

the GTRI connector

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GTRI—Present and Future



Director Donald Grace fields questions at the GTRI meeting. (Photo by Andrea Randolph)

"One thing characterizes our present situation—it's a time of change. We're undergoing all sorts of changes. Some we can control—some we can't."

With this statement, GTRI Director Donald Grace kicked off the "GTRI—Present and Future" meetings, held for all GTRI employees October 14-17.

Some of these changes stem from Dr. Pettit's sudden death, resulting in multiple shifts in leadership, he said. He also touched on the search for an executive vice chancellor with expertise in the area of technology and the possibilities for better cooperation with the University of Georgia as new leadership takes over there.

"Perhaps our most painful change—at least in the short

term," Dr. Grace pointed out, "is the change in our overhead cost recovery system. It had to be done. Our under-recovery in FY 1985, for example, was \$6.8 million. But the long-term results will mean more discretionary money for internal projects. It will make us less competitive moneywise, however." He added: "We can't compete with the 'Beltway bandits' on proposal costs, but we can compete with the other 'not-for-profits' in terms of quality, reputation, size, breadth of research, etc."

Dr. Grace commented that Tech now is much better appreciated and known throughout the state, principally because of the field offices, but also because of the "buddy system," which assigns a Tech alumnus to each legislator. One result is that the State allocation now includes \$500,000 in improvements for field offices and economic research.

In looking at FY 1986 highlights, Dr. Grace noted that a number of contract awards exceeded \$1 million. The largest—the T2 and Sierra projects—brought in \$22 million.

FY 1986 expenditures totaled \$65.6 million, and the FY 1987 figure is expected to reach \$72 million, Dr. Grace said. Statistics showing GTRI's growth are listed in the box at right.

A big change is that more than half of the space occupied by GTRI is leased—and at market rates. "This adds to

our costs, but we needed the space and we wouldn't have gotten it without leasing," Grace pointed out.

GTRI also is having to adjust to the emphasis on competition and new contracting vehicles in the federal contracting environment, Grace said. Associate Director Gerald Carey added, "Our sponsors are moving to larger programs that require multidisciplinary efforts. We need to stop competing destructively and put Georgia Tech's best foot forward collectively." He commented that cooperative research across lab and academic lines already is becoming commonplace at Tech.

Looking into the long-range future, Dr. Grace said that sponsored contract awards, which totaled \$54 million in FY 1985 and are estimated at \$74 million in 1987, are targeted for \$122 million by the year 2000 (FY 2001). GTRI's research faculty total, which stood at 556 in 1985 and should reach 575 in 1987, may rise to 1,200 by FY 2001.

"We must capitalize on our strengths, minimize our weaknesses, and change where we can," Dr. Grace said. In closing, he emphasized: "We are a fine organization made up of fine people. But we must find new and better ways to communicate, and we must continue to try to build quality. In the final analysis, quality is more important than growth."

Vital Statistics

How did GTRI fare in FY 1986? Following is a comparison with FY 1985:

Expenditures

Sponsored Personal Services:

1985 - \$20.9 million

1986 - \$22.8 million

Total Expended:

1985 - \$59.4 million

1986 - \$65.6 million

Proposal Activity

Submitted:

1985 - \$252 million

1986 - \$381 million

Awarded:

1985 - \$54.0 million

1986 - \$75.5 million

Pending:

1985 - \$141.9 million

1986 - \$283.0 million

Sponsors

Department of Defense:

1985 - 70.6%

1986 - 62.9%

Other Federal Government:

1985 - 14.6%

1986 - 12.7%

State & Local Government:

1985 - 1%

1986 - .8%

Industry:

1985 - 13.8%

1986 - 23.6% (includes 10% for industrial subcontracts from federal money)

Employees (June 30)

Full-Time Professionals:

1985 - 571

1986 - 559

Full-Time Support:

1985 - 273

1986 - 301

Part-Time Staff:

1985 - 127

1986 - 140

Students:

1985 - 226

1986 - 273

Total:

1985 - 1,237

1986 - 1,273

Corporation to Help Tech Transfer Technology to Industry

by Mark Hodges, RCO

What do Gatorade and enhanced Vitamin D in milk have in common? Both products originated in academic research laboratories, bringing significant industrial royalties to their respective universities.

