the GTRI connector

Published monthly for employees of the Georgia Tech Research Institute

Volume 3 Number 8 June 1987

Tech's Compact RCS Range Offers Unique Capabilities

An important task in present-day military planning is trying to make equipment and weapons as "invisible" as possible to enemy radar. In the field of stealth technology, GTRI is a leader in radar cross section (RCS) research, or "low observables," as it is often called.

Tech's Compact Range

One of the most useful tools in this effort is the compact range in the basement of the Baker Building. Dr. Richard C. Johnson of GTRI invented the indoor compact range for antenna measurements more than 20 years ago and was awarded a patent in 1967. Since then, GTRI's compact range facilities have been continuously improved with the addition of microwave absorber and modern electronic equipment.

Over the past two to three years, the Electronics and Computer Systems Laboratory (ECSL) has developed the compact range for high-resolution radar cross section (RCS) measurements. ECSL researchers Gene Weaver, Brian Shirley, and Chuck Ryan have developed a fully automated broadband 2-18 GHz system that can operate in both continuous and pulsed modes. The data processing employs Fourier transform signal processing to obtain a down-range resolution of approximately 0.3 inch.

The compact range is used to test and evaluate items from scale models of fighter planes to single components of military hardware at full scale. By using the Fourier transform processing, the signature of small components mounted on larger objects, such as test bodies, can be isolated and evaluated.

The range uses a 12' by 16' section of an offset-fed paraboloidal reflector to produce a plane wave in an approximate 4' by 6' test zone. The reflector is located in a radio wave absorbing anechoic chamber to minimize reflections from anywhere except the item being tested.

The researchers have just built and installed a new low-RCS wing-shaped model tower that can support targets up to 250 pounds. The GTRI-designed tower head can rotate a model horizontally 360 degrees. A dual synchro system in the tower head provides angular resolution of 0.09 degree.

Computer Controls

All of the positioning, transmitting and receiving equipment is connected, by digital data links, to a "Data Logger" computer system implemented by Weaver and Shirley, with computer hardware design by Jeff Hopper. This unique system is programmed to control and perform the RCS measurements automatically. Unique software features include automatic system calibration, adjustable data averaging, automatic status checking, and operator alert if data are erroneous.

The software error checking and control is so complete that most measurements can be performed unattended. Generally, such measurements require that the radio frequency source be tuned and the receiver relocked 1,601 times per measurement,

Gene Weaver (left) and Brian Shirley place a target on the new model tower in ECSL's fully automated compact range for antenna measurements in the 2-18 GHZ region. (Photo by Gary Meek)

and operators are needed to manipulate the test devices.

Three Operational Modes

The measurement system can be configured for operation in three modes. The continuous-wave (CW) mode is a 2-18 GHz, stepped frequency amplitude and phase measurement. A pulsed, single-frequency mode can be used to determine RCS as a function of azimuth angle when the target does not have an extremely low RCS.

The third mode uses a "chopped CW" system to perform measurements over the entire 2-18 GHz band, thus combining the advantages of both continuous and pulsed modes. "We use switches to reduce the coupling between the transmitting and receiving arms," Ryan says. "This produces a larger dynamic range that enables us to look at much lower RCS targets." This system currently is being tested and evaluated.

Unique Resource

"Our compact range is unique not in its hardware, but in its automation and Fourier transform processing," Weaver says. "We can accomplish complex measurements in hours that

See "Range," page 3

EDL Studies Economic Activity Related to Japan

by Lincoln Bates, EDL

Against the backdrop of U.S.-Japan jousting over trade, the Economic Development Laboratory has produced two studies offering guidance to Georgia developers and industries wishing to do business with Japan.

According to research economist Tom Majors, the studies permit determination of the suitability of attracting Japanese manufacturing investment or of exporting goods to Japan.

"Japan's Ministry of International Trade and Industry expects the country's investment in U.S. manufacturing to grow 14.2% annually until the year 2000," says Majors, noting that Japan's huge trade surplus, possible U.S. protectionist trade policies, appreciation of the yen, and a lower corporate tax rate here are incentives to Japanese investment.

Georgia, with its Atlanta transport hub, leads the Southeast in total Japanese investments and in the number of Japanese manufacturing plants. The state received $190 million in Japanese investments in 1986 alone and is well-positioned to attract still more, according to EDL's research.

