

The GTRI Connector

Did You Know . . .

- A raisin dropped in a glass of fresh champagne will bounce up and down continually from the bottom of the glass to the top.
- Potato chips were invented by a chef in Louisiana in 1865.
- Nose prints are used to identify dogs in the same way fingerprints are used to identify human beings.

—from *2201 Fascinating Facts*
by David Louis

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Shackelford Remembered as Fair, Loyal, Full of Integrity

By Lea McLees and John Toon, RCT

Ask people to name qualities they remember Bob Shackelford for, and integrity, fairness, loyalty and humor are on every list. GTRI's Gail Tucker, a former secretary of Shackelford's, best captured the thoughts of his friends and colleagues.

"He was one of the most honorable people I have ever known, as well as one of the most loyal to Georgia Tech," she recalled recently.

Shackelford, GTRI's executive associate director, died November 23 in Washington, D.C. of complications following major cancer surgery in October. He served Georgia



Bob Shackelford



EOEML and the Baker MAPS group donated and decorated a Christmas tree for the Festival of Trees at the Georgia World Congress Center, December 4-12. The tree was adorned entirely in gold and white in keeping with its theme, "Buzz's Enchanted Forest." All proceeds from the auction of the tree will go to Eggleston Children's Hospital. The decorating committee included from left, Ginny Myers, Donna Gamble, Sharon Mattson (chairperson) and Barbara Call. (Photo courtesy Sharon Mattson)

Tech for 34 years after joining GTRI's predecessor organization, the Engineering Experiment Station (EES), in 1959. He worked as a principal research scientist, chief of the Electro-Optics Division, and director of the Electromagnetics Laboratory.

Shackelford was named an associate director in 1984 and became executive associate director in 1989. At his death he was chief financial officer for GTRI with direct responsibility for financial and day-to-day operations and policies.

"Bob was an invaluable helper and advisor to me on far more than GTRI financial matters," Truly said. "He played a major role in developing the strategic plan and leading GTRI's reorganization. I value his honesty and forthrightness most of all." (See related column, page 6.)

A Product of Georgia Tech

Shackelford earned three Tech degrees: a bachelor's in electrical engineering and master's degrees in electrical engineering and

Ahuja Honored with Most Prestigious Award in Aeroacoustics

By Lea McLees, RCT

GTRI aerospace engineer Krishan Ahuja (AERO) recently received the most prestigious honor in the field of aeroacoustics — the 1993 International AIAA Aeroacoustics Award — for his advancement of aeroacoustical sciences.

The award is one of the highest honors won by a GTRI researcher. It was presented at an October 26 banquet during the 15th AIAA Aeroacoustics Conference in Long Beach, Calif. Most of his research sponsors, many current and former colleagues and four of his students were among the attendees.

"On one hand I felt a sense of disbelief,

Continued on page 6

Continued on page 7

Observed & Noted

Meet four of GTRI's lab secretaries. Turn to page 2 to read their profiles.

Need a computer file printed in color? GTRI employees can send files electronically to two color printers. Find out how on page 3.

Research projects with commercial potential might qualify for a yearly ATDC program. Turn to page 3 for details.

Are you a GRA or graduate co-op interested in direct deposit of your

Tech paycheck? Look for more information on page 3.

GTRI and its predecessors were the birthplaces of important radar technology, antenna advances — and the Yellow Jacket Bowling League.

Get the scoop on bowling on page 4.

Service activities can have unexpected payoffs. Read about Claudia Huff's experience on page 4.

A retiree is honored, and a young

researcher is headed for Antarctica. Read about Bill Howard and Peyton Thorn on page 5.

Congressional fellowships are available. Are you qualified? Find out on page 6.

Stuart Jacobsen is one of GTRI's newest employees. Get to know him on page 7.

Professional activities, personal news and more fill the back page. Find out what fellow GTRlers are up to on page 8.

News & Notes

Clockwise from the top left are: Miriam Crenshaw, Wendy Hanigofsky, Melanie Price, and Diane Smith.

Meet The Lab Secretaries

This month we caught up with four of the lab secretaries at GTRI.

Miriam Crenshaw, IITL

Came to Tech nine years ago. Previously worked in Social Sciences and in the former GTRI Office of the Director. Assists lab director, handles personnel-related matters, timesheets, and communications, ensures that project reports are properly documented, trains student employees and is liaison between lab and support services. Is proudest of managing and organizing day-to-day lab activities with little or no supervision. In 1993 she plans to enhance productivity, quality and work situations in IITL. After work Miriam attends DeKalb College, sings with her sisters in their gospel group and spends time with her two-year-old son.

Wendy Hanigofsky, ELSYS

Came to Tech five years ago. Previously worked as word processor operator on campus. Assists lab director, coordinates secretarial work overload, maintains personnel database, assists with all administrative and personnel paperwork, serves as lab contact. She is proud of getting along with just about everyone — something that she says is easy to do when you work with great people. In 1993 she plans to help with the continual transition of groups in the lab. After work she enjoys volleyball and aerobics, movies, friends, crafts and hiking.

Melanie Price, SEAL

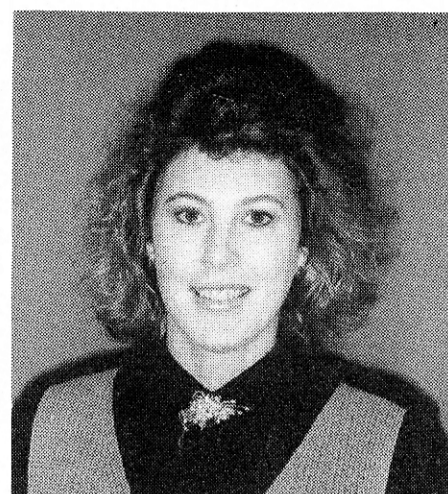
Came to Tech 10 years ago. Previously worked on campus as a word processor operator and a word processor specialist. Coordinates all activities for the laboratory and



“keeps the lab director out of trouble.” She is proudest of continually acquiring new skills that help her advance in her job. In 1993 her goal is to use computer software technology in administration and project support. After work she likes to read, cross stitch, and cook.

Diane Smith, EOEML

Came to Tech 11 years ago. Previously worked on campus as an administrative secretary. Her



main responsibility is coordinating lab activities. Her proudest moments are when her boss compliments her on her work. In 1993 she plans to assist the lab director and associate directors in the continual transition of their large, new lab. After work she plays sports with her son, watches football, baseball and basketball games, coaches Little League teams, writes, gardens, does aerobics and collects dolls and antique clocks.

