the GTRI connector

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Volume 3 Number 10 September 1987

Tech Team Gets Apparel Manufacturing Technology Center

by Lincoln Bates, EDL

The Economic Development Laboratory (EDL), in conjunction with Georgia Tech's School of Textile Engineering and Southern Tech, has been selected by the U.S. Defense Logistics Agency to establish one of three Apparel Advanced Manufacturing Technology Demonstration Centers (AAMTDC).

The three-year contract carries a $5-million tag, but some of that will involve cost sharing, according to EDL senior engineer John Adams, who will help manage the program. The center will include a 5,000-square foot plant on the Southern Tech campus. Industry will lend or donate the required equipment.

"This represents a move by EDL into the manufacturing technology area," says lab director David Clifton. "It's an indicator of the types of programs in which we'll increasingly be involved—programs requiring interdisciplinary teams and combined resources and capabilities."

"The federal government feels that the costs of domestic apparel suppliers are higher than necessary," Adams explains. "Many manufacturers have not availed themselves of new technology that could reduce those costs. Consequently, foreign competitors are capturing markets once claimed by American garment makers.

"The AAMTDC will help manufacturers evaluate new technologies that could improve their productivity. It also will demonstrate the application of nontraditional capital investment criteria and conduct research and development into manufacturing technologies."

Initially, the center will focus on producing four types of military shirts. It also will operate an Apparel Manufacturing Information Service to disseminate data to industry.

The AAMTDC will recruit a supporting coalition of relevant firms and industry organizations. "The first three years will be an incubation period," notes Adams, "after which the center will become self-perpetuating. In time, it will address a broad range of manufacturing problems facing coalition members."

(Left to right) John Adams of EDL/GTRI will direct a new $5-million Apparel Advanced Manufacturing Technology Demonstration Center program, assisted by Larry Haddock of Southern Tech and Wayne Tincher of Georgia Tech's School of Textile Engineering.

Wayne Tincher of Tech's School of Textile Engineering and Larry Haddock of Southern Tech join Adams as principal representatives of the collaborating units. EDL will develop the coalition and the information system, perform economic studies, and provide overall management. Textile Engineering will conduct R&D and supply technical expertise. And Southern Tech, in addition to providing facilities, will operate the plant and support research efforts.

Adams says the team hopes to have the center operational in the early spring of 1988.

What Is GTRI Doing About Its Future?

GTRI is not resting on its laurels. Here are some of the activities in progress to ensure our vitality in the future.

Technology Upgrade Program

GTRI has launched an Operation Upgrade program with the following objectives:

- Improve quality levels of research programs and staff.
- Improve GTRI's competitive position and vitality.
- Support Georgia Tech priorities in the Long-Range Plan.
- Respond to researchers' perception of investment priorities.

A senior technical guidance council already has been appointed to define and prioritize undergirding areas of research, as well as to generate strategic and nearer-term research objectives. The council will have a rotating membership. Current members are Jim Gallagher (EML)—chairman, Milton Cram (ECSL), George Ewell (STL), Dave Flowers (RAIL), Tom Miller (SEL), John Nemeth (EDL), Josh Nessmith (RAIL), Dan O'Neil (EMSL), Chuck Ryan (STL), and Chris Summers (EML).

GTRI Associate Director Howard Dean says, "We will invest in internal research programs to strengthen and undergird the technological areas in which we operate. After the senior guidance council defines these areas, a guidance team selected from our best technical leadership will be set up for each area—for example, millimeter waves. These teams will seek the advice of colleagues from the appropriate academic departments."

Each technical area guidance team will define and recommend research programs and tasks within its area, then monitor progress. "We also expect them to play a key role in identifying and recruiting quality researchers," Dean says. The area guidance teams will comprise the pool for staffing the senior technical guidance council on a rotating basis.

The Office of the Director, GTRI, has overall management responsibility, but Dean says the laboratories will have a strong supportive and participative role. The program also is expected to develop strong academic interaction and support, as well as significant leverage by sponsored funds.

A typical internal research project under this program will involve half-time support of a senior researcher, 25% other support, and three or four GRAs. They will work on two to four concurrent tasks. There will be program reviews, with dissemination and publication of results. The bottom line will be technology transfer for contract development and sponsored programs.

