

Sandia drives development of 'lean burn' car engine

Improved engine electronics goal of General Motors CRADA

By Mary Hatheway

Lab News Intern

Let's make a deal.

What if you could buy a car with improved fuel economy? It'll never fail an emissions test. And it comes with a ten-year, 100,000-mile warranty. Too good to be true?

What sets this car apart from others is its "lean burn" engine, a technology that General Motors (GM) is developing with help from Sandia.

One key to building a car with a lean-burn engine is installing the engine electronics — which monitor and control power output, fuel economy, air-fuel mixture, and exhaust emissions — under the hood of the vehicle rather than in the cab.

Moving electronics from the cab to the engine increases vehicle performance by enhancing combustion efficiency and reducing nitrous oxide exhaust. It also simplifies the cabling running from the engine to the electronics that sit under the dash.

But engine-mounted electronics must be capable of withstanding the considerable temperature extremes that exist under the hood.

Designing an electronics package to endure temperature cycles that fluctuate from as low as

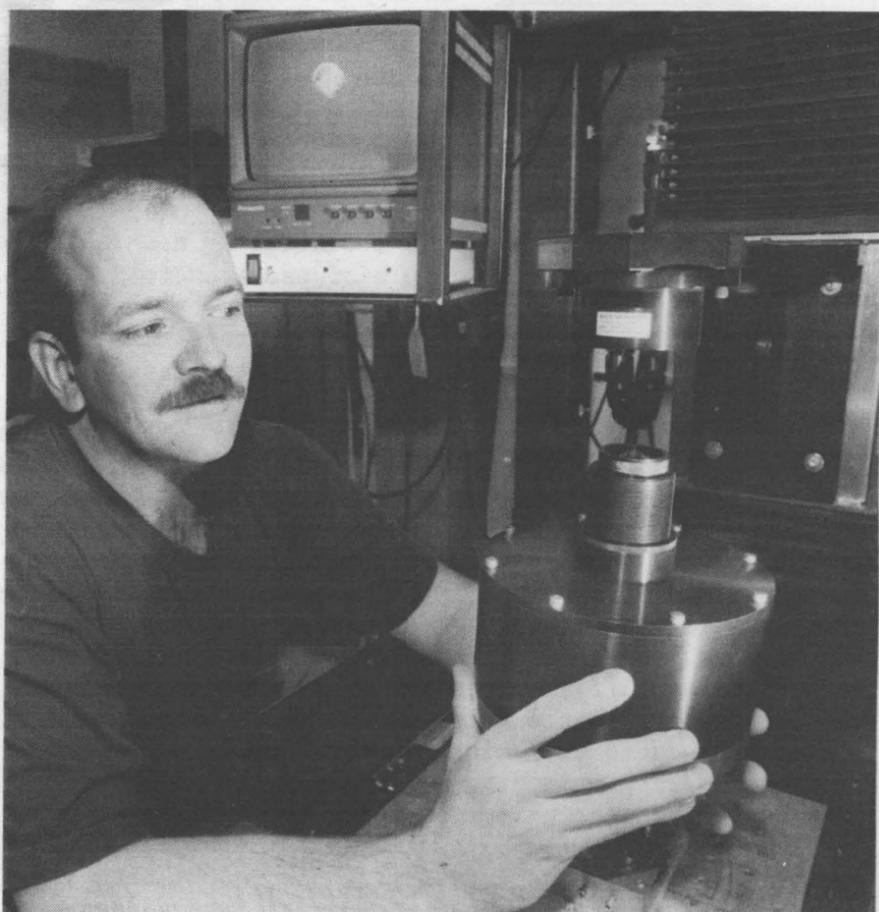
Under-hood electronics must endure temperature cycles that fluctuate from as low as -65°C to as high as 150°C.

-65°C (-85°F) to as high as 150°C (302°F) was the challenge GM presented to Sandia three years ago.

Through a four-year cooperative research and development agreement (CRADA), Sandia is helping GM design and test an electronics package for under-hood applications for its 2000 model year.

"The first step in this CRADA was identifying the enabling packaging technologies for under-hood applications," says Fernando Uribe of Electronic Processing Dept. 2411, project leader of the engine systems electronics CRADA with GM.

"It turns out that the candidate technology selected happens to be the backbone packaging technology used for a lot of the weapon components we've been making at Sandia. Basically, we just took that technology



DAVE KEICHER (1831) adjusts a laser that seals the electronics package Sandia is developing for General Motors. Dave says the laser-sealing process is unique because very high localized glass heating can be attained without damaging the electronics inside the package.

a step higher and worked on developing high-production, cost-competitive processes to meet
(Continued on page 4)

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Optional compressed workweek approved for Sandians

9/80 option available June 30 to exempt, nonexempt employees

It's official. Sandia has adopted a 9/80 compressed workweek option available to both exempt and nonexempt employees, effective June 30.

After months of speculation, Sandia's Quality Leadership Council (QLC) has approved a compressed workweek schedule that will enable participating employees to work 80 hours in nine days and get every other Friday off. The positive decision was based on feedback provided by employees participating in a compressed workweek pilot in divisions 4000, 5000, and 6000 and Dept. 8281 (*Lab News*, Jan. 20 and March 3).

"I believe the implementation of the 9/80

workweek recognizes the needs of the individual and of the company in achieving our business goals," says Charlie Emery, VP for Human Resources 3000. "I would like to recognize Susan Harty [3531] and Ray Shaum [10502], who were the leaders on this pilot, and their entire team. They really had some 'barriers to bust' to make this project work. They did a terrific job."

Susan, compressed workweek project leader, says several changes have been made as a result of the pilot.

The most significant change is in the schedule options available to employees who choose to participate. (No one is required to.)

(Continued on page 5)

Production Div. 14000 sorts out Labs' latest production assignment

By John German

Lab News Staff

During its half-century history, Sandia has had an on-and-off relationship with nuclear weapons-related manufacturing.

From the late 1940s until 1958, Sandia assembled various electrical and mechanical components for nuclear weapons and provided emergency-capability nuclear weapons for the military services. Components called "C-items" were manufactured here until the late 1960s, and in the '80s the Labs produced electronic components for the Trident II warhead, according to corporate historian Leland Johnson (13213).

On April 11, Sandia began a new phase in its relationship with the production line when it delivered 36 recertified neutron generators to the Navy for inclusion in the US nuclear stockpile. Sandia inherited neutron generator manufacturing responsibilities as part of DOE's efforts to streamline the nuclear weapons complex, which resulted in the closure of its neutron generator plant in Pinellas, Fla. (*Lab News*, June 11, 1993)

And more manufacturing-type work appears to be on the way. DOE is expected to give the go-ahead soon for Sandia to develop a medical radioisotope production capability at
(Continued on page 4)

The first 36 Sandia-built neutron generators were delivered to the Navy on April 11.

Earth Day festival culminates an active week for environment

7

Sandia organizations finding innovative ways to prevent waste

8



This & That

Editor in hiding - It may not show, but I'm now writing this column on a higher level - from the fourth floor of Bldg. 802 to be precise. As I mentioned in the last issue, I'm on a several-month special assignment to study how we can communicate more effectively and cost efficiently in the future, but I'll continue writing this column. If you need to talk with me, call me at my new number: 845-8511. If it's a *Lab News* matter, though, please call one of the staff listed at the bottom of this page.

* * *

Parting shots - Before I started my new assignment, several *Lab News* staffers brought a couple of passages to my attention from a new book, *The 776 Nastiest Things Ever Said*, by Ross and Kathryn Petras (HarperPerennial, 1995). I think the staff members took just a little too much pleasure in showing me these two passages: (1) "An editor should have a pimp for a brother so he'd have someone to look up to," attributed to writer Gene Fowler, and (2) "An editor is one who separates the wheat from the chaff and prints the chaff," attributed to the late Illinois governor and presidential candidate Adlai Stevenson. I quickly pointed out to them, though, that my main talent is in hiring chaff.

* * *

State-of-the-Labs interview in next issue - Acting *Lab News* Editor Ken Frazier and I were scheduled to interview President Al Narath and Executive VP Jim Tegnalia this Wednesday for our annual State-of-the-Labs feature. If all goes as planned, we'll have that feature in our next issue. With the recent news about Sandia downsizing and expecting smaller budgets in coming years, it could be a very interesting interview. And something tells me Al's next employee dialogue sessions (see announcement below) could be very well attended.

* * *

Maybe he's just unsupervisable - Just when I start thinking we've explored every conceivable unofficial Sandia record, I hear from someone else who believes he or she has another one. Kenneth Davis (2172) thinks he may own the Sandia record for having the most supervisors in a short time, with the exception of "floater" employees who move quickly from one job to another by design.

Ken has been at Sandia a little more than 5-1/2 years and is on his seventh supervisor. That may be a record in itself, but he's betting this part is: In his first 16 months at Sandia - July 1989 to November 1990 - he had five different supervisors. That's an average of a new supervisor every 3.2 months, even though Ken transferred only once during that time; two of his supervisors were promoted and two took lateral transfers. His fifth one lasted three years, though. Any challengers?

* * *

"Parfully" funny comment - It's not often that sportswriters make me laugh out loud, but Bill Lyon of Knight-Ridder Newspapers did when he wrote several weeks ago about this year's Masters golf tournament winner Ben Crenshaw, who nearly everyone says is a truly nice guy. Lyon was comparing "Gentle Ben" to some others on the professional tour, and wrote, "The professional golfers' caravan is riddled with backbiting, jealousy, pettiness, and mean-spirited gossip, pretty much like the office where you work." I've worked in a few of those offices.

- Larry Perrine (845-8511, MS 0129)

Space chargeback changes coming

The Space Chargeback Process Improvement Team, headed by Ray Heath (10605), is presenting seven space chargeback system alternatives this week (six new alternatives and the current chargeback system) to project owners Lynn Jones, Vice President of Laboratories Services 7000, and Paul Stanford, Vice President of Business Management & Chief Financial Officer 10000. The current space chargeback system, implemented at the start of FY94, needed to be improved because of customer dissatisfaction and equity issues, says Ray.

A team representing a range of customers and providers was assembled in late November 1994: Chuck Wiuff (1201), Brian Behling (2702), Pat Chavez (5601), Dave Klassen (7801), Steve Neely (8611), Mike Widmer (10401), Stephanie Lonsberry (10505), and Dave DeLucia (contractor). This team developed new space charging alternatives that are consistent with industry standards, provide incentives to use space and utilities more efficiently, and integrate with the overall Labs management processes.

These alternatives evolved after the team completed preliminary work, which included documenting the current space chargeback system; comparing the current system metrics with benchmarking studies; analyzing local comparable services and rates; surveying and validating customer and provider requirements; and analyzing five other sites' space chargeback systems.

