

The GTRI Connector

The wisdom of Barry

- Machines should work; people should think.
- The first myth of management is that it exists.
- Build a system that even a fool can use, and only a fool will want to use it.

(From the collection of Barry Rosenberg)

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Assessing the effects of long-term exposure to space rigors

By John Toon, RCO

Electro-optic components exposed to the rigors of space for nearly six years aboard NASA's Long Duration Exposure Facility (LDEF) show some unexpected performance changes that could affect future spacecraft design, a preliminary study by Georgia Tech scientists has reported.

Analysis of 136 electro-optic components carried by LDEF revealed significant changes in the performance of items such as bandpass filters and mirrors, possibly because of deterioration in their structure and in materials used for their manufacture. Other components appeared unchanged by their six-year sojourn—while at least one material seemed to work better after being struck by meteorites, shocked by temperature changes, and scoured by upper atmospheric oxidants.

In interpreting the performance changes they measured, however, the scientists had to consider the variations that would be produced by normal aging processes. Examination of the materials continues, with particular interest in holographic crystals which could be used for computer mass memories.

Effects of six years in space

"We are finding that organic materials like paints and polymer films, along with mirrors

and filters made by depositing dielectric films, are degraded in space," says Don Blue of GTRI's Electro-Optics Lab. "We were surprised because we really didn't anticipate anything of real significance would happen to these components during the few months they were originally expected to be in orbit."

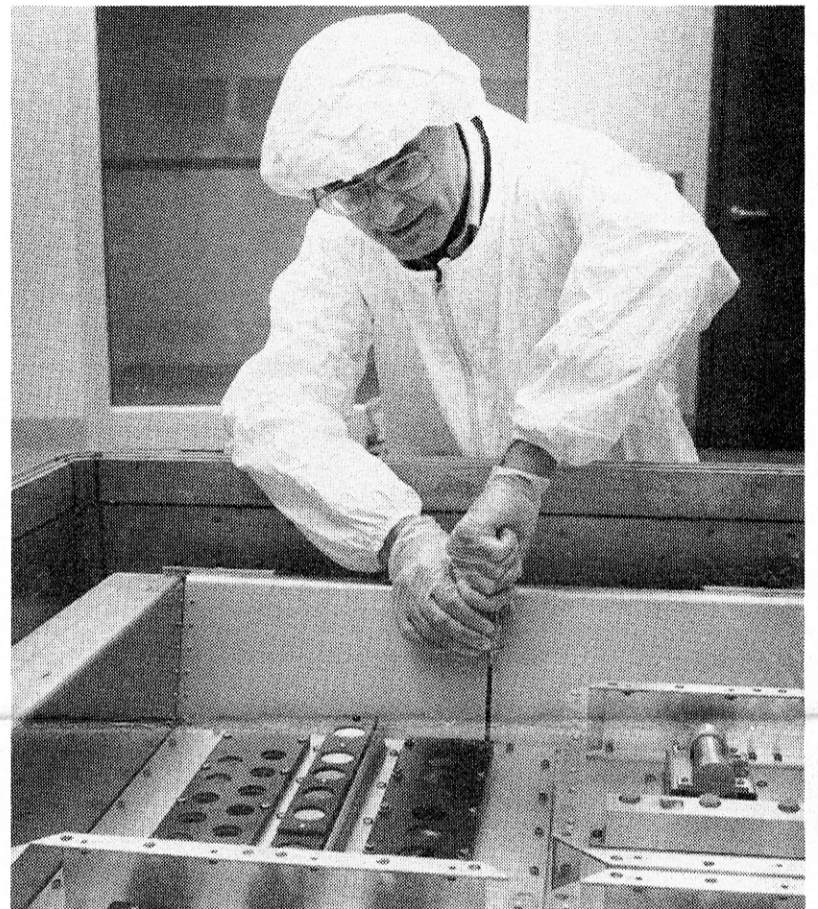
Certain filters are used to help satellites receive laser signals by screening out all but the color of light produced by the signalling laser. The researchers found that six years in space shifted the frequency of light admitted by the filters—and reduced the amount of light transmitted.

These filters were made by cementing together plates within which a thin film stack had been deposited. Blue believes that age and space exposure affected the cement and the deposited layers, and he suggests that space scientists should consider these color shifts and transmission losses in planning future missions.

Holographic crystals, which have potential to store large amounts of computer data, did not appear to be damaged, although the holograms originally stored on them have been degraded, due to the length of the LDEF mission. Electrical Engineering professors William Callen and Thomas Gaylord are studying the performance of the bulk crystals.

Some components carried on LDEF did not seem any the worse for wear. Infrared detectors performed as well after their return from space as they did when first installed on the LDEF test tray back in 1978. A silicon-based infrared detector still performed as designed, despite a crater caused by the impact of space debris, Blue said. And though scarred by the impact of micrometeorites, light-emitting diodes still worked well.

As expected, gas lasers containing helium did not work because the helium leaked out



in the vacuum of space. Even on the ground, Blue noted, gas lasers must be periodically refilled.

The researchers were surprised to find that six years in space appeared to improve the performance of black paints used for thermal control and low-reflectivity coatings. Preliminary study shows that the ability of the paints to absorb far-infrared emissions seemed to improve, possibly due to the creation of new light-absorbing sites by the breakup of paint binders and pigments.

Don Blue examines a tray of electro-optic components exposed to space conditions aboard the Long Duration Exposure Facility. (Photo by Joe Schwartz)

Continued on page 2

Observed & Noted

The Oracle relational database system is helping Georgia Tech keep track of an ever-increasing number of job applicants. *Read about it on page 2.*

Rosemarie Szostak lends her expertise to zeolite scientists in India and acts as mentor to two

Agnes Scott College externs. *Stories are on page 3.*

A bit of culture shock is involved when East meets West. Lincoln Bates describes the impressions of a Kazakh visitor to EDL *on page 4.*

RCO provides some tips on inter-

viewing with the media *on page 4.*

A large contingent of GTRI people, led by Jim Cofer, staged a successful symposium for the International Test & Evaluation Association (ITEA) in November. *Story and pictures are on page 5.*

GTRI names Devon Crowe chief scientist. *See page 5.*

Everything you ever wanted to know about patents is in the *Information, Please!* column. *See page 6.*

An essential part of TQM is eliminating late deliverables. *Read what GTRI is*

doing about it on page 6.

Christmas pictures of our Cobb County folks are *on page 7.*

Papers presented, honors, retirements, new hires, transfers, new spouses, new babies...you name it...*it's all on page 8.*



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**News
&
Notes**

LDEF

From page 1

Long delay complicates evaluation

The filters, mirrors, diodes, lasers and other components were part of a tray assembled in 1978 by Georgia Tech researchers to study the effects of space on electro-optic components. The components were placed to simulate how they would actually be used, and were partially covered by a sun shield. The tray, one of 86 experiments on LDEF, was carried aloft by the Space Shuttle Challenger in 1984.

The components were originally scheduled for a nine- to 12-month visit, but the Challenger disaster forced LDEF to wait nearly six years for its return to Earth in January 1990.

Since the experiments were returned, researchers have been remeasuring and analyzing the performance of the components—a task made more difficult by the long delay. Research teams have scattered, while component suppliers have gone out of business, original equipment used for the measurements has been lost or modified, and measurement techniques have changed.

Still, Blue believes it is worthwhile to obtain as much information as possible from the LDEF because so little is known about the effects of space exposure on modern electro-optic equipment.

