

# the GTRI connector

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## Technology Area Guidance Teams Selected

The Senior Technology Guidance Council has selected the members of the 13 Technology Area Guidance Teams, and these teams have already held their first meetings. Each team has written a work statement of its goals, program objectives, and research agenda.

This month, each team will present its preliminary recommendations for research tasks, and will hold a workshop at which research professionals are invited to bring their ideas and proposals for consideration. The area teams each will submit a consolidated list of recommendations, along with estimates of priority and financial magnitude. Then the Senior Guidance Council, together with OOD, will review all recommendations. GTRI Associate Director Howard Dean says the objective will be to prioritize the proposals from all areas and to assign resources.

### Back to Basics

"We've been essentially market driven in the last few years," Dean says. "But as the market becomes more competitive, we are forced to spend more on contract development and less on research. Our long-term vitality depends on finding ways to move ahead of the com-

petition again—to the cutting edge of technology."

Jim Gallagher, chairman of the Senior Technology Guidance Council, adds: "We have fallen behind in basic, conceptual research. This new program won't take anything away from the labs. It will enable them to improve their capabilities by funding exploration in new and emerging areas."

Dean sees several advantages to the new internally funded research program. "Besides improving GTRI's competitive position, it will maintain and renew the interest of our dedicated and creative researchers. It also has the potential to help Georgia Tech meet its goals in doctoral research programs," he says.

### Taking a Broad Look

The Senior Technology Guidance Council was formed to take a broad look at GTRI across lab boundaries. "This is something that is difficult to do," Dean explains. "Our labs have been so constrained by the system that they have been forced to take a narrow focus."

Gallagher says the Council has been wrestling with this task for four months. "We have come up with a list of 13 undergirding technology areas, and now we're

asking ourselves how best to identify and characterize these areas so everybody will have the same perspective across GTRI."

Dean adds: "Eventually we'll draw up a matrix to see which technological areas would impact the most applications."

## Technology Area Teams

Members of the Technology Area Guidance Teams are as follows:

**Low Observables:** Mike Tuley (team leader), Keith Johnson, John Meadors, Ricky Moore, Chuck Ryan.

**Software Computer Technology:** Brit Williams (team leader), John Gilmore, Dick Ingle, Virginia Jory, Mike West.

**Coherent Radar Technology:** Josh Nessmith (team leader), Bill Fishbein (consultant), Tom Miller, Don Rogers, Jim Scheer.

**Antenna Development:** Chuck Ryan (team leader), Larry Corey, Josh Nessmith.

**EW Techniques and Technology:** Tom Miller (team leader), Guy Morris (consultant), Dave Flowers, George McDougal.

**Multispectral Sensors:** Bill Holm (team leader), Neal Alexander (consultant), Bob Hyde (consultant), Jim Echard, Bill Owens.

**Compressive Receivers:** Dave Flowers (team leader), Jim

Echard, Harold Engler.

**Environmental Sensing:** John Nemeth (team leader), Garth Freeman (consultant), Lois Speaker (consultant), Ed Anderson, Marilyn Black, Gerry Grams, Bob McMillan, Frank Williamson.

**Applications of Coherent Sources:** Jim Gallagher (team leader), Mike Harris, Bob McMillan, Ricky Moore, Al Nelson.

**E-O Materials and Applications:** Chris Summers (team leader), Milt Cram, Allen Garrison, Ricky Moore, Otto Rausch.

**Space Power:** Dan O'Neil (team leader), Mike Harris, Doug Neale.

**Process Chemical Technology:** Tudor Thomas (team leader), Henry Chia, Dan O'Neil, Jim Walsh.

**Strategic Materials:** Tom Starr (team leader), John Handley, Chris Summers.

Other persons may be added to the teams.



Among those attending the joint Tech/Georgia meeting on the Georgia Tech campus October 30 were, left to right: *Back row*—Dr. John Burke, assistant vice president for services, University of Georgia; Dr. John Nemeth, chief, Environmental, Health, and Safety Division, EDL-GTRI; Arthur Brown, director of EDL's EDA University Center Program; EDL Director Dr. David Clifton. *Middle row*—Dr. Arthur Dunning, vice chancellor for services, Board of Regents; Robert Lann, head, Applied Research Branch, EDL; Dr. Marvin R. Williams, assistant professor, Cooperative Extension Service, University of Georgia; Charles Estes, associate chief, Industrial Extension Division, EDL; Melvin B. Hill, director, Carl Vinson Institute of Government, University of Georgia. *Front row*—Dr. William Flewellyn, director, Institute of Business, University of Georgia; John Adams, leader, Energy Resources Group, EDL; Dr. Eugene Younts, vice president for services, University of Georgia; William Whitworth, leader, Industrial Education Group, EDL; GTRI Director Dr. Donald J. Grace. (Photo by Gary Meek)

## Tech/Georgia Discuss Outreach Programs

When it comes to serving the state of Georgia, Georgia Tech and the University of Georgia are colleagues, not rivals. They cooperate in many ways, such as joint fund-raising and research programs. Now they are making a conscious effort to explore ways to collaborate on outreach programming for the state.

GTRI Director Dr. Donald J. Grace and Dr. S. Eugene Younts, vice president for services at the University of Georgia, have organized a joint planning group. The University and Tech have each hosted one meeting of the group so far to brief each other on the outreach activities of their institutions. The group is planning a retreat in early January.

"We hope to find a number of areas of mutual interaction," Dr. Grace said. And EDL Director David Clifton commented: "It's getting very competitive out

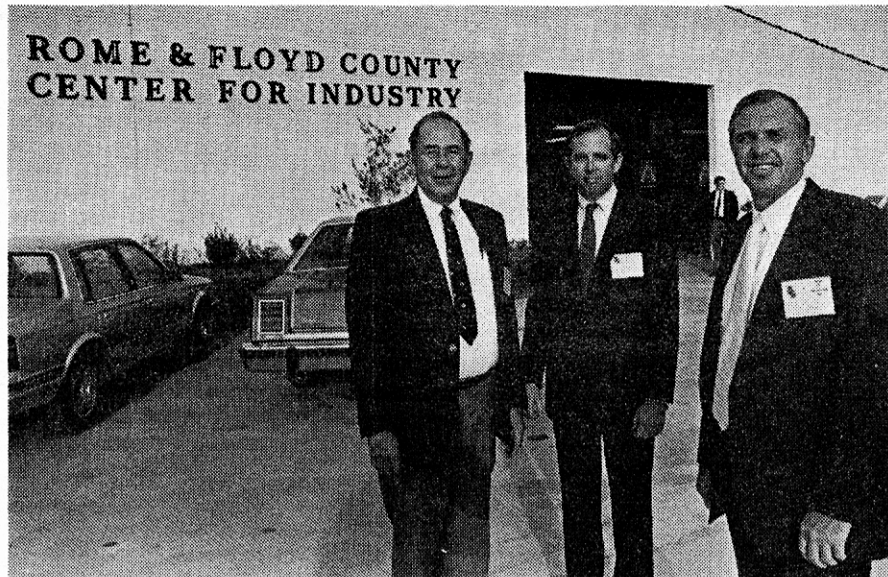
there. We must put our resources together to compete for research dollars."

