

# Sandia researchers make world's fastest engine

*Microsurgery and weapon applications among plans for these minuscule machines*

By Al Stotts

Media Relations Dept. 12621

What may be the world's fastest engine is not much larger than the thickness of a few human hairs, but it is capable of powering other devices such as microsurgical tools.

Developed by Sandia researchers, the engine is based in part on micromachining techniques developed at the Berkeley Sensor and Actuator Center in California. The Sandia mechanism has an innovative linkage that for the first time can convert linear motion to rotary motion for delivering continuous mechanical power to other micromachines.

In slow motion, the device looks like an old steam locomotive with its connecting rod driving a toothed gear that is only 50 microns

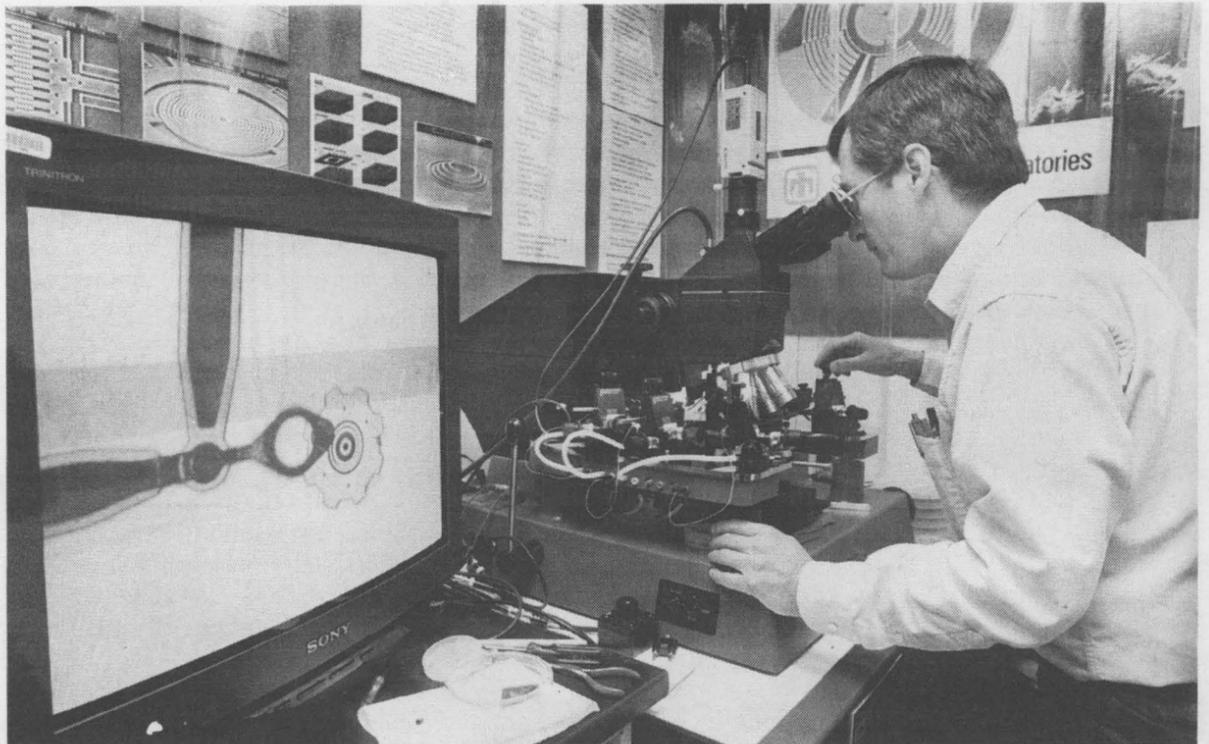
— or one five-hundredth of an inch — in diameter. By comparison, a human hair is about 75 microns thick.

"We think we have the fastest electrically driven rotating machine anywhere," says Ernie Garcia of Electromechanical Components Dept. 2641. "We know it's performing in the range of hundreds of thousands of revolutions per minute, but we're not prepared to say exactly until we get firm data from tests we're doing."

Because of its tiny size, the engine can attain record speeds, perhaps up to 500,000 rpm, without flying apart. Few other manufactured devices can exceed even 100,000 rpm.

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*"It's performing in the range of hundreds of thousands of revolutions per minute."*



**TINY DYNAMO** — Ernie Garcia (2641) peers through a microscope at a tiny machine he and fellow researcher Jeff Sniegowski (1325) developed that is fabricated at Sandia's Microelectronics Development Laboratory. Microsurgery is one potential application for the tiny machines, which are believed to attain speeds of up to 500,000 rpm. The toothed gear seen on the screen is only 50 microns — one five-hundredth of an inch — in diameter. By comparison, a human hair is about 75 microns thick. (Photo by Randy Montoya)

## Sandia National Laboratories **Sandia LabNews** Vol. 46, No. 25 December 16, 1994



**TOP LEADERS** — US Senator Pete Domenici with Sandia President Al Narath at the beginning of Domenici's address to Sandians Monday afternoon. Domenici said DOE and DoD have come up with a major, long-term mission for Sandia and the two other nuclear deterrence labs — "science-based stewardship." See story on page 4. (Photo by Randy Montoya)

### Compressed workweek pilot program to begin Feb. 1 in two divisions

Some New Mexico employees in Defense Programs Div. 5000 and Energy and Environment Div. 6000 will begin piloting a new compressed workweek schedule Feb. 1, 1995, according to an announcement that was scheduled to be distributed to all Sandians this week.

A Labs-wide implementation is targeted for May 1, according to the announcement from Human Resources VP Charlie Emery (3000). However, Sandia's bargaining units must first agree before any represented employees can participate. A special compressed workweek team that has been planning the program will begin immediately working with Labor Relations Dept. 3010 and the bargaining units to discuss and bargain appropriate contract issues.

A January *Lab News* article will discuss the compressed workweek issue in more detail, and town meetings will be scheduled in the next few months to explain procedures to employees and managers and to answer questions.

During the next few months, the compressed workweek team will also be working with all Sandia vice presidents to explore each division's concerns and to create guidelines for man-

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'Affirmative procurement' closes the Labs' recycling loop **6**

John Taylor writes history of 100-year-old New Mexico church **8**

# This & That

Who are Sandia's "real movers?" - I asked in the last issue if anyone can top Bob Graham's (1152) record of occupying the same Sandia office (in Bldg. 806) for more than 23 years. No one spoke up at Sandia/New Mexico, so we'll consider it a New Mexico record, but the Sandia record apparently belongs to Dan Ross (8284) at Sandia/California. Dan's had his office in the Electrical Standards Lab, Bldg. 913/Rm. 112, for more than 28 years.

Now I'm wondering which Sandian has had the most office locations, and who among 10-year-plus employees has moved the most times in the past 10 years. I've had six different offices in the past 10 years, but I'll bet that isn't tops. If you think you may have one of these records, send me a note at Mail Stop 0413 or fax it to 844-0645. (When counting, please don't count moving your desk within the same general office area as a move; let's define a move as a room or building number change.)

\* \* \*

Really wrong number! - To keep myself out of trouble, I'll report this without comment, but Jeff Everett, Manager of Sites Planning Dept. 7256, would appreciate everyone turning to page D96 of the latest *Sandia Directory* and fixing the misprint of his phone number. Please change it to 883-3407. The number listed for him now is for an Albuquerque psychiatric hospital.

\* \* \*

He's a word guy - Former *Lab News* Managing Editor Charles Shirley (12610) is quoted in the Nov. 28 issue of *Fortune* magazine. On page 193, *Fortune* reporter Daniel Seligman attacks the "Your call will be answered in the order in which it was received" statement you get on some customer-service answering devices. Seligman denounces it primarily because a single call cannot be "in order," and the statement drives some English purists nuts. Seligman then quotes Charles Shirley (a self-described "semipurist") who commented about this weighty matter on an Internet affiliate that works to resolve grammar problems. Charles says the "in order" phrase reminds him of the old saw: "The Indians of the Amazon always walk single file. At least the one I saw did."

Charles says he's honored to be quoted in *Fortune* in this context, but adds that Sandians should not call him for financial advice, because he knows lots more about English than money.

\* \* \*

Retiree directory reissued - In an economy move several years ago, Sandia decided to stop publishing a retiree directory, which didn't please most retirees. Well, buck up, retired folks! Your voices have been heard. A new directory is being printed and will be mailed soon. It will contain addresses for all Labs retirees, numbers to call for benefits information, and more. Retirees should receive their new directory within the next few weeks, says Olivia Moya of Benefits Administration Dept. 3344.

\* \* \*

See you Jan. 6 - If the staff holds up over the holiday break (Dec. 24-Jan. 2), and our desktop publishing system doesn't freeze up, we'll publish our next issue Friday, Jan. 6. Here's hoping you and yours have a safe and happy holiday break. - Larry Perrine

## Sandia expenditures contribute a billion-plus to New Mexico & California economies

Sandia pumped more than \$1.1 billion into the New Mexico and California economies in fiscal year 1994 (ended Sept. 30), counting employee salaries, commercial purchases of goods and services, retiree pensions, and taxes.

The \$1.1 billion does not include medical, dental, or other employee/retiree benefit payments.

In New Mexico, where the Labs employed 7,485 full-time equivalent (FTE) employees at the end of FY94, Sandia contributed more than \$950 million to the economy. This includes approximately \$400 million in salaries, \$45 million in pensions, commercial purchases of \$470 million, and \$45 million in state gross receipts taxes. (The New Mexico salary figure includes salaries for several employees who report here, but who are located in other states.)

The Labs contributed \$175 million to the California economy in FY94. Salaries for the 1,007 FTEs totaled \$55 million, pensions totaled about \$5 million, and purchases were \$115 million.

Sandia's commercial purchases from all sources in FY94 totaled \$880 million (including \$585 million in purchases from New Mexico and California companies). Almost half of the total commercial purchases, or \$435 million, were made from small businesses. Purchases from vendors classified as small, disadvantaged businesses were nearly \$90 million, and the Labs purchased \$65 million in goods and services from women-owned businesses.

## ★ Congratulations

To Joanna (10505) and Paul Frumkin, a son, Daniel Jacob, July 23.

To Robbie (10505) and Javon Evanoff, a daughter, Mallory, Oct. 30.

To Lori and Rush (9816) Robinett, a son, Rush Robinett IV, Nov. 23.

To Caryn (10501) and John (9132) White, a son, John Alexander, Nov. 25.

To Dora (1811) and Mark (1277) Derzon, a daughter, Shana Lucille, Nov. 27.

## Sandia LabNews

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Published Fortnightly on Fridays by  
Employee Communications Dept. 12622, MS 0413

MARTIN MARIETTA

## Bomb squads 'had a blast' at Sandia

Members of the nation's top bomb squads are touting the "mitts-on" instruction they received during a unique training conference held in Albuquerque in August.

"The response has been overwhelmingly positive," says Chris Cherry (9333), who created "Operation Albuquerque," cosponsored by Sandia and the Albuquerque Police Department (*Lab News*, Sept. 2).

During the week-long event, 28 bomb technicians representing some of the nation's most elite bomb squads — including the FBI and US Secret Service — tackled realistic bomb-disablement scenarios all over Albuquerque. Each scenario was "played" as if the bomb and situation were real.

Chris says the event trained technicians in various advanced bomb disablement technologies — including the Percussion-actuated Non-electric (PAN) disrupter, developed at Sandia under a Work for Others project for the FBI — and will make the technicians' jobs safer.

In a letter addressed to Labs President Al Narath, New Mexico State Police Chief John Denko writes: "The advanced instruction in the field of bomb disposal that the team members received was superior to any other instruction

that they have had."

Detective Joe Pau of the Los Angeles Police Department Explosives Unit called the Sandia bomb facsimiles "the most realistic and sophisticated devices" he had seen and writes: "Each bomb technician that participated in Operation Albuquerque was fortunate to see the next generation of explosive devices that the bombers will be making for the next ten years."

### 'May literally save a person's life'

Pau continued, "This training was truly beneficial to the working bomb technicians, and the information received from this type of training may literally save a person's life."

Other Sandians involved in Operation Albuquerque included Paul Cooper, Rod Owenby, Sue Spear, Olden Burchett (all 9333), Joe Arellano, Mike Baca, John Dunkin, Bobby Jones, Marty Jinzo, John Montoya (all 9333-1), Gilbert Gonzalez, and Richard Durant (both contractors).

Chris says most of the letters he received ended with a request that Sandia hold another conference next year. "We're looking into doing another one next year, with some refinements," he says. — John German

# Lasers may monitor toxic metals inside smokestacks

**Unique laser-spark technology measures emissions directly**

By Mike Sheehan

Lab News Correspondent

When it comes to cleaning up the environment, Sandia researchers are developing a real flare.

By adapting laser-spark spectroscopy (LASS) technology, Sandia has created a continuous emissions monitor (CEM) that will enable DOE facilities, manufacturing plants, incinerators, and glass vitrification units to measure toxic metals contained in the gases from thermal waste treatment streams. The new prototype uses a focused, pulsed laser beam that rapidly heats the metal particles, creating a spark or "fireworks" effect of energized material. Because each metal emits light at different wavelengths or colors, the CEM can actively detect and measure tiny amounts of target species — including the 11 metals regulated under the Clean Air Act — to ensure Environmental Protection Agency compliance for a particular facility.