"The study," notes Majors, "should prove useful to county developers trying to decide if Japanese investment is desirable for their areas."

The other study addresses exports to Japan, looking at what that country currently imports and at what present trade negotiations might effect. For Georgia, says Majors, certain high-tech gear and scientific/medical instruments may be worthwhile export items. He adds that agricultural products offer considerable promise because of Georgia's extensive resources and because there's a good chance tariffs will drop in this area.

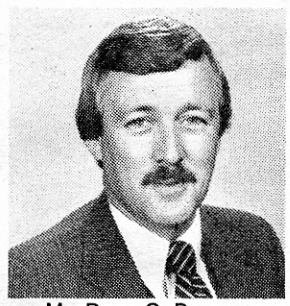
Would-be exporters also can find advice on where and how to investigate the potential of their products for sale to Japanese markets.

Both studies involved extensive examination of trade statistics and balance-of-payments figures as well as discussions with local Japanese manufacturers and site decision-makers, Georgia economic developers, and officials of state and federal trade agencies and the Japanese External Trade Office.

"These studies won't create investments or exports," observes Majors, "but they will serve as a guide to the game." And that game is an increasingly potent and important one.

Rear Adm. John T. Parker

Lt. Gen. Howard W. Leaf



Mr. Dean C. Borgman

STL Co-Hosts New Course on Modeling and Simulation

A brand new short course on "Modeling and Simulation in Combat and Materiel Development" was inaugurated on campus June 16-19. The course was cosponsored by the Systems and Techniques Laboratory in conjunction with the Georgia Tech Institute of Planning/Operational Analysis (Dr. Leslie G. Callahan, Jr., Acting Director) and Continuing Education.

The course reviewed the historical and current use of modeling and simulation technologies and materiel developments in the Department of Defense, and examined new technologies and organizational structures for improving weapons systems.

Among the instructors were several key presenters from DoD and industry. Dr. H. Steven Kimmel, Office of the Under Secretary of Defense, Acquisition, gave the keynote address. Rear Admiral John T. Parker, Jr., Commander, Operational Test and Evaluation Forces, U.S. Navy, presented the Navy view. Lieutenant General Howard W. Leaf (U.S. Air Force, Ret.), Vice President and General Manager, Advanced Program, BDM Corporation, gave the Air Force view. The industry view was presented by Mr. Dean C. Borgman, Vice President, Engineering, McDonnell Douglas Helicopter Company. Dr. Daniel F. MacDonald, Senior Vice President, BDM Corporation, gave a look at combat and materiel development in the future.

Georgia Tech presenters included Dr. Callahan, Dr. Donald D. Stevens (STL), Dr., Charles K. Watt (STL), and Dr. Dan Schrage (Aerospace Engineering).

The unclassified course drew approximately 100 participants, about evenly divided between the military and civilian contractors.

ECSL Staffers to Coordinate International IEEE Symposium

Several staff members of the Electronics and Computer Systems Laboratory are busy organizing and producing the 29th IEEE International Symposium on Electromagnetic Compatibility. Hugh Denny is the general chairman, John Daher is technical program chairman, and Ernest Donaldson is the treasurer and finance chairman; all are in the Electromagnetic Compatibility Division. Jim Toler (Biomedical Research Division) is in charge of local arrangements. Other laboratory staff members are likely to be involved in various other symposium activities as well.

The symposium will be held at the Radisson Hotel Atlanta (formerly the Downtown Marriott) on August 25-27, 1987. During the three days, 17 technical sessions plus two workshops will provide attendees with the opportunity to select from approximately 100 technical presentations. Technical papers will address modeling and testing of conducted and radiated electromagnetic emissions, shielding evaluations, cable and connector performance, electromagnetic pulse, electrostatic discharge, and lightning.

More than 100 companies are expected to exhibit instruments, testing facilities, and components associated with the assessment and control of unwanted electromagnetic energy. The expected 1,000 attendees will also have the opportunity to see local attractions and participate in an old-fashioned Georgia hoedown. The audience is expected to be truly international in scope, with numerous visitors from Europe, Asia, and South America.

It Seems to Me . . .

What is the single best idea you've found to help you do your job effectively?

Answer that question in 50 words or less and you may find yourself in print! In the July-August issue of the CONNECTOR, we'll print or summarize the best answers.

Send your answer, along with your name and lab/service group designation, to GTRI Connector, RCO, 223 CRB. If we get a sufficient show of interest, we may make this a regular reader feedback column.

