

Station News

Georgia Tech Engineering Experiment Station

Volume 13 Number 2

September 1982

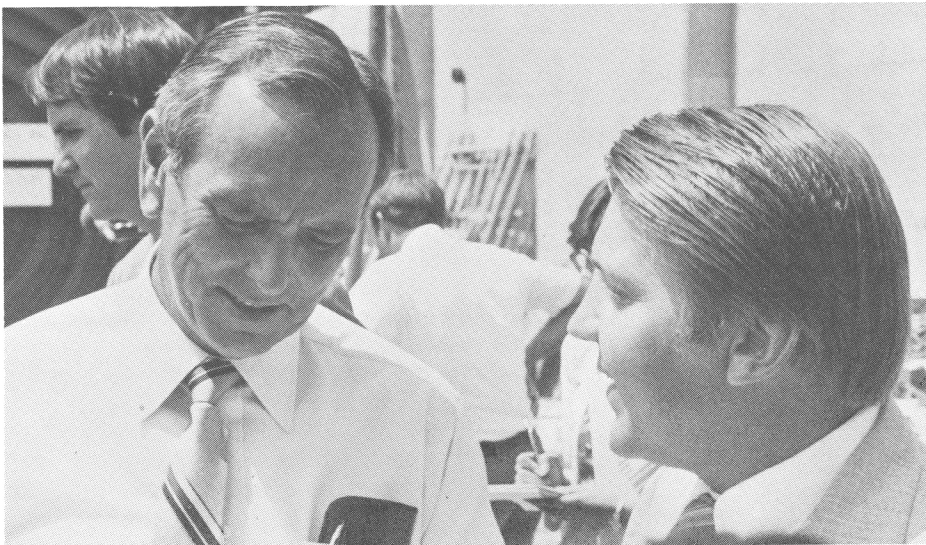
New Firms Try Wings

Two spin-offs from EES electronics research are among the first fledgling firms to be helped by the Advanced Technology Development Center (ATDC). David Ladd, formerly of the Radar and Instrumentation Lab (RAIL), is president of Pulsetek, a producer of modulators and power supplies for microwave and millimeter wave transmitting tubes. Dennis Kozakoff, formerly with the Electromagnetics Lab (EML), is president of Millimeter Wave Technology, Inc., a producer of low-cost antennas and components. Both men have resigned from EES to devote full time to their enterprises.

Pulsetek will develop and build a line of pulsed modulators and power supplies for the Varian Canada Microwave Division. They will be used with Varian's extended interaction oscillators and amplifiers (EIOs and EIAs), which are high-power millimeter wave devices used in radar systems.

The new company resulted from four years of R&D work at RAIL, during which Ladd did the innovative design for and helped build 14 EIO and EIA modulator units. "We were able to achieve good radar performance, precise control, and reliable operation," said Ladd. "We also managed to reduce the size of the pulse-type modulator greatly — from standard relay rack size (larger than a filing cabinet) to a 7" x 7" x 12" box. Our work developed the design to the point that it can now be marketed as a standard product."

Ladd says he could not have started his company without the help of ATDC, which enhanced the firm's stature with Varian. "ATDC also has arranged for us to rent specialized



An antenna manufactured by Millimeter Wave Technology, Inc., an EES spin-off, was displayed at Governor George Busbee's August 26 press conference, held on the ATDC complex construction site. Here, Governor Busbee (left) congratulates company president Dennis Kozakoff (right).

equipment at EES (on a limited, noninterfering basis) for use in manufacturing the modulators, and I am grateful for this support from EES."