"Our CEM is the only technology that has the potential to measure emissions directly in the smokestack — in situ," explains Nina Bergan French, program manager of the Metal Emissions Monitor Project in Technology Applications Dept. 8113. "Current methods require plant operators to extract a sample of

the thermal waste stream, then manually analyze it in a lab. It takes two to four weeks to get the results back, and some facilities spend up to \$50,000 a week conducting measurements. In contrast, CEM provides accurate, real-time monitoring on a continuous basis."

In addition, Bill Flower of Exploratory Systems Dept. 8111 emphasizes that the CEM allows facilities to understand how changing the operating conditions, such as increasing or decreasing the waste

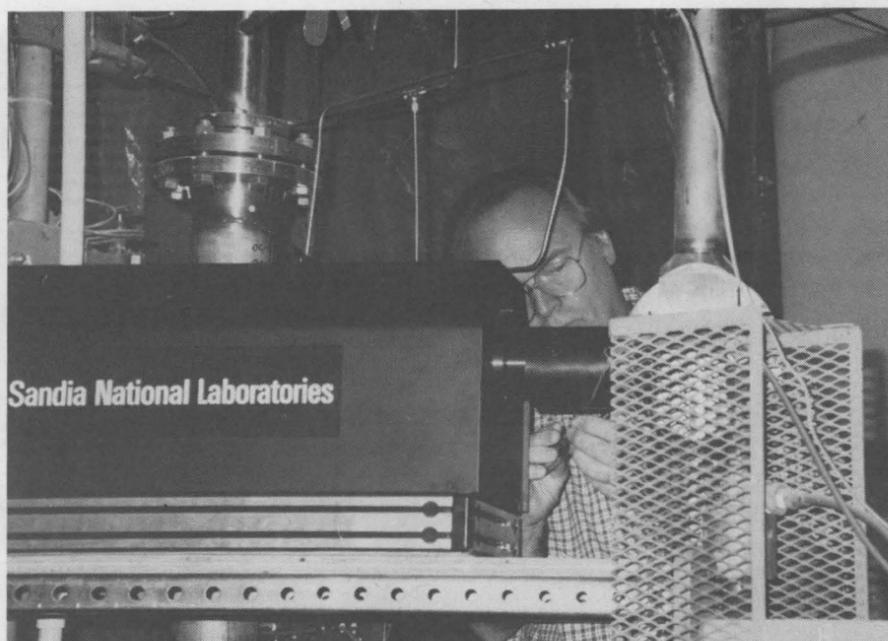
feed-rate, affects toxic emissions.

"The real beauty of this new technology is that plant operators can begin to understand a cause-and-effect relationship in their process," says Bill, principal investigator for the three-year, \$1.8 million project. "They can use the monitor to help optimize the design and operation of the treatment process to minimize emissions and maximize efficiency."

## Detecting minute parts of metals

Nina points out that the project team, which also includes Larry Peng (8713), Ron Renzi (8111), and Ken Hencken (8362), has set three major goals for developing and testing a second-generation LASS/CEM prototype monitor during 1995: improved detectability limits, more precise calibration techniques, and enhanced field ruggedness.

"In terms of enhanced detectability, we're talking about extremely small amounts of metals," she says. "For example, measuring one-tenth of a part per billion is equivalent to finding one misspelled word in a single-spaced, double-sided document two miles thick. Our goal is to achieve a factor of 10 times improvement in the current CEM's ability to detect lead, manganese, mercury, cadmium, and other regulated metals."



CLEMSON TEST — Ken Hencken (8362) performs final alignment of the prototype metal emissions monitor during field testing at Clemson University.

## Sandia California News

In addition, the team will develop a technique to calibrate the instrument during field use, and create a more robust CEM design capable of continuous operation in a plant environment with minimum maintenance. Sandia is working closely with industry to commercialize the LASS/CEM technology.

"The ultimate goal is to allow facilities to check emissions and display concentration results on a computer screen within seconds of taking a measurement," Nina says. "We are particularly interested in incorporating this method in new, innovative waste treatment technologies, such as plasma hearth furnaces and vitrification units that make glass out of inorganic sludge. We will also work with the DoD during FY95 and 96 to apply this technology to its demilitarization facilities. By working in close partnership with industry, we hope to make LASS/CEM a commercially viable product that will help treatment processes satisfy regulatory and public demand for assured compliance."

## LEAP collects \$159,000

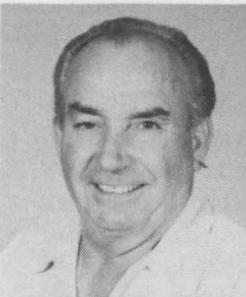
Some 34 local charitable agencies plus the United Way, Combined Health Appeal, and the Tri-Valley Community Fund will have a brighter future in 1995, thanks to hundreds of Sandians who pledged more than \$159,000 in the annual Livermore Employees Assistance Plan (LEAP) fund drive.

LEAP '94 chair Rene Bierbaum (8116) reports that 833 Sandians pledged \$159,300 during the 1994 campaign. Their pledges averaged \$191.24 each, an increase of 2.3 percent over 1993, despite the fact that total giving was down about \$2,000. There were 211 Sandians who increased their giving over 1993, and 74 people gave for the first time.

The number of "undesignated" pledges, those letting the LEAP committee decide where to spend the funds, jumped from 28 percent in 1993 to 45 percent this year. This means an increase in dollars for the 34 area charitable groups chosen by the employee committee.

A LEAP feedback survey from next year's chair, Jane Ann Lamph (12120), was mailed to California employees recently, and results will be announced.

## Employee death



TONY SOUZA

Antone "Tony" Souza of Modification Team II in Maintenance Engineering Dept. 8613 died Nov. 13 from cancer. He was 63.

He was a structural technician; he had worked at Sandia/California for 25 years.

He is survived by his wife, a son, a daughter, and his parents.

## Successful prototype tested at Clemson

For four days last August, Sandia researchers cooperated with the joule-melter vitrification project at Clemson University and DOE's Savannah River facility to complete a successful test of the first prototype metals emissions monitor. The Sandia team measured emissions from the joule-melter while it processed waste-water treatment sludge. According to Bill Flower (8111), data from the test provided the first insight into how emissions change in real-time as operating parameters, such as waste feed rate, are altered. Other key results achieved during the test:

- The continuous emissions monitor (CEM) readily detected stack emissions of calcium, boron, silicon, and other materials from the melting process in the glass vitrification unit.
- Increased stack emissions of materials contained in the glass were observed as water or wastes were added to the melter.

- The monitor measured cadmium, lead, and manganese — metals regulated under the Clean Air Act — in the stack emissions when these metals were introduced to the input waste stream at levels of 0.05 percent to 1 percent.

- Higher stirring during the glass vitrification process appeared to result in lower metal emissions.

"The Clemson staff members were excited by our ability to provide real-time information on metal emissions, as well as data showing the effect of operating conditions on these emissions," Bill says. "Our Clemson test represented a major step toward demonstrating the utility of the laser-spark monitor to provide information useful during the engineering development of advanced thermal waste treatment facilities."

Other Sandians contributing to the project include Dan Trujillo (8111), Howard Johnsen and Dave Ottesen (both 8713).

# 'Science-based stewardship' new long-term mission of the three nuclear labs, Domenici tells Sandians

By Ken Frazier

Lab News Managing Editor

US Senator Pete Domenici told an overflow audience of Sandians Monday that DOE and DoD have come up with a credible, major, long-term, 30-year defense mission for the "three great nuclear deterrent laboratories — Sandia, Los Alamos, and Lawrence Livermore."

He said it would be called the "science-based stewardship" program, and that it should begin to provide stability to the Defense Programs (DP) budgets of Sandia and the other two labs. The DP budget funds much of the core research and development at Sandia and the other labs. This advanced research and development helps power civilian as well as defense technological advances.

The new mission would stem naturally from the labs' historic missions of nuclear deterrence and stockpile stewardship and "nourish a great, great core of fantastic scientists with great, great potential," he said.

He said he was happy to report that the President's FY1996 budget is moving toward recognition of a science-based stewardship program to preserve and keep modern and safe the nuclear stockpile. "We are very hopeful that funding will be up, between \$200 million and \$400 million [for all three labs] for that mission," said Domenici.

## Mission will stabilize labs

"That means that we will stabilize for the first time on this mission with the new concept of science-based stewardship, built around these labs for the safeguarding of the nuclear weapons system."

Domenici, introduced by Sandia President Al Narath as an influential leader of good judgment, knowledge, and enthusiasm who is respected "on both sides of the aisle," spoke at a special Sandia colloquium in the Technology Transfer Center auditorium. When the 104th Congress convenes in January, Domenici will again assume chairmanship of the Senate Budget Committee, after a period as ranking



SENATOR PETE DOMENICI

minority member.

He left little doubt he would use his regained influence to support the long-term vitality of Sandia and the other two labs.

All signs indicate that the US will retain 3,000 to 4,000 nuclear weapons for at least 25 to 30 years, he said, and stewardship of those weapons will be "a big, big job." The work of maintaining them for such a long period, assuring and certifying their safety and performance regularly to a very high degree, will require that their key components continually be remanufactured and modernized, and that new, streamlined "intellectually driven" processes for doing so will need to be developed.

The new concept represents a shift to research, development, and maintenance and away from production. The need to develop more efficient, more streamlined ways to continually modernize and manufacture those components will require new facilities, he said. "If we build this concept into this laboratory, we may be building the manufacturing center of the future," a revolution in the way things are designed, perfected, and made — "in all

integrated circuits. The prototype is being powered "off chip" through a computer, but the goal is to combine it with microelectronics to create a "smart" electromechanical device.

"Integrated circuit fabrication provides a direct analogy to the gains that are expected from microfabricated electromechanical devices," Ernie says. "Integrated circuits have produced order-of-magnitude decreases in cost over discrete electronic components while simultaneously providing order-of-magnitude increases in performance, reliability, and ruggedness. Since the invention of the integrated circuit, the range of applications for them has surpassed even the most optimistic initial estimates. We believe the same will be true for micromachines."

And, adds Jeff, "Similar to integrated circuits, thousands to millions of complex electromechanical devices can be batch fabricated at one time. This batch fabrication, in turn, drives the cost of individual devices down by factors of hundreds or thousands of dollars."

Ernie and Jeff envision additional miniaturization of computer memory hard drives and numerous applications in transportation, security, and inspection technologies. They even expect to see self-assembling devices with computing power that would be capable of assembling other micromachines.

respects, a revolution."

Domenici noted that some have suggested the three labs be converted to purely civilian uses but said this was a naive view. Without a genuine defense-related mission of 30 to 40 years duration, there will be no labs, he said. "You've got to have an anchor," he said. A long-term defense mission is that anchor, and it allows the labs to carry out both that defense work and more civilian-related research.

Domenici's remarks came in the context of the recent national election, which he said showed people want less government. And that means, he said, that both the Congress and President Clinton are going to be trying to make government smaller. In the meantime, the Cold War mission of the labs had not been replaced by any other long-term permanent defense-oriented mission. The "science-based stewardship" program should provide that mission, he said, adding that it will make good use of the "vitality, creativity, promise, and potential" of the three labs.

## On related issues:

Domenici said recent political stirrings that DOE should be broken up are based on a "a lot of fuzzy" understanding in Washington about DOE. Often people don't understand that DOE has responsibility for the nation's nuclear weapons program. He said he was very hopeful that Congress "would think twice" before turning its back on the Truman Doctrine, which established responsibility for nuclear weapons within a civilian agency rather than within the Defense Department.

The economy is undergoing a transformation and is doing "fairly well," he said. The economic recovery is productivity-driven, he said, and that means the "wealth pot" of America is growing. Nevertheless, people are very anxious about change that affects their future and about their personal safety, which affects how they feel about life today. "Cynicism abounds. . . . It's hard to be a political leader today," he said, but added that he does plan to run again, for a fifth term. He joked that he was glad to note that term limits were ranked 11th among 12 concerns of Americans in a recent poll — "otherwise I might be out of here already."

## Fastest engine

(Continued from Page 1)

Potential defense and commercial applications of the power source include medical uses such as unclogging arteries; destroying abnormal cells; or surgical procedures inside eyes, ears, or perhaps even the brain. In addition, researchers envision the technology being applied to miniaturization of safety components in nuclear weapons, which would make retrofitting parts easier and allow for easier collocation of parts of similar function, among other benefits.

"The potential effects of micromachine technology on US defense and industrial products is enormous in terms of cost savings and performance increases," says Ernie. "In fact, the ability of the US to compete in world markets in the future will depend heavily on micromachine technology."

## Developers see wide-open possibilities

Ernie's research partner on the project is Jeff Sniegowski of Silicon Technologies Dept. 1325. The micromachine is fabricated at Sandia's Microelectronics Development Laboratory on the same kind of silicon wafer used to make

## Pilot workweek

(Continued from page 1)

agers to use when deciding whether alternative schedules will meet their business needs.