Also contributing to the NASA-supported work were Bob Shackelford, Jim Gallagher, Donal Gallentine, Marie Fair, Kevin Bottler, Charles Gorton, and Amitava Roy, all of Georgia Tech; and Sidney Perkowitz of Emory University. □

Oracle database system helps Human Resources automate applicant tracking tasks

By John Toon, RCO

One of Georgia Tech's first administrative uses of the Oracle Database System is now helping the Office of Human Resources keep up with an ever-increasing number of applications for Georgia Tech positions.

As many as 100 applicants visit the office each day, piling their resumes and applications atop a steady number arriving by mail. This year, the office will deal with approximately 3,500 candidates for technical slots—most of them in the Georgia Tech Research Institute—and as many as 10,000 applicants for classified jobs.

Each of the applications and resumes must be routed to the proper campus office, its progress tracked, statistics compiled, and the applicant advised of the ultimate decision. That task provided an opportunity to demonstrate the capabilities of Oracle, chosen in 1988 to be the standard database software for administrative systems.

In June 1989, the seed for the Oracle system was planted in GTRI's Human Resources Department, which at that time was separate from the Georgia Tech Personnel Office. Records of applicants for technical positions were then kept in a personal computer that could be accessed by just one person at a time. When applicants called to ask about

their status, staff members often had to sort through paper files and handwritten lists, making it difficult to answer questions, recalls Russ Cappello, who was then GTRI's technical recruiter.

Cappello contacted Art Vandenberg, now acting assistant director of the Information Systems and Services (ISS) Department of Georgia Tech's Office of Information Technology. They discussed a new applicant tracking system that would make information more accessible while automating more record-keeping.

By December of that year, Cappello had an Oracle database system running on the same IBM mainframe computer that houses the PROFS electronic mail system.

"This database made it easy enough so that when somebody called, I could just turn around to my computer and tell them their status," Cappello says. "It allowed multiple users to access the system at the same time, and even if data were being input, we could still look at the information."

The system generates routing sheets for applications and resumes, keeps track of their status, compiles statistics required for monthly Affirmative Action and other reporting, generates letters to the applicants—and even alerts the staff to candidates whose data may already be in the system. It can also help in locating qualified candidates for appropriate openings even if they may not have applied for them.

Because the Oracle interface relies on a user-friendly structured query language (SQL), staff members have flexibility in retrieving information, Vandenberg notes. 'Ad hoc' reporting capabilities allow a user to find applicants who possess certain expertise, or degrees from particular institutions, for example.

Like many databases, the Oracle system has evolved over time—a process made easier by the software's design.

Because the mainframe computer on which it originally operated was heavily used, response time for the database could be slow. To gain more speed, the database was moved to a less-used VAX computer running the UNIX operating system.

Making such a transfer could have been difficult with many software systems, Vandenberg notes, but because Oracle is designed to operate on many different platforms, the change was made quickly and with few interruptions. The same software

advantages are now helping the system move to a configuration of two Sun 4/490 servers, where Oracle's 'client-server' architecture will be put to use.

When GTRI's Human Resources Division merged with Georgia Tech's Personnel Office, database developers faced another challenge. Cappello, who became manager of personnel for the Human Resources Office, wanted the system to handle applicants for Georgia Tech's classified positions—an expanded task for which the system was not originally designed.

But by adding new fields and altering the database structure, Vandenberg and Claire Costello—ISS's manager of applications and database administrator—were able to make the changes.

"This is where you get your payoff for the Oracle relational database," says Vandenberg. "With this system, it is relatively easy to change the structure of the database. A flat or hierarchical database would have been much more difficult."

Other uses for Oracle

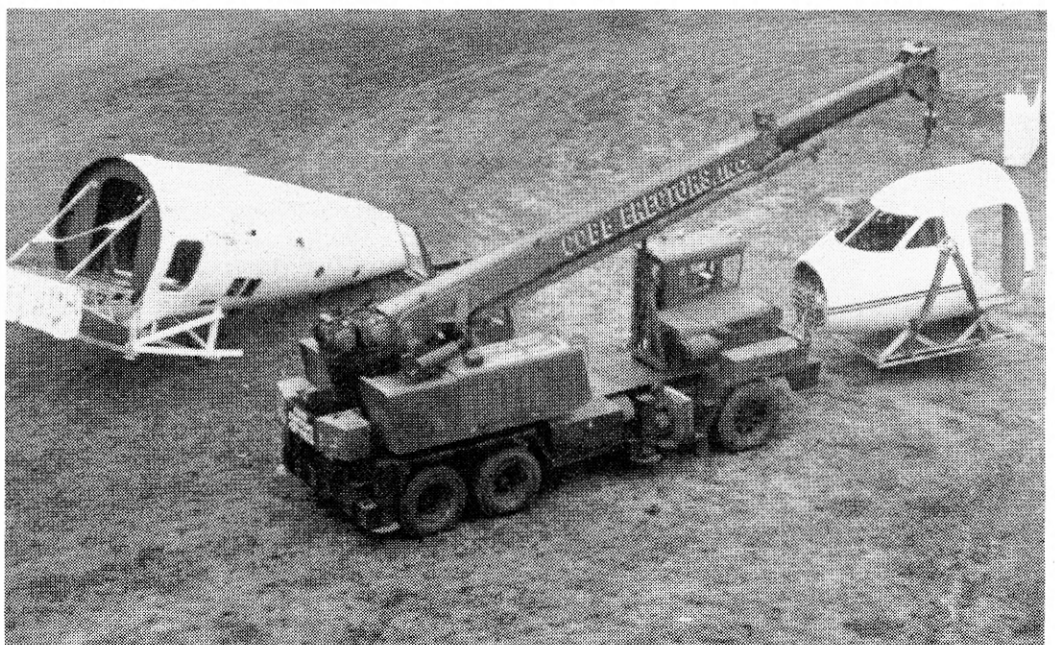
In addition to helping meet the office's needs, Vandenberg believes lessons learned from the system will help other campus units switch over from older Model 204, dBase or other systems—and pave the way for the Administrative Information Management System (AIMS) now under development. President John Patrick Crecine plans an integrated administrative database system that will allow campus units to better coordinate and share information for student recruitment, records management, financial information, and personnel services.

Officials from the Oracle Corporation are on campus working with Georgia Tech personnel to make that system a reality.