Dr. Younts proposed that the group conduct a series of economic development leadership workshops in the state. "We need to make folks aware of what we're doing, educate them as to what's involved," he said. Cooperation with the State Department of Community Affairs, the Department of Industry and Trade, and the legislature would be sought for these workshops.

### Tech Outreach Described

Among the attendees at the joint meeting on the Georgia Tech campus October 30 was Dr. Arthur Dunning, the new vice chancellor for services from the Board of Regents. The meeting featured presentations on several of Georgia Tech's services to Georgia.

Richard Meyer briefed the  
See "Outreach," page 8



Tech President John Patrick Crecine (right) and GTRI Director Donald Grace (left) helped dedicate the expanded industrial extension office in Rome November 4. The office has increased its professional staff from one to three, becoming a Georgia Technology Center. It has moved to the new Rome & Floyd County Center for Industry, which also houses a new ATDC-affiliated business incubator program. Bob Springfield (center) is the new director of the Rome office. (Photo by Gary Meek)



On October 16, the Georgia Tech Procurement Counseling Center was refunded for the third successive year. At the signing of the cooperative agreement were (seated, L to R) Harold O. Watson, associate director of small business for the Defense Logistics Agency, and GTRI Director Donald J. Grace; (standing, L to R) Charles Catlett, Procurement Counseling Center director; Navy Captain N.W. Hensley, commander, DCASR-Atlanta; OCA contracting officer Lynn Boyd; and OCA Director J.W. Dees. The center helps small and medium-size Georgia firms sell their products and services to the federal government by providing assistance with product evaluation, agency identification, and bidding procedure information. Last year, the center assisted 100 firms which secured approximately \$4.5 million in federal contracts. (Photo by Gary Meek)

## EDL Starts Radon Program

by Lincoln Bates, EDL

To meet the environmental health hazard posed by radioactive radon gas, indoor air quality specialists in the Economic Development Laboratory have launched a new program that combines research, education/information, and technical assistance.

"Radon is a dangerous environmental threat right now," says Dr. Marilyn Black, head of EDL's Analytical and Instrumentation Branch. "You can't see it or smell it, and its adverse effect, lung cancer, isn't immediately apparent," she adds.

"There's a lot of public apathy about radon," she says, "but everyone is affected to some degree." The gas dissipates rapidly outdoors and poses risk mainly when trapped inside structures.

A naturally occurring by-product of uranium decay, radon is ubiquitous in the air. Concentrations within homes and buildings will vary, depending on many factors, including soil permeability and construction design. The federal guideline for personal exposure is 4 picocuries per liter (pCi/L) of air, and the U.S. Environmental Protection Agency has predicted that one in five homes nationwide will measure above this acceptable level. Exposure to 4 pCi/L will produce one lung cancer death

in every 100 people, according to risk estimate data, Dr. Black notes. The risk factors increase linearly with higher exposure levels.

"The Georgia data we have acquired show that the state falls into the national average," Dr. Black says. "In 21% of the homes we've surveyed in various counties statewide, we've found higher-than-acceptable radon levels."

One of the advantages we do have, she adds, is that radon is fairly simple to detect and mitigate; however, this should be done by a qualified consultant or organization.

One-day public awareness seminars for homeowners, realtors, scientific and medical professionals, and other interested parties were held in October and November. Some 80 people attended the October radon seminar, which was covered by Channel 5.

Dr. Black plans a three-day technical course the first of the year for environmental health and safety professionals, consultants and engineers. Following that will come a mitigation course for contractors and architects. Meanwhile, EDL will continue radon research and offer technical assistance to real estate developers, building owners, and homeowners concerned about the possible presence of radon.

## Going to Japan?

Are you planning a trip to Japan, China or other countries near Japan? You can help Georgia Tech by spending a day with

Nissho Iwai Corporation, the Tech representative and agent in Japan. Contact Dr. Lowell Netherton (ext. 4-6900) in the Office of the Vice President for Research for details.

## EML Design Is Tiptop

by Martha Ann Stegar, RCO

A tilt-tray sorting system incorporating design improvements made by engineers in the Electromagnetics Laboratory (EML) soon will be sorting mail at the Beijing, China, post office.

Tony Jape of EML redesigned the tipping lever for tilt-tray sorting equipment manufactured by the Logan Company, a material-handling equipment manufacturer in Louisville, Kentucky. "It was a challenging design problem," says Jape, "because the system had to operate at higher speeds than before, yet give the packages a smoother ride."

Not only did Jape achieve the desired speed, smoothness and reliability goals, he was able to produce a finished prototype on a very tight schedule—so tight, in fact, that the company had a pattern maker make an expensive casting mold before EML's model

was even tested. When the EML prototype was delivered to Logan, it passed the test with flying colors. The company has since filed an application for a patent on Jape's design.

Tilt-tray sorters are used in distribution warehouses, airport baggage handling systems, and mail sorting systems. The items to be sorted are placed on trays bolted onto wheeled carrier vehicles that run along a track. At selected points, an arm attached to the track comes up and a rubber wheel rolls along the tipping lever, tipping the tray with its contents to the side. The items then slide down a chute into a waiting receptacle. All of this must be done with speed and precision, with as little vibration and noise as possible.

"Logan is a firm with an outstanding reputation for building rugged products," says Ron Bohlander, Jape's supervisor. "Their tilt-tray sortation equip-

ment had been around for some 20 years, and they were looking for ways to improve its performance. We had already done a general study for them when the China application came up."

Jape determined that the key to enhanced performance was the tipping or "index" lever. Its exact shape is critical. He developed a mathematical model to specify the optimum shape for the lever ramp and built the prototype index lever. EML instrument maker Don Swank machined the part. Jape also measured the performance of the pneumatic actuator, or tip-up mechanism, and recommended changes that would double its speed.

EML has a new contract with Logan to do additional work on more standard applications that should result in additional patents.

"This company now appreciates what a university can do for them," says Jape. "We helped them with a practical problem on a tight schedule."

## STL Studies Ada

The Systems and Techniques Laboratory (STL) has organized a training program in the Ada programming language to enhance the Ada capabilities of its software professionals. The program comes in response to DoD requirements for Ada usage in software development.

The initial offering is a 10-week Ada programming course. The course, taught by Dr. Bill Appleby of Tech's ICS School, focuses on Ada programming, the Ada software design philosophy, and real-time programming. Several STL engineers also are independently studying the broader aspects of Ada software engineering in order to prepare for contract development on programs requiring the Ada language.

Future plans include more advanced training courses, more independent study, acquisition of a suitable Ada development environment, and research into the hardware and software requirements for real-time Ada systems.

# Q & A

A productive part of the "GTRI—Present and Future" meetings each year is the question and answer period. To keep everyone informed of all the matters brought up at the four meetings this year, we are printing the questions and answers in the *Connector*.

The 24 questions asked this year covered such diverse areas as fiscal matters, organization, research, Cobb County facilities, GTRI and Tech's new president, and staff benefits. We will be answering these questions in the current and the following issue of the *Connector*.

## Fiscal Matters

**Q:** Under the new cost recovery system, will the overhead rate remain the same?

**A:** Several forces currently are at work that could cause increases, decreases, or offset to a stable rate structure for several years. Inflation and increases in the levels of administrative support (in GTRI or in GIT support services) would push the rate up, as would the costs of any non-state-owned space that could be needed by GTRI. Hopefully offsetting these increases are efforts to reach greater efficiency and cost effectiveness in the project management cost (PMC) and administrative cost areas.

