Station News

Georgia Tech Engineering Experiment Station

VOLUME 8 NUMBER 7 NOVEMBER 1979

Less Is More

A barrel of oil saved is as good as a barrel produced — and cheaper too.

Georgia Tech has been doing its part to contribute to the national goals set by President Carter to reduce foreign oil dependency. Even before these goals were set, Tech reduced energy consumption in its own facilities. A campus-wide conservation program reduced the Institute's annual energy bill by nearly 20 percent and saved more than $300,000 a year.

Tech conducts a wide variety of projects that assist schools, hospitals, local governments, industries, and building contractors in conserving energy. One of the most extensive of these projects is a four-year Industrial Energy Extension Service (IEES) that seeks to reduce the projected 1980 energy requirements of Georgia's industrial community by 10 to 20 percent.

Bill Moran, chief of the energy conservation division of the Technology Applications Laboratory, says, "As of today, we're saving Georgia's industries over 4.25 million barrels of oil per year, or at current oil prices, about $60.5 million. The program, which began in 1977, is running way ahead of its 1980 savings goals."

EES homeowners can do their part too by getting "Tips for Energy Savers," a 30-page booklet put together by the Department of Energy describing ways to save energy and dollars at home. This and other publications are available from ENERGY, P. O. Box 62, Oak Ridge, Tennessee, 37830.

Energy Study Heats Up LaGrange

LaGrange, Georgia, a medium-sized middle Georgia town, is setting an example for industrial energy users who have problems and want to solve them. At the suggestion of the LaGrange Industrial Authority, a study has been undertaken by a research team to see if the 507-acre LaGrange Industrial Park can meet its own energy needs with alternative fuels.

The Department of Energy has funded a team of engineers from EES, Sverdrup and Parcel Associates, and the Georgia Forestry Commission to consider the park as a model industrial site that could

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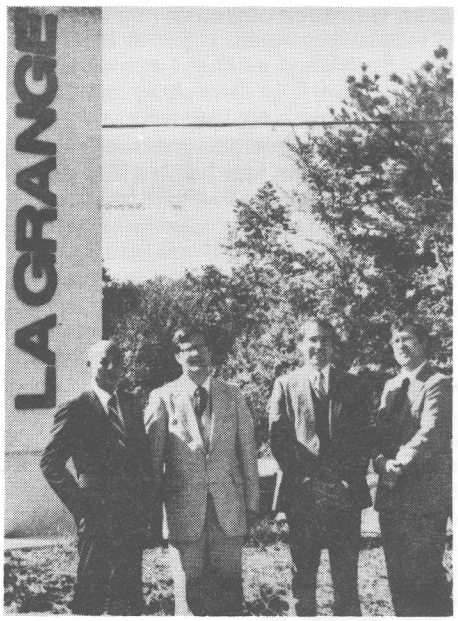


Plans were announced recently to study the use of alternate fuels and energy self-sufficiency for the LaGrange, Georgia industrial park. Research team members on hand for the announcement were (L-R): Jim Hamilton, head of the LaGrange Industrial Authority, David Wade, EES Energy Research Laboratory, Jerry Birchfield, EES Senior Staff, and Wayne Hodges, EES West Georgia Area Office.

STELSON CONSIDERED FOR DOE POST

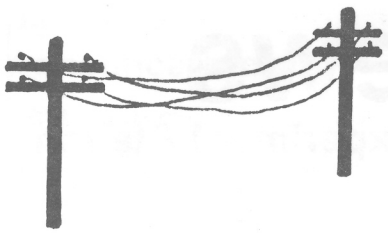
Tom Stelson, vice president for research at Tech, is being considered for a high-level post with the U. S. Department of Energy (DOE). Stelson has been asked to take a position with DOE as assistant secretary for conservation and solar energy, a post proposed by Energy Secretary Charles Duncan. Under a reorganization plan, that position will carry the added responsibility of directing the DOE programs in solar energy research, as well as demonstration and commercialization.