Hoping for similar results, the Georgia Institute of Technology has joined a consortium of universities in marketing technology innovations from its research laboratories.

Under a five-year agreement, University Technology Corporation (UTC) of Durham, North Carolina, will be exclusive licensing agent for most of Georgia Tech's technologies.

Tech will maintain the right to handle licensing for a few technologies with which it has already achieved industrial marketing success.

The Universities of Maryland and Connecticut have established similar arrangements with UTC. Dr. Milton Stompler, director of Georgia Tech's Office of Technology Transfer, says the consortium should give the participating universities wider markets than they would attract alone.

"Some university faculty members consider the work is done when a patent is secured," Stompler adds. "That's too narrow an objective. UTC has the expertise to make the final connection with

industry and earn royalties for the inventor and the university. I think this agreement will turn out to be a winner."

UTC's only income under the Tech contract will be from licensing. The agreement calls for the corporation to split all royalty income equally with Georgia Tech. However, Stompler says that the arrangement is very favorable to Tech. UTC will pay for the costs of patenting inventions out of its share of the royalties. Typically, this expense is more than \$10,000 per invention. The corporation will also provide Georgia Tech more than \$100,000 a year to operate the Office of Technology Transfer—nearly as much as Tech now

receives each year in non-software licensing royalties.

Stompler says that UTC representatives are already encouraging his office to work with faculty to generate more records of invention (ROI's). Georgia Tech has been averaging 60 ROI's per year, but the corporation thinks the total should be at least one per \$1 million of contract research at Tech — or over 100 annually.

The most prominent technology excluded from Tech's agreement with UTC is software, which now nets Tech \$1.6 million in licensing income a year, more than ten times the royalties accrued from all other university technologies combined.

Machine Vision System to Aid Poultry Processing

Engineers in EDL's Agricultural Research Program continue to develop new computer technology to increase productivity in the poultry processing industry. Their latest project involves machine vision and a laboratory-scale computer-controlled processing line.

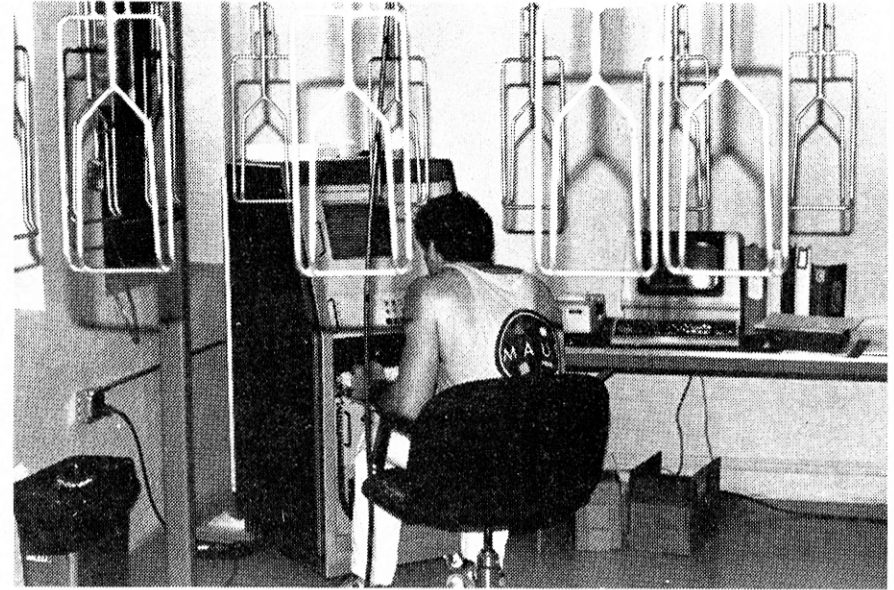
As line speeds continue to increase in poultry processing plants, it becomes increasingly difficult for workers to be consistent in their classification and inspection tasks. Fatigue and line "hypnosis" are ever-present problems. Thus the interest in automation.