The most effective of all single elements in reducing the rate—real research growth—is taking place. In the overhead rate relationship of indirect costs divided by direct costs of research, holding the indirect costs relatively constant while increasing the direct costs through more sponsored research could effect dramatic decreases in the rate for a year or two. After that, a step-function increase in space, and therefore, space costs, would be needed to accommodate the staff and equipment accompanying the increased research. So the most powerful thing we can do to hold the rate down, or even reduce it, is to do more research without increasing space or support staff proportionately.

**Q:** Give us an update on efforts to bring management information from central databases to project directors.

**A:** GTRI applications in the MODEL 204 Database Management System presently provide project directors with information on proposals (ACCESS

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204), projects (PADDATA, GTRID), personnel (HRD), and property inventory (GTRIPROP). Future applications will provide project directors with information on project accounting reporting and proposal tracking.

Present on-line production systems available to project directors include the following:

- The OCA Program Initiation Division database records proposal information in the M204 database environment. The project director can use ACCESS 204 to query the database for information on a per proposal basis or tailor custom summary reports based upon selected criteria, including: sponsor, lab, proposal amount, and performance period.

- The OCA Program Administration Division (PADDATA) system provides a method for administering project contracts under the M204 database environment. Within this system, a project director can query the database for detailed information on awarded contracts on a per project basis or tailor custom summary reports based upon selected criteria, including: sponsor, lab, contract amount, funded amount, and contract performance period.

- The Research Communications Office Database (GTRID) contains project abstracts, keywords and National Technical Information Service (NTIS) codes. Project directors can generate queries based upon selected criteria, including: NTIS codes, keywords, lab/division, and PD/PI name.

- The GTRI Property Database (GTRIPROP) system provides query/report access to all GTRI (state-owned) equipment. Project directors can generate queries based upon selected criteria, including: location, description, acquisition cost, lab/division placement, and equipment designation (scientific/non-scientific). This system is used to satisfy the equipment screening requirements of OMB.

- The GTRI Human Resources Department Database (HRD) contains the personnel information for researchers, support staff and students employed by GTRI. The database includes budget position, EEOC, educational and personal data. The data from this system could be made available to authorized personnel to generate project staffing support reports. (Access to the HRD database is currently restricted.)

The future systems development efforts by CRSD are in the areas of GTRI Accounting Reporting and Office of Contract Administration Program Initiation Division.

CRSD is presently converting the CDC Cyber COBOL-based GTRI Accounting Reporting system to the GTRI IBM 4381. The accounting reporting system is being converted initially to IBM

COBOL/VSAM. This system will be moved to the MODEL 204 database environment to support on-line access to accounting information. In the future, the project director will be able to query the database to obtain real-time accounting posting detail information and expense/encumbrance roll-up reporting.

CRSD is presently automating the Office of Contract Administration Program Initiation Division (PIDDATA) system. This system will provide on-line tools and management reports on PID's proposal preparation process. The project director will be able to track in real-time the progress of a proposal from inception to award. The database will include such information as intellectual property rights, non-disclosure agreements, patent and software rights, publication restrictions, and IQC, BOA, and Teaming agreements.

**Q:** You mentioned that the cost accounting system is not well suited for CSSR (cost schedule status reporting). I've heard rumors of a new system to be installed. Is this correct?

**A:** GTRI is in the first year of a major improvement in cost accounting. Efforts currently under way include:

- Transfer of the existing GTRI accounting system from the GIT-owned and controlled CYBER equipment to the GTRI IBM machines. This portion of the project is nearing the testing phase.

- Evaluation of the needs and identification of capabilities for a new database-compatible system which will load all GTRI data into a central database accessible to project directors. Our objectives are to allow project directors to access their data in machine-readable files to reformat as needed, to provide some preformatted reports to sponsors (like CSSR), and to make available to the project director in the system data which is not currently available. In the case of CSSR, there is an additional need for a third level of tasking, a level below the sub-project. This may be more difficult to address, depending upon the account structure in the Business Office software to be selected in the next few months.

- Study of the tradeoffs between development and purchase of such a system. We are looking at some third-party systems in place in other research university and not-for-profit environments.

**Q:** Is the Georgia Tech Business Office going to install a new cost accounting system?

**A:** The Georgia Tech Business Office is in the process of selecting software for

the payroll/accounts payable/general ledger (and a few other) functions which they perform for all of GIT, including GTRI. This system will not replace the GTRI cost reporting system, but will replace the MSA and other existing business software they are currently using. We will interact with these systems, but are not forced to use the same software or even the same vendor for our chosen cost reporting system. The only requirement is that we be able to send and receive data files. The primary impact of the business system software on GTRI will probably be the account number structure, which may limit the number of sub-levels we can have on a given project in our official accounts. This is not to say, however, that we could not somehow meet the CSSR-related needs in some way within our own system. This will be addressed as soon as the Business Office has made its selection.

**Q:** Contract development funds have been almost nonexistent this past year. How can you direct significant CD funds to the lower echelon staff at GTRI?

**A:** Contract development funds for discretionary use by the labs were in short supply during FY87 because of the requirement to cost-share the shortfalls in sponsored programs resulting from the change in cost recovery rates. Now that we have gone through one fiscal year cycle, and most of the transients are behind us, more funds will be available for this purpose. The lab overhead allocations for contract development were increased by almost a factor of two in July. This change, along with the increased funding to support seed research and equipment, will greatly improve our competitive position.

In our present organization, the responsibility for management of contract development funding and activities is most effectively performed at the laboratory level. Additional contract development funds have been held at the OOD level to support proposal efforts addressing broad technical areas which involve the facilities and staffs of several laboratories. We encourage staff at all levels to participate in this vital activity.

**Q:** What's the outlook for the next two to three years in terms of overhead funds for contract development and for capital outlay?

**A:** In this current year, we are already starting to reap the benefits of the separate overhead rate and cost recovery system for GTRI. Compared with FY87, we have increased significantly the lab allocations of contract development funds. We

Continued on page 4

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also have been able to identify very substantial funds for investment in internal projects to upgrade the technical levels at which we compete.

So far this year, we have received only minimal GTRC funds for equipment, but we are hopeful that the GTRC Board will make additional grants in December. We believe that this improved situation should continue for the next several years, based on our cost recovery system. In addition, there is evidence of greater support from the Chancellor and Board of Regents for an increase in State funds to support the general GTRI operation. If we are allocated the additional State funds in FY89 that we have requested, we will be able to start significant upgrades of our equipment base.

### Research

**Q:** What and how many technological thrust areas is the Senior Technology Guidance Council considering?

**Q:** When will the Senior Technology Guidance Council get the internal research dollars out to us troops? The year is rapidly disappearing.

**Q:** How are you going to select the individuals for the IR&D efforts you described (E projects)?

**A:** The activities of the Senior Technology Guidance Council should be reviewed with a recognition that it is developing a new way to address and structure our internal research program. As it progresses this year and beyond, the system it develops will become more refined and the whole process will become far less tedious.

