

Sandia helping lead high-tech revolution of textile industry

Electronic marketplace expected to save industry billions, prevent job losses

By Chris Miller

Media Relations Dept. 12621

Imagine choosing a fabric and fashion on the screen of your home computer, including information from a preprogrammed smart card that contains your body measurements, and having a perfectly fitted suit delivered to your door a few days later.

Such a thought is not at all far-fetched to a group of Sandians who are taking part in what has all the makings for a revolution of the textile/garment industry. Not only will the changes please the consumer, they also are expected to save the US Integrated Textile Complex (ITC) — made up of fiber producers, textile companies, sewn product manufacturers, and retailers — billions of dollars each year and prevent the potential loss of hundreds of thousands of jobs to overseas manufacturers.

The project, called Demand-Activated Manufacturing Architecture (DAMA), was begun in 1993 as part of the American Textile (AMTEX™) Partnership. AMTEX™ is a coordinated effort involving DOE laboratories, industry, and universities to help the nation's textile industry improve its competitiveness in the global marketplace. Sandia is working on a key component of the DAMA project — an

electronic marketplace that uses the information superhighway to provide communications links for the entire US ITC where all participants can buy and sell products and conduct business electronically. The goal is to link the entire textile complex so that each company in the supply chain responds as quickly as possible to market demands.

"The coordination and rapid transfer of information throughout the supply chain is a key element in producing the right product at the right time at the right cost," says Leon Chapman of Manufacturing Systems Reliability Dept. 6613, who serves as the DAMA seven-laboratory project manager. "Warehousing costs, inventory size, and waste can be reduced, while customer responsiveness and product development can be greatly improved through an effective electronic marketplace."

Flexible manufacturing process

The textile industry estimates it loses about \$25 billion each year through inventory waste. DAMA is expected to provide the means to cut that in half over the next 10 years. "In essence, DAMA will provide companies in the US ITC with the means to rapidly acquire and share business and

(Continued on page 5)



TEXTILE TECH — Sandians Ken Washington (left) and Leon Chapman examine a textile-production flow chart. Sandia is working on business tools for the electronic marketplace part of the American Textile Partnership's Demand-Activated Manufacturing Architecture project.

How can managers improve their skills? Targeted development takes aim at gaps

What kind of managers will Sandia need in the year 2000 and beyond? As the world changes — and the mission of the Labs along with it — the skills mix required of Sandia's managers must evolve.

A new Targeted Development Program is addressing Sandia's managerial skills needs in a highly focused way. Under the recently launched program, Sandia managers and managerial candidates can hone their skills in a way that serves their professional development needs as well as the 21st-century managerial needs of Sandia.

In early 1994, Large Staff, meeting on Sandia's future, identified 15 key managerial competencies that would be critical to the organization's success in the next century. Those competencies include:

Mission Success — Business acumen, results, organizational agility, customer focus, and strategic ability/priority setting.

Leadership — Decision quality, interpersonal savvy, and dealing with ambiguity.

Personal characteristics — Managing

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Sandia LabNews

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Sandia National Laboratories

Sol-gel research earns Sandia a 1995 Basic Energy Sciences award

Thin film deposition research keeps Labs' win streak alive

By John German

Lab News Staff

If DOE's Basic Energy Sciences (BES) annual awards competition were a horse race, Sandia's sol-gel research program would be a championship bloodline.

The program — which for two decades has sought to develop a greater understanding of the fundamental properties of sol-gel materials and has pioneered breakthrough techniques allowing researchers to develop thin films with tailored microstructures — has produced BES award winners in four of the last 10 competitions.

BES awards are conferred annually by

DOE's Office of Basic Energy Sciences/Division of Materials Sciences. Each year, one award is given to a technical program or project at a DOE-funded institution in each of nine categories. Traditionally, the winning programs receive a cash award in the form of capital equipment funding.

This year's award, for "sustained outstanding research in metallurgy and ceramics," recognizes continued achievements in sol-gel thin film deposition work at Sandia during the past 10 years. Only three awards are given for sustained achievement annually.

In years past, Sandia has fared well in the

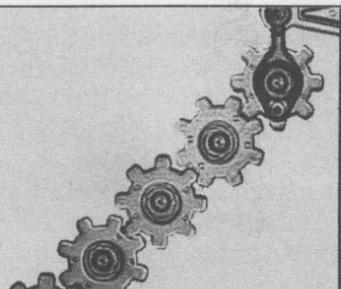
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This & That

"Macroaward" for micromachines - Congratulations to researchers Jeff Sniegowski (1325) and Ernest Garcia (2643), manager Paul McWhorter (1325), and everyone else at Sandia whose work contributed to a major award for the Labs late last year. For "significant advances in the fabrication of micromachines," the magazine *Industry Week* selected Sandia to receive one of five "Technologies of the Year" awards. Read more about the award on page 8.

By the way, the award results from a combination of excellent science and excellent science writing. *Industry Week* Senior Editor John Sheridan said the Labs received the award partly because ". . .we could understand your news release. It was very clear." He went on to say that the amount of technical jargon in many news releases describing scientific advances make them "impenetrable." So, congratulations are also in order for fellow writers Neal Singer (12620), who wrote the latest news release about this technology, and to Ace Etheridge (12621) and Al Stotts (former employee, now with DOE), who wrote earlier, related news releases.

* * *

A passel of peeves - Sandians submitted many pet peeves in response to my request last month. Several of you submitted similar peeves, and since most folks said they prefer to remain anonymous, I decided to publish them all anonymously. I don't have the space to print them all, but I'll start with some of the more interesting ones now and publish more in coming issues - parcel out the passel of pet peeves, so to speak:

- Thoughtless people who throw cigarette butts on the ground. This peeved person added, "Many of these people wouldn't even consider throwing other trash on the ground, but they toss their ugly butts down, and they usually lie there for months."

- People who park the Labs' "go-cart" (golf-cart-type) vehicles in regular parking spaces. One person who has a medical permit to park inside the technical area said, "On many mornings, I cannot find a parking place near my building. I wonder if they [the carts] reproduce when left out overnight? Maybe Sandia would spring to have them spayed."

- "The policy of signing and turning in time cards before the actual work has been completed has always bothered me . . . it is difficult enough to predict how we will spend the next half day, much less two or more days in advance, depending on when the cards are due. Hopefully the new electronic timecards can be handled in a more timely and accurate manner. . . ."

- "The tendency of some Sandians to coin words and introduce them into the vernacular. The one which currently sets my teeth on edge is 'signage.' "

* * *

NEW YORK CITY? - In the Dec. 15 issue, I mentioned Arizona Iced Tea and its pretty Southwestern-design cans, and then commented that it may not be brewed where you think it is. The can I checked didn't actually show where it's brewed but read "Manufactured for Ferolito, Vultaggio & Sons, Brooklyn NY."

- Larry Perrine (845-8511, MS 0129, lgperri@sandia.gov)

Sandia LabNews

Sandia National Laboratories

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LOCKHEED MARTIN

Employee dialogue sessions scheduled for Jan. 16-17 in N.M., Jan. 18 in California

Continuing a tradition begun by his predecessor, Sandia President and Labs Director C. Paul Robinson will conduct employee dialogue sessions in January for New Mexico and California employees.

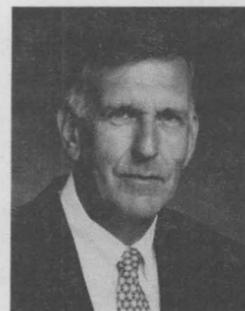
Employee dialogue sessions are generally held quarterly. They usually begin with a brief, informal presentation by the Sandia President about whatever issues are most current and then are opened to oral and written questions from the audience.

Here is the schedule:

- Tuesday, Jan. 16, 3-4 p.m., at the BDM Bldg. in Albuquerque.
- Wednesday, Jan. 17, two sessions, at 8:30-9:30 a.m. and again at 10-11 a.m., Technology Transfer Center (Bldg. 825), Sandia/New Mexico.
- Thursday, Jan. 18, two sessions, at 8:30-9:30 a.m. and again at 10-11 a.m., 902 Auditorium at Sandia/California.

Donald Carson named Director of PR & Communications

Donald Carson will be the new Director of Public Relations and Communications Center 12600, effective Jan. 15. Currently Don is Director of Public Affairs for Lockheed Martin Aero & Naval Systems in Baltimore, where he is responsible for public, media, and government relations, external and internal communications, and marketing communications.



DON CARSON

Don will have many of the same responsibilities at Sandia.

Executive Vice President John Crawford announced on Dec. 4 that Don had accepted the position, replacing former director Jerry Langheim, who is now Vice President of Communications for Lockheed Martin's new Energy and Environment Sector.

"I'm thrilled about coming to Sandia," says Don. "Everyone I've met so far has been top-notch."

Don joined Lockheed Martin in 1994 after 10 years with United Technologies International (UTI) Operations, where he was a marketing manager and then public relations manager for Pratt & Whitney Government Engines and Space Division. He later moved to become UTI's director of business development for Pratt & Whitney's first business office in Japan.

After joining the Air Force in 1964, Don was editor of *AIR FORCE* magazine and editor-in-chief of the Air Force News Service. He also served in a number of positions in public affairs, operations, safety, and media, before leaving in 1984.

Don has a BA in history from the Virginia Military Institute and is author of several books and numerous articles about various aerospace topics.

Radio Sandia goes off the air today

After a recent survey of Sandians showed that a relatively small percentage of them listen to Radio Sandia, Executive VP and Deputy Director John Crawford and Public Relations & Communications Center 12600 have agreed to close down the station as of today, Jan. 5. Breaking news about, or affecting, Sandia — news that has been the station's primary focus — will be made available through other media.

Those who have worked with the station since its inception in March 1991 wish to thank the Sandians who have supported Radio Sandia during that time.

Retirement open house

Sandia is holding an open house in honor of retiree Jack Cannon (6218) in the Area 1 Cafeteria (Bldg. 861) on Wednesday, Jan. 10, 2-4 p.m. Refreshments will be served. Friends and acquaintances are invited.



New Mexico — Robert Mascarenas (5821), Brian Murphy-Dye (14413)

'C - A - T' equals 'kuh - ah - tt' in talking phonics toy developed partly with Sandia's expertise

By Nancy Garcia

California Reporter

When entrepreneur Michael Wood decided to build a prototype of his own educational toy, he turned to Sandia for assistance.

Now his Phonics Learning System is being manufactured commercially and is available across the nation and overseas. The hinge-top Phonics Desk lets children ages 3 to 8 "see, feel, and hear" colorful plastic letters to learn basic reading and spelling skills. Marketed since October, the 12-by-18-inch "talking" toy sells at such outlets as Toys R Us. Overall, Wood's start-up company, Berkeley, Calif.-based LeapFrog, estimates first-year sales of up to \$10 million.

Sandia California News

The company opened its doors in March after Wood received extended technical assistance through DOE's Small Business Initiative Program at Sandia's Electronics Prototype Laboratory 8250-1. There, team supervisor Vern Barr and Paul Heppner (5300-A) used their system integration background and microelectronics expertise and worked with commercial suppliers to create three working prototypes.