SELECTED SEPTEMBER/OCTOBER 1993 AWARDS

Title	PI/Laboratory	Sponsor	Funded Amount
UA-60Q System Functional Performance Specification	Stancil, C. (AERO)	Serv-Air Inc.	79,296
Flight Test Instrumentation	McDougal, G. (ELSYS)	Air Force	535,902
Analog Circuit Analysis & Partitioning System Phase II	Cox, F. (ITL)	Air Force	1,448,145
JCATS Local Area Network System Development	Bennett, E. (ITL)	Army	425,000
Flight Plan Simulation Mapping System	Pyles, J. (ITL)	Army	474,823
ASIF Technical Requirements Analysis	Clark, D. (SEAL)	VEDA Incorporated	161,874
Proof of Concept for Construction of Authentic Backgrounds	Faust, N. (EOEML)	Horizon Technology Inc.	30,000
AN/MLQ-T4 Ground Jammer Threat Simulator Upgrade Program	Strike, T. (ELSYS)	TRW Inc.	160,857
AAR-47 Support/PAVE LOW III E System Integration	Brooks, J. (ELSYS)	Air Force	2,900,000
Application of Pollution Prevention Tech. to Reduce Indoor Air Emissions	Bayer, C. (EOEML)	Environ. Protection Agency	135,400
AAR-47 and ALQ-156A Integration with the ALR-69	Hallman, J. (EOEML)	Manufacturing Technology Inc.	300,000
Force Effectiveness Analysis	Currie, N. (SDL)	Army	152,407
Battlefield Combat Identification System Technical Support	Vander Meer, W. (SEAL)	Modern Technologies, Inc.	32,632
Radio Frequency Signature Simulation Support	Aberegg, K. (STL)	Army	99,998
Fourth MOD to Project TAS	Higgins, J. (SDL)	US Dept of Defense	511,136
Reconfigurable Control for Rotorcraft	Heiges, M. (AERO)	Army	97,463
Assessment of Impact Damage of Composite Rocket Motor Cases	Paris, H. (EOEML)	NASA	24,986
Pollution Prevention Program - FY 94	Walsh, J. (EOEML)	GA Hazardous Waste Mg. Auth.	307,124
Metals Resistant Fluid Cracking Catalysts (FCC)	Occelli, M. (EOEML)	EURON	97,343
Signature Measurements of the STRIX Mortar	Bullard, B. (HRO)	Army	76,955
Development of a Unit Level Intelligence Hypermedia System	Pennywitt, K. (ITL)	Air Force	110,000
Opossum Proof Analysis - Change I	Wilson, B. (ITL)	Army	69,580
Touted Unicorn	Wilson, B. (ITL)	Army	279,838
Radar Simulator, Seeker & Instrumentation Program	Devine, D. (SDL)	Army	469,235
Final Task on Current TOA (October-January)	Grenaker, E. (SDL)	US Dept of Treasury	198,473
Electronic Systems FME/FSA	Cotton, R. (SEAL)	Navy	67,837
Engineering Development & System Integration for Radar Environment Emulator	Clark, D. (SEAL)	H6 Systems Inc.	175,099
Phased Array Antennas	Corey, L. (SEAL)	Paramax Systems	455,542
Battle Field Environment & Performance Simulator	Saffold, J. (SEAL)	Army	275,000
Syntactic Foam Composite Development	Moore, R. (STL)	Navy	200,000

Here's How ...

GTRI Employees Can Access Color Printers From Their Computers

By Lea McLees, RCT

If you would like to use color diagrams for a conference talk, meeting with sponsors, proposal or other project, the technology you need is now accessible via your computer. Bill Joye, recently of STL and now working with OIP's Multimedia Lab, explains how GTRI employees can take advantage of these services.

What types of equipment are available for me to use for color printing?

Two color printers are available. One is the Tektronix Phaser II SDX, a dye-supplementation printer. It prints 300 dots per inch, continuous tone. This printer produces exactly the color you requested — purple, for example. The other color printer, a QMS ColorScript 100 thermal wax printer, provides a pattern of yellow, magenta and cyan dots that fools the eye into thinking you see the color you want. It prints faster than the Tektronix printer.

To use the printers, your computer and software must be able to generate color postscript files. All Macintoshes can, but UNIX and PC-based users need to check their machines to be sure. You also want to have a setup that maps the image in stroke instructions instead of a bitmap, to insure a better quality printout.

How do I send a file to either of these printers from a Macintosh computer? The printers use Apple printing protocol. So, from a Mac, get on GTRNet's Appletalk Zone. Go to your chooser and select GTRNET. Then select LASERWRITER and ZEPPPO as your printer driver for the Tektronix machine, or LASERWRITER and CHICO for the QMS machine. Print your file to it as you would to any other printer.

What if I have a UNIX-based machine, or a PC? First you need to use some software that will emulate LPR (remote line printer). If you are using a PC, two or three packages, such as FTP and PCNFS, will work. You configure LPR to send a file to GATOR7. Then instruct GATOR7 to send it to ZEPPPO for the Tektronix machine, or to CHICO for the QMS machine. Use the shell variables or parameters based on the software package you get.

If you use a UNIX-based machine, configure your /etc/printcap file to send the file to GATOR7. The printer queue is ZEPPPO or CHICO, depending on the machine you want to use.

How much does this cost, and how do I pay for it? Anyone at GTRI is free to use the machines at any time of day, but all are on the honor system to replace the supplies they use — as long as this system continues to work, the printers will not have to be put under lock and

key. Prints from the Techtronix machine, for example, cost \$2.25 per paper page and \$3.50 per transparency sheet. Prints from the QMS machine cost \$1 per page and \$2 per transparency.

As you can tell from the cost, it is best to proofread work carefully before you send it. If you need multiple copies of a page, you might want to print an original on one of the printers, and make copies on the color printer just off the CRB lobby. Copies are .60 per sheet and are billed to project numbers. (To get your name on the list of people authorized to use the copier, call Carl Baxter at 894-3511. The copier is available from 7:30 a.m. to 5 p.m. Monday through Friday.)

Are there any special page design considerations I need to know? Both printers have a slightly smaller print area than usual. Mac users will see the page size presented on the screen, and can adjust their images accordingly. UNIX and PC-based users will need to "guestimate," allowing larger margins at the top and bottom of their page designs.