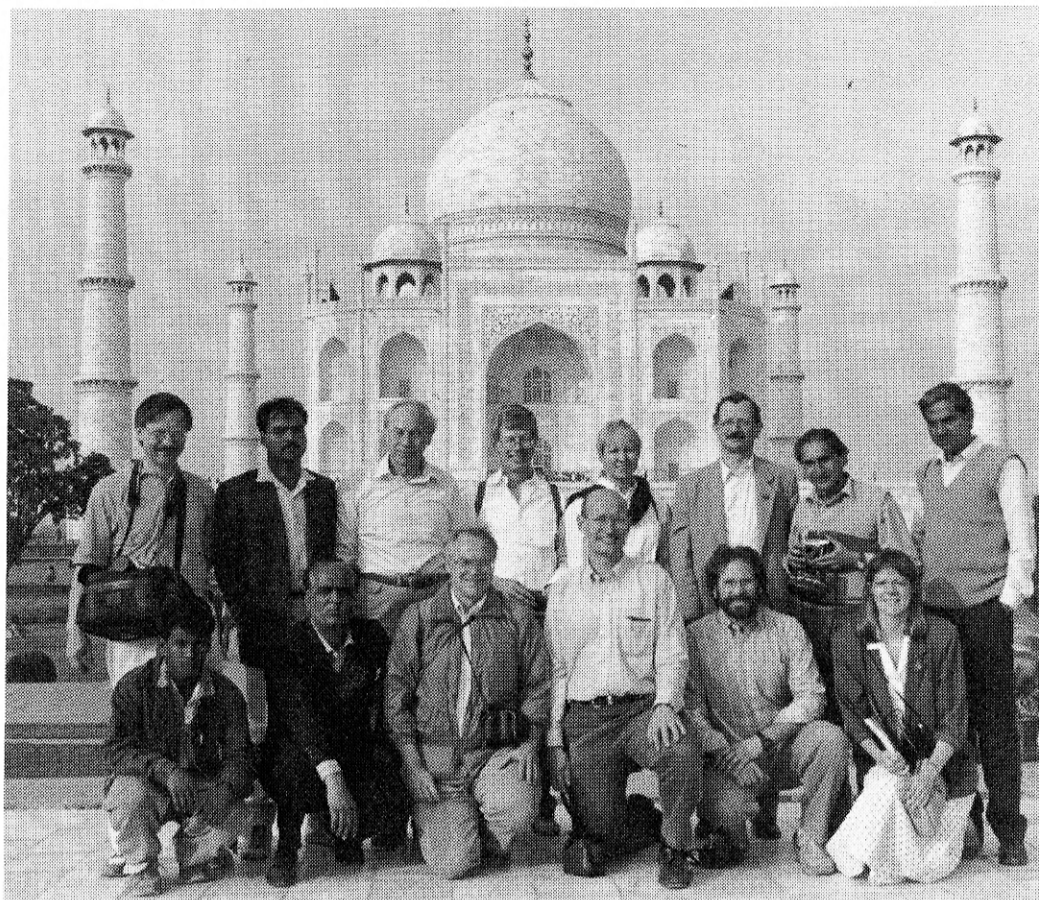
In addition to the AIMS project and the Human Resources applicant tracking system, a number of Oracle-based systems are being used or developed at Georgia Tech to maintain property records, manage financial information for research projects, and maintain data about prospective donors, Vandenberg says. Because Georgia Tech has a site license for the software, departments can use it at no cost.

"Oracle is really going to have an increasingly broad scope on campus," he adds. "While some units may still have utility in other database systems, certainly for administrative systems the standard is Oracle." □

One of Georgia Tech's first administrative uses of the Oracle Database System is helping the Office of Human Resources keep up with an ever-increasing number of job applications.



A Gulfstream II airplane fuselage and cockpit were donated late last year to the Aerospace Lab for use in active noise control research. (Photo by Anita Edwards)



While attending a zeolite workshop in India in January, Rosemarie Szostak (standing, 5th from left) and her American colleagues were taken to see the Taj Mahal.

Szostak provides zeolite expertise to Indian scientists

By Martha Ann Stegar, RCO

Rosemarie Szostak was one of ten American distinguished delegates to the Indo-US Workshop on Zeolite Heterogeneous Catalysis held January 6-8 at the Indian Institute of Petroleum in Dehradun, India. Sponsors were the catalysis societies of North America and of India.

The first such workshop in India, it was aimed at enriching Indian scientists' knowledge in the zeolite field and fostering new linkages among scientists, applied research institutes, and industry in both countries.

India has abundant supplies of natural zeolites, according to Dr. Szostak. "But the country recognizes its need to upgrade its indigenous technological capabilities in zeolite catalysis. Only by developing the technology for themselves, rather than buying it abroad, can India's large petroleum refining and petrochemical industries be competitive worldwide," she says.

The U.S. scientists, led by Prof. Gary L. Haller of Yale University, represented both academic and industrial aspects of zeolite technology, as did the 200 Indian scientists who attended the workshop. It was held in conjunction with the 50th anniversary celebration of the Indian Council of Scientific and Industrial Research.

Dr. Szostak co-chaired one of the nine technical sessions and presented a paper on "Template-Free Synthesis of Aluminophosphate H1 through H4," coauthored by Bryan Duncan, at another session.

The conference had been postponed twice because of internal problems and unrest in India. While there, the Americans were escorted by soldiers with rifles, Szostak said. Dehradun, the venue, is in northern India, near the Pakistan border and the Himalayas.

Szostak will return to India the end of February for three weeks, this time under the auspices of the United Nations Development Programme. She will provide consultation and advice on zeolite technology to the National Chemical Laboratories in Poona. She also will review progress the zeolite program there has made over the five years the UNDP has been funding it. In addition, she will give lectures at industries around India and teach a short course in laboratory safety. The U.S. National Safety Council is donating a slide presentation and providing all materials for the abbreviated course.

"I also was a technical advisor for the UNDP two years ago," Szostak says. "My expertise is in demand because GTRI has one of only a handful of labs worldwide that are involved at the cutting edge of zeolite synthesis."

In demand she certainly is. Since September, she has gone on invitation to Holland, Czechoslovakia, Norway, France, Switzerland and Germany. She also spent time at the university in Calabria, Italy, last January, and returned there in December. □

Agnes Scott students work in zeolite lab

By Martha Ann Stegar, RCO

Rosemarie Szostak, director of MSTL's Zeolite Research Program, hosted two Agnes Scott College students the week of January 13-17 to give them a taste of working in a chemical research lab. The students were participating in Agnes Scott's extern program, which pairs students with sponsors in a field of possible career choice for one week during the school's winter break.

The students—Wendy Baker, a junior majoring in physics and chemistry, and Jessica Churchville, a freshman planning to major in chemical engineering—worked on a short-

term zeolite synthesis project designed by Dr. Szostak to give results within a week. Their findings are part of a larger project, and they will be cited as contributing authors of any papers that will be written to announce results of the overall research.

Early in the week, Jessica and Wendy were able to find a new way of synthesizing offretite, a large-pore zeolite. Although offretite is not yet in industrial use, large-pore zeolites are an important class of materials used as catalysts in petroleum refining. They spent the rest of the week characterizing offretite via X-ray diffraction, infrared spectroscopy, and optical and electron microscopy.

"These techniques aren't normally used in standard undergraduate programs," Szostak says, "so their week gave them some insight and experience into other types of chemistry that can be pursued besides the standard fare."

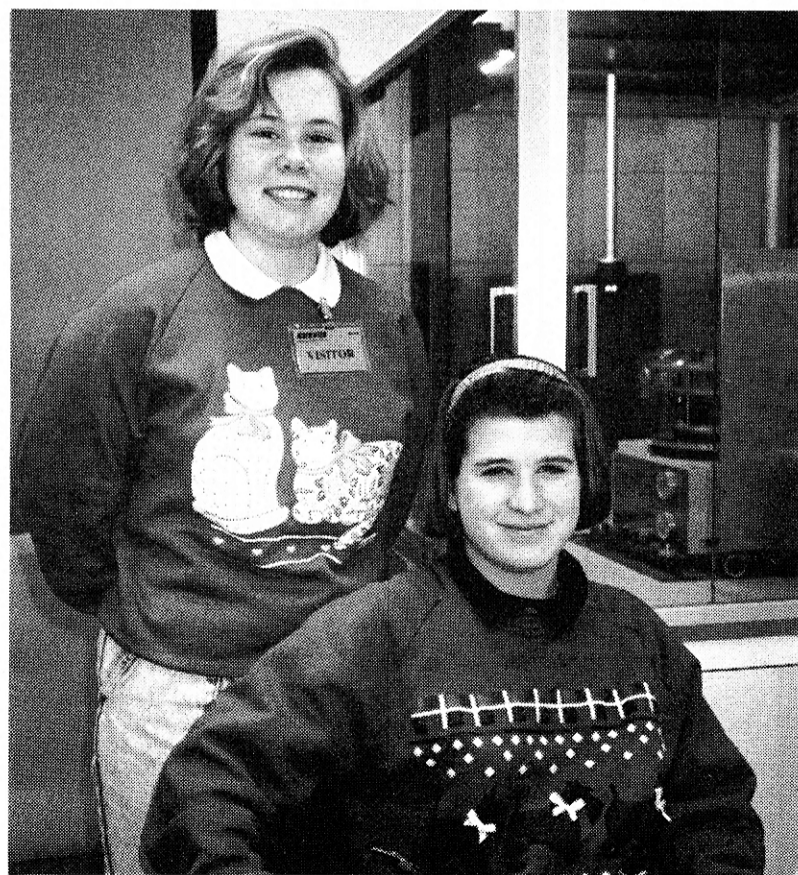
GRA Bryan Duncan, an earth and atmospheric sciences major at Georgia Tech who assists in GTRI's zeolite research, helped the students with their project.