Operation Upgrade is already under way and will continue indefinitely on a multiyear basis. Funds tentatively allocated for FY 1988 total $2.25 million, including both GTRI and GTRC sources.

Says Dean: "This program responds to one of the key needs defined by the cost reduction team assigned to address our organizational and policy effectiveness. The same needs were also identified in the luncheon discussions with many of our project directors during the past year."

See "Future," page 2

Y'all Come to the GTRI Meetings!

Are you curious about how GTRI fared this year? Do you wonder what the future holds for us? Is there a burning question you've been dying to ask Dr. Grace or one of the associate directors? Come to one of the "GTRI Present and Future" meetings!

Just as in previous meetings, Dr. Grace will take a comprehensive look at where we now stand and reveal plans and prognostications for the future. Every employee will have the opportunity at the meetings to submit written, unsigned questions for answer by OOD staff members.

Meetings at the Cobb County Research Facility will be held on Tuesday, October 13, and Wednesday, October 14, in the Building 1 auditorium. Campus meetings will be in the Student Center ballroom on Thursday, October 15, and Friday, October 16. All meetings will be from 3:00 to 5:00 p.m. A social hour with refreshments will follow the formal part of the gathering.

Come to one of these meetings and find out what's going on!

Lightning Protection for Traffic Lights:

Help for a Shocking Problem

by Martha Ann Stegar, RCO

How many times have you approached a busy traffic intersection after a thunderstorm and found it in chaos? The traffic light is out, so the drivers are on their own.

Engineers in ECSL's Electromagnetic Compatibility Division have researched this problem for the National Research Council's Transportation Research Board and have come up with several techniques for protecting electronic traffic control equipment from lightning and other fleeting overvoltages (transients).

Project director Hugh Denny says that traffic lights can be threatened by numerous problems. "They include lightning, power system faults, electrostatic discharges, inductive switching transients from nearby industrial equipment or from the traffic control equipment itself, and radiated electromagnetic interference from radio, TV, radar and mobile communication transmitters," Denny says.

But the most severe of these threats is lightning, especially in the South. This region is the most active thunderstorm area of the United States. In cities like Atlanta, with hundreds of interconnected traffic lights, even indirect lightning strikes can wreak havoc.

Typically, five to ten "slave units" are linked to a local controller, which, in turn, communicates with the master controller. The sudden jump in voltage caused by lightning can disrupt sensitive controller electronics in three ways: by a direct strike to the system, an indirect strike to power or communication lines, or by radiated coupling to exposed power, communications or sensor cables.

ECSL Study Results

In their recently completed first-phase study, Denny and coinvestigator John Rohrbaugh accomplished the following major tasks:

- They established lightning threat levels, and defined methods of predicting the lightning rate of occurrence from geographic location and local thunderstorm activity.
- They documented the effects of lightning on traffic control equipment, particularly the effects on extremely sensitive solid-state electronics within that equipment.
- They reviewed current protection practices and developed recommended procedures for the transient and electromagnetic interference protection, grounding, shielding and filtering of power and signal conductors, cabinets and equipment associated with traffic control.

"Our report will be useful to city and state governments in determining the severity of the threats to their traffic control equipment and the best methods of protection, and in weighing the cost to repair versus the cost to protect," says Denny.

Protect or Repair?

In an area with few storms or in a small town with only a handful of stand-alone traffic lights, obviously it would not be cost-effective to invest in protective measures. But in Atlanta, for example, the situation is much more complex. The city's traffic control system encompasses an area of approximately 150 square miles, the Tech research report says. The total number of lightning flashes to ground per year is approximately 1,800. With almost 1,000 traffic controllers located in this area, the probability of a controller being affected by lightning is very high and the cost of protection is probably justified, the study concludes.