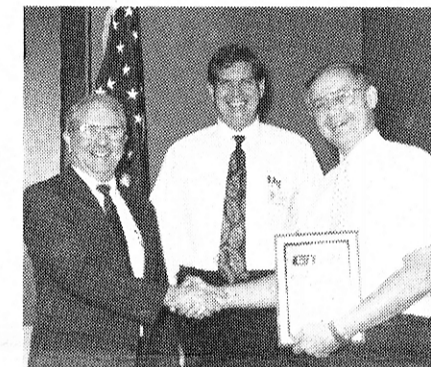
Where are the printers located? ZEPPPO is located in CRB Room 569, and CHICO is in CRB's second floor reception area. You will need to turn the machines on before using them, or ask someone to do it for you if you are printing from another building. Francine Bennett (894-3411) can do that for the QMS machine, CHICO. For ZEPPPO, the Tektronix, you might ask someone you know in CRB to do it. Documents take several minutes to print on the Tektronix machine, and less time on the QMS machine. Finally, be sure the printers are turned off when you're done — you would not want to accidentally print a 500-page black-and-white report to a color printer by mistake!

The equipment is available: Now it is up to your software and operating system to generate the images you want.

If you have questions about the printers, you may contact Bill Joye at 894-7038. If you have questions about the copier, call Carl Baxter at 894-3511. The computer support representative (CSR) in your lab can help you select software and set up your system to use the printers.

Direct Deposit Considered For GRAs, Graduate Co-ops

Direct deposit of paychecks for graduate research assistants (GRAs) was tested this quarter with GRAs working in mechanical and industrial engineering programs. As of mid-November Georgia Tech officials were hoping to offer direct deposit to all GRAs starting during winter quarter 1994. This option would be particularly helpful to students who spend much of their time doing research at GTRI but must pick up paychecks at their major schools. If you are GRA or a Graduate Co-op student at GTRI and you want to check the status of the direct deposit option, you may contact Cathy Dunnahoo at 894-6214.



News & Notes

Director Richard Truly and Chief Scientist Devon Crowe recently recognized three members rotating off the Senior Technology Guidance Council. From top, Krishan Abuja, Charlene Bayer, and Don Bodner. Not pictured is Harold Engler. (Photos by Dayton Funk)

ATDC Seeks Research Commercialization Proposals

Academic and research faculty from Georgia Research Alliance universities are invited to submit proposals for innovative product development funding through the Faculty Research Commercialization Program (FRCP). The program provides financial and business support for moving research technology from the conceptual laboratory stage toward a commercially viable product.

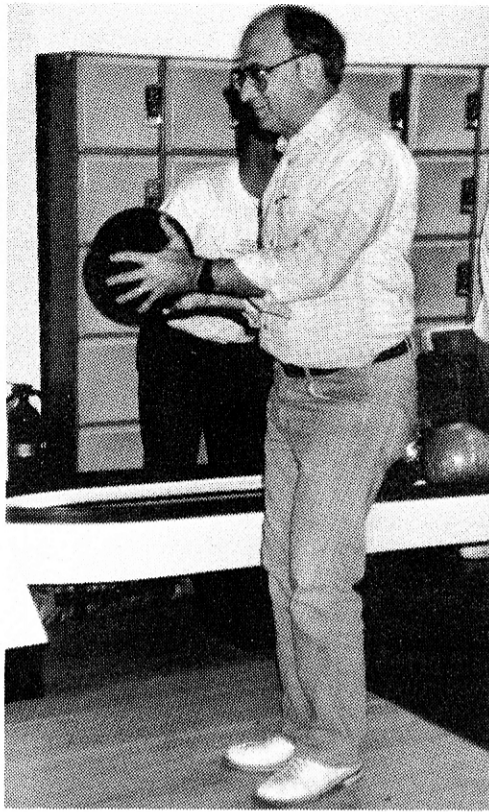
Support comes in the form of an Advanced Technology Development Center "sponsored project" valued at up to \$50,000 per project. The funding may be used for items such as equipment, materials, contract consulting and release time. Student involvement is encouraged; the funds are exempt from overhead.

Solicitation announcement packages will be mailed on January 15, 1994. Pre-proposal conferences and discussion of FRCP requirements will be announced at a later date. Proposals are due to ATDC by March 14 and will be reviewed by May 20. Awards will be announced June 1.

ATDC was formed in 1980 by the governor and the Georgia General Assembly to increase the high technology business base in Georgia. For more information on FRCP, contact Shelia Stanley at 894-3575.

Focus on Folks

Bill Youngblood prepares to throw a strike at one of the weekly get-togethers of the Yellow Jacket Bowling League. (Photo by Mary Wolfe)



GTRI: Birthplace of Yellow Jacket Bowlers

By Lea McLees, RCT

GTRI and its predecessor organizations on campus have pioneered many important international, state and campus developments — improving radar and antenna technology, stimulating economic development in Georgia — and starting the Yellow Jacket Bowling League.

Employees of the Engineering Experiment Station (EES) organized the team in the late 1940s, recalls Bob Tatum, a Georgia Tech retiree who worked for what is now the Georgia Tech Research Corporation (GTRC). He was one of the league's first members.

Service Activities Can Have Unexpected Payoffs

By Mark Hodges, RCT

Sometimes professional service activities can produce unexpected benefits. Just ask Claudia Huff of EOEML.

Last February, Huff assembled a panel discussion on "Technologies to Watch in Coming Years" for the annual conference of the Atlanta Chapter of the Society for Technical Communication. The panel, which Huff moderated, was composed of Alan Porter, a Georgia Tech professor; Kay Wallace, then vice president of the Georgia Research Alliance; and Mike Cassidy, then associate director of the Advanced Technology Development Center (ATDC) on the Georgia Tech campus.

"There was an audience of maybe 60 to 70 people," Huff said, "and after the presentation, a person came up to Mike and asked him about the ATDC's services to small,

"We started bowling at the Lucky Strike Bowling Center on Peachtree across from the Fox Theatre," he recalls. "It began as a duck pin league — you bowled on the same lanes that the team uses now, but you used smaller pins, a smaller ball, and you threw three times instead of two."

Today the league's 40 players meet at the Tech Student Center on Tuesday nights October through May, when classes are in session, to play the more familiar 10 pins version of the game, says GTRI's Harry Ross (RPM). Ross has been president of the league every year but two since 1979.

