

Station News

Georgia Tech Engineering Experiment Station

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Cueing Device For War Games

The Army soon may play its war games more realistically, thanks to a device developed by the Radar and Instrumentation Laboratory (RAIL) that simulates effects of indirect mortar and artillery fire.

The device mimics the smoke, noise and explosive signature of the impact of indirect fire projectiles, but with none of their destructive effects. It will be used primarily to cue soldiers to incoming rounds during war game maneuvers. Ultimately, the RAIL cueing system will allow gunners and forward observers to participate fully in practice maneuvers in which the use of live ammunition is unacceptable.

The cueing device is a small pneumatic cannon which launches harmless rounds and has a range of up to 230 yards. In field exercises, the devices are placed much closer to battlefield targets than the actual artillery.

"In a war game setting, artillery gunners would aim at targets several miles away and fire off blank rounds," explains Project Director **Robert Michelson**. "Then a computer would cause the cueing device to deliver a harmless cue at the same spot and time in which the real round would have hit."

When the cue hits ground, its impact corresponds to that of a served tennis ball. Exploding, it resembles a small smoke bomb with an associated flash of light and audible bang. The smoke, however, is nothing but chalk dust, and the flash/bang combination is nondestructive.

RAIL has successfully built and demonstrated the feasibility of a manually operated version of the artillery fire cueing device for the Army.

(Continued on page 4)



Don Alexander, Physical Plant, and John Scoville, ECSL, inspect part of the Facilities Management System they helped develop to reduce energy consumption on the Georgia Tech campus.

Raytheon Will Market GIT Facilities Management System

Georgia Tech's efforts to transfer its computerized energy management technology to industry have taken a large step forward with agreement by Raytheon Service Company to modify and market the GIT Facilities Management System (FMS). Raytheon will adapt and sell the system for such applications as college campuses, military bases and shopping malls.

EES engineers designed and developed the FMS in collaboration with Physical Plant personnel. The main function of the combined hardware/software system is to conserve energy, and it has—an average of 35% so far. But it also protects against fire and theft with alarms connected to the campus police station. A central minicomputer keeps records and displays the performance of each

building, which is independently controlled by its own microprocessor.

Large buildings such as O'Keefe and Baker are in the system now," said Physical Plant's **Don Alexander**, "and seven more are being added."

According to **John Scoville** of the Electronics and Computer Systems Lab (ECSL), who spearheaded development of the Tech system, "The system's advantages are that it's a relatively low-cost installation, provides a high degree of reliability, and is not complicated to operate and maintain."

Under terms of the agreement, Raytheon is commissioning ECSL to modify and improve the system to meet all the specifications of the Army, Navy and Air Force for their energy management and control systems.



Alford Named STL Director

Samuel T. Alford is the new director of the Systems and Techniques Laboratory (STL), replacing **Robert M. Goodman, Jr.** He had been acting director since July 31.

During his 12 years at EES, Alford has risen steadily from R&D group manager, to division chief, to program office manager, and has been associate director of STL since 1977. As manager of the "S" Program Office, he has been responsible for large programs involving threat radar systems. He previously managed a multimillion-dollar effort to develop specific radar simulators for the XM Program Office.

Alford received both a Bachelor of Electrical Engineering degree (with highest honor) and an M.S.E.E. from Georgia Tech.

EMSL Achieves Solar "First"

For the first time anywhere, a Stirling engine and generator unit has been used to convert solar energy into electrical power, with the power being fed to a commercial utility grid, according to **Doug Neale** of the Energy and Materials Sciences Lab. This first is the result of a joint program by Georgia Tech and United Stirling of Sweden.

EMSL's solar site crew evaluated a United Stirling P-40 engine with alternator at the DOE Advanced Components Test Facility during August. The solar receiver for the engine consisted of a standard United Stirling heater head assembly designed for a fossil-fuel combustor inside a

refractory-lined cavity of Georgia Tech design. They first supplied 440-volt, 3-phase power to the utility grid on August 12, realizing output in excess of 7 kilowatts.

United Stirling is fabricating a modified heater head assembly especially for solar thermal applications. This version will be evaluated at EES.



EES Appoints Carey

EES has a new associate director, Major General **Gerald J. Carey, Jr.**, (USAF, Retired).