This is the second time Szostak has sponsored an Agnes Scott extern. Alicia Long came in 1989, and Szostak later hired her for two summers. Alicia currently is a graduate student in Georgia Tech's School of Chemistry.

Dr. Szostak believes it is important to encourage undergraduates to get involved in research. "I particularly want to see more women get excited about the sciences," she says, adding that a similar opportunity to make a contribution to actual research work during her college days turned her on to chemical research as a career.

"It has been a thrill to see Bryan and Alicia—two students who have worked in the zeolite program—continue in graduate school at Tech. And I have been able to help place other student assistants who didn't want to pursue advanced degrees in good jobs. It makes the extra effort involved in working with students worthwhile." □

*"It's important to encourage undergraduates to get involved in research. I particularly want to see more women get excited about the sciences."
—Rosemarie Szostak*



Agnes Scott students Wendy Baker (standing) and Jessica Churchville are shown using an X-ray diffractometer to characterize zeolite materials they synthesized during a week's externship at GTRI's Materials Science and Technology Lab. (Photo by Martha Ann Stegar)

**Profile
&
Insight**

What should you do (or not do) when facing an interview with the media? RCO provides some dos and don'ts for you.

East meets West

By Lincoln Bates, EDL

An entrepreneur from the (former Soviet) republic of Kazakhstan visited the Economic Development Laboratory (EDL) for a week in November, with Charles Estes acting as host. He was one of 19 business interns in Atlanta for two weeks to learn about the free market economy.

Most of the group were economists, but the EDL visitor, Eldos Aziev, is a physicist-turned-businessman who also wanted to interest American firms in a product his research institute developed. The device, which electrically cleans process tubes, couldn't be commercialized prior to perestroika.

"We did a patent search and his product appears to be unique," says Estes, adding that initial reaction by local industries and utilities was favorable. Currency and exchange rates could be a problem, however, to say nothing of communications. "There are no direct lines between here and Kazakhstan, but electronic mail may be a possibility," Estes notes.

A next step entails developing funding to bring the product over here for evaluation and demonstration. An ATDC company has the lead in working with Aziev, according to Estes.

The visitors, sponsored by the private Central Asian Foundation, were matched with Atlanta families with professional commonalities, says Estes. Some group activities were held, such as company overviews by Coca-Cola and Chick-fil-A and a reception/seminar by the Emory School of Business.

At an introductory meeting with some EDL staff, Aziev said the Kazakhs wanted to use knowledge acquired about market relationships to develop their country's economy. And they'd like to encourage American investment. The republic is rich in natural resources, including huge oil reserves. "There are lots of Japanese and Koreans already there," he said.

On visiting Sportstown and Home Depot, says Estes, Aziev noted all the merchandise on the shelves with no one buying it and wondered if it were defective. "He didn't understand inventory at the retail level," says Estes, adding that Aziev disliked the malls—too many people.

"His family was skeptical about his going to the United States because of the violence they'd seen on American television and in the movies," Estes recalls. But Western influence isn't all bad. "He started speaking English at age 8, and he has all the Beatles albums. He said he was brought up to think of Americans as enemies, but he calls that 'rubbish' now," Estes says. □

**Research meets reporting:
Tips on interviewing
with the media**

By Lea McLees, RCO

Perhaps the Space Shuttle has lifted off and your years of research qualify you to comment on some of the scientific experiments aboard. Or maybe the results of your work have been published in the proceedings of a conference, or in a news release.

In any of these cases, you may get calls from reporters or editors with newspapers, trade journals and magazines in your field, and possibly from television or radio reporters. They are interested in your knowledge and work.

Essentially, the press shares some of your goals as a researcher, such as the gathering, confirmation and sharing of accurate information. However, the reporter's work is slightly different from the steps you take as a researcher. Following are some tips on understanding and being prepared for an interview with the press.

Be prepared in advance, if possible. Once you know you're going to be interviewed, take a moment to prepare ahead of time. Compose a brief outline of the most important points to make.

Remember: The interview starts with "hello." Assume that the interview begins the very minute you begin talking to a reporter. The interviewer should introduce himself or herself by telling you his or her name, title and the publication/station represented.

Keep your responses short and clear. Brevity and simplicity in answers is best. A reporter for even such respected publications as *The Wall Street Journal* or *Aviation Week and Space Technology* sometimes has an opportunity to write a lengthy story, but more often he may get only the equivalent of two double-spaced pages for one printed story. A television or radio reporter may have 90 seconds maximum for a broadcast piece. In addition, a reporter may not have the same technical understanding of your field that you do. Therefore, it is best to avoid lapsing into scientific language familiar to your colleagues. Be ready to explain any terms that might be unfamiliar to the reporter.

Carefully consider what you say. Any direct quote a writer decides to use will be reported just as you said it. Although many print reporters will repair grammatical errors (such as subject/verb agreement), they otherwise print EXACTLY WHAT YOU SAY. Be sure to take your time, say what you mean, and choose words accurately. Consider the most concise and informative way of an-

swering—if you don't quite understand what the interviewer wants to know, ask the person to repeat the question. And if you don't want to see something in print or hear it on television, don't say it.

Review your statements. Feel free to ask a reporter to repeat your statements back to you during the interview. The interviewer will appreciate your concern for accuracy. You might want to review any key points as you near the conclusion of your interview, or go over something you think was missed. Be accessible for follow-up questions later on—conscientious reporters often call back to double-check details.

Do not expect a chance to review work before it is disseminated. Reporters rarely agree to send you an article or broadcast tape to review before publication. However, no harm is done by asking. The media's right to print or broadcast accurate, truthful information without submitting it to the source for review is part of our national guarantee of freedom of the press.

Respond promptly. The reporter who calls you may be working on a tight deadline, through no fault of her own. She may have to complete a story that day, even that hour, so try to respond promptly. You benefit by returning calls early, giving a reporter even 15 extra minutes to spend perfecting a story or broadcast piece about your work. But remember: If you need a few minutes to attend to a visitor in your office or finish a task, arrange a convenient, prompt time to talk later. You, as well as the reporter, need to be able to focus on the questions you are being asked when you are being interviewed.

Know what to expect after the interview. Once an article or television brief appears on your work, potential sponsors, fellow researchers, and others may call to express interest and ask questions. Sometimes reporters from other publications will phone because they, too, want to write about your work. Keep your list of important points to make near the phone, along with any project information you may be able to mail out. Articles and television spots have attracted the attention of potential sponsors in a number of cases, so interviewing with the press can result in excellent returns.

