Station News

Georgia Tech Engineering Experiment Station

Volume 14 Number 4 November 1983

RAIL Helps Army Build New Lab

The Radar and Instrumentation Lab (RAIL) has a new $3.5-million contract to help the U.S. Army design and implement a Non-Cooperative Target Recognition (NCTR) facility at Fort Monmouth, New Jersey. The laboratory will comprise a measurements range with a turntable of 30 tons capacity; six radar test beds, including both ground-based and air-platform radars; in-field data reduction and analysis equipment, including two data collection vans; and an off-line analysis facility configured around a VAX PDP 11/780 mainframe.

The lab's mission will be to generate, reduce and analyze ground target data for development, implementation and evaluation of target recognition systems. It will be part of the Combat Surveillance and Target Acquisition Laboratory of the Army's Electronics Research and Development Command.

Project Director Marvin Cohen said the six-month planning and equipment-ordering phase is just getting under way. For the remainder of the three-year program, RAIL will establish an on-site group to direct installation of the laboratory. It is hoped that this will lead to other contracts and a long-term EES field office at Fort Monmouth.

EML Office Supports Army Missile Lab

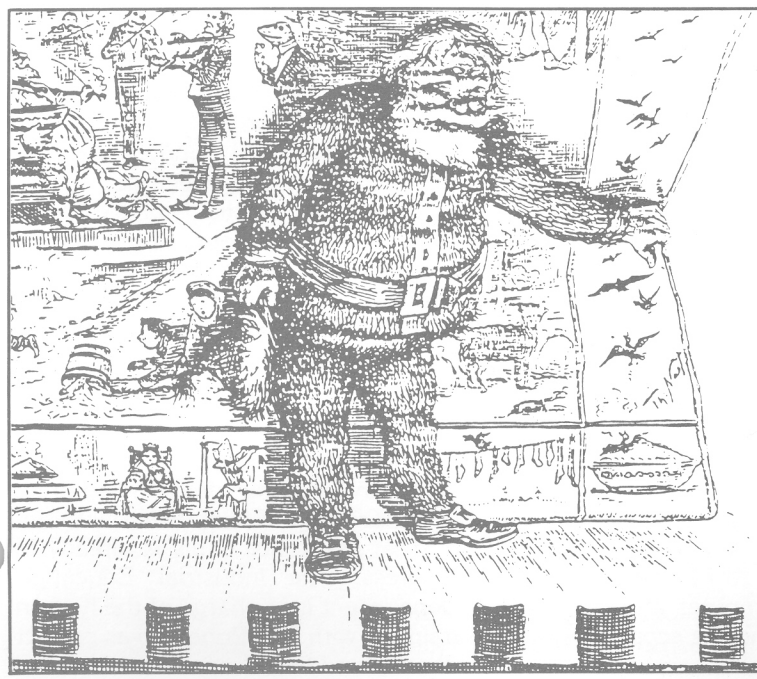
It is common knowledge that EES has a field office in Huntsville, Alabama, but not many people are aware of its size. The Huntsville Operations of the Electromagnetics Laboratory (EML) has approximately 40 employees—15 engineers plus 25 co-op, part-time and secretarial personnel—stationed at the U.S. Army Missile Command (MICOM).

The group is involved in developing and running computer simulations of missile systems. They also test these computer models against actual flight test data and hardware-in-the-loop simulation results. The hardware-in-the-loop tests, which involve energizing actual missile hardware as part of the simulations, are run in three simulators in the Advanced Simulation Center at MICOM.

The first and largest of these simulators is the Radio Frequency Simulation System (RFSS), where hardware-in-the-loop simulation is used to evaluate active, semiactive and passive homing missiles. The illustration shows the multilevel RFSS facility and a sketch of an engagement scenario being simulated in the RFSS. The target array (large circled area in the drawing) is 40 feet in diameter and contains 550 RF antenna horns.

The other MICOM simulators currently being used by EES employees

(See "Huntsville," page 2)



Presenting for your holiday entertainment . . .

The EES Christmas Parties!