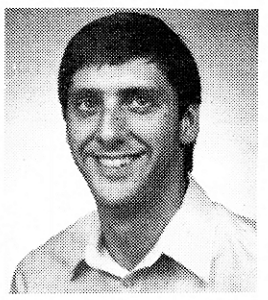
Denny and Rohrbaugh say there's a need for a general lightning test specification for traffic control equipment. "By standardizing the threat conditions, controller manufacturers can provide a protected unit at a lower cost than if individual municipalities impose varying specifications and requirements," Denny says. The report includes recommended modifications to the National Electrical Manufacturers Association (NEMA) Standard TS 1-1983 to add lightning test specifications.

The researchers are just getting under way with the second phase of their program: to develop video training tapes and student/instructor notes to more graphically illustrate proper protection principles and practices. These materials will be used to train traffic engineers and installation/maintenance personnel nationwide.

GTRI to the Rescue

In an emergency, you can always count on a GTRI engineer! Take Walter Haines (SEL) and Alan Pashkevich (EDL), for example.

A Project Lifesaver



Walter, a member of SEL's Electronic Support Measures Division, is GTRI's only known practitioner of the art of inflight computer repair. According to the July issue of *SEL Signals,* it happened this way:

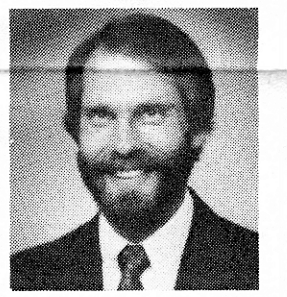
"On June 9, immediately after departure from Brown Field in GTRI's C-131 aircraft, the TEDSS computer began behaving abnormally at the beginning of a data-gathering operation. . . This operation was to gather data on a number of different types of radar emitters in north Georgia, Tennessee and Alabama. Two flight crew members and five other SEL personnel were involved.

"The effort was the last and most extensive of a current H project designed to demonstrate a new capability to potential sponsors and attract new research funding. A current sponsor had expressed great interest in funding a new program based on whether the operation was a success.

"Our hero, after a moment of thought, realized that the particular problem was one he had seen quite some time before, and was possibly caused by a particular cable being loose inside the Compaq computer. He disassembled the computer, found and repaired the loose cable, and got everything back together in such a short time that there was no (adverse) impact on the project."

A Real Lifesaver

Alan Pashkevich of EDL's Industrial Extension Division literally saved someone's life last month. According to the August issue of *EDL Exchange,* "Quick reactions by Alan Pashkevich saved a teenager from possibly drowning in Tallulah Gorge.



"Alan was hiking in the gorge when he saw a boy tumble some 60 feet down the rocks and into the river. He rushed out to the stunned boy, wondering about injuries and mentally reviewing CPR techniques. Using a cross-chest carry, he transported the 185-pound boy to a nearby beach. The victim began breathing again during the carry. Allan then helped keep him warm until paramedics arrived."

Well done, gentlemen!

Future (from page 1)

Cost Reduction Teams

In a related matter, eight cost reduction task teams which have been studying GTRI's work systems since February have submitted their reports and recommendations to OOD. An executive team currently is reviewing and prioritizing these recommendations.

"We are classifying the recommendations into three categories," explains Ned Ellington, an industrial and systems engineer from EDL who is supporting the executive team. "Changes which we can readily accomplish, changes that are desirable but need concurrence from outside GTRI, and complex and costly changes that will require much study and analysis before undertaking them."

Many recommendations were offered with the idea of improving processes at GTRI rather than reducing costs, Ellington says.

The GTRI administration already has responded to some of the recommended changes. For instance, the Instrumentation and Calibration Department has been consolidated into the Mechanical Services Department, and both components of the new combined department have appointed advisory/user committees.

Two of the recommendations relating to the Facilities Management Department also have been implemented. The defensive driving course is one of the procedures developed to assure that persons driving GTRI vehicles are qualified and licensed. And steps have been taken to incorporate performance and accountability requirements in service contracts for GSTRF-owned property.

In the area of staff development and training, a project director training course is in place, the Project Director's Manual is being updated, and an advanced contract development course is being developed. Other recommendations are being considered.

In the area of personnel systems, recommendations to streamline the hiring process are being implemented, and measures to assist the professional in preparing promotion papers are being considered. Improvement of the performance appraisal process also is under study.