The problem with automating a poultry processing line is the irregularity of the product. But machine vision technology will allow a computer to electronically assess visible characteristics of an object, using video cameras. A properly programmed computer can analyze the relative lightness or darkness of each pixel of the image transmitted by the camera to determine the

shapes and patterns in the image.

The first machine vision application GTRI's engineers hope to accomplish is the computerized sizing of slaughtered birds as they pass on the processing line. The next goal is to grade birds on the line, electronically spotting skin tears and discolorations, missing parts, or other downgrading factors. Eventually, they hope to have the system assist with on-line inspection.

As part of their machine vision research, GTRI engineers have designed and built a laboratory-scale computer-controlled processing line. It is one of only three such research lines in the country. The line will be used for developing lighting schemes to assist the vision system in capturing the image of a moving bird on the processing line. Eventually, the computer control capability will be linked to the vision system, so its computer can change the speed on the line as necessary



Glenn Katz tests EDL's computer-controlled poultry processing line during its construction. It will be used in a machine vision project. (Photo by Stephanie Babbitt)

to analyze images.

"We believe machine vision can be used profitably for repetitive tasks in the poultry processing plant," says project leader Costas Soulakos. "The advantage of the computer is

that it doesn't get bored, distracted or preoccupied. So machine vision is faster and more accurate than human vision in repetitive applications requiring attention to several items at once."

Industrial Extension Service Marks 25th Anniversary

by Lincoln Bates, EDL

Georgia Tech's Industrial Extension Service (IES) turns 25 this year. From a modest beginning in 1961 with a single field office in Rome, IES has grown into a 13-office network currently budgeted at \$2.5 million and annually conducting more than 1,000 assistance projects for companies across the state. The service not only enhances Georgia's economic growth, it enriches Tech and GTRI as well.

A statewide industrial extension service was mandated by the legislature as Georgia's

economy turned from agriculture to manufacturing. "The original purpose was industrial development," says EDL Associate Director Rich Combes, "and the offices in the 1960's were staffed with economic development specialists rather than engineers. As Georgia succeeded in attracting industry, the mission became one of supporting established firms."

Providing technical assistance—a service which itself helps attract industry—to small and medium-size firms demands different skills of the IES staff. Today's resident pro-

fessionals are familiar with manufacturing technology, productivity improvement, microprocessors, automation, continuing education, management techniques, and economic development. Combes figures the benefit-to-cost ratio for IES assistance projects runs about 20 to 1.

A major facet of IES activity involves interaction with GTRI and Georgia Tech. For example, IES has worked with other labs in obtaining contracts. An SEL staffer works out of the Macon office representing program interests in Warner Robins. And extension ac-

tivities offer opportunities for research scientists and engineers to work with industries in areas of specific interest or expertise. More than 250 such interactions occurred in FY 1986, says Combes—a fivefold increase over the previous year.

The recent expansion of five regional offices to Georgia Technology Centers and the initiation last August of satellite-delivered continuing education courses in Macon presage an even stronger Tech presence via IES in Georgia's technological and industrial communities over the next 25 years.

GTRI Gets National Media Coverage

by Ray Moore, RCO

A short worm has stretched the name of Georgia Tech from coast to coast. The story of the nematode is one of several that have brought national media attention to Georgia Tech so far this fiscal year.

The nematode is only about a quarter of an inch long. But researchers say these round worms might be as effective as rodents in testing the toxicity of hazardous chemicals. Research performed by doctoral student Phil Williams of EDL and his advisor, Dr. David Dusenberry in Biology, was reported in the *Wall Street Journal* July 28, in *Chemical Business* in September, and on Cable News Network in Oc-

tober.

Science writer Lee Hotz wrote about STL's work on the SAM simulator for the Atlanta newspapers on July 8. The Associated Press picked up the story and Ernie Ruda got calls from the *Air Force Times*, ABC, CNN and a Las Vegas newspaper.