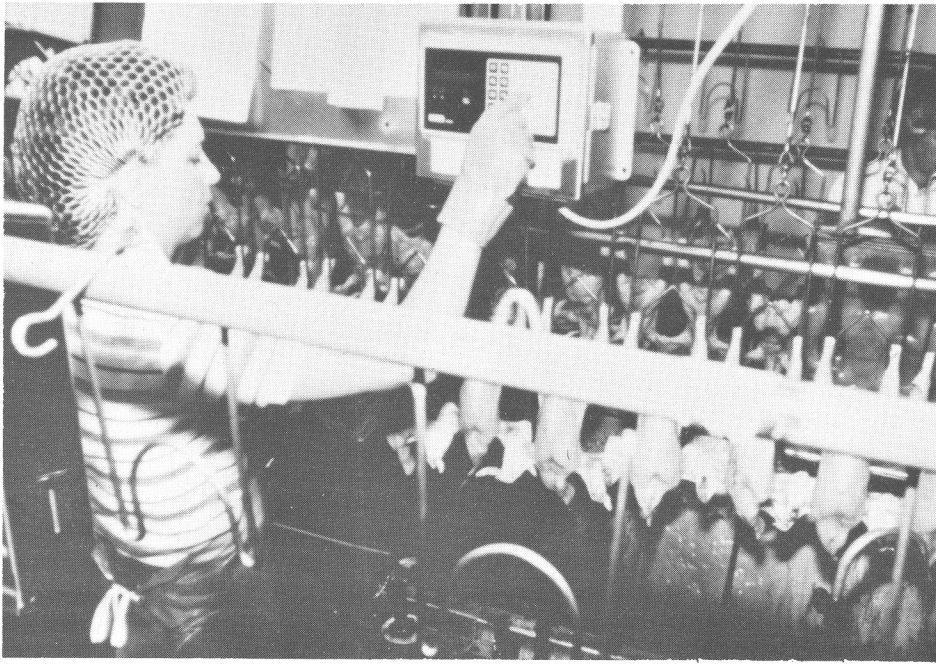
Millimeter Wave Technology, Inc.'s new low-cost antenna fabrication technique may make it possible for the average American family to have its own backyard earth station antenna to receive TV channels directly from space satellites. Kozakoff estimates that the design, which is based on the Fresnel zone plate concept, could reduce antenna cost to less than one half that of a conventional parabolic aluminum reflector. The antenna is flat rather than curved, so there is less material to fabricate. It is molded of a series of concentric styrofoam rings to which a metallic coating is applied, rather than being made entirely of metal, so it is much cheaper to build and much lighter in weight. The 10-foot diameter (3.5 to 4.2 GHz) TV antenna weighs about 120 pounds.

Kozakoff is developing other versions of the new antenna concept, including a 1-foot diameter radar anten-

na for commercial aircraft and a 6-inch diameter antenna for missile guidance. The smaller antennas also have numerous potential applications in communications and television, according to Kozakoff.

"We also plan to bring other high-technology products from the laboratory to the marketplace," Kozakoff said. "Our work on millimeter wave integrated circuits and related devices could launch a new millimeter wave industry around Georgia Tech, much as development of the digital integrated circuit spawned the Silicon Valley industrial empire about Stanford University in the 1960s."

Kozakoff praises ATDC for its guidance to Georgia Tech entrepreneurs in avoiding conflicts of interest. He sees ATDC as the link that joins the complementary roles of the university as innovator and industry as implementor. Best of all, by helping in-house entrepreneurs to commercialize Georgia Tech research developments, ATDC is keeping the economic benefits of Georgia's mindpower at home.



A worker on the chicken eviscerating line at Mar-Jac Poultry uses the electronic condemned bird reporting system designed by engineers in EES' Technology Applications Laboratory.

TAL Counts Chickens After They Hatch

The chicken is Georgia's number one agricultural commodity, and engineers in the Technology Applications Lab (TAL) are working hard to keep it that way. Under the guidance of the Georgia Poultry Federation, TAL engineers work with farmers and industries to solve difficult technical problems affecting production efficiency and profitability. The primary source of funding is the Georgia legislature.

One of the hottest of TAL's current poultry projects is an electronic poultry inspection system. The poultry processing industry is highly mechanized and automated, but makes very little use of computers. "In view of the fact that the industry operates under high volume and low profit margin conditions," said agricultural researcher Larry Moriarty, "we were surprised to find that virtually no production control systems are available to processors. We took an informal poll of Georgia poultry processors, and the single most requested item was a system that would automate the reporting of condemned birds.

"Of the approximately 150,000 birds that a typical plant processes each day, about 1% (or 1,500) will be rejected. Some are diseased or have other defects chargeable to the grower. Others are condemned because of mishaps during processing,

such as overscalding. Birds condemned for grower-related problems are charged back to the grower, while the plant-caused rejects are absorbed by the plant. In addition, the U.S. Department of Agriculture requires daily reports on all rejected birds. All this requires a fairly complicated record-keeping operation which is now done manually. It usually takes at least one day to tabulate the data, which means that a lot of birds can be ruined by defective or out-of-adjustment machinery before the problem is detected."

