

New Labs Lasers Could Start Showing Up in All Kinds of Places

Like so many important new semiconductor devices, a new Sandia-developed laser isn't much to look at in itself — its diameter is less than half the thickness of a human hair.

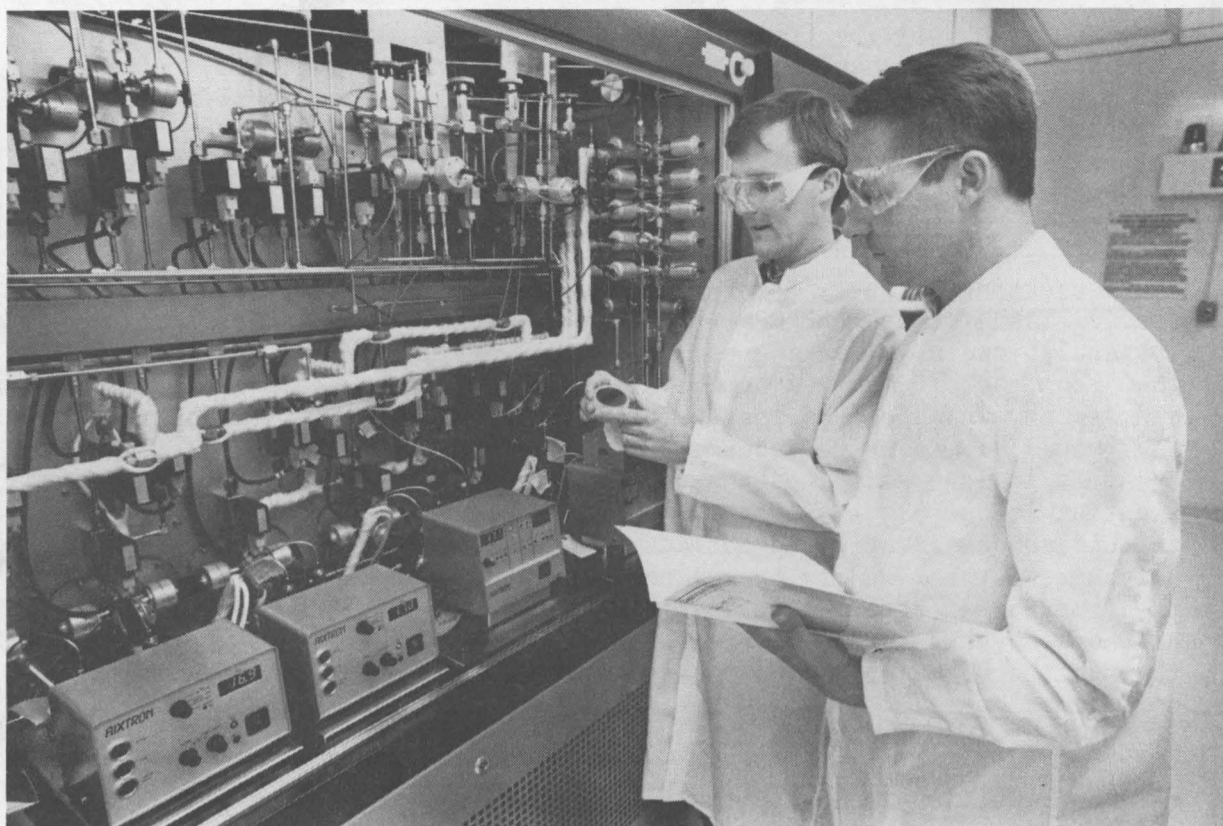
But that's no disadvantage, the developers are quick to point out. "Because these lasers are so small and can be fashioned in closely packed two-dimensional arrays," says Rick Schneider of Semiconductor Materials Dept. 1311, "it should be possible to put more than 10,000 of them on a single two-inch wafer. The prospect of 2-D arrays of visible laser diodes is one of the most noteworthy aspects of the device."

The designers won a technological race with this "laser on a chip": They were the first to produce an electrically injected visible-light vertical-cavity surface emitting laser.

"We knew that other labs were working on this type of device," says Rick. "But we didn't know any details, because it's the kind of project that tends to be secretive."

"We think this is an extremely important development," says Del Owyong, Manager of Photonics Programs Dept. 1304. "It's the first laser of its type to produce visible light. With further development, we foresee numerous applications for these devices."

Rick and Jim Lott, an Air Force officer doing research at Sandia for his PhD, reported the
(Continued on Page Four)



NEW LASER'S BIRTHPLACE — Rick Schneider (1311, left) and Jim Lott, an Air Force officer doing research at Sandia, stand by the metalorganic vapor phase epitaxial growth system used to grow wafers from which a new type of semiconductor laser is fabricated. A third developer of the new laser, contractor Jeff Figiel, was not available for the photo.

LAB NEWS

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SANDIA NATIONAL LABORATORIES

JULY 23, 1993

**How Long Have You Been at the Labs?
See If You Made the 'Top 25' List — Page Two**



BLIND TRUST — Sandians undergoing Facilities Operation and Maintenance Center 7800's High Performance Team Training find their way around an Area 3 training ground in the absence of vision. The exercise teaches teammates to use each other and alternate senses to overcome their common problem. The activity is just one of several challenging exercises participating work teams are faced with during the training. More photos and an article about the unique new training program begin on page seven.
(Photo by Randy Montoya)

More Screening Likely

Depleted Uranium Draws Attention of Labs Health Pros

Is depleted uranium a threat to employee and public health at Sandia? That question, visited several times before in the history of the Labs, is being asked again by Sandia health professionals.

Several recently identified depleted uranium sites and some potentially worrisome radiological test results for three employees have put Sandia's medical and radiation protection (health physics) professionals into high gear testing and re-evaluating possible modes of exposure for employees, contractors, and the public. To date, however, no exposures have been confirmed in excess of limits set by DOE or the Occupational Safety and Health Administration (OSHA).

The physical form of most of the depleted uranium at Sandia sites — in visible chunks rather than small, easily ingested particles — decreases the likelihood of the material's finding its way into someone's body. So does its chemical nature: Uranium does not readily combine with water.

Warrants Full Attention

But those facts don't mean complacency is warranted.

"We're giving this our full attention," says Al Stanley, Manager of Radiation Protection Measurements Dept. 7715. "Our concern for the protection of our workers and the public has been and continues to be the top priority."

Earlier this week, employees were invited to a meeting to learn about the status of depleted uranium at Sandia — why it's at the Labs and what's being done. Albuquerque citizens and area media will be informed at regular quarterly meetings covering environmental, safety, and health (ES&H) issues. The next public meeting in that ongoing series will be Aug. 19.

In recent weeks, about 60 people have been tested by radiation protection personnel for possible uranium uptake at Sandia. Minute amounts of uranium — but above what is considered the average range for the general population — were found
(Continued on Page Four)

This & That

Obscene Spelling Checker Needed - Sometimes I really do earn the "big bucks" I make here. Several weeks ago, I was reviewing a draft article by a LAB NEWS writer and caught an entertaining spelling of "assess" - entertaining, but unprintable. I issued a gentle reminder to the writer to always make use of the spelling checker, but the thought then occurred that the misspelling was actually a correct spelling in its own right.

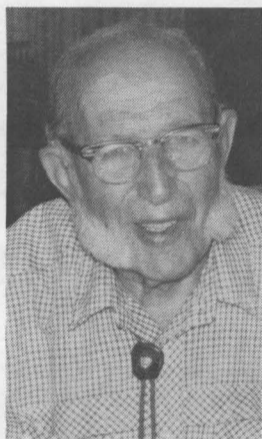
* * *

Sweating It Out - Several months ago, we started planning a special issue of the LAB NEWS to be distributed as soon as possible (hopefully the next working day) after our new management and operating (M&O) contractor is named by DOE. The problem, of course, was that we didn't know which one of the two finalists - Battelle or Martin Marietta - it would be, so we had to prepare two separate issues.

As I was completing this column early this week, we were still sweating it out - not knowing which one would get the contract or when the big announcement would be made, but there was no shortage of rumors. As you read this, we may or may not know, but our plan was to distribute the four-page "extra" to employees right away and then to include it as part of the next regular issue for retirees and other folks who get it through the US mail. That's a long-winded way of saying that you folks on our mailing list may find the "extra" in this issue, and you may not. If not this issue, almost certainly the next.

Regardless, the special issue is just the beginning of our coverage. We'll be talking regularly to Sandia management and to officials of our new management contractor to get more info to you as soon as possible. If you have specific questions that you'd like us to cover, mail us a note - Employee Communications Dept. 7162, or fax it to 844-0645.

* * *



Arno Leupold

Sandia Centenarian - Arno Leupold is evidently the first Sandia retiree to live 100 years. The Deming (N.M.) High School and University of New Mexico graduate celebrated his 100th birthday in California on July 9. He transferred from Western Electric to Sandia in 1950 and worked here until his retirement in 1958. We couldn't get a current photo, but here's a late 1970s picture of Arno, courtesy of his daughter, Claire Barnes of Albuquerque.

Also, in June I reported that Isabel Castillo's (1956) father had turned 100 and asked whether any other Sandians had 100-year-old parents. Evidently no active Sandia employees do, but retiree Byron Murphey of Moscow, Idaho, wrote to say that his mother, Gladys, turned 101 early this year.

* * *

They Keep Going and Going and... - Speaking of folks with long service records, we've got a photo of Merrill Jones (9215) on the Milepost page in this issue. He's one of only two active employees to achieve 45 years of service. Roy Crumley (7216) is the other one. Also, see list of "top 25" at right; of course, many of these folks began work here when they were 12. Thanks to Bonnie Vigil (7532) for the list. •LP

Here's the Question

What Do You Think?

As announced in the July 9 LAB NEWS, we're resurrecting our "What Do You Think?" feature. We'll pose questions, ask readers to respond, and publish responses.

Here's the first question:

Some Sandians say their jobs aren't as satisfying as they used to be and that employee morale is low. What one or two things could Sandia management (at any level) do to improve the situation?

We'll be calling 20 or so Sandians (at all sites) today or early next week and asking you personally to respond to the question. If you agree, we'll fax you a one-page form (with guidelines) that you can complete and fax back to us. Other employees are also welcome to respond - not just the folks we call. If you'd like to respond, please call us for a form on 844-7841 or 844-7522.

We'll publish as many responses as possible as soon as possible - in the next issue if space is available.

New Toll-Free Number for Dental Claim Administrator

The toll-free (800) number for The Travelers, claim administrator for the Dental Expense Plan, is now 1-800-842-6216. This number became effective June 28. The mailing address, which is printed on the dental claim form, remains The Travelers, Managed Care and Employee Benefits Operations, P.O. Box 660277, Dallas, TX 75266.

Years of Service Top 25 Employees

(As of July 1, 1993)

Name	Org.	Date	Years
Roy Crumley	7216	9/9/47	45.9
Merrill Jones	9215	7/6/48	45.0
Howard Devaney	2641	11/26/48	44.6
Zachary Ortiz	9613	1/3/49	44.5
George Walker	367	1/3/49	44.5
Marcelia Samuelson	7613	1/20/49	44.5
Stan Reynolds	2761	9/30/49	43.8
Benjamin Jaramillo	7221	9/28/50	42.8
John Tenbrink	5711	10/9/50	42.8
Daniel Sheldon	323	1/10/51	42.5
Robert Scharrer	5941	2/21/51	42.4
Paul Kirby	7142	3/1/51	42.4
Richard Jones	2753	3/12/51	42.4
Theodore Pfeffer	9322	7/5/51	42.0
John Souza	5151	7/19/51	42.0
Bruce Higgins	2473	8/3/51	42.0
Matthew Connors	8523	10/18/51	41.8
Horace Poteet	5902	11/14/51	41.7
Don Odell	2486	12/13/51	41.6
Ruth Brooks	7521	1/19/52	41.5
Frank Conrad	9548	1/23/52	41.5
James Clemons	2712	2/26/52	41.4
Arturo Jimenez	7617	3/13/52	41.4
Gilbert Leyba	2412	4/2/52	41.3
Lorena Schneider	8501	4/9/52	41.3

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Results of 1993 Drive

Bond Allotments Exceed \$3.8 Million

Once again, Sandians' US Savings Bond allotments have set a record. Allotments made during this year's bond campaign reached \$3,874,827 - more than a 4-1/2-percent increase over the 1992 allotments, according to Doug Robertson (20A), 1993 Savings Bond Chairman.