Stelson, who has guided a large energy research effort here at Tech, has not officially accepted the position but regards the job as a challenge. If he is appointed and approved by the senate, he will take a one-year leave of absence from Tech.

He is a member of the Energy Research Advisory Board of the U. S. Department of Energy, a member of the Board of the Southern Solar Energy Center, and Science and Technology Advisor to Governor George Busbee of Georgia.

"Secretary Duncan's primary goal is one of energy conservation," Stelson said. "Half of the energy consumed in the U. S. is in the form of oil. Half of that oil is imported. To end foreign oil imports, Americans would have to cut energy use by 25%. That's a tough job."

"But it's not impossible," Stelson went on to say. "It would require a new realization by the public of the importance of conservation — some people still do not believe that there is an energy crisis at hand."



Station to Station

I've been giving a lot of thought to the importance of our keeping in better touch with each other, not just in terms of factual information, but in terms of strengthening a truly remarkable organization. Our own daily activities are important — participating in planning and decision-making, being recognized and appreciated for what we've accomplished — but having an awareness of others' contributions to the success of EES is equally as important. As the Station continues to grow in staff size and diversity of its locations, I think all of us need to make a special effort to be better communicators.

We're now housed in five different areas on campus, without counting the newly-acquired O'Keefe School, slated to be ready for occupancy in the first quarter of 1980. To round out the greater Atlanta area, there's also the Cobb County Facility, the C&S Tower, and the Atlantic Steel Building. Now add eight Field Offices, and the Warner-Robins group to our Georgia locations. The Operations Office in Huntsville, Alabama, is quite close, compared to our new Asia Office in the Philippines, manned by Ross Hammond. And there's continuing discussion about participating in the development of a major R & D Center in Ireland.

One step in the right direction toward better communications was a visit by Dr. Stelson and myself to the EES Huntsville Office earlier this month, at the invitation of J. W. Dees and Jim Schuchardt. There are now 11 staff members permanently stationed there, with projections calling for the number to be doubled in six months. We found them to be grappling with a familiar set of problems, like office space, administrative red tape, and recruiting; at the same time, the sponsors told us how pleased they are with the technical quality, dedication and enthusiasm these people are providing.

Other current efforts to improve communications from the Station Director's office include the new edition of our "picture book," showing all of EES staff by organizational affiliation. The booklet, due off the presses soon, should help us associate unfamiliar names and faces. We're planning to make more use of laboratory coordinators for interaction with the Service Groups and in performing the professional recruiting function. I'm in the process of appointing EES representatives to provide direct liaison with individual Academic Schools and Departments. An ad hoc Professional Staff Development Committee is being asked to evaluate and propose revisions to our program in this important activity.

It's difficult to use this column for communication when it only flows in one direction. You can help close the loop by writing an informal note to me (319 Hinman Building), calling me (3400), or by sending your comments via your supervisor if you prefer.

Are there other steps you would like me to consider for improving and expanding positive interaction among our staff? What can you do about it yourself?

Donald J. Grace

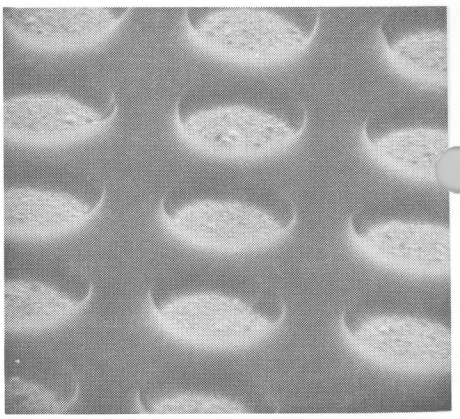
STAAC Spells Relief: SE Manufacturers Get Help

Any firm in the eight-state southeastern region which has been damaged by imports, or which is in danger of being damaged by imports, can find help through the Southeastern Trade Adjustment Assistance Center (STAAC) established at Tech by the Economic Development Administration (EDA) of the U. S. Department of Commerce.