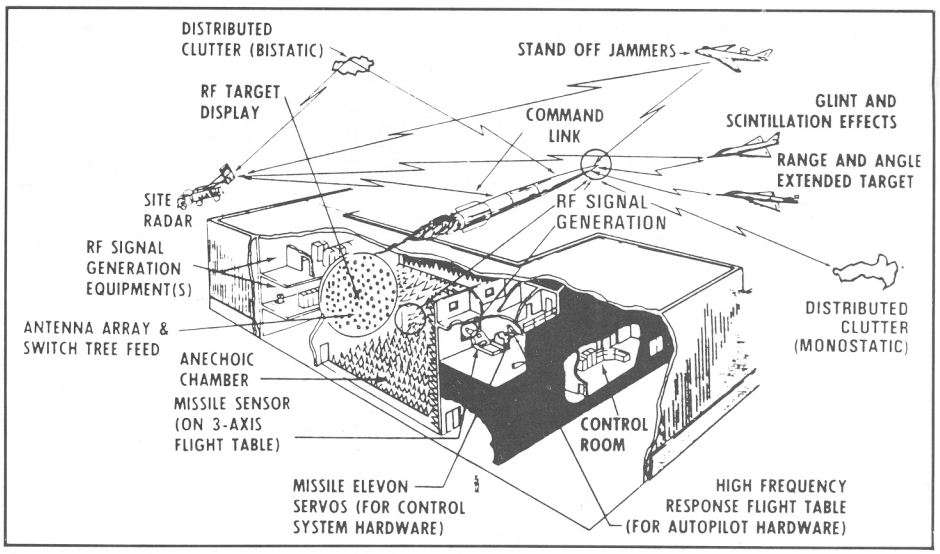
Tech Campus Party
O'Keefe Building Cafeteria
Thursday, December 15
3:00 to 5:00 p.m.

Cobb County Party
Building 1 Auditorium
Friday, December 16
3:00 to 5:00 p.m.

Huntsville *(From page 1)*

are the Infrared Simulation System (IRSS) and the Electro-Optical Simulation System (EOSS).

Through the data compiled from the hardware tests, EES personnel have developed computer simulations which are now being used to evaluate both components and whole missile systems. In the future, as these computer simulations are refined and validated against hardware-in-the-loop simulations and flight tests, they will be used to a greater extent since they cost less than the other two tests.



An engagement scenario is simulated in the Radio Frequency Simulation System with missile hardware in the loop. (Drawing courtesy of U.S. Army MICOM)

Thermite Research Sparks Interest

Kathryn ("Kaycee") Logan is setting off fireworks in her laboratory in the basement of Hinman these days and getting spectacular results. She and her student assistants in the Energy and Materials Sciences Lab (EMSL) are using a thermite reaction to produce a great deal of heat in order to synthesize refractory materials.

The particular material that is the object of Logan's research is titanium diboride. It currently is available as a powder that can be sintered into small shapes by hot pressing, but this method is very expensive.

The advantage of the thermite process is that it takes inexpensive powdered materials—titanium dioxide, boric anhydride, and aluminum—and heats them to a relatively low temperature by means of a hot wire or furnace to start the thermite reaction. This reaction produces the desired titanium diboride plus aluminum oxide (corundum). Ideally, the reaction produces sufficient heat to melt the TiB_2 and Al_2O_3 (3000°C), allowing the two materials to be separated. This self-sustaining combustion process is rapid and relatively inexpensive.

"EMSL's research is funded by the Army Materials and Mechanics Research Center as part of its liaison with industry in an effort to produce harder refractory materials," Logan said. "The process has considerable potential commercial impact. For instance, aluminum companies are interested in the production of such materials for use in the aluminum smelting process."

The Army contract is a direct result of efforts by J. D. Walton, who retired from EES in June but is advising on the project as a consultant. It resurrects work that Walton directed in EES's old Ceramics Branch in the late 1950's.

Harrison Wins National Old Crow Award

Joe Harrison, manager of the Eglin Field Office of the Systems Engineering Lab, has won the National Association of Old Crows Test and Evaluation Medal for 1983. He received the award at the national AOC convention, held November 1-3 at Virginia Beach.

Harrison won on the basis of his significant contributions to the test and evaluation of electronic warfare equipment for more than a decade. The citation stated: "His achievements have favorably impacted every EW system either in operation or development at this time. His endeavors have repeatedly improved the Department of Defense's ability to perform better tests in a more timely manner."