"I find it the most friendly group of people I've ever bowled with," he said. "It is the only league I've ever bowled in where your opponents applaud if you get a strike."

The league is made up of 10 teams of four people each who meet once a week for two hours of bowling and camaraderie. The team that wins the most games is recognized at an end-of-the-year picnic, and every league player gets a trophy for participating. This past year that trophy was a bright yellow Buzz-adorned bowling pin.

The league is sanctioned by the American Bowling Congress and the Women's International Bowling Congress, but members do not have to be expert bowlers, Ross says.

"It's a 90 percent handicap league," said Ross, whose team has placed first three times since 1970. "We set a score based on 200. Then subtract your average, and 90 percent of the difference is added to each of your game's scores. If you averaged 100 points per game, you would have an 90-pin handicap. That makes it fair for the novice bowler, and the experienced bowler can really compete."

Among current and former members are GTRI's Hugh Denny (SEAL), Lloyd Lilly (ELSYS), and Cheryl Barnett (ELSYS); retired aerospace professor Don Dutton; current math professor Jack Line; Mary Wolfe (HRD); Abbie Hendricks (PARS); and GTRI's Jerry Bryson (RSD).



"I enjoy it because you meet a lot of good people and get exercise," said Bryson — he uses the trusty blue bowling ball he bought 25 years ago while stationed in Germany. "It's a mixture of everyone at Georgia Tech — students, faculty, staff, retired people, former Tech employees. There's a team from the Physical Plant, and OCA has a team every year."

Formerly an all-EES group, the team opened its membership to the entire Georgia Tech community in the mid-1960s, Tatum recalls.

"The league has been good for developing interchange that did not exist between people at GTRI and the academic departments," he said. "That was the purpose of opening it to the entire institution, and that was a good thing."

The league even produced its own bowling champion. Former mechanical engineering student Roger Dalkins won an International American Championship in Hong Kong and is now an American Bowling Congress executive.

Tatum and his wife Irene are taking some time off from bowling for health reasons, but they hope to return to the lanes with their fellow Yellow Jackets in the future. In the meantime, Tatum and other league members have a special request for Baker Building employees: If you come across a Yellow Jacket Bowling League plaque in a storage room or office that lists the names of winning team members starting in the late 1940s, let him know.

"Our first plaque of winner's names disappeared, and it is probably in an office in the Baker Building," he said. "If we could find that plaque we could establish the exact beginning date of the league. That plaque holds some team history."

If you find the above-mentioned plaque, please call Tatum at 634-2341. If you are interested in bowling with the league, contact Ross at 894-3515. It's too late to start a 1993-94 team, but sometimes individuals can fill vacated slots on existing teams during mid-season.

technology-based companies."

This individual was Todd Willis, president of Commerce Communications, a firm that develops custom training tools for a variety of corporate customers. One of Willis' clients, BellSouth Cellular, wanted to make use of virtual reality technology for training.

Willis was interested in ATDC as a means of gaining access to sophisticated technical expertise on the Georgia Tech campus. His discussion with Cassidy led to Commerce Communications becoming one of ATDC's incubator companies.

"It's an opportunity to develop new product technology," Willis said. "The association has been a really good opportunity for us."

Huff was pleased to find that her panel discussion was not only informative but provided a useful vehicle for assisting a local company and Georgia Tech.

"This presentation was on a Saturday morning in winter," she said. "It was hard to get out of bed and go. But you never know what kind of connections people are going to make. In this case what happened benefitted everyone involved."

Wild Weasels Sports Update

The Wild Weasels flag football team won three games and lost one in the regular season this fall. They made it into the playoffs, but lost their first game on November 8. Team members are Kim Cole, Jeff Hallman, Matt Bradley, Tom Autrey, Dan Mack, Russell Leath, Roy Thompson and David Zobel, all of ELSYS; and David Garrity (Multimedia Lab), Gistand Minor III (SSD) and Keith Hughes (SSD).

The Wild Weasels volleyball team made it through three playoff games in November. They accrued two wins and one loss in the regular season. Team members are Rob Kossler, Matt Bradley, Fred McKeen, Lou Fertig, Ben Slocum, Andy Slack, and Wendy Hanigofsky, all of ELSYS.

The volleyball team made a major scientific advance this year, as well. They began developing the FRED theory of wins and losses after they noticed a possible negative correlation coefficient between Fred McKeen's attendance at games and whether the team won or lost. Team members say this phenomenon requires further study.

"Bill Howard's on the Phone for You ..."

By Lea McLees, RCT

"Perfectionist" is a label Marianne Thompson wears with pride. She was determined to make sure "all the t's were crossed and all the i's were dotted" when she came to Georgia Tech and began administering the tuition reimbursement plan for GTRI research faculty 11 years ago.

Then she met Bill Howard. He headed the committee that developed and established the Educational Assistance Program for Georgia Tech research faculty in 1975.

He also changed Thompson's definition of perfectionism.

"One day the phone rang, and you told me I'd gotten the paper clip in upside down," Thompson told Howard at an October 25 retirement "roast and toast" reception held in his honor.

Howard, who completed 27 years of service to Georgia Tech at the end of October, was recognized and thanked by more than 50 friends and co-workers for his work at GTRI. They conspired with Thompson, groaning in unison every time anyone said "Bill Howard's on the phone for you" during the roast portion of the program.

But there was plenty of toasting, too.

"I have learned more working with you than I've learned from anyone else I've worked with," Thompson said. "I have come to admire and respect you deeply."

Pat O'Hare described Howard as a "helper,

supporter, benefactor and friend."

"There's none better," added Eunice Glover.

Howard served GTRI in a variety of positions after his arrival at Georgia Tech in 1966 as a research scientist. Most recently he served as senior research scientist and executive assistant to the associate director providing technical support and assistance to GTRI's leaders on a variety of matters. Prior to that he was special assistant for staff development, helping with professional recruiting, preparation and review of research faculty evaluations, exit interviews, and interaction on complaints and potential grievances.

Howard also worked as a senior research scientist, headed the former Economic Development Lab's Occupational Safety and Health group, and led the Special Projects Branch and Manpower Resources Section of one of GTRI's predecessor organizations, the Industrial Development Division (IDD), during his career. In his retirement letter to President John P. Crecine, Howard noted that "These years have been very challenging and very rewarding—requiring hard work and dedication.