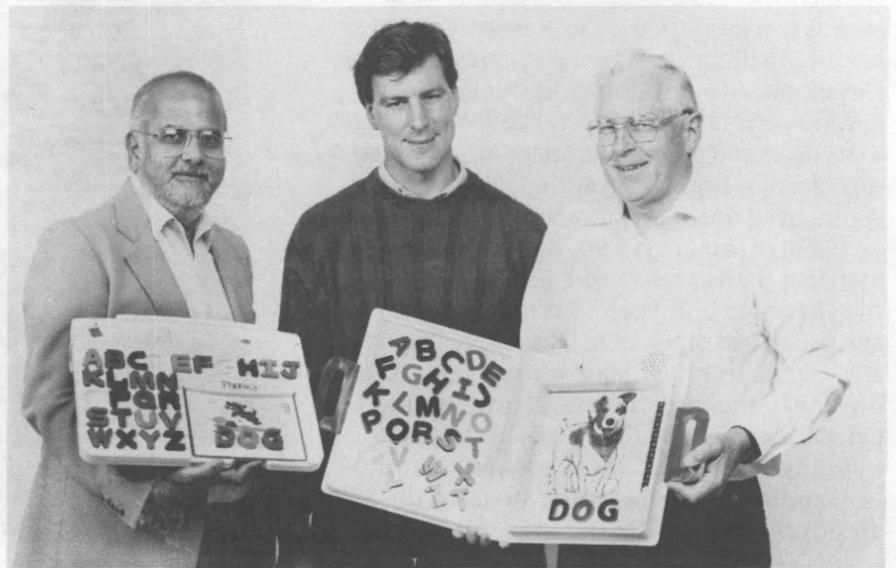
Vern's job normally involves making joint test assemblies to verify weapon performance. The only component in the toy that was new to him, however, is a large membrane switch, similar to the keypad control of a microwave oven. When brightly colored magnetic letters are placed on this surface in their indented places, the device says their names. Sliding an illustrated card into a slot alongside causes the toy to spell the item pictured, then say its name. Next, placing the proper letters in sequence below the card produces the pho-

netic sound made by each letter within that word. For example, a child spelling "C - A - T" hears "kuh - ah - tt." If the child presses these letters from left to right, the phonetic sounds are repeated, and the desk says the word, then adds a rewarding phrase, such as "Awesome!"

Six lesson sets, containing 20 picture cards for words up to five letters long, were developed by early childhood education experts at Stanford University's Graduate School of Education. Each card bears a list of short words that rhyme with the item illustrated.

"There are no electronic toys that teach phonics the same way we do," Wood says. Producing phonetic sounds within the context of the 500 words included in the lesson sets is an invention protected by US patent.

Wood plans to launch a Phonics Bus next year, a wheeled toy carrying animals that introduces letter names and sounds to children ages 18 months to 3 years. He's already received positive feedback from educators



THE PHONICS DESK is displayed by Subra Subramanian (8842), left. At right, Vern Barr (8250-1) holds one of the original prototypes whose production he coordinated. LeapFrog company founder and president Michael Wood, middle, says he couldn't have started the company without Sandia's assistance.

"It's a true educational thing. It helps people to spell and learn, and that's good."

who've used the current toys, including a speech pathology instructor who had been struggling to teach a blind boy how letters make sounds.

Wood was inspired to create the phonics toy five years ago while teaching his three-year-old son Matt the sounds of the alphabet letters whose names the boy had just mastered.

"I told him to think of them as animals that have names and make sounds," Wood said. "A lion says 'roar,' a cat says 'meow,' and he could pretend the letters are 26 animals that make sounds."

Knew of Sandia's resources

Wood knew about "talking" electronic chips from his law practice. He was also familiar with resources available at Sandia. "I was able to make a toy that can teach kids around the world, using technical resources right here in my back yard," Wood says. "I don't think I could have started the company without the assistance I received from Vern and Paul. They had experience that is difficult to find under one roof. Vern was remarkably creative in working with manufacturers to develop ideas to keep the project within cost parameters while maintaining quality. He was absolutely dedicated, and participated in many late-night calls and weekend calls and meetings as the prototype design evolved."

Being used to working on many diverse projects, Vern said the three-month project was quite manageable and allowed him to learn more about the US industrial production, which could help him in future projects involving commercial suppliers.

The design obviously has some features unique to use by children. Vern says it was made "so you could spill jam on it," and the power shuts off automatically. His three-year-old grandson particularly enjoys playing with one of Vern's copies.

"It's a true educational thing," Vern says. "It helps people to spell and learn, and that's good."

Funded at roughly \$2 million annually for the past two years by DOE, the Small Business Initiative Program was formed in response to requests by small businesses for help solving short-term technical problems, says Subra Subramanian, manager of licensing at Sandia/California's Technology Transfer Program 8842. Sandia has provided technical assistance to more than 500 small businesses in the United States.



RECORD GIFT-GIVING — Sandia/California employees set a new record last month in the annual Holiday Spirit campaign by purchasing gifts requested by 447 individuals and families through seven local area agencies. From that list 761 gifts were wrapped and sent to the agencies for specific people in need. In addition some 2,200 pounds of groceries were donated by Sandians for two agencies — Family Crisis Center in Livermore and Love Thy Neighbor in Manteca. Total participants included 527 Sandia employees and on-site contractors. Shown sorting through the mounds of presents ready to be shipped off site are, from left, Mary Henry (8534), Holly Mendonca (8534-1), and Renee Haynes (8811-1).

BES award

(Continued from page 1)

competition, often winning two or more of awards in a given year. Last year Sandia won a record five BES awards — the most ever by a single laboratory — including one for developing new processing techniques that allowed aerogels to be produced at room temperature and pressure, a major hurdle preventing widespread commercial use of the ultra-lightweight aerogels.

George Samara (1152), BES/MS program manager, says Sandia's sole BES award this year is a victory to be savored. "When competing against all the other DOE labs and being evaluated by the technical staff at those labs, receiving one of the three awards in the Sustained Outstanding Research category is truly outstanding," he says. "This year's award continues Sandia's 13-year winning streak in the BES awards competition."

Understanding thin films

Sol-gel thin films are often created by withdrawing a substrate from a solution and allowing the liquid to cure on the substrate into a more-or-less solid material through evaporation and other physical and chemical mechanisms. The thin film deposition program has sought to understand these mechanisms and to create sol-gel thin films with tailored attributes — such as specific refractive indices, porosities, pore sizes, and surface areas.

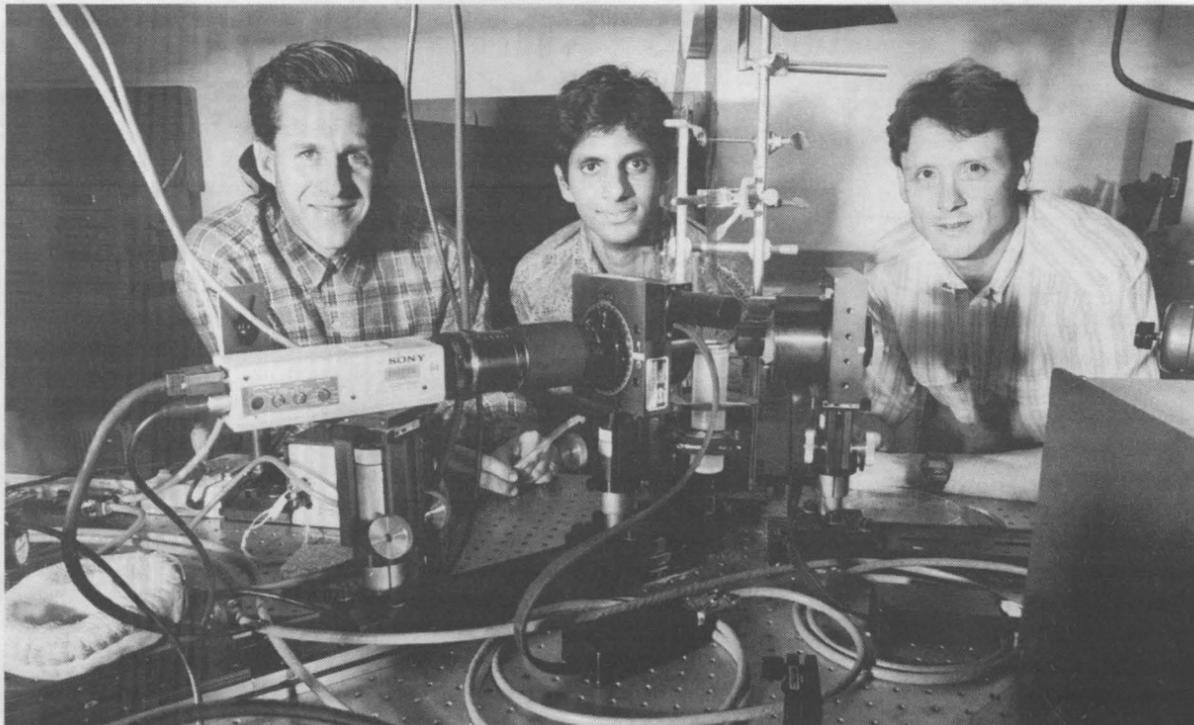
The program's era of success began around 1986, when a Sandia team pioneered the use of fractals and scattering to understand sol-gel structure.

The breakthrough earned Sandia its first sol-gel-related BES award in 1986.

In 1988 the Sandia team came up with imaging ellipsometry, a diagnostic technique by which researchers could measure the thickness and refractive index of a portion of a sol-gel thin film while the film was being deposited, or dip coated, on a substrate.

"Imaging ellipsometry was one of the enabling diagnostic tools that Sandia

"Ellipsometry got us thinking about the right issues — namely capillarity, evaporation, and chemistry."



CHAMPION RESEARCH — Three of the materials science researchers who have contributed to Sandia's award-winning sol-gel research are, from left, Jeff Brinker (1846), Sai Prakash, and Al Hurd (1841). At the time of this photo Sai was a University of New Mexico student working at Sandia. He is now at the University of Minnesota.

researchers needed to achieve subsequent successes in thin film deposition," says Al Hurd, Manager of Ceramic Processing Science Dept. 1841. "Ellipsometry got us thinking about the right issues — namely capillarity, evaporation, and chemistry."

Soon after, Greg Frye, now of Microsensor Research and Development Dept. 1315, applied another key diagnostic tool, called surface acoustic wave analysis, that allowed pore size and distribution to be measured, "an important key to understanding the films' microstructures," says Al.

Perhaps the biggest breakthrough came in 1994 with the development of the ambient pressure aerogel process by Jeff Brinker (1846) and co-workers from the University of New Mexico. Subsequent achievements revealed a wide range of other fundamental chemical and physical phenomena associated with thin film deposition, and researchers at Sandia and elsewhere began to exploit those insights to create customized films and coating processes.

Remarkable societal potential

Ultimately, says Al, this improved understanding of sol-gels may lead to films useful for a variety of commercial applications in optics, acoustics, electronics, insulation, and sensors.

Six Sandians named on award citation

Sandia's Basic Energy Sciences/Materials Science (BES/MS) award for 1995 names the following Sandia researchers: Jeff Brinker (1846), Al Hurd (1841), Randy Schunk (9111), Greg Frye (1315), Carol Ashley (1846), and Josh Samuel (1841, a postdoc from Hebrew University, Israel).

In addition, three non-Sandia researchers with whom Sandia has done collaborative work also are included: Rich Cairncross, a former Sandia postdoc now at the University of Delaware's chemical engineering department, Bruce Dunn of the University of California-Los Angeles' (UCLA) materials science department, and Jeff Zink of UCLA's chemistry department.

Because researchers can control the porosity (and thus tune the index of refraction) of some films, for instance, multilayer sol-gel coatings help improve reflectivity of optical devices such as solar mirrors.

On integrated circuits, sol-gel thin films could serve as overlayers to reduce unwanted capacitance between conductive lines and ultimately contribute to faster and more compact computers. Thin film membranes made from certain sol-gels might also be useful in chemical sensors and gas-separation filters, or, in aerogel form, as thermal insulators in refrigerators or between window panes.

"Sol-gels' impact on society will be remarkable if they live up to their potential," says Al.

Other DOE labs winning 1995 BES awards include Ames Laboratory (three awards), Pacific Northwest Laboratory (two awards, one of which is shared with the University of New Mexico), Lawrence Berkeley National Laboratory (two awards), Argonne National Laboratory (one award), and Oak Ridge and Lawrence Livermore national labs (shared one award).