Happy Anniversary!

At the faculty/staff honors luncheon June 2, **Jerry L. Eaves** (RAIL) and **Gerald K. Webb** (RCO) received Gold-T pins for 25 years of service to Georgia Tech.

Slide Programs Now Available on Laser Video Discs

Researchers now have a new marketing tool—an audiovisual briefing of GTRI projects which can be shown on laser video discs in Cobb County and five campus locations.

Four slide programs and one videotape presentation are stored on each 12-inch disc. Disc players and television monitors can be cued and running in a matter of seconds.

Players and monitors are permanently installed in conference rooms 238 and 292 in the Centennial Research Building, Conference Room 303 in the Baker Building, Conference Room 114 in ERB, and in the President's Conference Room of the Carnegie Building. Another fixed installation is in the auditorium at Cobb County. A seventh unit in the Research Communications Office can be wheeled to different parts of the Centennial Research Building.

The programs on the first 12-inch disc are: GTRI Overview (3 minutes); Electronics Research (20 minutes); Research in EMSL/EDL (8 minutes); Research at Georgia Tech (including GTRI); and a videotape on Tech's Research in Space Programs. The videotape includes some GTRI projects.

Dr. A. P. Sheppard, associate vice president for research, commissioned RCO to prepare the laser disc material, and Dr. Fred Rossini, director of the Office of Interdisciplinary Programs, will oversee expansion of the technology into other sponsor presentations.

Dr. Sheppard said, "Each of these 12-inch records will hold 54,000 slide frames on one side. That means that we have discs for storing and recovering data, including picture, text and voice, driven by a computer which can give us speedy random access and printouts."

The long-range plan would include producing discs with pictures and explanatory text that could be pre-programmed to suit the needs of various clients or visitors. The monitors at some stations will have menus for interactive touch-screen response. Eventually Tech may acquire portable players so that a project director can travel with a disc player and hook it to almost any TV monitor on site.

Operating instructions are available at each of the present locations.

Software Review

by Pat Mathiasmeier, CRSD

CRSD is now operating a Training Facility at the Cobb County Research Facility (CCRF). Five computers are set up in the CRSD terminal room, and CRSD instructors regularly conduct classes for GTRI personnel at CCRF. Several courses have been added to the Training Facility curriculum this year.

C Programming Language

An introduction to programming in the C language. Originally developed for systems programming in the UNIX operating system environment, C provides performance approaching that of assembly language together with the portability and productivity features of a higher order language. Topics covered include structure, syntax, data types and structures, operators and expressions, control flow, functions, array and pointers, compilers, and support products. Prerequisites: Programming experience.

Organizing Your Hard Disk

Designed to make working with a hard disk easier, faster, and more efficient. Topics covered include tree structured directories, the prompt and path command, autoexec.bat and config.sys files, DOS shell programs, creating menu systems with BATCH commands, setting up RAM disks, using backup and restore, and disk optimizers. Prerequisites: Beginning DOS.

Rbase System V

Covers the concept of database management and typical applications. Topics covered include an introduction to the theory of databases, file structure and field types, database creation and use, the use of data entry and the retrieval of information from the database. Students also learn sorting and indexing commands, program language codes, as well as commands in the formatting of output with the development of reports. Finally, accessing information by communicating with other programs is discussed. Prerequisites: Beginning DOS.

IBM PC Communication

Covers the basics of communicating with the IBM PC and looks at three popular communications packages. Some of the functions covered for each of the three packages are establishing a connection, originating and answering calls, uploading and downloading files, and capturing data. Also covered are mainframe-to-PC transfers using Kermit and mainframe-to-mainframe transfers. Prerequisites: Beginning DOS.

See "Software," page 3

GTRI Says Good-bye to Three Retirees

Dick Johnson

Dr. Richard C. Johnson retired March 31 after 31 years of distinguished service to GTRI. A principal research engineer in the Office of the Director since 1979, he played a large role in the growth of electronics activity at GTRI.

Dr. Johnson headed the Radar Branch from 1963 to 1968, was chief of the Electronics Division (equivalent to a laboratory) from 1968 to 1972, and manager of the Systems and Techniques Department from 1972 to 1975. The last named position was equivalent to GTRI associate director today. He was an associate director of GTRI from 1975 to 1979, and a member of the OOD senior staff from 1979 until his retirement.