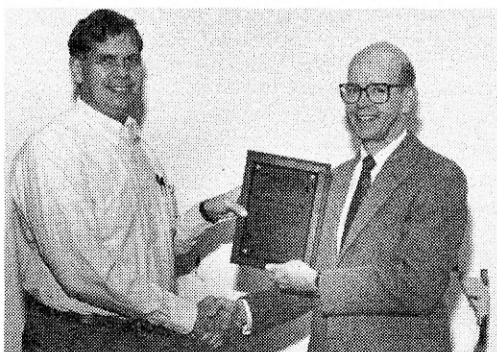
If you have questions about interviewing with the press or about articles that have been published based on interviews with you about your work, please don't hesitate to call Lea McLees or John Toon in Research Communications at 894-3444. We will be glad to help you any way we can. □

STGC thanks Flowers, Miller

Dave Flowers and Tom Miller received recognition plaques in appreciation of their service as charter members of the Senior Technology Guidance Council (STGC) in December. Devon Crowe, GTRI chief scientist and associate director for strategic planning and internal research, presented the plaques at the December 2 senior management and administrative staff meeting.

Flowers and Miller rotated off the council after being members since its inception in 1987. Replacing Flowers is Charlene Bayer, and replacing Miller is Harold Engler. Crowe also announced that Krish Ahuja replaced Milton Cram on the STGC when Cram resigned from GTRI last April. □

Devon Crowe presented appreciation plaques to outgoing STGC charter members Dave Flowers (left photo) and Tom Miller (right photo) at the December senior staff meeting. (Photos by Karen Gurty)



ITEA comes to Atlanta!

The Atlanta chapter of the International Test & Evaluation Association (ITEA) hosted the organization's annual symposium November 18-21. The event was held at the Colony Square Hotel in Atlanta.

Jim Cofer served as symposium chairman, with Bud Sears and Tony Chimera as co-chairs. "Most of the hard work was done by 10 subcommittee heads—all from GTRI," Cofer said. They were Howard Atkinson, Mike Cooper, Wade Garnto, Adrienne Harrington, Jim Higgins, George McDougal, Sherri Odom, John Schonk, Larry Stroud, and Bill Youngblood.

ITEA is a rapidly growing not-for-profit professional association. Founded in 1980, the association is dedicated to advancing information in the field of test and evaluation. Currently there are approximately 1,500 individual members and 70 corporate members. ITEA brings together professionals from the government, military, academia and private industry to discuss, analyze and solve today's challenging test and evaluation issues. With increasing requirements for more realistic and stressful testing of major system acquisitions, it is becoming essential that industry, government and academia work together to plan and execute test programs that will satisfy these challenges.

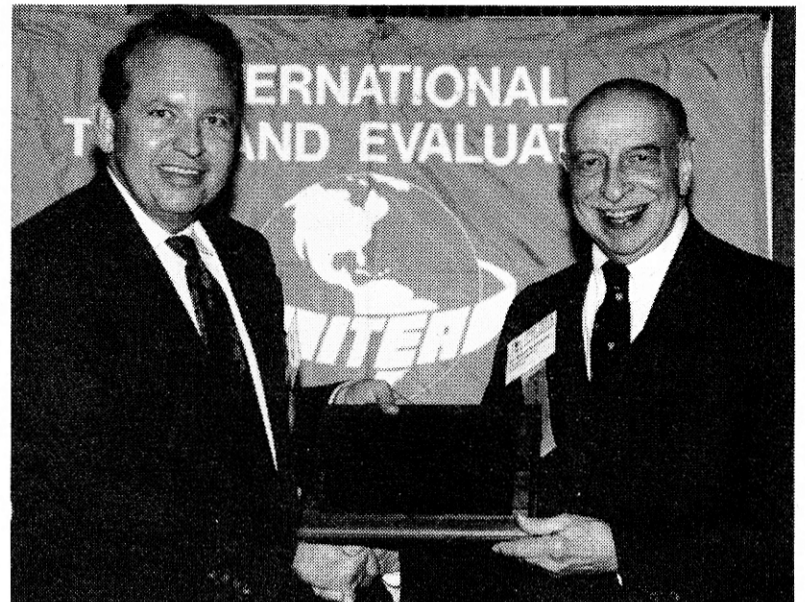
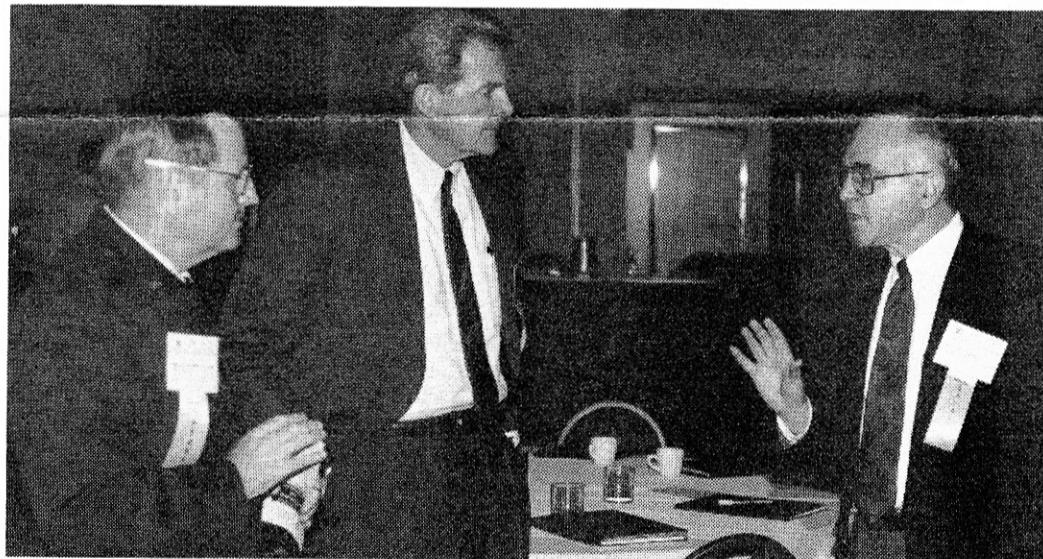
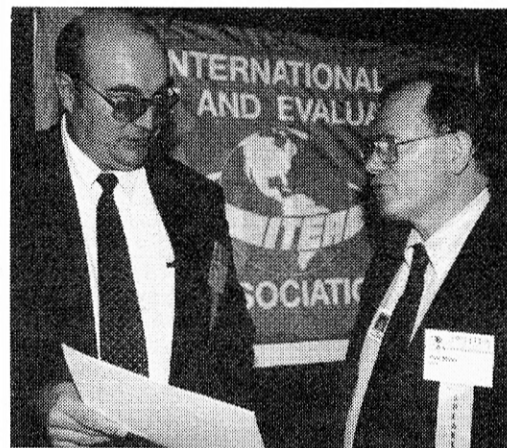
The Planning Committee chose as their theme "The Impacts of Emerging Technologies on Test and Evaluation." This theme was particularly appropriate since most chapter members are research faculty at Georgia Tech as well as because the test community must keep pace with the cutting-edge technologies of the weapons systems being evaluated. The test community also places strong emphasis on technology transfer and education for the test professional; consequently, sessions covering these topics were included.