Information circulating earlier this year indicated that a compressed Sandia workweek would probably mean that most employees would work a "9/80" schedule — 80 hours in nine weekdays and get a three-day weekend starting every other Friday. This week's announcement, however, does not mention the specifics, but compressed workweek team leader Susan Harty (3531) says the specifics will be announced to employees as soon as possible.

The team has set up a special phone number that employees can call to ask questions or give input. The phone will be answered in person, Tuesdays through Thursdays 1-3 p.m. Mountain Time. It is equipped with voicemail so employees can leave questions and input at any time. The number is 844-3263.

Charlie Emery's announcement notes that a two-thirds vote of nonexempt employees in California is necessary to implement a compressed workweek there. California law requires it.

— Larry Perrine

# First experiment of its kind finds key airliner inspection technique is reliable

**Sandians evaluate airline industry safety inspections in the field**

By Julie Clausen

Media Relations Dept. 12621

A Sandia study has determined that a common inspection technique used to detect cracks in aircraft is reliable in spotting damage before it becomes severe, although performance levels vary significantly among inspectors and inspection facilities.

More than half the inspectors observed at nine major commercial airlines and maintenance facilities around the country achieved detection rates exceeding 95 percent for cracks measuring 0.1 inch, the target minimum length for routine detection. With larger cracks, the probability of detection was even higher.

Inspectors were evaluated by Sandia researchers as part of an assessment of the reliability of inspection of aircraft by the eddy current method. Sponsored by the Federal Aviation Administration (FAA), the study is one of the first major projects of the FAA's Aging Aircraft NDI Validation Center, operated by Sandia at Albuquerque International Airport. (NDI stands for nondestructive inspection.)

It represents the first experiment in civil aviation history to assess the reliability of inspections performed outside the laboratory. All inspections took place in actual maintenance facilities amid the noise, lighting problems, and other distractions an inspector would typically experience.

"Overall, the inspectors were capable of doing a very good job," says Floyd Spencer of Statistics & Human Factors Dept. 12323, co-author of the report with Donald Schurman of Science Applications International Corp.

Eleven of the 45 inspections (24 percent) were accomplished without missing any cracks exceeding 0.1 inch. Distractions, intermittent equipment problems, reduced accessibility to the panels, and painted surfaces all appeared to affect detection rates negatively.

"Many of the inspectors overcame less-than-optimum field inspection conditions while achieving reliabilities near those obtained under laboratory conditions," Floyd says.

## Aging aircraft a national concern

Inspection of aircraft, especially aging aircraft, is a matter of national concern. The average age of aircraft in the US commercial transport fleet is now about 13 years. Aircraft manufacturers, airlines, and the FAA have all established programs to address these concerns.

Inspectors were evaluated using a 23-meter-long simulated fuselage section containing the kinds of flaws that would be found on an aircraft after thousands of takeoffs and landings. The panels logged 20,000 miles around the US between April and August 1993 in visits to American Airlines, Dalfort Aviation, Aloha Airlines, Tramco, Alaska Airlines, United Airlines, Delta Airlines, US Air, and Miami NDT. To secure industry cooperation and to guarantee that individual inspection results could not be used against the facility or the inspectors,

experiment results are not linked to any one facility.

The study found that:

- Differences in performance among facilities and individual inspectors were significant. Some of the influencing factors were accessibility, whether the inspection surface was painted or bare, and instrument calibration practices."

- Some inspection "misses" were independent of crack length. Large cracks that were missed in many of the inspections were likely a result of factors such as momentary distractions or occasional equipment problems.

- Although all inspectors were trained in eddy current inspection techniques, many were not trained on the specific equipment they were using. "A better understanding of equipment capabilities would result in better inspections," according to the study.

- Some of the variability observed between facilities and inspectors can be attributed to differences in procedures, both in use and calibration of the equipment.

The FAA, US airlines, and aircraft manufacturers are using the results to improve maintenance practices and procedures. The FAA will also use them in assessing gains that may come from advanced NDI techniques validated by Sandia at the Aging Aircraft NDI Validation Center.

## Eddy current method pinpoints cracks

High-frequency eddy current inspections are an integral part of routine aircraft maintenance checks. The widely used technique uses magnetic fields to detect cracks along the seams of an aircraft's fuselage. The seams,



**CHECKING FOR CRACKS** — Ken Harmon, a team supervisor in Sandia's Aging Aircraft Project Dept. 2757, demonstrates the eddy current inspection method on an aircraft fuselage at the Federal Aviation Administration's Aging Aircraft NDI Validation Center, operated by Sandia at Albuquerque International Airport. A Sandia study evaluated the reliability of the method at nine major facilities around the country.

which are held together by rivets and adhesives, are vulnerable to corrosion and fatigue. Cracks may indicate the beginning of structural failure.

Small, isolated cracks typically do not present a problem. However, numerous adjacent cracks can grow and link with one another, resulting in a catastrophic "zipper effect" such as occurred in 1988 when an Aloha Airlines passenger jet's roof peeled off during flight. The airliner made it back to Hawaii, but a flight attendant was sucked out and killed.

Sandia's experiment was designed to evaluate the capability and reliability of eddy current inspection procedures as they are done routinely at airline maintenance and inspection facilities. The inspectors chose which equipment and procedures to use.

Data were also gathered on environmental conditions within the facilities and the training and background of inspectors — the so-called "field" and "human" factors that may affect inspection performance.

## ! Take Note

Generous people look for opportunities to help the less fortunate at all times, but especially during the holiday season. Here's a United Way of Central New Mexico agency to consider: The Domestic Violence Shelter can shelter up to 80 people and averages 60 at any time. However, during the holidays, often more than 100 are sheltered. The shelter needs personal items, such as toiletries, clothing and shoes (women's and children's), children's art supplies, diapers, beds, bedding, office and school supplies, nonperishable food and kitchen items, dishes, etc. Projects needing volunteers include landscaping and yardwork, painting and repair work, computer training for residents and staff, general office help, electrical, plumbing, carpentry, child care, casework, counseling, bookkeeping, speaker's bureau, and community awareness activities. For more

information about donating items, money, or time, please call Kathy Silva (3611) on 844-6281 or Krista Edmonds (7312) on 844-1474.

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Big Brothers/Big Sisters of Albuquerque is recruiting volunteers to serve as role models and companions to children of single-parent families in Bernalillo, Sandoval, Valencia, and Torrance counties. Big Brothers/Big Sisters works with children who are at risk of dropping out of school, joining gangs, drug and alcohol abuse, and teen pregnancy. Its goal is to make a difference in these children's lives before such problems develop. There are 300 children on the BB/BS waiting list. If you think you might be interested in being a friend, companion, or role model to one of them, please call Big Brothers/Big Sisters on 837-9223.

# 'Affirmative Procurement' closes the recycling loop

## Team promotes buying green

By Mary Hatheway

Lab News Writing Intern

Sandia uses 77 million sheets of virgin paper (no recycled content) every year. That means that every Sandian on average uses about 40 sheets of virgin paper each day.

And that's only the tip of the iceberg, says Robyn Davis of Pollution Prevention Dept. 7576. Each year it takes about 8,000 trees, 3.2 million gallons of water, 1.9 million kilowatt hours of electricity, and 4,600 cubic feet of landfill space to meet Sandia's paper use and disposal needs. And, although much of this paper is eventually recycled, many of the resources spent on producing the paper are

### Four ways you can help 'close the recycling loop'

- Purchase recycled paper for printers and copy machines
- Use both sides of paper when making copies
- When practical, review computer documents on the screen instead of making hard copies
- Refer to the new catalog for recycled products (available next month) through Just-in-Time

## Medical Care Plan premium deduction

As previously announced, beginning Jan. 1, 1995, all Sandia employees will be required to share cost of medical coverage for their eligible dependents. According to the contract between DOE and Martin Marietta Corporation, employees retiring before Jan. 1 will not share in the cost for their dependents' medical coverage, but active employees and employees retiring on or after Jan. 1 will. Employees or retirees currently paying a portion of their medical coverage or additional cost of a more expensive health maintenance organization (HMO) plan will continue to pay extra premiums.

The monthly cost is based on the number of dependents covered under your medical plan only, not the dental or vision plans. You will pay nothing if you have no dependents, \$17/mo. for one dependent, and \$28 for two or more dependents. If you retire on or after Jan. 1 and your dependent has primary Medicare coverage, you will pay \$5 per month for that dependent.

If your dependent is a Sandia employee or a Sandia retiree, you do not count him or her as a dependent for calculating premium cost. If your spouse works at Sandia for less than 25 hours per week, then you need to count him or her as a dependent. Do not count Class II dependents for whom you currently pay a premium.

The cost will be deducted from employees' weekly paychecks in four equal installments each month. During the months with a fifth paycheck, no deduction will be taken from the additional paycheck. The first installment will be deducted from paychecks to be issued on Jan. 5. The deduction will be \$4.25 per week for one dependent and \$7 per week for two or more dependents.

For more information, call Richard Garcia in Sandia/New Mexico Benefits and Work/Family Benefits Dept. 3343 on 845-9704 or Jo Sandelin (3343) in Sandia/California on 294-2073.

gone forever.

Robyn is chairperson of Sandia's new Affirmative Procurement Team, a group of Sandians trying to conserve resources by educating employees about purchasing and using recycled products, and by making them available for purchase. Affirmative procurement means purchasing products made from recycled materials instead of products made from virgin materials when price and quality are comparable.

Robyn says the impetus for establishing the team was an October 1993 executive order mandating affirmative procurement programs for all federal agencies. DOE's subsequent release of even more stringent procurement guidelines, along with Sandia's recent change from the Kirtland landfill to the city's Cerro Colorado landfill, have, according to Robyn, increased the urgency of the affirmative procurement issue at Sandia.

"What we have is an edict from the President and the Department of Energy requiring that we start buying recycled products, but no mechanism to implement the necessary changes," she says. "Our Affirmative Procurement Team is helping Sandians meet those guidelines."

### Team eyes year-end EPA deadline

Meeting the Dec. 31, 1994, deadline for achieving minimum EPA standards for recycled material content in paper is one issue the team has been tackling. Other projects include printing Sandia's phone directory on recycled paper, encouraging Sandia's cafeterias to switch from disposable ware made of "forever foam" to recycled foam and paper products, and publishing a catalog of environmentally preferable products to be furnished to secretaries along with the Just-in-Time catalog in January 1995.

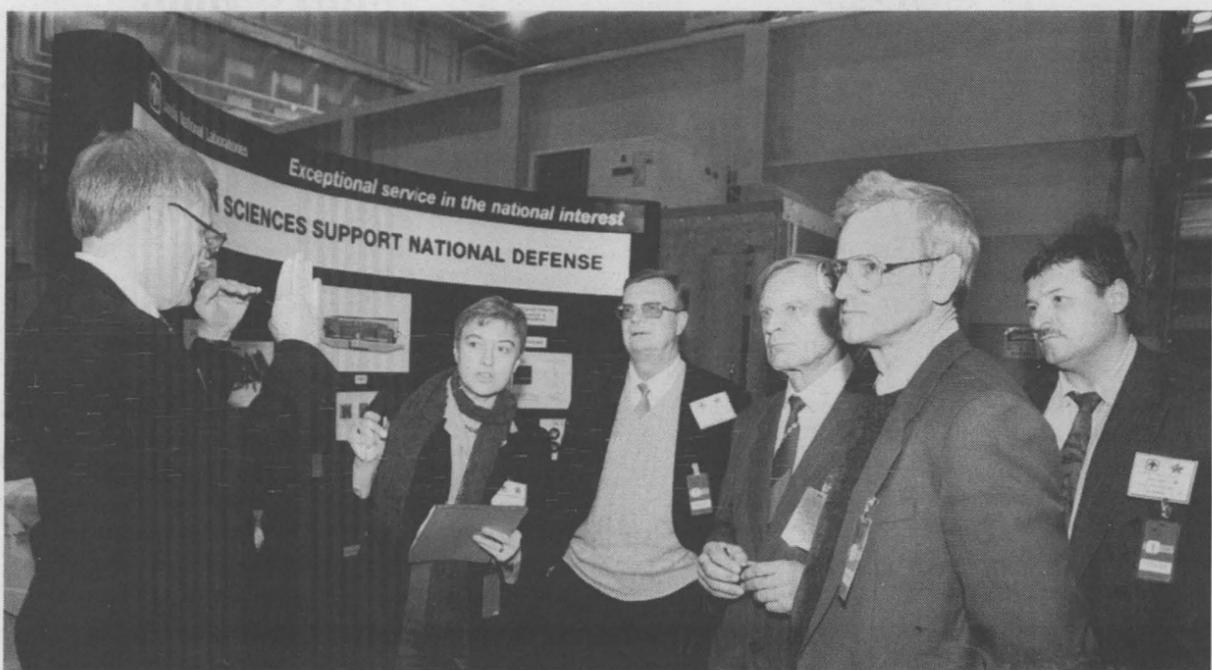
But recycled paper is not the only product for which the EPA has established procurement guidelines. By Dec. 31, 1998, minimum recycled content standards must also be met for concrete, re-refined oil, tires, and building insulation. Although the team is concentrating on



PAPER CHASE — Robyn Davis (7576) leafs through paper at a recycling collection point at Sandia's property reapplication yard. Sandia recycles 240 tons of paper a year, but buys back only a fraction of that as recycled paper products.

the paper issue now, it plans to address affirmative procurement of other materials in the near future.