Total allotments increased even though participation declined slightly, from 90.2 percent of employees in 1992 to 89.3 percent this year. More than 47 percent of Sandians are at the bond-a-month level (enough allotted to buy a \$50 bond each month).

Outdoor Opportunity

New Mexico Volunteers for the Outdoors needs people to help improve trails in the Manzano Mountain State Park, July 31-Aug. 1. To volunteer, call 298-5197 or 880-1063 by Tuesday, July 27.

Help Us Recognize Sandians

The LAB NEWS wants to recognize Sandia employees and retirees who receive honors and awards - work-related and community-related - and who have other outstanding achievements.

Has your friend, colleague, boss, or employee been honored for good works? Named a fellow or elected to an office in a professional society? Received a best-paper award at a meeting? Had a book published?

If so, give us a call at 844-7841, or send a note with a few details to Department 7162.

New Knowledge, New Friends**Summer Work Program Attracts 110 Students, Faculty**

As Sandia focuses on a wider range of customers and partners, the cultural and regional diversity of summer students has likewise grown.

Managed by the Special Programs Coordinator in Personnel and Employee Resources Dept. 8522, the Summer Program has 35 graduate students, 47 undergraduates, 13 high school students, three post-docs, eight high school teachers, and four university faculty members — totaling 110 participants this year, compared with 70 last summer. "The participants are from various universities across the nation as well as from local schools, and represent diverse disciplines," reports Program Coordinator Brenda McFarland (8522).

Participants are assigned to work in areas related to their degree program and professional career aspirations. The summer at Sandia is intended to enhance competence in their chosen fields by exposure to the Labs' unique research facilities and staff expertise. The program is also intended to be exciting and fun, helping the students discover new knowledge and make new friends.

Sharing Work and Leisure

Leena Alam, a Princeton undergraduate in chemical engineering, comments, "Both my roommates [for the summer], Rachel Adams, a University of Michigan undergraduate, and Sharon Yeung, a Yale graduate student from Texas, are

"It's a really great experience to meet people with the same interests from other schools all over the country."

also here at Sandia. We all found each other and got an apartment close by." Sandia gave each student information on available housing and a list of all the summer 1993 interns. "We've been spending a lot of time together," says Leena. "A lot of the students plan to attend the A's and Red Sox baseball game this Friday. It's a really great experience to meet people with the same interests from other schools all over the country."

Leena works with Ann Yoshimura (8112) on the Thermal Cycle Analysis Program, which allows industry and university researchers to analyze different thermal cycles and is of much interest to utilities and to schools teaching thermodynamics. Compressors, turbines, heaters, coolers, and reactors all create cycles for generating power applied to multiple uses. This program simulates these cycles, using a graphics interface so a user can design custom cycles by varying fluids, temperature, pressure, and the other variables in the thermodynamic cycle. By changing the variables, the user can compare the efficiency of these differing cycles.

Leena is designing a user's manual as a reference and learning tool for this program. She is also working on fuel cells, an additional component, and is documenting how components can be added to customize Ann's program.

Explosively Actuated Valves

Khira-Lisa Adams, a Harvard undergraduate studying mechanical engineering, returns to Sandia for her second summer, working with Howard Hirano, Manager of Development Engineering Dept. 8441. "Howard and staff members provide me with opportunities to work on challenging projects that allow me to gain engineering experience while contributing to Sandia programs," says Khira-Lisa.

Currently working on the design, fabrication, and testing of explosively actuated valves and the conceptual design of a waste management project, Khira-Lisa also has the opportunity to explore what a mechanical engineer does, giving her more

insight and career direction. She is impressed with the Sandia staff: "They have been very helpful and informative, telling me about their work and giving me valuable ideas and suggestions."

Mike Lewis, a graduate student in computer science from Penn State University, is working in Distributed Computing Dept. 1952, managed by Ray Cline. Mike's summer project involves analyzing the performance of parallel programs within heterogeneous distributed systems. In parallel programming, many computers "cooperate" to complete a common task; this requires that they communicate with one another via message passing. Using the programs he is writing, Mike hopes to characterize the performance of this communication within several different computing environments.

Working on Wave Form Encoder

A UC Berkeley graduate student from San Jose, Howard Hsieh, is studying electrical engineering. With Ken Condreva of Telemetry Systems Dept. 8454, Howard is on a 10-week summer project called the "Time Expanding Wave Form Encoder," a circuit board that reads data samples very fast (8 megahertz) and sends output to a computer at a slower rate. It's used for any application with signal processing, and Howard is testing how it works in the field, analyzing the wiring, and suggesting improvements.

Howard says, "I enjoy this project because it



SANDIA SUMMER HIRES — Five of the 110 summer program participants at Sandia/California gather for a photo: (from left, standing) Robert Wigand, a San Lorenzo high school teacher from Castro Valley; Howard Hsieh, a UCB grad student from San Jose; Mike Lewis, a Penn State grad student; and Khira-Lisa Adams, a Harvard undergrad from Aptos, Calif.; seated is Leena Alam, a Princeton undergrad from New Jersey.

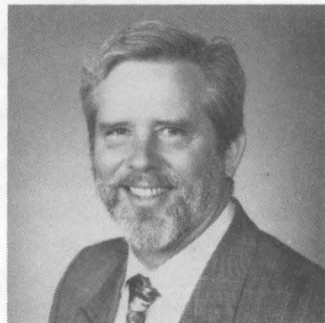
involves a lot of different branches of electrical engineering and gives me exposure to many different fields: signal processing, digital design, computer architecture, and analog devices."

Robert Wigand, a science teacher at Arroyo High School in San Lorenzo, Calif., says, "Sandia supports education and opens its expertise to many teachers and students. This program not only gives students a lot of exposure at a high level, but also opens up opportunities for Sandia to bring its knowledge to bear on many commercial problems all over the country." Bob is in his second summer at Sandia. This year he is working in two areas: Special Programs with Brenda McFarland in Dept. 8522 and Education Outreach (8526) as a liaison with other on-site summer faculty members.

**SANDIA CALIFORNIA NEWS****Supervisory Appointments**

TAZ BRAMLETTE to Manager of Environmental Systems Program Office 8106.

Taz came to Sandia/California in 1971 as a member of the technical staff in the Applied Mechanics Department. He has also worked in the Solar Central Receiver and Combustion Research departments as well as on the 8000 Planning Staff. He was the DOE representative to the International Energy Agency Small Solar Power Systems Project in Cologne, Germany, in 1980-81.

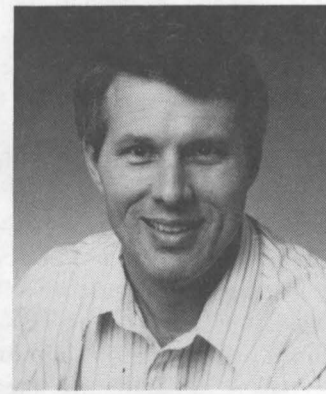
**TAZ BRAMLETTE**

Taz has a BS, MS, and PhD in aerospace engineering from the Georgia Institute of Technology. He was a postdoctoral research fellow at the von Karman Institute in Belgium in 1967-68.

Before joining Sandia, Taz spent two years at Bell Aerospace in Buffalo, N.Y.

LARRY RAHN to Manager of Diagnostics and Reacting Flow Dept. 8351.

Larry joined Sandia at the California site in 1976 as a physicist in the Device Studies Division. He has also worked in the Applied Physics and Diagnostics Research divisions. He was named a distinguished member of the technical staff in 1983 and

**LARRY RAHN**

received the 1987 O.W. "Bill" Adams Award for outstanding contributions to combustion research.

Larry has a BA in physics and math from Phillips University at Enid, Okla., and a PhD in physics from Kansas State University. He spent two years doing postdoctoral research at Michigan State University before coming to Sandia.

(Continued from Page One)

New Laser

achievement in the May 13 *Electronics Letters*. Another key person in developing the new device, says Rick, was contract employee Jeff Figiel.

Device's Potential Stirs Interest

New lasers of this type could lead to a wide range of products, with possible early uses including less-expensive laser printing and plastic fiber communications. Eventual applications could include use in more-compact bar-code scanners for supermarkets and other stores.

News of the laser has spread rapidly among researchers and companies that work with optoelectronic devices. Says Jeff Tsao, Manager of Dept. 1311, "One of the most satisfying aspects of this work is that it represents the fruits of two years' research at Sandia aimed at taming and controlling the properties of a tricky new materials system. Many new semiconducting materials systems seem promising at first but never make an impact on device technologies. There seems to be a high degree of confidence that Sandia's research results might eventually evolve into manufacturable devices."

Sandia is already exploring agreements with several companies to develop the lasers into marketable form. "It's premature to name any names right now," says Rick, "but it's clear that several major optoelectronics producers are interested."

One objective of further development is to find ways to manufacture the lasers reliably and cheaply enough for commercial applications. (See "Plug-in' vs. Optical Pumping: New Laser Is No Snap to Make.")

Since the initial results, contributions in advanced process development have been made by Randy Shul and John Zolper, both of Compound Semiconductor Technology Dept. 1322. Managed by Tom Zipperian, the department is responsible for the Compound Semiconductor Research Lab, where work on the new laser is done. Kent Choquette and Kevin Lear of Photonics Research Dept. 1312, along with contractor Sean Kilcoyne, have done device testing and process development.

Beams Straight Out of Chip

Vertical-cavity surface emitting lasers — VCSELs, pronounced "vixels" — emit light directly from the surface of the semiconductor material in which they're grown. That's an advantage over conventional semiconductor lasers, which emit sideways from the edge of the semicon-

'Plug-in' vs. Optical Pumping: New Laser Is No Snap to Make

Optically pumped lasing was first demonstrated in visible-light vertical-cavity surface emitting lasers (VCSELs) at Sandia in late 1991. (Optically pumped lasing means that one laser powers another.) Since then, Sandia researchers have moved on to electrically injected devices.

Electrical injection is necessary if a laser is to be more than a laboratory research tool. It allows the laser to be operated essentially by connecting it to a power supply rather than pumping it with another laser.

The new visible-light lasers have layers of indium-aluminum-gallium phosphide for the active optical cavity, along with other materials to create microscopic reflectors. Sandians in Physical and Chemical Sciences Center 1100 and Microelectronics and Photonics Core Competency Center 1300 previously developed techniques to reliably produce VCSELs that emit infrared light. Even these "conventional" infrared VCSELs are difficult to fabricate.

"VCSELs in general push the tolerance and precision limits of modern crystal growth techniques," says Rick Schneider (1311). Materials for producing visible light are even tougher to deal with. "The materials that allow us to get from the infrared to the red wavelengths pose more severe manufacturing issues. In fact, they pose greater problems even from a research point of view. They're just a lot trickier to work with."

The lasers are grown with a technique called metalorganic vapor phase epitaxy, which allows the gradual building up of multiple thin layers of semiconductor materials. Because the layers are so thin, they can accommodate slight mismatches in the spacing of atoms where each layer meets. The result is a strained-layer superlattice, a type of technology developed at Sandia in the 1980s to create semiconductors with specially tailored properties.

ductor chip. Emission perpendicular to the chip's surface makes it easier to fashion closely packed arrays of lasers. VCSELs are also known for their tight, circular beam.

The shortest wavelength previously reported for a VCSEL was 699 nanometers, just at or outside the edge of the visible light spectrum. The new Sandia lasers emit light at shorter wavelengths, in the red part of the spectrum.

"We have obtained lasing emission at wavelengths from 691 nanometers all the way down to 628 nanometers, covering almost all of the red part of the spectrum," says Jim. This is especially significant for visual display applications, he says, since the human eye is more sensitive to shorter red wavelengths than to the longer ones.

"Visible VCSELs may be an enabling technology for advanced applications such as plastic fiber-based optical communications for local-area networks, two-dimensional visible arrays for displays — including laser projection displays and printing — and optical memory," says Rick. Plastic optical fibers would be cheaper than glass for short-distance communication (perhaps within a building), and visible VCSELs should offer better beam quality and easier coupling to the fibers than currently available sources.

An important step the Sandia team has just made is progressing from a pulsed laser to one that shines continuously. "We recently demonstrated continuous-wave operation at room temperature," says Jim. "This means the device can be operated without cooling, and from a direct-current source, eliminating the need for expensive current pulse generation electronics."

Because of the high cost of circuitry for pulsed operation, this achievement was a must for eventually getting the new lasers into the marketplace — possibly even the neighborhood supermarket.

The red light produced by the Sandia lasers can match the wavelength of lasers used in bar-code scanners, which make up an important commercial laser market and are perhaps the one most familiar in everyday life. The cumbersome helium-neon tube-type lasers used at checkout counters emit at 633 nanometers.