Firms which have suffered declining sales, losses in production, or employee layoffs because of imports can call on the Economic Development Laboratory's STAAC full-time staff of specialists, the Area Office Staff of the Industrial Extension Division, plus a wide range of multi-disciplined consulting experts available through Tech to help solve specific company problems.

Most of the firms seeking assistance are small, less than $10 million in sales, and much of the assistance has been related to the formulation of marketing and financial strategies. Bob Springfield of EDL reports that Tech has worked successfully with 61 firms in the 8-state region, securing assistance totaling about $6 million. Springfield said, "Most of these companies would have gone broke without our help. When we begin to look closely at the firm's position in relation to imports, we uncover many other problems that the firms must clear up to regain a good position."

In September, STAAC participated in the American Apparel Manufacturers Association Bobbin Show at the World Congress Center. Sallie Daniel, Dan Kemper and Katy Martinson of EDL and Larry Haddock of Southern Tech were on hand during the show at the STAAC booth to talk with industry representatives informally about the Tech program.



This micron mixer diode array, photographed with the help of a scanning electron microscope, appears as a mere speck when examined with the naked eye.

Tech Opens Doors in Philippines

10,000 miles away from home, Tech researchers are setting up shop to help developing countries solve a whole host of problems relating to industrial development and technology transfer.

Gerry Hein, director of the Engineering Extension Laboratory, has announced that as of September, Georgia Tech has an office located at the University of the Philippines in Manila.

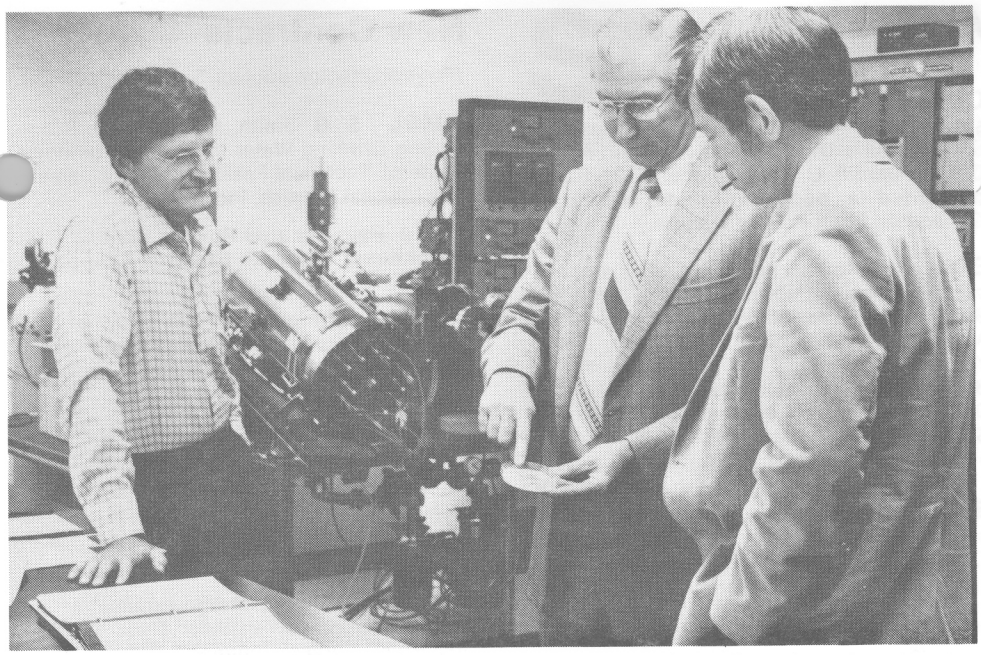
EES conducts a number of programs in Asia and Hein says the new office will make it easier to supervise current programs and open up new opportunities for industrial extension.