The preferred space chargeback system is scheduled for implementation starting in FY96. The *Lab News* will report on the preferred system when it is selected.

Guidelines for 1995 Sandia President's Quality Award available today

Guidelines for the third annual Sandia President's Quality Award (PQA) are available from your Division Quality Coordinator today, according to PQA Project Manager Susan Harris of Corporate Quality Excellence Dept. 12909. She says the guidelines are an excellent tool for improving quality in your organization. Feedback from teams that participated last year indicated that by following the guidelines, they achieved improvements in customer focus, process management, and results.

The purpose of the PQA is to encourage self-assessment, share successes, and recognize achievement. Winning teams from 1994 will receive recognition when a representative from each team attends the Sandia Employee Recognition Night on June 3.

Here are other dates to remember:

May 22	Intent to submit deadline
June 28	Application deadline
Sept. 1	Announcement of winners
Oct. 19	Awards ceremony

For more information, contact your Division Quality Coordinator:

1000	Karen Guidotti	845-9561
2000	Ron Diegle	844-4878
3000	Jim Henderson	844-8481
4000	Olen Thompson	271-7822
5000	Debbie Dominguez	844-1984
6000	Suzanne Weissmann	845-9331
7000	Gail Willette	844-6214
8000	Cliff Yokomizo	294-2949
9000	Tanya McMullen	845-9090
10000	Gene Smit	844-9420
11000	Claire Gallipoli	845-8452
12000	Charles Tapp	271-7900
13000	Carol Harrison	845-0575
14000	Bill Lucy	845-8870

If your Division Quality Coordinator is unavailable, contact Susan Harris at 271-7951.

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LOCKHEED MARTIN

Employee dialogues May 18, 23 to focus on Congress, Sandia

All Sandians are invited to attend Sandia President Al Narath's upcoming quarterly employee dialogue sessions. He will speak about the potential impact of current and anticipated Congressional actions on Sandia. Questions can be on any Sandia subject.

In New Mexico, sessions will be held Thursday, May 18, at 10 a.m. in the BDM Building and at 1:30 and 3 p.m. in the Technology Transfer Center (Bldg. 825). Employees located off-site should attend the morning session at BDM. On-site employees with last names beginning A-M should attend the 1:30 p.m. session; those with last names N-Z, the 3 p.m. session. In California, two sessions will be held Tuesday, May 23, in the Sandia/California auditorium (Bldg. 904). Employees with last names beginning A-M should attend the session beginning at 8:30 a.m., N-Z the session at 10 a.m.

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Burning questions are being answered at the CRF

Diesel engine study redefines old combustion concepts

By Nancy Garcia

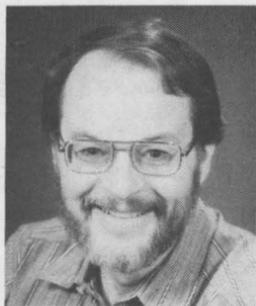
California Reporter

Just how diesel fuel burns within an engine could only be imagined until researchers at Sandia's Combustion Research Facility, working in partnership with Cummins Engine Co., looked into the problem — literally.

Using a special research engine with quartz windows and laser diagnostic techniques, the team mapped out how fuel in a heavy-duty diesel engine mixes with air in the cylinder and burns. Their findings have permanently changed the picture of diesel engine combustion and are helping designers create more environmentally friendly engines.

In the diesel engine, fuel was thought to burn in a simple diffusion flame around the edges of the fuel jet. The new studies show that the hot air within the cylinder completely vaporizes the fuel by the time it has traveled 25 millimeters (about an inch) from the injector. Combustion occurs in the vaporized fuel and initially produces small soot particles, whose size and concentration increase as the soot moves farther down the reacting jet.

This picture allows engine designers to fine-tune approaches for minimizing emissions. "We've shown engine designers that liquid fuel doesn't hit the combustion-chamber wall under typical conditions, and that when combustion starts, the fuel and air are more well-mixed than had been thought," says John Dec of Combustion in Engines & Furnaces Dept. 8362. "To reduce soot, they need to mix the fuel as quickly as possible, and to break up the 'head vortex' (where larger particles occur)."



JOHN DEC

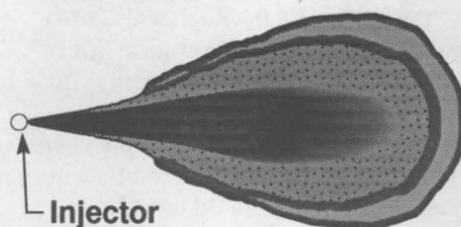
John has worked for more than five years as principal investigator on the project with Sandian Eldon Porter of Dept. 8362 and visiting researcher Cristoph Espey, who spent four years on the project as a Cummins-sponsored graduate student. The collaboration with Cummins, the world's largest producer of diesel engines of more than 200 horsepower, began in the mid-1980s and developed in 1993 into a cooperative research and development agreement (CRADA), cost-shared between Cummins and DOE.

Building a truly predictive model

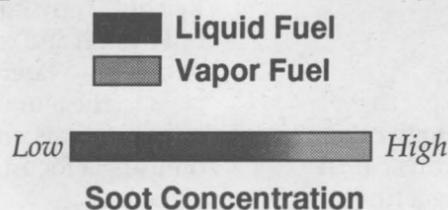
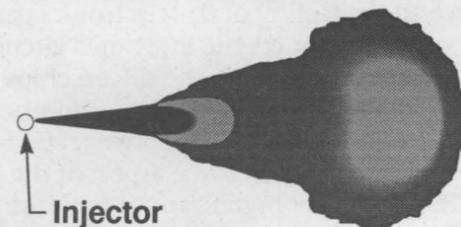
Creating a better picture of diesel engine combustion allows Cummins to "reach better solutions faster and at a lower cost," John says, as the company responds to tightening emissions standards. Besides indicating how engineers should manipulate fuel and air flow in an engine, the results of these experiments help researchers develop computer models, he adds.

"The ultimate goal is to build a truly predictive computer model for designing diesel engines," John says. The CRADA addresses this goal. Sandian Ken Marx of Dept. 8362 is working on computer submodels of fuel spray and combustion. John and Eldon obtain experimental data, while partners at Lawrence Livermore National Laboratory study the combustion chemistry. Meanwhile, collaborators at Los Alamos National Laboratory are creating a new fluid dynamics code (which will incorporate Ken's diesel-specific submodels and LLNL's chemistry submodels) to simulate the entire

Old Conceptual Model



New Picture of Diesel Combustion



LASER-SHEET IMAGING reveals the true cross-section of a combusting diesel fuel jet, right, which contrasts markedly from the previous model of a simple diffusion flame, left.

Sandia California News

diesel combustion process on massively parallel computers or networked workstations.

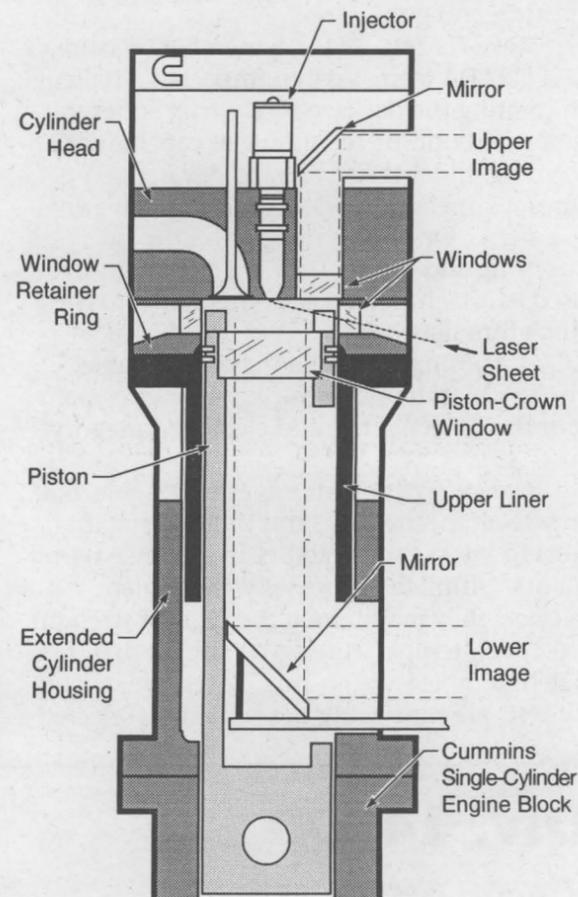
Previously, John says, computer model developers knew little more than how fast the fuel burned, and what emissions came out the tailpipe. Now, with new data from the research engine, the number of assumptions needed for computer models have dramatically decreased, while the ability of the refined models to predict engine performance has greatly increased.

Diagnostic now used worldwide

Meanwhile, a diagnostic approach that John's group developed out of necessity to image soot distributions in the diesel engine has become a standard technique for research groups around the world. This technique, laser-induced incandescence, shows soot concentration. When used in combination with light scattering techniques, it can also provide soot particle size distribution.

To conduct such laser diagnostics, a sheet of laser light is projected into the firing engine so that it slices through a combusting fuel jet. The laser sheet creates an optical signal, which is imaged via mirrors through quartz windows in the top and bottom of the combustion chamber.

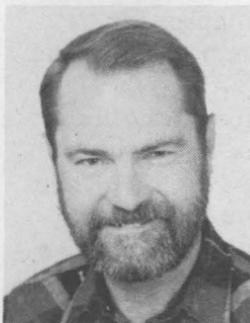
"Although we've made considerable progress in understanding diesel combustion, we are continually discovering new aspects of the process," John says. For example, a recent study showed that when the engine is turbocharged, the distance the liquid fuel penetrates before it vaporizes can drop to as little as 13 millimeters (half an inch), significantly altering the combustion process.



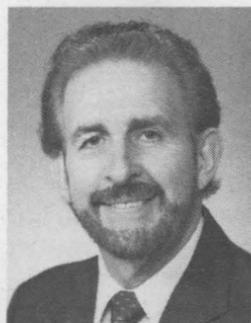
THIS RESEARCH engine retains the basic geometry of a production Cummins heavy-duty engine, but it has been modified with windows at the top and bottom of the combustion chamber so that mirrors can be used to image the combustion process. The laser sheet is shown entering the combustion chamber through a smaller window in the cylinder wall.

"The end of the need for this research is not yet in sight," John says, adding that Cummins uses the information in an ongoing way to continually improve its diesel engines.

Recent Retirees



Cal Feemster 29
8713



Marlin Pound 38
8600



Jim Carrell 42
8414



'Lean burn' engine

(Continued from page 1)

GM's criteria for production capability."