"Eventually, we'd like to see affirmative procurement established as Sandia policy," Robyn says. "Right now, though, we're focusing our energies on making Sandians aware of the need to buy recycled products and working with our Procurement Center to make more recycled products available."



RUSSIAN NUCLEAR SCIENTISTS — Jim Powell (9300, left) explains testing on the Hermes III accelerator to Vladimir Nechai, Director of VNIITF (All-Russian Research Institute of Technical Physics) and colleagues during their four-day visit to Sandia. VNIITF was the second nuclear weapons institute established by the Soviet Union. It is located in Snezhinsk, formerly known as Chelyabinsk-70, one of the "closed cities" of the Soviet Union, now opened to Westerners. Nechai is in the center, wearing a sweater vest. With him are (from left) interpreter Elena Bloomstein; and VNIITF officials Yuri Kuznetsov, first scientific deputy director; Aleksandr Senkin, chief designer; and Oleg Buryakov, deputy director on conversion and international relations. Professor Nechai, a specialist in theoretical nuclear physics and director of VNIITF since 1988, also gave a Sandia colloquium on the development, current state, and prospects for the future of VNIITF. While at Sandia the visitors toured Sandia facilities for microelectronics, pulsed power, simulation testing, and cooperative monitoring. They also discussed with Sandia officials Sandia/VNIITF collaborations and a variety of issues such as protection and control of nuclear material and environmental protection.

## Feedback

### Radial keratotomy coverage limited

*Q: I recently investigated the possibility of having an outpatient surgical procedure called a radial keratotomy performed to improve my eyesight. This procedure has been around for more than 15 years and is far from experimental. I found that Sandia will only pay for this procedure (of approximately \$2,000) under the extreme circumstances that your vision is uncorrectable to 20/70 with glasses.*

*While mine is correctable to 20/20, my eyes are in excess of 20/800 and the strain of working at a computer for long periods often is very tiring. I also found out that a local grocery chain, covers the procedure at 100 percent for their employees. If our benefits are as excellent as we hear, shouldn't they be as good as the neighborhood grocery store?*

*A: You are correct in saying the surgical procedure to correct astigmatism, known as radial keratotomy, is no longer considered by many physicians to be an experimental procedure. Even so, radial keratotomy does have considerable potential complications and is not advised in many cases. However, the Medical Care Plan does cover radial keratotomy if it is determined to be medically necessary and if it is not performed for convenience or for cosmetic reasons.*

*A guideline used by the Medical Care Plan to review for medical necessity states that the visual acuity of the patient must be uncorrectable with a lens to at least 20/70. If vision in either eye can be corrected with a lens to 20/70 or better (e.g., 20/60, 20/50, 20/40), then a radial keratotomy is not considered medically necessary. In many health care plans, radial keratotomy is not covered under any circumstances. The grocery chain cited indicated that its health plan does not*

*cover this procedure under any circumstance.*

*Also, Sandia offers an excellent occupational health team and ergonomics group that can assess worksites on individual bases. These evaluations may result in recommendations for relief of specific tensions such as eye strain from computer terminal usage. Employees with problems like that cited above may call the medical reception desk on 845-8692 to arrange a clinic appointment for evaluation.*

*Ralph Bonner (10500, formerly 3500)*

### Shared health care premiums

*Q: Employees retiring after Jan. 1, 1995, will be required to pay shared health care premiums. Will the premiums for retirees in this group who are younger than 65 remain the same after the Sandia health care plan becomes secondary to Medicare at age 65? If not, what will be the formula?*

*Second, in time, the shared health care premiums will surely increase for regular employees. Will they also increase for post-Jan. 1, 1995, retirees who are paying shared premiums? If so, by what amount?*

*A: Employees retiring after Jan. 1, 1995, will be required to pay health care premiums for their covered eligible dependents. When dependents reach age 65, and Medicare becomes primary to Sandia health care, premium sharing will be reduced to \$5. This amount will be adjusted when the contribution rate for employees is also adjusted. Currently, this rate will not be adjusted until Jan. 1, 1997.*

*The \$5 premium was calculated as follows:*

*For retirees under age 65, the Sandia health plans reimburse approximately 80 percent of the actual charges (after all appropriate deductibles, co-insurance and coordination of*

*benefits have been deducted). For retirees and dependents of retirees over age 65, Medicare pays primary, with the Sandia health plans reimbursing approximately 20 percent of actual charges. To determine what portion of the premium sharing should be charged for dependents over 65, the 20 percent is divided by the 80 percent, equaling 25 percent. Using the current \$17 rate, 25 percent of \$17 is \$4.25, which is rounded to the next highest whole dollar; \$5, resulting in the \$5 rate for all Medicare primary dependents of employees who retire after Dec. 31, 1994.*

*Post Jan. 1, 1995, retirees will contribute the same amount toward the premium for covered dependents under age 65 as regular employees will. When a retiree reaches age 65, Medicare will become primary, and the retiree will pay a percentage of the current premium share amount (see above referenced formula). Currently, DOE would like the premium sharing to be approximately 10 percent of the cost to provide dependent coverage. Sandia's intention is to negotiate, with DOE, as low a premium as possible.*

*Jann Levin (3343)*

*(Note: See related article on page 6.)*

### What hours 'nonoperational'?

*Q: Most of Sandia's building doors have signs that read: "These doors alarmed during nonoperational hours. Call security . . ."*

*What are our nonoperational hours? I never know whether to call or not.*

*A: Nonoperational hours are defined in the Sandia Site Safeguards and Security Plan as 7 p.m. to 6 a.m. Monday through Friday, and 24 hours on weekends and holidays. Safeguards and Security (SAS) begins securing buildings and setting alarms at 6 p.m.*

*Because some Sandia organizations work shifts spanning 24 hours a day, seven days a week, it is imperative that these employees have access/egress capabilities at all times. SAS has the responsibility of assessing and responding to alarms, which is why employees may be asked to notify Security when leaving a secured area.*

*Frank Gallegos (7400)*

### Eubank gate needs speed limit

*Q: There used to be a 25 miles per hour speed limit sign on Eubank just north of the curve that leads to the Eubank gate. Lately I have seen drivers coming from Eubank and around the curve quite fast. This is not bad during non-peak times when there are no Kirtland Security Police standing in the middle of the road; the Security Police seem to realize this and wave people through.*

*However, this is potentially dangerous to the occasional halted vehicle and when there are Security Police in the middle of the road directing traffic. People driving around the corner have no idea there might be such hazards and usually don't mind the 15 mph speed limit of the gate.*

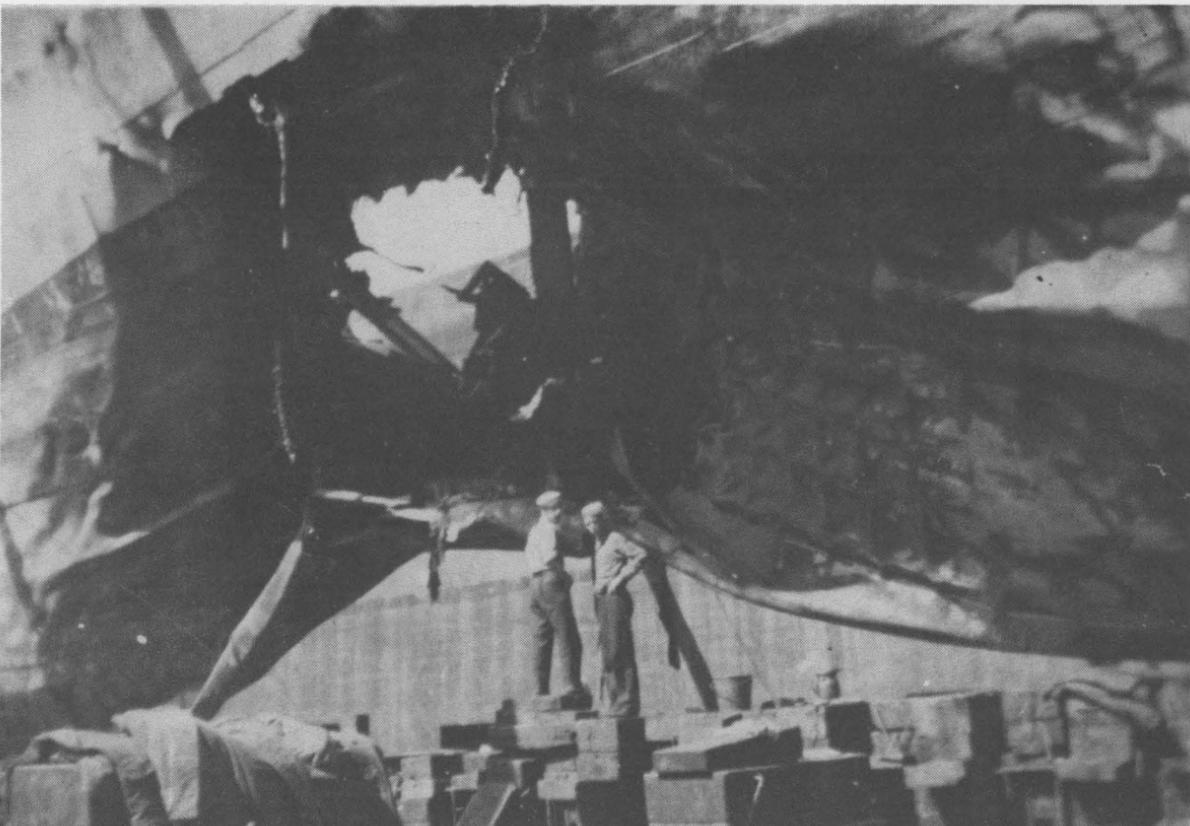
*I suggest the return of the 25 mph sign north of the curve and the addition of a "Reduced Speed Ahead" sign between that sign and the traffic light north of the curve. Both of these signs will remind people of the slower speed necessary to negotiate the gate safely. I realize this may be a city issue, but I think it is important in order to prevent a serious accident.*

*A: Thank you for bringing this to my attention. In order to speed up responses to unsafe traffic conditions feel free to contact the Sandia Traffic Committee directly by calling Wayne Burton (7256) on 883-3367 or Gus Arellano (7732) on 845-9977.*

*The city traffic engineer has scheduled installation of speed limit and curve warning signs along the approach to the gate. [They had not been installed as of publication deadline.]*

*Wayne Burton (7256)*

## Favorite Old Photo



This photo shows the hole blown in the bow of my ship, the USS *Mansfield*, a destroyer, by a North Korean mine in Wonsan Harbor on Sept. 30, 1950. The Korean War started June 25, 1950, and that same day we left Sasebo, Japan, for Korea. Around Sept. 13, the *Mansfield* was outside of Wonsan Harbor, North Korea, in preparation for the invasion of Inchon. We were one of what were called "sitting duck" destroyers, situated to draw enemy fire for the invasion. On Sept. 30, we hit a North Korean mine. The mine exploded at the bow, below the water line, and blew up our ammunition magazine. Many of my shipmates were injured. We had to go into drydock in Sasebo for temporary repairs. That's where this picture was taken. I knew the two shipmates in the photo. After more extensive repairs to the ship in Bremerton, Wash., I went for a second tour of Navy duty. In April 1951, we escorted General MacArthur's ship halfway from Tokyo to Wake Island, where he met President Truman. After getting out of the Navy, I worked as a commercial printer in Albuquerque and then came to Sandia in 1978. Sandians may be interested to know that before my time on the *Mansfield*, I served a year (in 1949) as an engineer/fireman on the USS *Iowa*, the battleship that a few years back suffered a tragic gun turret explosion that Sandia investigated. — Onofre Candelaria (13418)

# Sandian delves into history of old local church

## Amateur historian intrigued by Peralta's past

Although John Taylor (5006) doesn't speak Spanish, the words "La Dedicacion de Peralta" in a century-old newspaper were a sight for his sore eyes.

John had already spent hours at the library looking through old documents when that headline in *Revista Catolica* caught his eye. The article confirmed that the Catholic church in Peralta, N.M., (about 10 miles south of Albuquerque) had been officially dedicated in 1892.

Although a 100-year-old church may not be that remarkable in New Mexico, John's discovery was a triumph of sorts. He had attended "Our Lady of Guadalupe" in Peralta since 1979 but never could pin down its age.

"When I asked the other members of the parish, some said the church was about 50 years old, some said 100, and some said 200," he says. "So I decided I'd go to the library and find out for myself."

But John's cursory research didn't ring many bells. Although the nearby churches at Tomé and Isleta were well documented, the history books gave nary a mention to the church at Peralta.

### Sentence by sentence

So John began to study Peralta's history in his spare time. He looked through card catalogs and photo files at public libraries and museums. He spent evenings at the National Archives while on business trips to Washington, D.C., poring over microfilm and genealogical data.