★ Congratulations

To Lorri and Mike (9409) Arms, a son, Brian Benjamin, Dec. 6.

To Rebecca D. (5318) and Scott Horton, a daughter, Avery Nicole, Dec. 11.

Sandia pumps more than \$1 billion into New Mexico, California economies

Sandia pumped more than a billion dollars directly into the New Mexico and California economies in fiscal year 1995 with employee salaries, medical and dental benefits, retiree pensions, commercial purchases, and gross receipts taxes.

Sandia paid more than \$400 million in wages to New Mexico employees during the fiscal year that ended Sept. 30. New Mexico retiree pension payments during the same period amounted to about \$47 million. An additional \$30 million in medical and dental benefits for Sandia employees and retirees was paid to New Mexico healthcare providers in FY95.

Corresponding payments in California were more than \$63 million in wages, more than \$5 million in retiree pension payments, and about \$5 million in medical and dental benefits.

Sandia's total FY95 payroll was more

than \$470 million.

Sandia's total commercial purchases of goods and services in FY95 were more than \$760 million, more than half of which were made with small business suppliers. More than \$335 million of those purchases were made with New Mexico suppliers. Commercial purchases from California suppliers amounted to \$112 million.

Sandia also paid the State of New Mexico almost \$48 million in gross receipts taxes in FY95.

The above numbers do not take into account any multiplier effects. Using FY 1994 numbers, DOE and New Mexico State University issued a report last summer saying Sandia's annual budget of \$1.4 billion supported a total economic impact of \$4.9 billion, or about 6 percent of total economic activity in New Mexico.

Textiles

(Continued from page 1)

product information throughout the pipeline," Leon says. "From this they can adjust their flexible manufacturing process in response to short-term changes in demand for their products. This will provide you and me access to mass customization of our apparel products."

DAMA's potential impact on the nation's economy is enormous. The textile industry contributes more than \$52 billion each year to the nation's gross domestic product, provides about 2 million jobs, and is the largest employer within the US manufacturing sector. The project's goal of helping the industry reduce waste and speed communications among US manufacturers should help combat the threat of off-shore competition.

DAMA's success will depend on the timely processing of information and the communication and management of huge amounts of data. How big is the task? Thousands of apparel manufacturers supply the nation's 100,000 retail stores. Two billion retail stock-keeping units are annually tracked by point-of-sale information (typically bar codes). And clothing manufacturers engage in as many as 2 million fabric-yard transactions with a single supplier in a week.

DAMA's electronic marketplace will allow information to be dispersed instantly throughout the textile industry. When an item is sold and an order is then placed, every company involved in the manufacturing process of a particular product would be notified through the information highway. Through pre-arranged, electronic trading partnerships, all activities for meeting an order could be cooperatively managed to minimize inventories, reduce lead times, and more effectively respond to consumer demand.

Lawrence Livermore National Laboratory is responsible for the DAMA Connectivity and Infrastructure task, an important element in establishing an electronic marketplace over the Internet. But simply creating an electronic marketplace won't be enough. It will take a combination of new business tools for use in the electronic marketplace and the discovery of effective business strategies to make it truly useful.

Lawrence Berkeley National Laboratory is developing new business strategies using

simulation techniques in the Enterprise Modeling and Simulation task of DAMA, and is supported in that effort by Pacific Northwest Laboratory.

"This work will help the industry identify and act upon opportunities made possible by the DAMA electronic marketplace," Leon says.

Sandia developing the business tools

As the lead lab for the Cooperative Business Management (CBM) task, Sandia is developing the project's new business tools. Sandia must ensure the tools are viable in the future electronic marketplace and are available to existing companies as well as the more than 125,000 small and medium businesses involved in cut-and-sew operations. The pathway to commercialization of these tools is through the DAMA Education, Outreach, and Commercialization task, which is led by industry and supported by Los Alamos and Pacific Northwest national laboratories.

"Sandia is working closely with Idaho, Oak Ridge, and Lawrence Livermore national laboratories, and industry to develop computer tools that US ITC companies can use to share and analyze information in the DAMA electronic marketplace," says Ken Washington (6614), manager of the CBM task. "This has been a true partnership. Industry has actively participated in defining the tool functional requirements and in evaluating the prototype tools, and the labs have provided the information technologies to realize their development."

An important step toward this goal has already been achieved with the development of the Textile Exchange Network (TEXNET) prototype for securely sharing inventory data, point-of-sale information, and other business data over the Internet for all sectors of the industry (fiber, textile, apparel, and retail).

Applications extend widely

"Today, we are in the process of implementing TEXNET in a pilot with industry where data will be accessed and shared. This will be an important step because it will test the robustness of the security features designed into TEXNET," Ken says. "We are also in the process of developing a Supply Chain Integrated-analysis Prototype (SCIP) that will work in concert with TEXNET to analyze the shared data in support of cooperative decision-making."

The DAMA project is a direct outgrowth of a number of DOE research programs and is

33 companies, 7 labs, 5 universities involved in DAMA

The Demand-Activated Manufacturing Architecture (DAMA) textile project team consists of 33 companies, seven national laboratories, and five universities working together under a cooperative research and development agreement. Participating companies include such giants as Spartan Mills, Milliken, Burlington, Fieldcrest Cannon, Haggard, JC Penney, Russell Corp., Kimberly-Clark Corp., L.L. Bean, Land's End, and Wal-Mart. Federal funding comes from the defense programs, energy research program, and environmental management program offices of DOE, which supports seven national laboratories (INEL, LANL, LBNL, LLNL, ORNL, PNL, and Sandia). The total project investment in FY96 is \$27.3 million, with industry contributing \$16.2 million and DOE \$11.1 million.

In addition to those mentioned in the lead story, other Sandians involved in the DAMA project are Debra Browitt, Samuel Dengler, Kelly Gomez, Leslie Interrante, John Linebarger, Craig Parr, Laurence Phillips, William Stubblefield, and Eunice Young (all 6614); Charlene Harlan, John Linebarger, and Barbara Meloche (all 6613); Jessica Glicker (6217); and Ed Weinbrecht (6625).

expected to provide significant benefits to the department.

"We believe these tools have a great deal of application potential outside the textile complex," Ken says. "For example, we are developing SCIP using an object-oriented approach such that the textile supply chain being emphasized today can later be easily replaced with any other manufacturing supply chain of interest. This dual-benefit aspect of DAMA could turn out to be important; we'll know more after we explore further the apparent parallels between the electronic communication ambitions of the textile complex and those of the DOE nuclear weapons production complex."

There are plans for Sandia to lead an effort involving the three Defense Programs labs — Los Alamos, Lawrence Livermore, and Sandia — to explore further various dual benefit opportunities.

"Sandia has a lot at stake in the DAMA project since Sandia is responsible for the overall laboratory project management," Leon says. Sandia is managing the project through advanced applications on the Internet including the use of the World Wide Web, e-mail, and File Transfer Protocol (FTP) to rapidly communicate information across the project to all participants. Some of these same techniques will be used for the electronic marketplace.

A complete history of the project meetings, reports, briefings, and products resides on servers connected to the Internet. All participants can surf the net and obtain this information any time via a modem connection. Leon says the DAMA "internauts" are truly "walking the talk" of an electronic marketplace — a paperless process of operating and managing the DAMA project on the Internet.



Sandia, unions agree on offering VSIP package to represented employees

Sandia members of all three labor unions at the Labs became eligible to apply for the Voluntary Separation Incentive Program (VSIP) package.

The Office and Professional Employees International Union (OPEIU) and the Metal Trades Council reached agreement with Sandia the week before the holiday break on making the VSIP available to employees they represent. The Security Police Association members were already eligible, as were all nonrepresented employees.

The package of written materials for represented employees went out to them almost immediately.

"I am pleased that we were able to reach agreement with the labor unions and offer the incentive package to all Sandians," said Robert Fraser, Manager of Labor Relations Dept. 3560.

Represented and nonrepresented employees who decided to apply for the VSIP package had until midnight last night, Jan. 4, to have their completed and approved applications in to the Employee Development Center (in New Mexico) or the Human Resources Department (in California).

As explained in the Dec. 15 *Lab News* and in detailed written materials distributed to all employees, the plan provides financial and other incentives for employees in certain job functions to voluntarily end their Labs employment. Preference is given to employees in job functions officially designated as "impacted." The VSIP is part of a larger and more comprehensive workforce realignment program at Sandia.

The *Lab News* will provide updates in future issues.

Portrait of a writer: Sandian collaborates on book with James A. Michener

Biography portrays Michener's early years, literary influences

By Ken Frazier

Lab News Acting Editor

James A. Michener is one of the master storytellers of our age (*Hawaii, The Source, Caravans, Centennial, Space, Chesapeake, Texas, Caribbean, Poland*, and other epic historical novels), but how a Sandia physicist and his wife came to collaborate on a new book with the celebrated novelist and educator makes quite a story in itself.

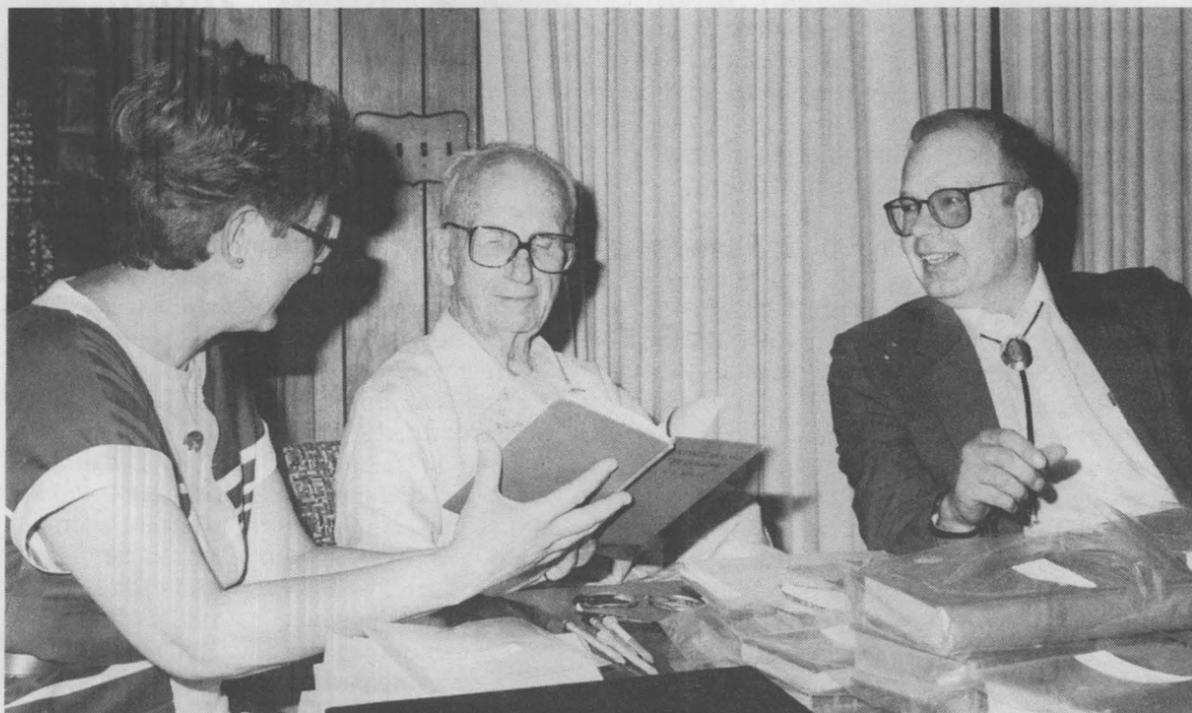
The book, *James A. Michener: The Beginning Teacher and His Textbooks, With Notes and Reminiscences by James A. Michener*, is written and published by G.L. Dybwad and Joy V. Bliss. G.L. is Gay Dybwad, a distinguished member of technical staff in Electronic Processing Dept. 1411. Joy, a physician and lawyer, is Gay's marital and literary partner.