Invited speakers from Tech included President John Patrick Crecine, Executive Vice President Mike Thomas, Jerry Carey, Tom Miller, Gene Griessman, and Melvin Kranzberg. President Crecine used the occasion to announce a proposed new master's degree certificate program in test and evaluation. Additionally, the following GTRI employees presented papers in separate poster sessions:

- Mike Cooper, Ron Prado, and George Wright—"The Electronic Combat Process Analysis"
- Philip West, Harold Engler, Mark Austin, and Mike Cooper—"The GTRI Generic Doppler Processor"
- Henry Cotten—"Using a Large Compact Range for Microwave Test and Evaluation of Full-Sized Targets"
- Tim Floyd and Tom Miller—"Application of Scalable Computer Architectures in Test and Evaluation"
- Barry Mitchell—"The Global RANge CAPability (GRANCAP)"
- Richard Morrison—"Advantages of an Integrated Test Facility Approach to the EC Test Process"
- George Wright, Ron Prado, and Mike Cooper—"Application of the Electronic Combat Analysis Process to RF Receivers"

In conjunction with the symposium, Bud Sears coordinated two new short courses sponsored jointly by ITEA and Georgia Tech. Entitled "Test Planning and Design" and "Electronic Combat Test and Evaluation," they drew 85 attendees the day before the symposium started. Instructors included Sears, Tom Miller, and two Navy Test and Evaluation employees.

This year's attendance of 400 stands out in contrast to previous typical numbers of 225-300 attendees. National ITEA headquarters depends on the annual symposium to generate a significant portion of the yearly budget, and this year's event produced approximately 150% of normal revenue. The national officers were very complimentary of the Atlanta chapter and GTRI and asked if they could come back here every year. Chairman Cofer responded, "MAYBE we'd try it again in five years." □



Crowe named chief scientist

Devon Crowe has been named to the newly created position of chief scientist for GTRI. His appointment was announced January 7 by GTRI Director Don Grace, who said the position includes the following responsibilities:

- ◆ Perform technology assessment for strategic planning
- ◆ Chair Council of GTRI Fellows
- ◆ Chair Senior Technology Guidance Council (STGC)
- ◆ Identify and foster new research areas
- ◆ Foster continuous improvement in GTRI research quality
- ◆ Facilitate academic interactions

Dr. Grace also said that, since Jim Wiltse retired December 31, Crowe will incorporate most of Dr. Wiltse's previous functions as director of professional development and academic interaction into the chief scientist role.

For the time being, Crowe will continue to serve as the laboratory group director for EOL, ESTL, MSTL and PSL. He also will retain his position on the GTRI Executive Council.

Observations from a pro

Here are some philosophical comments from Ed Allen, who contributed much to the cable television industry. They're the kinds of things you might want to pause and think about and share with others.

✓ It's not what you say or do; it's how you treat people. That is how they will remember you.

✓ People who view the world at 60 the same as they did at 30 have wasted 30 years of their lives.

✓ Good executives surround themselves with enough good people who can get the job done so they can put their feet up on the desk and think. That's what they're being paid for.

✓ Don't be content with "average." This means you're as close to the bottom as you are to the top.

✓ Without communication, understanding is impossible. Without understanding, conflicts are probable.

✓ To change is difficult. Not to change is fatal.

Source: Tom Kerver, writing in *Cablevision*. Quoted in *communication briefings*, January 1992. □

Scenes from the ITEA symposium. Top: Jim Cofer (L), symposium chairman, presents an appreciation award to banquet speaker Dr. Melvin Kranzberg, professor (retired) in Tech's School of History, Technology and Society. Middle left: Bud Sears (L) and Tom Miller of CAL teach a new electronics short course to ITEA attendees. (Photos by Gary Meek) Middle right: Dr. John P. Crecine (2nd from right) describes Tech's new master's degree in test and evaluation during the session on educational issues. (Photo by Wade Garnto) Bottom: Jerry Carey with the symposium's two keynote speakers—Gen. John Corder (L), commander of TAWC, and Dr. Victor Reis (R), director of DARPA. (Photo by Margaret Barrett)

**Queries
&
Quotes**

GTRI's Library liaison, Ann Campbell, begins a two-part series on patents.

The Quality column reports on a Process Improvement Team that is studying the problem of late deliverables.

**Information,
Please!**

Facts about patents

By Ann Campbell, Library

The earliest patents, in 14th century Europe, were granted to individual petitioners or bestowed as favors by kings. In the New World, people petitioned the colonial legislatures for patents. The first North American patent went to Samuel Winslow of Massachusetts in 1641 for a new method to make salt.

A brief history of the U.S. Patent Office

In 1787, the U.S. became the first nation to protect intellectual property. Article I, Section 8, of the Constitution instructed Congress "to promote the progress of science and the useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." The first patent law, enacted in 1790, created a patent board consisting of the Secretaries of State, War and the Treasury. In 1802, the Patent Office became a distinct unit in the State Department with Dr. William Thornton as superintendent. Trademarks were added in 1836. The Patent and Trademark Office moved to the Interior Department in 1849 and to Commerce in 1925.

The first U.S. patent went to Samuel Hopkins in 1790 for a new process for making pot-ash and pearl-ash. In 1991, the five-millionth U.S. patent was awarded to Lonnie Ingram and Tyrell Conway from the University of Florida for ethanol production by *escherichia coli* strain expressing *zymomonas* PDC and ADH genes.

What is a U.S. patent?

A patent is a property right granted to the inventor in exchange for making the invention or discovery public. The patent allows the inventor to exclude others from making, using or selling the invention in the United States and its territories and possessions for a limited time period.

Kinds of patents

The most common patent is the utility patent. This patent is granted for any new and useful process, machine, manufacture, composition of matter, or any improvement thereof. The device may be as simple as a paper clip or as complex as a computer. Examples of items that qualify for utility patents include: a process for tempering steel, sewing machine, ballpoint pen, teflon, or a camera that develops its own pictures.

Plant patents have been granted since 1930. They are awarded to discoverers or creators of asexually reproduced distinct and new varieties of plants. The plants can be mutants or hybrids produced by cuttings, grafting, budding or other non-seed methods. Varieties of roses are frequently patented.

Design patents are granted for new, original and ornamental designs for manufactured products. The design patent protects only the appearance of the article, not its structure or utilitarian features. A device to

warm disposable baby wipes received a design patent. The heating coil is not new. The case that encloses the coil and holds the wipes is patentable.

Animals were not patented until the U.S. Supreme Court ruled in 1980 that a living microorganism capable of "eating" oil slicks is patentable. In 1988, a patent was issued for a special strain of mice useful in cancer research. Currently, animals are patented as utility patents, but animal patent guidelines need to be developed to protect the research investments of biotechnology companies.

Criteria for patenting

A device must be both useful and new to be patented. "Useful" is interpreted liberally. A 1986 patent was granted for a "self-congratulator" device to give the wearer a pat on the back. The Patent Office considered it a new "management incentive program." "Useful" implies that the invention operates to achieve the intended purpose.

To be "new" means that the invention cannot be (1) known about or used in this country or (2) patented or described in a printed publication in this or a foreign country prior to invention by the patent applicant. If one of these events occurs, whether caused by the inventor or another party, the inventor must apply for his patent within one year of the earliest disclosure or lose his right to patent.

The invention also must be sufficiently different from prior technology and not be obvious to one who has ordinary skill in the technology.

Who may apply for a patent

A patent must be filed under the name of the actual inventor, not under a company name. Financial backers, whether individuals or corporations, cannot be named as co-inventors. Patent rights may be assigned to another party (the assignee), frequently the financial backer. If the assignee is designated on the patent application, it will be listed on the patent. Post-issue assignments or reassignments usually occur when the patent is sold or when one company buys another and acquires all its patents.