An internationally respected scientist, Dr. Johnson is a fellow of the Institute of Electrical and Electronics Engineers. He was president of the IEEE Antennas and Propagation Society in 1980, and distinguished lecturer in 1978-1979.

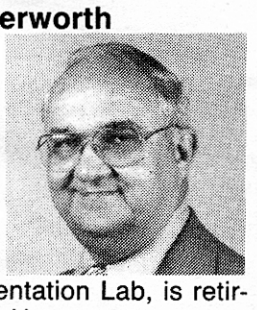
He has some 75 major reports and publications to his credit, including coauthorship of the *Antenna Engineering Handbook* (1984). His basic compact antenna range design was patented in 1967.

Dr. Johnson's contributions in microwave theory and components include development of design techniques for linear waveguide tapers, microwave ring switches, and dual-polarized transducers. In the area of microwave antennas, he formulated methods for designing several types of geodesic lenses, developed techniques for reducing wide-angle sidelobes in radar antennas, and developed compact ranges.

Dr. Johnson received his BS and MS degrees in physics and his PhD from Georgia Tech.

Although he is officially retired, you'll still see him around the campus. He is available "hourly-as-needed" to help with antenna problems as always.

Clark Butterworth



J. Clark Butterworth, head of the Radar Technology Branch of the Radar and Instrumentation Lab, is retiring June 30. He came to EES/GTRI as a technician in 1951 after graduating from Southern Technical Institute, and has held the title of senior research technologist since 1981.

Butterworth's research interests are in the fields of millimeter and submillimeter wave transmitter techniques, high-voltage power supplies, high-voltage pulse techniques, radar systems and measurements methods. He is the author of 33 major reports and publications.

Among his research accomplishments at GTRI were design and development of pulse modulators for millimeter wave extended interaction oscillators, development of a solid-state dual modulator for high-power magnetrons, and design and development of a 5.9 GHz solid-state radar transponder.

Lillian Johnson

Lab personnel who deal with travel expense statements and the like have been missing accounting assistant Lillian R. Johnson for several months. She retired January 30 from the GTRI Accounting and Budget Department.

Johnson came to Georgia Tech in 1960 to work in the office of the Vice President for Business and Finance, and transferred to EES/GTRI in 1971 as a bookkeeping machine operator. She was promoted to accounting assistant in 1980.

Range (from page 1)

would have taken years by the old, time-honored methods."

The range is used not only to test devices developed at GTRI, but to perform testing for government agencies and private companies. "In the past two years, 80% of our work has been for smaller companies that can't afford their own compact ranges," Weaver points out. "We get a lot of small contracts—the longest has been for two months—but the volume has been enough to make us self-sufficient. These contracts, in turn, have allowed us to maintain and upgrade our facilities, software and techniques, to stay technically current and to support many of GTRI's larger contracts."

Ryan emphasizes that the range, built up gradually by small investments over the years, would take $5- to $6-million to duplicate today. Thus it is an invaluable resource for both antenna and RCS measurements at Georgia Tech.

Software (from page 2)

General Markup Language

Access the powerful printing capabilities of the IBM 6670 and 3812 laser printers through a PROFS or CMS account. The General Markup Language is a text processing program that allows the user to "mark" text with tags that create tables of contents and indexes, draw boxes, lists, headers, footnotes, and figures. Prerequisites: None.

Library On-Line Catalog

Students learn to retrieve bibliographic information describing holdings of the Price Gilbert Library catalog database. Any record available in the microfiche catalog is available on-line. Topics covered include system logon, and search, print, and message commands. Prerequisites: None.

PROFESSIONAL ACTIVITIES

ECONOMIC DEVELOPMENT LAB

David Clifton attended a conference in Washington (DC) June 8-9 entitled "Using Technology to Compete: Strategies to Assist the Small/Medium-Sized Manufacturer" and participated in a panel discussion on Elements of an Effective Technology Assistance Policy for Small Manufacturers."

Art Brown chaired a workshop on "Developing New Infrastructure" at a southern regional seminar, "The Higher Education-Economic Development Connection: Making the Partnership Work," April 27-28 in Orlando (FL).

On June 4, **John Nemeth** spoke at the Governor's Conference on the Environment on community right-to-know regarding hazardous materials in the workplace and potential exposure to the public.