"The emission down to the 628-nanometer wavelength that Jim mentioned is still a research result," says Rick, "but it certainly suggests that commercial versions of these devices could be used in applications — such as scanning — that currently use helium-neon lasers."

●CS/KFrazier(7161)

(Continued from Page One)

Depleted Uranium

in six cases. Because of the extremely low levels involved and the need to confirm results and evaluate possible intake pathways, retesting is now being done. Of the six, three samples have been determined to be inaccurate readings and three are still being investigated.

Sandia medical and radiation protection organizations have formed a process management team to study how test results on individuals are to be reviewed and evaluated, reports Dr. Larry Clevenger, Director of Sandia's Occupational Medicine Center 7030. This move recognizes that more people are likely to be tested for uranium exposure in the months ahead.

Surveys Began a Decade Ago

A large volume of research and published literature on depleted uranium indicate it is not a hazard to health when exposure standards are followed, Al says (see "Depleted Uranium: What Is It, and How Dangerous?"). However, examining the potential hazard now can give valuable insights into how to mitigate problems if they are

uncovered, he says.

Sandians have worked with depleted uranium in important experiments in both applied and basic sciences over the past four decades. Efforts to survey possible contamination and experiment sites, beginning with aerial surveys, date back more than

a decade. These early surveys led to some of the Labs' first cleanup projects, well in advance of the arrival of the DOE Tiger Team in 1991 and Sandia's ES&H initiative of recent years.

More detailed "square foot" surveys, begun last
(Continued on Next Page)

Depleted Uranium: What Is It, and How Dangerous?

Depleted uranium is natural uranium with a less-than-normal percentage of the more active U-235 isotope (often called "weapons grade" uranium). It can pose both a chemical and radiological threat to humans if it gets inside the body. However, its chemical reluctance to combine with water and the size of most particles involved in many Sandia experiments make the likelihood of its ingestion or inhalation slim.

Natural uranium is found in drinking water, food, and soil. It is present to some extent in everyone's body, depending on locale and diet. Depleted uranium, by comparison, is viewed as being about 30 percent less toxic than natural uranium.

Considered safe when exposure standards

are met, depleted uranium has been used to simulate nuclear fuel and weapon explosives packages in Sandia experiments for several decades. As a result, some work sites contain depleted uranium debris. These sites are now being identified and defined in detail by health physics personnel as a part of Sandia's ES&H initiative.

As detailed surveying work continues throughout the Labs, more areas with depleted uranium may be identified. That's why health professionals are again examining the question of whether concentrations of uranium exceed regulatory limits, and if so, how to mitigate the hazard. The regulatory limits define the exposure levels below which no significant health effects are expected.

Running on the Sun**Collegiate Solar Cars Hit the Road in DOE-Sponsored Race**

Surviving traffic wasn't the only challenge for a group of solar vehicles that recently raced across the country. Clouds, hills, stoplights, and pure chance posed problems for participants in last month's Sunrayce 93, a DOE-sponsored intercollegiate solar car competition. Obstacles aside, Sunrayce officials, including Paul Basore of Photovoltaic Technology Research Dept. 6213, declared the race a success.

Held every two years, Sunrayce is designed to challenge the engineering and design skills of students and promote renewable energy research. Challenge it did. From deciphering race routes to raising funds and making quick roadside fixes, the 34 colleges participating in the event had no end to what they called "life lessons." As Sunrayce's lead sponsor, DOE achieved just the results it had hoped for.

Not the Average Highway Vehicle

Creative engineering might be the best description of the event, which combines the mechanical design problems of creating a solar vehicle with the logistics of racing it. Paul was Sandia's main contribution to the event. He was selected to help DOE with the race based on his experience as a photovoltaic consultant for GM Sunrayce 90, the first solar car race in the country. Paul also drives a solar powered electric vehicle of his own.

In the course of the two-year project, which included developing race regulations, reviewing project proposals, conducting regional qualifiers, and overseeing the actual race, Paul served as the race's regulations manager. Not always an easy job, he says, but fun.

As regulations manager, Paul was in charge of ensuring a fair race and making sure each vehicle met race specifications. Vehicles were restricted to a size of 2 by 6 meters, solar power as the only energy source, and a battery capacity of five kilowatt-hours (about one day's worth of driving). Each car had to have seat belts, horns, turn indicators, tail/stop lights, rear vision systems, and a solar array not exceeding 8 square meters of ground surface. Once cars passed inspections held at regional qualifiers, they were deemed roadworthy and awarded an official Texas license plate.

The six-day race June 20-26 from Arlington, Texas, to Minneapolis, Minn., followed secondary

state and county roads in normal traffic. Team drivers were required to obey all state and local laws. Part of Paul's job was to make sure they did. To help police this aspect of the race, a group of Missouri public school teachers volunteered to serve as observers for the race. One teacher accompanied each team on the trip.

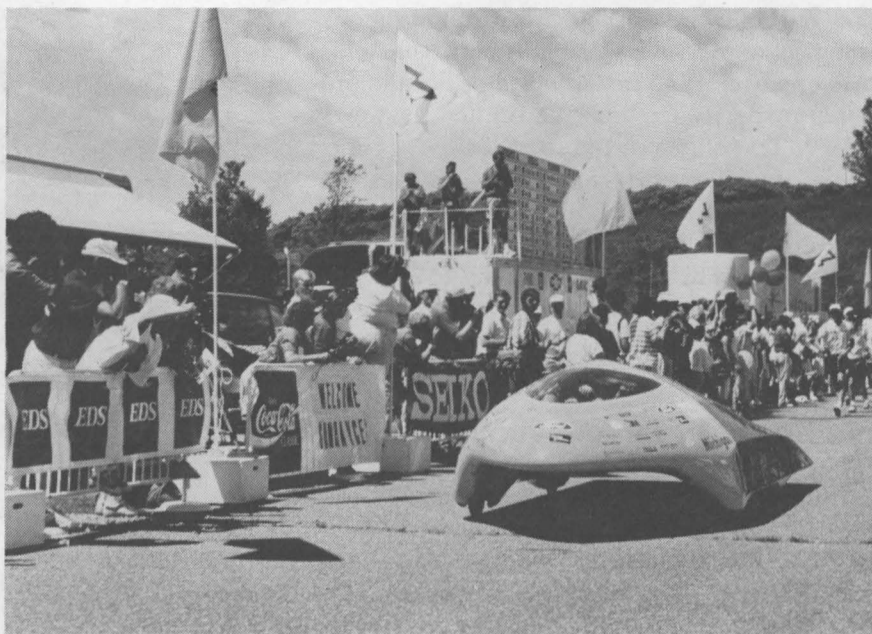
The teachers presented a written report to Paul and his three assistants at the end of each day's trip, which began at 9 a.m. and concluded (regardless of position) at 6:30 p.m. Penalties were issued based on these reports. On the average about four major penalties were issued per day for infractions such as speeding, failing to stop at a red light, passing another car along a double yellow line, or not allowing a competing car to pass. Teams could appeal their cases at regular evening hearings Paul participated in each night.

"I wasn't the most popular person," says Paul, "but it was understandable. Each team wants to win. Any penalty could impair their chances."

Teams Dream of Speeding Tickets

As part of the first Sunrayce competition in 1990, teams attempted to receive speeding tickets, mostly by talking officers into issuing them. This year, the New Mexico Tech team was among those who hoped to be fast enough to receive a real one.

The Zia Roadrunner was indeed pulled over by local police in the last few miles of the race. Unfortunately, because of motor problems, the team was going under the minimum speed limit. They were forced to tow their vehicle to the finish line. The situation was one of the few times that Paul was able to make a favorable ruling. Because the New Mexico team would have finished the route in the allotted time, they received credit for finishing the race.



SOLAR STREAK — The University of Michigan's Maize & Blue solar car speeds past the finish line at Minneapolis Zoological Gardens to win the DOE-sponsored Sunrayce 93 intercollegiate solar car competition. The car averaged 28 miles per hour over the 1,000-mile race route.

"They did a good job with what they had," Paul says of the New Mexico Tech team. "Tech had a first-year team with one of the lowest budgets in the race. They encountered a lot of difficulties and hopefully learned from them. That's what the competition is all about."

In the end, the University of Michigan's Maize & Blue rolled to its second straight victory, averaging 28 miles per hour over the 1,000-mile course. Gradually, each of the 34 cars that began the race rolled past the finish line (one way or another). As the event came to a close, teams already had their eyes on Sunrayce 95. Paul plans to officiate for the event again.

"Working on Sunrayce is not only fun and exciting," says Paul, "but it also advances the goals of Sandia's energy programs through education."

DOE's Richard King, this year's race director, agrees.

"The creators of Sunrayce envisioned a program that would motivate university students to undertake a complex, ambitious project and see it through," he says. "In that sense, the race was a success. What started out as a race among students ended up as a race among engineers and scientists." ●DT

(Continued from Preceding Page)

year on the basis of a priority list, have brought depleted uranium back into the spotlight. Sandia has been doing "bioassays," or tests of employees and contractors working near depleted uranium, for several years. However, recent surveying activity has caused the number of tests to be sharply increased.

In March, depleted uranium contamination was confirmed at remote Site 9939, just west of Lovelace Road near the Sol Se Mete Canyon turnoff. Depleted uranium was used in simulations of nuclear reactor accidents at the site and at two other related test sites, 9940 and 9920. These experiments date to the late 1970s. Sandia's cable site in Sol Se Mete Canyon has also been identified as a site where depleted uranium was used in weapons engineering tests.

During the Tiger Team assessment, depleted uranium contamination was noted near the target area at Sandia's rocket sled track. In fact, numerous tests at the track have created an area of contamination that has been fairly well defined.

Sandia also tested gun-launched projectiles for tanks with more than two dozen Army anti-tank rounds containing depleted uranium in 1984. The testing was designed to assess an armor system to defeat Soviet depleted uranium projectiles. Because of the test design, the debris was captured

in a pit south of Bldg. 6750 (the gun facility in Technical Area 3). This site has been identified for further remediation.

At most of these sites, the material is primarily in visible chunks rather than dispersed as particles, health physics surveyors note. Such chunks are the least likely to find a pathway into the bodies of workers or to reach the general public, experts say.

"If any workers are identified as potentially having an uptake of uranium," explains Al Stanley, "health physics specialists will try to determine the approximate time and resultant dosage of radiation received. This involves a workplace hazard assessment. Part of this effort involves making isotope abundance measurements to try to determine if the uranium detected is from natural sources or from depleted uranium."

Identified Sites Surveyed

While this work goes on, health physics, industrial hygiene, and medical professionals have embarked on a program to ensure there is no danger to people at the sites identified. Some of the major activities:

- The sites are being surveyed to accurately define the area covered by depleted uranium debris, explains Hong-Nian Jow, Manager of Radiation Protection Operations Dept. 7714.
- Hong-Nian and other radiation protection

employees want to identify other locations that may also have depleted uranium. Anyone who knows of a site should contact Hong-Nian on 844-5699.

• As part of a program in place at Sandia since the 1950s, laboratory analysis by industrial hygiene is also being done on air samples at Site 9940. These samples will help determine if an inhalation hazard exists. Sandia industrial hygiene professionals are monitoring workers and area air for total uranium. All data are well below OSHA occupational limits, reports JoAnne Pigg, Manager of Industrial Hygiene/Toxicology Dept. 7711.

• In some cases, facilities have been posted with signs and locked. In other cases, workers are being trained to deal with the hazard, as they do with other hazards in work at Sandia. At Site 9940, for example, radiation monitoring equipment has been installed, and workers are using special footwear and clothing when in contaminated areas.

• The number of employees and contractors being tested for possible exposure is being expanded. A process management team has been developed to coordinate efforts from medical and other groups in reviewing these test results. At the same time, workers affected by the testing are being kept up-to-date with briefings.

●WKeener(7161)

Former Rivals, Future Research

Partnerships, Tech Transfer Part of Russian Aid Package

"With the end of the Cold War and the disbandment of the Soviet Union, America has a historic opportunity to foster world peace and promote prosperity for both the US and the newly independent states of the former Soviet Union (FSU)," says Roger Hagengruber, Vice President of Defense Programs Div. 5000.

Building on this opportunity, Sandia recently sponsored the FSU International Industrial Partnership Workshop to discuss ways of helping the

Industrial partnerships with the former Soviet Union are vital to the new states' survival.

newly independent states of the FSU successfully shift to free market economies. The workshop focused on developing better business dealings and technology exchanges with the FSU.