Aviation Week also is carrying the message of GTRI research. AW reported on Ted Doll of SEL and his work to use sound instead of sight to alert pilots to threats. In September, AW's engineering editor, Stan Kandebo, came to Tech to interview John Gilmore of EML about autonomous helicopters and Roy Scruggs of ECSL about using robots in space vehicles.

Other September media visits included Richard Malloy of *BYTE* talking with Chris Summers of EML about gallium arsenide semiconductors; and Dora Hatras of *Business Facilities* interviewing Johanna Thomas about Tech's assistance to industries hurt by imports.

The offbeat subject of cow manure resulted in coast-to-coast coverage for Chuck Ross of EDL. On an energy integrated farm, the EDL team uses manure to make electricity. Their work was videotaped for showing on more than 160 television stations carrying Mr. Wizard's science features.

Some other national media contacts: *Machine Design*,

IEEE Spectrum and *Inside R&D* re the solar heated waterfall; *Inside R&D*, thermite research; *Optics News*, the coming of three optic computing specialists to Tech from Battelle (including Nile Hartman to GTRI); *NEWSDAY*, Gilmore's autonomous helicopter; *Metalworking News*, Ron Bohlander's automated guided vehicle research; and *Lasers and Applications*, laser/heart surgery research involving Bob Platt of EML.

In Georgia, the Environmental Health and Safety Division has been featured in more than 40 newspapers, and the work of the regional offices, particularly in economic development studies, has been carried in more than 30 newspapers.

QUESTIONS, ANYONE?

by Charles McCullough, HRD

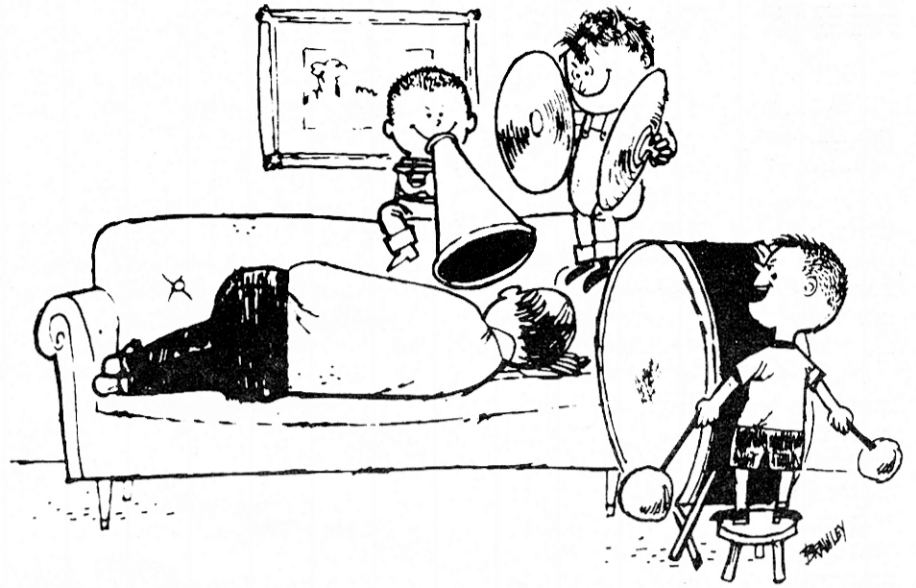
Classified materials. Secret projects. Government inspectors snooping around. For most people, these things are just script elements for next week's rerun of "I Spy." For us at GTRI, they're as much a part of life as green sheets and RFP's. But no matter how commonplace and everyday they are, classified materials can never be treated casually. The unexpected must be assumed to be imminent. The unanticipated may as well be anticipated. It's a curious fact of life that if you get halfway to the office and wonder if you unplugged your coffee pot, you probably did; but if you get halfway home and wonder if you returned that report to the safe, you probably didn't.

Case in point: Remember the GTRI researcher who, late one dark and stormy night, was the sole occupant of ERB and decided it wouldn't hurt to use an unauthorized copier? It jammed, of course, trapping a number of pages of

classified documents in the innards of the machine, inaccessible to everyone but one very uncleared copier repairman.