As part of the CRADA, Sandia is responsible for developing and characterizing the performance and reliability of the electronics package that will interconnect the integrated circuits and protect the circuitry; the silicon chips used in the circuitry will be designed by another company. Fernando says ten organizations at Sandia are working on some aspect of the project. (See "Ten Labs organizations fuel GM CRADA work.")

Telemetry technology

To create the new electronics package, Sandia engineers chose a technology originally used in telemetry applications called "thick-film, chip and wire." Using a fine-meshed screen, a pattern is screenprinted onto a piece of alumina substrate, creating a conductive pattern commonly referred to as a thick-film network. Silicon chips are then mounted on the thick-film substrate and wired to the thick-film network using aluminum and gold wire.

Steve Garrett (2411), a member of Sandia's GM CRADA team, says an important challenge in creating the package is selecting adhesive and wire-bonding technologies capable of performing under the stresses of elevated temperatures, temperature cycling, and corrosive environments. One of his responsibilities is choosing and testing the die-attach adhesives used to attach electronic components to the thick-film network.

"Choosing the best adhesive available ensures that the electronic components maintain their mechanical and electrical integrity," Steve says.

Several types of adhesives were subjected to screen, mechanical, and thermal stability tests to assess their viability in engine environments. Ultimately, epoxies were chosen because they maintained the highest strength after high-temperature aging and "fatiguing" due to temperature cycling. Extensive reliability tests are now being performed on selected

epoxies to ensure that the optimum adhesive is chosen.

Airtight package

The next step in protecting the sensitive electronics and interconnections from the wear and tear of engine life is creating an airtight "hermetic" package. The package seals corrosive liquids and gases from the engine out of the package and seals in pure nitrogen, which acts as a stabilizing agent.

Larry Kovacic (2476) created the package design, an alumina substrate covered by a cup-shaped, glass-sealed alumina lid, and Dave Keicher, Tony Romero, and Paul Schanwald (all of Physical and Joining Metallurgy Dept. 1831) developed a laser sealing technique to join the glass to the alumina using their expertise in laser materials processing. This concept is based on using a focusing assembly to reflow the glass seal.

To achieve the glass-to-alumina seal, a laser transmits a beam through two lenses that focus the light onto a circular mirror. The light reflects off the mirror, creating a uniform, 360° illumination that is directed at the seam, and the high temperature seal is complete.

Dave says the process is unique because very high localized glass heating, in the range of 450°C, can be attained along the glass seal region where the alumina lid joins the alumina plate, creating an airtight seal without damaging the electronics inside, which have a critical temperature tolerance of 150°C. The process has potential application for sealing high-density electronics based on multichip module packaging technologies.

Helping US automakers

T.J. Allard, project manager and Manager of Industrial Programs Dept. 2205, says one of the goals of the Sandia/GM CRADA is helping US auto manufacturers gain a competitive edge in the world market. Although the CRADA-derived technology is protected for five years, much of it will eventually be shared with Chrysler and Ford, as well as other interested parties in the US auto industry. First use of the technology will be restricted to manufacture within the United States.

Ten Labs organizations fuel GM CRADA work

The ten Sandia organizations involved with the GM engine systems electronics CRADA are:

Thermal and Fluid Engineering Dept. 1513
 Engineering and Manufacturing Mechanics Dept. 1517
 Electron Microscopy/ Metallography Dept. 1822
 Physical and Joining Metallurgy Dept. 1831
 Industrial Programs Dept. 2205
 Analog ASICs and IC Simulation Modeling Dept. 2272
 Reliability Physics Dept. 2276
 Electronic Processing Dept. 2411
 Organic Materials Dept. 2472
 Ceramic and Glass Processing Dept. 2476

T.J. says GM attended a series of "garage shows," expositions at which automotive manufacturers and suppliers talk to engineers from national labs and research institutions, where Sandia presented information about high-temperature materials and processes.

"GM saw the value of the capabilities Sandia was presenting and initiated a CRADA with us," he says.

★ Congratulations

To Karen Andersen (7711) and Geoffrey Watts, married in Albuquerque, March 29.

To Karla (12300) and Casey Simoes, a son, Casey Troy, March 31.

To LaRee and Richard (7818) Hammond, a son, Malachi Ethan, April 8.

To Lorraine Chavez and Corey Cook (9132), married in Albuquerque, April 8.

To Regina and Thomas (5111) Henderson, a son, Khari Jumanne, April 18.

Div. 14000

(Continued from page 1)

its Annular Core Research Reactor (ACRR) in Area 5 (*Lab News*, Sept. 30, 1994).

Not just generators

Sandia is sorting out its new assignment rather quickly. Labs top management added a separate production organization to Sandia's corporate structure in November — Production Div. 14000, now headed by Acting Vice President Gary Beeler.

The new division already has some 115 employees on roll, about two-thirds doing neutron generator work and one-third getting Sandia's production-related business practices in order — including planning, scheduling, and quality support, says Gary.

Of those 115, 82 are former employees of the Pinellas Plant who were transferred to Sandia late last year. About half of them remain at Pinellas until October to help close the plant and transfer equipment to Sandia.

Gary estimates Sandia will reach its target production capacity of 500 neutron generators a year within five years. (A neutron generator provides the pulse of neutrons that initiates a nuclear explosion when fissile material is brought together as a critical mass. A weapon's neutron generator needs to be replaced periodically because the half-life of tritium, its main

ingredient, is only 12.3 years.)

And if DOE gives its approval for medical radioisotope production in June, adds Gary, most of Reactor Engineering Technology Center 6500 will be transferred programmatically to Div. 14000. It will take about three years to develop a full-scale molybdenum-99 production capability, he says.

In addition, Sandia's responsibilities in support of DOE's Manufacturing Development Engineering (MDE) program fall under the 14000 umbrella. (Under the MDE program, weapon components are procured from commercial suppliers instead of being manufactured within the weapon complex. Sandia has been managing



GARY BEELER

the MDE program since 1993.)

Gary estimates that when all is said and done, the 14000 roster will include about 220 employees. Several departments in Component Development and Engineering Support Div. 2000 will support the neutron generator and MDE work as well.

The Labs also has hired the former plant manager of Digital Equipment Corporation's microelectronics plant in Albuquerque,

J. Leonard Martinez, to help manage the production organization.

Some new buildings, too

Three new buildings are under construction that will affect production activities — the Neutron Generator/Switch Tube Facility (Bldg. 870), where neutron generators will be fabricated; the Explosives Components Facility (Bldg. 905), where final production acceptance of neutron generators will take place; and the Integrated Manufacturing Design Facility, where many of the new Div. 14000 employees will have their offices.

"We've got our hands full," says Gary.

He acknowledges there's some uneasiness about manufacturing at Sandia, which has been primarily a research and development organization since its inception. "I think we're going to have to merge the production culture at Pinellas with the R&D culture at Sandia into some kind of a Sandia production culture," he says. "That's something that needs to be worked on."

Watch future *Lab News* issues for more about Sandia production activities.

Retirement open house

Sandia is holding an open house for retiree Lester Sandlin (2664) in the Area 1 Cafeteria (Bldg. 861) Wednesday, May 3, 2-4 p.m. Refreshments will be served. Friends and acquaintances are invited.

9/80 workweek

(Continued from page 1)

Only one compressed workweek option, a "true" 9/80 workweek, will be offered, available to both exempt and nonexempt employees.

"We knew going into the pilot that system programming would make it difficult for us to offer the true 9/80 option to nonexempt employees," Susan says. "At first we planned to offer, beginning in May, the three compressed workweek options that had been piloted. We hoped to have the programming in place to offer nonexempts a 9/80 schedule by January 1996. By re-prioritizing a lot of planned projects in our financial systems, our application maintenance programmers and financial employees were able to get that date moved up to June 30."

At that time, Charlie says, nonrepresented employees will have the option of working the 9/80 schedule. (The company is still actively working with the union leadership, but represented employees will not be included until after negotiations are completed.)

Under the schedule, all days for participating employees would be nine-hour days except Friday. Every Friday worked would be an eight-hour day; the alternate Friday would be a day off.

Technically, this is the same option that was available to exempt employees during the pilot, but Susan says it is now a true 9/80 schedule because the workweek is defined as midday Friday to midday Friday (see graphic).

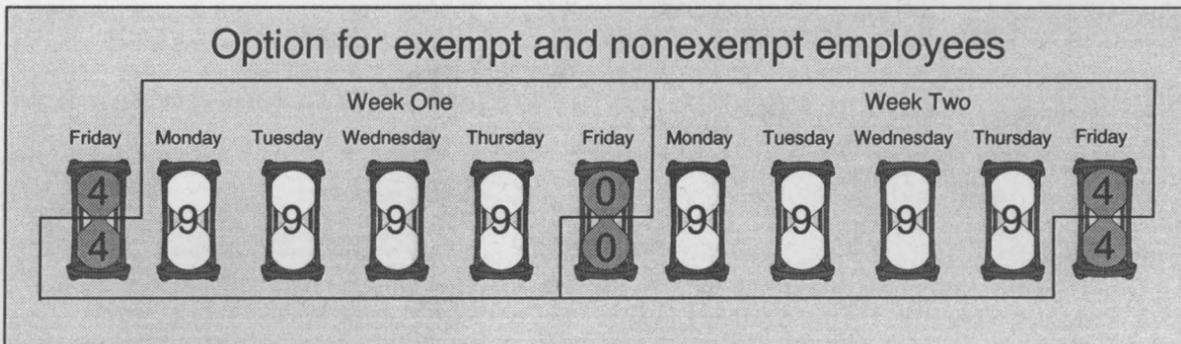
She stresses that this definition is for purposes of calculating overtime only, and does not apply to labor distribution or attendance tracking. For the most part, she says, the change in workweek will not be evident to employees.

"Employees will still work full days on the Fridays they're scheduled to work and will be off all day on the Fridays they're scheduled off," she says. "But by defining the workweek in this way, so that no week has more than 40 hours, we can give all employees the same option."

Although Sandia's standard business hours will continue to be 8 a.m. to 4:30 p.m. with a 30-minute lunch period, Susan says SQLC has defined standard 9/80 workweek hours as 7:30 a.m. to 5 p.m. to accommodate the schedule's nine-hour days. Employees can choose to work the nine-hour day as they see fit, provided the schedule meets their department's business needs.

"This program is designed to be as convenient and flexible as possible for employees," Charlie says, "but there are tradeoffs."

One tradeoff is that nonexempt employees will not be able to switch their day off during the workweek. And any employee adopting the schedule will be encouraged to adhere to it for



THE COMPRESSED workweek approved by SQLC runs from midday Friday to midday Friday. All days are nine hours except Fridays. Every Friday worked is eight hours; alternate Fridays are days off.

a significant period of time, most likely a year. But, he says, the pilot results indicate that employees consider it a good trade.