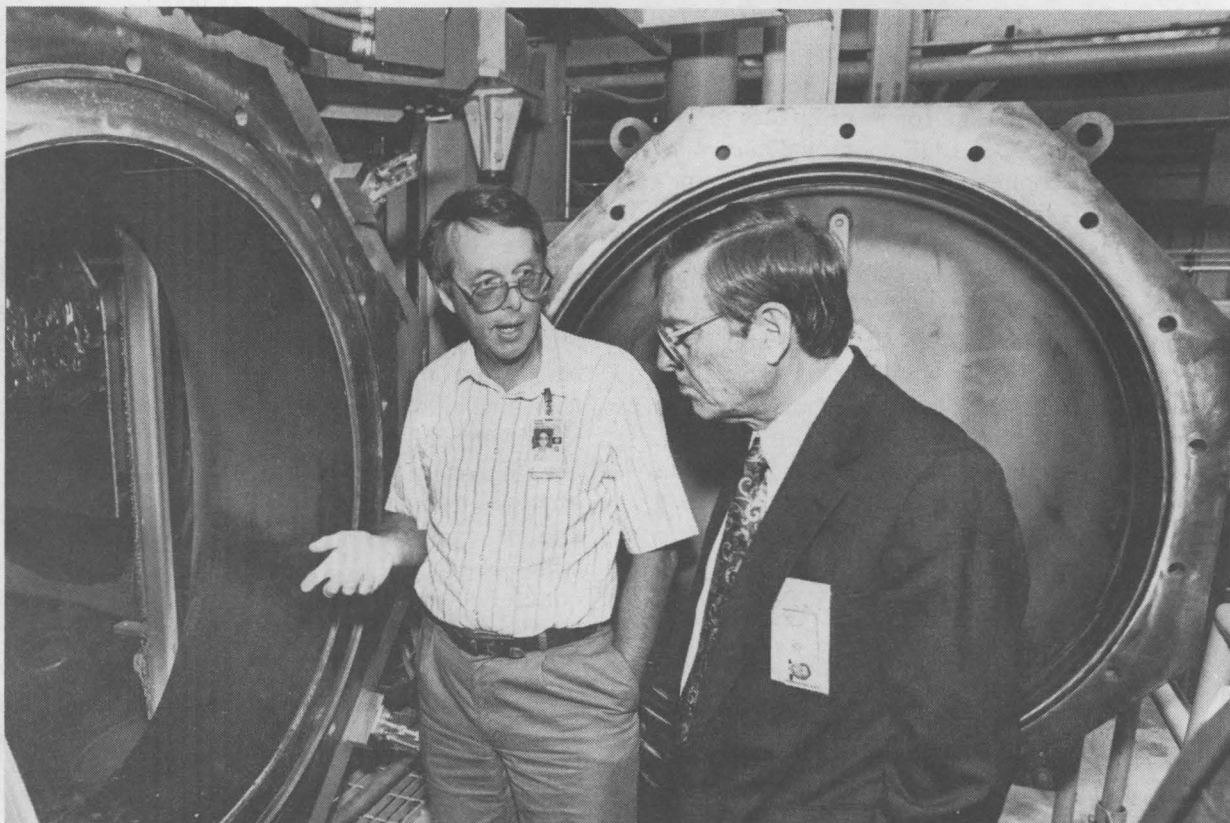
"We've not been as successful in partnering US industry with the FSU as we had hoped," said US Senator Pete Domenici during a panel discussion with industry representatives. Legislation such as the Nunn-Lugar and Freedom Support Acts has designated about \$800 million for nuclear weapons dismantlement and economic stabilization, including cooperative research and industrial partnerships in the FSU.

As part of the workshop, Domenici asked industry representatives for ideas on changes or improvements in US policy that would assist businesses in creating industrial partnerships with the FSU, an element he says is essential to the survival of the newly independent states. Domenici is currently working on an improved Russian aid package scheduled for congressional review in the next few months.

'A Tremendous Experiment'

"It's crucial that the [FSU] scientists and engineers formerly employed by war are used to convert their technology to peaceful uses," Domenici said. "This is a tremendous experiment for the FSU's newly independent states in free market economies."

Creating partnerships between DOE laboratories and US industry that involve the newly inde-



INSIDE A FURNACE — James Van Den Avyle of Physical and Joining Metallurgy Dept. 1831 and US Senator Pete Domenici take a look inside Sandia's electron beam furnace used for metals research during a July 8 tour of area facilities. The visit was part of an industrial workshop on developing better international business partnerships with the newly independent states of the former Soviet Union.

pendent states would go a long way toward meeting the objectives of the Nunn-Lugar and Freedom Support Acts, says Roger.

"US industry recognizes that an important role for the national labs to play in these exchanges would be to help identify and assess potentially useful technologies for use in the US as well as those that could be transferred to the FSU," says Paul Shoemaker, Manager of Strategic Planning Program Office 4514. "National labs would also be a part of validating and adjusting new technologies to US standards."

"Research institutes in the FSU seem to favor work with US national labs," says Paul. "After so many years of intense competition, they are familiar with us and recognize our abilities."

"We can't afford another Yugoslavia," said Domenici, referring to the hostilities that devel-

oped after that country broke into separate states. "Technology stabilization and defense technology conversion efforts are the keys to helping the newly independent states succeed economically — something that will benefit us all." **•DT**

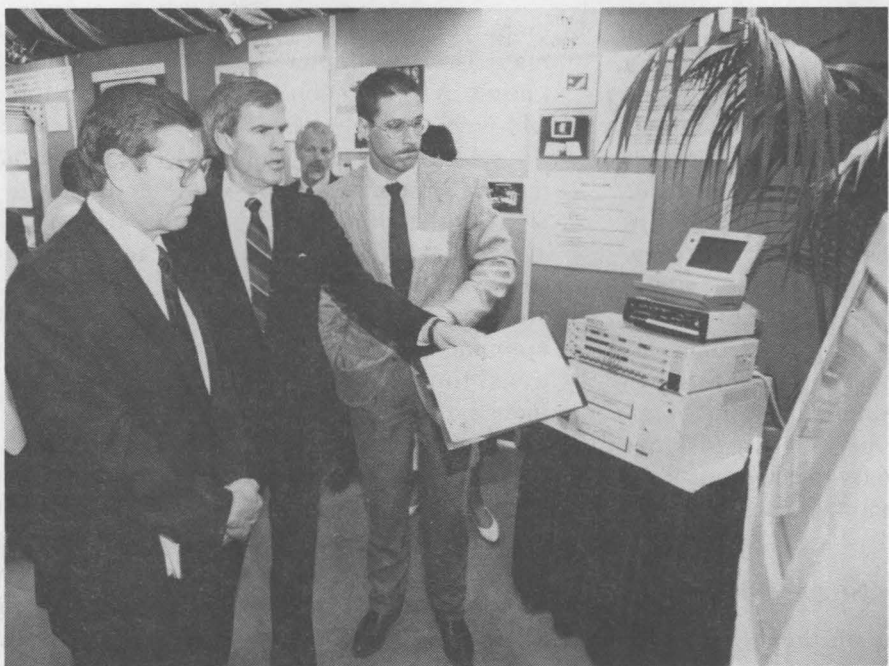
Employee Death

T. Patrick Conlon of Manufacturing Technologies Center 2400 died suddenly on July 2.

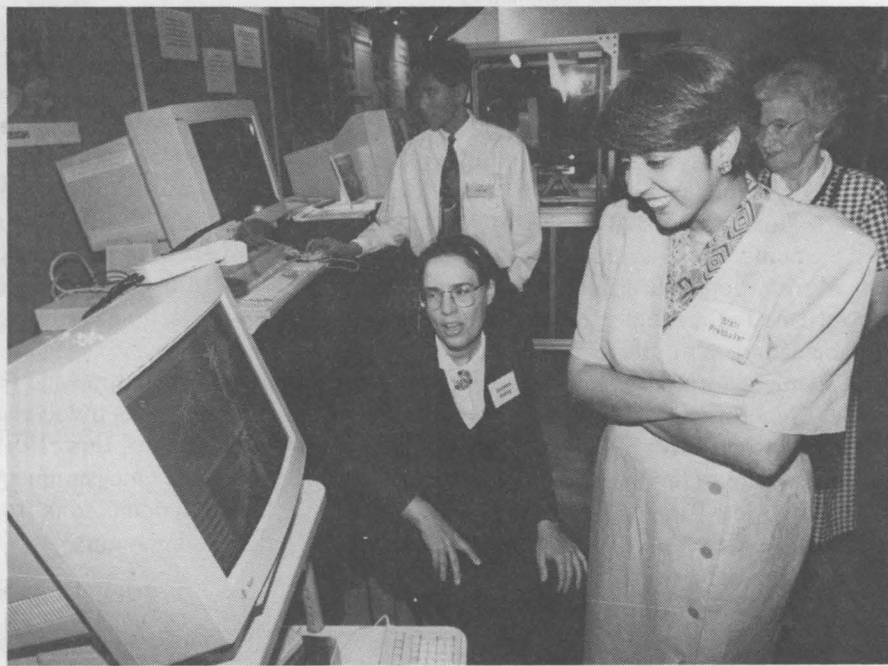
He was 56 years old.

Pat was a manager and a member of the technical staff and had been at Sandia since 1965.

He is survived by a son and a daughter.



SHOW OF TECHNOLOGY — In photo above, Ed Marek (right) of Structural Dynamics Dept. 1434 gives a brief demonstration of Sandia's systems reliability technology for US Senators Jeff Bingaman (middle) and Pete Domenici. In photo at right, Rodema Ashby (seated) of Software and Integration Technologies Dept. 2862 shows National Institute of Standards and Technology (NIST) Director Arati Prabhakar Sandia-developed Interactive Collaborative Environment (ICE) technologies. ICE systems enable multiple designers to work



simultaneously on the same project from different locations in a building or around the world. These technologies were two of five Sandia demonstrated at a special exhibit showcasing big-industry technologies that could be adopted by small US manufacturers. The July 12 exhibit, held at the US Senate Hart Office Building in Washington, D.C., was designed to help small manufacturers stay abreast of technological developments and promote technology transfer, says Bingaman, one of the exhibit sponsors.



CLIMBING THE WALLS — Team members lend helping hands as they try to hoist Rudy Sanchez of Facilities Operations Dept. 7814 to the top of a 12-foot wall. The event, which requires each team member to make it to the top of the wall, marks the culmination of the program's training effort. This last exercise is one of the program's most difficult, but according to team members, who push, stack, and pull their ways to the top, it's also one of the most fun. (Photos by Randy Montoya)



FALL OF FAITH — Catching Ed Williams of Maintenance Management Program Office 7016 should feel like catching a two-pound book, says Jay Wright of Roberts Training and Consulting, if everything is done properly. The trust fall, designed to develop mutual trust between team members, is the first of a series of unusual exercises these Sandians encountered in their High Performance Team Training.

New Training Program Turns Quality Words into Actions

Falling backward off a five-foot ladder gives Tony Chavez of Facilities Operations Dept. 7814 new ideas about quality and trust. If he keeps his body straight, his weight will be distributed evenly among 12 fellow workers waiting to catch him. If not, he risks overloading one or two people with too much work. Each pair of arms extended across his path must also carry a portion of his weight, or the entire project — in this case Tony — could fall through.

Lessons such as these are all part of Facilities Operations and Maintenance Center 7800's efforts to pair good concepts — quality, integrity, teamwork — with real-world meaning.

"You can't just pass these words off in a memo," says Jim Rush of Facilities O&M Special Projects Dept. 7817. "They have to be trained in. Companies like AT&T, Johnson & Johnson, and Ford have been doing this for years."

Results achieved by AT&T/Little Rock's award-winning training program included higher levels of employee performance and increased job satisfaction. Much like the AT&T programs, Sandia's High Performance Team Training program sends teams through three phases of instruction in a total of six days.

(Continued on Page Eight)



JUST PASSING THROUGH — Members of a 7800 training group get a lesson in creative teamwork as they try to maneuver themselves past a giant spider web made of rope. Rules allow no more than two people to pass through each space in the web, and they can't touch the ropes.

Sandia News Briefs

Discounts on AT&T Products Available Through September

Sandia employees and retirees remain eligible for AT&T employee discounts on equipment purchased at AT&T Phone Centers through Sept. 30. Employees and retirees normally receive discounts of 35 percent off everyday selling prices and 15 percent off clearance prices, according to information provided by AT&T. The discounts will no longer be available as of Oct. 1, when a new contractor takes over management and operating responsibility for the Labs.