For the past three years, Carey has been Commander of the Tactical Air Warfare Center at Eglin Air Force Base, Florida. There he managed a full spectrum of new technical areas, including air-to-air missile guidance and control, chemical defense, and jam-resistant communications. Previous experience includes participation in implementing new technologies in the Air Force Systems Command.

Commented EES Director **Don Grace**: "We're delighted that on retiring, General Carey has elected to start a second career with EES. We plan to capitalize on his proven strengths in the planning process and management of interactive programs. His strong background in electronic warfare and command and control suggests specific areas where he will want to get involved, but we hope he'll become active in other programs as well, such as energy and development of management information systems."

Carey received a master's degree in aeronautical engineering from Texas A&M University and a B.S.A.E. from the USAF Institute of Technology. He is a member of Tau Beta Pi, Sigma Gamma Tau, and the American Institute of Aeronautics and Astronautics.

EDL Studies Prevention

By Anthony DeCurtis, EDL

An ounce of prevention may be worth a pound of cure, but somehow we never worry about prevention until we need the cure. Cures no longer come cheap, however, and that's where **Judi Komaki** and **Bob Collins**, behavioral psychologists in the Economic Development Laboratory (EDL), enter the picture.

They are directing major research projects designed to save tax dollars by improving the preventive maintenance (PM) techniques of large public organizations.

Komaki is now completing a three-year study exploring personnel aspects of maintenance in the Marine Corps. Her analysis of the existing system at Camp Lejeune, North Carolina, revealed many problems typical of PM programs.

"Maintenance is invisible; it produces no tangible product. Inspected vehicles look exactly the same as ones that haven't been inspected," Komaki points out. "Besides, nothing much happens when maintenance isn't done. Defects don't show up for months, or even years. As a result, PM performance is difficult to measure and, not surprisingly, no acceptable measures of PM were found at Camp Lejeune."

Like most organizations, the Marine Corps tended to express its concern with

Staff Member

ECONOMIC DEVELOPMENT LAB

Judi Komaki read a paper, "Towards Conquering the Criterion Problem," in an "Issues in Training Research" symposium at the annual meeting of the American Psychological Association in Los Angeles in August.

ELECTROMAGNETICS LAB

Joseph G. Jay and **Michael Rowan** presented a paper on "Geoprocessing Applications in Two Local School Systems" and a slide presentation on geoprocessing/remote sensing research at Georgia Tech at the 1981 Urban Regional Information Systems Association Conference.

ENERGY & MATERIALS SCIENCES LAB

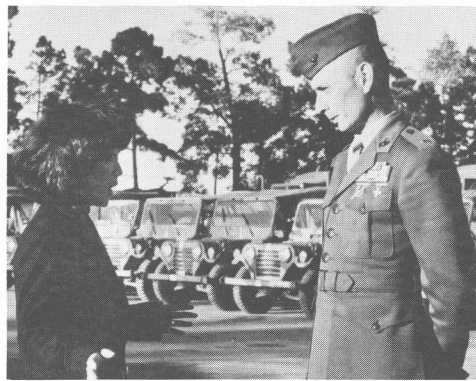
At the Electron Microscopy Society of America meeting held in Atlanta in August, **John Brown** presented a paper entitled "Electron Microscopy in Physical Sciences." **Jim Hubbard** was local arrangements chairman, and

ive Maintenance

PM more in rhetoric than action. On-line personnel would be vilified when equipment went down, yet when work schedules got tight, PM assignments would be the first the men were told to drop. Maintenance, in effect was deemed important only in time of crisis.

Because downtime is not an appropriate measure of PM performance (equipment could fail due to faulty design, for example), Komaki designed a system to measure how often Marines completed their assigned PM tasks. To motivate the Marines to complete these tasks more often, she instituted a feedback program. Graphs were posted so that the men could see how they had done. The result was sustained improvement, as much as 300% in some cases, in the number of maintenance tasks completed. Says Judi, "The key is performance consequences. It should make a difference when one person does a good job and another doesn't."