"One of my most rewarding experiences was as project director of the on-site Safety and Health Consultation Program for Georgia Business and Industry," he wrote. "This was a \$1.25 million contract in 1978, and is a program which has been funded annually by the Department of Labor at an average of \$600,000."

In appreciation of his scrupulous attention to detail, Howard was presented an "Honorary Doctorate in Detail Management" by his colleagues. It recognized his status as "Chief Dotter and P's and Crosser of T's" ("where 'T' stands for



Integrity and 'T' stands for Tenacity"). He also was presented a print of "Grey Morning at Tech" by Travers Green (TE '50), framed by Earl Cagle of Georgia Tech Purchasing, and signed by co-workers on the back side.

Howard and his wife Sylvia plan to travel now that both are retired. But he pledged to stay in touch with his Georgia Tech co-workers and friends.

"If I can ever help you, if I can do anything, I hope you'll call me," he said.

If you take him up on this offer, rest assured — as soon as he and Sylvia return from their adventures, Bill Howard will be on the phone for you, once again.

Profile & Insight

Bill Howard cuts a cake for guests at his retirement reception. Behind him are colleagues and friends lining up to sign the back of a Georgia Tech print that they presented to him. (Photo by Lea McLees)

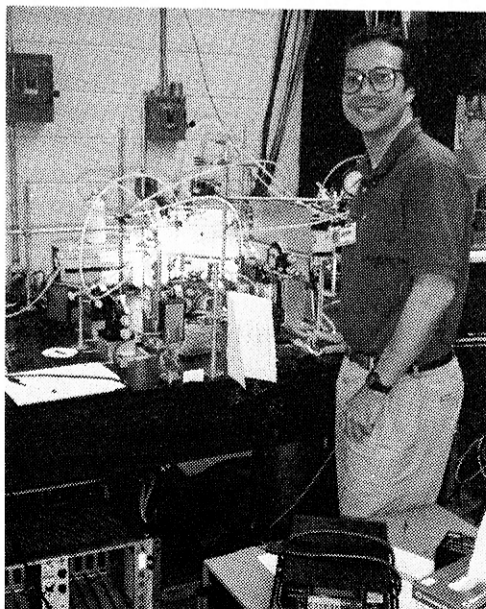
Research Will Take Ph.D. Candidate to Cold Continent

By Lea McLees, RCT

Ph.D. student Peyton Thom's interest in chemistry and his work at GTRI have evolved into an opportunity that few people have — he will be headed for Antarctica in early February.

Thom will spend a month on the continent at the base of the globe as part of a National Science Foundation project led by Principal Research Scientist Fred Eisle (EOEML) and Research Scientist Harald Berresheim (EAS). Their objective is to measure ground-level sulfur in Antarctica.

"Tropospheric sulfur chemistry in Antarctica and the Southern Ocean is quite unique," he



said. "I am going to Palmer Station, Antarctica — the smallest and northernmost station operated by the United States on that continent — as the scientist responsible for measuring the sulfur dioxide concentrations in the atmosphere."

Thom will be operating a very sensitive sulfur dioxide detecting instrument recently developed at the University of Miami. Fellow scientists will be measuring the amounts of other sulfur species simultaneously, Thom said.

This project is just one of several environmental research opportunities the budding atmospheric chemist has had at GTRI. When he first began working with Paul Wine in 1986, Thom studied cloud chemistry, trying to better understand the sulfuric acid formation in clouds that leads to acid rain. For the last four years he has concentrated on gas phase chemistry, selecting the reactions of bromine with nitrogen dioxide and atomic oxygen as his dissertation topic. Both of these reactions are involved in the process through which man-made and natural bromine destroy the stratospheric ozone that protects the earth from the sun's ultraviolet rays.

"Man-made bromine is released into the atmosphere in three ways," Thom said. "Halons, bromine's most damaging form, come from fire extinguishers. Methyl bromide, which also occurs in nature, is an agricultural fumigant; it is injected into the soil and is used in silos to kill bugs. Bromine-containing compounds are also used as additives in leaded gasoline, although that is not much of a problem in the United States."

Thom found that both the reactions he studied happen faster at lower temperatures. The temperature of stratospheric ozone, located about 19 miles above the earth's surface, ranges around -70 degrees F.

Thom also found that one reaction — that of bromine and atomic oxygen — happens about 33 percent faster than previously reported. That finding indicates a slightly higher rate of ozone destruction than was previously known.

Thom's doctoral research will help make computer models more realistic, and that is important, Wine said.

"Because chlorofluorocarbons are being phased out, it is expected that bromine will become a more important catalyst for ozone destruction in the future," he explained. "Prediction of likely anthropogenic effects on stratospheric ozone through the 21st century requires accurate kinetic information on the reactions Peyton has studied."

As he finishes up his dissertation on bromine reactions, Thom is preparing for Antarctica. He attended an Antarctica orientation conference in September organized by the NSF's U.S. Antarctica Program to find out about transportation, housing, weather and communications at Palmer Station.

"The cold weather clothing will be issued to me at Puntas Arenas, Chile, before I cross the Drake Passage to Palmer Station by ship," he said. "As I will be there in the summer, temperatures are expected to be above freezing — hopefully I'll not need the cold weather clothing very much."

After finishing his post-doctoral research, teaching and doing research are at the top of Thom's "to do" list.

"I think it would be fun to teach at a small university, or work at a NASA, NOAA (National Oceanographic and Atmospheric Administration) or EPA lab," he said. "I like research, and I'm always in a learning mode. That is one of the main reasons I came back to college to get a doctoral degree."

Peyton Thom will be headed to Antarctica in early 1994 to help fellow scientists learn more about sulfur in the troposphere over Antarctica. (Photo by Lea McLees)

News & Notes

Bob Shackelford: In Appreciation

We were teen-agers when we came together as classmates at Georgia Tech. That Tech experience (still going on today) ingrained in each of us a work and ethics lesson we would never forget. Getting through this place helped us, and made us, grow up.

In 1959 our class graduated and we went our separate ways — some to run businesses, some to fight our wars, some to find careers in science and research. Today we are spread around the country and the globe. When my path brought me back to campus after all these years, it was an immense advantage and pleasure to find, in Bob, a new colleague who had been shaped by those same early years at Tech — one who had

loved this place and forged his own career right here.