Sandian Helps Sensitron Semiconductor Cut Wastes

Sally Hoier of Organic Materials Dept. 2472 recently received a letter of thanks from Sensitron Semiconductor, a division of RSM Electron Power, for her assistance in helping the company develop an environmentally friendly process for cleaning silicon chips. The work, done through the National Small Business Technology Exchange Program, helped Sensitron Semiconductor eliminate 20-40 gallons of freon and 16 gallons of acid waste a month. The new freon-free process produces only 5 gallons of waste a month.

Sandians Assist KAO Strategic Planning

Jo Ann Romero of Strategic Business Planning 6604A and Doug Weaver of Capability Assessment Program Office 6604 assisted DOE's Albuquerque Operations (AL)/Kirtland Area Office (KAO) during nearly a year of KAO's strategic planning. The KAO Strategic Plan was completed in April. Jo Ann developed the process that KAO used to carry out the planning and facilitated meetings of the KAO Strategic Planning Committee. Doug served as what the group called a "provocateur," bringing the perspective of someone outside KAO to the committee's discussions. KAO Manager Kathy Carlson says, "I appreciate the help that Jo Ann and Doug gave us during this process. Their assistance underscores my intention that the KAO-Sandia relationship is one of partnering and cooperation." KAO is responsible for DOE oversight of contractor-operated facilities on Kirtland AFB, including the Labs, the Inhalation Toxicology Research Institute (ITRI), and Ross Aviation.

RATLER Lunar Rover Wins International Design Competition

Sandia's Robotic All-Terrain Lunar Exploration Rover (RATLER) recently won the London-based *Design Engineering* magazine's monthly international design competition. The 24-inch-tall lunar exploration vehicle, developed by Paul Klarer of Advanced Vehicle Development Dept. 9616, Jim Purvis of Civil Space & Seismic Verification Dept. 9204, and Kent Biringer of Arms Control Studies Dept. 4115, will now be entered in the magazine's annual competition.

DOE Issues Statement on Non-nuclear Consolidations

DOE issued a Proposed Finding of No Significant Impact July 8 regarding its proposal to consolidate the non-nuclear manufacturing functions of the nuclear weapons complex. The finding is based on an environmental assessment of the proposed non-nuclear consolidation. Under the proposed action, most non-nuclear manufacturing functions would be consolidated at the Kansas City Plant (Missouri). Sandia/New Mexico, the Savannah River Site (South Carolina), and Los Alamos National Laboratory would pick up some non-nuclear activities, while all weapons complex functions at the Mound (Ohio) and Pinellas (Florida) plants and the non-nuclear functions at Rocky Flats (Colorado) would be closed out.

(Continued from Page Seven)

New Quality Training Program

The program begins with high performance team building where team members learn about group dynamics, conducting effective meetings, improving communication, and resolving conflicts. Next, members take on the process quality improvement session where they chart their work, look for ways to improve efficiency, and develop routine strategies for problem solving. The final session of High Performance Team Training is the lab portion of the program — two days in the field facing walls, falls, and giant spider webs.

Concepts Soon Catch On

Roberts Training and Consulting, supported by Mario Ramirez (7817) and Pat Ortiz (7817), leads the field sessions on a special course constructed by Maintenance Operations Dept. 7818 in Area 3. At first, exercises seem to have little to do with work at Sandia. As the training continues, however, concepts begin to catch on. Teams become more aware of individual strengths and weaknesses. Actions are carried out in an orderly, agreed-upon manner. Barriers are broken. Faced with maneuvering 10 people through a giant spider web made of rope without touching it, team members find themselves on equal footing. Every idea is potentially valid.

"No one has experience passing through giant webs," says Jim. The situation, he says, parallels any novel problem and the kinds of approaches necessary to solve it.

Keeping Up with Competition

"Working groups such as the teams we are training are fast replacing old corporate systems," says Jim. "In the past, supervisors simply told everyone what to do, how to do it, and when. That system isn't successful in today's competitive environment. No one person has all the best answers all the time.

"The better our working groups get at what they do," Jim continues, "the more marketable they become. At a time when everyone is scrambling for contracts, that's important.

"In the 7800 Center," says Jim, "there's no technology that sets us apart from our competition. People are our only real long-term competitive advantage. We want to make sure our people are the best."

For more information about High Performance Team Training, contact Jim on 844-1962. ●DT

Volunteer Opportunities

Volunteers In Action needs help with several community projects and assistance for one individual. To volunteer, call Al Stotts in Public Relations Dept. 7161 on 844-2282.

Project Partnership, a cooperative effort of the US Office of Personnel Management, Image Inc.,



and the Hispanic Association of Colleges and Universities, needs mentors for Albuquerque Public Schools students.

The Partnership provides opportunities in the federal sector for Hispanic youth. Participating students are a mix of high-achieving students involved in math and science programs and at-risk students involved with activities through Youth Development Inc. Mentorship training will be provided Tuesday, Aug. 31, from 8:30 a.m. to 4 p.m. in Albuquerque.

The *New Mexico Pro-Am Open Invitational Golf Tournament* scheduled for Aug. 3-5 at the Rio Rancho Country Club will raise money for five local charities. One of those organizations, Cuidando los Niños, needs volunteers to assist in pre-tournament preparations and tournament activities. Other charities that will receive funds from the tournament are the Women's Community Association, Pounders, Joy Junction, and All Faiths Receiving Home. Volunteers are needed for before- and during-tournament activities at several locations.

Also, *volunteer readers* are needed for a blind person enrolled in a masters degree program in public administration at the University of New Mexico. The student needs people who can devote about two hours in the evenings two to three times a week for preliminary literature searches, research and copying of material as needed for assigned papers and exams, and reading of text material.



RECENT VISITORS — Nestor Ortiz (left, 6400) discusses some of the Labs' nuclear technology with US Senator Jeff Bingaman (right) and US Representative Pat Schroeder of Colorado during their recent Sandia tour. Schroeder, Chair of the House Armed Services Subcommittee on Research and Development, was here to learn more about New Mexico's research capabilities and to discuss legislation to encourage partnering between national labs and private industry.

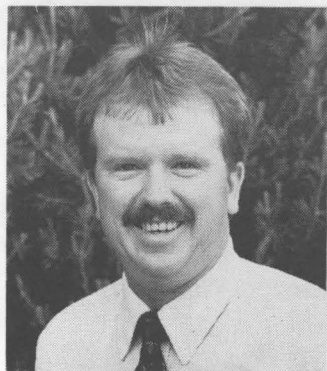
AN OLD BIRD — No, we're not talking about retired LAB NEWS photographer Bill Laskar, but about what's on his shirt — the original design of the Sandia thunderbird logo. The logo, designed by Clyde Walker (dec.), was chosen from designs submitted by more than 200 Sandians in 1955. Bill is seen here with his trusty Speed Graphic, the professionals' camera of choice for many years. Many of Bill's fine Sandia photos can be seen during Sandia "photo fairs" to be held soon in Albuquerque and Livermore. Employees and retirees are invited to attend these fairs and submit their own Sandia-related photos for possible publication in a new pictorial history of the Labs. Fairs will be held at Sandia/New Mexico in the Technology Transfer Center on July 30 (retirees) and Aug. 2-3 (employees). The Sandia/California fair (employees and retirees) will be Aug. 4 in the Combustion Research Facility. "Old bird" T-shirts will be available for \$8 at the fairs. For more information, see July 9 LAB NEWS or call Karen Shane on 844-9180 or Donna Bruce on 844-6315.



Supervisory Appointments

DOUGLAS MANGUM to Manager of Command and Control Dept. I 5711.

Doug joined Sandia in 1985 as an electrical engineer in the Advanced Electrical Systems Division.



DOUG MANGUM

Other organizations he's worked for include Digital Subsystems Div. II and Command and Control Dept. II. His work has been in the use-control area in recent years, developing advanced use-control concepts for PAL controllers and providing system level design and program management for next-generation use-control equipment.

Doug has a BS in electrical engineering from Texas A&M University and an MS in the same field from UNM, completed through Sandia's Special Engineering Degree program.

TONY HERNANDEZ to Manager of Technical Support Dept. 5101.



TONY HERNANDEZ

Tony joined Sandia in 1983 as a mechanical engineer in the Trident II Warhead Department, where he helped design and develop a variety of non-nuclear weapon components. Other organizations he's worked for include the Advanced Fusion Development Department, where he was project manager for Sandia's Dismantlement System Studies, and the Advanced Weapon Projects Department, where he was system project leader for the Multi-Application Surety Technology (MAST)

program. He received a Sandia Award of Excellence for providing overall project direction in the Sandia development of a videotape depicting the nuclear stockpile dismantlement process and for contributing to the success of the MAST development project.

Tony has a BS and an MS in mechanical engineering, both from the University of Tulsa. He is a member of the National Society of Professional Engineers.

Credit Union Will Be Biggest Albuquerque Independent

Sandia Laboratory Federal Credit Union (SLFCU) last month passed \$300 million in assets, making it the largest locally owned independent financial institution in Albuquerque (once the pending sale of a local bank to an out-of-state company is completed).

Federal examiners from the National Credit Union Administration recently reviewed SLFCU and gave it the highest composite ranking for capital adequacy, asset quality, management, earnings, and liquidity management. Reviews by two independent analysts also resulted in their highest ratings.

As credit union customers become more geographically separated, SLFCU is providing services through means that don't require a visit to an office. Since January 1992, more than 60 percent of new accounts in New Mexico have been in households more than 10 miles from any SLFCU branch office. The credit union's telecommunication system offers both human operators and automated transactions with toll-free access throughout the US. This phone access includes most of the credit union's financial services at virtually any hour of the day.

SLFCU serves about 30,000 current and former Sandia employees and their family members.

this month in the past...

Sandia LAB NEWS

40 years ago...In July 1953, President Eisenhower nominated Sandia President Donald Quarles (now deceased) to be Assistant Secretary of Defense in charge of Research and Development. He was confirmed and began his new job in September. James McRae (also now deceased) succeeded Quarles as Sandia President.

30 years ago...The Coronado Club was advertising a "South of the Border" buffet — at a buck twenty-five per person. The Sandia payroll for FY63 was announced as \$62.4 million. Sandian A. J. Petersen (now deceased), a devoted "rock hound," found fossilized fish remains at the Nevada Test Site that were estimated by the Smithsonian Institution to be 15-18 million years old.

20 years ago...Among the items in the July '73 LAB NEWS ads: two Santa Fe Opera tickets (La Boheme) for \$5.50 each and three "priceless" large velvet oil paintings. Gerry Yonas (now VP-9000) had his photo in the paper for being promoted to Manager of the Plasma and Electron Beam Physics Research Department; there was no visible gray in his beard then.

10 years ago...Two new Sandia vice presidencies were formed — Technical Support 7000, led by Bob Peurifoy (now retired), and Energy Programs 6000, led by Everet Beckner (now acting Assistant Secretary for Defense Programs at DOE). *Our Turbulent Sun*, a book by Sandia Public Relations staffer Ken Frazier (7161), was named one of the best nontechnical astronomy books published the previous year.

Congratulations

To Laurie and Dennis (2757) Roach, a son, Devin John, June 27.

To Gretchen and Brett (9323) Bedeaux, a son, Timothy Curtis, June 29.

Take Note

Retiring and not shown in LAB NEWS photos: Louise Bland (7617), Frank Burns (4343), Ralph Carden (7327), Marge Patton (1237).