As head of the new office, Ross Hammond will oversee operations involving more than a million dollars of research work including a pyrolysis project in the Philippines where rice hulls are used to produce gas and charcoal, various water pumping projects in Indonesia, and an industrial extension project in Korea.

The U. S. Agency for International Development, the United Nations Industrial Development Organization and the Korea Credit Guarantee Fund provide most of the funding for these projects.

CORRECTION:

In the last issue it was stated that the Systems Engineering Laboratory would conduct all of the Station's electronic defense system work, including that done by RAIL. In correction, electronic defense work is done by all of the electronics laboratories and SEL has taken over certain portions of that work previously done by RAIL and STL.



(L-R) Earl Meeks, Gordon Harrison and Walter Cox examine a sample of a semi-conductor layer less than a micron thick grown in the EML Solid State Sciences Division Laboratory.

Probe the Life of a Cell?

Someday scientists may be able to look into the private life of a single cell using probes a hundred times smaller than the width of a human hair. The development of microstructure science — the understanding of structures with dimensions of a micron or less — is well underway at Tech.

On October 11, Georgia Tech researchers who have addressed microstructures separately — in different schools and in EES laboratories — gathered in the Electrical Engineering Conference Room. The purpose of the meeting was to address microstructure problems collectively and to look at the opportunities of an interdisciplinary approach to further research in this area.

Gordon Harrison, the conference organizer, said, "There is an enormous amount of interest here in the Tech research community and in the electronics industry in developing microstructure fabrication techniques." Harrison added, "A new interdisciplinary program could push existing microstructure research into dimensions less than a micron."

Harrison, Walter Cox, Jimmy Hubbard, Dale Covington, and Billy Livesay represented EES at this initial meeting. Cox felt response to the conference was favorable, indicating that those who attended welcomed the opportunity to discover the full extent of microstructure research on campus.

Tech's microstructure research programs in EES, the School of Physics, the School of Chemistry, Electrical Engineering, and Chemical Engineering have focused primarily on studies of surfaces of micron and submicron dimensions.

Using ion implantation, for example, researchers can aim and fire tiny supercharged particles at a target surface. The particles penetrate the surface and totally change the surface characteristics of the target. Soft metals can become hard, metals with "rough" surfaces can become frictionless.

Units of measure smaller than a micron are called angstroms. Tech researchers hope to develop electronic circuitry at the angstrom level. As the dimensions get smaller, the need for more sophisticated equipment at Tech will increase, however.

In the Solid State Sciences Division of EML, the growth of semiconductor layers has been controlled down to a thickness of 200 angstroms using a molecular beam epitaxy system. It is difficult to see objects less than 200 angstroms in size — like biological cells in living tissue, which vary in size from five to 10 angstroms. With advanced electron beam lithography techniques and equipment, researchers might design and build circuitry 100 times smaller than that on the market now.

This means that we might build a calculator or watch parts a hundred times smaller than the present, or include 100 times more circuitry.

Harrison says that the major holdup to progress at Tech is in the cost of instrumentation. An electron beam lithography system costs in the neighborhood of $1,000,000. Tech could develop a limited capability by modifying one of several scanning electron microscopes on campus for less than $50,000.

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LaGrange

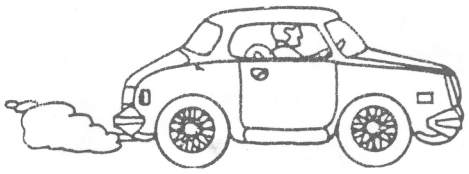
(continued from page 1)

be adapted to an integrated energy system. The system would produce energy from a location in or near the park, providing all or part of the electrical and heating needs of the industrial clients. Jerry Birchfield, EES Senior Staff, David Wade, Energy Research Laboratory, and Wayne Hodges, EES West Georgia Area Office, will represent Tech on the research team.

Manufacturing operations in the LaGrange area are heavily dependent on natural gas, propane, and fuel oil. It is hoped that as a result of this study the LaGrange park will be able to break away from these expensive, dwindling fuels, and use instead, renewable resources like wood, or coal, an abundant natural resource.

