Lamp Division. From 1960 to 1964 he served as manager of Financial Personnel Service and then left the Company for executive positions with Dun & Bradstreet, Mr. Johnson returned to General Electric in 1966.

Q: Mr. Johnson, the recent organization changes announced by the Company put a greater emphasis on the manpower function. Do you see this as unique with General Electric or is it also true in industry generally?

A: Most alert companies in today's environment are devoting much more attention to their relationships with professional employees. They recognize that these people are keys to a company's growth and profitability. They are a very important consideration for General Electric now and in the years ahead.

Q: With a name as well-known as ours, is it still relatively easy to attract top talent to our Company?

A: It used to be the case. In fact, the electrical industry itself held a magnetic attraction for top professional and managerial talent, and General Electric jobs were among the most prized in the industry. Today, the recruiting competition is rugged, and it also includes representatives from the non-industry fields such as government, education, and civic service.

Q: What's your reaction to such a competitive manpower market?

A: Our first response to this increasing competition was based on the philosophy of better utilization of human resources, and in this area we've made progress. But we've also realized that this isn't enough. Today's managers and professionals are becoming a more mobile group. They're much more likely to leave GE to look for greater total satisfaction from their work. Their expectations are higher; their tolerance level is lower. To meet this challenge in General Electric, and to continue to attract and retain talented people, we've been seeking and will continue seeking, ways of helping individuals identify their real interests and goals—and the sacrifices they're willing to make to attain them—and blending these with the Company's.

Q: With the recently-announced enlarged scope of Management Manpower Development, do you feel better equipped to meet future needs?

A: We're hopeful that our enlarged scope will make us more effective in helping operating management develop many outstanding candidates for key professional and managerial positions. It's a first step in assigning responsibility to a single corporate-level organization. We're pulling together all the relevant pieces of the work done in the functional corporate staff components. Of course, most of the work will continue to be done by operations in the field. We'll provide the Company-wide focus.

Q: How is this going to benefit the Company?

A: It is our intent to make this focus responsive to the Company needs for a steady flow of professional and managerial personnel—people who can grapple successfully with the constantly increasing complexity and intensity of industrial competition. Future managers will be challenged with new and more complicated liason with the government, internationally-based business competition, tremendous social and economic problems in the plant communities and the nation, and usage of increasingly complex communication and information systems, to mention a very few things ahead. It's not just a matter of producing people as skilled as the ones we have; they'll have to be better.

Q: How would you define your mission in management manpower development?

A: To build an integrated Company-wide system that includes all aspects of relations with our exempt people so that we provide a series of opportunities over a full career that are rewarding to the individual and the Company. To accomplish this we'll have to keep improving the main areas of our work: exempt manpower planning; organization planning; recruiting, selection and placement; education, training and development; personnel inventories; exempt compensation. We've pulled these together for increased effectiveness and attention.

Q: You mention manpower planning: What are you doing in this area?

A: We're interested in developing a better over-all approach to exempt manpower selection and development. This means plans for improving the identification, development, and selection of professional and managerial personnel.

Q: Does this also include the subject of turnover—specifically those who leave the Company?

A: Yes. We'll continue to take a look at the causes of high talent turnover and recommend ways to minimize it. In today's environment we're more apt to lose top talent through the "high mobility" attitudes that exist.

Q: What are some of the things your organization is doing in the recruiting area?

A: In both educational relations and recruiting we're bringing together the overall work that has been done in separate components in order to further enhance our position on campus. We're developing plans for recruiting from minority groups to fill managerial and professional positions, and also to recruit the high-talent managers and professional people who →

leave other companies in search of greater opportunities.

Q: Are you also working on an internal, Company-wide placement system?

A: Each of the functional staff components has been providing an avenue to Company-wide placement and this will continue. Now that the personnel doing this work have been brought together in MMD, we'll have the opportunity to look at how we can improve this work—at how we can better satisfy the business needs of the operating components, and the personal needs of professional employees. At this time, it is too early to say what specific changes in emphasis, scope or approach may result.

Q: How does your work relate to that of operating components in the Company?

A: We see our role as that of producing the leadership in developing a Company-wide system, providing corporate staff support to make it work, and to do specific pooled operating work such as recruiting. The design of the system will be based on the requirement that most of the implementation work be done by operating components at all levels throughout the Company.

Hummingbird Flies By Wire

The hummingbird is a sweet little bird that excels at vertical take-offs, and that's how mother nature intended it to be. But there's a man-made hummingbird that's flying in Atlanta, Georgia, with a revolutionary flight control system far more complex than that of our feathered friend.