Bob was invaluable to me when I arrived at GTRI last December and even before, as Cody and I were making our personal decision to return. He was the principal person behind the scenes, helping me to privately think out and then begin to accomplish those things I hoped to do for GTRI. Bob helped me understand the pros and cons of the organization and its culture. He spent hours teaching me about the players on campus and their strengths and weaknesses. He accepted major responsibility during the strategic planning process in the spring by leading, along with Ed Reedy, the groups that eventually developed the new structure GTRI now operates under.

Most of all, I admired Bob's integrity and trustworthiness. I came to know

quickly what so many others already know; that I could count on him for unbiased straight advice, whether on personal or business matters.

But I think his greatest contribution to GTRI has had little to do with technology. He set a tone of personal ethics and integrity. Every one of us could simply look to the way Bob conducted his own business as a GTRI leader and see an example of how to handle our own career challenges. Bob never advertised it, but who he was and how he lived his life said everything.

Since our days here as teen-agers Bob never stopped learning, and he never stopped teaching. In Bob Shackelford's passing, GTRI researchers, support personnel, managers and students have lost our best role model.

—Richard H. Truly

1994-95 Congressional Fellowships Available

If you are interested in using your knowledge, skills and experience to help Congress in its deliberations of science and technology issues, a Congressional Fellowship may be for you.

The Office of Technology Assessment (OTA) is taking applications for up to six one-year appointments in Washington, D.C. In addition to assisting Congress, Fellows get a firsthand view of how Congress establishes national science and technology policy. "Identifying and supporting candidates for professional society Congressional Fellow nominations" is Strategy No. 29 in the GTRI Strategic Plan. GTRI administrators will be glad to assist qualified candidates who are interested in applying.

Applicants have demonstrated exceptional ability in areas such as the physical or biological sciences, engineering, law, economics, public health, environmental and social sciences, and public policy. They have extensive experience in science and technology issues, or have completed doctoral-level research.

As a Fellow, one must be prepared to "perform balanced, comprehensive analyses; to work cooperatively in an interdisciplinary team setting; and present reports in clear, concise language," according to the call for applications. Salary ranges from \$35,000 to \$70,000 per year, based on current salary, training and experience. In some instances a Fellow is allowed to accept a salary supplement from his/her parent organization.

Applications and letters of reference must be received at OTA by February 1, 1994. Finalists will participate in personal interviews March 29 through 30. Awards will be announced by April 6, and fellowships will most likely start in September 1994.

All GTRI research faculty should have received a mailing about the fellowships, containing additional information about OTA and the application process. If you did not receive this mailing, you may contact Gail Tucker at 894-3500. If you need help preparing an application for a specific fellowship, you may call Devon Crowe at the same number.

Shackelford

From page 1

physics. Fred Dyer, now co-director of the Multimedia Lab, worked with him at EES while they were in graduate school. He remembers Shackelford's dependability and attention to detail, describing him as "honorable, trustworthy, and a man of his word."

Shackelford began work at the entry levels of the organization. He was part of a team that developed the compact range for making antenna measurements, one of EES' most important accomplishments. He worked on programs ranging from sensors and lasers to radar, microelectronics, atmospheric studies and guidance systems. He authored more than 44 major reports and publications.

"Having been at every level of the organization at one time or another helped him understand the issues of day-to-day research work," Dyer said. "Bob was sensitive to the need to invest in research for the future."

Howard Dean, retired executive associate director of GTRI, agrees. He recalls Shackelford's view of GTRI "as part of Georgia Tech ... GTRI's role in Georgia ... and his deep appreciation for the importance of project entrepreneurs and project directors in GTRI's success."

Shackelford could have retired several years ago but chose to stay. "Bob stayed because he cared so much about Georgia Tech and GTRI," said co-worker and friend Devon Crowe.

Behind the Scenes

Shackelford made his contributions quietly, recalls John Hooper, a professor of electrical engineering and director of the Microelectronics Research Center during the early 1980s.

"He made significant contributions to Georgia Tech, and always did it in an unassuming way — not self-serving at all," Hooper said.

One of Shackelford's greatest legacies is the bright, competent researchers he hired and nurtured for GTRI, says Pat O'Hare, a colleague and close friend. "He spent hours not only working with people as a technical peer, but as a special mentor," O'Hare said. "He never got in the way of their shining stars."

Researcher Bob McMillan (SDL) was hired by Shackelford in 1976 into the

Electromagnetics Lab. McMillan recalls Shackelford's fairness and his support for research. Shackelford arranged financial assistance that made it possible for McMillan and Tucker to organize a conference in China every other year since 1990.

"He was very quick with a compliment, too," McMillan recalls. "He recognized you when you did something out of the ordinary. He was a good advocate, and he helped me a lot."

Humor and Photography

On the outside, Shackelford's demeanor was often quiet and serious. But those who worked closely with him eventually experienced his disarming humor. Friend and colleague Pat O'Hare recalls Shackelford's way of calming tense discussions or disagreements about work matters — by passing a football back and forth across the office. Shackelford had promised O'Hare a particularly memorable prank on O'Hare's next birthday.

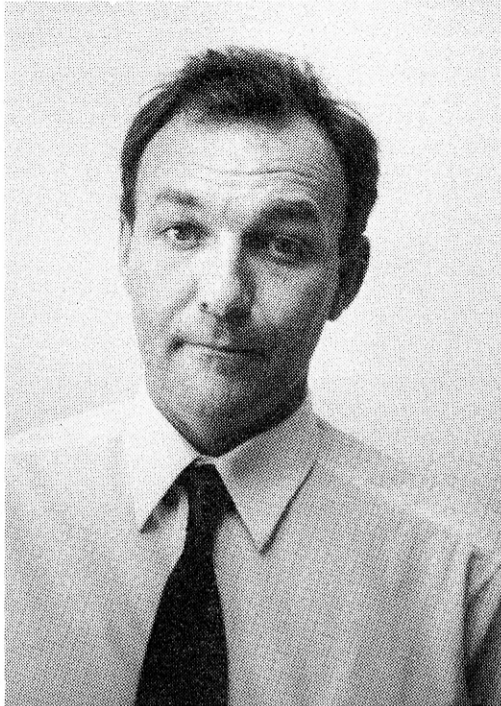
"On the 26th of December I turn 50 — I am not quite sure whether I have escaped that prank or not," O'Hare mused.

Shackelford appreciated classical and jazz music, loved gadgets and was an avid photographer. One of O'Hare's most cherished possessions is a photo of two golden and red mushrooms that Shackelford noticed while walking in the woods at O'Hare's cabin.