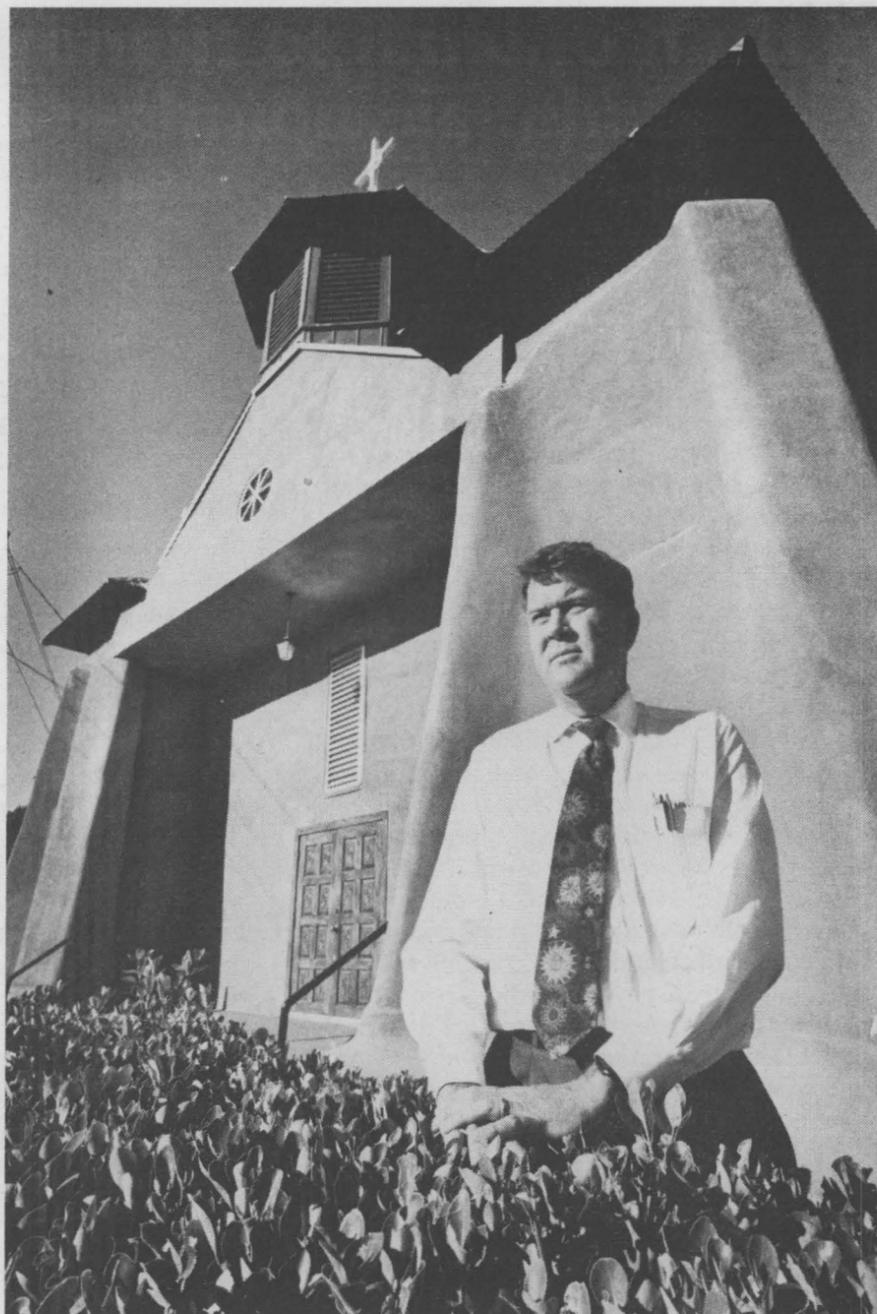
He took trips down memory lane with congregation elders. "A lot of them remember things about the community, but they say the church has always been there, always been the same," he says. "This church has been a rallying point for this community for more than a century."

One sentence at a time, he began to write the history of Our Lady of Guadalupe.

He discovered that the church property was donated by the wealthy Otero family and that a private sacristy had existed on the property several decades before the church was built.

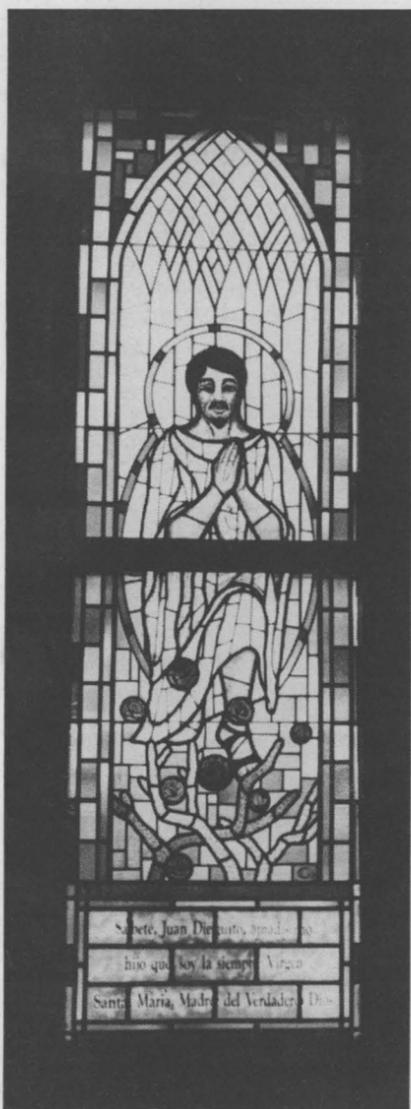
He traced the Peralta area's past from the early 1300s through the

*(Continued on next page)*



John Taylor (5006) has studied the 100-year history of the Catholic church at Peralta. The pitched roof and steeples were added in 1912.

### Photography by Randy Montoya



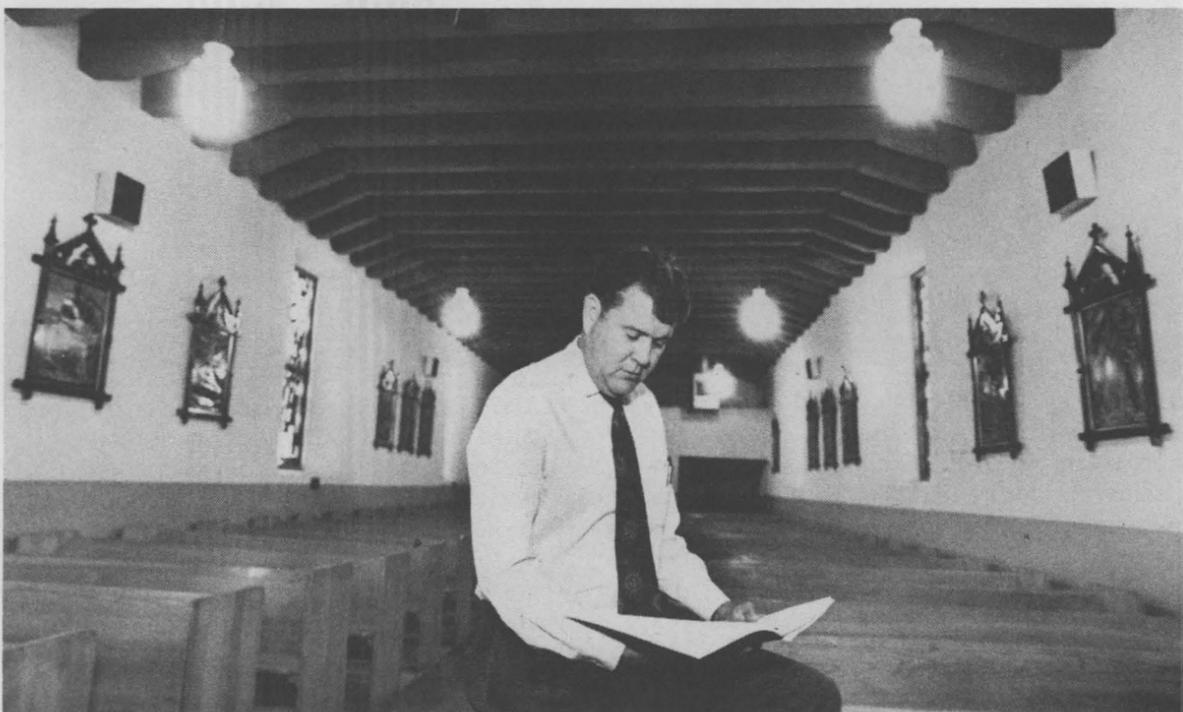
New stained glass windows, made by an Albuquerque artist and donated by members of the congregation, were added to the church during recent renovations.



Our Lady of Guadalupe circa 1900. The bell, shipped from St. Louis in 1892, remains at the church today.



Our Lady of Guadalupe today. The cruciform buttresses are uncommon in southwestern churches.



The interior of the Peralta church is modeled after the older church at Tomé. The wooden vigas were cut and hauled from the Manzano Mountains. The original roof was made from a mixture of hay and oil cloth.

# Want to be a science pen pal? Join 'Science-By-Mail' program

**Bob Graham recommends 'exciting' experience**

"Thank you so much for everything you sent me. It's the nicest thing anyone ever sent me."

"I am thrilled to be your Science-By-Mail pen pal."

If you like to communicate your excitement and knowledge about science to young people and want to engage in some one-on-one correspondence that stimulates their interest in science and brings comments like these, then the Science-By-Mail program may be for you.

Bob Graham of Advanced Materials Physics & Devices Dept. 1153 participates in the program. The comments above came in letters to him. He's found it so satisfying and stimulating that he wants to encourage scientists from Sandia, DOE, and University of New Mexico to become a science pen pal to youngsters throughout the nation.

"All of us, especially at a national laboratory, have a responsibility to communicate science to the general public, especially young people," Bob says. "Science-By-Mail is an opportunity to return something to my home community. It's been a stimulating and exciting experience for me, and I highly recommend it to my scientific colleagues."

Science-By-Mail is coordinated through the Museum of Science in Boston and funded by the National Science Foundation, private industry, and donations. Its goal is to interest a wide variety of children in science and to change the stereotypical image of scientists.

Each scientist who enrolls is assigned four or five groups, with one to four young people per group.

Bob's a pen pal to students in his hometown of Uvalde, Texas, near Houston. It's been rewarding to him to work with youngsters there. "It's nice. You have a personal connection. The idea is to make scientists look like the

real people they are."

The young people receive activity kits that contain a booklet, hands-on experiments, science notes that outline the scientific principles involved in each packet, and a "Big Challenge."

The scientist begins by writing a short letter to each group. "This is a chance to personalize scientists to students," says Bob. "You tell them a little about yourself personally, then tell them something about the kind of science you do." The volunteer scientists are asked to respond to any letters from the students within a week or two.

Bob says the kids like to get materials. To every youngster in his pen-pal groups who wrote to him (seven did) he sent color prints of the famous "string of pearls" photo of the fragments of Comet Shoemaker-Levy 9. They loved it, and it helped stimulate their interest in the Jupiter impact event. "I saw and read everything that had to do with the comet crash," one wrote him. "It was simply marvelous. I can't describe it." Another asked: "What if it [the comet-crash] were us it's hitting and not Jupiter?" (It's a good question. Mark Boslough [1433] and three Sandia colleagues gave a paper on that at the 1994 Hypervelocity Impact Symposium in Santa Fe. See *Lab News*, Oct. 28.)

And one of the girls, Becky Lynn Cockerill, age 10, sent Bob her own drawing of the Jupiter impact. She includes on it the watchful face of "Dr. Graham."

To become a volunteer scientist in the program, contact: Science-By-Mail, Boston Museum of Science, Science Park, Boston, MA 02114; telephone 800-729-3300. Bob has brochures with addresses for different regions and says he'll be glad to talk to any Sandian or local scientist who seems interested. He's on 844-1931.

—Ken Frazier

(Continued from preceding page)

Pueblo revolt of 1680 and Mexican reconquest of 1692. He studied the area's sole Civil War skirmish, the so-called Battle of Peralta in 1862, which took place just a mile north of the church in what is now Bosque Farms.

He found anecdotes recounting the great flood of 1879, which presumably halted the church's construction for a time, and of the town drunk tolling the church bell at 3 a.m. "That was when the rope hung outside," he says.

And he studied the origins of each of the church's "accoutrements of worship" — statues, stations of the cross, bell, etc.

## A coincidental centennial

But by far the most important product of his research was the age of the church, says John, because by coincidence, the church was nearing the century mark when he made the discovery in 1987. "That allowed us to plan a centennial, which resulted in a whole year of community building in Peralta," he says. "I really feel good about that."

John's research has been compiled in a 120-page book, titled *Our Lady of Guadalupe Parish History Project*, now in its second edition.

He hesitates to call himself a real historian, because writing the book was a "matter of pulling a lot of stuff together," he says.

Still, his research into Peralta's past has kindled an interest in Civil War history. John's next book, scheduled to be published by UNM Press next fall, covers the Battle of Valverde,

which occurred in February 1862 south of Socorro, N.M. (See box.)

After that, he says, he'd like to write a book called *The Physics of Soccer*. (John is also a high school soccer referee.) But, he says, that depends on "what my wife lets me do."