But the book's origins have much more to do with Gay's longtime avocation of buying and selling old books than with his scientific profession of processing electronic materials.

The story begins in 1987. Gay then lived in Pennsylvania where he was a researcher at AT&T Bell Labs at Allentown (before coming to Sandia in 1990). This is not far from Michener country, the area of eastern Pennsylvania where Michener grew up and spent his formative years learning and teaching. (Michener went to high school in Doylestown, Pa., and was a Phi Beta Kappa, "Highest Honors," graduate of Swarthmore College in English and history in 1929.)

"I was buying and selling books as a weekend hobby," Gay recalls. He saw a small ad for an auction in the town of Oley, and although it was 40 miles away, he decided to drive to it. He noticed that one of the hundreds of books for sale had the name "James A. Michener" in handwriting in it. He thought little of it at the time. He ended up buying 19 boxes of books that day.

"I got these things home and started going through them," he recalls. One by one, distrib-



MICHENER MEETING — Sandia scientist Gay Dybwad (right) and his wife Joy Bliss (left) reunite James A. Michener with textbooks he had used 64 years earlier. This first meeting with him at his home in Austin, Texas, in 1993 led to collaboration among the three of them in a book just published.

uted randomly throughout the boxes, he found more such books, each signed by Michener. All in all, 18 of the books, all textbooks from the late 1920s, had the Michener name in them. Many had marginal markings, even poems, all written in the same handwriting.

'Then I knew I had something'

Later he got an authentic copy of James A. Michener's signature. He compared it to the script in the book. They were identical.

"So I wrote to Mr. Michener" — Gay's deep respect for Michener is obvious — "and got this very nice letter in return. Then I really knew I had something."

"How astonished I was to see those old pages with their signatures," Michener wrote in his letter of reply to Gay (reproduced in the

new book). "The books in question were a portion of those I used in teaching at The Hill School in Pottstown and at the George School in Newton, both in Pennsylvania. I am most happy they have fallen into the hands of someone who appreciates them. . . . I often wondered what had happened to them." The Hill School was, and still is, a large, private, boys high school where Michener had his first teaching position.

Their correspondence eventually led to an idea. Why not write a book about Michener's early years as a student and a teacher? Three biographies and even Michener's own autobiography, *The World is My Home: A Memoir* (Random House, 1992), left obvious gaps in the record, Gay realized. The textbooks would
(Continued on next page)

Two formative books, and a teaching job almost lost

The cover of *James A. Michener: The Beginning Teacher and His Textbooks* reproduces two pages from one of the textbooks Michener used in 1929, *Sentence Analysis by Diagramming*, by Henry C. Edgar. In the Dybwads' biography, Michener recalls first reading that book:

"Spurred by that fortuitous introduction to the subject, I quickly became an expert in breaking down the English sentence, staying two assignments ahead of my students. I'm afraid I became so intrigued by the mathematics of the subject that I assigned my students far more work in sentence structure than they needed, but if they learned little from my excesses, I learned a great deal. My love for the English sentence started with Edgar, for when I completed his tidy little handbook, I really understood both the complexities and the niceties of the sentence, of which I would probably write more than a million. . . . It would be impossible, I suppose, to teach diagramming today. Too archaic, too tedious, and not visibly of value to the young student, but those of us who explored the sentence form in this manner came away

with a sense of structure that many writers today fail to acquire."

His old copy of Charles Dickens' *Great Expectations* (an "almost flawless novel") reminded Michener of the value of listening, restudying, and redrafting. For Dickens wrote two endings to the novel, circulated drafts of both to friends, and then chose the version that, Michener notes approvingly, had more emotion, mood, image, warmth, and finality. He decided right then: "If such immortals of the written word could subject themselves to superior criticism, so would I, if I ever became a writer." He says he has adhered to that self-advice throughout the subsequent 66 years.

Most of the material hadn't been seen by Michener in more than six decades. Some of it was entirely unknown to him. An example is a May 22, 1933, letter from the guidance director at Hill School explaining why he felt the 26-year-old Michener wasn't the right person for a job he had applied for at George School: ". . . Jimmie Michener's main interests are intellectual. . . . I think that member of thy committee who called him a humanist was right. . . . Jimmie is not a person to make any Quaker contribu-

tions to the new curriculum. . . . To be quite frank, I cannot see Jimmie in the position that you are trying to fill."

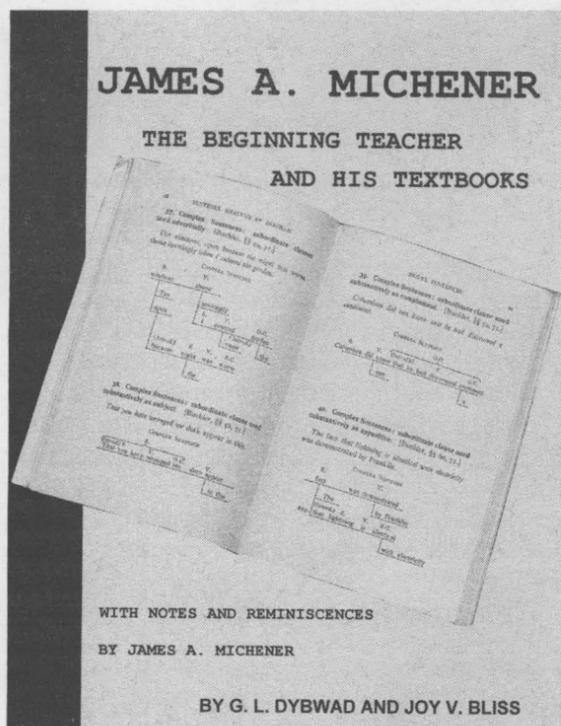
The Dybwads wondered if Michener had known about the guidance director's non-endorsement. (Michener got the job anyway; others had recommended him highly.) Gay showed Michener a copy of the letter. "You astound me!" Michener answered. "Never heard of this about-face. . . . The existence of this letter, in the depth of the depression when it would have been easy for George School to drop me and hire a real Quaker, is a major discovery. George School showed courage in sticking with me, and I pray they never regretted the decision." The non-endorsement letter is photoreproduced in the book, with Michener's comments beside it.

James A. Michener: The Beginning Teacher and His Textbooks, is available for \$29.95 at Page One bookstore in Albuquerque or by contacting: The Book Stops Here, Publisher; 1108 Rocky Point Court NE, Albuquerque 87123-1952; telephone 296-9047.

(Continued from preceding page)

be just a start. Their biography would be based on original documents and papers — and interviews — that the Dybwads would seek at the schools where Michener studied and taught. It might seem an audacious idea, but Gay and his wife did have some experience in writing and publishing — they have their own publishing operation and imprint, called The Book Stops Here. They had written and published one previous historical book this way, *Annotated Bibliography: The World's Columbian Exposition, 1893*.

"When we approached Mr. Michener about three years ago to do a joint project with him," Gay says, "he wanted to be sure we knew our business. He wanted to make sure it would be professionally done. We met with him, and he asked us a lot of questions, and then he agreed.



We probably wouldn't have got his approval if we hadn't already published a book.

"As you can imagine, that first meeting was very interesting. We met with him at his house in Austin." Michener has lived all over the world in researching and writing his books, but in recent years he has called Austin, Texas, his home. They found he lives very modestly, in a ranch-style house on a tree-shaded side street. Amazingly for such a scholar and writer, they say, his bookshelves are empty. He has given away all his books, even his own, and instead gets books for his research from the University of Texas library. He types his drafts on one of three manual typewriters in his home-office. Assistants transfer them to a computer.

The books 'moved me deeply'

"We brought the textbooks with us to show him," says Gay. "He was quite taken with them. He waxed very nostalgic."

Michener writes about all this in the foreword — dated May 1993 — to the new book. First, he refers to the initial letter from the Dybwads as "perhaps the most amazing correspondence I have ever received as a writer." It came from a couple he had never heard of, "from the unlikely home town of Albuquerque, New Mexico," who, "by some extraordinary device" had come into possession of "eighteen high school textbooks from which I had taught English in 1929, sixty-four years ago. . . . I recognized every book and remembered its significance to me long ago. The handwriting of the notes and poems was certainly mine and this reunion of text and teacher after such a long span of years moved me deeply."

They recorded his reminiscences about the books and his answers to their questions. As he

finished, Michener exclaimed, "My, but this is an amazing resurrection."

For their part, the Dybwads were equally impressed. "He is still amazingly inquisitive," Gay told the *Lab News*. "He's the most future-directed person I know."

Gay says Michener's memory is phenomenal. During their interview, Michener began reading a poem he had commented upon favorably in the margins of a 1929 book, then raised his head, and "with obvious feeling" recited the remaining stanzas from memory, 64 years later.

They were pleased to find that despite his age (he'll be 89 on Feb. 3), Michener was still teaching and learning. He has established and endowed writers programs at the University of Texas-Austin and the University of Miami. "I have always affiliated with bright students," Michener told them. "They're all very knowledgeable and they're very exciting. I don't want to deal with people at the least common denominator. I want them up there a little bit. That's my constant ambition: raise their sights." They say he advocates teaching the intelligent and willing and removing those who disrupt and are unwilling to learn.

That first meeting was scheduled for a half day. It lasted all day. It led to a contractual agreement by which the Dybwads would research and write a book about Michener's early years, based on original materials, and Michener would contribute his own comments and observations, all for 100 copies of the book.

Says Michener in the book: "I told them that if they found some sensible way to present the books and my relation to them, with my notes, I would cooperate with no royalty from me in what could prove an interesting portrait of a professional writer at the very birth date of his career in books."

With Michener's approval, the Dybwads contacted the schools at which Michener taught, asking to examine their archives. They wrote letters and got detailed replies. They began using their vacation time to return to Pennsylvania, talk to people, and copy these papers. They talked to some of Michener's former students and their contemporaries.

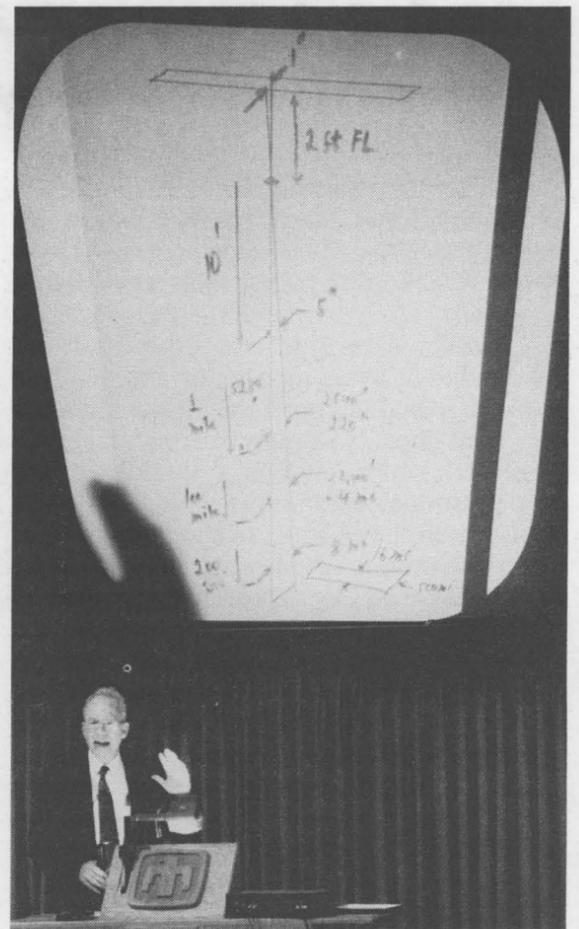
Emphasis on his teaching years

The result has just been published. The book spans the period from 1921 to the publication in 1947 of Michener's first book, *Tales of the South Pacific*, which won a Pulitzer Prize, led to the Rogers and Hammerstein musical *South Pacific*, and launched his career as a professional writer. But the emphasis is on his years of teaching: 1929-1931 and 1933-1936, and the influences that led to his writing career.