Charlie also thanked VPs Roger Hagengruber (5000), Dan Hartley (6000), and Paul Robinson (4000) and their divisions for voluntarily piloting the project for three months.

Meetless Fridays

One important change that will be encouraged to ease adoption of the 9/80 schedule is implementation of the "meetless" Friday. Scheduling meetings on Fridays will be discouraged as a general rule so meetings will not conflict with anyone's day off.

"Meetless Fridays are beneficial to everyone," Susan says. "They prevent individuals from having to come in on their day off for a meeting and they give those who are working a day to catch up on office work without the interruption of meetings."

Susan says there have been some misunderstandings about the program. "First, I want to stress that the 9/80 is only an option we're making available to employees, and is by no means mandatory," Susan says. "Employees who don't want to participate or can't arrange their schedules to a 9/80 workweek may continue on the standard schedule."

Another misunderstanding is that the compressed workweek schedule affects vacation accrual. "Many people are under the mistaken impression that vacation accrues differently for employees on the 9/80," she says. "That's not so. Employees will still accrue the same number of hours of vacation a year, whether they are on the compressed schedule or not."

Timecard training

The main challenge in switching over to a 9/80 workweek is getting employees trained to fill out timecards properly, says Susan.

"During the program's pilot phase, the timecard error rate went up drastically," she says. "We'll be doing comprehensive training before we go Labs-wide with the compressed workweek to ensure that doesn't happen again." In fact, it will be a requirement for each center to be trained before they can enter the program.

She says each division will need a plan for how and when training will occur. She'll be asking each division for a point of contact to be responsible for the division's plan. She expects most divisions will do training by centers.

"All managers and secretaries will need to attend a timecard training session so they can in turn train the employees in their departments," she says. "We'll also be distributing a training video on filling out timecards. Once a department's employees and managers have been trained, and the managers sign that they are trained and accountable for their employees' time cards, they'll be ready to go on the compressed workweek on June 30."

Susan says timecard training will begin immediately and continue through May and June. Employees will receive training information via their division's point of contact.

Also during this time, Sandia/California will be conducting a vote of its nonexempt employees, as required by California law, on whether to accept the 9/80 workweek option. If they accept it, she expects that California also will be ready to implement the 9/80 option by June 30.

Radio Sandia (1610 AM) is airing the first of a multipart program about the 9/80 workweek today, Friday. Part 2 will run over the weekend, Part 3 (probably) on Monday. — Mary Hatheway



PHYSICAL EXAM — Dr. Terry Lash, Director of DOE's Office of Nuclear Energy (left, with hands on tank rim), gets a close-up look as Dennis Nelson (6521, white shirt, pointing) explains the operations and capabilities of Sandia's Annular Core Research Reactor (ACRR) to him and members of the Albuquerque community. The evening before the tour, Lash attended a public meeting held to explain the ACRR's proposed use in the production of medical isotopes. The 100 or so people who attended the meeting and those who went along on the tour showed near-universal support for the proposal.

See Weekly Bulletin early on the Internal Web

External news summary and weather reports also available

On Friday afternoons Sandia/New Mexico employees who are hooked to Sandia's Internal Web can now get a jump on the following week. Janet Carpenter (12621), who coordinates the *Weekly Bulletin*, is putting each Monday's *Bulletin* on the Web each preceding Friday. (This service will be available soon at Sandia/California.) In a month or so, Employee Communications Dept. 12622 will begin reducing the number of paper *Bulletins* distributed — when more folks get linked to the Internal Web and comfortable accessing information this way.

The *Weekly Bulletin* can be found on the Internal Web under the Communications icon

in the Daily and Weekly News category. Other information in this category and available to Sandians on the Internal Web at all locations includes the publication *Heads Up!* (daily external news briefs of interest to Sandians), the Radio Sandia schedule, and the latest weather reports.

Sandia computer users who need help gaining access to the Internal Web should contact their local area network (LAN) managers or customer service unit project managers. (Some Sandia buildings aren't wired yet.) Call the central computing help desk on 845-2243 for more information.

Martin Chavez kicks off Sandia's Earth Week activities

Albuquerque's mayor aggressively addresses water conservation and air quality issues

Albuquerque Mayor Martin Chavez says major changes are coming — some within the next few months — concerning Albuquerque's water conservation and air quality controls.

Mayor Chavez, opening Sandia's Earth Week activities on Monday, April 17, told Sandians at the Technology Transfer Center that most people come to Albuquerque for the quality of life. Albuquerque, he said, must protect and preserve its environment for economic development to continue. Chavez, who said he has a 100 percent pro-environment voting record during his five years in the State Senate, gave his views on everything from aquifers to xeriscaping, and promised new city buses, more bicycle trails, increased community-based planning, fully xeriscaped airport grounds (along with 15 percent xeriscaped lands on new developments), and major changes in mass transit — possibly even a light-rail train system.

Water conservation efforts

Albuquerque, unlike most cities, draws its water entirely from underground aquifers. The aquifer is depleting, and Chavez wants to sound the alarm that it's time to get serious about water.

One reason for the city's recent 22 percent water rate increase was to pay for aquifer studies. Albuquerque water rates, though, are still considerably lower than many surrounding areas. Chavez says we'll see water start to be priced as the "scarce resource" that it is.

Albuquerque is concentrating on three ways to conserve water:

- **Individual conservation.** Chavez hopes to cut water use by 30 percent within the next four years through individual conservation efforts. For example, we can wash cars using a nozzle to turn off the stream when it's not needed; also, we can easily arrange water-efficient plumbing. Within 12 months, under the City Council's Water Conservation Program, "water abusers" will be hit with a surcharge. The mayor predicts 10 percent of Albuquerque residents will be paying this water surcharge.

- **Accessing surface rights.** Albuquerque had a city commission in the 1960s that purchased substantial water rights in the San Juan-Chama Diversion. The water runs down the Chama River, dumps into the Rio Grande, and flows on into Texas. The city is determining the best technology for removing and cleaning this water.

- **Reinjection technology.** Chavez projects Albuquerque's city-wide reinjection system will be the largest in the world. He is proposing Albuquerque will stop all discharge into the Rio Grande, accomplishing complete recycling. This project will take 15 to 20 years to accomplish.

Chavez says if Albuquerque accomplishes these three projects, the aquifer will be in a "positive recharge situation."

But what about growth? The mayor says growth must be discussed as a part of water usage, and he hopes to control, shape, and direct growth to enhance Albuquerque's quality of life. He says the new Office of Economic Development at City Hall is using a screening process to assess industries that want to come to Albuquerque, to determine if they are good for the city.

Air quality efforts

Albuquerque has been a "clean-air city" for three years. This means that because of new cars being bought, "no burn nights," and the oxygenated fuels program, Albuquerque has done very well with air quality control. However, there are still big challenges ahead:

- **Regionalized solutions.** Chavez would like to see a move toward creating "one legal air shed" with Los Lunas, Belen, Rio Rancho, Los Ranchos, and other surrounding areas. He says the surrounding areas are using "different straws but the same glass" and are making no sacrifices; therefore, it's not fair to ask Albuquerque to sacrifice and adhere to air quality standards unless he tries to get surrounding areas involved as well.

- **"Big box" developments.** Development areas called "big boxes" cause more car use

by encouraging more shopping stops. One large strip of big boxes is in the Winrock/Coronado Mall area. This area is a "hot spot" in terms of air quality. Based on current studies, new expansion areas will be encouraged in better air-quality districts. Owners and developers will be encouraged to get involved with the expansion, and an internal mass transit system will be created for the new areas. The mayor says he will work aggressively with employers to organize car pools for the new districts' employees.

- **Buses.** Chavez says Southwesterners are addicted to single-occupancy vehicles and he hopes to reverse this trend. He has ordered new buses, which will arrive in six months to a year. He says dialogue on buses has been "wholly inadequate" to address Albuquerque's transportation problems.

- **Regional transit authority.** The mayor says



MAYOR MARTIN CHAVEZ (right) is greeted by Dan Hartley, Vice President of Energy & Environment 6000 (left), and Paul Robinson, Vice President of Laboratory Development 4000. Mayor Chavez opened Sandia's Earth Week activities on April 17 at the Technology Transfer Center, explaining his water conservation and air quality concerns, accomplishments, and plans.

a task force has been established to create a regional transit authority. He says getting acceptance for this idea will be tough because it involves local authorities giving up power to a regional authority. The transit authority needs to explore new transportation systems, including a light-rail train system that the mayor says could be in Albuquerque's future. A north-south rail is already here. Chavez says we just need an east-west line and he added that talks are already going on with the railroad. If this idea is viable, bus routes and park-and-rides would be built around the train lines.

- **Bicycle routes.** The mayor says the city has a dedicated funding source for the construction of bicycle trails. He considers bicycles "basic transportation" and applauded the many Sandians who bicycle to work. He said we can expect aggressive construction of bicycle trails within the next three years. — Tammy Locke

Mayor answers Sandians' questions

Q: *Couldn't the city re-stripe roads for bicyclists? A lot of roads could support the extra foot for re-stripping, which would be more economical than buying the right-of-way to put in bike paths.*

A: Six months ago, Chavez brought together different Albuquerque groups interested in bike trails, and they established "action steps" for implementing their bike trail plans. He said he wants to see "a basic spine of offroad trails."

Q: *Could the city approve of filtered gray water for irrigation and watering?*

A: The city is considering using gray water for parks. But it's cheaper to pump water out of the aquifer than to pump gray water uphill. Gray water can be economically used, though, if gravity can play a part in transporting it. For this reason, the city's proposed new public golf course will be located in the valley, watered with gray water.

Q: *What's being done about the filling of empty lots?*

A: Chavez has established an "in-fill" committee, comprising developers, environmentalists, architects and planners, and neighborhood activists, to work on the "in-fill" project. This project assumes there will be an increase in the density of people in a given space. Com-

munity-based planning was established in 11 planning units in the city, so neighborhoods can determine what will happen in their own "in-fill"-designated areas.

Q: *The city monitors fireplace usage on "no burn nights." Do you propose doing the same for excessive watering?*

A: Mayor Chavez mentioned his visit to a local radio station, where he was asked if the "fire police," who work in the winter hunting "no-burn night" violators, could monitor water in the summer. He liked the idea. He said only one intern was doing all water enforcement for all of Albuquerque at that time, but now about 40 meter readers can cite water violators.