From 1969 until his retirement from the Air Force in 1982, Harrison directed hundreds of EW tests at Eglin Air Force Base and Wright Patterson Air Force Base. At EES, he is working to combine computer modeling with testing to expand the scope of system evaluation.

Korean Educators Study at Tech

The Technology Applications Lab (TAL), in cooperation with the Republic of Korea's Technical Education Research Institute, is conducting a professional training program for members of Korea's higher education community. The program is designed to give participants an overview of technical/vocational training from an industrial perspective.

Roughly 40 Korean college professors from several engineering disciplines arrived in mid-October for three months of training. Although a number of Georgia higher education groups will be involved in the different phases of training, they will spend most of their time at TAL. Laboratory staff members will conduct sessions on such topics as electrical energy management, waste heat recovery, boiler management, information retrieval, energy conservation, and audiovisual techniques in technology transfer. Participants also will visit a variety of local industrial facilities.

This is the second major training program currently administered by the International Programs Division of TAL. An ongoing program to train Egyptian technical specialists in industrial assistance skills is already in progress. The Industrial Education Department is in charge of the Korean training, with Ben Roberson as project director and Mac Davis as coordinator.

EES Gains Two More Research Leaders

Dr. Donald W. Lyons and Dr. Josh T. Nessmith have joined EES under the Senior Research Faculty Leadership Grant Program sponsored by the Vice President for Research.

Dr. Lyons has joined the EES/OOD senior staff as a principal research engineer. He will develop research programs and sponsored support focusing on the application of advanced technologies in traditional industries.

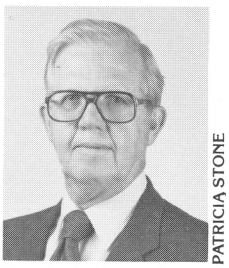
"We will look at such industries as textiles, food processing, and metalworking, which are the traditional major sources of industrial employment in Georgia and the Southeast," Lyons said. "Our research will emphasize identifying new technologies and high-tech developments, then extending or adapting them for installation into the manufacturing processes of these industries." In this effort, he hopes to work cooperatively with the many groups at Tech with already established programs of industrial research and technical assistance.

For the past two years, Dr. Lyons has been technical director of the Federation of Norwegian Engineering Industries, identifying new manufacturing technologies available in the U.S. for licensing or purchase. He was professor of textile science and mechanical engineering at Clemson University for 14 years.

Dr. Nessmith has joined the Radar and Instrumentation Lab (RAIL) as a principal research engineer. He will plan and direct sponsored research in the field of tracking sensors.

He will direct his initial efforts toward extending current capabilities in obtaining metric and phenomenological data with active and passive sensors operating in the microwave, millimeter and optical portions of the electromagnetic spectrum, either singly or in combination. The research will focus initially on defining and solving the measurement problems encountered in high-stress environments. This research is expected to bring together some of the diverse skills and technologies that have been, and are being, developed in RAIL and EES.


PATRICIA STONE
Dr. Donald Lyons


PATRICIA STONE
Dr. Josh Nessmith

Dr. Nessmith comes to EES from RCA in Moorestown, New Jersey, where he was systems engineering manager for more than 15 years, as well as deputy program manager of the R&D phase of the AEGIS Program. Most recently, he served as senior scientific advisor.

Professional Activities

ECONOMIC DEVELOPMENT LAB

Sherman Dudley (Industrial Extension Div.) recently spoke at an Economic Development Conference sponsored by Congressman Lindsay Thomas and the Southeast Georgia Chamber of Commerce Council. His topics were "The Importance of Existing Industry in Economic Growth" and "Motivating the Community for Economic Development."

Three members of the Southeastern TAAC staff gave presentations at the national Trade Adjustment Assistance Center Conference in Boulder, Colorado, September 19-21. **Bob Springfield** spoke on "A Simulated Adjustment Plan Review Committee Session," **Charles France** on "Determining Direct Labor Losses and Productivity Improvement Potential in an Apparel Manufacturing Environment," and **Bill Plouffe** on "Plant Layout and Determining a Firm's Equipment Needs." Springfield was reelected to the National Steering Committee for Trade Adjustment Assistance.