"James A. Michener's preparation for a high school teaching career and the consequences of his early teaching years had a dramatic effect upon his lifework," Gay writes.

The book, published in hardcover on enameled paper, is filled with high-quality photoreproductions of letters to, from, and about Michener; poems by him; old photos; newspaper and yearbook clippings; and Michener's specially prepared reminiscences and commentaries, including notes about how he used the textbooks to learn and teach. Each ends with his signature and oriental block mark.

"Many have written about Mr. Michener," Gay writes in his introduction, "but to our knowledge, this is the first time he has contributed written segments to a biography about himself and then further authenticated the work by subscribing his signatures and appending his special rubrics in the oriental style denoting 'finished.' We feel honored."



GARWIN ON CORONA — Noted scientist Richard Garwin, at a recent Sandia colloquium, describes the ground swath covered photographically by early Corona program satellites. Corona, a joint Central Intelligence Agency-Air Force effort, was America's first satellite reconnaissance program. From 1960-1972, 145 one-ton Corona satellites carrying specially made cameras were launched from Vandenberg AFB into polar orbit, providing 800,000 photographs of strategic areas of the earth, each on a frame of film 2 inches by 30 inches, each showing an area up to 16 miles wide and 500 miles long. The film capsule typically reentered the atmosphere after one day, descended by parachute, and was snatched in mid-air by an Air Force plane. The film was analyzed within hours by the National Photographic Interpretation Center, and the reports based on it provided strategic intelligence for the President. In early 1995, the US government declassified the Corona program and all its imagery. Garwin, who was involved with the program during those years both directly and as a member of the Defense Science Board and the President's Science Advisory Committee, described for Sandians "this remarkable achievement of American science, technology, and organization." He was hosted by Labs Director C. Paul Robinson. Garwin, now an IBM fellow emeritus, recently became a Sandia consultant.

Employee deaths



Nancy Finley

Nancy Finley of Environmental Regulatory Assessment Dept. 6626 died Dec. 16 after a short illness.

She was 53 years old.

Nancy was a senior member of the technical staff

and had been at Sandia since 1978.

She is survived by her daughter, Moira, and son, Ian.

Albert Langford of Logistics Systems and Property Management Dept. 7611 died Dec. 10 after a long illness.

He was 62 years old.

Albert was a staff member and had been at Sandia since 1984.

He is survived by his wife, Margaret.

Sandia's micromachines named one of top five technologies of year by *Industry Week*

For significant advances in the fabrication of micromachines, Sandia has been selected to receive one of five "Technologies of the Year" awards by editors of the trade journal *Industry Week*.

"We chose the Sandia work because it appeared to be a leading-edge advance in a technology that has potential for significant long-term impact in variety of areas," said the magazine's senior editor, John Sheridan.

The Sandia micromotors, with gears smaller than the diameter of a human hair, are the first to drive external gearing and be built in batches entirely by microelectronic fabrication techniques. The machines can drive gears 30 times their size, and spin at hundreds of thousands of revolutions a minute.

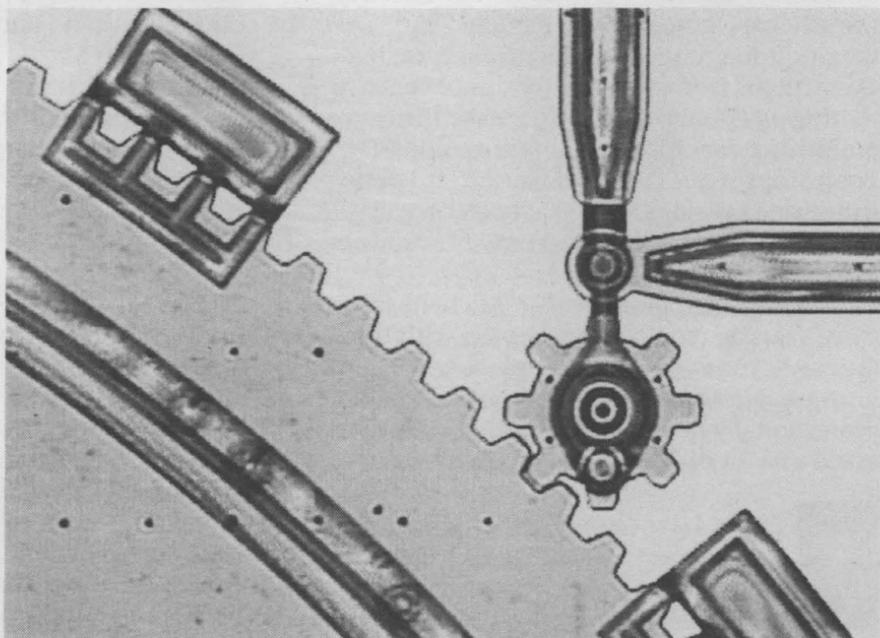
An article by Sheridan describing the Sandia technology in the magazine's Dec. 18 issue begins, "For a decade or longer, scientists have been fascinated by the potential of micromachines — devices so small that some of the components are invisible to the naked eye."

In the piece, Sandia researchers Jeff Sniogowski (1325) and Ernest Garcia (2643), manager Paul McWhorter (1325), and VP for Research and Exploratory Technology Bob Eagan (1000) speculate on future uses of the tiny machines. These include service as clean-

ing devices that remove minute dust particles from computer chips, optical switches in telecommunication systems, tiny gyroscopes for automobile navigation systems, and locking devices on nuclear weapons systems.

Presentation of the award will be made to Bob Eagan during the magazine's "Managing for Innovation Conference," March 19-20 at the McCormick Center in Chicago, in cooperation with the National Association of Manufacturers during National Manufacturing Week.

Industry Week, based in Cleveland, has a controlled circulation of 230,000, mostly in the manufacturing sector, and is distributed mainly to corporation executives, CEOs, presidents, vice-



HIGH GEAR — Sandia's micromachines, like the one pictured here, were named one of the top five technologies of the year by *Industry Week* magazine.

presidents, owners, and partners of companies having a hundred or more employees, according to its circulation director, Bruce Sprague. This is the third year the magazine has announced awards for technological innovations.

— Neal Singer (12620)

Developing managers

(Continued from page 1)

diversity, organizational change, listening, learning on-the-fly, and ethics and values.

People development — Developing and motivating others, and building team spirit.

Of those skills, nine — including managing diversity, listening, organizational change, building team spirit, and organizational agility — were identified as "gaps" looming ahead for the organization.

Based on the results of that meeting, Charlie Emery, VP of Human Resources Division 3000, assigned Jo Ann Romero to manage the Leadership and Management Development Department. Jo Ann's charter was to design and implement a program that would directly address the skills gap issue.

Enhancing specific skills

"The Large Staff meeting identified an expansive set of competencies they felt we will need in the year 2000," Jo Ann says. The challenge in designing this new program, she says, was to devise a way of correlating the needs of individual managers with the needs of the Labs.

"We knew a generic, broad-brush approach wouldn't work," Jo Ann said. "We decided early on in this process that we would have to get very focused on enhancing specific skills among specific manager groups."

The solution was to design a "targeted" program, one in which each manager/managerial candidate could customize his or her own program of development.

The available options include courses targeted to each managerial level from the newly promoted manager to the seasoned executive. The available courses are offered internally and externally. They include such things as "Survival Skills for Sandia Managers," "Decision Making and Problem Solving," "Conflict Resolution," "Management Problems of the Technical Leader," "Negotiations," "Strategic Leadership Practices," and

many more.

In addition, a portfolio describing the courses, the competency areas they address, and the nontraining options is available to guide the manager or managerial candidate in making development choices.

Program based on four steps

The Targeted Development Program, Jo Ann says, is based on four steps. Here is how they work:

In the **assessment** step, the individual's strengths and gaps relative to Sandia's competencies are identified. The assessment tool is based on an instrument developed by Novations Group, Inc. To use it, a manager/candidate's peers, subordinates, and superiors complete a comprehensive questionnaire about the individual's strengths and weaknesses in each competency area. The assessment instrument is confidentially "scored" by Novations and the individual's managerial skills and gaps are identified.

Equipped with the results of the assessment, the individual meets with his or her director or a consultant from Jo Ann's group. Together they **plan** a course of development, which may incorporate formal training course work or nontraining "hands-on" opportunities for enhancing skills in specific areas identified in the assessment. (Studies indicate that managers learn 80 percent of their skills in on-the-job situations, Jo Ann notes.) Some of the nontraining options include job rotations, in-place assignments, and other similar development options.

In a dynamic process, the manager **implements** the skills developed through course work and hands-on experiences in the workplace; 12 to 18 months later, the manager's development of new skills is **evaluated** through another round of assessments.

"The Targeted Development Program," Jo Ann says, "is designed as a systematic continuous improvement cycle for development among our managers."

While the Targeted Development Program aims to enhance the skills of managers at all

levels of experience, Jo Ann says she considers new Sandia managers to be her group's "key customers."

"Our thinking is that we want to get them the kind of support and information they need right away," she says. To that end, she says, her group has initiated a new eight-session, four-hour-per-session course, "Survival Skills for Sandia Managers." In addition, a premanagement "Orientation to Management" class has been started. Those new to the management ranks are also offered the support of an experienced mentor and given a handbook that provides concise, down-to-earth answers to frequently asked questions about a wide range of management issues and responsibilities.

Jo Ann says the need for sophisticated new management development tools is greater than ever. Sandia's demographics, she notes, indicate that as many as 40 percent of current managers are eligible for retirement and could retire between now and the year 2000. That would constitute a significant loss of experience, she says, a loss that can be addressed by an aggressive development program. Also, she recalls that the 1992 reorganization process eliminated a management level that had traditionally served as a training ground. With that level gone, she notes, alternative development tools assume increasing importance for the organization.

Jo Ann offers high praise for the colleagues who helped develop the new program. Among them are Linda Houston, Tracey Lamee, and Carol Crown (all of 8526) at Sandia/California, who, she says, "have been in almost daily contact with my office" to assure that California site managers have the same development opportunities as those in New Mexico.

Jo Ann also expresses appreciation to line managers Kathleen Schulz (6605) and Russ Skocypek (1513) for their involvement.

She says another group, consisting of line directors and managers and the Leadership and Management Development Advisory Council, has been "our reality check as we moved ahead and has provided many good ideas for successful implementation."

Check out redesigned 'Hot News' on Internal Web

Latest internal and external news at your fingertips

Sandians who can access the Labs' Internal Web home page can now obtain a new mix of internal and external news by clicking directly on the "Hot News" icon that's visible directly beneath the 10 major information categories. The redesigned Hot News page, which became operational late last year, includes five major categories of information:

- Special employee news and announcements (coordinated by the Labs' "virtual newsroom" group in Media and Employee Communications Dept. 12620),
- Latest Sandia news releases (issued by Sandia's Media Relations Dept. 12621),
- External news affecting Sandia,
- *Heads Up!* (short daily summary of mostly external news and some internal news, issued by Employee Communications Dept. 12622), and
- The Sandia Labs *Weekly Bulletin* (issued by Dept. 12622).

"I think Sandians will find the new Hot News page helpful in keeping themselves informed about what's going on around the Labs and about major national and international events affecting Sandia," says Hot News Editor Larry Perrine (12620). "We'll refine the system as we gain experience, but I believe this is a good start at establishing a Labs-wide electronic news service."