Not all water can be accounted for, however. Chavez said about 11 percent of water is "missing" for various reasons, including broken pipes or theft. Albuquerque's 11 percent missing water is lower than the national average, though — most major cities accept 19 to 22 percent lost water. Even so, Chavez says \$12 million is being spent to increase the response time to citizens' calls about broken water pipes. The reason: the mayor says citizens won't conserve water if they see water running down the street; so even though \$12 million is being

(Continued on next page)

Earth Day Festival was a learning experience for many

More than 1,000 employees and hundreds of children turned out despite the rain and storm clouds for the 1995 Earth Day Festival on Hardin Field last Friday, April 21. This year's festival celebrated national Earth Day's 25th anniversary. Sandia, DOE, and Kirtland AFB sponsored the event, held under three big tents. More than 50 displays showcased Sandia, DOE, and KAFB technologies and achievements in earth-friendly activities and provided information about conservation, recycling, using environmentally friendly products, landscaping hints to save water, and other information about how to protect the environment.

Give-aways included 1,000 tree saplings (desert willow, bur oak, and Austrian pine) from Tree New Mexico and wildflower seeds



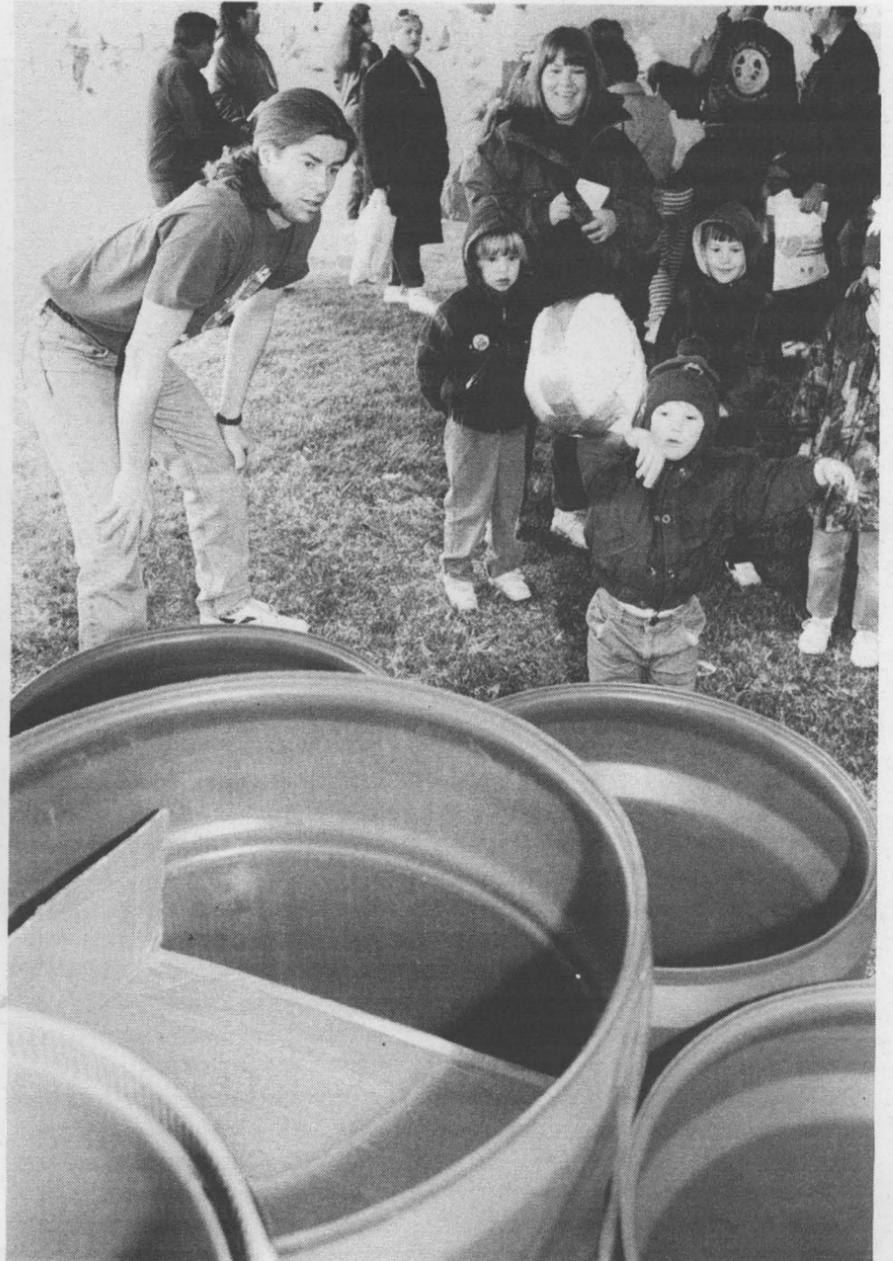
BEAR HUG — Smokey Bear (Brad Altman, 6448) passed out hugs to children attending the Earth Day Festival on Hardin Field April 21. Also on hand was Mother Earth (Joan Woodard, Director of Environmental Programs Center 6600).

packaged by the Senior Citizens of Albuquerque. Drawings with winners announced every 10 minutes yielded canvas tote bags and zippered lunch bags with a mug inside. Many exhibits provided free pens and pencils, cups, literature, sun screen, coloring books, key-chains, magnets, or other handy items with environmental themes printed on them.

Animals also visited Earth Day. Talking Talons, an organization that educates young people about ecology with wildlife presentations, was present with a hawk, a burrowing owl, and a bat. Several rescued dogs from the Animal Humane Association were also at an exhibit as a reminder that animals are not for throwing away.

Educational signs dotted the field with tips about recycling and protecting the environment. Household hints included how to make environmentally friendly furniture polish (three parts olive oil to one part vinegar) and using toothpaste on a damp cloth to remove water stains from furniture. Another sign informed viewers that "approximately 12 percent of US emissions of sulfur oxide and nitrogen oxide — both key causes of acid rain — come from home heating."

The Environment, Safety, & Health booth



PITCHING POLLUTION — A pollution-prevention game provided children attending the Earth Day Festival a chance to pitch pollution into appropriate barrels. John Killoran (left, contractor) encouraged kids to throw a wadded paper ball wrapped in duct tape into barrels marked with recycling options. Three balls in a barrel earned a chance at a drawing for dinner at Romano's Macaroni Grill. The game was located in Pollution Prevention Alley, which included displays by Sandia vendors of alternative technologies.

included children's drawings of what ES&H means to them. Most were pictures of the Earth. One picture said, "I love the Earth, keep it clean." Another picture summed up the reason for holding an Earth Day festival. It said, "The Earth needs all the friends it can get."

— Janet Carpenter

(Continued from preceding page)

spent to address a "perception," it is money well-spent if it gets people to conserve.

Mayor Chavez implores Sandians to help save Kirtland

Mayor Chavez, wrapping up his Earth Week talk, strongly urged Sandians to do everything in their power to save Kirtland Air Force Base. If it is realigned, he said, "every aspect of our economy will take a hit." Not only would realignment "damage Sandia's mission," but it would affect 21,000 jobs, 8 percent of the city's work force. "It will be much easier to build for the future if we have Kirtland."

Take Note

Two summer programs to study the natural and cultural diversity of the American Southwest will be offered by the University of New Mexico's Southwest Institute and be hosted by New Mexico Tech. Both eight-day programs, which can be taken for graduate academic credit, begin with a two-day lecture, followed by six days of traveling. The first program, "The Gateway Plains and the Santa Fe Trail," is scheduled June 10-17 and again July 8-15. The second program, "Canyon Country of the Colorado Plateau," is planned for June 24-July 1 and again July 29-Aug. 5. The enrollment deadline is May 15. For course fees and other information, call Jerry Williams at the Southwest Institute on 277-2828 or 277-3105.

Governor Gary Johnson will address the Good Government Group at its Spring Luncheon Colloquium on Thursday, May 4, with registration beginning at 11:30 a.m., lunch

served at noon, and Governor Johnson speaking at 12:30 p.m. The event will be at the Sheraton Old Town Hotel, 800 Rio Grande Boulevard NW. Governor Johnson will give his views on the results of the 1995 legislative session. Reservation deadline is Monday, May 1; call Doug or Jane Swift on 296-3564.

The sixth annual Share Our Strength/Taste of the Nation de Albuquerque, a benefit for hunger relief, is on Sunday, May 7, 4-8 p.m., at the Albuquerque Convention Center. All money raised from this food, wine, and beverage tasting event will go directly to organizations fighting hunger. The benefit will feature foods from 40 Albuquerque restaurants. Tickets are \$30 per person and are available from Furr's Supermarkets, all participating restaurants, or by calling 800-955-8278.

Slowing Sandia's waste stream to a trickle

High-dollar pollution problems often remedied by low-tech solutions

As thousands of employees were enjoying Earth Week festivities last week, several Sandia organizations were quietly doing their parts for the environment at various work sites and labs.

Roofers in Facilities Development Center 7900, for instance, are using a citrus-based solvent derived from orange peels to clean roof membranes during roof renovations on old Sandia buildings. (See "Three pollution prevention success stories" below.)

Sandia's Pollution Prevention Program is encouraging other organizations to find similar ways of reducing their waste streams, says Jim Fish, Manager of Pollution Prevention Dept. 7576. "The goal is to help reduce the Labs' impact on the environment by minimizing the amount of hazardous waste generated at Sandia," he says, "as well as reduce air emissions and water discharges."

Not only is minimizing waste generation the right thing to do environmentally, he says, it also helps reduce the high costs of managing hazardous materials and controlling the pollution associated with them.

Sensible solutions

Sandia's Pollution Prevention Program is designed to help line organizations find alternative ways of doing business that make sense, both from an environmental and efficiency standpoint, says Maria Walsh (7576), chair of Sandia's Pollution Reduction Group (PRG). "We can take a fresh look at operations and offer some innovative, often low-tech ways to reduce waste, save money, increase efficiency, and improve quality," she says.

Typically, a pollution prevention project is initiated in one of three ways: (1) a line organization requests assistance in reducing a particularly problematic or expensive waste stream; (2) the pollution prevention folks identify a lab or organization that generates a waste that is difficult or expensive to dispose of; or (3) an organization or facility has trouble meeting air emissions or water discharge regulations.

PRG members then study the operation



DAVID SZKLARZ of Waste Operations Dept. 7577 examines fluorescent lamps being stored in preparation for shipment to a recycling facility. The glass tubes, aluminum ends, and mercury will be recovered and reused.

and its processes, with the involvement of the line organization, and offer suggestions that reduce the amount of waste generated without hindering the organization's work. Often, it's a less toxic cleaning substance, a minor process modification, or an inexpensive technology that results in significantly reduced hazardous by-products.

"Sometimes our ideas are off-the-wall, and

they may or may not work," she says. "If they do, great. If they don't, we try again."

Ultimately, of course, it's the line organization's decision whether to implement the suggestions. "We serve as a resource to the line," says Robyn Davis (7576), New Mexico pollution prevention site coordinator. "We're not telling anyone how to do their jobs."