While the circumstances surrounding an incident like that make for many a good knee slap over a hand of poker, they're still the makings of a security violation that's like a single brick on a domino board: it discredits an individual; it embarrasses the laboratory; it diminishes sponsor confidence; it endangers GTRI's security rating; it compromises national security.

Granted, it's simpler to slide those classified photos under your desk blotter when the three glasses of iced tea you had at lunch kick in than to lock them up and have to wrestle them back out five minutes later. Granted, it's unlikely that the new word processor operator would lie about having received a clearance. Granted, those uncleared visitors probably won't see anything sensitive enough to matter.



I GO BOOM-BOOM, FREDDIE GOES WHAM-WHAM, AND HANKIE YOU SCREAM... "SECURITY INSPECTION" AS LOUD AS YOU CAN!

Granted, the Walker family seemed like such nice people.

Treat those everyday contacts with classified materials with the same sense of ongoing awareness for safety as you do with your

everyday contact with the loonies going 80 mph on I-75. Because the minute you drop your guard, they'll be talking about you and what happened late one dark and stormy night.

Cox Heads Microelectronics Center

Dr. Walter Cox, director of the Electromagnetics Laboratory (EML) for the past two years, has assumed the directorship of Tech's Microelectronics Research Center.

GTRI Associate Director Robert Shackelford is acting director of EML until a permanent director can be found.

Dr. Cox has been heavily involved in the work of the Microelec-

tronics Research Center since its inception. His areas of technical expertise are semiconductor materials and devices, microwave and millimeter wave components, and gallium arsenide integrated circuits.

"We all owe Dr. John Hooper a debt of gratitude for the outstanding job he has done in organizing the Microelectronics Research

Center and his success in acquiring financial support to ensure its future growth," Cox says. "Under his leadership, the Center has attracted quality researchers to the academic departments as well as GTRI and established state-of-the-art facilities for semiconductor materials growth, materials characterization, and VLSI design which rank with the best such facilities in the country. We will continue to work to attract additional personnel of this quality, to

broaden our research program, and to add to our facilities.

"The high level of respect enjoyed by Dr. Hooper placed him in an excellent position to involve a broad base of researchers in the Center's multidisciplinary research programs. This involvement of researchers from many departments is critical to its success and will continue to be a high priority as I assume this new responsibility."

PROFESSIONAL ACTIVITIES

ECONOMIC DEVELOPMENT LAB

Doug Moore made a presentation to weatherization contractors on "Moisture Control in Building Construction" at the 1986 Southeast Energy Expo last month in Chattanooga, sponsored by TVA.

In September, **Mark Demyanek** and **William Spain** directed sessions at the National Asbestos Council's Fall Technical Conference in New Orleans. In October, Demyanek addressed the Georgia Chapter of the American Society of Safety Engineers on asbestos regulations.

David Hogue spoke on "Asbestos in Buildings" at the American Industrial Hygiene Association (Tennessee Valley Chapter) Conference in Nashville (TN) in mid-October.

John Nemeth was one of eight expert panelists on a national PBS teleconference addressing the problems of small-quantity hazardous waste generators, which was aired October 22.

The Analytical and Instrumentation Branch hosted Tech's Second Annual Indoor Air Quality Symposium September 23-25, followed by an optional sampling and analysis workshop September 26. The symposium featured several prominent speakers and covered such topics as bioaerosols, radon, passive smoking, "tight building syndrome," and strategies and techniques for mitigating indoor air

pollution hazards. **Marilyn Black** presented a paper on "Office Building Surveys," and **Charlene Bayer** spoke on "Volatile Organic Compounds." **Lou Brackett** assisted them in the sampling and analysis workshop.

Marilyn Black recently made a presentation, "Passive Smoke in the Office Complexes," to the Georgia Chapter of the American Industrial Hygiene Association.