Normally, the first application for a patent is filed in the country where the invention is developed, even if the company headquarters are located in a different country. In some countries, this is a legal requirement. Filing for additional patents in other countries may be advisable if the product will be made or sold in those countries or to protect against foreign competition or unauthorized manufacture.

How long are patents valid?

The term of a utility patent is 17 years from the date of issue. Utility patents issued after December 12, 1980, require payment of maintenance fees at 3 1/2, 7 1/2 and 11 1/2-year anniversaries to retain their validity. Plant and design patents are valid for 14 years and have no maintenance fees. Patents may be extended but not renewed. The Patent Commissioner can grant extensions up to five years, usually for drugs, medical devices, food additives, and dyes that must satisfy FDA requirements before they can be marketed. Congress, by special act, may also extend patents.

(Next month: More facts about patents) □

**Focus on
Quality**

By Michael Matheus, Captain, USAF
Adjunct Research Engineer

In line with OOD's actions for management of GTRI's quality improvement effort, the Executive Council has identified several areas for quality improvement within GTRI.

One major area for improvement which is of considerable importance to any contractor is the problem of late deliverables—reports, technical data, etc., identified for delivery to a sponsor that are not submitted on time. In response to the Executive Council's request for a pilot program to investigate the issue, the Radar and Instrumentation Development Laboratory (RIDL) has volunteered to conduct a Process Improvement Team (PIT) review of late deliverables, led by me, in consultation with RIDL Director Evan Chastain.

You might be asking yourself why an Air Force person is writing this article, and why is timeliness of deliverables so important. Let me give you the facts.

I am assigned to GTRI for a 10-month period as part of the Air Force's Education With Industry (EWI) program, administered by the Air Force Institute of Technology (AFIT) at Wright-Patterson Air Force Base, Ohio. Each year, approximately 130 officers, ranging from lieutenant to lieutenant colonel, enter the EWI program to study industry's organizational structures, management methods, and technology in more than 36 different functional disciplines at over 70 locations throughout the country. The objective is to develop management qualities and technical leadership abilities in these officers to enable them to be more effective in their Air Force careers. Industry benefits from this endeavor by developing a cadre of officers within the Air Force who have an in-depth understanding of industry's objectives, problems and business operations, which helps improve interactions in areas of common interest such as program development, project performance, and customer satisfaction. So, in effect, while I'm still a blue-suiter, I'm also a GTRI employee, sharing in the organization's woes and joys and working toward its objectives.

Now enough about me. Let's get to the heart of the issue!

Timeliness of deliverables obviously has been important in the past for customer satisfaction, but the government's focus on the importance of such performance indicators has risen considerably. A crucial example can be found in the *Federal Register*, Vol. 56, No. 235, Friday, December 6, 1991, on page 63888, in an article on "Solicitation of public comment on a draft Office of Federal Procurement Policy (OFPP) Policy Letter requiring Federal agencies to consider past performance information in the selection of Government contractors." This Policy Letter "establishes minimum requirements pertaining to the collection of contractor past performance information and the use of such information in the contractor selection process."

Sound important? Continue reading; it gets better. The article indicates that "... a past performance information system is an

ongoing effort to collect and record past performance information for subsequent use in evaluating or rating contractors for contract awards," citing that "common rating factors include: quality of performance; on-time delivery or adherence to schedule; performance at contract price or within specified cost estimates." The importance of contractor selection based upon past performance factors, such as timeliness of deliverables, with respect to the shrinking defense dollar is plainly expressed by the article's statement, "A contractor's past performance record is a key indicator for predicting future performance and 41 U.S.C. 403 requires 'a satisfactory performance record' as a prerequisite to being determined a 'responsible source'."

Now that storm clouds have gathered and are threatening to rain on your parade, how can a TQM-inspired Process Improvement Team (PIT) help clear the skies? In a nutshell, TQM methods stress a common-sense approach to problem solving backed by hard facts. The PIT is utilizing extensive Office of Contract Administration (OCA) data while conducting a 'cradle-to-grave' approach, analyzing all processes involved in the deliverables issue from initial contract development to contract completion. Emphasis is on the relevant processes and the resulting root causes of the problem, not the symptoms. Analysis is accomplished by using many TQM tools, including cause-and-

effect diagrams, pareto charts and histograms, and statistical methods.

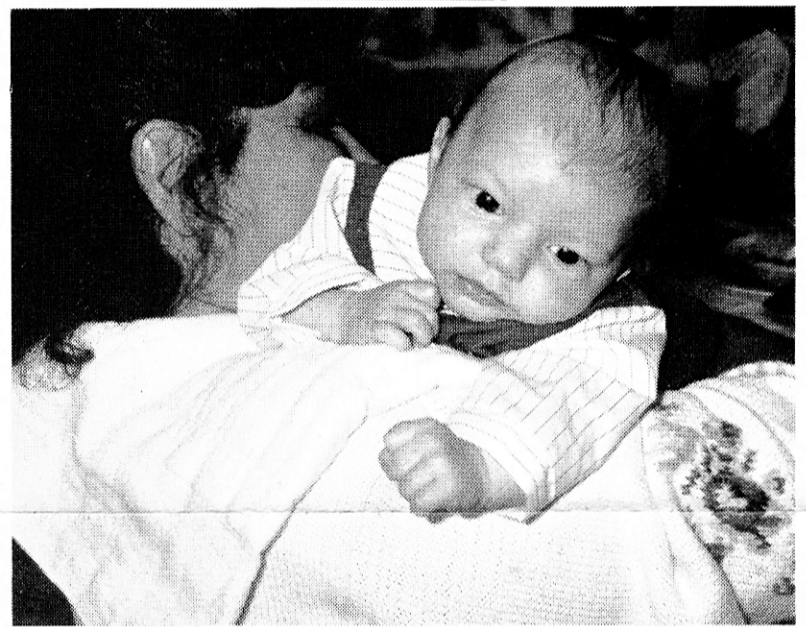
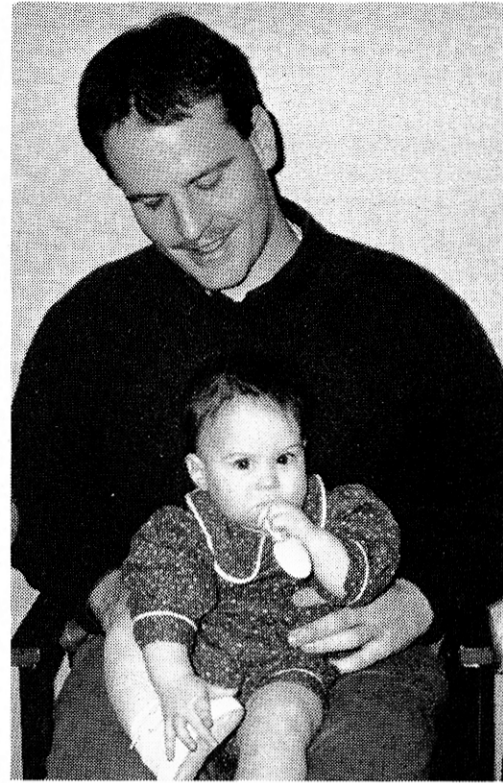
The team will offer specific recommendations for improvement to the Executive Council. We are led to believe that RIDL will be the test unit for implementing these improvements, which will be validated through data analysis during the test period. It is recognized that specific deliverable problems will vary from lab to lab, but the team intends to formulate its results into a guide, a sort of road map, that other GTRI labs will find useful in conducting their own investigations.