The task teams made recommendations in five other areas, and the executive team should have completed its analysis of them by mid-September. A report on these recommendations will be in a future issue of the *Connector.*

Food Conference Draws Large Crowd

by Carrie Stikeleather, EDL

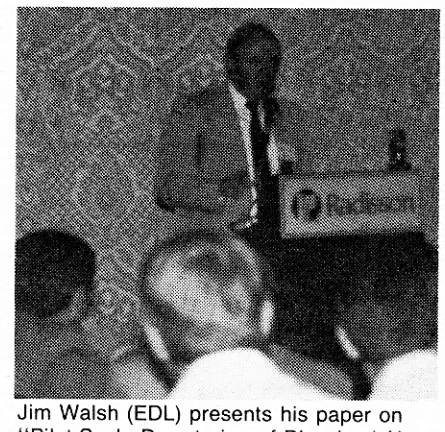
Have you ever wondered about the effects of crab scraps on marine environments? Or about the potential utilization of scallop viscera silage for solid waste management and as a feedstuff for swine? If you answered yes to either of the above, you should have been at the Environmental, Health and Safety Division's 1987 Food Processing Waste Conference September 1-2.

The conference—the first U.S. effort of its kind since an EPA-sponsored food processing waste seminar 10 years ago—was presented to encourage the exchange of information concerning the management of wastes generated by the food processing industry. And with hundreds of billions of gallons of wastewater currently being discharged in municipal sewer systems annually, costing industry hundreds of billions of dollars in surcharges each year, much emphasis was placed on innovations for in-plant treatment.

"The purpose of the conference," said conference chairman Edd Valentine of EDL, "was to promote the understanding and development of new research on food processing waste treatment, as well as process design, operating strategies, and regulatory issues affecting the industry. Our speakers covered all of these topics and more. The conference was a big success."

More than 200 people in areas ranging from academia and consulting to actual waste treatment came from all over the U.S. and abroad to attend the two-day conference, which was held at the downtown Radisson Hotel.

The 12-session, 40-speaker agenda (including presentations by EDL's Steve Harper and Jim Walsh) covered practical application and a variety of current research in wastewater treatment.



Jim Walsh (EDL) presents his paper on "Pilot-Scale Dewatering of Dissolved-Air-Flotation Sludge" at the recent Food Processing Waste Conference. (Photo by Stephanie Babbitt)

Conference co-chairman Chuck Ross commented: "We are very pleased with the response to this year's conference, and plans are already under way for 1988."

EDL Tackles Poultry Sludge

by Carrie Stikeleather, EDL

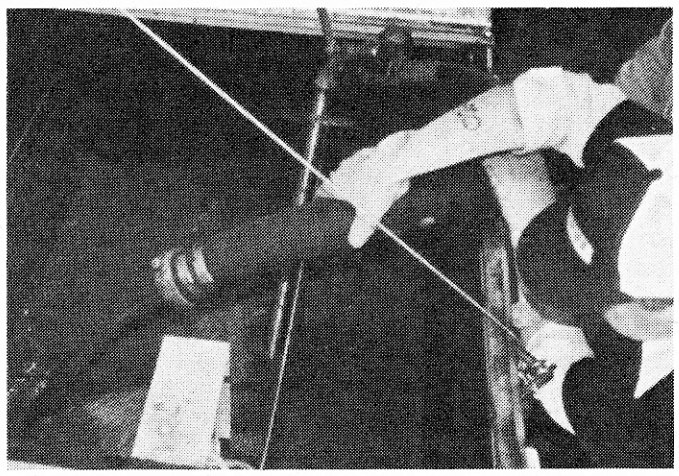
Edd Valentine and Jim Walsh of EDL'S Environmental, Health and Safety Division have come up with a possible solution to a critical need among poultry processors: sludge dewatering. Wastewater treatment methods used in poultry plants generate sludge that is often more than 90% water.

The Tech researchers recently have developed an entirely new process called thermally enhanced dewatering that requires only the simplest equipment and operation. This new method uses heat to speed the natural gravity separation of water from sludge to just four hours—many times faster than the old method.