Will supplement printed media

Larry says the system is not intended to replace traditional printed employee publications such as the *Lab News* and *Weekly Bulletin*, but primarily to supplement that coverage and give employees instant access to the latest important news and announcements. "How-

ever," he says, "once many employees get accustomed to accessing news this way, we may be able to cut back some on the number of paper communications distributed. Sandians have long said they get too much paper coming to their desks.

"Some Sandians can't access the Internal Web yet, but more are gaining the capability every day, and we encourage those who get information this way to share it with others when appropriate," says Larry.

"Late last year, we had several important announcements that employees needed to get before the break, but we didn't have any printed publications coming out before the break," he says. "The Hot News system in combination with the oldest form of communication — the grapevine — worked pretty well in getting this information to employees. So I think there's definitely a role for such a system." (These announcements dealt with the Voluntary Separation Incentive Program, make-up sessions for the mandatory ethics training, and end-of-year withdrawals from the Sandia Savings Plan.)

Built into the redesigned Hot News system is an electronic form that allows employees to submit special announcements and news suggestions to the editor. The form is accessed via a "hot link" that's high on the Hot News page.

"I encourage folks to use the form to submit possible Hot News items, but I do want to emphasize that the 'special employee news and announcements' category is truly for special announcements," says Larry. "Routine announcements that have traditionally gone in the *Weekly Bulletin* at Sandia/New Mexico and in the daily *TNT* publication at Sandia/Califor-

nia should continue to be submitted to those publications. Special announcements for Hot News should be items that employees need to know about soon, that come about too late to be included in the printed publications, or that are so important that they need to be included in several media."

Employees who do not have access to the electronic form on the Internal Web, but who have items that may need to be posted on Hot News, can call Larry at 845-8511 or e-mail him at lgperri@sandia.gov.

Because the redesigned Hot News page is so new, Larry says the "external news affecting Sandia" category may be a little sparse at first, but it will eventually include news from DOE, Lockheed Martin, and maybe other DOE labs. "Also, as soon as it's ready, a new home page from our Congressional Relations Program Office (12120) will be posted in this category early this year," he says. The Congressional Relations office regularly reports on the status of legislation and other government actions that affect the Labs.

Most items will remain on the Hot News home page for two weeks, or until they become outdated, and those with any historical value will then go into monthly news archives that can be accessed at the bottom of the page.

Larry says several people helped design the new Hot News home page. "Fran Current and Rita Hoak [both 4612] helped a lot in the initial stages, and Sam Cancilla [4612] was particularly helpful in providing a lot of good practical ideas and getting the system running. Also, Rocky Corley and Jennie Negin [both 4403] of Sandia's WebCo group are providing continuing support to post items on Hot News."

Sandians aren't toying with models

Up, up, and away . . . Some kids grow up playing with model rockets — six-, seven-, or even 24-inch models they ignite to send soaring 600 feet into the air.

A group of grown-up Sandians is still setting off rockets, but you can forget the six-inch models. Three Sandians and one contractor have formed the Albuquerque Rocket Society (ARS), whose latest project is an eight-foot-tall model that will fly to 10,000 feet on 500 pounds of thrust.

This isn't just kids' stuff.

The society, which is affiliated with the Tripoli Rocketry Association, was formed to promote education and experimentation in model and amateur rocketry.

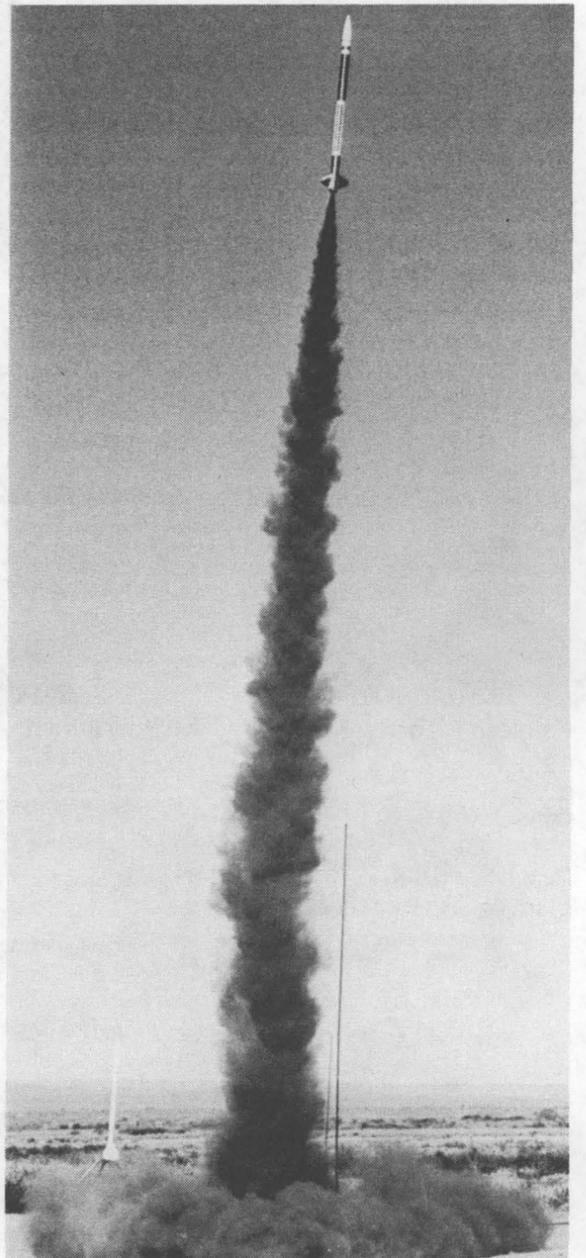
Sandians Andy Rogulich, Steve Pink, Jeff Jackson (all Aircraft Compatibility Dept. 2147), and contractor Mike Bernard (Intense Beams Research Dept. 9531) spend weekends and nights working on anything from small hobby rockets to high-powered eleven-foot models, which are launched twice a month near Moriarty. The Federal Aviation Administration has granted the group a special waiver for these launches because of the high altitudes to which they fly.

The ARS, which meets once a month in Albuquerque, is always looking for new members. "We want to get people, of any age or level of experience, to come out and see how exciting rocketry can be," says Andy, "even if they've never built a model before."

The Society's next launch will be Jan. 13. Call Steve Pink at 292-0146 for more information.

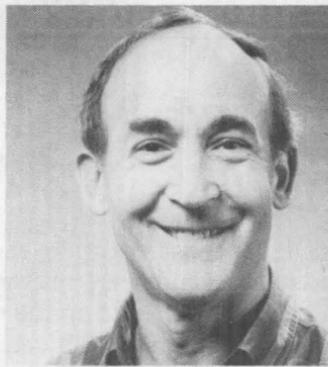


3 . . . 2 . . . 1 . . . — Andy Rogulich and Jeff Jackson (both 2147) of the Albuquerque Rocket Society prepare for a launch outside Moriarty. A LOC Vulcanite (right) heads off to the troposphere. Most high-powered model rockets, like the Vulcanite, use solid-fuel motors, but some larger rockets utilize a solid-fuel/nitrous oxide hybrid motor. (Photos courtesy of the Albuquerque Rocket Society)



Mileposts

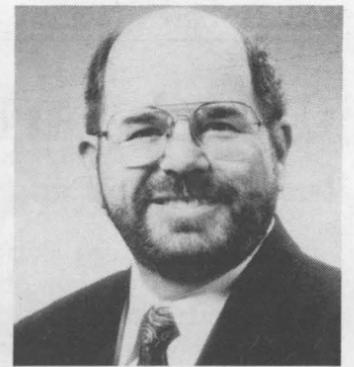
January 1996



Phillip Walkington 30
9752



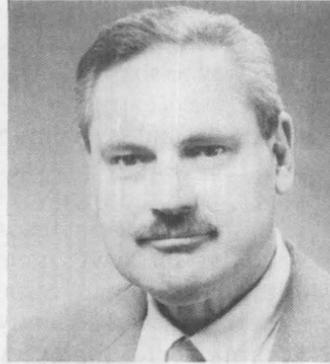
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Jeff Philbin 25
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Ray Jojola 20
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Walt Dickenman 15
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Jennie Negin 20
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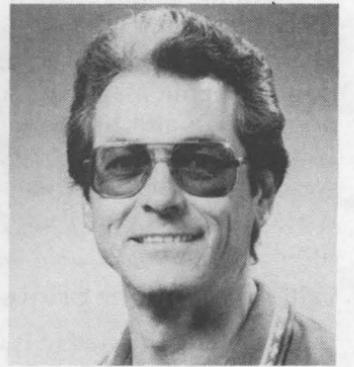
Janice Vaughan 15
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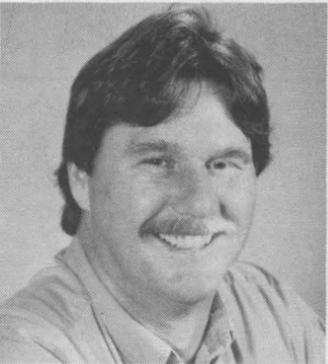
Mary Gonzales 20
1822



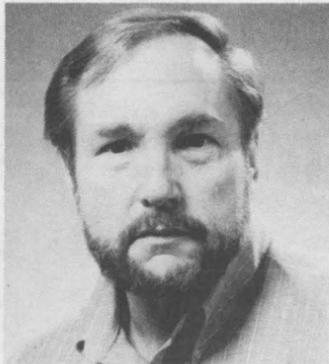
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Victor Baca 20
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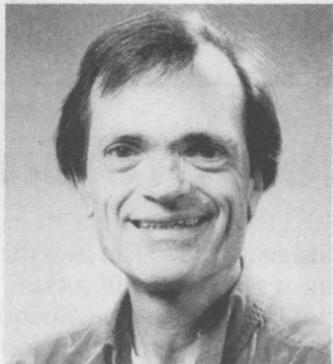
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Andrew Dumas 15
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Leo Torres 15
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Leslie Orear 20
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Janet Ahrens 15
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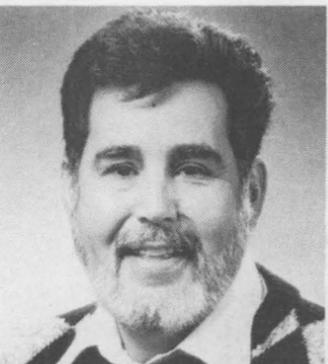
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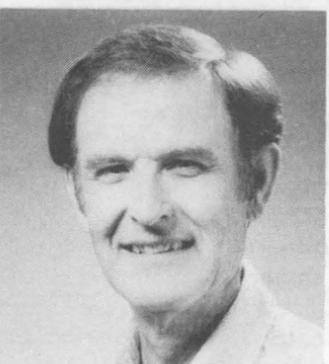
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10231



John Chavarria 15
8418



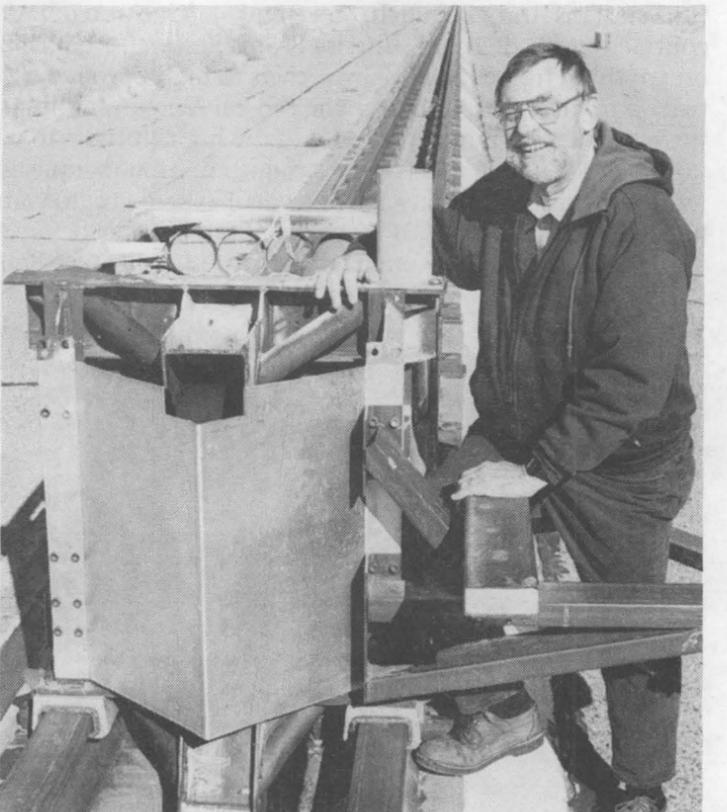
Rudy Baca 15
4913



Russell Haushalter 25
1142



Thomas Gutierrez 15
7809



Floyd Mathews 35
9761

Take Note

Sandia Corporate Archives and History Program invites you to view its current exhibit, "End of a War; Beginning of a Laboratory," now displayed in several locations: in the north hallway of Bldg. 894, at the National Atomic Museum, and at the Sandia Laboratory Federal Credit Union at Juan Tabo and Comanche NE. The next exhibit, planned for International Women's Day in March, will be a survey of women's contributions to Sandia.