Moriarty designed a computerized condemned bird reporting system that provides plant management with up-to-the-minute information so problems can be corrected right away. At any time, detailed data can be displayed or printed on birds condemned on the eviscerating line, total plant status, summaries on each grower, and line stoppage summary.

A prototype system has been operating at Mar-Jac Poultry in Gainesville for six months and is being modified to incorporate suggested changes and improvements. Several other companies want to install similar systems. Moriarty currently is querying poultry equipment manufacturers to see who would be interested in manufacturing and marketing the system commercially.

STATION TO STATION

It's been quite a few months since the previous appearance of this column, despite my best intentions to use it as a greatly needed medium of communication. The subject this time is better relationships through better understanding.

As many of you know, Bill Howard conducted bilateral interviews to examine the interactions between labs and service groups. The results of these discussions have already been shared. More recently, at your request, he extended the effort to include my office and the Office of Contract Administration. The results of these interviews will be exchanged soon.

Meanwhile, the results of the HEMI/GOLD questionnaires which most of you filled out have now been distributed to the work group leaders (lab directors, director of services, and myself). We will be meeting with you soon in a number of re-

Professional

ELECTRONICS & COMPUTER SYSTEMS LAB

On August 26, **Larry Becker**, **Mark Morgan**, and **Ed Shanahan** demonstrated their work with the U.S. Army Forces Command (FORSCOM) intelligence user's group to 85 engineers at Fort Belvoir, Virginia. The presentation, sponsored by the Topographic Group of the Army Mobility Equipment Research and Development Command, highlighted intelligence analyst support by computer application programs on a microcomputer.

ENERGY & MATERIALS SCIENCES LAB

Hans Spauschus presented a paper entitled "Factors Affecting Reliability of Hermetic Compressors" at the Purdue Compressor Technology Conference, held July 21-23.

OFFICE OF THE DIRECTOR

Jerry Carey has been elected a national director of the Association of Old Crows. An article by Carey and **Bud Sears**, SEL, on "C³CM Modeling and Simulation" appeared in the July issue of the *Journal of Electronic Defense*.

TECHNOLOGY APPLICATIONS LAB

At the 17th Intersociety Energy Conversion Engineering Conference in Los Angeles on August 12-13, **Michael Brown** and **Tom McGowan** presented a paper on "Alternate Fuel Gas Turbine Cycles," and **Bill Bulpitt** and **Jerry Birchfield** presented a paper entitled "Overview of Worldwide Biomass Energy Potential and Applications."

Jim Walsh has been appointed chairman of the American Society for Testing of Metals Subcommittee E44.12 on Biomass Conversion Systems.

view sessions to discuss and understand your responses. Even more important is the next step of preparing action plans for each group, for the group leader, and for the institution to follow in achieving selected improvement goals. Every staff member has an important role to play in this process of introspection and constructive change.

Still another related effort will be under way shortly. Every decade, Georgia Tech undertakes a self-study, and 1982 is the year. We've been given an eight-page list of questions to consider, ranging from long-range plans to use of facilities, which is due to be completed by mid-December. Inputs from all elements of EES will be needed.

I earnestly solicit your enthusiastic participation in all of these efforts to make the Station an even better place to work and grow.

Donald J. Grace, Director



Freeport Kaolin Company of Gordon, Georgia, was the first firm to join Georgia Tech's Corporate Liaison Program. Here, Campus Liaison Officer Gordon R. Harrison (center) presents a plaque recognizing charter membership to Freeport executives Paul H. Bacon (left), vice president and general manager, and John T. Williamson, president.

Activities

Chuck Ross gave a paper on "Evaluation of Alternate Energy Technologies for a Southeastern Dairy" at the June 27 meeting of the American Society of Agricultural Engineers at the University of Wisconsin in Madison. Coauthors were **Rich Combes** and **Ralph Lamade**.

At the Southeastern Poultry Processors Workshop in Atlanta, **Larry Moriarty** presented a paper on "The Future of Computer Applications in Processing Plants," and **Craig Wyvill** read a paper on "Noise Control in Processing Plants."