Funding for the PRG comes from a charge-back "tax" system on waste generators. Charge-back funds are managed by a Pollution Prevention Team made up of representatives from the Pollution Prevention Program and several waste-generating organizations.

For more information about pollution prevention, call Maria on 848-0342, Robyn on 848-0969, or California pollution prevention site coordinator Sally Raubfogel (8642) on 294-2341.

— John German

Holly Stegman sniffs out the most missing property to win dinner for two

Holly Stegman, property coordinator for Pulsed Power Sciences Center 1200, followed the scent to 368 missing property items to become the top dog in the missing property



contest sponsored by Property Management Systems Dept. 7616 (see March 3 Lab News). Bob Davis (2761)

came in second by a nose for locating 356 items. Holly was awarded a dinner for two at Garduños for her detective work. It was a race right up to the deadline with many employees participating. As a result of their hard work, a total of 2,394 missing items were reported. "Unfortunately," says Shirley Ramirez, Supervisor of Inventory Team 7616-1, "there are still lots of items left to find."

Three pollution prevention success stories

Pollution Prevention Dept. 7576 has been tracking pollution prevention projects being implemented in various line organizations, says John Killoran (7576). Here are a few:

- In the past, 8,000 to 12,000 gallons of used oil from Sandia vacuum pumps, insulating oil applications, hydraulics, and motor pool maintenance operations was burned each year in special air-monitored incineration facilities. Now Waste Operations Dept. 7577 is sending used oil to a refinery, where it is distilled into gas oils and diesel fuels (sold for use in process heaters), heavy contaminants (sold as asphalt flux), and purified lube oil (sold for use in motor oil, industrial cutting oil, and transmission fluid). The new process saves Sandia approximately 80 percent of its previous incineration costs. Contact: David Szklarz (7577)

- Waste Operations Dept. 7577, with the help of Facility Shared Systems Dept. 7809, is recycling approximately seven tons of used fluorescent lamps each year (see photo). In the past, the glass tubes were crushed, packed into drums, and incinerated, an expensive disposal method that

resulted in unnecessary mercury destruction. Now the tubes are temporarily stored at Sandia and then sent intact to a recycler. Aluminum ends and glass tubes are recycled, and mercury is recovered and reused. The new method reduces Sandia's disposal costs by about 25 percent and recycles approximately 95 percent of the bulbs' weight. Contact: David Szklarz (7577)

- Facilities Development Center 7900 is using a citrus-based solvent, Bio-T, as an alternative to traditional solvents used to clean plastic and rubber roof membranes prior to heat-sealing during roof renovations. In the past, roofers scrubbed the membranes with traditional solvents (chlorinated hydrocarbons, hazardous caustics, acids, or petroleum-based cleaners) and then rinsed with water, creating contaminated wastewater and volatile organic compound emissions. The new solvent, derived from orange peels, is more powerful than many traditional solvents and is nontoxic, non-caustic, noncarcinogenic, biodegradable, and water soluble. Karen Crain (7913), now a member of Sandia's Affirmative Procurement Team, first investigated Bio-T's possible use at Sandia.

Retiree deaths

Burrell Snelling (84)	.....4252.....	March 2
John Hoice (70)	.....2431.....	March 2
Silverio Lujan (74)	.....3613.....	March 4
Corry McDonald (81)	.....2436.....	March 5
Robert Parks (69)	.....132.....	March 6
Samuel Allen (83)	.....7111.....	March 12
J. B. Baskett (73)	.....2432.....	March 17
Paul Welker (83)	.....7112.....	March 18
Oliver Chapman (85)	.....4613.....	March 20
Frederick Deiber (72)	.....2853.....	March 26

Sympathy

To Debbie Lee Campos (10210) on the death of her son, Keanu Ray, in Albuquerque, March 21.

To Rose Gehrke (10217) on the death of her mother, Helen Noha, in Florida, N.Y., March 21.

To Nina Coe (10232) on the death of her husband, Ralph, in Albuquerque, March 23.

To Dorothy McCoy (7613) on the death of her grandmother, Juanita Van Sanchez, in Albuquerque, March 25.

To Felix Silva III (7435) on the death of his grandfather, Felix Silva, Sr., in Albuquerque, April 7.

To David Kozlowski (2172) on the death of his father, and to Lori Kozlowski (7616) on the death of her father-in-law, in Albuquerque, April 15.

Asian Pacific American Month runs through May

Sandia, other local organizations collaborate on events

Sandia, Kirtland AFB, DOE, and local community groups are co-sponsoring a variety of events throughout May in observance of Asian Pacific American Heritage Month.

Among highlights of the many events already scheduled will be a May 4 Chinese cooking demonstration by Martin Yan, the award-winning chef who has appeared in televised cooking shows in the US and Canada, and a May 31 talk on diversity and making a difference by Julia Chang Bloch, former US ambassador to Nepal and now a BankAmerica Corp. executive.

Yan, who was born in Guangzhou, China, began his career as a cook apprentice in Hong Kong, where he later earned his diploma from the Overseas Institute of Cookery. He moved to Canada and later to California, where he earned an MS in food science from the University of California, Davis. He will present a cooking demonstration at the Coronado Club main dining room.

Bloch, now Group Executive Vice President and head of Corporate Relations for BankAmerica, is responsible for the banking giant's governmental, public policy, media, and internal and external communications programs. Born in China, she came to the US at age nine and earned degrees from Harvard and the University of California, Berkeley before being appointed an ambassador by President Bush in 1989.

Schedule of events

Following is a list of events scheduled now for observance of Asian Pacific American Heritage Month and contacts for information about those events:

- April 28, noon, UNM US-Japan Center — Azusa Takegami, Japanese language lessons and videotapes of Japanese culture. Contact Hisako Yamada, 277-1490.

- May 4, 11:15 a.m., Coronado Club — Martin Yan cooking demonstration.
- May 5-21, N.M. State Fair Grounds — Variety of arts at Albuquerque's annual *iMagnifico!* festival. Albuquerque Convention and Visitors Bureau, 842-9918.
- May 12-14, KAFB East Gym — Volleyball tournament. Fred Ader, 846-5496.
- May 15, noon, KAFB Theater — Wade Ishimoto (5902), martial arts demonstration. Dennis Kirson (DOE), 845-4879.
- May 17, 11:30 a.m., DOE/AL Bldg. 381, Rms. A, B, C — Grace Hsu demonstration of Chinese calligraphy. Dennis Kirson (DOE), 845-4879.
- May 24, 11:30 a.m., DOE/AL Bldg. 381, Rms. A, B, C — Demonstration of Ikebana (art of Japanese flower arrangement). Dennis Kirson (DOE), 845-4879.
- May 30-June 3, City of Albuquerque — America Japan Week; numerous exhibits, performances, opportunities for multicultural involvement; all events free and open to the public. Hideyo Yamamoto, 842-9918.
- May 31, noon, Coronado Club — Julia Chang Bloch talk on diversity.
- June 3, Albuquerque Civic Center — Summerfest celebrates Asia Night, with variety of Asian food and culture. Albuquerque Convention and Visitors Bureau, 842-9918.

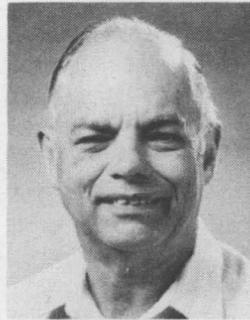
Take Note

The U.S. Geological Survey Albuquerque Seismological Laboratory is celebrating Earth Sciences Day with an open house Saturday, April 29, 10 a.m.-2 p.m. This event is for anyone with access to Kirtland Air Force Base and will feature presentations on earthquake locations and seismic stations, damage caused by earthquakes, and seismograph function. Directions to the lab: Drive south on Wyoming, past the Atomic Museum, past the stop light, and to the stop sign. Turn left (southeast), drive (past golf course) 3.3 miles to Lovelace Road. Turn right, go 3.4 miles to Isleta Road (just before two water towers). Turn left, and go 2.2 miles (most of the road is unpaved gravel).

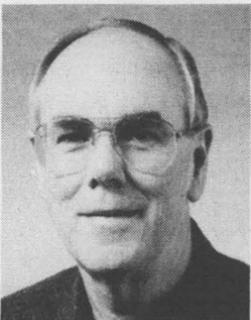
Recent Retirees



Jim Todd 36
6113



Bob Henning 11
2484



Bob Clark 33
2223



T. J. Williams 40
2671

Feedback

Q: All of us at Sandia recently received a new copy of the Code of Ethics and Standards of Conduct, apparently in honor of the merger of Martin and Lockheed. This was an excellent opportunity to review the Sandia values and the corresponding Lockheed Martin Unifying Principles.

At the same time, we are reading in the local paper some of the terms of the Lockheed Martin merger, and I find myself a little confused. Like many Sandians, I am from a small town. Unlike people like you and perhaps Messrs. [Lockheed Martin Chairman and CEO Dan] Tellep and [Lockheed Martin President Norman] Augustine, with a formal training in ethics, my knowledge of ethics is the simple, unsophisticated kind of ethics we learned from our parents and perhaps from Sunday school. My ethical compass is restricted to easy-to-understand principles like the Golden Rule and the Ten Commandments.

What I don't understand is this: Norm Augustine, with an annual salary that exceeds the lifetime income of a large fraction of his employees, merges Martin with another company, destroys the livelihood of 30,000 employees, and is rewarded for this action with an \$8.1 million bonus. To add insult to injury, instead of having the stockholders pay this bonus, the company persuades the government to treat this bonus and others — totaling more than \$31 million — as allowable expenses. I don't get it. Where is the Integrity? Where is the Excellence? Where is the Teamwork? And, most of all, how does this affect Our Strength is Our People?

A: Thank you for your support of the new Sandia ethics awareness program and our new Code of Ethics and Standards of Conduct. I applaud your explanation of your values and ethical principles, and your method of steering an ethical course through life's daily challenges. If everyone's actions were like yours, no organization would need an ethics office.

As for the \$8.1 million dollar bonus you read about in the *Albuquerque Journal*, you, like others, evidently took the article as gospel. There is nothing so clear as one side of a story, and I would expect one who lives by such simple unsophisticated ethical values would check both sides before passing judgment.

Mr. Augustine's \$8.1 million bonus consisted of \$5.3 million in bonuses and stock options he would have received regardless of the merger and \$2.3 million as a direct result of the merger. The payments were part of a Martin initiative to provide \$82.4 million special payments to 460 top executives in retirement annuities and bonuses should a merger or takeover occur. The payments in question were adopted by Martin Marietta Corporation in 1990 to retain top managers at a time of turmoil in the industry and to thwart hostile takeover bids by making it extra expensive for a buyer to take over the company. The \$31 million in payments by the government toward the special payment package was an obligation that would eventually have been paid regardless of the merger. There were no deals between top Martin Marietta management and Pentagon officials to provide bonuses for the merger.