Sympathy

To Lambert Turnage (7433) on the death of his mother, Charlena Keith, in Hartsville, S.C., Nov. 28.

To Nancy (6641) and Juan (3344) Griego on the death of her mother and his mother-in-law in Minnesota, Dec. 3.

To Nick Durand (7513) on the death of his mother in Fairbault, Minn., Dec. 13.

To Teree and Bobby (2314) Rush on the death of their infant daughter, Brittany Nicole, Dec. 13.

To David Van Ornum (1481) on the death of his mother, Kathryn Van Ornum, in Albuquerque, Dec. 17.

To Heinz Schmitt (2000) on the death of his father, Walter Schmitt, in New York, Dec. 19.

Retiree deaths

Jose Valdez (87)	4575	Oct. 2
Dale Easton (80)	4512	Oct. 10
Ruth Derrick (87)	4338	Oct. 12
Dorothy Hoeke (78)	1000	Oct. 16
Frank Speakman (68)	2411	Oct. 18
Adolfo Sanchez (75)	1474	Oct. 20
Wilfred Slade (85)	1525	Oct. 22
Jerry Hood (61)	300	Oct. 23
William Luxford (85)	2491	Oct. 23
Joseph Gordon (87)	2492	Oct. 24
Johnson Jordan (81)	7121	Oct. 26
Ethel Lonner (89)	3256	Oct. 27
John Rohrer (87)	5525	Oct. 27
Joseph Garcia (72)	3500	Oct. 27
Leo Jercinovic (75)	3440	Oct. 29

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

REFRIGERATOR, '92 Roper, no-frost, 14 cu. ft., white, like new, \$275 OBO. Ricker, 296-2191.
 DESK, 30" x 60", double-pedestal, wood, walnut finish, \$260. Aden, 296-9787.
 TEXTBOOK, "Labor Relations," \$50; two twin-size beds, wood frames, \$50 ea.; bikes; double-size waterbed, \$75. Crosby, 858-3128.
 GUITAR, Fender Heartfield, w/hardcase, \$550 OBO; kerosene heater, 8,200-Btu, electric ignition, \$50. Van Den Avyle, 898-6474.
 SKIS, 200cm, Rossignol-GS Quantum 969 w/Look 3D, Z7 bindings, excellent condition, \$150. Johnson, 271-8669.
 SOFA SLEEPER, \$75; executive desk, \$50; baby-bouncer chair, \$25; 2 mountain bikes, \$125 ea. Gonzales, 344-8381.
 NORDICTRAC, basic model, \$175; daybed, w/box spring & mattress, perfect condition, \$125. Meirans, 271-2313.
 NORDICTRAC EXCEL, \$325; Chinese charger, 15-3/4-in., Thousand Butterflies design, \$500; Victorian armchair, \$500 OBO. Frames, 344-6451.
 OAK CRIB/YOUTH BED, \$200; Fisher-Price car seat, \$40; antique cocktail server, \$100; high chair; booster; car seat. Schkade, 299-7439.
 BLACK TELEVISION CABINET, wooden w/glass doors, \$25; 4 Ansel Adams prints, black wooden frames, \$100. Sobel, 281-8792.
 BLACK COCKER SPANIEL, 6 yrs. old, female, spayed, \$100; Atari 520ST computer, programs/games, \$75. Briscoe, 291-0492.
 GO-CART, \$600; workout machine, \$175; ski-workout machine, \$95; LWB camper shell, \$75; parallel bars, \$150. Marquez, 898-3169.
 WOODBURNING STOVE, Orley Baby Jane, back draft, \$300. Sterk, 856-7784.
 CHILD'S FISHER-PRICE STOVE, excellent condition, all accessories, \$40. Greear, 839-4255.
 DAVID WINTER COTTAGE, Premier 1994 Xmas, \$220; Wurliitzer Fun-maker organ, M530, \$600. Saya, 296-1817.
 DIVAN, manufactured by Heritage/Henredon, down-filled cushions, brocade covering, excellent condition, \$600. Wangerin, 889-3542.
 TELEVISION, JVC, 27-in., \$350; Minolta 400si, 2 zoom lenses, new, \$300; Audio Concept speakers, light oak, \$300/pr. Crenshaw, 296-8948.
 GEOWORKS 386 COMPUTER, color monitor, keyboard, Print Shop, Bible, 13 games, & more. Garcia, 344-9609, after 6 p.m.
 WOMAN'S SHEEPSKIN JACKET, petite, Overland shearing, paid \$700, sell for \$450 OBO. Babcock, 299-3121, leave message.

PUPPIES & MOM: white German Shepherd/Rotweiler puppies & white shepherd mom, free to good home. Goodson, 286-1267.
 SOFA & LOVESEAT, you haul, \$30. Ruby, 821-0982.
 ACOUSTIC GUITAR, Yamaha FG 410, perfect condition, never used, paid \$160, best offer. Furch, 345-1411.
 MILITARY SPECIAL FORCES SWEATERS, new, black wool, \$8; new wool army shirts, \$3.50; both men's small only. Roberts, 866-5422.
 WATERBED, super-single, complete, \$95; dog run, chain-link, 11 x 16, \$90. Baronner, 262-2455.
 TELESCOPE, 8-in. Celestron, Schmitt-Cassegrain optics, Beyers mount, ideal deep-sky & solar system viewing, \$1,995. Williams, 856-5722.
 TV/VCR UNIT, 13-in., hardly used, \$250 OBO. Tadios, 271-2377.
 STOVE, refrigerator, dishwasher, all matching, good condition, all \$400 OBO; NordicFlex gold exerciser, w/all attachments, \$500 OBO. Hauber, 898-0997.
 BMW FACTORY TOOLS, assorted, w/bearing pullers for 4- & 5-spd. gearboxes. Armstrong, 271-8302.
 LUGGAGE, new, Pierre Cardin, 22 x 28, wheels, beige tweed, \$30. Tremi, 823-2996.
 LIVE .41 MAGNUM AMMO, new & once-fired 30-06 cases, reasonable. Diegle, 856-5608.
 AQUARIUM, 10-gallon tank, w/storage stand, all equipment, ideal "starter kit," \$45. Jackson, 293-0262.
 CHEST OF DRAWERS, top folds to changing table, \$100. Pott, 821-2253.
 VCR PLUS, \$20; Dirt Devil hand vacuum, w/attachments, \$20; Eureka vacuum, w/attachments, \$20; all like new. Prins, 867-9440.
 SNOW BLOWER, 8-hp, electric start, rubber tracks, light, Sears best, like new, used 2 seasons. Greer, 299-9455.
 ENTERTAINMENT UNITS, VCR/stereo/TV, 3-pc. cabinet, matched set, oak finish, glass doors, on rollers, excellent condition, \$350. Seyfer, 292-0179.
 CANON SURE SHOT CAMERA, model AF35ML, case, \$35; large upholstered recliner, brown, \$50; all good condition. Auerbach, 296-1489.
 CHAIN SAWS, 2 ea., 24-in. bar McCulloch, \$25 OBO; 15-in. bar McCulloch, \$25 OBO. Walston, 296-0372.
 BABY ITEMS: travel crib, \$60; high chair, \$35; swing, \$25; infant carseat, \$15; bouncer chair, \$8; Johnny JumpUp, \$8; like new. Sjaardema, 299-8042.
 TAPE DECK, dual-cassette, Technics, almost new, \$90. Hill, 856-6423.
 WASHER & DRYER, Wards/Maytag, white, good condition, \$75 ea. or trade for refrigerator. Hulett, 255-8961.
 NORDICWALKER, like new, originally \$650, asking \$500. Romero, 857-0466.
 WASHER/DRYER, apartment-size, like new, \$500; child's desk/bed (new mattress on top), \$300. Ryburn, 237-0600.

DEADLINE: Friday noon before week of publication unless changed by holiday. MAIL to Dept. 12622, MS 0413, or FAX to 844-0645. You may also send ads by e-mail to Nancy Campanozzi (nrcampa@sandia.gov). Questions? Call Nancy on 844-7522. Due to space constraints, ads will be printed on a first-come, first-served basis.

Ad Rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. No phone-ins.
4. Use 8 1/2-by 11-inch paper.
5. Type or print ad; use accepted abbreviations.
6. One ad per issue.
7. We will not run the same ad more than twice.
8. No "for rent" ads except for employees on temporary assignment.
9. No commercial ads.
10. For active and retired Sandians and DOE employees.
11. Housing listed for sale is available without regard to race, creed, color, or national origin.
12. "Work Wanted" ads limited to student-aged children of employees.

DISHWASHER, Kenmore, 3-yr. old, excellent condition, \$50. Montoya, 296-4268.

TRANSPORTATION

'86 CUTLASS FIRENZA, 6-cyl., 2-dr., AC, 35K miles, 1 owner, excellent condition, \$4,000. Stromberg, 828-0892.
 '84 VOLVO DL, 4-spd./OD, AC, AM/FM tape, clock stopped working so must sell, 149K miles, below book, \$3,500. Baugher, 265-8306.
 '86 NISSAN KING CAB ST, 4x4, 5-spd., fuel-injection, PW, shell, 144K miles, \$4,260=loan value. Davis, 266-2538.
 '77 280Z, runs well, recent tires, battery, & brakes, tinted windows. Pierce, 299-2801, ask for Greg.
 '82 PONTIAC J2000, excellent gas mileage, very reliable, \$1,000. Parry, 884-7934.
 '86 FORD F-250, 8-ft. bed w/camper shell, 460 V8, 4-spd., off-road tires, 88K miles, \$7,500. Danneels, 292-1548.
 '78 DODGE CARGO VAN, 91K miles, new transmission & brakes, does not burn oil, \$1,000. Bazar, 898-1467.
 '69 CHEV. PICKUP, finished shell camper, good mechanical & physical condition, \$2,500. Jackson, 293-0262.
 '86 MERCEDES 560 SEL, pearl-black exterior, gray leather interior, 30K miles, perfect condition. Ahr, 345-2521.