Initially this group of research leaders has had to cope with trying to develop common definitions and perceptions of our research needs at the same time it was developing the process itself. We are all the products of the system that has evolved at GTRI through the years, and it is

quite a challenge for all the participants to develop perspectives that focus on GTRI as a whole rather than individual lab orientations. All of these considerations have led, of necessity, to a slow program startup. However, we now expect to start initiating specific research projects in January.

The Council has identified 13 areas to be addressed by Area Guidance Teams. Those teams have been identified and are in the process of preparing their recommendations for review by the Council and OOD. (See article on page 1.) Subsequently, those research program recommendations will be published to the labs and to our researchers at large for comments and recommendations.

We are considering an open workshop format as a way for the respective Area Guidance Teams to get these additional inputs more expeditiously and effectively. After that part of the process, OOD, with the help of the Council and lab directors, will set its funding priorities and will release the funds and the projects. The project or task leaders and participants for these research efforts will be selected with the advice and assistance of the teams and lab directors. The progress and results of these research activities will be closely monitored, reviewed and published.

**Q:** Do you see GTRI becoming meaningfully involved in Ph.D. support/thesis research support?

**A:** Yes. This trend is being emphasized in several ways. As an example, we have identified about a dozen GTRI faculty members who will serve as dissertation advisors for EE graduate students working in GTRI. These GTRI faculty were approved by the Electrical Engineering School faculty, the Dean of Engineering, and the Director of Graduate Studies. Their names will be listed in the Georgia Tech catalog along with EE faculty. Related interactions are being developed with other schools.

Another indicator is a plan

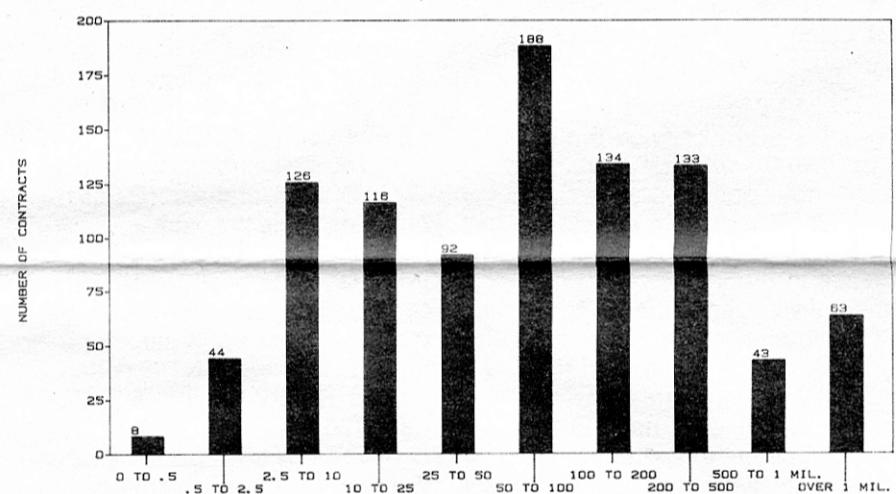
recently proposed by the Associate Vice President for Graduate Studies and Research. This plan would support GRAs in Fiscal 1988 if the students have the "doctoral degree as their education objective or enroll in a thesis-option M.S. program." It is hoped that at least some M.S. candidates doing the thesis option would become interested in continuing in a doctoral program.

Within GTRI, the recently formed Senior Technology Guidance Council is reviewing GTRI technical areas and will make recommendations to OOD for potential funding of new internal research projects. Part of the funding would be used to support GRAs, who would be included in the internal research. These projects also may offer possibilities for funding of thesis work. In addition, increased interaction with academic faculty will be encouraged as part of this program.

Second, these contracts do require greater cooperation among the labs because larger contracts generally require multidisciplinary inputs. For example, the sponsor may be looking for not only an RF solution, but also perhaps an infrared solution, as well as some applications of expert systems for artificial intelligence. This would bring together the assets of three laboratories. Therefore, we are encouraging cooperation because not only do sponsor requirements demand that it be done so, but the contractual size also requires it.

We are attempting, as much as possible, to allocate tasks from large contracts to several laboratories, assigning them sub-budgets from the main contract. This is true in several areas, including the work we are doing for Warner Robins in special operations. We are also trying to stimulate lab cooperation through

FY 87  
GTRI-SIZE OF \*ACTIVE SPONSORED PROJECTS



\* PROJECTS UNTERMINATED AND HAVING NON-ZERO BUDGETS AT 6/30/87

**Q:** You suggested that we need to move toward doing business in larger contracts. This will require inter-lab cooperation. Presently, I see incentives only for competition. Do you have specific incentives in mind to promote cooperation, or punishments to prevent competition? What are they?

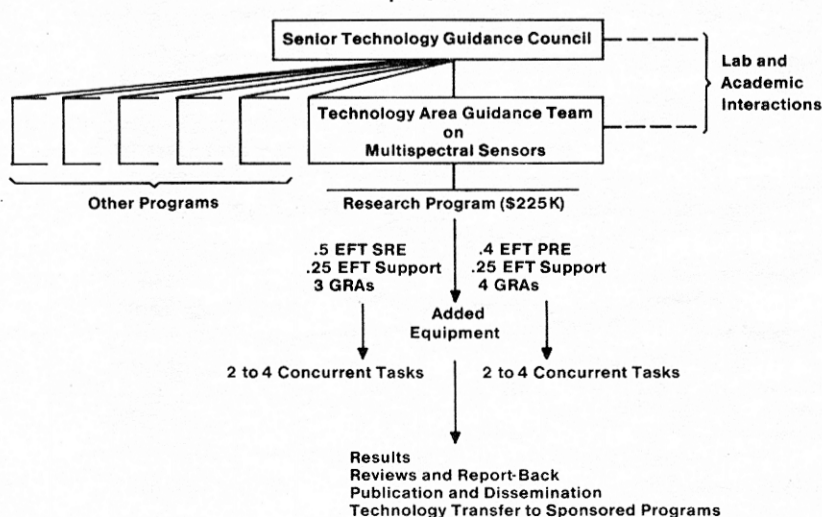
**A:** GTRI already is moving toward doing business in larger contracts. During FY 1987, we moved from some 45 contracts over \$1 million to 65 contracts. This shift is driven by two factors.

First, we would like to have larger contracts because the proposal efforts are disproportionate to the amount of the contract; it usually takes the same effort to win a \$200,000 contract as it might for a \$3-4 million task ordering contract. Consequently, the Competition in Government Act creates a better situation for us to compete and win large contracts.

exchange meetings that allow people to learn about the capabilities that exist within our laboratories. Certainly, we have stressed the need to cooperate to the laboratory directors, and they are, in many cases, tracking the areas and the projects in which they are working with other laboratories. We also are developing research thrusts in areas such as millimeter waves, low observables, and other areas that will bring our people together in developing joint equipment usage, joint research, and joint proposals.

We think that the cooperation is there in principle. It is in our best interest as an organization to find methods for greater cooperation while still maintaining the cohesiveness and accountability within the laboratory structure. This is a problem faced not only by Georgia Tech and the Research Institute, but also by many corporations with multiple R&D units. The nature of research in the future will be multidisciplinary; consequently,

HOW THE NEW INTERNAL RESEARCH PROGRAM WILL WORK  
Example Scenario



## You Asked About It . . .

Georgia Tech has got to be able to react to this change in research needs if it is going to be competitive.