—John German

## John Taylor to discuss the Battle of Valverde

John Taylor (5006) will discuss the Battle of Valverde, one of two significant Civil War battles to take place in New Mexico, on Tuesday, Dec. 20, 4:30-5:30 p.m., in Bldg. 836, Rm. 104A. Everyone is welcome.

## Welcome

**Albuquerque** — Joe Baxter (4112), Gary Hoe (7906), William Kitsos (7915), Mary Neale (6000), Linda Wood (7615)

**Other New Mexico** — Ellen Dombroski (6347), Michael Valley (2752)

**New Jersey** — Shawn-Yu Lin (1312)

**North Carolina** — Raymond Beets (7577)

**Virginia** — Yukiko Sekine (13316)



this month in the past...

**Sandia  
LAB NEWS**

**45 years ago...** In December 1949, some employees formed a Sandia Corporation Brass Band "to serve the employees in parades, athletic events, picnics, and scheduled concerts." Personal news was big in the company newspaper in 1949, and it was sometimes political. From the SLF (?) Department: "Harry Hunter . . . has recovered from a week's illness for he is back in good form and making derogatory remarks about Democrats. We don't think we will ever convert him." (Retiree Harry Hunter died in 1965.)

**30 years ago...** The *Lab News* featured ballistic weapon test work at Sandia's Tonopah Test Range (TTR). Tests consisted of rocket firings and both high- and low-altitude drops from aircraft. The Nevada facility was quite active at the time (1964), conducting three to five tests a week. About 680 drop tests and 555 rocket tests were conducted at TTR between February 1957 and December 1964. TTR remains open today, but less testing is done now.

**20 years ago...** A new "down-firing" gun used in the Labs' "terradynamics" program was featured. The Sandia-developed gun was tested near Edgewood, N.M. It fired projectiles into the ground to generate data about how far they penetrated and how different types of rock and soil affected deceleration of projectiles. The barrel was 35 feet long, and the gun could accelerate a 300 lb., 6-in.-diameter projectile up to 3,000 ft/second. This gun and newer versions were used for years thereafter at the Tonopah Test Range. (Current news reiterates the importance of this work. Last week, US Deputy Defense Secretary John Deutch proposed a new counterproliferation initiative program plan that includes developing payloads to destroy deeply buried targets housing weapons of mass destruction.)

## Take Note

Retiring and not seen in Lab News pictures: Robert Anderson (5167), 37 years; Bruce Barnaby (1143), 24 years; K.D. Boultinghouse (9612), 37 years; Laurino Campbell (7613), 26 years; Berry Estes (6513), 22 years; Herb Floyd (12612), 36 years; Mary Gonzalez (2476), 26 years; Frances Griego (1333), 15 years; Gibson Guernsey (2481), 40 years; Ronald Husa (2314), 34 years; Marie Iverson (2900), 29 years; Catherine Lee (12111), 12 years; Donald Love (12810), 31 years; Adolfo Maes (10232), 38 years; Blanche Ottinger (9322), 26 years; Ziggy Piscotty (13314), 27 years; Karen Shane (12640), 26 years; John Shane (5167), 30 years; William Sullivan (6502), 34 years; Jack Walker (6501), 30 years.

## Sympathy

To Kent Meeks (5166) on the death of his mother, Virginia Ann Meeks, in Tyler, Tex., Dec. 3.

To Dolores Sanchez-McGlotten (5822) on the death of her brother in Albuquerque, Dec. 3.

To Clyde Northrup (7251) on the death of his sister, Evelyn Northrup, in Phoenix, Dec. 7.

## Recent Retirees



Frank Conrad 42  
5848



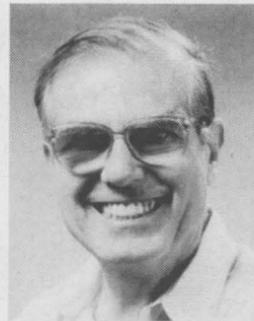
Bill Hartman 37  
9602



Jim McDowell 34  
5123



John Sisneros 42  
10402



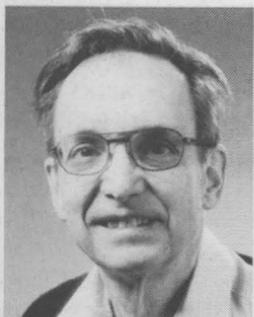
Sanders Dolce 28  
9308



Bryan Cason 37  
7584



James Johnson 35  
6306



Jim Plimpton 33  
9301



Kyle Williams 40  
2481



Sherwood Duliere 36  
12336



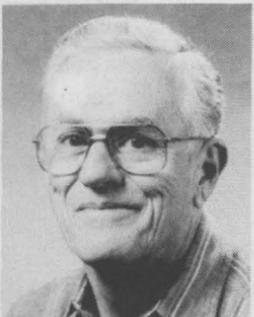
Frank Biggs 35  
9312



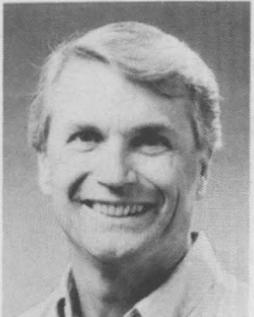
Jan Frey 14  
6119



John Garcia 38  
2483



Richard Wahlberg 38  
9613



Joe Abbin 30  
5093



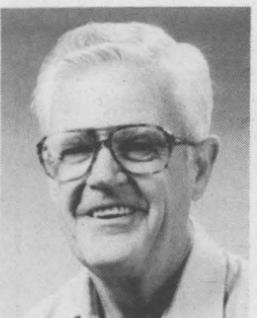
George Perkins 36  
10402



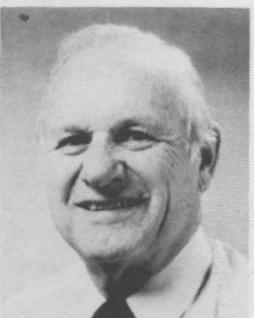
Al Chabai 36  
9311



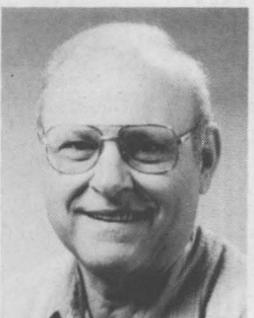
Bruce Caskey 36  
13911



Leroy Sparks 37  
12361



Bob Dougherty 36  
13902



John Brane 34  
2781



Sam Martin 33  
2641



Bob Hughen 32  
5900



John Schamaun 33  
5941

## Sandia News Briefs

### Sandia, RIMtech team up on electromagnetic landfill imaging

Working with scientists in Geophysics Dept. 6116, RIMtech Inc., a Colorado company, has commercialized an approach to identifying subsurface landfill contamination. Using mining technology originally designed for coal surveying, researchers can obtain three-dimensional views of chemical waste landfills, providing information about the porosity, saturation, and chemistry of soil at contaminated sites. The basis of the imaging process is non-destructive electromagnetic signals sent from transmitters submerged in boreholes to both subsurface and above-ground receivers. The data is compiled in a manner similar to medical tomographic imaging, where a series of flat cross-sectional images are combined by computer to provide a three-dimensional image. The system has been demonstrated on actual hazardous wastes buried at Sandia's Chemical Waste Landfill. David Borns (6116) says that the technology has applications for environmental surveying, as well as possible applications for enhanced oil recovery.

### DOE math and science training program offered to rural middle school teachers

Rural middle school science and math teachers throughout New Mexico are invited to apply for DOE's Teacher Opportunities to Promote Science (TOPS) program conducted by Sandia and Los Alamos national laboratories. TOPS is geared to rural educators who have little access to technical resources and professional development opportunities. It provides teachers with skills necessary to set up successful hands-on science learning experiences in their classrooms. Participating teachers attend summer institutes and follow-up workshops during the academic year. Teachers receive graduate credit, lodging, and transportation reimbursement, plus stipends for the summer institute, classroom materials and equipment, and technical assistance at their school sites. Applications are due Feb. 1. For more information, contact the Sandia Education Outreach Department at MS 1351, Albuquerque, 87185, or call 889-2325.

Send potential Sandia News Briefs to Lab News, Dept. 12622, MS 0413, fax 844-0645.

### Retirement open houses

Sandia is holding open houses for the following retirees: **Frank James Conrad** (5848) in Bldg. 822, Conf. Rms. A/B, on Friday, Dec. 16, 8:30-11:30 a.m.; **Edward Gonzales** (7814) in the Area 1 Cafeteria (Bldg. 861) on Friday, Dec. 16, 2-4 p.m.; **Ned Keltner** (2761) in the Area 1 Cafeteria (Bldg. 861) on Monday, Dec. 19, 2-4 p.m.; **Richard Wahlberg** (9613) in Bldg. 822, Conf. Rms. A/B, on Monday, Dec. 19, 2-4 p.m.; **Karlton Boultinghouse** (9612) in Bldg. 822, Conf. Rms. A/B, on Tuesday, Dec. 20, 2-4 p.m.; **John Sisneros** (10402) in the Area 1 Cafeteria (Bldg. 861) on Tuesday, Dec. 20, 2-4 p.m.; **Ken Grant** (7911) in the Coronado Club Fiesta Room on Tuesday, Dec. 20, 4:30 p.m.; **Kenneth Payne** (5147) in the Coronado Club Zia Room on Wednesday, Dec. 21, 4-7 p.m.; **Sherwood Duliere** (12336) in the Area 1 Cafeteria (Bldg. 861) on Wednesday, Dec. 21, 2-4 p.m.; **Al Jacobson** (2503) in the Coronado Club Eldorado Room on Wednesday, Dec. 21, 5-7 p.m.; **Melvin Brock** (12365) in the Area 1 Cafeteria (Bldg. 861) on Wednesday, Dec. 21, 9-10:30 a.m.; **Kyle Williams** (2481) in Bldg. 892, Conf. Rm. 216, on Thursday, Dec. 22, 9-10:30 a.m.; and **Edward Clark** (2742) in the Area 1 Cafeteria (Bldg. 861) on Thursday, Dec. 22, 2-4 p.m. Refreshments will be served. Friends and acquaintances are invited.

# Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

## MISCELLANEOUS

- ELECTRONIC KEYBOARD and stand, Yamaha PSR150, lots of voices and special features, like new, used very little, \$150. Kercheval, 864-6549.
- LAYOUT/DRAFTING TABLE, Plan Hold, 42" x 30", white, w/parallel bar, pencil tray, lower knee tray, \$100. Drennan, 897-7153.
- CHILDREN'S BUNKBEDS, including mattress, good condition, \$60. Chavez, 842-6374 after 6 p.m.
- COMPUTER SOFTWARE, Lotus 1-2-3 for Macintosh, w/audio training program, latest version, unopened, \$40. Lagasse, 298-0977.
- WOMAN'S ROLLER SKATES, Trac, red and white, size 7, good condition, \$15. Jajola, 242-8459.
- BERNINA SEWING TABLE, for Bernina sewing machines 700 & 800 series, like new, \$35. Wing, 898-0062.
- SKI BOOTS, Salomon SX-92 Equipe, white/black/blue, men's size 8-1/2 to 9-1/2, cost \$350, asking \$100. Schkade, 292-5126.
- WOMAN'S DIAMOND RING, 14K white gold, 1.06ct. center stone, 4 side stones are 0.11ct., total weight is 1.31ct., best offer. Besse, 275-0841.
- TAHOE TIMESHARES (2), south shore, 5-star resorts, base of Heavenly Ski Resort, w/hot tubs, on-site pool, covered parking, sleeps 2-6. Ingwerson, 510-455-5024.
- BICYCLE WIND TRAINER, Supergo, converts road bike to stationary bike, like new, \$50. Smith, 243-0714.
- PET CARRIER, small; luggage carrier; backpack; auto-top ski carrier, all in good condition. Baca, 884-4622.
- ACOUSTIC GUITAR, Tama TG160, all solid exotic woods, Brazilian rosewood, German spruce, mahogany, ebony, magnificent & mint, \$6,500. Eden, 821-3759.
- PRINTER, HP Deskjet, w/font cartridges, 128K RAM cartridge, software, \$150. Huddgens, 865-3796.
- DRUMMERS, accessorize your drum set, w/Tama high-pitch, 4-piece Octaban, w/stand, \$250; snare drum, w/stand, \$50. Rogers, 293-5726.
- MOTORCYCLE JACKETS, red leather Hein Gericke, men's & women's large, \$300/pair; woman's turquoise/silver belt buckle, \$150. Shane, 294-4920.
- GUITAR, Ibanez Performance, ovankol wood, limited edition, comes w/5KB case, both new, must sell, \$475 OBO. Robertson, 294-2652.
- SEGA GAME GEAR, 2 games, new, \$125; 401 Tunturi Walker, \$50. Parker, 866-1468, leave message.
- ELECTRONIC KEYBOARD, Yamaha, 49-key, \$45. Edmunds, 856-6918.
- MICROWAVE OVEN, 1500 watt, 1.5 cu. ft., browning element, temperature probe, carousel added, excellent condition, \$115. Guttman, 888-5114.
- WOODBURNING STOVE, long-burn capacity. Garcia, 343-8207, ask for Steve.
- OAK BEDROOM FURNITURE, Early American reproduction, dresser w/ogee mirror & nightstand, great shape, \$550. Hass, 299-3506.
- SUPER VGA MONITOR, 14-in. Princeton Graphics Ultrasync, for Macintosh or PC, \$175; Cobra Radar Detector S-K, \$50. Smith, 856-1567.
- GALVANIZED WATER TANK, 500-gal., \$800. Jajola, 869-5946.
- WHITE MINK JACKET, w/fox trim, like new, appraised \$1,590, will sell for \$800 OBO. Abadie, 821-0523.
- GERMAN SHEPHERD PUPPY, white, great gift, male or female, \$125, must see. Gutierrez, 877-1076 or 242-2562.
- ANTIQUE, 30's Zenith multiband radio/turntable, cabinet, \$150; 1918 Brunswick wind-up record player, wood cabinet, \$300; HO train/table, \$50. Axness, 296-4691.
- COMPUTER, AT&T 6300, w/color monitor, \$125; Wagner Paint-n-Roll roller, \$10. Hall, 298-8617.
- WASHER, Whirlpool, 20 years old, works fine, 4-cycle, \$60. Breeding, 260-0820.
- TREADMILL, 1 year old, DP Health Mate, 1-hp, 5-mph. Haid, 292-0159.
- FORMAL FLOWER GIRL DRESS, size 12, rose lace over rose satin, matching shoes, worn once, paid \$140, will take \$75. McDuffie, 292-0459 or 263-5578.
- FORD FLATHEAD 238 V8 engine & two transmissions, runs, recently rebuilt, came out of '49 Ford, \$200. Langwell, 865-3059 evenings.
- EXERCISE BICYCLE, lifestyle 575, dual-action ergometer, like new, \$125. Meloche, 296-1452.
- CAL-SPA HOT TUB, \$4,000; twin bedroom set, wood, \$500; trumpet, like new, \$200; cockatoo & cage, \$2,000. Smith, 344-5886.
- COMPUTER, Leading Edge 286, 30MB HD, 3-1/2-in. & 5-1/4-in. floppies, mouse, Sound Blaster, speakers, Word 6.0, VGA color monitor, \$350. Lockwood, 821-6331.
- RUGER 10/22, wood folding stock, vent guards, flash suppressor, 6 clips, assault rifle case, more, \$280 OBO. Cunico, 892-8365.
- COMPUTER SYSTEM, IBM-clone (Mega), w/35MB HD, super VGA monitor, Panasonic dot matrix printer, lots software, \$350. LaBarro, 821-1957.
- WOODWORKING WORKBENCH, small, maple, w/one drawer, 45 years old, \$95. McConnell, 268-3109, leave message.
- SAAB 900 ACCESSORIES, used, 4-piece blue carpet floor mats, custom windshield reflector, headlight, hydraulic back-lift arm, \$75. Corey, 294-6337.
- RANGE & DISHWASHER (undercounter), 4-burner electric range, both almond, Whirlpool, good condition, \$75 ea./\$125 both. Fahrenholtz, 291-0948.
- PERSONAL COMPUTER, Packard-Bell 286, color monitor, CD ROM software, 5-1/4-in. & 3-1/2-in. floppy drives, printer, mouse, more software, \$700. Schofield, 292-7220.
- TWO SPEAKERS, 50 watts, Optimus slimline, \$30; travel iron, \$5. Tilgner, 848-0662.
- MUSIC BOX COLLECTION, spring motor-driven, small, 12 various sizes, cute styles, free to good home. Horine, 266-4534.
- BUNKBED, red metal, twin over full, frame only, \$80 OBO. Koepf, 294-7136.
- DINING ROOM TABLE, w/4 chairs, \$400; matching washer/dryer, Kenmore, almond, \$300; refrigerator, 2 yrs. old, \$575; cat climbers, \$40. Salazar, 281-0560.
- ENLARGER, 4 x 5, \$90; steering wheel, \$15. Goodwin, 294-6702.
- SKI BIB, black, child's size, X-large by Ossy; red & black satin clown, 15 in. long, w/porcelain head, from Europe. Wagner, 823-9323.
- TEAC DUAL CASSETTE DECK, excellent condition, \$50; Cordata 8088 PC, \$100. Olman, 884-4663.
- ORGAN, Baldwin Orga-Sonic, walnut, very good condition, price negotiable. Beatty, 299-3429.
- METAL DESK, L-shaped, XT5, Commodore PC10, (IBM-XT clone), \$75; Amana microwave oven, \$30. Harstad, 298-6551.
- THREE TIRES, P235/75R15, on rims, plus two extra rims, \$100. Ewen, 836-3563.
- TRAK SKIS AND BOOTS, cross-country, fairly new, good condition, "N" bindings, men's size 10, \$50. Anderson, 265-7460.
- KICKERBOX, two, 15-in. "Power" woofers, 300-watt max, 4-ohm.; 100-watt "Pyramid" crossovers included, charcoal gray, \$125. Aguilar, 844-8343.
- SKI & TRAM SEASON PASSES for Sandia Peak, \$350 OBO for set. Schultz, 821-5158, ask for Lyle, or 291-1600 days.
- FREE KITTENS, Pinky, Sam, Henry, Bandit, Whiner & Misty, need homes for Christmas, box-trained, 7 wks. Waddoups, 865-7952.
- MAHOGANY BAR, portable, 39"H x 26"W x 15"D, mint condition, two mixing surfaces, 24 recessed glasses (2 sizes), \$1,200 in store, \$375. Deuel, 344-0411.
- MICROWAVE OVEN, Tappan, 700-watt, turntable, auto defrost, programmable, 23.5"W x 17"D x 15"H, black front and woodgrain sides, used, \$115. Hatch, 281-0543.
- WINCHESTER 101, lightweight, 12-gauge over & under shotgun, 7 choke tubes, \$780; Alumamax 2-gun case, \$85. Klett, 884-8354.
- TROMBONE, Bundy, excellent condition, w/case, \$100. Wilson, 281-6493.
- SONY TV, 48 in., remote control, rear projection, excellent, \$1,100 OBO. Hindi, 296-6510.
- QUEEN-SIZE BED, oak, pedestal, w/6 drawers; unfinished oak nightstand, 22"W x 20"D x 21"H, one drawer, \$125 for both. Brooks, 275-0056.
- OSTER KITCHEN CENTER, blender, mixer/doughmaker, saladmaker, food processor, w/touch-control panel, accessories, instructions, cookbook. \$120. Prins, 867-9440.
- ROADSTER TRIPLE-GOLD RIMS, w/tires, 13x7, brand new, only fits a Buick, Olds Cutlass, Monte Carlo, Grand Prix, \$1,300 OBO. Navarrete, 823-1788.
- FREE SUPER-SINGLE WATERBED, mattress, heater, no liner, 12 under-drawers, excellent condition. Sevier, 883-1263.
- LOWERY ELECTRONIC ORGAN, music books, lesson material, bench. Watson, 298-2374.
- TV/STEREO ENTERTAINMENT CENTER, all wood, oak, paid \$1,200, will sell for \$300; stepper, \$100. Smith, 275-8185.

**Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 12622, MS 0413, or fax to 844-0645.**

### Ad Rules

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

- PA SPEAKERS, Peavey SP-3, full range, rugged reinforced transportable enclosures, single 15-in. woofer, 1-in. driver, high-frequency horn, reasonable. Ramirez, 291-9657.
- SPA, '91 model w/ozonator, excellent condition, seldom used, Rovel interior, seats six people, \$2,400. Castillo, 294-5182.
- BOOKCASE HEADBOARD for twin bed, w/dark honey-oak veneer, \$50. Lee, 256-0239.
- DOUBLE SOFA SLEEPER, \$285; 2 wedding gowns, size 5, one white & one ivory w/veil, \$100; rabbit fur coat, size 5, \$75. Clavey, 292-7667.
- HIDE-A-BED, \$75 OBO; electric typewriter, \$35; high chair, stroller, playpen, expanding child gates, car seats, make offer. Nation, 298-5605.

### Deadline change

The next *Lab News* will be published Jan. 6. Deadline for ads and other submissions is 4:30 p.m., Thursday, Dec. 22.

- CARTOP SKI RACK, BarreCrafter, locking, gutter mount, \$40; DP300 Bodytime multigym (rower-type), good condition, \$25. Murata, 887-8459.
- CD ROM FOR COMPUTER, single speed, external w/interface & speakers, \$150, some titles, extra. Floran, 237-2620.
- PUPPIES, Rottweiler-cross, 6 wks. old, \$35 without shots. Lamb, 281-6903.
- SOFA & LOVESEAT, popular pattern, w/light Southwestern colors, looks new, has stain guard, recently cleaned, very comfortable, \$575 for both. Jackson, 275-2524.
- BABY GRAND PIANO, Lester, mahogany, excellent condition, \$3,600 OBO. Dieter, 296-8287.
- HANDMADE TAOS BED, w/twin mattress, \$200; child's table & 2 chairs, maple/oak, \$90; coffee table, \$30. Sweeney, 247-4866.
- SOLID-WOOD TABLE, drop leaf, w/four chairs, \$150; oak computer desk & arm chair, \$175, all like new. Henry, 296-1781.
- KITCHEN TABLE, drop leaf, \$60; stereo/speakers in cabinet, \$100. Porter, 884-4577.
- PHOTO PRINT DRYER, electric, Arkay, 16" x 24", \$10. Shunney, 265-1620 mornings.
- GIRL'S BEDROOM FURNITURE, desk, dresser, nightstand, \$125; TV, \$40; misc. items. O'Neill, 292-6192.
- COLOR TV, Sears, 25-in., \$100; Commodore 64 computer, joystick, tape unit & manuals, \$25. Lundgren, 293-4697.
- SKI RACK, BarreCrafter, holds seven pairs, lockable, for van w/roof rack, \$50. Karnes, 880-1163.
- SKI PANTS, 34-in. waist, \$50; ski bibs, \$20; Century infant car seat, \$20; Graco walker; situp bench, cheap. Pregent, 281-1414.
- HUMMEL'S LAST ANNIVERSARY PLATE, 1985, collector's item, still in original box, market value over \$200, sell for \$125. Deuel, 344-0411.

- GERMAN SHEPHERD CROSS, female, spayed, friendly and affectionate, housebroken, dislikes cats and female dogs, free to good home. Brown, 271-1997.
- TUFF-BOX, locking storage for tools & misc., fits full-size pickups, practically new, \$50 OBO. Ross, 299-3023.
- LAWN MOWER, good buy. Nash, 292-7086.

## TRANSPORTATION

- '76 FIAT, dependable, 2-dr., removable hardtop, \$850 OBO. Guinn, 898-9339.
- '92 CHEV. S-10, long bed, low mileage, steel metallic gray, 5-spd. stick, loaded, excellent condition, \$9,500. Baca, 265-2881.
- BICYCLE, specialized Sirrus, 20-in., 21-spd., 6 months old, \$350. Evans, 897-7954.
- '81 NISSAN 280ZX (Datsun), 2+2, w/T-tops, loaded, only 79K miles, outstanding condition, very well maintained, \$4,250 OBO. Chavez, 275-0490.
- '85 PLYMOUTH RELIANT, 2-dr., excellent condition, \$1,600 OBO. Simons, 296-0974.
- '79 BRONCO, 351, AT, AC, PB, PS, cruise, Alpine pullout cassette, new tires, Class IV hitch, \$3,000. Cooper, 888-0967.
- '90 TOYOTA CELICA, All-Trac turbo, 4-WD, ABS, airbag, AC, sunroof, CD, leather, like new; only 33K miles, \$14,500. Smith, 856-1567.
- '86 HONDA CRX, 5-spd., \$2,800. Maez, 298-4824.
- '87 NISSAN PATHFINDER, V6-SE, 105K miles, alarm system, AC, AM/FM cassette stereo, super condition, below book value, \$8,500. Kristen, 764-8513.
- '77 DODGE ASPEN LE, station wagon, AT, AC, PB, cruise, AM/FM radio, runs well, transmission slips. Axness, 296-4691.
- '85 BMW 535i, excellent, 5-spd., sunroof, leather, cellphone, red, original, complete records, \$7,900. Baca, 292-5342.
- '66 BAJA BUG, 1600cc engine, dual port, lots of extras, center line rims, excellent condition, \$2,500. Lucero, 898-2738.
- '88 DODGE CARAVAN LE, 86K miles, V6, AC, cruise, tilt, PW, PL, PS, good condition, \$4,900 OBO. Holen, 296-0986.
- BOY'S BIKE, Free Spirit, 27-in., 10-spd., excellent condition, \$60. Lovejoy, 822-8797, ask for Mike.
- '85 TOYOTA SUPRA, excellent interior/body, recent compression test shows strong engine, below book, \$4,950. Clemena, 828-1450.
- '85 CADILLAC CIMARRON, 4-dr., excellent, SLFCU will loan \$2,950, asking \$2,500. Zaluga, 344-1564.
- '86 GMC CUSTOM VAN, price reduced, loaded, immaculate, 70K miles, high top, AT, dual-AR, 3/4-ton, V8-305, \$6,500. Aragon, 897-3878.
- BICYCLES: girl's 20-in. Murray, boy's 20-in. Huffy, very good condition, \$30 ea. Sutherland, 345-1183.
- '79 MERCEDES 300 SD, original motor totally rebuilt, clean, excellent condition, new tires, cream w/buckskin interior, \$5,250. Salazar, 281-0560.
- MOUNTAIN BIKE, 18-spd., \$30; Trek 400 bike, \$150; dirt bike, \$50. Goodwin, 294-6702.
- BICYCLE, 3-spd., needs some work. Make offer. Nation, 298-5605.
- '89 PLYMOUTH ACCLAIM, 2.5L, 81K miles, AT, AC, new tires, beige, \$3,200. Peters, 296-7390.
- '90 FORD RANGER PICKUP, approximately 75,433 miles, bids through 12/20/94, right to refuse all bids, subject to prior sale, sold as is. Sandia Laboratory FCU, 505-293-0400, ex. 344.
- '93 JEEP CHEROKEE SPORT, 4-WD, white, 2-door, 5-spd., hitch, AM/FM, AC, ski rack, excellent condition, below book, \$15,700. Shannon, 281-3038.
- '89 FORD TAURUS, 3-seat stationwagon, below book, AC, power door lock, cassette, cruise, white, good condition. McKiernan, 255-2277.
- '90 ACURA LEGEND 4D LS, fully loaded, mint condition, low 45K miles, gold color, asking \$16,950. Adams, 823-1845.
- ROAD BIKE, 12-spd., 21 in., like new, \$150. Nash, 292-7086.
- '72 OLDS. DELTA 88, 115K miles, AT, PS, PB, runs well, great fixer-upper, \$700 OBO. Paulos, 275-5926.
- MOUNTAIN BIKE, Trek 8700, 18-in., carbon-fiber frame, XT, DX, Gruppo front suspension fork, \$550 firm. Johnson, 884-1249.
- DIAMONDBACK BIKE, 20-in., \$60. Harstad, 298-6551.
- '88 MAZDA 929, 4-dr., luxury model, 89K miles, excellent condition, \$7,300 OBO. Martinez, 242-9067.