Edd Valentine made presentations on EDL's newly developed thermally enhanced sludge dewatering process at the spring meeting of the Georgia Poultry Federation and the Southeastern Processors Workshop in Atlanta last month.

Marilyn Black presented a paper, coauthored by **Charlene Bayer** and **Lou Brackett** and entitled "An Office Building IAQ Problem," at a recent ASHRAE Indoor Air Symposium in Washington (DC). Both Black and Bayer made indoor air quality presentations at the U.S. Department of Interior annual safety meeting in Atlanta.

The entire Asbestos Group traveled to Seattle the week of May 11 to give the "Supervision of Asbestos Abatement Projects" course to 80 people.

ELECTRONICS & COMPUTER SYSTEMS LAB

John Daher presented a paper, "Shielding Effectiveness of Metallic Joints versus Corrosion Prevention," at the Tri-Service Conference on Corrosion, held at the U.S. Air Force Academy, Colorado Springs, May 5-7. **Jan Gooch** (EMSL) was coauthor.

At the SPIE Technical Symposium Southeast in Orlando May 22, **Eric Barnhart** gave a paper on "Millimeter Wave Communications: Air-to-Air Applications," and **Jeff Hopper** presented a paper on "Infrared Image Acquisition and Analysis System Using Optical Disk Storage."

Norberto Ezquerra gave a poster session on "A Method for 3D Display of Arterial Structure Superimposed on Myocardial Perfusion Distribution" June 3 at the Society of Nuclear Medicine conference in Toronto.

ENERGY & MATERIALS SCIENCES LAB

Tom Starr gave two presentations at the Fossil Energy Materials Program Conference.

John Handley gave a lecture on "Radome and Antenna Analysis" at the Antennas and Propagation Society Los Angeles Chapter meeting May 12.

Jan Gooch's work on fish oil applications was published in the February issues of *Chemical Marketing Reporter* and *American Paint & Coatings Technology,* the April issue of *Modern Paint & Coatings,* and the May *Industrial Finishing.*

RADAR & INSTRUMENTATION LAB

Presenting papers at the SPIE Technical Symposium Southeast in Orlando in May were: **Bill Holm,** "Dual-Mode IR/MMW Sensor Scene Registration"; **Neal Alexander,** "94 GHz Search and Track Antenna"; and **Gene Martin,** "Balloon Lofted Sphere as a Range Dependent Calibrated Target for Millimeter Wave Radar."

This month, **Joe Bradley** received his MSEE from Georgia Tech.

SYSTEMS & TECHNIQUES LAB

Jeffrey Sitterle presented two papers at the International Geoscience and Remote Sensing Symposium at the University of Michigan, Ann Arbor, May 18-21: "On the Temporal Power Spectrum of the Intensity and Angle-of-Arrival Fluctuations of a General Beamwave" and "Simulation of an Atmospherically Corrupted Signal at the Focal Plane of a Reflective Antenna." Coauthors were Dr. Frank Merat and Dr. Paul Claspy of Case Western Reserve University.

SYSTEMS ENGINEERING LAB

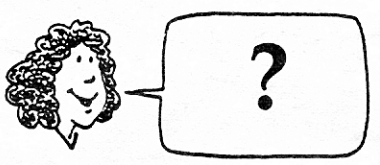
The Ninth Annual Electronic Warfare Program Review was held at the Cobb County Facility May 12-14 with 84 DoD personnel from 19 installations in attendance. Presenters from SEL, STL, RAIL, EML and ECSL made 40 presentations.

Dean Spencer presented a paper on signal collection requirements for ECCM at the National Security TEDS-6 Symposium May 6.

Dennis Folds received his PhD in psychology from Georgia Tech in June. His dissertation, which received a commendation for excellence, is entitled "Response Organization and Time-Sharing in Dual-Task Performance."

Phil West was a coauthor of a paper, "Approximate Nonlinear Filtering for Piecewise Linear Systems," presented by Professor A. H. Haddad (EE) at the NATO AGARD Symposium on Guidance and Control, Athens, Greece, in May.

QUESTIONS, ANYONE?



by Charles McCullough, HRD

You've heard of I-9 by now, haven't you? No, it's not a karate move intended to blind your opponent, nor a new EDL research project on mutant dogs. I-9 is a remarkably simple form that must be filled out by all new employees. But behind this little form is aggressive new federal legislation that affects every employer in the country: the Immigration Reform and Control Act. Here are answers to the questions most often asked about this new legislation.