A paper on "Heat Recovery for Hatcheries," presented by **Mike Smith** at the Poultry Processors Workshop in Birmingham, Alabama, also was published in the August 2 edition of *The Poultry Times*.

LuAnn Rockett made a presentation on the Industrial Energy Extension Service program to the Energy Committee of the Georgia Textile Manufacturers Association in Atlanta on August 3.

Carol Aton made three presentations on high technology at the State Vocational In-Service Conference on August 3-6 in Atlanta. She also spoke on "Job Opportunities in High Technology" at the Vocational Sex Equity Summer Training Conference on St. Simons Island on July 12.

Ginny Thomas spoke on "High Technology Implications for the High School Instructor" at the Atlanta Public Schools Annual Vocational Education In-Service Conference, speaking on August 10 to vocational education teachers and administrators and on August 26 to math and science teachers.

EES Gains From Corporate Liaison Program

EES is \$19,475 richer, thanks to the Corporate Liaison Program (CLP). Individuals and laboratories earned the money by assisting industrial members of the program. The total amount allocated to all campus units was \$37,700.

"All EES laboratories received some money, based on the number of projects they have listed in the directory of current research at Georgia Tech which we distribute to corporate members," said Gordon Harrison, coordinator of the Corporate Liaison Program. "In addition, whenever an individual provided assistance, both he and his lab were credited with revenue sharing points. The number of points you can earn ranges from 1 for supplying a reprint of a paper or other information to 12 for chairing a CLP seminar or visiting a member company. If you bring in a new member, you get \$1,000 (1/20 of the initial membership fee)."

The amount of money to be distributed was determined by prorating the membership fees according to the number of months each company had been in the program through June 30, 1982. In the future, funds will be distributed every six months. Of the industry's \$20,000 membership fee, 50% goes to the participating academic and research units, 20% to assisting faculty/staff members, and 30% to cover program costs.

These funds are set aside in a special account within the Georgia Tech Foundation, Inc. They may be used by the unit heads and staff members as unrestricted funds to support their professional responsibilities.

"We're pleased that during our first year we were able to sign up seven members and get a pledge from another firm to join when the economy improves," Harrison said. "The paid members include General Dynamics Corporation, Lockheed Corporation, TRW, Inc., Combustion Engineering, Freeport Kaolin Company, Russell Corporation, and a Japanese firm, TDK Electronics Company. Other companies are visiting the campus regularly to discuss the program with our Office of Corporate Relations."

Harrison stressed the added potential for research contracts growing out of EES interactions with industry through the Corporate Liaison Program. One such contract is under negotiation now.

The Corporate Liaison Program is an activity of the Office of the Vice President for Institute Relations and Development, and Vice President Warren Heeman and Assistant Vice President Dell Sikes have devoted a great deal of time to launching the program. A new man on the team is Jim Osborne, who came to Tech September 1 to serve as Director of Corporate Relations.

Laboratories Welcome Numerous New Employees

ELECTRONICS & COMPUTER SYSTEMS LAB

ECSL welcomes three new employees: **John P. Rohrbaugh**, research engineer I, who is returning after a year in Ohio; **Robert W. Baggerman**, research engineer I, a former student assistant; and **Norman D. Ellingson**, senior research associate, who moved here from Washington, D.C.

ENERGY & MATERIALS SCIENCES LAB

EMSL has created two programs ofices to develop new programs and coordinate across functional lines: Defense Programs Office, headed by **John Handley**, and Industry Programs Office, managed by **Wally Shakun**. It continues to have three divisions. **Tom Starr** has been named acting chief of the Material Sciences Division; **Bob Cassanova** is chief of the Solar Energy Division; and **Zenon Redkevitch** is chief of the Bioengineering Division (formerly Biomass Conversion).

OFFICE OF THE DIRECTOR

Barbara Neshvad and Larry Turner were married on August 28.

RADAR & INSTRUMENTATION LAB

Neal Alexander has been appointed manager of the new Special Projects Office, to handle large multidisciplinary, multi-unit projects.

SERVICE GROUPS

Accounting: **Luci Herndon** has transferred to Geophysical Sciences.

Instrumentation/Calibration: **Reid Boswell** is a new electronics technician I.

Mechanical Services: **Minnie Lou Green** has resigned.

Research Property Management: **T. Kay Buswell** has replaced **Sophia Masenburg** as senior secretary.