Edwin Bethea has been chosen a distinguished alumnus of Knoxville College. He will be honored at the 9th Annual Conference of the National Association for Equal Opportunity in Higher Education in Washington, D.C. About 300 graduates of historically black institutions will receive awards.

Paul Middendorf, Mike Luster, Phil Williams and **Ken Smith** have written a paper entitled "Noise Exposure: Action Level Criteria as a Predictor of the Permissible Exposure Level Criterion" which will appear in the December issue of the *American Industrial Hygiene Association Journal.*

An article by **James Burson** and **William Spain** on selecting personal protective equipment was published in the September issue of *Occupational Health and Safety.*

Presenting papers at the Southeastern Annual Meeting of the American Chemical Society were the following: **Marilyn Black,** "Chromatographic Analysis of Reduced Sulfur Compounds" (coauthor) and "Formaldehyde Monitoring Using Classical Techniques and Solid Adsorbent Collection"; **Nancy Zakraysek,** "Personal Exposures Following Applications of Pesticides for Termite Control," coauthored by **Marilyn Black, Phil Williams,** and **Ken Smith; Charlene Bayer,** "Comparison of Extraction Techniques for Priority Pollutants by GC/MS Analysis."

ELECTROMAGNETICS LAB

A paper by **Dave Schmieder** and **Marshall Weathersby** entitled "Detection Performance in Clutter with Variable Resolution" was published in *IEEE Transactions on Aerospace and Electronic Systems.*

ELECTRONICS & COMPUTER SYSTEMS LAB

Ron Seaman was the site coordinator for the IEEE Atlanta Section's recent short course, "Robot Sensing and Intelligence," taken via satellite transmission at Lockheed-Georgia. Seaman is vice chairman of the Atlanta Section.

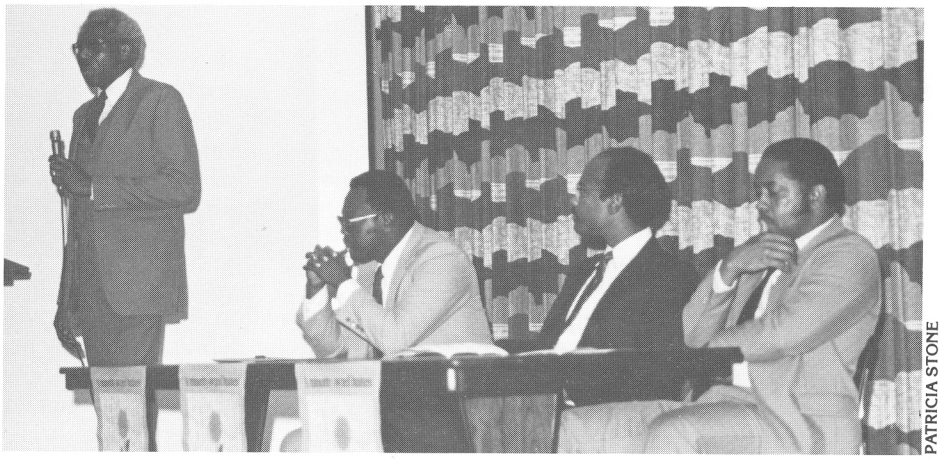
ENERGY & MATERIALS SCIENCES LAB

Jim Hubbard was a guest lecturer for an asbestos continuing education course at the University of South Carolina on October 25. He spoke on materials testing and clearance testing.

RADAR & INSTRUMENTATION LAB

Arch Corriher was Local Arrangements Chairman of the 1983 IEEE Professional Communications Conference held in Atlanta October 18-21. He and **Celeste Millen** (Library) presented a paper entitled "Computerized Databases as Sources of Business and Technical Information." He also chaired a session.

The IEEE Aerospace and Electronics Systems Society has invited **Josh Nessmith** to continue to serve as national vice president of technical operations for 1984.