By the way, Mr. Augustine donated the \$2.3 million to charity.

Jack Dickey (12700)

Help us recognize Sandians

The *Lab News* wants to recognize Sandia employees and retirees who receive honors and awards. Call Tammy Locke on 844-1860, or send her a note with a few details to Dept. 12622, MS 0413. In Livermore, contact Barry Schrader (8522) on 294-2447, MS 9111.



Web hot sites

The Lockheed Martin homepage — Information about Lockheed Martin's merger, corporate vision, biographies of top execs, an organization chart, descriptions of major programs, links to Lockheed Martin facilities, and video clips showing key technologies in action. Type <http://www.lmco.com/>

The Federal Web Locator — One-stop shopping for all federal government information on the World Wide Web, with links to the US House and Senate, independent and executive agencies, the Library of Congress, and more. Find it via Sandia's external Web "government sites" menu, or type <http://www.law.vill.edu/Fed-Agency/>

The Dilbert Zone — If you've ever believed the buzzword-challenged comic strip hero Dilbert worked at Sandia, check out <http://www.unitedmedia.com/comics/dilbert/> for an all-too-realistic portrayal of corporate life, with daily Dilbert strips, a two-week Dilbert archive, and info about corporate humor guru Scott Adams.

Web Hot Sites can be practical, educational, even a little fun, as long as they pertain in some way to Sandia work. To submit your favorite Web site, send e-mail to John German (jdgerma@sandia.gov), or call 844-5199. Make sure to include an accurate http address for each submission. We may not be able to publish all submissions, but we will select some of the best and use them when space is available.

Sandia's savings bond drive comes with some new incentives this year

Bond campaign runs May 1-22; prizes to be raffled

Expect a few changes in this year's savings bond campaign. That's the message of Sandia Savings Bond Committee Chairman Gary Riser (10000).

As always, when the campaign gets going on Monday, Sandians will be able to sign up to purchase Series EE bonds through a payroll deduction plan, but they may get a little more than they bargained for in the process.

That's because this year, the bond drive committee is offering incentives to California and New Mexico employees who purchase savings bonds. The incentives, which will all be raffled off randomly throughout the course of the campaign, include roundtrip airline tickets, weekend hotel stays, and rental car certificates (see box below).

"We have two classes of bond investors at Sandia. There are those who faithfully buy the same number of bonds every year," Gary says. "Then there are those who've never bought before or who buy sporadically. These incentives are designed to reward those who buy each year and attract those who've never bought or who buy inconsistently. We're really pushing employee support of this campaign."

This year's goal for employee participation is 90 percent, a goal that campaign chairman Gary Riser believes will be exceeded.

"US savings bonds are a sound investment, and we know many people will buy them on their own merit alone," Gary says. "But this is the first year we've offered incentives like this, and I expect it to be a banner year for savings bond purchases at Sandia."

New market-based rate

Sandians who buy bonds may also notice a difference in the way a bond's interest is calculated, Gary says.

Beginning May 1, savings bonds will earn market-based interest right from the start. The US Treasury will announce two savings bond rates each May 1 and Nov. 1. These rates are the short-term rate that applies from a bond's issue date until it is five years old and the long-term rate that applies after five years. The short-term savings bond rate is 85 percent of the average six-month Treasury security yields and the long-term rate is 85 percent of the

average of five-year Treasury security yields. The new market-based rate EE bonds will increase in value every six months.

This will likely be the last year Sandians can buy a "bond a year" by making a one-time purchase of a \$50 bond instead of having a weekly deduction taken out of each paycheck. Starting next year, employees who buy bonds will have to sign up for a minimum deduction of \$2 per week because new payroll software won't allow the once-a-year deduction.

Gary says he's also pushing for upper-level management to support the campaign. That shouldn't be too hard, considering that this year Sandia Executive VP Jim Tegnalia is the New Mexico US Savings Bond Campaign Chairman. Jim recently hosted a kickoff luncheon for the state bond campaign attended by Governor Gary Johnson and US Treasurer Mary Ellen Withrow. (One hundred brand new one-dollar bills, co-signed by Withrow, will also be given away during the course of the campaign.)

"Our challenge in New Mexico this year is to build on last year's outstanding campaign,"



BUY BONDS is the message of the winners of this year's US Savings Bonds New Mexico Student Poster Contest. The students received awards at the recent state Savings Bond Campaign Kickoff luncheon, sponsored by Sandia. They are, from left to right, Albert Trujillo, third place, Candice Adams, first place, and Karen Hatch, second place. With them are, from left to right, Sandia Executive VP Jim Tegnalia, NM First Lady Dee Johnson, Governor Gary Johnson, and US Treasurer Mary Ellen Withrow. Sandia's bond campaign runs May 1-22.

Jim says. "Savings bonds are an affordable, safe investment offering competitive interest rates, and, through payroll deduction, are simple to purchase."

In 1994, New Mexicans purchased \$52.4 million worth of savings bonds. The state's leading company campaigns were run by Ethicon (96 percent employee participation), Sandia (87 percent), and US West (65 percent).

Center representatives and canvassers will be available throughout the course of the campaign to answer questions on savings bond options and varying interest rates.

Bond buying incentives

Incentives to be awarded in random drawings to savings bond purchasers throughout the course of the campaign:

- a pair of roundtrip tickets on TWA
- a pair of roundtrip tickets on Delta Airlines
- a single roundtrip ticket on Southwest Airlines
- a single roundtrip ticket on America West Airlines
- a weekend stay and free breakfast at the Albuquerque Marriott
- a weekend stay at the Doubletree Hotel
- three \$100 certificates for Hertz Rent-A-Car
- several travel bags



SAVE KIRTLAND!—Several thousand people gathered at Albuquerque Civic Plaza at midday April 20 in a rally in support of saving Kirtland Air Force Base. Earlier that day at a hearing attended by an estimated 1,200 people in the Albuquerque Convention Center, seven members of the Defense Base Closure and Realignment Commission heard a 50-minute presentation from the Kirtland Retention Task Force, headed by retired Air Force Lt. Gen. Leo Marquez. Charlie Thomas, Manager of Sandia's Sites Integration/Liaison Dept. 7255 and a former Commander of Kirtland, was one of the task force members who spoke. The commission was given evidence that closing Kirtland would cost far more than the Air Force had originally anticipated and was told that Kirtland is the only place in the nation where the DOE, Sandia, the Defense Department, and the Air Force work together to keep the nation's nuclear arsenal "safe and secure." The commission's recommendations are due to President Clinton July 1 and to Congress this fall.



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

MISCELLANEOUS

MONOPOLY GAME; Nintendo Zapper; remote-controlled cars; alarm clock; miscellaneous bathroom hardware, all free. Armstrong, 266-2334.

MAN'S AND WOMAN'S DOWNHILL SKIS, KVC Competition Series, poles, \$100/OBO each set. Torres, 831-6458.

YARD SALE, street-wide, April 29-30, Elwood Dr. NW, one block west of 2nd St. off Osuna, appliances, etc. Something for everyone. Smith, 344-5886.

CULTIVATOR, electric, light-duty, GDXTW, \$20; scroll saw, Craftsman, \$18; circular saw, 7-1/4-in, 1-hp, BVD, \$12; drill, \$8. Rainhart, 821-3690.

LAWN-MOWER ENGINE, 5-hp, vertical shaft, runs well but needs new rings, less muffler, free. West, 292-2271.

NAD STEREO CD, cassette, Polk speakers, \$1,000; Panasonic fax, \$250; 2 cedar-lined wardrobes, \$150/both; queen-size bed, \$125; electric typewriter, \$75. Mann, 343-0524.

STEREO EQUALIZER EQ-1, Audio Reflex, 10 channels, \$20; Adaptec 1542B, SCSI controller, Bus Master, \$100. Hatley, 822-8577.

ANTIQUÉ DROP-FRONT DESK, w/stool, \$350; king-size waterbed, w/12-drawer underdresser, mattress, side rails, heater, \$250. Snyder, 281-3822.

FREE LAWN MOWER, gas-driven, needs work. Wilson, 293-2228, after 6 p.m.

HITCH FOR MINI VAN, Class II, used on '91 Chev. Lumina, will fit Olds & Pontiac versions, \$40. Everett, 873-6132.

CURVED SOFA, Autumn Wood, 108" x 108", beautiful Southwestern blues/mauves on white, \$300. Hartwigsen, 865-7836.

GOLD'S GYM MEMBERSHIP, 11 months, \$225 OBO. Roybal, 255-2909.

KITCHEN CABINETS SPACE, 11' x 13', new 8'4" Formica top, and 8-ft. "L" shape, built-in Frigidaire oven & dishwasher, two ovens, stove. Rael, 884-4778.

CALCULATOR, TI 59, w/instruction manuals, electronic programs & PC100C printer; all for \$150. Henry, 266-6467.

LAWN MOWER, 4-hp, Sears Craftsman, 20-in., rear bag, excellent condition, \$95. Bendure, 867-9099.

COUCH, excellent condition, dual heater, 35,000 Btu, \$150. Sanchez, 836-5672, after 4 p.m.

RAIN DIAL, 6-station, \$150; 12-station, \$200; sprinkler parts; full-size waterbed, \$100; Star printer, doesn't work. Crosby, 858-3128.

TEMPORARY ELECTRIC POLE, complete w/breaker panel, meter receptical, conduit, weather head, 6 x 6 x 16', \$55. Thornberg, 866-6108.

CEMETERY PROPERTY, Sunset Memorial, Garden of Gethsemane, 4 plots, \$800/ea., \$3,200/all. Mincks, 510-447-3649.

ROTOTILLER, Sears, 5-hp, 17-in. rear-tine tiller, w/counter rotating tines, excellent condition, spare parts, manual included, \$350. Convissor, 828-2137.

MAN'S WATCH, Tag-Heuer, two-tone diver, w/original box & papers, new \$480, asking \$300. Hoke, 298-6619, after 5 p.m.

DART BOARD, Widdy Professional, wound paper, double sided for extra games, excellent condition, one-third new price \$80. Dybwad, 296-9047.

CASUAL DINING TABLE, w/4 cloth swivel chairs, excellent condition, \$150. Carter, 291-0779.

TIRES AND WHEELS, from Toyota pickup, size P195/75R14, set of 4, new, never been used, \$125/set. Reif, 299-4243.

REFRIGERATOR, Amana, 16-ft., white, \$175; fireplace insert, \$100. Chavez, 842-6374.

TROY-BILT ROTOTILLER, 7-hp Kohler engine (horse), bumper guard, transferable lifetime warranty, runs well, great shape, \$1,000. Berry, 897-3652.