I'd like to conclude by acknowledging the hard-working folks who are 'making it happen.' Our Process Improvement Team members, unofficially dubbed the PIT Crew, include RIDL's Joe Bruder, Wayne Cassaday, Brian Hudson, Jim Kurtz, Ted Lane, Jim Scheer, John Trostel, and Frank Williamson. OCA's Jack Dell and MAPS' Yalcin Peker are also vital members of the group. Of considerable help to the team is TQM facilitator Ned Ellington, from the Economic Development Laboratory's Georgia Productivity and Quality Council. Special thanks are due to MAPS' Charlotte Batson for her analysis and portrayal of significant data related to this project.

(Note: This article reflects the views of the author and not necessarily those of the Air Force or the Department of Defense.) □

Focus on Folks

Christmas at Cobb County



Christmas at Cobb County: Several labs collaborated on a covered dish family Christmas lunch December 20, with children much in evidence. Top right: Bryan Keel and daughter, Katie. Middle right: Shirley Chastain burps new grandson James Evan Kirby. Bottom right: Frances Shiflett (L) and Mary Sue Hunt show off the door of their MAPS office. Top left: Sharing food and fellowship are (clockwise from left) Roy Myers, Mike and Christopher Brinkmann, Wayne Cassaday, Meredith and David Brinkmann. Bottom left: (L-R) Jim Echard, Joe Galliano, Cheryl Barnett, Bob and Ann McMillan. (Photos by Martha Ann Stegar)

Focus on Folks

Top: Don Grace and Jerry Webb share a private joke as Jerry holds up his official GTRI retirement plaque. His co-workers at RCO presented him with a plaque featuring a model of the "Ramblin' Wreck," and his friends gave him a Georgia Tech watch. Bottom: Jerry talks to his son, Tech senior Bill Webb (left), at his retirement party December 17. An applied biology major, Bill plans to attend the Medical College of Georgia in Augusta upon graduation. (Photos by Joe Schwartz)



Jerry Webb retires

RCO staff artist Gerald K. (Jerry) Webb retired December 31 after nearly 30 years of service to Georgia Tech. RCO hosted a reception in his honor December 17.

Jerry came to work September 4, 1962, as a draftsman at the Photo Lab (now PPC), moving 11 years later to EES/GTRI. He was staff artist for the Industrial Development Division/Economic Development Laboratory, continuing that role with the Office of International Programs when it split off from EDL. In 1979 he joined the new Editorial Assistance Office, which was absorbed into the Research Communications Office (RCO) in January 1980. "I've moved 13 times in the past 29 years at Tech," Jerry says.

A native of Johnson County, Georgia, Jerry attended Middle Georgia College until he was drafted into the U.S. Army, where he served 1954-56. He was stationed in Germany for 17 months, serving as chief mechanic with the 519th Field Artillery Battalion. Prior to coming to Tech, he worked in the lab at Glasrock Products.

Jerry, a talented cartoonist, was well known for his witty drawings of GTRI personalities and his photographic collages of GTRI parties and picnics. His homespun humor and common-sense approach to life attracted a wide circle of friends at Georgia Tech.

Jerry keeps busy with maintaining two large vegetable gardens and his antique auto collection, but is available to work hourly as needed. □

Awards Competition in December—for the GTRI Annual Report and for RCO's total public information program on research at Georgia Tech. Individual recognition goes to **Mark Hodges** and **Jim Kloeppe** for the former and to **John Toon** and **Lea McLees** for the latter. □

Personnel News

Economic Development Lab

Zack Osborne, a retired Air Force colonel experienced in military contracting, has joined the staff of the Georgia Procurement Assistance Center. He is based in Warner Robins and will focus his business development efforts on the Macon area and south Georgia.

Jan Youtie is a new staff member in the Economic and Marketing Services Branch. Formerly with the A.L. Burruss Institute at Kennesaw State College, Dr. Youtie will concentrate on market research and analysis.

Mike Cantor resigned in early January.

Electronic Support Measures Lab

David Grosch, **Richard Pracht**, **Cindy Wierschem**, and **Brent Zitting** are departing ESML.

Management & Project Support

Jonathan James has terminated his employment as a co-op.

Microwave & Antenna Technology Development Lab

PRE **Charles E. (Chuck) Ryan** retired December 31.

Tony Wilkey resigned effective January 24.

Signature Technology Lab

Thomas P. McElwain joined STL January 13 as an RE I. He received his MSEE last year from Syracuse University.

Robert P. Zimmer, Jr., transferred to STL from MATDL January 3. He also received an MSEE last year, but from Georgia Tech.

Threat Systems Development Lab

Co-op **Michael Cladakis** has transferred to TSDL from the Mechanical Services Department.

Recent terminations include SRS **William Miller** and RE II's **Joseph Bartlett** and **Jeff Nichols**. □

Professional Activities

Economic Development Lab

In mid-January, **Dave Swanson** presented a paper at the Third Arab Conference on Teaching Physics in Assvit, Egypt.

Carolyn Carter of the Madison Regional Office has been elected secretary-treasurer of the Northeast Georgia Chamber Roundtable, a coalition of chamber executives and other economic development professionals from a 10-county area around Athens.

The Macon Regional Office assisted with a regional export seminar January 21. The event, "Global Growth Opportunities," was sponsored by Congressman Roy Rowland in conjunction with the Global Education Center.

Materials Science & Technology Lab

At the 4th Annual DoD Electromagnetic Windows Symposium, held November 19-21, **Tom Starr** made a presentation on "Characterization of High Temperature Dielectric Fibers." Coauthors included **John Hanigofsky**, **Dave Emmerich**, and **Gina Hardin** of MSTL, **Rick Moore** and **Tanya Robbins** of STL, and **Bill Livesay** and **Jim Hollinger** of PSL.

Tom Starr also was a session chairman and invited speaker at the Materials Research Society meeting held December 2-6. He presented a paper on "Advances in Modeling of the Chemical Vapor Infiltration Process."

Research Communications Office

RCO won two awards of excellence in the CASE District III Communications



Belle of the ball: Bob Crowe, Mechanical Services Department at CCRF, participated in the \$1.98 Beauty Contest at the Canton Moose Lodge November 2.

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EDITOR & DESIGN
Martha Ann Stegar, RCO
894-6988

EDITORIAL REVIEW
Patrick O'Hare, OOD
894-3490

ASSOCIATE EDITORS
Marsha Barton, Cobb II
528-7750
Lincoln Bates, O'Keefe
894-6091
Janice Davis, ERB
894-8229
Carey Floyd, Cobb I
528-7012
Wendy Hanigofsky, CRB
894-7136
Eunice Kelsey, Services
894-6972
Joanna King, Baker
853-0460
Kathie Coogler Prado, CRB
894-7268
Janice Rogers, OOD
894-3401

Personal Notes

Wedding Bells

Robert P. Zimmer, Jr. (STL) was married to Angie Kennedy December 14. The couple honeymooned in Paris.

December 7 was the date of two weddings in MATDL: **Brad Newton** was married to Robin Wineman and **Jamie Thomas** was married to Ronnie Patrick.

Cradle Roll

Congratulations to Mary and **John Trostel** (RIDL), who had a baby boy, Sean Michael, January 2, and to Diane and **Tony Wilkey** (MATDL), who became the proud parents of a baby daughter, Sarah Jane, January 4. □