Q: What is the Immigration Reform and Control Act supposed to accomplish?

A: The whole intent is to curb the employment of *illegal* aliens. Note the emphasis on *illegal.* The Immigration Reform and Control Act (all right, let's go ahead and call it IRCA) is not intended to keep employers from hiring aliens, just the illegal variety.

Q: In as few words as possible, what does this Act do?

A: As few words as possible? You must be the one that keeps mailing in copies of this column marked, "Wordy! Wordy!" At any rate, the IRCA charges employers with the responsibility of obtaining from each new employee proof of identity and proof of eligibility to work (meaning, the employee has to prove that he or she is not an illegal alien). Further, the act imposes stiff criminal and civil penalties and/or industrial-strength fines for employers who are found to be in non-compliance.

Q: How do new employees prove their eligibility to work? And why this business of "proof of identity"?

A: A new employee proves his or her eligibility to work by showing up with certain designated documents (originals only!) that prove he or she is not an illegal alien. The new employee must provide proof of identity so that the employer knows that the documentation proving eligibility to work does, in fact, belong to that person. Your lab's personnel coordinator, or your department manager, has a list of exactly what documents can be used.

Q: Who is included in the definition of "new employee"?

A: All employees with a hire date of 1 June 1987 or later must complete an I-9 within the first three days of their employment. In addition, everyone who is now in our employ and was hired on or after 7 November 1986 must complete an I-9 by the end of September of this year.

Q: What do new employees do with all this great proof they're carrying around with them?

A: During the first three days of employment, all new employees (including student employees, including part time employees . . . well, never mind, we went through this exercise in last month's column) report to the office of an authorized deputy and fill out and sign an I-9 form. The I-9 form basically asks the employee, "Who are you? And what makes you eligible to work: citizenship or some type of legal alien status?" Then, the employee shows his or her original documents of proof of identity and work eligibility to the deputy, who peruses them. The deputy then completes the bottom portion of the form, certifying what documents were shown and attesting that they seemed to be genuine. Photocopies of the forms of proof are then made, attached to the original I-9 form, and the whole packet is shipped off to some place of great safekeeping so that federal auditors can dig through them if they get the itch to do so.

Q: Is there an authorized deputy within GTRI?

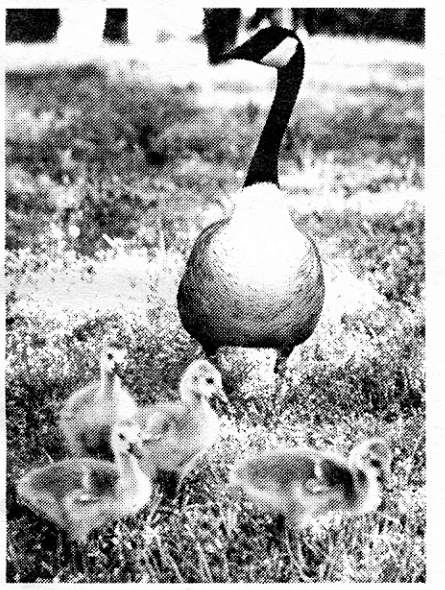
A: The Human Resources Department has an authorized deputy. New GTRI employees employed on the main campus or at GTRF/CC must visit our offices in the Coliseum Annex Building within the first three days of their employment.

Q: What do new employees do when they're hired at our Huntsville, Alabama, facility?

A: Details about how to handle new employees at our remote sites, including the field offices, will be decided in meetings to take place shortly after the deadline for this column. HRD will distribute more specific procedures through the Administrative Network as soon as the information is available.

Q: I leave next month for a year's educational leave of absence. Will I need to go through the I-9 ordeal upon my return?

A: In the first place, it's not an ordeal. It's five minutes of utter simplicity. If you were employed by us prior to 7 November 1986 and have remained in our employ continuously since then, you are "grandfathered" in, meaning GTRI doesn't have to obtain an I-9 from you. If you go on a leave of absence for reasons of study, illness or pregnancy, you retain your grandfathered status. However, if your employment is terminated and you later return to our employ, you would, at that time, have to be I-9'ed by us.