An avid outdoorsman, Shackelford raised horses for years, admired Tropicana roses, grew apples and raised prize blueberries. "He was probably equally at home on his tractor as he was pouring over a physics problem in the lab," O'Hare said.

Shackelford's wife, Barbara, remains at their home in College Park. The couple have three daughters and a son: Christy Shackelford of Southbridge, Mass.; Terry Santacroce of Los Angeles; Cindy Dodd of Montgomery, Ala.; and Johnathan Cox of Lawrenceville, Ga. Shackelford's mother, Jessie Mae Shackelford, lives in Union City, and he has two grandchildren.

Those who wish to honor Shackelford may send their contributions to Southwest Christian Hospice, which was a very important part of his life. The donations will be used to build a garden, walkway and fishpond that Shackelford had planned to construct for hospice residents. Donations are tax-deductible and may be mailed to 7225 Lester Road, Union City, Ga. 30291.



Stuart Jacobsen

GTRI Greetings

Welcome to one of our newest employees!

Ten Good Things We Know About Stuart Jacobsen:

1. Stuart comes to GTRI after completing post-doctoral studies in solid state laser materials at the University of Georgia — Yellow Jackets football devotees applaud this career move.
2. Here at GTRI he is a research scientist studying phosphors for high-definition displays. He also is involved in day-to-day operations of the Phosphor Technology Center of Excellence on campus.
3. Stuart earned a bachelor's and a doctorate in chemistry from Strathclyde University in Glasgow, Scotland.
4. After that he served as a Royal Society Fellow at the Institute for Inorganic Chemistry in Berne, Switzerland. There he studied optical properties of transition metal ions.
5. A native of Scotland, he has a nice accent.
6. Stuart says that the culture of the Southern United States is more similar to Scottish culture than anywhere else he's lived.
7. His family includes wife Laura, also a native of Scotland; Kim, 5, who was born in Switzerland; and new arrival Christopher, who was born in the United States eight months ago.
8. Stuart and his family are looking for a house to buy in the Atlanta area.
9. Needless to say, Stuart is a busy guy. However, when he does get free time he likes to go skiing. He also enjoys swimming in tropical coral reef waters.
10. Stuart says that Sri Lanka is the best place to do tropical swimming.

Calendar						

Events of Interest

For information on all but the Jan. 13 events you may call the Office of Information Technology at 894-4660. This is just a sample of OIT's January classes.

January 10

Understanding and Using Your Georgia Tech Computer Account, 2-4 p.m., Rm. 239/Rich Building.

January 12

Introduction to Parallel Processing, 10 a.m.-noon, Rm. 239/Rich Building.

January 13

Graphics, Visualization and Usability (GVU) Demo Day, 1:30-5 p.m., Rm. 259/College of Computing. All are welcome. Refreshments served.

"User Interfaces for Information Visualization," presented by Ben Schneiderman, University of Maryland. Noon, Room 102 A/B MiRC (Pettit Building). Part of GVU Distinguished Lecture Series.

January 26

Introduction to NuPop, 10 a.m.-noon, Rm. 239/Rich Building.

Abuja

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and on the other I am absolutely thrilled with the award," Ahuja said of the recognition. "I was present as a student at the conference when Sir James Lighthill (the developer of classical theory of jet noise) was given the first AIAA Aeroacoustics award. I had never even dreamed that one day I would be honored with the same prestigious recognition."

The award recipient is selected by the American Institute of Aeronautics and Astronautics (AIAA) Aeroacoustics Technical Committee. Ahuja is the third faculty member from a U.S. university to receive it, joining Krishnamurty Karamcheti of Stanford University and Christopher Tam of Florida State University.

GTRI Director Richard Truly commended Ahuja for his achievement.

"I am particularly proud that this prestigious award has been made to Ahuja," he said. "It reflects recognition of outstanding achievement in his area of expertise, and leadership by him here at Georgia Tech."

"I think it's great," said research engineer Marilyn Smith (AERO), a senior member of the AIAA and a colleague of Ahuja's for 15 years. "No one I know deserves it more than he does. He is, in my opinion, one of GTRI'S best treasures technically. He has done so much for not only GTRI, but also for students in aerospace, mechanical and electrical engineering."

Ahuja was not just an award recipient at the AIAA Aeronautics conference. He broke his own record for the largest number of papers authored and coauthored by an individual at the conference — five separate technical papers on five different topics.

Ahuja is chief of the Acoustics, Aeronautics and Advanced Vehicles Division in the Aerospace Laboratory, and serves as a professor in Tech's School of Aerospace Engineering. He came to GTRI in 1989 after working for Lockheed Aeronautical Systems Company, Syracuse University, the University of Southampton's Institute of Sound and Vibration Research, and Rolls-Royce, Ltd.'s Aero-Engine Division.



Krish Ahuja

Ahuja has spent more than 20 years researching and developing experimental acoustics. Among the study areas for which he is recognized are jet noise, flow and acoustic interactions, acoustics of aircraft propulsion systems, and noise control. Jet noise is his main area of interest. He has been funded each year since 1989 by NASA Lewis Research Center to continue developing innovative methods of suppressing supersonic jet noise. His use of sound to control jet flows and flows over wings is internationally known. Extensions of that research helped Ahuja and his team earn the Fall 1993 AEDC Technical Achievement Award on November 12.

He and his research team also have developed technology for using one sound to cancel out another — a sound that is of equal magnitude of the offending noise, but of opposite phase.

Among Ahuja's more unusual work has been the use of a large stereo speaker to emit sonic booms, allowing evaluation of the booms' effects on humans and structures. He and his colleagues also are studying prediction, measurement and control of wind noise in moving cars by wiring an auto with microphones, recording the wind noise generated at various points on the vehicle while driving, and analyzing the data.

Ahuja says he has been lucky to work for top research organizations throughout his career, from his start at Rolls-Royce Ltd. to his current work at GTRI.

"I am grateful for the support of the GTRI management and my colleagues in the AE School," he said. "I am fortunate to be blessed with the support of some 25 top-notch Georgia Tech students, who provide me with 50 additional arms; it means a lot to an experimentalist like me. I made a point in my acceptance speech, and I mean it: that I share my award with my co-workers and students, who made it all possible."

Ahuja's future goal is to use aircraft-acoustics related technology to understand and control noise problems of other industries. In particular, he plans to study noise problems related to flow valves, rotors, vacuum cleaners, trucks, lawn mowers and buildings and dwellings. He also plans to use acoustics as a tool in agricultural and medical technologies.