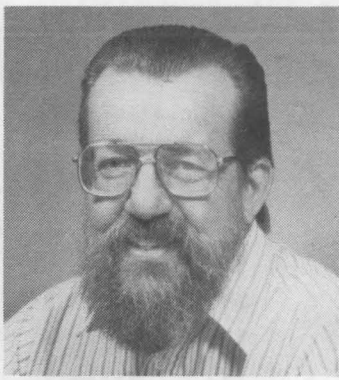
Earnings Factors May 1993

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	1.0987
Government Obligations	.9983
Equity Portfolio	1.0265
Guaranteed Interest Fund	1.0062
South Africa Restricted Fund	1.0315
Long-Term Savings and Security Plan (LTSSP)	
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Guaranteed Interest Fund	1.0063
South Africa Restricted Fund	1.0316
Equity Portfolio	1.0265
Employer Stock Fund	1.1006

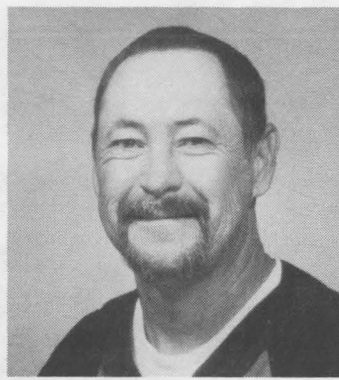
MILEPOSTS

LAB NEWS

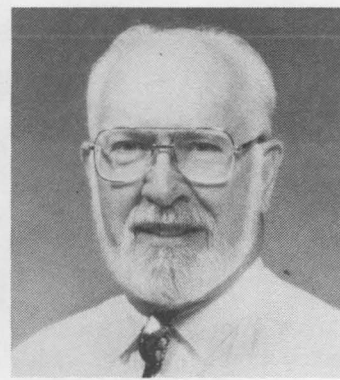
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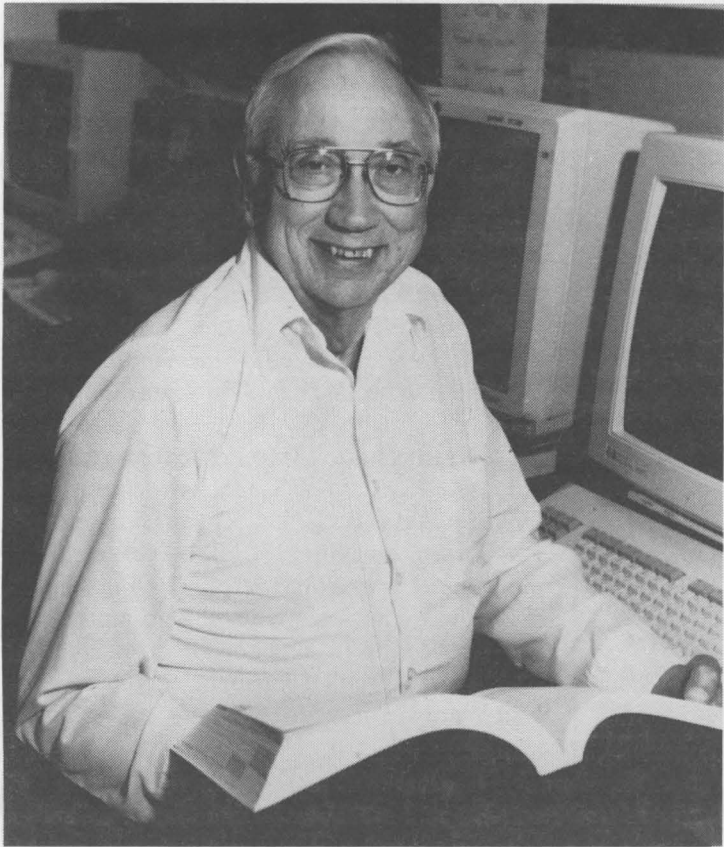
Randy Cole
6418 25



Ernest Gurule
7813 15



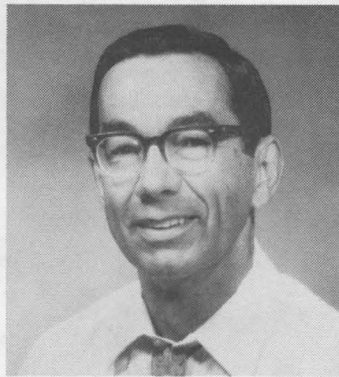
Ray Mosteller
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Merrill Jones
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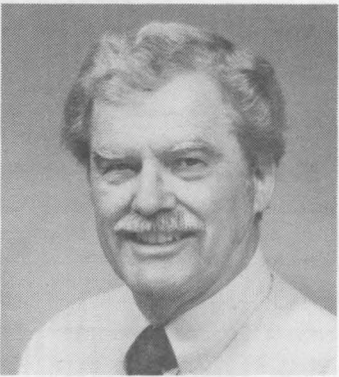
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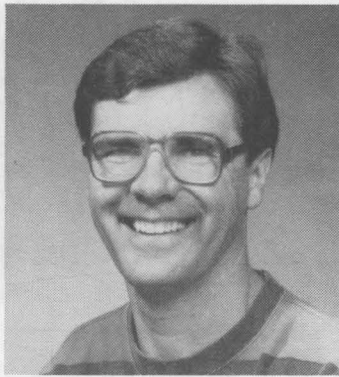
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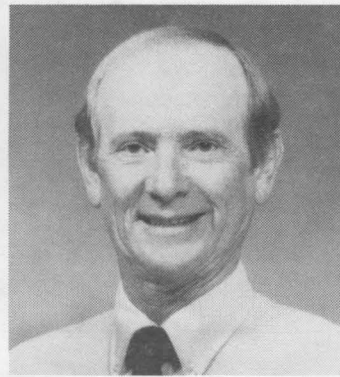
Adelita Montoya
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Eugene Kenderdine
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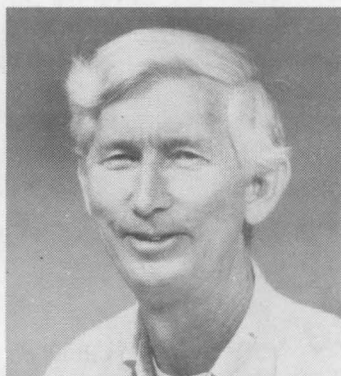
Richard Kottenstette
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Eric Moss
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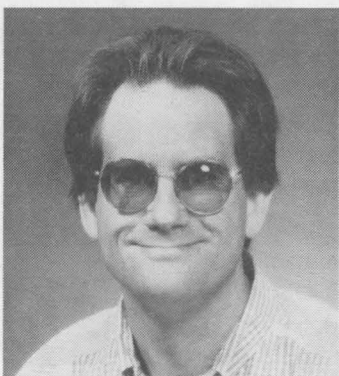
Don Schreiner
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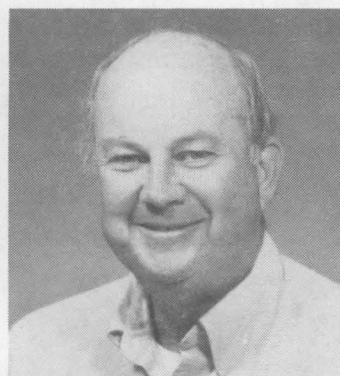
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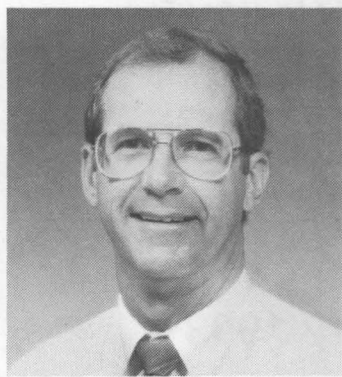
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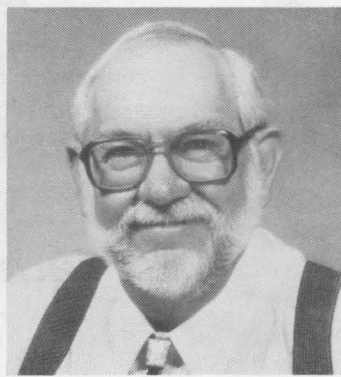
Phillip Fuerschbach
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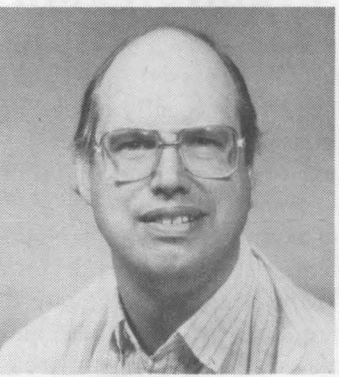
Theodore Welton
9214 30



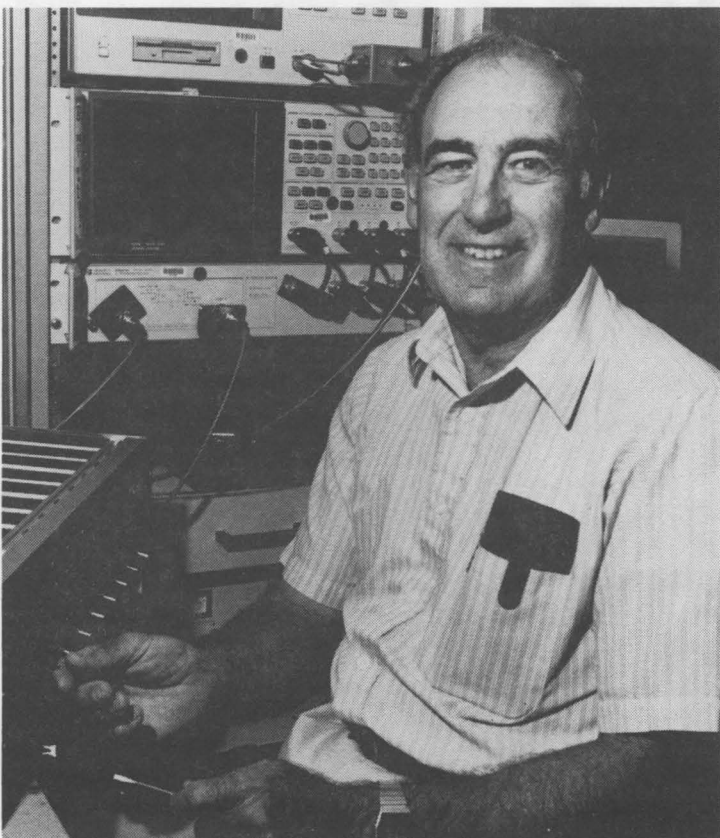
Wayne Shirley
7017 25



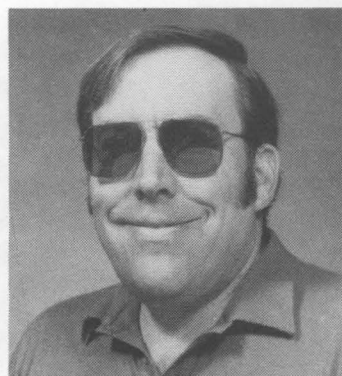
Paul Spellman
4341 35



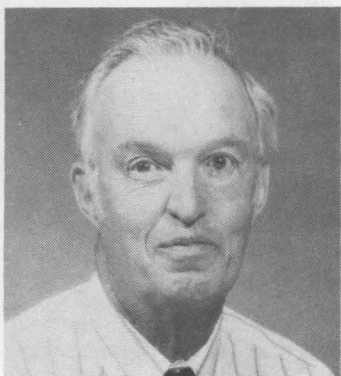
Gary Chemistruck
7153 15



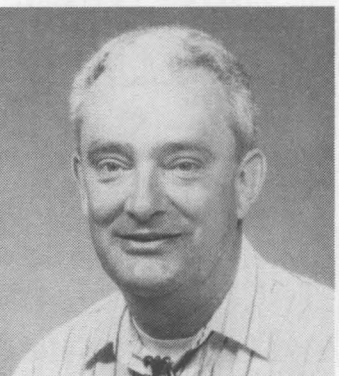
Richard Oliveira
9322 35



Allen Wilshusen
2341 25



John Mitchell
9602 35



Jim Borders
1823 25

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 7162 or fax to 844-0645.

Ad Rules

- Limit 20 words, including last name and home phone (the LAB NEWS will edit longer ads).
- Include organization and full name with each ad submission.
- Submit each ad in writing. No phone-ins.
- Use 8 1/2" by 11-inch paper.
- Use separate sheet for each ad category.
- Type or print ads legibly; use only accepted abbreviations.
- One ad per category per issue.
- No more than two insertions of same "for sale" or "wanted" item.
- No "for rent" ads except for employees on temporary assignment.
- No commercial ads.
- For active and retired Sandians and DOE employees.
- Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.
- "Work wanted" ads limited to student-aged children of employees.

MISCELLANEOUS

CAR PARTS, for '70 Mustang: 3-spd. transmission w/bell housing, clutch, pressure plate, and other engine parts, all for \$40. Chavez, 842-6374 after 6 p.m.

MOTOR, for evaporative cooler, 1/4-hp, 2-spd.; side-view mirrors for towing; lavatory faucet, new; wood doors. Moss, 298-2643.

PLYWOOD, approximately 30 sheets, most 6- to 8-ft. by 3- to 4-ft., 1/2 to 1-in. thick, \$250 OBO for all. Armstrong, 254-9230.

WATERBED, king-size, bookcase headboard, 6-drawer pedestal, padded railing, Life-Time bladder, \$250 OBO. Anastasio, 293-8467.