Tons of what could be referred to as "energy wood" are wasted in the forests and lumber mills all across the state. The DOE study will provide specific data on waste wood availability and probable costs associated with its gathering, transportation, and storage in the West Georgia area.

Researchers will also examine the cost effectiveness of burning garbage and coal to generate energy in the event of a temporary shortage of wood.



Two's Company, Three's a *Carpool*

Start your own carpool to and from work!

These folks sent in their names and addresses because they're interested in cutting the cost and the strain of driving long distances to work. Contact them at the numbers listed. Send us your name, number, route, and any other information (smoking/non-smoking, type of car) and we'll print it in the next issue.

Dee Ramunno, 894-3400. Area: Norcross, near Peachtree World Center of Tennis.

Jane Holley Wilson, 894-3195. North DeKalb Mall, 5 passengers, 8-4:30, M-F.

Ken Smith, 894-3806. Doraville to Atlantic Steel Bldg. off 16th Street daily via Buford Highway. Non-smoking.

Betty Coburn, 894-3120. Kennesaw via I-75, Chevrolet Monte Carlo, 4 passengers, non-smoking, 8-5, M-F.

Ray Moore, 894-3444. Newnan via I-85, 5 passenger sedan, non-smoking, 8-5, M-W-F.

Jackie Erney, 894-3444. Midtown-Durant Place, 3 passengers, smoking, 8-5, M-F.

Personnel Announcements

CSTL Fred Cox, III, a recent graduate of Tech's School of Information and Computer Science joined CSTL as a Research Scientist I in the Robotics Branch.

CSTL also welcomes LaVern Daniel, secretary, Computer Applications Branch; Seeta Deljoo, secretary, Software Research Division, and Judi Gilbert, secretary, Software Applications Division.

EML T. P. Morton has been transferred from RAIL to EML/RSD. EML has hired A. R. Davis, as a Research Engineer I, M. L. Foster, as a Research Engineer I, L. T. Schaefer, as a Research Engineer I (Huntsville Operation), and Cheryl Barnett, as a Secretary.

Marilyn Huber, Administrative Secretary, recently left EML to go with her husband who has been transferred to Chicago.

Pictured recently at an Economic Development Laboratory housewarming are David Clifton, director (L) and George Dodson (R). Clifton welcomed staffers to EDL's new headquarters in the Atlantic Steel Building and bade farewell to Dodson who is leaving EES to join the U.S. Air Force Regional Civil Engineering Eastern Division.

ETL John K. Daher, Research Engineer I, is working in the Electromagnetic Compatibility Branch with Hugh Denny. Daher came from Dayton, Ohio, after finishing his BEE degree at the University of Dayton.

John O. Battle, Research Engineer II, is working in the Communications Systems Branch with Richard Moss. Battle worked at Chrysler Corporation in Huntsville, Alabama before coming to Tech.

RAIL Margaret Reimer began work recently as a Graduate Research Assistant.

Michael Jackson and Charles Wilcox have joined the staff as co-op students.

Otto Rausch and Jim Matthews are back working with RAIL again.

SEL James V. Thomas with the Countermeasures Division recently married Debra Maggi.

STL Antonio L. Gunther, Sr. joined the Division as an Electronics Technician I.

Laurie Chambers, Supply Services, recently wed Kerry Nickerson.

Awards/Presentations:

CMSL Mahendra Bery was invited to speak at the First International Symposium on Anaerobic Digestion held at University College Cardiff, U. K. September 17-21. Bery presented a paper entitled "Methane Generation From Poultry Manure."

EDL Judi Komaki and Bob Collins organized a symposium, "Better Business Through Behaviorism," for the meetings of the American Psychological Association, New York, in September. During the symposium Bob and Judi presented a paper, "Behavioral Definition and Improvement of Customer Service in Retail Merchandising," describing a recently sponsored project.