**News
&
Notes**

Focus on Folks

Professional Activities

Aerospace Laboratory

Marilyn Smith was upgraded to Senior Member of the American Institute of Aeronautics and Astronautics during September.

Research done by **Krish Ahuja, Kevin Massey** and Chris Tam (Florida State University) has been selected for the Arnold Engineering Development Center's Quarterly Technical Achievement Award. The project addresses jet/facility acoustic interactions at the center.

Electro-optics, Environment & Materials Laboratory

Nile Hartman attended the Sensors Expo '93 in Philadelphia, Penn., October 26-29. He presented an invited tutorial entitled "Integrated Optic Sensor: Techniques and Capabilities." He also served as a session chairman and organizer of a technical session titled "Integrated Optic Sensors."

Bob Schwerzel attended the annual meeting of the Advisory Board of the Center for Photochemical Sciences at Bowling Green State University, in Bowling Green, Ohio, October 22-23. He is an adjunct faculty member of the Center. This year's meeting was a symposium on "Diversity in Research," with lectures by several internationally known photochemists, including Mostafa El-Sayed of UCLA, the editor of the *Journal of Physical Chemistry*. It was a good opportunity for Bob to renew old acquaintances and to explore several possible future collaborations.

Paul Schlumper gave a half-day seminar on "Applied Ergonomics" November 2 in Forsyth, Ga. The seminar was part of a course for industrial engineers in the textile industry.

Kirk Mahan represented the Safety, Health and Ergonomics Branch of EOEML at the National Safety Congress and Exhibition in Chicago, Ill., October 3-6. The Congress was attended by 17,500 safety and health professionals and 800 exhibitors. This annual conference is the largest gathering of these professionals in the United States.

John Nemeth was an invited panelist at the Army Environmental Policy Institute Workshop on Emerging Technologies in Indianapolis, Ind., November 8-9.

Electronic Systems Laboratory

Deborah Mitta co-authored "Software Interface Evaluation: Modeling of Human Error," a paper presented at the 37th Annual Meeting of the Human Factors and Ergonomics Society in Seattle, Wash. The conference was held October 11-15.

Jeffrey Gerth presented a paper entitled "Identification of Sounds with Multiple Timbres" at the 37th Annual Meeting of the Human Factors and Ergonomics Society held in Seattle, Wash., October 11-15. This research represents the final experiment in his dissertation, completed last year. It also is one facet of continuing research on innovative auditory display

concepts in the Human Factors Branch of ELSYS' Concepts Analysis Division.

Robert Kossler presented a paper titled "Utility of MATLAB in the Testing of a 1-Bit DRFM" at the MATLAB Users Conference in Cambridge, Mass. on October 20. The paper was coauthored by Nick Pomponio and included in the conference electronic proceedings.

Research Communications Team

John Toon and Dan Forbush (State University of New York) presented "PR in the 21st Century: What you Need to Know Now" on October 3 at the Communicating University Research conference sponsored by the Council for the Advancement and Support of Education (CASE). The presentation summarized predictions about how technology will change the way university public information officers work with the news media.

Systems Development Laboratory

Gene Greneker (formerly SEAL and now SDL) and Don Strausberger authored "Smart Microwave Sensors for IVHS Traffic Flow Monitoring and Incident Detection Concepts." The paper was presented September 16 at the International Symposium on Automotive Technology and Automation in Aachen, Germany, by **Jim Cofer** (ACO), who was on vacation in Europe with his family at the time.

Sensors and Electromagnetic Applications Laboratory

Scott Goldstein, Jeff Holder and **Mary Ann Ingram** (ECE) attended the 27th Asilomar Conference on Signals, Systems and Computers in Pacific Grove, Calif., November 1-3. They presented an invited paper titled "The Application of Two-Dimensional Wavelets and Filterbanks for Convergence Enhancement in Adaptive Arrays for Space Communications."

Personal Notes

Congratulations!

...to **Tony White** (AIST), who won \$10,000 in a B98.5 FM radio contest.

Cradle Roll

Dana Stocks-Douglas (ELSYS) and her husband John welcomed a son, James Jarett, on October 22.

Tina and **Dirk Holcombe** (RCT and ARL/STB) are the proud parents of a son, Nathan Mark, born October 25.

Staying in Touch

Annette Weinberger (SDL) is still on medical leave of absence and is doing well. She would love to hear from her Georgia Tech friends!

Volunteers

Tom Autrey (ELSYS) is a member of the Atlanta Chapter of the National Railway Historical Society. The Society owns the Southeastern Railway Museum in Duluth — there Autrey has helped with track repair, switching railcars around, and restoring old passenger railcars.

Valli McNear (EOEML) was part of the Georgia Tech Olympic Committee volunteer team that participated in a December 2 Georgia Tech-sponsored holiday party for Techwood Home residents. The team decorated, helped with traffic control and wrapped gifts.

Our Sympathy

...to **Mark Hodges** (RCT), whose father-in-law died at the end of October.

...to **Lee Hughey** (AIST), whose mother died in late November.

...to the family of **Bob Shackelford**, GTRI's executive associate director, who died in late November.

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Personnel News

Administrative Information Systems Team

Teresa Royce has transferred in from IITL.

Aerospace Laboratory

Mark Costello has terminated.

Electronic Systems Laboratory

Jason Collins has transferred to IITL.
Don Lewinski is planning to retire on December 17.

Electro-optics, Environment and Materials Laboratory

Stuart Jacobsen has begun work as a research scientist.

Chuck Ross and **David Tanner** have terminated.

Information Technology and Telecommunications Laboratory

Edward Boggs, Clay Hart and **Julia Thompson** have terminated.

Paula Nolan has transferred to the Bookstore.

Management and Project Support Group

Lisa McDonald has transferred to MAPS 5 from SDL.

Helen Hunton has transferred to MAPS 6 from MAPS 5.

Research Support and Finance

Bill Howard has retired.

Research Operations

James Allen has been hired as a senior research engineer.

Sensors and Electromagnetic Applications Laboratory

Gene Greneker has transferred in from SDL.

Barry Mitchell has begun work as a senior research engineer.

Daniel Lagesse and **David Merriman** have terminated.

Support Services Department

David Hanson has terminated.

Systems Development Laboratory

Ralph Brooks has terminated.