CAMERA LENS, 35mm, 80-200 Macro, fits Pentax, Minolta, \$80. Bouchard, 265-8148.

WATER LILIES, red and white, pads formed, \$8/ea. Halbgewachs, 268-1584.

RIMS, four, Ford, 8-hole, 16-1/2-in., \$30/ea. Zirzow, 281-9896.

SLEEPER SOFA, Mayo double, solid oak frame, neutral color emphasizing browns, no wood exposed, talk price. Branstetter, 292-5978.

MOTORCYCLE HELMET, w/shield, Honda, size 7-1/8, \$75; Kolcraft double stroller, \$40; badminton set, brand new, \$15. Lappin, 296-3457.

SHOP MANUAL, for '89 Grand Am, \$10. Holmes, 292-0898.

LAWNMOWER, gas-powered, 19-in., Toro, rear bagger, good condition, \$75. Gubbels, 884-3711.

WATERBED, queen-size, \$150; desk, 72" x 36", \$75; printer, \$25; exercise bike, \$10; Shop-Vac, \$10; ironing board, \$3; fireplace tools, \$5. Williams, 275-0582.

LAWNMOWER, Murray, 3.5-hp, \$100. Wright, 891-1998.

TRAILER HITCH, removable ball, previously mounted on '68 Cougar for pulling horse trailer, 3,500-lb. gross pull, \$125 or make offer. Quinlan, 296-1852.

McLEAN WHEELS, four, 15x10, w/gold stems and spinners, never been used, \$1,400. Chavez, 766-6918.

BED FRAME, king-size, w/rollers, excellent condition, \$75; Minolta VHS camcorder, full-size, w/batteries and carrying case, \$220. Stuart, 265-7315.

MEDICAL EQUIPMENT: wheelchair, new, paid \$750, sell for \$325; padded toilet seat, w/frames and armrests, \$65; aluminum cane, 4-legs, \$30. Behar-Trump, 831-5621.

DINING TABLE, 42-in., hexagonal shape, glass top, 4 chairs, \$50; ceiling fan, blue, w/light, 5 blades, 48-in., \$20. Schultz, 275-9349.

ERECTOR SET, 550 parts, \$40; Little Tikes Country Cottage playhouse, \$100; Little Tikes pedal car, \$20. Excellent condition. Smith, 281-9360.

LAWNMOWER, 16-in., Scott hand mower, \$65. Brower, 298-2254 after 7 p.m.

APPLE IMAGEWRITER, 3 yrs. old, used sparingly, \$175. Gniady, 299-6529.

GE WASHING MACHINE, Kenmore dryer, excellent condition, \$75/ea. or \$140 for both. Dwyer, 271-1328.

CAMPER "PORTA POTTY," w/chemicals, \$35; Coleman lantern, \$10; branding irons, \$12/ea. Peterson, 256-7514.

BUILT-IN STORAGE UNIT, for bathroom, three 1/4" x 16" hinged doors, storage shelves, 48"W x 36"H x 4"D, solid wood frame, \$100 OBO. Stang, 256-7793.

GAS CLOTHES DRYER, Speed Queen, 6 years old, used only in cold months, like new, \$150. Kupper, 298-7720.

LOWRY ORGAN, w/automatic rhythm and drums, owners manual and music included, \$450. Barham, 293-2412.

AIR CONDITIONER, Sears Kenmore, 12,000 Btu, window mount, used one season, \$225. Evans, 281-0288.

WATERBED, queen-size, mirrored bookcase headboard, mattress, heater, 12-drawer pedestal, \$250 OBO; Marlin .22 semi-automatic rifle, \$50 OBO. Wilde, 243-4209.

COMMERCIAL AIRHOSES, two, 100-ft., heavy duty, 3/8" with 1/4" NPT fittings, list cost \$120/ea., sell for \$80/ea. Scranton, 869-6589 after 6 p.m.

COUCH & LOVESEAT, neutral color, 3 years old, very clean, good condition, \$500/pr. McDuffie, 292-0459.

WATERBED, \$125; washer, \$125; conference table, \$150; corner table, \$30; modem, \$50; drafting table w/parallel bar, \$125. Wernicke, 260-1857.

WOOD STOVE, air-tight, Grizzley, heats 2,000 sq. ft., glass doors, blower motor, stack, used 8 yrs., excellent condition, \$500. Sturgeon, 281-9035.

WEIGHT BENCH & WEIGHTS, Marcy; oak gun cabinet; poker table; KM wall modules. Senglaub, 281-8002.

CRIB, w/mattress, excellent condition, \$100; clown crib mobile, primary colors, \$15. Meeke, 828-9825.

ROWING MACHINE, Amrec 610, \$175; Nintendo w/Zapper gun and nine games (games not sold separately), \$100. Sobering, 292-5322.

TROLLING MOTOR, Minn Kota, electric, 65-turbo, 5-spd., 35-lb. thrust, bought in summer '91, used twice, \$250. Crego, 292-0266.

WIRELESS TRANSMITTER, w/2 receivers and 2 lamp modules, will flash lamps when doorbell or telephone rings, \$75. Anastasio, 821-4245.

GARAGE SALE, July 23-24, 8 a.m.-2 p.m., 9631 DeVargas Loop NE, Black & Decker lawn mower, \$150; landscaping materials; exercise bike; furniture; etc. Omstead, 823-2096.

WINDOWS, aluminum sliding type, w/new screens, three 4' x 8', one 4' x 5', great for a sunroom, \$100. Kanno, 899-0788.

WATERBED, queen-size, 6-drawer frame, padded rails, bookcase headboard, heater & liner included, great condition, \$175 OBO. Koehler, 298-2488.

DOGS, Lhaso Apsos, two, father/daughter, free to good home. Armijo, 247-8798.

KARASTAN RUG, Blue Dynasty, 9' x 11', \$250 OBO; Taos bed, solid oak, custom made, cedar-lined drawers, \$600 OBO. Meyers, 243-3342.

MICROWAVE OVEN, Montgomery Ward, 1.5 cu. ft., digital, thermometer, manual, cookbook, good condition, \$110; portable crib, like new, \$35. Krause, 299-0931.

CLOSET DIVIDER, chrome, adjustable to extend rod for slacks, blouses, and/or childrens clothes, good condition, \$8. Wagner, 823-9323.

CHAIN-LINK FENCE, 100 ft. long, 3 ft. high, includes two 12-ft.-long gates, \$150. Tissot, 345-1501 evenings.

GARAGE SALE, Aug. 6-7, 8 a.m.-4 p.m., for La Cueva HS speech team, Eisenhower Middle School patio, 11001 Camero NE. Bennett, 298-1142.

CAMPER SHELL, Brahma, tan, fits short-bed or supercab Ranger pickup, 2 yrs. old, excellent condition, \$375. Sargent, 865-3227.

EAST MOUNTAIN YARD SALE, July 23-24, begins 9 a.m., near Frost & Mountain Valley (N217), watch for signs. Dean, 281-3489.

FILL DIRT, more than 3 yds., clean, you haul, free. Brooks, 275-0056.

SANTA FE OPERA TICKETS, Capriccio, Aug. 6, 2 for \$112; La Boheme, Aug. 7, 2 for \$82; Magic Flute, Aug. 9, 2 for \$100. Novak, 268-8258.

INDIAN TRIBAL NATION BOOKS, 40, and framed commemorative silver coins, Franklin Mint limited edition, complete autographed set, \$600. Montano, 892-0987.

STEREO SYSTEM, JVC CD player, Kenwood receiver, Pioneer speakers, 150-watt, great sound, excellent condition. Sherman, 292-3297.

DELTA CROSSBED TOOLBOX, full-size, \$50; LP construction heater, \$75; bench seat for '84 Ford pickup, brown cloth, \$100. Ashcraft, 281-5993.

BUILDING LUMBER, assorted lengths and widths; mirrors, two, \$15 and \$20; wood screen doors, 36-in.; dining table and chairs. Garcia, 888-3686.

DOGS: German shepherd female, \$100; German shepherd male, \$125. Gutierrez, 877-1076 after 6 p.m.

CARPET, 65 sq. yds., w/pad, plush celery, \$120; drapes, Springcrest, celery, 2 pair, w/hardware, 8' x 12' and 8' x 11', \$75/ea.; Panasonic camcorder, w/case, \$275. Trump, 299-5162.

REFRIGERATORS: GE, 17.2 cu. ft., \$350; 8 cu. ft., \$225. Both in excellent condition. Babcock, 299-3121, leave message.

DELTA POOL TABLE, slate; queen-size waterbed; colonial couch, brown; leaded glass tulip light fixture; banjo; microscope. Dupree, 294-1835.

CINDERBLOCKS, 8-in., 40c/ea.; corrugated aluminum roofing, 4' x 8' sheets, \$4; 55-gal. drum w/dispensing spout, \$2.50; water barrel, 50-gal., \$50. Mozley, 299-4204.

GUN, .300, Weatherby Magnum Laser-mark, w/3-9x Weatherby scope, never fired, beautiful wood, paid more than \$1,600, make offer. Mariman, 883-8660.

SAILBOARD, '86 Mistral Maui, excellent condition, \$400. Sjaardema, 299-8042.

DINING ROOM CHAIRS, antique, four, including armchair, exceptional carving, walnut inlays, \$525; picture frames, all sizes, new. Biffle, 293-7043.

METAL BUNK BED FRAME, blue, twin-size, full combo, \$110. Stephens, 822-8584.

TRAVEL VOUCHERS, two, to Fort Lauderdale and Bahamas, includes five nights' accommodations, plus cruise, \$300 OBO. Simoes, 899-1755, leave message.

SOFA, Southwest design, brown, 8-ft., \$225; occasional chair, brown, \$45. Both in excellent condition. Rex, 822-0450.

WATER HEATER, 30-gal., 230-volt, 5 yrs. old, single element, works fine, \$50; seat cover, brown, for '88 & newer Chev. pickup, \$15. Jackson, 281-8927.

GIRL'S BEDROOM SET, twin-size, includes canopy bed, dresser w/mirror, box spring, mattress, and bedding, \$275. Norwood, 266-2717.

AQUARIUM, 55-gal., w/heavy glass top, \$75; butcher block kitchen cart, oak w/white doors, \$50. Wallace, 256-1643.

S&W REVOLVER, .38 spl., 4" barrel mod., 15-4, like new, \$225; pistol safe, 3' x 8' x 11", simplex combo lock, 13 lbs., \$95. Mooney, 281-2612.

EXERCISE CYCLE, Sears, w/speedometer, odometer, timer, \$75; bookcase headboard, wood, twin-size, \$40. Lockwood, 298-9563.

WROUGHT IRON TABLE, white, w/4 chairs, recently upholstered, excellent condition, \$150; baby bed, could be used as a doll bed, \$20. Lucero, 296-1747.

BEDROOM SETS, two, white, double bed, including mattress and box spring, dresser w/mirror and bureau, \$400 and \$300. West, 296-1483.

MISCELLANEOUS: new and used carpeting w/pads; large coffee table; patio furniture; Amiga 2000, w/PC-compatible board. Low prices. Banas, 265-0924.

COUCH & LOVESEAT, cinnamon, great with Southwest decor, casual style, like new, \$375. Luikens, 881-1382.

RADIAL ARM SAW, Sears, \$100; antique sewing machine, Singer, \$150; bird bath & statue, \$95. Beck, 299-4786.

EPSON PRINTER, FX-185NLQ, \$95; cable, \$8; FX-100, \$85. Dietzel, 294-4702.

TRANSPORTATION

'88 PONTIAC GRAND AM, AM/FM, cruise, 2-dr., 97K highway miles, car phone, excellent condition, \$3,895. Smith, 281-2940.

'84 HONDA PRELUDE, AC, PS, PB, 5-spd., 111K miles, excellent condition. Sedillo, 1-864-3532.

'89 FORD BRONCO XLT, 302 V8, AT, overdrive, towing package, 4x4 on fly, low mileage, many extras, excellent condition, \$13,000. Bouchard, 265-8148.

'81 HONDA CX500D MOTORCYCLE, low miles, w/extras, original owner, \$850 OBO. Zirzow, 281-9896.

'92 OLDS SILHOUETTE VAN, 3.8L, AT, AC, ABS, CD, towing/power package, 14K miles, 6-yr. extended warranty. Nelsen, 281-4093.

BICYCLE, Raleigh Technium Pro Triathlon, aluminum, Shimano 105 package, 3 yrs. old, extras. Potter, 869-4716.