Nancy Davis presented an invited paper, "Ethical Issues of Computer Software Piracy," to the Black Data Processor Association's Eighth Annual Convention in Atlanta September 20.

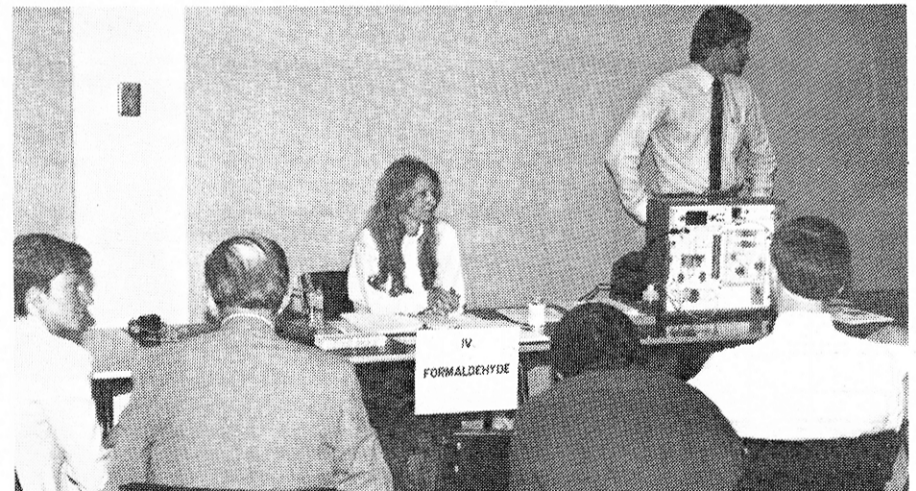
ELECTRONICS & COMPUTER SYSTEMS LAB

Jim Coleman presented a paper, coauthored with **Gerald Owens**, at the Conference on Applied Military Decision Aids and Support Systems, held at Ft. Wayne (IN). The paper's title was "An Embedded Expert System for Tactical Mission Planning."

ENERGY & MATERIALS SCIENCES LAB

Jan Gooch presented a paper, "Optimization of Process Parameters for Investment Cast Molding," at the 15th Annual North American Thermal Analysis Society Conference September 22 in Cincinnati.

An article by **Tom Starr**, entitled "Packing Density of Fiber/Powder Blends," appeared in the September issue of the *American*



Dr. Marilyn Black (seated) conducted an analysis and sampling techniques workshop as part of the Indoor Air Quality Symposium recently hosted by EDL. (Special Photo)

Ceramic Society Bulletin.

Jim Hubbard presented a paper at the National Asbestos Council's Second Annual Technical Conference in New Orleans September 22. The paper was entitled "Techniques for Testing Sealants on Asbestos Containing Insulation."

Hans Spauschus was co-chairman of an international conference at Purdue University August 4-7 on Compressor Engineering and Recent Advances in Refrigeration Machinery.

RADAR & INSTRUMENTATION LAB

Katherine Taylor received her MSEE from Georgia Tech in September.

The Radar Cross Section short course was held September 16-18 with 72 attendees. Principles of Modern Radar, the most popular course and highest dollar-earner

Tech has ever had, is coming up November 3-7.

SYSTEMS ENGINEERING LAB

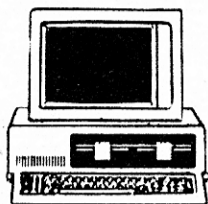
David Fentem received his MSEE degree September 6.

Ted Doll presented a paper entitled "Development of Three-Dimensional Audio Signals" at the SAE Aerospace Technology Conference in Long Beach (CA) October 14.

David Flowers submitted an article entitled "Monopulse Countermeasures: Introduction to Dual Coherent Source Techniques (U)" to the Air Force Wright Aeronautical Laboratories in September.

SYSTEMS & TECHNIQUES LAB

Virginia Jory and **John Cribbs** participated in a series of ITEAMS meetings at Redstone Arsenal in September.