The pilot-scale portable dewatering unit that researchers built for field testing has yielded successful results in several tests. They filled the dewatering tank with sludge and in about four hours, the unit removed more than 70% of the water (by weight) which had separated from the sludge.

Eleven tests of the system have been completed to date. Laboratory analyses of the separated water and sludge showed that more than 90% of the chemical oxygen demand and total solids in the tested sludge appears to have remained with the cake, which ranges from 25% to 29% solids.

The liquid removed from the sludge is still a potent wastewater. However, it can be diluted with treated wastewater and discharged with only a minor impact on the total plant wastewater quality.



A researcher fills the dewatering tank with sludge from poultry processing wastewater in a test of EDL's new thermally enhanced dewatering process. (Photo by Edd Valentine)

Encouraged by these results, researchers are planning further tests of the thermally enhanced dewatering (TED) system, in hopes of preparing a full-scale feasibility analysis for the system.

Says Walsh, "Equipment costs for current sludge dewatering systems start in the $100,000 range. We are working to make TED an effective, easy-to-use and economical alternative to these systems."

PROFESSIONAL ACTIVITIES

ECONOMIC DEVELOPMENT LAB

John Nemeth has been appointed by the Georgia Emergency Response Commission to the Georgia SARA Planning Committee, which will review and coordinate emergency response planning for the state.

Costas Soulakos presented a paper, "Machine Vision and Its Application in Manufacturing," at the 2nd Annual Engineering Technology Conference sponsored by the State Board of Postsecondary Education in Atlanta August 5-7.

Bobby Cline discussed the value of supplemental training for employees at the spring conference of the Georgia Society for Textile Training and Development.

At the Southeastern Poultry Data Processing Seminar August 17-19, **Wayne Daley** made a presentation on "Future Trends in Automated Houses," **Craig Wyvill** talked on "Future Trends in Computerized Inspection," and **Chris Thompson** spoke on "Machine Vision."

Craig Wyvill had an article, "The Computerization of the Poultry Industry," in the August issue of *Broiler Industry.*

ELECTROMAGNETICS LAB

Abbas Torabi presented a paper on "MBE Growth and Application of Superlattices and Quantum Wells" at the 31st Annual International Technical Symposium on Optical and Optoelectronics in San Diego (CA) August 17.

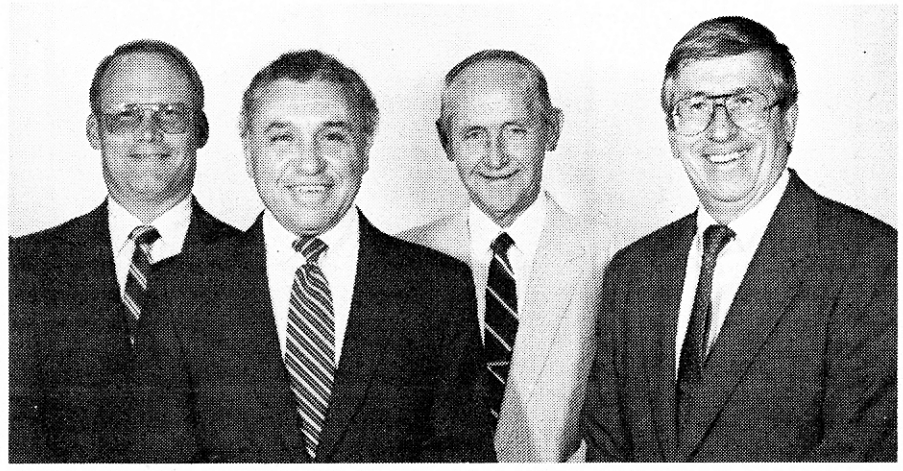
ENERGY & MATERIALS SCIENCES LAB

Jan Gooch presented a paper entitled "Techniques for Stabilizing Emissions" at DSM Resins BV in Zwolle, The Netherlands, August 13.

At the First European Conference on Thermoelectrics, held in Cardiff, Wales, September 15-17, **Wallace Shakun** and **David Henderson** presented a paper on "A Conceptual 500 Watt Thermoelectric Generator Utilizing Bismuth Telluride for the Module Elements."