Research Security: **Edward Gilmore** has been hired as a security specialist.

Supply Services: **Lynn Brown** has left to work for her husband.

SYSTEMS & TECHNIQUES LAB

The Defense Electronics Division welcomed **James M. Cox, Jr.**, senior research technologist; **Mark Krah** and **John L. Estes**, research engineers I; (Ms.) **Jerry Phelps**, electronics technician II; and three electronics technicians I: **Kerwin Harold**, **Sandy Sheffield** and **Rebecca Abel**. It also congratulated cop **Tim Lewis** on the birth of a daughter, Virginia Autumn.

SYSTEMS ENGINEERING LAB

SEL is bursting with new employees. In the Defense Systems Division, new research engineers I are **Gary W. Holladay**, **James P. Sporn**, and **Guy A. Primiano**; **Larry R. Qualls** is a research engineer II. Concepts Analysis Division

welcomed Senior Research Engineers **Roy V. Miller**, **Donald J. Imsand**, and **William R. Hensley** (Eglin Field Office), Programmer III **Jane P. Batson**, Artist **Judith A. Wiesman**, and Research Engineer I **William T. Weatherford**. New to the Electronic Support Measures Division are **Steven C. Abel**, drafter, and **Louis H. Richardson**, systems analyst. **Bryan V. Gantt** is a research engineer I in the Countermeasures Development Division. **Donald J. Lewinski**, senior research engineer, transferred from RAIL to the Electronic Support Measures Division. **Steven L. Stilley** resigned from the Eglin Field Office.

Congratulations to **Joe Harris**, who was married to Terri Welch on September 11, and to **Gary Sanders**, who will be married to Connie Brader on October 2. Welcome to Kathryn Louise Marks, born on September 2 to Mary and **Jim Marks**.

TECHNOLOGY APPLICATIONS LAB

In the Energy Conservation Division, **Wesley Pidgeon** is a new research engineer I, and **Rick Steenblik's** transfer from EMSL has been made permanent. **Queen E. Buford** is TAL's new administrative secretary. **Bill Larson** has rejoined the International Division. **Keith Nelms** is the new associate editor for *Station News*.

Army Under Secretary Visits EES

For more than 15 months, the Command and Control Branch of the Electronics and Computer Systems Lab has been attempting to convince military agencies that commercially available off-the-shelf technology can do what the Department of Defense (DoD) often attempts to build on its own. Appreciating the approach propounded by the EES engineers, the U.S. Army Forces Command (FORSCOM), headquartered at Fort McPherson, funded a one-year effort to train soldiers in the use of Apple microcomputers and to explore their potential applications in tactical military command, control, and intelligence decision-making situations.

The success of this program and the need to decide between extended funding of this approach versus the usual DoD approach led to a visit to Georgia Tech on August 20 by the Under Secretary of the Army, James R.

Ambrose. Project Director Edward J. Shanahan, Jr., briefed Dr. Ambrose on the project's goals and tasks. Demonstrations of several fundamental developments, including data base management, video disc/computer interfacing, interactive graphics, and telecommunications, were conducted by Larry Becker, Steve Randolph, Mark Morgan, and Grant Wagner.

The success of the program has prompted the Department of the Army to fund a seven-year program, called MicroFix, to exploit the use of microcomputers and commercially available technology in a use-learn-develop approach to add as a near-term fix a minimum automated intelligence capability to tactical units. The Command and Control Branch of ECSL, headed by H. Bennett Teates, will continue to support FORSCOM as its principal technical agency for system management and software development.

Station News

Vol. 13 No. 2

September 1982

Published monthly for employees of the Engineering Experiment Station, Georgia Institute of Technology, Atlanta, Georgia. Georgia Tech is a unit of the University System of Georgia.

Editor

Martha Ann Stegar 3405

Graphics

Gerald K. Webb 3405

Associate Editors

Dee Ramunno, OOD 3400

Anthony DeCurtis, EDL 3844

Gail Tucker, EML 3500

Gayle Hudson, ECSL 3542

Charlotte Sanders, EMSL 3460

Ginny Gross, EMSL 3589

Maggi Harrison, RAIL 424-9621

Janice Manders, SEL 3519

Cindy King, STL 424-9647

Keith Nelms, TAL 3412

Molly Bell, Service Groups 3445