Last fall, the Hummingbird—an experimental vertical take-off and landing aircraft—made its first conventional flight. It was a success.

The Hummingbird is being developed by Lockheed-Georgia Co. It's equipped with a GE flight control system in which the pilot's controls don't have mechanical linkage to the airplane's control surfaces as in a conventional system. All during the test flight, the pilot is "flying by wire." Or, with all-electronic controls.

Included in the "fly-by-wire" system are control force sensors, rate gyros, flight control computers, and hydrolic servo-actuators. It's equipped with two backup systems, which makes it "triple redundant." Result: high reliability.

The purpose of the Hummingbird is to develop the technology and design requirements for integrated flight control systems for future aircraft. A similar system is under consideration for the Boeing Supersonic Transport, for which Avionic Controls holds a development contract.

Power for the Hummingbird is supplied by six GE J85 turbojets.

Talking Points

Tower of Lendin'

Students of GE architecture will note with interest the accompanying photograph of part of the General Electric Credit Corporation's new, but temporary, home in Greenwich, Conn.

Now, it's a rare GE plant that can boast of its own regal tower, but this one is historic and quite utilitarian. It was built in 1918 as the plant manager's office when the tower was part of Arbor Press, the original owner.

There's a surprise inside the tower, because it actually surrounds (and camouflages) a 30,000-gallon water tower. Water reserves in the tank were originally for fire fighting, and have never been used.

TOWER IN OLDE GREENWICH
Tanks for the memory.

Big Leagues

A Long Island, N.Y., homeowner discovered that his 1931 Monitor Top refrigerator had finally given up. He wrote to the Company—a bit tongue-in-cheek—that he assumed his refrigerator "had a lifetime guarantee and was good forever." Repairs, he said, would run $200.

Writing a reply was up to Lew A. Miller, Advertising and Sales Promotion, Louisville.

"It surely was a dependable piece of merchandise," he wrote. "It even outlasted durable athletes like Babe Ruth and Lou Gehrig who slugged 45 homers each in 1931. Most of us thought *Colliers*, the popular 5 cent magazine of the day, would last forever. It didn't.

"Many of the top names of that year, you'll recall: Max Schmeling, Billy Burke, Al Simmons, Frankie Frisch; Herbert Hoover was President and the Star Spangled Banner was officially designated as the National Anthem.

"Most of these people have died or long ago retired.

"Only your Monitor Top and the Star Spangled Banner survived these last 37 years. Surely that kind of dependability makes us very proud and must make you extremely grateful that you have had such good fortune being the owner of a famous GE Monitor Top refrigerator!"

After receiving Mr. Miller's letter, the customer—who was an advertising executive—sent the letter to *Advertising Age* with the comment: "The impression left by the carefully-documented and humorous letter was massive among my friends and business associates." →

Liberace's Lights

Pianist Liberace's ever-present candelabra disappeared under larcenous circumstances during an east coast concert tour, but he had help from General Electric in finding a replacement. Lamp Division's Lady of Light presented the colorful entertainer with a sparkling new electric model. Liberace was happy.

Turned on by the electric candelabra, he thought it would be nice to wear a light-up suit since he was worried about people leaving before the finale of his act. General Electric helped out with a 300-bulb suit that took seven months to build.

Now, at the end of his performances, Liberace "blows out" the candelabra and lights up—all 300 bulbs worth!

Turkey Tuck-in

Raising turkeys, say veteran poultrymen, is a delicate art. The birds are especially susceptible to diseases, crowd to keep warm only to smother to death, and will fight and peck each other.

Ohio State University researchers believe that an answer to these problems may be in keeping gobblers roasty-toasty. A research project has begun that will place 1,000 newly-hatched birds snugly at 95 degrees under a cozy General Electric 2,000-watt Calray® heater from the Industrial Heating Department. The blanket of warm air will be regulated by a GE thermistor sensing unit from the Magnetic Materials Department that will detect the slightest temperature change, and a solid state control from the Semiconductor Products Department will control things to plus or minus .2 of a degree.

If the project is successful, it's likely that poultrymen and the Company will be talking turkey in the future.

Oberlin Olé

Oberlin College met defending champion North Park College on the GE College Bowl recently, and put on the biggest second half blitz (275 points) in the history of the TV program. Oberlin won 410-35.