'85 NISSAN PICKUP, 4x4, 5-spd., AC, camper shell, good dependable truck, \$3,400. Hunkins, 299-4964.

GIRL'S BICYCLE, Schwinn Traveler, 10-spd., 26-in., excellent condition, \$75 OBO. Kjeldgaard, 268-8835.

'90 ACURA INTEGRA GS, 3-dr., anti-lock brakes, sunroof, cruise, AC, AM/FM cassette, red, 17K miles, NADA book, creampuff. Henderson, 299-6083.

MAN'S TOURING BIKE, 12-spd., 24-in. frame, 700mm wheels, fingertip shifters, \$50. Buck, 438-3873.

'89 TOYOTA CELICA GT, 2-dr., 5-spd., many extras, excellent condition, \$8,950. Beer, 867-3150.

'92 FORD EXPLORER XLT, 4x4, 15K miles, loaded, leather, 5-spd., original owner, \$19,000. Dwyer, 271-1328.

'86 HONDA 110, bought new in '89, 1,200 actual miles, excellent condition, \$800. Smith, 384-5182.

'81 KAWASAKI GPZ1100, original owner, adult ridden, lots of spare parts, excellent condition, \$2,300. Barnard, 292-5648 evenings.

'79 DODGE POWERWAGON, FT 4WD, rebuilt T-case & transmission, good tires, needs engine work, excellent vehicle, \$995 OBO. Pascarella, 292-6489.

'88 KAWASAKI KX80, dirtbike, never raced, big wheel, excellent condition, \$725. Marquez, 899-2408.

'87 BMW 325, 80K miles, 5-spd., granite exterior, parchment interior, excellent condition, \$9,150 OBO. Vandenberg, 281-1791.

'69 HALF-TON PICKUP, rebuilt engine and front end, \$2,700. Stephens, 822-8584.

'86 FORD EDDIE BAUER BRONCO II, 4WD, AT, V6, AC, full power, loaded, garage kept, clean, NADA \$6,300, sell for \$5,700 OBO. Zaorski, 281-9194.

'87 DODGE RAM CONVERSION VAN, all options plus extras, prime condition, one owner, low mileage, \$7,500. Stocks, 823-1541.

'88 PLYMOUTH VOYAGER, V6, AC, AT, PB, PS, cruise, AM/FM stereo cassette, 7-passenger seating, 64K miles, excellent condition. Armentrout, 294-4140.

'78 CORVETTE PACE CAR, 25th anniversary limited edition, 45K actual miles, AT, AC, power windows, T-tops, \$10,000. Haines, 296-9738.

'85 NISSAN PICKUP, 4WD, 4-cyl., 5-spd., w/shell, runs well, \$3,700. Fokins, 345-2801.

'88 FORD F150 PICKUP, EFI V8, 5-spd., long bed, auxiliary tank, camper package, cloth bench, 6-ply Michelins, 72K miles, \$6,100. Smith, 265-4080.

'89 CHEV. BLAZER, Tahoe package, V6, AT w/overdrive, cruise, AM/FM, AC, power windows and locks, original owner, great condition, \$8,500. Richards, 265-6775 or 263-7901.

RACING BIKE, Trek 1100, 52cm frame, Suntour components, 21-spd., black w/turquoise trim, two pumps, \$250. Douglas, 281-9843.

'85 CHEV. CAVALIER, 2.0 liter engine, PS, AT, AC, AM/FM, one owner, excellent condition. Gutierrez, 865-9542.

'88 PLYMOUTH GRAND VOYAGER LE, charcoal, "wood" siding, 3-liter V6, 61K miles, new radials, brakes, shocks, one owner, \$9,750. Mooney, 281-2612.

'70 TRAVEL TRAILER, Airstream International, 27-ft., new hot water tanks, toilet, tires, brakes, \$6,000 OBO. Archibeque, 266-1252.

MOUNTAIN BICYCLE, Raleigh, 18-spd., 20-in. frame, red, \$75. Schroeder, 296-1011.

'82 HONDA CM250 MOTORCYCLE, windshield rack, new battery, owner's and shop manuals, 6,200 miles, excellent condition, \$600 OBO. Suber, 275-1933.

'90 BUICK REGAL, V6, 2-dr., 30K miles, all power, clean, must sell, below book. Reynolds, 821-8779.

REAL ESTATE

3-BDR. HOME, 2-story, 2-1/2 baths, 1,550 sq. ft., solar, sprinklers, 2-car garage, needs some fix-up, near Indian School/Chelwood, \$102,000. Barnette, 292-5186.

7 ACRES, sportsman's paradise, stream divides lush, heavily wooded area, northern NM, all utilities, year-round access, \$37,500. Jolly, 1-684-2468.

3-BDR. MOBILE HOME, '85 Cavco, 1,800 sq. ft., 2 baths, woodstove, deck, skylights, all utilities, washer, dryer, dishwasher, Sandia Park, excellent condition, \$31,900. Romero, 298-8586.

2-BDR. TOWNHOUSE, 2 baths, 1,620 sq. ft., double garage, 2 x 6 const., professionally landscaped, borders city park, Academy/Eubank area. O'Connor, 821-1315.

3-BDR. HOME, 1-3/4 baths, 1,615 sq. ft., tasteful landscaping, views, Tramway/Indian School area, very clean, many extras, \$108,000. Roesch, 296-8248.

1-BDR. MOBILE HOME, 1 bath, completely rebuilt, near Sandia (Eubank/Central), \$210/mo. parking fee includes everything except electricity, \$6,295. Mortley, 877-0136.

3-BDR. CUSTOM HOME, 1-3/4 baths, vigas, kiva fireplace, deck w/city and mountain views, corner lot, Taylor Ranch, \$97,900. Snyder, 898-2029.

TIMESHARE, 2-bdr., Ruidoso, NM, completely furnished, RCI affiliated, horseracing season, \$2,000/week. West, 281-3460.

3-BDR. HOME, 1,800 sq. ft., extra-large heated garage, storage building, on one acre, off Rio Bravo, \$99,500. White, 873-4230.

1-ACRE RESIDENTIAL LOT, water to property line, two miles southeast of Edgewood, \$19,000. Depoy, 298-8308.

WANTED

VOLVO RIMS, two, 14-in., mid '80s, steel. Zirzow, 281-9896.

BACK ISSUES of US News, Time, Newsweek, '88-present, needed by teacher for high school project. Barnard, 256-7772.

GOOD HOME, for chocolate-point Siamese tomcat, shots, neutered, "talkative," affectionate. Wilde, 243-4209.

TOWING DOLLY for car. Smit, 296-3327.

TEACH-YOURSELF COURSES, in French and Portuguese, prefer tape & text courses. Myers, 271-1525.

RV REFRIGERATOR, gas/12-volt/110-volt, or just gas/12volt. Skogmo, 294-0133.

RENTAL HOME, in east mountain area, for responsible couple w/outside dogs, for 6 months while building a home. Schaub, 865-8807.

SLIDE RULES, any kind, but interested in circular, cylindrical, and unusual sizes. Thomas, 821-0134.

CAR-TOP LUGGAGE CARRIER, enclosed. Ashcraft, 281-5993.

LOVING HOME for Cocker Spaniel, AKC-registered, spayed, black female, shots, loves attention and playing fetch, too many dogs. Hauber, 898-0997.

PARTNER, one-third interest in '82 Cessna 172, full IFR, Mattituck engine, perfect condition. Jackson, 281-8927.

SANDIANS helped by United Way agency to share their story with LAB NEWS readers during ECP campaign. Carpenter, 4-7841.

WORK WANTED

RESPONSIBLE TEEN would like to babysit, prefer area east of Louisiana. Rodacy, 293-1668.





SQUARE BUBBLES? — Nope. Sandia Science Advisor Barbara Jennings (7327) blows round bubbles from a square-shaped blower for first-grade students during a demonstration at Cochiti Elementary School.

Square Bubbles and Science Fun

Sandia's Science Advisors' Program Needs Retirees

"Can I make square bubbles?" Sandia Science Advisor (SCIAD) Barbara Jennings (7327) asks first graders at Cochiti Elementary School. Some say yes; others are doubtful.

Four popsicle sticks, some soap, a little air, and the secret is revealed. Despite the square-shaped blower, the bubble is round. This is only one of many experiments Barbara conducts during her regular visits to the school.

The SCIAD program has become increasingly popular, and more SCIADs are needed to meet the demand in New Mexico. To help meet these needs, Sandia's Educational Outreach Dept. 35 hopes to recruit retirees to become part-time SCIADs for elementary and middle schools. Retirees who join the program will be screened, selected, and trained

in their new jobs by the Education Outreach Department. They must commit to serve one school year and will be paid for their services through a "speaker letter" agreement.

As SCIADs, retirees will work with school faculty to plan how the school and SCIAD will work together to achieve program goals. They will also be reviewed on a quarterly basis to assess performance and verify services rendered.

"Our retirees possess a wealth of knowledge," says Science Advisors Program Coordinator Sheri Martinez (35), "and our schools can make good use of their services to enhance math and science programs for area children."

Interested retirees should call Sheri on 889-2313 or Jesus Martinez on 889-2305. ●DT

'Best and Brightest'

Top High School Students Spending Two Weeks at Labs

Top math and science high school students from 50 states and seven foreign countries are spending a two-week internship at the Labs July 18-31, studying the latest innovations in engineering research.

This is the first year the High School Science Student Honors Research Program has taken place at Sandia. The program is sponsored by DOE.

Scientists and engineers at Sandia will act as mentors for the students. Professors from the Waste-management Education and Research Consortium (WERC) will also work with the students on solving a soil contamination problem. Students will be divided into teams to design a clean-up strategy.

"These are some of the best and the brightest students in the world," says Sandia program coordinator Natalie Olague of Education Outreach Dept. 35. "These students will work hand-in-hand with professionals on the newest technologies available. This experience will offer the participants a deeper appreciation of the challenges and rewards of technological and scientific advancement."

Among the goals of the program are to assist students in recognizing why engineering research requires chemistry, physics, and mathematics, and to offer a hands-on experience with state-of-the-art techniques and materials used in research. The program is also intended to con-

vey to students an understanding of the impacts of science and technology on society, provide a forum for the exchange of ideas between students and professional engineers and scientists, introduce the students to the critical thinking skills used in science and engineering, and stress the importance of respect for safety, health, and the environment.

SOLID TEAMWORK between Sandians and DOE appraisers helped the Labs earn good marks during a recent ES&H appraisal of Sandia work sites. The appraisal, which took the place of the long-awaited-then-suspended DOE Technical Safety Appraisal (TSA), was a comprehensive ES&H appraisal of both the New Mexico and California sites. Here, from left, Lisa Polito (7601), William Bryant (DOE/AL), Elena Holland (9204), and Willy Molina (DOE/AL) review the *Pressure Safety Manual*, which provides safety requirements for pressure systems.



Coronado Club Activities

Whoop It Up with The Poorboys

POORBOYS TONIGHT! — The boots will be scootin' this evening, July 23, when the Isleta Poorboys strike up their C&W tunes from 7 to 11 p.m. The dancers don't get a lot of rest when the 'Boys are in town. To help you make merry, the kitchen staff is offering grilled salmon steak (\$10.95), prime rib (\$11.95), or the all-you-can-eat buffet featuring baron of beef, baked ham, roast turkey breast, and more (can it really be just \$6.95?). Grab your phone, dial 265-6791, and make your reservation.

KIDS' BINGO — Bring the family next Friday evening, July 30, and have some guaranteed fun at Kids' Bingo. All kids playing bingo get a free hot dog and soft drink, and they can enjoy cartoons and a movie from 5 to 7 p.m. An a la carte buffet will begin at 5 p.m. Bingo starts at 7 p.m. and features great prizes that any kid would love to win.

REMEMBER SPLASHDOWN — Every Thursday and Friday evening you can "splash down" in the Club's pool (or just "land" on the patio) to wind down from all those long days at work. Visit the buffet line — it's open 5-8 p.m., and members get a 10-percent discount. The pool and patio stay open until 9 p.m. (except Friday, July 30 — see next item). Regular prices apply: \$2 for members who haven't purchased season passes, \$3 for members' guests.

POOL CLOSED NEXT WEEKEND — Because the Club is hosting the Sundance Swimming Championships, the pool and patio will close at 6 p.m. Friday, July 30, and will remain closed July 31-Aug. 1.

Congratulations

To Emily and Maurus (7435) Wanya, a daughter, Marisa Nellie, June 22.

To Karen Melgaard (9221) and Conrad Stayner (5513), married in Lake Tahoe, June 26.