PATRICIA STONE

EES helped Atlanta observe national Minority Enterprise Development Week in October. Among several activities at Georgia Tech was this panel discussion conducted for the student chapter of the Society of Black Engineers. Participants (L-R) were Ed Bethea, director of EDL's Technology Utilization and Commercialization Center (TUCC); Frank Brown, director of EDL's Rural Assistance Program (RAP); Calvin Espy, a Tech graduate and president of an Atlanta company that manufactures a plant-care product which he invented; and Columbus Sanders, president of a small engineering design and electronics manufacturing firm in Huntsville, Alabama. The U.S. Minority Business Development Agency has named Mr. Sanders the Minority Businessman of the Year for Manufacturing in the Southeast. Both men are clients of TUCC and RAP.

Strictly Personal

ECONOMIC DEVELOPMENT LAB

John Warden joined the Business Development Division in October as a senior research associate to work in the Trade Adjustment Assistance Program.

ELECTROMAGNETICS LAB

Huntsville Operations: **Tom McFadden,** research engineer II, has a new daughter, Courtney, born October 18.

Susan Elm and **Keith Blanton** are new research scientists I in the Electro-Optics Division.

OFFICE OF THE DIRECTOR

Fred Dyer has been assigned to OOD as a senior staff member, although he will maintain his office in the Electronics Research Building.

RADAR & INSTRUMENTATION LAB

RAIL held its annual "Pig Out" by the lake at the Cobb County Research Facility in October. **Sam Thomas** camped out overnight to roast a pig for the get-together the following day by RAIL employees and their families. Special thanks also are due **Bob Trebits** and **Joe Lindsey** for their contributions to a successful event.

Melanie Luke is the new word processor operator in the Analysis Division, replacing **Sandra Saxon,** who was promoted to administrative secretary.

New employees in the Instrumentation & Measurements Division are **Donna Puckett,** word processor operator, and **Scott Wearn,** research engineer I.

The Development Division has gained **James Sanders,** reseach engineer II, and **Lamar Gostin,** research technologist I.

Joining the Modeling & Simulation Division were **Bruce Brownlee** and **Allen Cochrane,** senior research engineers; **Roland Stebbins,** research engineer II; and **Pamela Blalock** and **Julie Huitt,** research scientists I.

Elaine Martin, Jim Ussailis, and **Eric Sjoberg** have resigned.

Other promotions include **Bruce Lavers,** electronics technician III; **Beverly Hutchinson,** research associate I; and **Mike Baden,** research engineer I.

SYSTEMS & TECHNIQUES LAB

Four employees received promotions in October: **Kevin Thomas,** electronic technician; **Frank Lee,** mechanical designer; **Tana Gurley,** administrative secretary; and **Teresa Brown,** word processor operator.

Consuela and **Alex Morrison** have a new son, David Michael, born October 20, and Annette and **Rickey Cotton** have a new daughter, Jenny Elizabeth, born October 15.

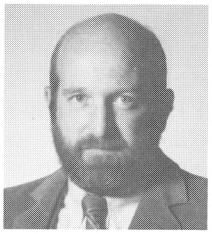
S&TL said good-bye to **Gary Simpson, Robin Parks,** and **Lawrence Cail.**

SYSTEMS ENGINEERING LAB

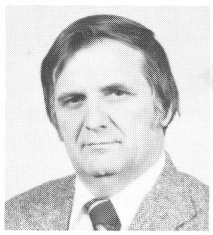
Lee Edwards has been appointed head of the Advanced Programs Office and **Tom Miller** has been named chief engineer for SEL.

Welcome to **Patricia Page,** senior secretary, and **Mark Linebarger,** programmer II. **Gary Sanders** has resigned.

Fred Cox is the proud father of a new baby girl—Emily.



Pat Burns



Joe Parks

Staffers Achieve IEEE Senior Grade

Two senior research personnel of the Systems and Techniques Lab—C. Patrick Burns and Joe K. Parks—have been elected to senior membership in the Institute of Electrical and Electronics Engineers. Only 10% of the membership have attained this grade, the highest professional level for which application can be made.

Burns is chief of the Microwave Systems Division. He has 15 years experience in designing and testing radar antennas and developing new antenna measurement techniques.

Parks is chief of the Defense Electronics Division. He has more than 10 years experience in microwave antenna and ferrite design and holds three patents on ferrite devices. He also is an attorney and a member of the State Bar of Georgia.

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