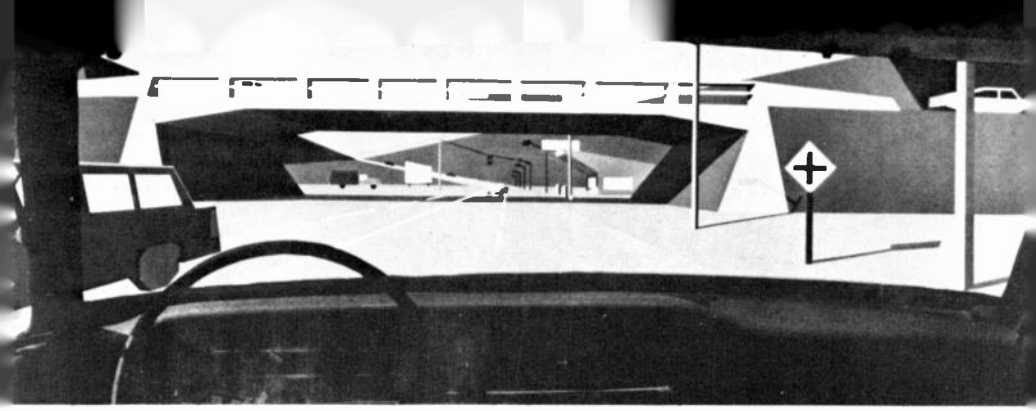
Art a la Computer

Is the era of romantically-inspired artists fading in favor of the computer assist? It certainly is in the case of 17-year-old Hendersonville, N.C., artist Lorna Frady.

She used a GE-235 computer to help her produce an eleven-foot-long painting called "Structural Exposition." It's presently on display at the State Department of Public Instruction at Raleigh (see photo).

"The computer makes art more objective," says artist Frady, who used a time-sharing terminal in a Winston-Salem school to prepare her work. She explains that every element of a structural painting is related to a specific number system. She chose the square root of five.

COMPUTER ARTIST LORNA



NEW APPROACH TO SAFER HIGHWAYS

AROUND THE COMPANY

Safer Highways: UCLA's Institute of Transportation and Traffic and the school of Architecture and Urban Planning are looking to the Company to determine how its computer-generated picture technique, applied to projects for NASA and the U.S. Navy (*The Monogram,* Sept. '66), can be a vital tool in highway safety research. The simulation technique, which includes computers programmed to display constantly changing traffic situations, should be potentially useful in analyzing a person's driving abilities. The UCLA study, being handled by Electronics Laboratory and Apollo Systems Department, Daytona Beach, is part of a contract assigned to the University by the U.S. Department of Transportation.

Pressing Plastics: The largest plastics-molding press ever built will soon be installed in a new 10,000-square-foot addition being constructed for the Plastics Laboratory in Appliance Park, Louisville. The 230-ton horizontal reciprocating screw press can exert pressures up to 36,000 psi. Expanding the Laboratory facility and equipping it with the giant molding press and new compounding machines will provide materials and process technology on new, proprietary polymers.

Contracts: Heavy Military Electronics Systems, Syracuse, has been awarded one of two competitive contracts by the U.S. Naval Ordnance Systems Command for the performance of a three-month study leading to the development of an advanced radar and infrared detection subsystem for an improved shipborne aircraft and missile defense system. Ordnance Systems, Pittsfield, working with HMES, will be responsible for the antenna subsystem.... Also in Syracuse, the Electronics Laboratory is under contract to NASA's Marshall Spaceflight Center to develop a special computer program for the most efficient and effective layout of various types of printed circuit boards.... Knolls Atomic Power Laboratory, Schenectady, has received a five-year extension of its prime contract with the Atomic Energy Commission. Since the first contract signed in 1946, KAPL has provided a variety of services

in the nuclear field for the AEC.

Add On: The U.S. Army Missile Command, Redstone Arsenal, Huntsville, Ala., has awarded a $5.2-million contract to Heavy Military Electronic Systems for additional anti-jamming improvement kits for High Power Acquisition Radar (HIPAR) used in the Nike-Hercules surface-to-air missile system. HMES has been producing HIPAR kits for the past 16 months under another contract.

Tops For TV: One of the world's most modern and best-equipped television studios has been opened at Electronics Park by the Visual Communication Products Department. The GE Telecenter will be used for color television lighting seminars, live demonstrations of the latest TV studio equipment and customer service schools. Studio lighting facilities include a broad range of Quartzline® lamps and a unique arena lighting simulation system developed by the Large Lamp Department at Nela Park. The arena lighting display permits customers to review and evaluate television camera performance while duplicating the many different lighting conditions they encounter in producing remote TV pickups.