**Q:** Much of GTRI's present focus is centered around military applications research (even to the extent of hiring Dr. Watt from DoD to head STL). GTRI, additionally, should aggressively pursue alternate, peaceful applications of technology research to be in agreement with its charter. What is presently being done for the short and long term toward this end? Examples of alternative research: weather radar, medical equipment.

**A:** First, Dr. Watt was hired not simply to pursue mili-

tary applications. He was hired because of his technical and management background across both industry and government. He brought a very talented capability to GTRI.

With regard to aggressively pursuing alternative peaceful applications of technology, certainly GTRI is very much open to those applications. We have worked with millimeter-wave radar to determine the thickness of ice in order to provide safe passage for ships through all weather conditions. We have determined cloud cover and cyclonic development in order to predict potential behavior of damaging weather conditions. We have worked on medical applications of

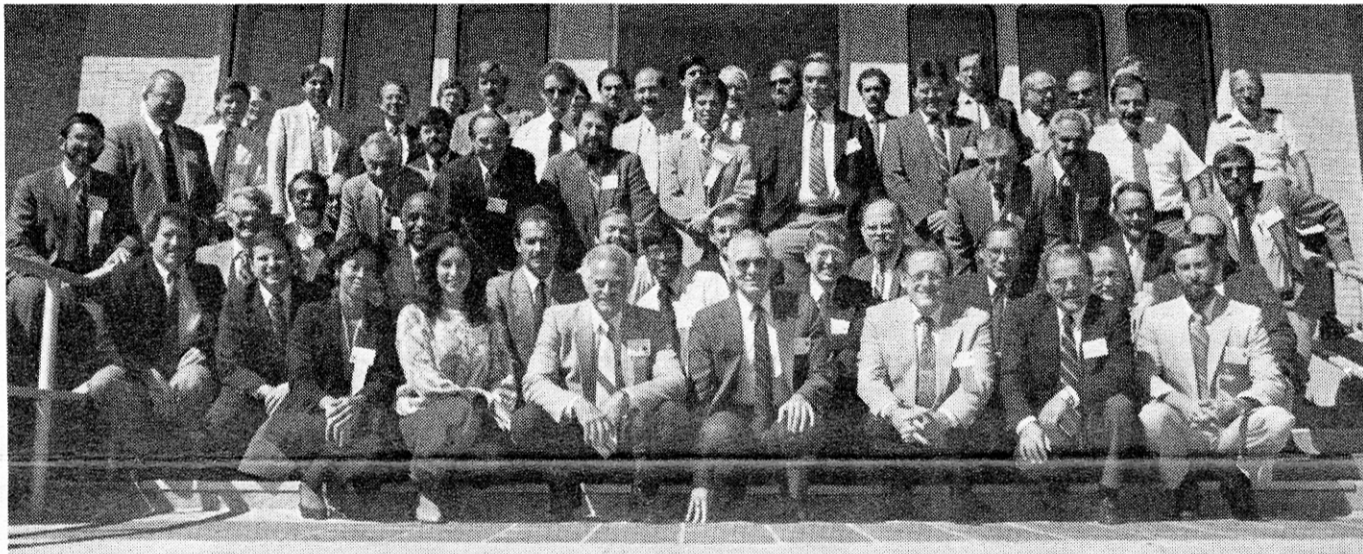
microwave technology. We have used radar to determine the locations of deficiencies in roads, as well as where the locations of breaks in oil pipes might be. Thus, the concept that Georgia Tech is totally dedicated toward non-peaceful applications in technology is not correct.

Nevertheless, the charter that was given to Georgia Tech to provide a base for support of national defense objectives requires that the university contribute to the strength of the United States. If the universities do not participate in certain elements of the defense requirements of the nation, certainly the nation's objectives in providing a safe and secure society are not going to

be achieved.

The whole basis for the strength of the United States and the free world is maintained in part by a superior technology base which is rapidly being overcome by potential adversaries. If the universities abrogate that responsibility, that is a serious defect.

This is not an answer to the direct questions, but should help to set in proper perspective the fact that military research many times provides the cutting edge of technology. Thus, the research objectives of the university are well served, not necessarily from a national defense point of view, but from a cutting edge of technology point of view.



GTRI-Cobb County hosted the Missile/Projectile/Airborne Test Instrumentation Antenna Workshop October 6-8. Sponsors were the Instrumentation Branch of the Air Force Armament Laboratory and the 6595th Missile Test Group of the Space and Missile Test Organization. The workshop brought together industrial, academic and government professionals to assess the state of the art for onboard missile and projectile test and evaluation antennas, and to make comprehensive plans for research and development of onboard instrumentation antennas. Tom Brown and Linda Jordan of STL coordinated the workshop. (Photo by Kay Lindsey)



The International Test and Evaluation Association's Atlanta Chapter held its kickoff meeting October 21 at GTRI-Cobb County. Forty people heard guest speaker Harry J. Peters (right) discuss new initiatives in the U.S. Army Test and Evaluation Command. Here, Atlanta Chapter President Tony Chimera (left) greets Mr. Peters. (Photo by Anita Edwards)



## Software Review

by John Dillard, CRSD

While GTRI's IBM 4381 is used primarily for administrative purposes such as the Model 204 Database and PROFS (electronic mail), it is also available for sponsored research to anyone at Georgia Tech with a valid project number.

The IBM 4381 has a wide variety of commercial software. All of the software is under software maintenance and will be kept at current revision levels as updates arrive. Following is a description of packages available as of fall 1987.

**IBM XEDIT**, the System Product Editor, is a versatile, highly powerful, full-screen editor. In addition to a full featured editor, Xedit provides extended editing features and definition of up to 27 single key-stroke functions.

**IBM REXX**, the System Product Interpreter, offers the programmer an interface for executing series of CP and CMS commands, as well as writing XEDIT macros. REXX is a

Pascal-like language, complete with a full assortment of structural and flow-control statements, as well as a full line of functions, including system calling and string handling functions.

**IBM Script**, the Document Composition Facility, is a full-function text formatter. Script works by inserting dot commands in a file of unformatted text. This allows the use of special formats such as indexes and tables of contents, figure boxes, lists, boldface, and larger typefaces.

**GML**, The Generalized Markup Language, is an extension of Script. It sets up standard document formats and allows for easy creation of documents within those formats. GML commands can be used with or instead of Script commands to create documents, ensuring standard formats and providing greater capabilities using less effort.

**IBM 370 Assembler** is the native machine language of the IBM 370 architecture line. It provides the programmer the highest degree of functionality when programming on the IBM 4381.

**PL/1** is a multi-purpose programming language. The language has a rich instruction set, and performance characteristics of PL/1 are outstanding. In addition to the PL/1 compiler, there is the Sort library, a debugger, and the standard PL/1

library routines.

**VS FORTRAN II** Version 1.4 is an implementation of FORTRAN standard ANSI x3.9-1978. FORTRAN is a mathematics-oriented language most suited to engineering and scientific applications. There is an extensive library of mathematical functions, and an interactive debugger.

**VS COBOL II** Version 1.2 is a business-oriented language suitable for business and database applications. The VS COBOL II compiler is an implementation of ANSI x3.23-1974 COBOL.