RADAR & INSTRUMENTATION LAB

Gene Greneker recently delivered an invited paper at the Snow VII Conference hosted by the Cold Regions Research and Engineering Laboratory, operated by the U.S. Army Corps of Engineers in Hanover (NH). The paper, entitled "Meteorological and Snow Pack Conditions That Affect the Radar Reflectivity of Snow at Two Millimeter Wave Frenquencies," was coauthored by **M. J. Gary, R. G. Heikes, J. M. Trostel,** and **N. C. Currie.**



Officers of the new Atlanta Chapter of the International Test and Evaluation Association are (left to right) Howard Atkinson, secretary; Anthony Chimera, president; Samuel Alford, vice president; and Ed Shanahan, treasurer. (Photo by Anita Edwards)

ITEA Chapter Formed

A local chapter of the International Test and Evaluation Association (ITEA) was formed at an organizational meeting held at the GTRI Cobb County Research Facility on July 9.

Officers of the new Atlanta chapter are Anthony J. Chimera (GTRI), president; Samuel T. Alford (GTRI), vice president; E. Howard Atkinson (GTRI), secretary; and Edward J. Shanahan, Jr. (Consultant's Choice, Inc.), treasurer.

Founded in 1980 as a nonprofit international society, ITEA is the leading association for professionals in the rapidly growing test and evaluation community.

The Atlanta Chapter currently has 19 members. Anyone interested in joining or requiring additional information should contact Tony Chimera at 424-9604.

PERSONNEL NEWS

ECONOMIC DEVELOPMENT LAB

Senior secretary **Karen Pugh** transferred to SEL in late August.

Phil Loveless, director of the Gainesville office, has resigned.

Bob Springfield is the new director of the Rome office.

ENERGY & MATERIALS SCIENCES LAB

Welcome to **Ruth Thompson,** senior secretary, and to GRAs **Bonnie Dixit, Jim Kearns, Woo Lee,** and **Jed Lyons.**

Gwennette Barkley and **Rob Roglin** have resigned.

SERVICE DEPARTMENTS

Mark Peterson is a new GRA in Research Communications. He is working on his master's in management.

Other new employees are **Vince Crockett, Jr.,** maintenance worker I in Facilities Management; **Willie Dixon,** now a permanent stores clerk I in Supply Services; and **Angela Daniel** and **Karen Ladd,** duplicator equipment operators in PPC.

Yvonne Jackson, secretary in Research Security, has resigned.

SYSTEMS ENGINEERING LAB

George McDougal received the July Employee of the Month Award because "when faced with the conflicting deadlines of getting project deliverables out and getting a quality proposal out, he put in the extra time to do it all."

Three new GRAs joined the Defense Systems Division in July: **William Davis, Therese Tubbs,** and **Nancy Wolf.**

In the Surveillance Technology Branch, **Loretta McNutt** is a new word processor operator, and former co-op **Byron Coker** has started as an RE I.

Loretta O'Neal and **Zack Bergen** have resigned.

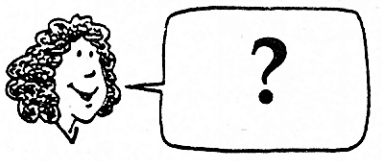
SYSTEMS & TECHNIQUES LAB

George Ewell has been appointed to the newly created position of chief scientist for STL.

News from the Microwave Systems Division: MSD welcomes new GRA **Robert Layden** and welcomes back **Joann Nelson** as a systems analyst I. She worked at MSD previously as a laboratory technician I. **Lynne Patterson** has received her degree in electrical engineering and is now working as an RE I. **Lance Diamond** has resigned.

The tennis tournament was one of the highlights of the annual SEL picnic, held this year on August 22. Participants included: *back row* (L-R)—Russell Leath (2nd place, men), Joey Brooks, (1st place, men), Lloyd Lilly, Tom Miller, Don Sanford, Cheryl Barnett; *front row*—Kelly Brooks (1st place, women), Bob Zimmer, "Army" Armitage, Katherline Armitage. Martha Zimmer (2nd place, women) took the picture.

QUESTIONS, ANYONE?



by Charles McCullough, HRD

"I'm considering teaching a course next quarter in one of the academic schools. What effect will this have on me in a personnel sense?"