LARGE-SCREEN DISPLAY

Milestone: In recent weeks the Housewares Division plant in Ontario, California, earned the distinction of turning out the 100-millionth iron, marking a once-in-a-lifetime milestone. The Company produced its first irons more than 64 years ago at a Pittsfield, Mass., plant.

Detecting Particles: The Company's Research and Development Center has announced a new technique for detecting exceedingly small loose particles that might sabotage the electronic systems of spacecraft, computers, or even some home appliances. By using a highly sensitive listening system during vibration tests, GE engineers can detect the sounds made by tiny droplets of solder or other bits of manufacturing debris bouncing around inside sealed electronic components. The quality control technique can also be used to locate loose wires or parts in an electronic assembly.

Crime Control: Law enforcement representatives from 15 nations are taking part in a seminar on advanced mobile two-way radio communications techniques at Communication Products Department, Lynchburg. When the 36 State Department guests return to their home countries, they'll plan, install, operate and maintain communications systems as a more effective element in crime control.

Grad News: Arizona State University and the Company have set up an engineering graduate course of studies that is expected to be a model for other university-industry programs. The course, which has five first-year students enrolled, features an integrated curriculum in math and physics; a mixed university and GE faculty; and a team design project replacing the master's thesis. The program was announced by Information Systems Equipment, Phoenix.

PEOPLE

Alert: "She prevented a week's shutdown of the Panama Canal," says a letter to the Instrument Department about BARBARA FROST, secretary in Order Service. E. L. LYONS, Marine and Defense Facilities Sales, Washington Office, wrote to PHIL SMITH, the Department's manager of marketing, about the alertness of Miss Frost. "She received an emergency call during vacation shutdown," he said, "and undertook to personally locate, walk through, package and air mail an absolutely needed probe nozzle for a leak detector. A vapor leak on a nuclear barge power plant could not be located without this equipment. The Panama Canal would have been without electricity if it had not been for Miss Frost's able assistance." Mr. Smith (shown in the photo) presented a special PRIDE citation to Miss Frost for her efforts.

Olympic Postscript: Among the returning U.S. Olympic medal winners was SUSIE SHIELDS, daughter of Refrigerator Department employee JOHN SHIELDS. Miss Shields received the bronze medal in the 100-meter butterfly event in Mexico City after overtaking world champion Aagje Kok of Holland in the final 25 meters.... Also at Mexico City were Outdoor Lighting Department's TERRY GIBBS and SHERRY KEETER, members of the Blue Ridge Mountain Dancers. The top folk dancing group was part of the Olympic cultural program.

Rare Pair: A citation from Massachusetts GOV. JOHN A. VOLPE and a ride in a limousine were among the special surprises marking Pittsfield employee

CITATION FOR MISS FROST

Keeping the Panama Canal open.

LAWRENCE J. LAMY's 50th anniversary observance. He started with the Company in 1918, and recalls seeing Charles P. Steinmetz visiting the plant as well as an era when there were noon band concerts at the plant. "I've been very happy with GE," he said recently, "I never missed a week's pay and the benefits program is wonderful." He'll retire next year.... Another 50-year employee is HARRY C. SHEPHERD, supervisor — Banking and Foreign Exchange, IGE Export Division, who retired recently among a flurry of well-wishes from fellow employees. Mr. Shepherd received a plaque from Vice President HOYT P. STEELE and a color television set to start his retirement off in style.

Honors: The newly-elected President of the American Vacuum Society is DR. JAMES M. LAFFERTY, manager of the R&D Center's Physics Laboratory. . . . DR. ROBERT H. DOREMUS, a physical chemist at the R&D Center, has been elected a Fellow of the American Institute of Chemists. . . . Evendale engineer and former Ohio State defensive end ROBERT

S. DORSEY, has received a Distinguished Football Alumnus Award from the National Football Foundation and Hall of Fame.... DR. HENRY MOROZUMI, an explorer, engineer and GE employee at Syracuse, has been named one of the Outstanding Young Men of America for 1969 and is included in the 1969 compilation of those men between 21 and 35 who have distinguished themselves in one or more fields. Dr. Morozumi is the same employee who had a mountain range named after him (*The Monogram*, February, '68) .... GENE E. BRADLEY, manager of International Government Relations, Washington, has received the second prize in the 1968 McKinsey Awards for his *Harvard Business Review* article "What Businessmen need to know about the Student Left."