**Syncsort** is a fast external sorting product that can be used either interactively or called from programming languages such as COBOL and FORTRAN. Syncsort provides multiple key sorts from multiple files.

**VSAM** is a utility which supports the creation and management of indexed-sequential files. Files can be created, copied, merged, modified, or reorganized using the facilities provided by VSAM.

**IBM Interactive System Productivity Facility (ISPF)** is the manager and provider of services for interactive applications. It provides control and services to support processing of interactive applications in the VM/CMS environment.

**Kermit** is a versatile file transfer utility. It is supported by most of the machines on campus, and by over

200 different machines and operating systems in all. It allows for transfer of Binary and Text files from one machine to another, providing that Kermit is available on both machines.

**PVM**, the VM/Pass-through Facility, allows users access to other IBM machines, provided a PVM link exists between the two machines. A user on either the GTRI 4381 or one of the two OCS machines can access any of the three machines for a terminal session.

**RSCS**, the Remote Spooling Communications Subsystem, is a file transfer and storage system. Using RSCS, users can queue files for printing, and can send files to other users on the system. In addition, files can be sent to other machines if there are RSCS connections, either directly or indirectly, to the other machines. BITNET, an international communications network, is available with RSCS, and provides file transfer capabilities to universities throughout the U.S. and abroad. Gateways to ARPANET, NSFNET, SURANET, CSNET and others are also provided on BITNET.

If you are interested in obtaining a VM/SP account for research purposes, contact John Dillard at 894-7172.

## Lab Director Envisions EML's Future

Devon Crowe believes a lab director should be the servant of his staff.

"I feel that the lab organization is intended as a support structure for the people doing the research," says Crowe, who is the new director of the Electromagnetics Laboratory (EML). "If you hire highly qualified technical people, they are usually self-motivated. I operate on the assumption that if the organization provides the right environment and opportunities, people will be motivated to do a good job. I work for everyone in the lab. I'm here to facilitate their work."

Since taking the EML helm in late September, Crowe has been meeting with individual division chiefs, branch heads and project

directors—learning EML's capabilities and desires. "We are examining the capabilities we now have and identifying the gaps so that we can strengthen the present capabilities and develop complementary ones," Crowe says. "Our goal is to pursue a continual increase in the quality of personnel and facilities within the lab, as well as of the products delivered to sponsors."

The basis for determining future directions will be systematic, rather than by target of opportunity, Crowe says. He wants to take an "end-to-end" look at each technical area in which EML is working to identify which of the technical components are missing or need to be strengthened. "This way, we can maximize our return on in-

vestment in recruiting," he says.

Crowe says he was attracted to his new job because of the opportunity to participate in building a center of excellence on a large scale. "The highest priorities of my managerial responsibility," he says, "are raising our facilities to the state of the art; pursuing contracts with a greater emphasis on basic research that will enable us to create the state of the art; and recruiting the most technically capable people we can find."

"Many of our people are interested in basic research," Crowe points out. "But these contracts are more difficult to bring in because less money is spent on this type of research; thus, there is less available to compete for. And some of the organizations we compete

against have built-in pricing advantages or subsidies. These would include captive government labs, and those enjoying substantial private endowment or state subsidies. Therefore, technical excellence and, wherever possible, technical uniqueness will be requirements for success."

Crowe also is interested in interlab cooperation. "We can leverage each other's technical capabilities in pursuit of contracts," he says. "It will take some time for this process to evolve, but I envision EML as the creator of technical concepts which grow into systems applications. At that point, it could make sense for a systems-oriented lab to take the lead in the development of that concept."



Janice Manders recently was elected to the Powder Springs City Council. (Photo by Joe Schwartz)

## Way to Go, Janice!

Janice Manders has become only the second woman ever elected to the Powder Springs City Council. She was high scorer in a three-person race in the general election, and beat the incumbent in the October 31 runoff to win the seat. She will begin her two-year term in January.

Janice, who is the assistant to GTRI Director Donald Grace, is a lifelong resident of Powder Springs. She spent six weeks of hard campaigning to win the post on the five-person council. In addition to the usual campaign signs and mailout flyers with her platform, Janice did a lot of

telephoning at night and knocked on doors on the weekends.

"One unique thing that may have won the race for me," says Janice, "is that just before each election, I sent handwritten reminder cards to every voter who had committed to vote for me."

Janice would like to serve on the Council's administrative committee. She feels that her 11 years of administrative experience at Georgia Tech, first in SEL and now in OOD, would be helpful. And tackling the problems of running a city will give her a broader perspective on her work at Tech.

## Engineering Vocabulary

Those readers who enjoyed the "Research Definitions" in the February *Connector* might find the following terms useful for confusing project sponsors:

"It is in the process" — So wrapped up in red tape that the situation is almost hopeless.

"We will look into it" — By the time the wheel makes a full turn, we assume you will have forgotten about it.

"A program" — Any assignment that can't be completed by one telephone call.

"Expedite" — To compound confusion with commotion.

"Channels" — The trail left by inter-office memos.

"Coordinator" — The guy who has a desk between two expeditors.

"Consultant (or expert)" — Any ordinary guy more than 50 miles from home.

"To implement a program" — Hire more people and expand the office.

"Under consideration" — Never heard of it.

"Under active consideration" — We're looking in the files for it.

"A conference" — A place where conversation is substituted for the dreariness of labor and the loneliness of thought.

"To negotiate" — To seek a meeting of minds without a knocking together of heads.

"Reliable source" — The guy you just met.

"Informed source" — The guy who told the guy you just met.

"Unimpeachable source" — The guy who started the rumor originally.

"To clarify" — To fill in the background with so many details that the foreground goes underground.

"We are making a survey" — We need more time to think of an answer.

"Note and initial" — Let's spread the responsibility for this.

"See me" or "Let's discuss" — Come down to my office, I'm lonesome.

"Let's get together on this" — I'm assuming you're as confused as I am.

"Give us the benefit of your present thinking" — We'll listen to what you have to say as long as it doesn't interfere with what we've already decided to do.

"Will advise you in due course" — If we figure it out, we'll let you know.

"To give someone the picture" — A long, confused and inaccurate statement to a newcomer.

## Patent Seminar Scheduled

A seminar on "When and How to Use the Patenting Process at Georgia Tech" will be held on Tuesday, December 8, at 2:00 p.m. in Room 303 of the Baker Building.

Dr. Milton Stomblor, associate director, OCA, will cover the

Georgia Tech patent policy, how to determine if/when it is worthwhile to submit a patent disclosure, procedures to be followed, forms to use, and whom to contact.

If you wish to attend, please call Judy Cooper at ext. 4-3479.

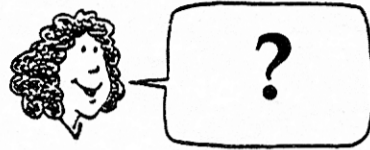
## In Memoriam

GTRI retiree Wardell (Steve) Stephens died October 23 after a cerebral hemorrhage. He was 66 years old.

Steve, a former mechanical technician II in the Facilities Management Department, retired in December 1985 after 32 years of service. He was a favorite among GTRI employees, who enjoyed his outgoing personality and cheerful "I'll fix it for you" attitude.