First, let's define what it is we're talking about: When a GTRI employee works for, and is paid in part by, another campus unit, the terminology for this is a **shared appointment.** Shared appointments often occur with our research faculty who teach in the academic schools or participate in research programs being conducted in the schools or centers.

A shared appointment is recognized only when the "other" department is outside GTRI. If you work half a month on a research project in your own lab, and half a month on a research project in another GTRI lab, this distribution of your efforts is handled via your GTRI timesheet and a shared appointment has not occurred.

When a shared appointment does occur, though, you'll continue to be paid your regular monthly salary in one single paycheck (assuming that your total percentage of time remains the same); your "years of service" continue to build up with no effect; your faculty status remains exactly the same. You will continue to submit your GTRI timesheet each month, but the total of the percentages you report on that timesheet must add up to only the total percent of your effort in GTRI. For instance, if you are shared for 50% during the month of October with the School of Mechanical Engineering, you report only the remaining 50% of your effort on your GTRI timesheet.

The most important element that is often overlooked regarding shared appointments is vacation and sick leave. Here's the definitive statement regarding these cherished items.

Vacation earned during a shared appointment is earned in both the home department (GTRI) and the work department (the "other" department in which you are working) in direct proportion to the percentages of the shared appointment. If you're 50:50 with EE for three months, half the vacation you earn during those months is earned in EE, half in GTRI. Vacation taken during the shared appointment should also be reported in direct proportion. Again, if you're 50:50 with EE for three months, half of all vacation you take should be taken in EE, the other half in GTRI. **Caution: all vacation earned in the work department that has not been used will be forfeited when the shared appointment ends!** The bottom line is, "Either use it or lose it," or "He who hesitates is lost."

Sick leave is earned just like vacation, in direct proportion to the percentages of the shared appointment. Sick leave taken also should be reported in the appropriate proportions. Unlike vacation, sick leave earned, but not taken, in the work department can—and will be—transferred back to the home department at the end of the shared appointment.

Holidays occurring during a shared appointment must be proportionately distributed between both departments.

Your lab's or department's Administrative Network representative has specific instructions on how vacation, sick leave, and holidays should be reported on your GTRI timesheet any time you are shared with a non-GTRI unit.

You Are Invited

Devon Crowe, the new director of the Electromagnetics Lab, will be honored at a **Welcome Reception** from noon to 3:00 p.m. on Friday, October 2, at the Alumni/Faculty House. Everyone is invited.

Don't forget to submit your suggestions for GTRI Research Award nominees to your lab director or department head **before** October 15. And be sure to come to the **Awards Ceremony** at 3:00 p.m. on December 3 in the Student Center ballroom.

Personal Notes

EMSL: Cherie and **Everett Chapman** welcomed their first child, a son, Jason Everett, August 25.

FMD: Our sympathy to **Brenda Hill,** whose father died August 31. Brenda wishes to thank all those who send flowers, cards, and otherwise expressed their sympathy at her loss.

OOD: Sherri Burris and **Richard Odom** (SEL) were married August 8.

STL: Congratulations to Lynn and **Homer Cochran** on the birth of Elizabeth Ann on September 2. **Steve Thompson** was married to Rebecca Martin on July 11.

STL's Design Services Group (DSG) has widely expanded its photographic services. For example, by using a new process camera technique, DSG can reproduce multicolor enlargements, reductions, prints and viewgraphs from many different types of originals. The quality of these reproductions is very good, and the material cost is minimal ($3 per color viewgraph) compared with either a custom lab ($20) or DSG's polaroid system ($10).

For a full description of all the photographic services that DSG offers, contact Anita Edwards or Kay Lindsey at 424-9660.

NEWS FLASH!

Georgia Tech achieved a "no deficiency" rating in the government security inspection recently conducted on the campus.

Research security coordinator Al Becker thanks all those who made this achievement possible.

"Such a finding is extremely rare in any circumstance," Becker says, "but in a facility as large and complex as ours, it is truly exceptional. In fact, the chief of the inspection team stated it was the only no-deficiency inspection that she had ever observed."

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