Bob Collins, with the help of EDL's **Bill Darley** and **Johanna Williams**, has recently begun a project to design and implement an effective maintenance management system for local governments. Using road equipment in Haralson County as the basis of his



Judi Komaki of EDL discusses with a battalion commander at Camp Lejeune, North Carolina, why vehicle maintenance is frequently neglected.

research, Collins sees the central issue of the project as designing a maintenance program that county supervisors will maintain: "We have to devise a system that is comprehensive enough to address the maintenance problem and understandable enough to be carried on by management after we leave. We're training supervisors to conduct regular inspections of their operator's work, based on the measurement system we drew up, and to provide recognition and feedback to the operators."

Funded by the Inter-University Task Force, a program of the Georgia Department of Community Affairs, the project will involve preparing a manual telling how other county governments can set up similar maintenance systems.

Present Papers, Chair Sessions

James Johnson was treasurer. **Kaycee Logan** also attended. Hubbard recently attended a short course on air quality control at West Georgia College. Logan participated in the annual Army Military Affiliate Radio System (MARS) meeting in Madison, Georgia. She is the state training officer.

J. D. Walton presented a paper on "Development of a Solar Cooker Using the Spiral Fresnel Concentrator" at the International Congress of the International Solar Energy Society, held August 23-25 in Brighton, England. He then visited contacts in the high-temperature radome and solar energy fields in Paris.

OFFICE OF THE DIRECTOR

Jim Wiltse was the keynote speaker at the 5th Annual Antenna Applications Symposium at the University of Illinois on September 23. He was a session chairman at the SPIE (International Society for Optical Engineering) 25th

Annual International Technical Symposium in San Diego August 27-28. He also is on the steering committee for the Defense Advanced Research Projects Agency/Tri-Service Millimeter Wave Symposium, to be held in Huntsville, Alabama, and will be a session chairman on October 22.

SYSTEMS ENGINEERING LAB

Bob Zimmer is chairman of the IEEE 1981 International Conference on Cybernetics and Society to be held in Atlanta on October 26-28.

Barbara Sajor attended the Special Libraries Association meeting in Atlanta and the Defense Industrial Security Institute meeting in Richmond, Virginia.

TECHNOLOGY APPLICATIONS LAB

Bo Hendrix coordinated the American Association for the Advancement of Science Regional Energy Seminar held on the Georgia Tech campus October 1-2.

DOE Funds Solar Research Center

Georgia Tech's solar energy program got a major boost recently when the Department of Energy (DOE) awarded the Energy and Materials Sciences Lab \$504,000 to start the Solar Thermal Advanced Research Center on the Tech campus.

The funding is the first increment of an \$8.75-million, five-year program which includes high-temperature solar energy research and the operation of the Advanced Components Test Facility on the campus. If the five-year research program is fully implemented, the contract will be the largest the Station has ever received.

"Until this year, DOE emphasized demonstrations of existing solar thermal technologies," said Center Director **Bob Cassanova**. "The new thrust is to get universities and industries more involved in problem-focused research which creates new technologies for more efficient use of solar energy and for conversion of solar energy to storable chemicals and fuels."

Solar thermal energy systems collect the heat from the sun and convert it into useful forms of energy. Examples are roof-top collectors or fields of parabolic mirrors which reflect and concentrate solar rays onto a central focusing point.

The new project will enable EMSL to expand its current experimental testing program in solar thermal energy at the 325-kilowatt Advanced Components Test Facility. The center will emphasize research and development on advanced, high-temperature solar systems.

Researchers will conduct projects aimed at:

- Development of materials with greater resistance to high temperatures
- Production of synthetic fuels and chemicals with solar energy
- Development of solar systems as viable sources of industrial electricity and high-temperature heat for certain industrial processes.

In the past DOE has funded solar thermal R&D on a project-by-project basis. The Tech center and a similar center being established at the University of Houston will focus the agency's work in this area.

Personnel News

ELECTROMAGNETICS LAB

Donald Blue is acting chief of the Electro-Optics Division.

Sharon and **Marshall Weathersby** are the proud parents of a daughter, Rebecca Leigh, born August 31.

ENERGY & MATERIALS SCIENCES LAB

Ginny Gross underwent major surgery in September.

SERVICE GROUPS

Station News is grateful to **Brenda Wilkerson**, Personnel Services, who has consented to take **Kathy Fuller's** place as associate editor. Kathy has transferred to the Office of Institute Relations and Development.