Software Review

by Pat Mathiasmeier, CRSD

Georgia Tech has signed a campus-wide licensing agreement with the Computer Corporation of America for the MODEL 204 (M204) database management system. M204, chosen as the database standard by the U.S. Department of Defense, is being used for large-scale database applications of interest to multiple departments and laboratories. M204 is currently on a GTRI IBM 4361, a GTRI 4381, and an OCS 4381 under both the VM and MVS environments.

Several databases have been implemented in M204. These databases contain information useful to lab directors, GTRI administrators, research support personnel, and project personnel. Databases on the GTRI M204 system include contract information maintained by the Office of Contract Administration, project abstract data maintained by the Research Communications Office, a complete GTRI equipment inventory downloaded from the GT Property Control database located on the OCS Cyber, and personnel data maintained by the Human Resources Department. On the OCS M204 system, the campus police department maintains a database of parking tickets issued on campus.

Future systems will include Supply Services and GTRI Accounting. The addition of these two

databases will enable laboratory and project management to retrieve integrated project information, including project accounting data such as personal services, fringe benefits, materials and supplies, travel, capital equipment, and computer charges and research support data such as MR status, RFP status, and listings of contract number/project number.

Several of these databases are currently available using ACCESS 204, a query and reporting facility which gives the user a menu-driven interface to database information. When writing a proposal which requires equipment, project directors can search the SCIENTIFIC database, which contains all scientific equipment over \$1000, to see if GTRI currently owns any of the proposed items. Administrative personnel can use the GT PROPERTY database to look at equipment

located in a given room or belonging to a specific laboratory.

Two more M204 databases will soon be available through ACCESS. The OCA database contains project information on deliverables, proposal status, and mod status. The Research Communications Office database provides abstracts and administrative data on most projects, and the user can query the database for information by keyword or NTIS code.

Accounts have been established for each of the GTRI laboratories. You can obtain details on these accounts from your laboratory administrative network representative. Classes on ACCESS 204 are now offered through the CRSD Training Facility. If you are interested in signing up for an ACCESS class or for any of the other classes offered at the Training Facility, call 6206 to register.

Professional Recruiter Joins GTRI

Russ Cappello has joined the staff of the Human Resources Department as a professional recruiter.

Cappello has had extensive experience as a recruiter and personnel consultant over the past 25 years. He comes to GTRI from ITT Telecom, Raleigh, North Carolina, where he was senior technical recruiter for two years. In February

1986, ITT appointed him director of a bureau to manage the outplacement of nearly 1,300 salaried employees who were being left jobless by a massive reduction in force. When he left ITT eight months later, he had found jobs for 1,000 of these people.

He previously was a partner in a professional search firm, where he

recruited candidates for client companies in engineering/technical, data processing, and sales/marketing areas. During a 20-year career in the U.S. Army, he served as personnel supervisor, recruiter, area manager, and operations manager.

Cappello has expertise in both general personnel searches and those which target particular types of persons for specific positions. "With my background as a

headhunter, I've made numerous contacts, and I expect to find qualified candidates for employment through personal contacts and referrals, as well as through the usual formal means," Cappello says.

"I'm here to help management in the labs find the people they need. I consider my task to be to find the best-qualified people in the most cost-effective way."

PERSONNEL NEWS

ENERGY & MATERIALS SCIENCES LAB

The Materials Science Division welcomes **Paula T. Hammond**, RE I.

Welcome also to **Chuck LaMar**, RS II.

EMSL says "farewell and good luck" to **Rick Zabor**.

Daniel Plonk will continue to work part time at EMSL while pursuing a PhD in mechanical engineering at Georgia Tech.

RADAR & INSTRUMENTATION LAB

Welcome to **John Knight**, a co-op in the Technology Development Division who is pursuing a BSEE at Georgia Tech.

Mike Baden has completed his year-long assignment at Fort Monmouth and is working in the Radar Applications Division.

Danny Lunsford has been promoted to systems analyst I.

RAIL said good-bye last month to **Gene Knott** and **Jeff Daniel**.

Departing from the New Jersey office were **Ken Spann** and **Emerson Frost**.