EEL J. D. Walton was invited to attend a special U. N. conference on energy held October 25-28 in Virginia. The conference, sponsored by the Stanley Foundation, commemorated the twentieth anniversary of the Strategy for Peace U. S. Foreign Policy Conference.

EML R. W. Bird and J. M. Welch recently attended the First Annual National Conference on Recent Advances in Microcomputers, "Focus on 16-Bit Microprocessors," in Columbia, South Carolina. The purpose of this conference was to present examples of the new 16-bit microprocessors, support devices and development systems.

Jim Stratigos was interviewed recently by WSB-TV meteorologist Alan Eustis about Tech's participation in high altitude, severe storm research programs sponsored by NASA. During the interview, which was aired on the 6 o'clock news, Stratigos described the millimeter wave radiometric sensors which will be involved in a series of flight tests aboard the B-57 aircraft this fall. Researchers will be seeking data on hurricanes in the Caribbean while flying at 60,000 feet.

ERL Dave Wade and Ben Trammell presented papers at the Central Chilled Water and Heating Plant Conference - 1979 at Syracuse University, on August 21-23. Wade spoke on "District Heating for the Community of Piqua, Ohio" and Trammell presented "Power Plant Options for Cogeneration in a District Heating System."

SEL The Flight Crew of the Countermeasures Division has completed a group of field tests. H. W. Andrews is the Project Director; H. Calloway, Pilot; J. Moore, Co-Pilot, and Dusty Rhodes, Electronic Specialist.

STL Cliff Burdette was invited to participate in a two-week advanced study opportunity to be held at the University of East Anglia, Norwich, England, from July 23 through August 4, 1979. The study was concerned with theoretical methods for determining the interaction of electromagnetic waves with biological structures.

RAIL Jerry Eaves and Ed Reedy presented a paper at the 1979 Military Electronics Exposition in Anaheim, California, October 23-25. Gene Knott's paper "The Thickness Criterion for Single-Layer Radar Absorbents" was published in the September issue of IEEE Transactions on Antennas and Propagation.

New Contracts

(Project Director, Subject, Sponsor, Funding)

CMSL S. B. Smith, Iodinator for Disinfecting Drinking Water in Small Community Systems-Technical Feasibility Study, Jameson Medical Plastics, Inc., $29,338.

C. J. Ray, Uncured Powder Coating Film Thickness, General Electric Company, $21,450.

CSTL J. Scoville, Feasibility Study, Testing, Report, and Cost Estimates for Industrial Facilities Management System, General Electric Company, $8,500.

L. P. Elam, Data Communication Link for Remote Interactive Graphics, General Electric Company, $16,404.

J. E. Doss, PDP-11 Software Modifications for Pennwalt Anode Motor Control System, Cadre Corporation, $18,700.

EDL D. S. Clifton, Intergovernmental Personnel Assignment — Collier, Department of the Army, Forces Command HQ Engineer, $26,556.

J. C. Muller, Proposal to Fabricate a Prototype Plastic Umbrella Tip Mold, Atlanta Umbrella Company, $927.

EEL R. W. Hammond, Science & Technology Mission-Bangladesh, United Nations Educational, Scientific, and Cultural Organization, $2,581.

EML J. A. Stratigos, Global Atmospheric Measurements Experiment on Tropospheric Aerosols and Gases (GAMETAG), National Science Foundation, $229,000.

ERL T. F. McGowan, Development of an Updraft Wood Gasifier, Tennessee Valley Authority, $19,997.

ETL B. M. Jenkins, Investigation of Cardiac Pacemaker Responses to a 450 MHz Environment, Intermedics, Inc., $4,500.

RAIL J. A. Scheer, 95 GHz Radar Measurement Program, Standard Elektrik Lorenz AG, Stuttgart, West Germany, $48,320.

SEL D. C. Flowers, Evaluation of Monopulse Angle Deception Countermeasures, Analytic Services, Inc., $349,917.

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