Deborah Parmenter, assistant manager of Personnel Services, resigned October 1 to await new responsibilities as a mother. **Bob Hawkins** has taken the assistant manager position vacated by **Chip Wiggins**. Other new faces in PSD are **Lillie Strickland**, personnel assistant I, and **Joann Ward**, word processor operator.

Cindy Frayer has replaced **Liz Lasto** as clerk III in Mechanical Services.

Mailroom Supervisor **Bill Boyd** resigned September 11 to further pursue his art career in North Carolina.

Facilities Management Secretary **Brenda King** returned to work part time on August 31, following a two-week hospital stay.

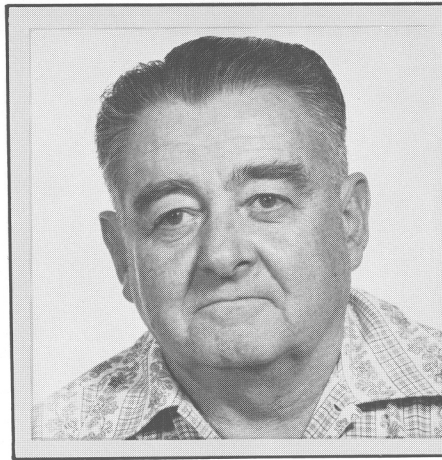
SYSTEMS ENGINEERING LAB

Congratulations to **Robert White**, who received his M.S.E.E. and **John Timar**, who received his M.S.I.C.S.

SEL personnel and their families enjoyed a summer get-together held at the Naval Recreational Facility at Lake Alatoona on August 29.

"All Savers" Offered

Credit Union members can purchase the new tax-exempt "All Saver" certificates from the State Employees' Credit Union anytime from October 1, 1981, through December 31, 1982. These one-year certificates will pay interest at 70% of the yield on one-year Treasury bills, and a minimum purchase of \$500 is required. Call the Credit Union office at 656-3748 or Charles Ramsay, Georgia Tech Personnel, extension 4629.



In Memoriam

EES extends its sympathies to the family and friends of **William D. Fife**, who died September 19 after an extended illness. A mechanical technician III in the Electro-Optics Division of the Electromagnetics Lab, he was an excellent machinist. He previously had worked in the Systems and Techniques Lab. Fife made many friends during his 15-year career at Georgia Tech, and he will be sorely missed.

Pat Mathiasmeier resigned effective September 11.

SEL has gained a raft of new employees. **Andrew Borden**, senior research engineer, became manager of the SEL Eglin field office October 1. The ESM Division welcomed **Daniel Murphy**, research engineer I, **Curtis Colee**, drafter II, and **Vickie Tibbitts**, senior secretary. **Douglas Ayerst** is a new research engineer I with the Concepts Analysis Division.

SYSTEMS & TECHNIQUES LAB

New employees in the Defense Electronics Division are **Phillip Pflueger**, senior research engineer, **Donald Esper**, electronics technician III, **Robert Bryans**, research technician I, and **Bernhard Jager**, research engineer I. **Teresa Brown** was promoted to technical typist in the "S" Program Office.

TECHNOLOGY APPLICATIONS LAB

A belated welcome to **Sidney I. Firstman**, who fills a newly created principal research engineer position for marketing and program planning.

Frank Malvar resigned effective October 2 to work with a Miami construction firm.

With the birth of a son, **Joshua Adrian**, on September 23, **Karen** and **Bo Hendrix** now have one of each.

Larry Banta won the grand prize at the Tech Bookstore open house: a trip for two to the Tech-Tulane game in New Orleans, given by Corporate Travel International.

Cueing, Continued

The lab is seeking a new contract from the Army to design and build a computer-controlled prototype with a breech-loading launcher. It would have multiple cue magazines and an extended launch range.

Solar Meetings

The Georgia Solar Energy Association (GSEA) is an Atlanta-based affiliate of the International Solar Energy Society composed largely of professional and commercial members. EES has a hand in shaping its programs through **Tom McGowan** of the Technology Applications Lab, who is chairman of the GSEA board.

McGowan extends a special invitation to all EES staffers to attend the meetings. Upcoming topics include: Georgia's tax credit laws (October 30), Georgia Power solar homes project (December 10), Georgia Solar Symposium (January), heat pumps (February 25), Georgia Power corporate headquarters building (March 25), Knoxville Energy Expo (April 29), urban energy situation (May 27).

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