SERVICE DEPARTMENTS

Computer Related Services: Welcome to **Michael Rhine**, computer operations supervisor.

Facilities Management: Welcome back to **Wilbert Stewart**, CRB building attendant, from an extended absence due to an auto accident. **John White** has been promoted to programmer I.

Human Resources: **Dennis Wanless** has been promoted to personnel assistant I and **Ted Sladovich** to data processing specialist. **Debbie Coleman** has resigned.

Research Security: Welcome back to **Al Becker**, whose recovery from hip surgery is about complete.

Supply Services: **Willie Dixon** has transferred from Physical Plant as a stores clerk I.

SYSTEMS ENGINEERING LAB

Congratulations to September Employee of the Month **Charlie Krebs**, who made outstanding contributions to two research projects and tenaciously followed up several proposals.

The Concepts Analysis Division welcomes **Susie Drake**, graphics technician.

The Electronic Support Measures Division welcomes **Stephen Hubbard**, RE I, who comes from the University of Wisconsin.

SEL said good-bye to secretary **Deborah Borges** and co-ops **Lee Evans** and **Byron Coker**.

SYSTEMS & TECHNIQUES LAB

STL welcomes **Frank Sawyer**, RE I; **Tim Sanders**, co-op; and **James A. Hall** and **Richard M. Librizzi**, GRA's.

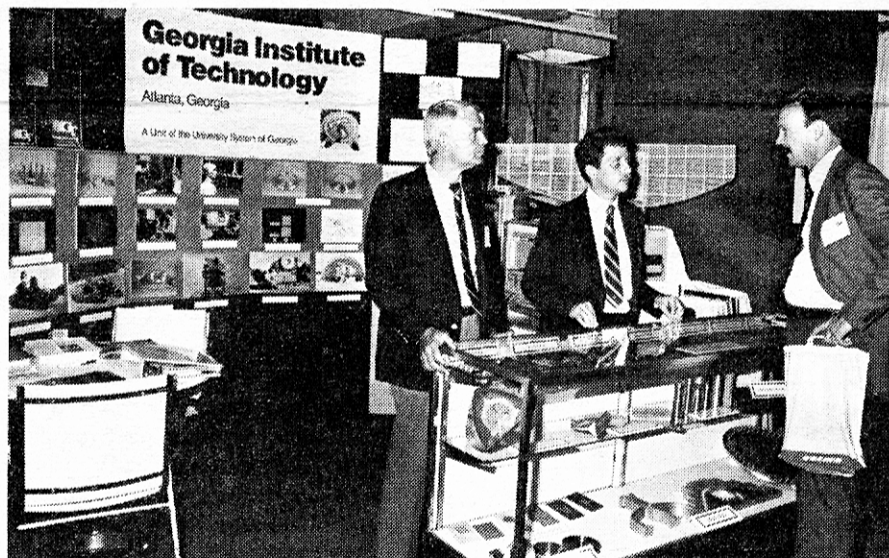
Charles H. Chapman has transferred from SEL. **Eugene Griffin**, **Elizabeth Stark**, and **Andrew Vandiver** have resigned.

Personal Notes

EDL: Congratulations to **Chuck Ross**, who got married in late September.

RAIL: Congratulations to **Jerry Eaves** and **Gary Price** on the birth of their grandson, John Timothy Price, Jr., who was born September 11. He is the son of former GTRI employees Robin and Tim Price.

SEL: Congratulations to **Alexis** and **Steve Livesay** on the birth of their son, Mark Thomas.



Phil Pflueger of STL (left) and Doug Olsen of SEL (center) are shown taking their turn at the GTRI exhibit during the 23rd Annual Department of Defense/Association of Old Crows Electronic Warfare Technical Symposium and Convention in Atlanta September 28 - October 2. The exhibit was expanded for showing at the Warner Robins Air Force Base open house October 11, where it and one of the SEL planes were seen by 65,000 people. The exhibit was created with help from many willing hands in RCO, SEL and STL, and EDL assisted with the Warner Robins booth. (Photo by Anita Edwards)

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