## QUESTIONS, ANYONE?



by Charles McCullough, HRD

"It looks like my division secretary's husband is going to be transferred out of state, so I'll probably have a vacant position to fill pretty soon. Has anything changed in the recruiting and hiring process?"

The basic process is much the same as you're used to in recruiting and hiring for classified positions, but there have been some changes in forms, timeframes and the approval process that you, as a hiring supervisor, need to know.

First, if you feel that a classified position's title is no longer appropriate, you still need to complete a Position Classification Questionnaire. This form has been revised so recently that the ink is still wet. The old Position Classification Questionnaire was a single sheet, front and back. The new form is four pages (relax, the type style is much bigger) and allows for a more accurate and objective description of the duties being performed in the position. Your lab received a supply of the new forms during the first week of November.

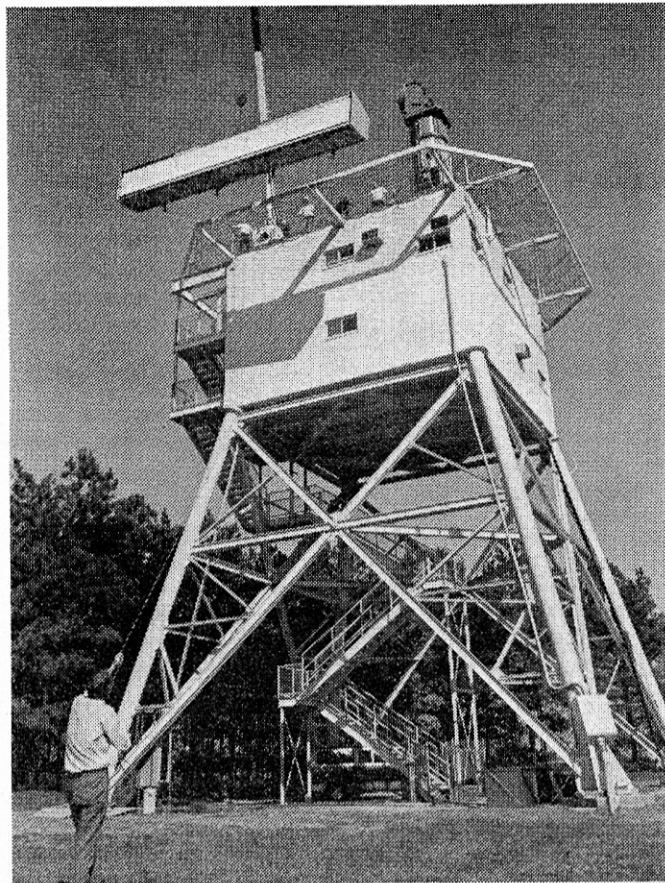
If you're comfortable with the present title of a classified position that you're about to fill, forget the Position Classification Questionnaire and go directly to the Job Request Form. This form, too, has been revised slightly, but it still serves as the source by which your vacant position gets posted in the Georgia Tech Job Bulletin. Remember that if your Job Request Form gets to HRD in time for us to review it and get it to Personnel by 5:00 p.m. on Monday, your vacant job will run in the next day's (Tuesday's) Job Bulletin. Your vacant job listing must run for five days

before you can select a candidate. If that 5:00 Monday window is missed, you won't see your posting in the Bulletin until the following Tuesday. A slightly new twist: a posting in the Job Bulletin will be pulled after 30 days. If you want the job to be advertised longer than 30 days, you'll need to provide a memo to justify running it longer.

After you've received applications and conducted interviews and you're ready to make a decision, your reasons for selection or nonselection of each candidate must be noted on every Referral form you received. In the past, if you didn't interview a candidate, you didn't need to note a reason for not selecting that applicant for the job. Now, every Referral form must show the reason for nonselection (or selection).

Once your Referrals have been returned to HRD, we take them to Georgia Tech's Affirmative Action Officer. This is a fairly new additional step in the approval loop. The AA Officer's job is to make sure you don't get the Institute in a jam by having practiced discriminatory selection practices. Of the referred candidates, did you interview a representative pool of females and minorities? (If you didn't, you just might have to do some more interviewing.) Of the interviewed candidates, did you make your selection and rejection decisions based on job-related qualifications and are your reasons for selection and rejection that you've shown on the Referrals an accurate reflection of this? Because of this additional step, it now takes a few days longer to get an approval to hire than you might be accustomed to, so be prepared for a somewhat lengthier wait before you get the okay to jump on the phone and offer a candidate the job.

## Sierra Program Progresses



The Sierra Program recently achieved a significant milestone as the first of two airborne phased-array telemetry antennas was raised to the top of the far-field test facility receive tower at GTRI's Cobb County facility. The 30-foot-long antenna is the largest yet tested on GTRI's unique test range. The antenna weighs approximately 3,300 pounds, and total weight, including the specially manufactured test frame, is over 6,500 pounds. When this series of tests is completed in early December, the antenna will be installed in a modified DeHavilland DH-8 aircraft to provide test range support for the U.S. Air Force. (Photo by Kay Lindsey)



Every Friday morning, Bill Cooke, director of the \$7.2-million Sierra project, holds a strategy meeting. Seen at the October 30 meeting are (L-R) Bill Cooke, Jimmy Woody, John Sweeney, Joe Harris, Cal Jamison, and Norm Ellingson. (Photo by Mark Pellegrini)

## PROFESSIONAL ACTIVITIES

### ECONOMIC DEVELOPMENT LAB

David Clifton made a presentation in Macon to the Governor's Growth Strategy Commission in mid-October.

On October 15, Claudia Huff, Johanna Thomas, and Bob Springfield gave a presentation on "The Professional Communicator as a Problem Solver" at the IEEE International Communication Conference in Winnipeg, Manitoba.

At a Trade Adjustment Assistance Centers conference in Boulder (CO) October 19-21, Johanna Thomas and Bob Springfield led workshops on organizational behavior management and viability analysis as it relates to a firm's recovery.

The National Association of Management and Technical Assistance Centers recognized Sherman Dudley and Bill Darley with first- and third-place awards, respectively, in its 1987 national competition for outstanding assistance projects. Dudley's work with a Fargo food-processing firm and Darley's work with a Cartersville facility were performed through Tech's EDA

University Center, directed by Art Brown.

At the invitation of the county commissions of Atkinson, Pierce and Clinch counties, John Nemeth spoke in October at three public information meetings concerning the establishment of a state hazardous waste management facility. The three counties are among 12 that have applied to be the location for such a facility.

### ENERGY & MATERIALS SCIENCES LAB

Steve Bomar gave a talk on "Advanced Energy Research" at the Naval Facilities Engineering Command in Charleston (SC) October 21.

Lois Speaker gave a talk, "LB Films—From Laboratory Toy to Antifouling Technology," at an invited seminar at the Hawaiian Natural Energy Institute, University of Hawaii, October 9.

At the Tenth International Conference on Chemical Vapor Deposition, held in Waikiki (HA) October 19-23, Tom Starr presented a paper entitled "Model for Rapid CVI of Ceramic Composites."

Van Nostrand Reinhold Company is publishing a book by Rosemarie Szostak entitled *Molecular Sieves: Their Synthesis and Identification*.