'91 MERCURY CAPRI XR2, convertible, w/hard & soft tops, excellent condition, 32K miles. Bentz, 237-9552.
 '95 BUICK RIVIERA, Jadestone, V6, super-charged 3.8L, leather interior, low mileage, loaded, \$27,850. Perez, 828-9005.
 '91 EAGLE PREMIER ES, extra clean inside & out, white/blue interior, \$5,975. Woody, 892-2251.
 '84 VANAGON, 4-spd., AM/FM tape, rebuilt heads, new seals & rings, Amsoil oil & filters, below book @ \$2,800. Baugher, 265-8306.
 '92 FORD TAURUS, excellent condition, AT, all power, AM/FM cassette, \$7,900. Dibben, 343-0303.
 '89 CHEV. EXPLORER CONVERSION VAN, loaded w/every option, 51K miles, always garaged, excellent condition, \$11,000. Baremore, 296-9267.
 '92 CHEV. S-10 BLAZER, 4x4, AT, AC, ABS, red, 4.3L, V6, 50K miles, great condition, must sell, \$11,500 OBO. Rael, 877-0696.
 '91 BUICK REGAL, AT, 6-cyl., PW, PL, cruise control, 75K miles, new brakes, \$6,800. Lyons, 255-6913.
 '81 GMC PICKUP, 3/4-ton, 4x4, new rims, new tires, recent tuneup, great condition. Pierson, 299-9693.
 '93 HONDA ACCORD EX, 4-dr., 5-spd., white, under 20K miles, factory warranty, alloy wheels, moonroof, \$15,995. Henderson, 237-9845.

RECREATIONAL

CHILD'S MOUNTAIN BIKE, fits kids 8-12 yrs. old, very good condition, 10-spd., black w/silver specks, \$50 OBO. Field, 890-6523.
 TIMESHARES, due to death in family several timeshare weeks available at reasonable prices, highly desirable. Ludwig, 856-5111.
 TIMESHARE APARTMENT in Pagosa Springs, beautiful, sleeps 6, close to golf & skiing. Dahly, 281-2440.
 GOLF BALLS, like new, all brands & colors, 10 for \$1; golf clubs 3-SW, Golfsmith irons, \$100. Dwyer, 271-1328.
 TELEMAR BOOT, Black Diamond/Scarpa Terminators, 2nd generation model, men's size 11-1/2, \$450+ new, asking \$260. Ritchey, 298-4311.
 GOLF CLUBS, men's Macgregor Nicklaus Tour Classic, 3-W, 1, 3, 5 woods, \$230; woman's petite basic set, \$85. Templin, 884-4293.
 '93 KAWASAKI NINJA 500, very good condition, 4K miles, \$2,550 OBO. Hudson, 281-6978.
 DYNASTAR SKIS, 203mm Salomon bindings, used sparingly, \$75. Koenig, 294-2264.
 TWO LIFT TICKETS, Angel Fire. Laderach, 888-0712.
 '75 CHINOOK CAMPER, pop-top, on Toyota chassis, good mileage, dual tires, \$800 OBO. Stamm, 255-2640/256-7614.
 '95 POWER SCOOTER, 2-cyl., 15-mph, cost \$450, asking \$300 OBO. Babcock, 299-3121, leave message and phone number.

REAL ESTATE

3-BDR. HOME, Northeast, 1-1/2 baths, 1,300 sq. ft., open floor plan & den, close to base, \$95,000. Meluso, 296-0145.
 4-BDR. HOME, near Nature Center, 2,550 sq. ft., easy care, quiet cul-de-sac, Southwest-style solar, \$259,900. Ball, 344-7437.
 4-BDR. HOME, 2 full baths, 2 fireplaces, sunroom/hot tub, far Northeast Heights, immediate occupancy, 2,350 sq. ft., \$157,900. Dawson, 828-0873.
 3-BDR. HOME, w/study, Academy Acres, 1,950 sq. ft., excellent condition, 2-car garage, new swamp cooler, roof, furnace. Vigil, 271-1328.
 CUSTOM-BUILT HOME, 2,400 sq. ft., 2 landscaped acres in Peralta, \$239,000, 2 additional laser leveled, irrigated acres available. Fleming, 865-3545/866-0350.
 2-BDR. SKI CONDO, near Purgatory, 1,310 sq. ft., 2 baths, furnished, excellent construction, great rental history, \$99,500. Moore, 764-8489.
 2-BDR. HOME, 2 baths, 2-car garage, oak cabinets, skylights, quiet neighborhood, in Countrywood, Paseo & Wyoming area. Schneider, 822-9273.

WANTED

HOUSEMATE, female or male, 3-bdr. house, separate baths, walk-in closets, washer/dryer, fireplace, 2-car garage, \$275/mo. plus 1/2 utilities. Ewen, 836-3563.
 HOUSEMATE, share 3-bdr., 2-bath home in Edgewood w/nonsmoking female, pets negotiable, \$400 including utilities. Kanipe, 281-2812.
 JEEP WHEEL, 15x7, factory chrome spoke from Laredo pkg., top dollar. Mulder, 294-5858.
 FERRET CAGE for son's ferret, rabbit cage will also work fine, prefer small-medium cage (2' high x 4' long). Vigil, 880-0026.
 DRUM SET, reasonable. Carroll, 298-2827.
 CEMENT MIXER, approximately 1/3-yd. capacity, prefer electric drive, any condition. Lanes, 856-7738.
 SWAGE BLOCK for blacksmithing. Marrs, 281-9889.
 SOCCER EQUIPMENT for AYSO girls team, any extra cones, flags, etc., that are no longer needed, will pick up. Nickerson, 888-4159.
 TEXTBOOKS: "The Hebrew Prophets," "The Catholic Study Bible," "Getting Funded: A Complete Guide to Proposal Writing." Crosby, 858-3128.

LOST & FOUND

LOST: Solitaire opal ring in 4-prong gold setting. Jennings, 268-8789.
 FOUND: Half of a bicycle rack for car bumper. Gibson, 296-3239.
 FOUND: CD player, in water tower parking lot. Otts, 844-3305.

Atomic Museum seeks volunteers, foundation members, donations

The National Atomic Museum needs Sandians' help. For years, the museum has existed with the help of an active volunteer program. Joni Hezlep, Museum Director and Manager of National Atomic Museum Dept. 12672, says the museum could not have continued to operate effectively without these volunteers. The volunteers are retired managers and staff from Sandia, DOE, the military, and industry. They serve as receptionists, tour guides, and store cashiers. Some volunteers are also available for special projects such as research, exhibit preparation, and other museum events.

The museum formalized the volunteer program in September 1992 by establishing the nonprofit National Atomic Museum Foundation. The Foundation's purpose is to help further the museum's cultural, educational, and scientific programs by raising funds for new exhibits, advertising, renovation of existing exhibits, publications to support exhibits, and exhibit receptions. Membership fees also help support these projects.

Several Sandians already are Foundation members, and some are on its board of trustees. But, especially now that Sandia is operating the museum, Joni would like to enlist more Sandians as volunteers and members. "I want to encourage more Sandians to get involved. The museum will certainly benefit, and I believe Sandians will find the experience worthwhile."

Below are dues for basic and contributing membership categories. All donations (including membership dues) are tax deductible. In addition, members receive the foundation's quarterly newsletter, discounts on semiannual Trinity Site tours, a 10 percent discount on museum store merchandise, and invitations to special events and exhibit openings.

Annual basic memberships: Individual, \$25; Participating, \$35; Family, \$50.

Contributing memberships: National, \$100; Sustaining, \$250; Patron, \$500.

For information, contact Harold Jeblick, Membership Chairman, National Atomic Museum Foundation, at 284-3245.

Coronado Club

Jan. 5 — Friday night dinner/dance. \$6.95 all-you-can-eat buffet, 6-9 p.m. Music by Isleta Poorboys, 7-11 p.m.

Jan. 7 — Sunday brunch buffet, 10 a.m.-2 p.m. \$6.95 adult members; \$1.00 for children 3 to 12; free for children 3 and under. Music for buffet by So Rare, 1-4 p.m.

Jan. 11, 18, 25 — Thursday bingo night. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

Jan. 12 — Friday night dinner/dance. \$6.95 all-you-can-eat buffet, 6-9 p.m. Music by Bobby Buttram, 7-11 p.m.

Jan. 14 — Cantina opens at 4 p.m.

Jan. 19 — Kids' bingo; buffet from 5-8 p.m.; cartoons and movies; bingo from 7-9 p.m.; free hot dog and soft drink for all kids playing bingo. Cost of a bingo packet is \$2.50

Jan. 21 — Sunday brunch buffet, 10 a.m.-2 p.m. \$6.95 adult members; \$1.00 for children 3 to 12; free for children 3 and under. Music for buffet by Bob Weiler, 1-4 p.m.

Fun & Games

Golf — The Sandia Women's Golf Association (SWGA) recently completed its 1995 season with the following results: 18-Hole Tournament overall winners — Marlene Shields (9742), low gross, and Beth Connors (2111), low net; 9-Hole Tournament overall winners: Yone Knighton, low gross, and Shirley Lopez (5799), low net; A League — Karen Smith (6600) and Renae Perrine (6000), first place; Tana Calvin (2000), Janet Nelson (12600), and Maryanne Cunningham (2400), second place; B League — Marge Kopriva (6612), Lucy Dickinson, and Yvonne Batchelor (9419), first place; Shirley Lopez, Suzette Beck (10203), and Lisa Trainor (4814), second place; Par-3 League — Jodie McPherson and Marlene Sanders, first place; Beth Connors, Marge Kopriva, and Shirley Lopez, second place; Special awards — Sportsmanship, Marcie Samuelson (12111);

Special Recognition for Seven Years' Service as SWGA Handicap Director to Teresa Mills (6401); 18-Hole Handicap Most Improved to Beth Connors; and 9-Hole Handicap Most Improved to Judy Hansen (10232). For more information about SWGA, call Renae Perrine at 293-1429.

Skiing — The American Lung Association of New Mexico is again offering ski privilege cards to New Mexico skiers. The New Mexico Ski Privilege Card is good at seven New Mexico ski areas: Taos, Angel Fire, Red River, Ski Apache,

Ski Rio, Sipapu, and Snow Canyon. The card costs \$40 (\$224 value) and all funds will go to fight lung disease. Only 1,000 cards are available and may be purchased at the American Lung Association Office (216 Truman NE), Sportz Outdoor (6915 Montgomery NE), and Alpine Sports (121 Sandoval in Santa Fe). Breathing problems are the number one cause of death of infants under one year of age and the number three cause of death among adults. For more information, call the American Lung Association at 265-0732 or 1-800-221-LUNG outside the Albuquerque area.

New Mexico Symphony offers 'Buy 1, Get 1 Free'

Sandians once again are being given an opportunity to buy two tickets for the price of one to the New Mexico Symphony Orchestra (NMSO).

More than 100 Sandians took advantage of the same offer in November.

The next two concerts, being conducted by David Lockington, will be Friday, Jan. 19, at 8 p.m. and Sunday, Jan. 21, at 4 p.m. at Hoffmantown Baptist Church. This should be a special event — Lockington's wife, Dyland Jenson, will be the guest violinist. The program includes Tchaikovsky's Symphony No. 4 in F minor and Ravel's *Tzigane*.

Jack Dickey (12700), who attended November's concert says, "Mozart was great. I'd like to go again."

"Buy 1, Get 1 Free" tickets must be purchased in person or by phone at the NMSO Symphony Store in American Square, Suite 4 (3301 Menaul NE, just west of Carlisle).

When ordering, you must mention you are a Sandia employee. Call 881-8999 to charge tickets.



MOVE 'EM OUT — Surplus copiers at Sandia's reapplication warehouse await pickup by local school officials. Sandia is donating 15 surplus Kodak copiers to New Mexico schools to help replace outdated equipment. The donations are part of the K-12 Gift Program, established by President Bush in an Executive Order and implemented in October 1994. The Gift Program provides a way for DOE labs to donate surplus or excess education-related equipment to elementary and secondary schools to help improve math and science curricula. In the first year of the program, Sandia provided more than 800 pieces of equipment valued at more than \$3.3 million to public and private schools in the state.