- '87 DODGE COLT, 3-dr., hatchback, AC, cassette, 30-mpg, perfect car for first-time driver, \$1,350. Pounds, 831-3317.
- '90 VW JETTA, 4-dr., power locks, windows, & steering, sunroof, low mileage, cruise, AT, AM/FM cassette, \$7,800. Rhodes, 884-8394.

## REAL ESTATE

- 2-BDR. CONDO at Purgatory, 1 mile from ski area, 2 baths, 1,450 sq. ft., great summer or winter, by owner. Hanks, 867-1745.
- TAHOE TIMESHARES (2), south shore, one week/yr. plus bonus time, can exchange for worldwide resorts, suites w/hot tubs, will consider trades. Ingwerson, 510-455-5024.
- 3-BDR. MOBILE HOME, 14' x 78', 2 full baths, large kitchen, fully carpeted, \$13,000. Nielson, 873-9235.
- 2-BDR. CONDO, exclusive far NE heights, assumable FHA ARM, 6.5%, or refinancing, \$110,000. Perez, 291-0022.
- NEW CORRALES HOME, Southwest style, vigas, tile, radiant heat, great views, 2,600 sq. ft., paved road, natural gas, CTV. Karler, 298-3265.
- 2-BDR. MOBILE HOME, '79 Centurion, 14' x 64', 1-1/2 baths, \$6,500. Irwin, 821-6871.
- 4-BDR. CUSTOM HOME, new, open floor plan, mountain views, High Resort, Rio Rancho, over 2,800 sq. ft., 1/2 acre, \$230,000. Rivera, 892-3236.

## WANTED

- APARTMENT, for short-term lease (two months) during home construction, start mid-December thru January. Goodson, 265-2080.
- ROOMMATE, male/female, responsible, non-smoker, share home near Eubank/Constitution NE, references required, no pets, \$275/mo. plus 1/2 utilities & damage deposit. Allen, 275-3318.
- NORDICTRACK EQUIPMENT, ski machine & weight machine. Conway, 271-0770.
- BULL SNAKE, or other nonpoisonous snake, to fit into 10-gal. terrarium. Rockwell, 884-4206.
- THULE ski attachment. Cropp, 296-1877.
- SANDIANS interested in taking a 15-day trip to Central Europe this spring. Benton, 275-2602.
- GUNS, also old Western and Indian items. Zaluga, 344-1564.
- HOUSES TO CLEAN, references available upon request, reasonable rates. Kaufmann, 865-3272 or 292-9249, ask for Andrea.
- TYMPANI OR KETTLE DRUM, needed by Albuquerque Concert Band, okay if repairs are needed. Skogmo, 292-9773.
- HOUSEMATE, female or male, 3-bdr. house, 2-car garage, washer/dryer, plenty of storage space, large backyard, \$250/month, 1/2 utilities. Ewen, 836-3563.
- ROOMMATE, large NE Heights home, non-smoker, no pets, woman preferred, \$425/mo. plus 1/2 utilities. Schrader, 298-4154.
- STAR WARS TOYS, action figures, vehicles, playsets. Boatman, 291-1241.
- PROFESSIONAL TURNTABLES, Technics SL-1200 MK2, also rack-mount CD players, power amplifiers, other sound, lighting, accessories. Ramirez, 291-9657.
- ODD JOBS, trash removal, light moving, yard work, Christmas decoration setup & removal, Christmas tree disposal, other misc. Kulju, 299-8182.
- X-C SKIER WANNABEES, free all-day group lesson, experienced teacher, \$10 deposit, returned on day of lesson. Shunney, 265-1620.
- MUSICIANS to form nonperforming, mid-level string quartet or chamber music ensemble at my home, far NE Heights area. Terrazas, 291-0905.
- CHEST OF DRAWERS, reasonable. Essm-macher, 865-7066.
- '79 DATSUN, king cab pickup, w/good body. Roybal, 255-2909.

## LOST & FOUND

- LOST: Black-leather glove w/fringe, on Nov. 22, near Bldg. 880, Gate 6, or the Cafeteria. Falconi, 845-0432.
- LOST: Bronze eagle-and-sword pin, 2" x 1-1/2", in Bldg. 800/802 area. Tafuya, 865-9816.
- LOST: Prescription sunglasses, black frame, in soft brown case, lost Dec. 2, between Bldg. 864 and the cafeteria. Martinez, 296-3702.

## Sandia in the News

This is a periodic column listing a selection of recent print and broadcast news reports about Sandia. It is provided by Media Relations Dept. 12621 to give Sandians a sense of what is being said about Labs work in national and international media.

A *Science* magazine article titled "Science in Russia," quoted a nuclear weapons expert of the former Soviet Union, Rashid Sunyaev, about his increasing interactions with Sandia and Lawrence Livermore. "It's strange," he said, "to be collaborating with institutes that were once our main enemies."

*Lasers & Optics* reports on clinical trials of a new Sandia/Indigo Medical/Phillips Lab/Los Alamos laser system for correcting benign prostate enlargement.

*Time* magazine printed comments by solar energy researcher Paul Basore (6219) in an article about the prospects of renewable energy sources — the winds, tides, and sun's rays. In the piece Paul predicts that "within 20 years, homeowners and small businesses everywhere but in the gloomiest of climates will find it most economical to generate their own solar power."

A "HealthWatch" piece on Dallas TV station KXAS featured work between Sandia and Massachusetts General Hospital on treatment of severe burns with precisely aimed lasers. The story included sound bites with Ned Godshall (2665) and Scott Holswade (2674). WUSA-TV, Washington, D.C., also ran the feature.

A *Popular Science* story dealing with a growing environmental program — old tires — covered a Sandia/Titan Technologies process designed to reduce tires, in a nonpolluting way, to their basic components — oils, steel, carbon black, ash.

*Business Week* reported on Sandia's capability to detect defects in integrated circuits. The technique, the story said, permits engineers to take a snapshot of all the circuit paths on a chip.

## Coronado Club

Dec. 16 (tonight) Coronado Club Christmas Party. Dinner served 6-9 p.m. All-you-can-eat buffet, baked ham, baron of beef, roast turkey breast, poached fish, Chef's choice, \$6.95 members, \$7.95 guests. Music by Together Band, 7-11 p.m.

Dec. 18 — Sunday brunch buffet, 10 a.m.-2 p.m. Tea dance, 1-4 p.m., music by Los Gatos.

Dec. 31 — Western New Year's Eve, with the Isleta Poorboys. Doors open at 6 p.m. with a cocktail hour. Dinner served 7-9 p.m. Surf 'n' turf buffet with prime rib and golden fried shrimp, salad bar, green chile stew. Music from 8 p.m. to 12:30 a.m. Bottle of champagne at midnight. \$25 for member couples and \$30 for guest couples. Prepaid reservations only, through Dec. 23.

Jan. 5, 12, 19, 26 — Thursday Bingo nights. Card sales and buffet beginning at 5:30 p.m., early birds' bingo begins at 6:45 p.m.

Jan. 6 — Friday night dinner/dance. Dinner served 6-9 p.m., all-you-can-eat-buffet, \$6.95. Music by Isleta Poorboys, 7-11 p.m.

A special meeting of the Coronado Club active members is scheduled for 5 p.m., Jan. 24, in the main ballroom. The purpose is to revise the bylaws to update wording and make them reflect current philosophies of the club. Draft changes and recommendations will be available at the club beginning Jan. 3.

## Sandia News Briefs

### Jim Asay receives Ballistics Award

The Aeroballistic Range Association recently presented its Ballistics Award to Jim Asay, Manager of Defense Programs Technology Base Program Office 5602, for advancing ballistic range technology internationally. The award was presented recently at the Association's 45th meeting in Huntsville, Ala. Jim was named a Fellow of the Aeroballistic Range Association in October. He has also been recognized for his service as President of the Hypervelocity Impact Society, 1992-94, and received that society's Distinguished Scientist Award for sustained leadership, innovation, and technical excellence in hypervelocity research.

### Navy League honors Al Narath

Sandia President Al Narath recently received the Roosevelts Gold Medal for Science from the Navy League of the United States, New York Council, in recognition of his accomplishments in original scientific research and for his leadership role at Sandia. The League points out that Al's technical career has been in the field of solid-state physics, and his early research demonstrated the utility of superconducting magnets in examining the properties of metals. He now serves on many professional committees and boards, including the Center for International and Strategic Studies, the Chief of Naval Operations Executive Panel, the Coalition to Increase Minority Doctorates, and the National Research Council Board on Physics and Astronomy. The Roosevelts Award is named after two distinguished former New York Navy League members, Theodore and Franklin Delano Roosevelt.

### Jay Vinson receives Secretary of Defense Medal

Secretary of Defense William Perry recently awarded Jay Vinson, Advanced Systems Development Dept. 5161, the Secretary of Defense Medal for Outstanding Public Service. The award, one of the highest that the Secretary can present to a non-DoD civilian employee, is "for exceptionally distinguished service as Scientific Advisor, United States Nuclear Command and Control System Support Office, Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence, from January 1993 through December 1994." Jay has been in Washington, D.C., on special assignment for the past two years and will return to Sandia in the Advanced Systems Development Department next month.

### ECP campaign inspires department managers to help the homeless

Ron Kulju (2612), 1994 Employee Contribution Plan (ECP) Center 2600 representative, had a few ideas to inspire employees and prove management support for the recent annual campaign to raise funds for United Way of Central New Mexico. He didn't have to twist any arms, though. He asked managers to write a few sentences about what United Way means to them, and included these testimonials on the center campaign meeting agendas. Each center manager also contributed money for door prizes given at center ECP meetings. To top off the campaign, Ron asked center managers if they might be willing to perform volunteer service at a United Way agency. Center 2600 Director John Stichman, Don Schroeder (2605), Bob Longoria (2611), Ray Leuenberger (2645), and Floyd Braaten (2653) went to St. Martin's Hospitality Center on Saturday, Dec. 3, and painted office space and cleaned out and rearranged a storage room. Ron learned about St. Martin's by contacting Volunteers in Action coordinator Redd Eakin, Community Relations Dept. 12651, for information about agencies needing volunteers. Anyone interested in volunteering at a United Way agency or other community service organization can call Redd on 844-4124.

Send potential Sandia News Briefs to Lab News, Dept. 12622, MS 0413, fax 844-0645.



FLAT PANEL DISPLAYS PLUS — Bill Alzheimer (right), Director of Advanced Manufacturing Technology Center 2900, talks with Lance Glasser, Director of the Advanced Research Projects Agency's (ARPA) Electronics Systems Technology Office, during a workshop of the National Center for Advanced Information Components Manufacturing (NCAICM) in Albuquerque. Workshop organizer Jim Jorgensen (2903) says the purpose of the three-day meeting was to provide attendees with a program overview of NCAICM's 25 technical projects in the areas of flat-panel displays, advanced lithography, opto-electronics, and microelectronics and to provide a forum for technical interchange among the workshop's participants. More than 100 representatives from industry, the national labs, DOE, ARPA, SEMATECH, and the US Display Consortium attended.