At the Second DoD Electromagnetic Windows Symposium, held October 6-8 at Arnold Engineering Development Center, Arnold Air Force Station (TN), John Handley chaired a session on "EO/IR Design and Testing." He has been appointed a member of the Working Group for Electromagnetic Windows of the Joint Directors of Laboratories Panel for Advanced Materials.

Dan O'Neil presented an invited and sponsored paper at the European Economic Community's International Workshop on Pyrolysis of Agri-Wastes held in L'Aquila, Italy, October 15-16. Ray Kovac was coauthor of the paper, entitled "Advanced Biomass Pyrolysis Technology in the U.S."

### RADAR & INSTRUMENTATION LAB

Gene Greneker presented a paper entitled "The Correlation of Measured Snowpack Physical

Parameters to Changes in Millimeter Wave Radar Reflectivity" at Radar-87, sponsored by IEE in London. Coauthors were M. J. Gary, J. M. Trostel, and Nick Currie.

During the first quarter of FY88, RAIL received 36 contract awards providing funding in excess of \$13.25 million—an all-time high for the lab. In September alone, the lab received 13 awards totaling approximately \$10 million.

### RESEARCH COMMUNICATIONS

Jim Kloepfel is the author of a new book, *Danger Beneath the Waves: A History of the Confederate Submarine H. L. Hunley*. The 118-page volume bears a price tag of \$5.00.

### SYSTEMS & TECHNIQUES LAB

Larry Corey and Robert Howard presented a paper, "The Pointing Accuracy of Phased Array Radars with Correlated Phase Errors," at the Radar-87 Conference in London October 18-22. Coauthors were Josh Nessmith and Jeff Holder of RAIL.

## PERSONNEL NEWS

### ECONOMIC DEVELOPMENT LAB

**Jim Smith** is a new long-term consultant in the Environmental, Health, and Safety Division (EHSD), focusing on electron microscopy and asbestos.

**Susan Griffin** has joined the Energy Resources Group as an RA II.

**Bill Ewing** has resigned, and **Mark Demyanek** will head the Asbestos Group. Also resigning was **William Spain**; **Dave Mayer** will head the Continuing Education Publications Operation. **Susan Bevington** also has departed EHSD.

### ENERGY & MATERIALS SCIENCES LAB

**Joanna King** has been promoted to senior administrative secretary in the office of the lab director.

Welcome to **Joel Shutt**, RS II. Thanks and best wishes to **Jean Williams**, who retired November 30.

### RADAR & INSTRUMENTATION LAB

**Tracy Wallace** has been named acting head of the Technology Development Branch.

Farewell to **Bruce Cherry**, who has moved to Seattle.

### SERVICE GROUPS

Welcome to **Claude Oldham**, telecommunications support specialist I in CRSD; **Theresa Hand**, secretary in Research Security; and **Karen Hooker**, word processor operator in Accounting.

Good-bye to **Mark Bishop**, machinist in Mechanical Services, and **Gina Lawrence**, systems analyst I in CRSD.

Congratulations to Supply Services' **Bobby Ramey** on his promotion to clerk IV; Mechanical Services' **James Ross** on his promotion to research machinist; Human Resources' **Cathy Dunnahoo** on her promotion to administrative assistant; and to **Harriett Matthews** on her transfer from OOD to HRD with a promotion to staff assistant in recruiting.

### SYSTEMS ENGINEERING LAB

Congratulations to September employee of the month **Jack Landgren**, who won for his "substantial contributions to many different efforts."

**Cheryl Barnett** is the new *GTRI Connector* associate editor for SEL.

New employees in the Concepts Analysis Division include the following:

**Kathy Gilbreath**, an hourly-as-needed graphics technician I, is a

cum laude graduate in art from West Georgia College.

**Elaine Baran**, graphics technician I, has a BFA degree from Youngstown State University.

The new word processor operator is **Delores Nogradi**, a graduate of Durham College of Commerce, Kingston, Jamaica.

In the director's office, **Richard Register** is a new student assistant. He is a freshman ISyE major.

**Pike King** has resigned.

### SYSTEMS & TECHNIQUES LAB

**Joel E. Ruda** is a new research technologist I in the Microwave Systems Division. He graduated from the Southern College of Technology in September with a bachelor's degree in electrical engineering technology.

New to the Advanced Technology Division are RE II **H. Dwayne Mills** and RE I **William R. Myles**.

## Outreach

(from page 1)

group on a bold set of initiatives the Advanced Technology Development Center has instigated to create ATDC-type organizations in other locations over the state, to set up affiliated industry incubators in other metropolitan areas, and to create a \$10-million seed capital fund for entrepreneurs. "We want to make the most efficient use of University System resources for the overall economic development of the state," he said.

In his briefing on environmental activities in EDL, John Nemeth announced that they were cooperating with the University of Georgia on two proposals to do environmental science and engineering work.

Other EDL speakers were as

follows: John Adams spoke on the energy audit program and the new advanced manufacturing technology center for the apparel industry. Arthur Brown described the EDA University Center Program and the Procurement Counseling Center to help Georgia industries get government contracts. And William Whitworth reported on the Industrial Education program of in-plant supervisory training for small companies.

Dr. Clifford Bragdon, director of Tech's Education Extension Services, described the planned \$35-million continuing education center, current and planned video-based and satellite-linked instruction activities, and cooperative agreements with other units of the University System.



RAIL held its annual picnic on Halloween by the lake at the Cobb County facility. Some 90 people gathered for excellent food and games. (Photo by Maggi Harrison)



These RAIL employees were honored at the picnic for their outstanding service during the past year: (L to R) Mark Tippens, Devin Seely, Neal Alexander, Linda Harkness, Evan Chastain, Guy Morris, Tom Perry, and Joe Lindsey. Not pictured are Otto Rausch, Molly Gary, Ralph Brooks, Mike Baden, Gene Greneker, Margaret Horst, Frank Williamson, Beth Floyd, Glenn Petterson, Frank Branham, Bill Marshall. (Photo by Maggi Harrison)

## These Words Cut Both Ways

(Quoted from *Communication Briefings*, April 1987)

An economics professor at Lehigh University has come up with a collection of recommendation statements that can be taken in a couple of ways. Here are a few that Robert Thornton suggests:

•If you're commenting about someone who was lazy while working for you, you might write: "In my opinion, you will be very fortunate to get this person to work for you."

•To describe someone who demonstrated zero ability, you

might write: "I most enthusiastically recommend this candidate with no qualifications whatsoever."

•When writing about someone who was so unproductive that the job would be better left unfilled, try: "I can assure you that no person will be better for the job."

**(Editor's Note:** Before you write that next letter of recommendation or respond to an inquiry from an employer, you should check with your legal or personnel office about the legal implications of what you write or say.)

## Personal Notes

**ECSL:** Judy and **Juan Santamaria** welcomed a second son, Nicholas Blake, October 28.

**OOD:** **Bob Shackelford** gained his first grandson (second grandchild), born to his daughter November 5.

**Services:** Condolences to the family of retired instrument maker **Robert Knox**, who passed away October 29.

## Holiday Schedule

Here are the Georgia Tech official holidays for 1988:

Jan. 1	New Year's Day
Jan. 18	Martin Luther King's Birthday
July 4	Independence Day
Sept. 5	Labor Day
Nov. 24-25	Thanksgiving Break
Dec. 26-30	Christmas Break

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