Duo and Trio: There may be other twin sisters in the Company, but probably none who have chalked up the 25-year GE employment record of the Philadelphia Works' twin sisters RUTH SHAW and RUBY WILLIAMS. They came to the city from their hometown of Amherst, Va., and soon found General Electric jobs. Both have enjoyed their years with the Company, and, says Ruth, "I found all GE benefits especially good, but particularly the insurance. We both have had illnesses through the years and we've both been very pleased with the coverage." . . . Meanwhile, there may be a potential employee or three at General Purpose Motor Department, Fort Wayne, Ind., where employee HUBERT BRYANT and his wife SANDY became parents of triplets; Ronald, Tamara, and Michael. They already have two children. The family was covered by the GE Insurance Plan, but Mrs. Bryant's personal plan to return to work at General Electric has been shelved under the "press of business."

FORT WAYNE FOURSOME

Triplets make five; rather quickly.

Viet Vet: STEVE KOTSKI is a Pittsfield employee long on courage. The test helper at the Power Transformer Department was fighting in Viet Nam two years ago and suffered combat injuries that left him —at 19—a double amputee. Mr. Kotski spent six months in hospitals learning to walk again with the help of artificial limbs. He graduated from Cardinal Cushing Academy last June, was married in August, and started with GE in September.

IEEE Fellows: Six GE employees have been elected Fellows by the Board of Directors of the Institute of Electrical and Electronics Engineers: ALFRED F. H. BISCHOFF, information systems, Valley Forge Space Center; DR. ALLAN N. GREENWOOD, laboratory operation, Power Transmission Division; ROBERT P. HAVILAND, space systems organization; THOMAS I. PAGANELLI, Heavy Military Electronic Systems; HAROLD N. SCHNEIDER, high power laboratory, Philadelphia; WILLIAM W. BROWN, retired consultant, Syracuse.

NOW ICE AND WATER ON THE DOOR

PRODUCTS

Appliance Preview: The 1969 GE Major Appliance Line includes a completely new refrigerator convenience, an ice cube and chilled water dispenser on the door. Located on the outside, the Custom Dispenser feature automatically fills a glass with cubes or chilled water at a touch. The 23.5 cu. ft. Americana model, with a freezer capacity of 295 lbs., will be available in January. Among 25 other refrigerators and 10 freezers included in the '69 line are two new 19.1 cu. ft. side-by-side refrigerators, two 17.6 cu. ft. top-freezer models, and the line's first no-frost freezer with automatic icemaker. . . . Also for the kitchen, the new line introduces the single-oven Versatronic® range which offers the homemaker the choice of cooking the electronic way, the conventional way, or both.

. . . For the benefit of *Monogram* readers, mini-skirted secretary Patti Burke teamed up with Wayman O. Leftwich, general manager, Large Refrigerator Department, to show off the top of this year's line.

Dishwashing Wonders: In '69, GE will have a complete line-up of built-in and portable dishwashers that incorporate the Power-Flo System for increased efficiency and lower sound levels. The top-of-the-line built-in model, part of the new Americana Collection of appliances for the kitchen, comes with the exclusive Selecta-Level racks making it possible to wash odd-size china and cookware with a regular load of dishes. This five-cycle, two-speed model also features the Mini-Wash,® a short cycle for lightly soiled dishes that uses less water and detergent, and requires less time. Other dishwashers in the new line include: a deluxe front-load convertible model with a handsome solid cherry wood carving top; front-load portables with the "built-in" look; and top-load Mobile Maid dishwashers with two-speed Thoro-Wash action and five keyboard selected cycles.

Tune In, Turn On: The GE home laundry product line adds the new Versatronic, a washer which allows the homemaker to "tune in" any wash or spin speed combination ranging from hand wash to the strongest agitation, or any spin speed from gentle to normal. This washer has the Mini-basket for small loads of delicate items. GE's '69 line also includes a new, popular-priced programmed washer that requires only the press of a button to have the right combination of wash action, spin speed, and wash and rinse temperature for every fabric.

Bigger 'N Better: Hotpoint's first 40-inch cabinet and drop-in self-cleaning oven models debut as part of the 36-model line of cabinet, drop-in, and slide-in electric ranges for 1969. New wall oven models this coming year include three additional 24-inch self-cleaning units. In range hoods, Hotpoint now has available a new line of three 30-inch and five 36-inch models.

ORGANIZATION

Appliance and Television

A Refrigerator Products Division is established and Stanley C. Gault is appointed General Manager.