For several years, a flock of Canadian geese have spent their winters on the lake at the Cobb County facility. This year, two geese stayed to raise their family. (Photo by Anita Edwards)

HRD, Personnel, and PARS held their second annual picnic May 14. Forced indoors by the rain, but enjoying the food nevertheless are administrators (L-R) Betty Yarborough (HRD), John Gibson (Personnel), Sybil Small (PARS), and Pat O'Hare (OOD). (Photo by Gary Meek)

PERSONNEL NEWS

OFFICE OF THE DIRECTOR

Janice Manders will become administrative assistant to Dr. Donald J. Grace, effective July 1. She is transferring from SEL, where she was administrative coordinator for Bob Zimmer.

RADAR & INSTRUMENTATION LAB

Neal Warner has joined the Fort Monmouth office as an SRE. He formerly worked for the U.S. Army Communications and Electronics Command at Fort Monmouth and Quantitative Services of Ocean (NY). A registered professional engineer (New Jersey), he received his BSEE from Drexel University and his MSEE from Newark College of Engineering.

William Tolhurst is a new RE I in the Technology Development Division. He received his BSEE from the University of Texas and previously worked for Rockwell International in Cedar Rapids (IA). He has experience in multiprocessor control configurations.

With the receipt of their BSEE degrees from Georgia Tech this month, former co-ops **Scott Bostater** and **Jeff Jenkins** have joined the staff as full-time RE I's.

Randall Hartwig has changed from hourly to a full-time ET II.

New GRA's are **Kelley Daniel,** who is helping Guy Morris in the development of contractual vehicles, and **Scott Hrastar,** who is working in the Modeling and Analysis Division. Kelley has a BS in industrial management from Georgia Tech, and Scott has a BSEE from Ohio State.

William Gunn is a new co-op in the Technology Development Division. He is pursuing a BSEE at Tech.

SERVICE DEPARTMENTS

New employees: **Monica Rowland,** staff assistant in Computer Related Services, who transferred from the College of Architecture; **Nancy Snyder,** accounting clerk in Accounting, who transferred from the Cashier's Office; **Terrell Brown,** machinist in Mechanical Services; and **John McKibben,** now a permanent graphics technician I in the Photo Lab.

Congratulations to Instrumentation and Calibration's **Bob Cash** on his promotion to electronics specialist.

Terminations: **Linda Houseworth,** HRD; **Andrea Randolph,** PPC; **Robin Rooks,** PPC.

SYSTEMS & TECHNIQUES LAB

Welcome to new employees **Richard Ivy,** RE II; **Philip Tickle,** RE I; **Bradley Newton,** RE I; and **Michael Lee,** ET III.

Grover Richardson was promoted to electronics specialist.

Anne Roe and **Patricia Jones** terminated their employment.

SYSTEMS ENGINEERING LAB

Congratulations to employee of the month **Bill Kuhn,** who played a key role in the continued success and potential expansion of the Automatic Test Equipment Software Support Environment project.

Richard J. Pracht, former student assistant in the Defense Systems Division, has been hired as an RE I. Former co-op **Lee Evans** will stay on in Electronic Support Measures (ESM) as an RE I.

New hires include **Robert J. Butera,** co-op in ESM, and **Kathryn A. Kitta,** student assistant in the Countermeasures Development Division.

Personal Notes

EDL: Ben and **Lynn Holt** have a new daughter, Jessica Ragan, born May 19.

Lou Brackett has entered Tech's graduate program in management.

EMSL: Congratulations to student assistant **Doug Twait** for winning the Outstanding Senior award in materials engineering.

RAIL: Scott Bostater and Cheryl Deese were married June 6, and **Cece Edwards** was married to Vernon Hetrick on April 3.

Judy and **Powers Garmon** welcomed their first child, Caroline, born April 1.

Condolences to **Cece Hetrick** on the recent death of her sister.

SEL: Patti McRae was married May 30 to Mitch Hoffmire.

STL: Congratulations to **Don Bodnar,** whose son, David, graduated first in his class at North Cobb High School and will be entering Georgia Tech in the fall as a President's Scholar.

SSD: Condolences to **Billy Boner** and **Jerry Brown**, whose fathers recently died.

the GTRI connector

Published monthly for employees of the Georgia Tech Research Institute

Vol. 3 No. 8 June 1987

Published by the Research Communications Office, Centennial Research Building, Georgia Institute of Technology, Atlanta, GA 30332. Georgia Tech is a unit of the University System of Georgia. Typesetting and printing by Walton Press, Inc., Monroe, GA. The deadline for submission of copy is the first Tuesday of each month.