An Air Conditioning and Group Support Division is established, and Joseph H. Gauss is assigned responsibility. The Refrigeration and Air Conditioning Division is discontinued.

A Kitchen Appliance Division is established, and Donald W. Lynch is assigned responsibility. The Kitchen Appliance and Home Laundry Division is discontinued.

Hicks B. Waldron is appointed Deputy Division General Manager—International Appliance and Television Operations.

Air Conditioning and Group Support

The organization of this newly-established Division includes the following components: Central Air Conditioning Department, Stanley A. Gorski, General Manager; Room Air Conditioner Department, Willis E. Forsyth, General Manager; Louisville Relations and Utilities Operation; Group Legal Operation; Group Purchasing Operation; Group Industrial Design Operation; Major Appliance Laboratories; Organization and Manpower Operation; Business Planning Operation.

Bull-General Electric

Jean V. Danet has been appointed General Manager of Bull-GE Greece.

Chemical and Metallurgical

A Membrane Products Operation is established.

Contractor Equipment

W. Blake Miller is appointed General Manager of the Distribution Assemblies Department.

John S. Macdonald is appointed Consultant to the General Manager, Distribution Assemblies Department.

James P. Curley is appointed General Manager of the Circuit Protective Devices Department.

Charles P. Hayes is appointed Consultant to the General Manager, Circuit Protective Devices Department.

Executive

The following have been elected Vice Presidents of the Company by the Board of Directors: Donald W. Lynch, Lester E. Pankonin, and Donald E. Perry.

Home Laundry

The organization of this Division includes the following components: Automatic Dryer Department, George P. Welch, General Manager; Automatic Washer Department, Jack J. Clarke, General Manager;

WILLIS E. FORSYTH GEORGE P. WELCH

RICHARD BLOCK

RICHARD O. DONEGAN

PHILIP J. DRIECI

WAYMAN O. LEFTWICH

Home Laundry Components Business Section; Specialty Home Laundry Marketing Operation; Business Planning Operation.

Information Systems

Richard M. Bloch is appointed General Manager—Advanced Development and Resources Planning Division.

Kitchen Appliance

This newly-established Division includes the following components: Consumer Range Department, Richard O. Donegan, General Manager; Contract Range Department, A. Melcher Anderson, General Manager; Dishwasher and Disposall Department, William R. Hull, General Manager; Range Components Department, Norman W. Kirschke, General Manager; Business Planning Operation.

Refrigerator Products

The organization of this newly-established Division includes the following components: Consumer Refrigerator Department, William B. Clemmens, General Manager; Contract Refrigerator Department, Philip J. Drieci, General Manager; Large Refrigerator Department, Wayman O. Leftwich, General Manager; Refrigerator Components Department, John A. Berges, General Manager; Technical Resources Operation; Specialty Refrigertion Marketing Operation; Chicago Relations Operation; Business Planning Operation.

WILLIAM R. HULL

NORMAN W. KIRSCHKE

LETTERS

(Continued from inside front cover)

hand getting in the way of the minute hand, but this defect was easily repaired.

WILLIAM A. THOMAS
South Egremont, Mass.

General Electric College Bowl

(NBC-TV, Sundays, 6:00 p.m. Eastern Time)

Participants: January 5—Swarthmore College (Pa.); January 12 — Augustana College (Sioux Falls, S.D.); January 19 — Oklahoma State University (Stillwater, Okla.); January 26—Cornell University (Ithaca, N.Y.); Case Western Reserve University (Cleveland, Ohio).

EDITORIAL

Keeping Things Moving

MODERN MAN has developed amazingly efficient modes of transportation to whisk him virtually anywhere at his leisure. Motorcar and superjet are symbols of our mobile society. Freedom of movement is assumed.

Our issue this month contains both encouragement and awesome warning about our transportation systems, present and future. Cleveland's rapid transit is a reality, but elsewhere such modernized urban transit isn't appearing. Cars remain king in most of our cities. New highways pave over taxable land, sometimes slicing communities in two. Average driving speeds on city streets are slowing to the horse-and-buggy level. Airport approaches clog. Air pollution increases.

Are we approaching the day when everything stops? That question was posed recently by a national magazine in an issue that examined our highway building spree and air traffic jams together with possible solutions.

Man must learn to manage and plan transportation if his urban clogged arteries are to be opened again. But he must recalibrate his thinking from patchwork here and there to the basic systems challenge of moving *people*.

Solutions will require the creative contribution of industry, but there must be a strong desire on the part of our nation, our governments, and our communities to face up to the needs.

Before everything stops.