PING-PONG TABLE, \$60; chipper/mulcher, \$350; gasoline-powered weedcutter, \$50; dresser, w/mirror, \$125; freezer, \$250; single bed, \$80; Sears tablesaw, \$200. Axness, 296-4691.

GARAGE SALE, April 29, 8 a.m. to noon, 9604 Bolack NE, trike, carseat, skis, desk, chests, boy's clothes sizes 2-5, toys, tables. Filter, 823-1232.

RIDING LAWN MOWER, Sears, 36-in., 10-hp, slightly used, works great, \$350. Bailar, 865-1518.

TWO-HORSE TRAILER, Hale, tandem axle, electric brakes, \$1,150. West, 865-5204.

MINOLTA CAMERA, X-370N SLR, 28-70mm zoom, 50mm fixed lenses, autoflash, bag, used only once, \$350 firm. Leisher, 281-5258.

DOGHOUSE, for small dog, excellent condition, wood w/shingled roof, best offer. Schulz, 294-5195.

NORDICTRACK PRO, \$300. Smith, 865-7261.

SILVER KING VACUUM CLEANER, brand new, w/all attachments, worth \$1,850, will sell for \$550. Norton, 275-7329.

ROOFING STAPLER, Paslode, like new, with approx. 8,000 1-1/2-in. staples, \$260. Stinebaugh, 275-3170.

MDM IFR SIMULATOR, 1/3 share, \$225. Shapnek, 281-5913.

TORO LAWN MOWER, Recycler II Super Pro mulching model, \$600 new last year, will sell for \$425. Ashcraft, 884-4934.

TRACKS/CAR SET, Super Duper Double Looper, in original carton, \$30; children's trampoline (3-4 ft.), \$6. Moonka, 856-1110.

WINDOW SHADE, Hunter Douglas, new, horizontal (146"W), white, \$450 new, asking \$225; 286 computer, printer, make offer. Benham, 856-2739.

VIDEO CAMERA, Panasonic PV-710, full-size VHS tapes, slim body design, w/2 batteries, hard case, like new, \$300. Kelly, 271-9589.

YARD SALE, 2 families, April 29, 7 a.m.-3 p.m., 1808 Shirlane NE, 1 block north of Indian School at Chelwood. Petersen, 275-7467.

CRYPTS, 2 floor-level, Chester French Memorial Mausoleum, \$1,000 below market. Wallace, 915-697-8997, call collect, ask for Gil.

HUGE GARAGE SALE, April 29-30, 9 a.m., 712 Amherst SE, clothing, books, heater, lights, other great stuff. Spraggins, 256-7408.

ACOUSTIC GUITAR, Washburn "Enrique Tapicas", 6-string, w/case, \$175; Polar Accurex heart-rate monitor, new, \$150. Alsbrooks, 869-7840.

TIRES, 2 Goodyear Eagle M&S, off '89 Mustang GT, P225/60VR15, like new, \$50. Schriener, 856-0805.

CHINESE RUG, beautiful, 8' x 10', ivory w/multi-medallion border, \$600; brass bed, queen, \$150; antique bureau, 4 drawers, \$95. Lambert, 344-9012.

COFFEE TABLE, solid oak, 30" x 50" x 16"H, \$70; recliner, \$90. Lewin, 898-2303.

RED LAVA ROCK, for landscaping, enough to cover approx. 30' x 12' area, free, you haul. Evans, 299-7105.

RECORD ALBUMS; 2 stereo speakers, \$50; wet suit, \$50; couch & extra-wide chair w/ottoman, \$100. Kilbane, 293-0481.

ENTERTAINMENT CENTER, solid oak, 6' x 5-1/2", \$175. Mairson, 899-8386.

STEREO RECEIVER, Marantz Model 2215B, \$25; Tandberg TCD300 cassette deck, \$20. Guilford, 255-6294.

FIFTIES FURNITURE, excellent condition: buffet sideboard, \$175, end table, \$25; exercise bicycle, almost new, \$45. Bennett, 889-0929.

PURE-BRED COLLIE PUPPIES, registered, 6 wks. old April 24, choice of 7, 4 females, 3 males, first shots, tri-color & blue Merle, w/papers, \$200 ea. Sturgeon, 281-9035.

LARGE ROOFTOP CARRIER, Sears, \$40; two tires, Uniroyal, 175/70SR13, M&S, \$15/pr; heater blower assembly, 1/6-hp, \$25. Franczek, 856-5927.

FURNITURE: couch, coffee table, chair, end table, vanity & mirror, hide-a-bed, girl's bedroom set, 2nd refrigerator. Cole, 293-6122.

FENDER JAZZ BASS SPECIAL, fretless, pearl white, hard fender case, new strings, super clean, J/P pickups, \$550. Kureczko, 281-8206.

SOLID OAK BUNK BED, excellent condition, includes side rails, ladder, \$400. Crawford, 897-3282.

THIRTIES CHERRY & MAHOGHANY TABLE, round, (48-in. diameter), starburst top on pedestal, mint condition, w/4 cane-back chairs, \$750. Bronkema, 291-1323.

CHILDCRAFT CRIB, chest of drawers, nightstand, crib converts to youth bed, chest to desk, oak, excellent condition, \$600 firm. Jacobs, 281-8478.

TELESCOPE, 40-power, w/2-power spotting scope, excellent condition, \$30. Romero, 864-9756.

SHOTGUN, Winchester 101, double-barrel w/full chokes, 20-gauge, 30-in. barrels virtually new w/box, \$1,000. Altman, 254-0103.

EXTERNAL FAX MODEM, 14.4 Kbps, Easy Options by IBM, cables included, \$75. Crowder, 821-9126.

INTERNAL FAX MODEM, 14.4, for PC, brand new, includes communications software & related manuals, \$70. Martinez, 888-3067.

S&W .357 STAINLESS REVOLVER, 6 in., \$350; Sterling .22 LR, semi-auto, nickel-plated pocket pistol, \$100; Ultra-Hi muzzle-loader, .45 cal. rifle, \$100. Szklarz, 292-3995.

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

ATTENTION: Department 12622 is now on cc:Mail. You may send classified ads to Nancy Campanozzi. Any questions, call Nancy on 844-7522.

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 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.

OAK CORNER CABINETS; oak breakfast nook; sofa table; large wall mirror; recliner sofa; black baker's rack; chipper-shredder. Greer, 281-4514.

GOLF CLUBS, 560 Tour Series, 3 & 5 woods, Harrison Boron Gold Graphite, strong shafts, w/covers, \$35/ea., chipper, \$12, putter, \$12. Lujan, 299-4820.

LOVESEAT, good condition, \$50; smokers: one Brinkman, \$20; 21-in. Weber kettle, cook delicious turkey, chicken, pork in summer, \$20. Dreike, 299-6670.

WOODBURNING STOVE, long-burn capacity, \$375. Garcia, 343-8207.

SET OF TIRES, 185/70/R14, for Nissan Maxima, great for spares, \$10/ea.; clown doll, w/porcelain face, \$9. Wagner, 823-9323.

AMERICAN RACING RIMS, chrome, 14 in., really nice, must see/sell, \$400 OBO. Abeyta, 864-3670.

FOR ADOPTION TO APPROVED HOME, 3-yr.-old Alaskan Malamute, neutered male, excellent family pet. Miller, 281-3696.

TEA SERVICE, \$500; scroll saw, \$100; 35mm camera outfit, \$300; concert flute, \$125; paintings, offers; Lladro porcelain figurines, \$200 ea. Eikelberg, 296-0899.

FIFTIES NOVICE STATION, Drake 2-NT XMTR, 2-C receiver, 2-CQ Q-multiplier, Hallicrafters HA-5 YFO, rack/cart & extra tubes, \$225. Roose, 296-4129.

IBM TYPEWRITER, Selectric II, needs minor repair, green in color, \$100. Olson, 296-1918.

STOVE, gas, self-cleaning, sealed burners, electronic ignition, almond, excellent condition, 1 yr. old, paid more than \$600, will sell for \$400. Langwell, 293-2728.

CELLULAR PHONE, Motorola, 4 months old, hardly used, comes w/2 batteries, 2 chargers, other accessories. Rael, 873-1634.

INDIAN BEADWORK, Northern Plains, probably '50s: belt, headband, satchel; trader war club w/engraved metal; shell necklace, best offers. Dubicka, 296-6557.

VHS CAMCORDER, Panasonic, \$475; GE dockable VHS VCR & camera, \$375; 2-in. B&W pocket TV, \$100; Zenith VHS, stereo VCR, \$375. Waggoner, 293-4755.

ANTIQUÉ FURNITURE; buffets, dining room sets, dressers, mirrors, French country, w/claw feet, several pieces. Sanchez, 898-9598, call for appointment.

BOSE 301 SPEAKERS, \$70/pr.; Pioneer CD player, \$70; Sony 9-band graphic equalizer, \$30; Onkyo amp/tuner, \$15; Technics cassette player, \$10. Tweet, 822-9357.

TREADMILL, Cadence 2100, Fitness Trak, 5.0-mph, speed/pulse monitor, incline lift assist, \$175 OBO; electrostatic air cleaner, \$50 OBO. Mikawa, 281-7245.

WIRE WHEEL COVERS, 14-in., all metal, Rally, 72-spoke, four, \$35/all or \$9/ea. Carpenter, 294-1372.

COLOR TV, 25-in. console, \$100; microwave, \$85; both work great & good condition. McAnaney, 293-0794.

BOOKCASE, 4' tall x 2' wide, \$10; 4-drawer chest, \$15. VanDeusen, 291-8196.

STAIR STEPPER, Forum Model SM1-AS, side rails, adjustable tension, four-function electronic computer, complete instructions, \$75 OBO. Rosinski, 823-1805.

FIREPLACE GLASS DOORS, to fit 32" wide by 24" high opening. McConahy, 884-5071.

PANASONIC PRINTER 1124, \$85; propane barbecue grill, \$75; 1/2-hp swamp cooler motor, \$15, little used. Burgett, 275-0229.

THREE CEMETERY LOTS, Sunset Memorial Park, Block 10, choice location, \$775 ea. Summers, 881-7765.

DINING TABLE, Thomasville, 42" x 64", w/4 arm chairs, two 16-in. leafs, pecan finish, excellent condition, \$550; matching washer & dryer, \$300. Salazar, 281-0560.

RUNNING BOARDS, aluminum diamond plate, fits '87-'95 full-size Ford Bronco, 1 yr. old, original price \$200, sell for \$75. Stirbis, 299-8442.

RCA COLORTRAK TV, 25-in. diagonal, pecan finish console, 100% solid state, casters, \$120; plate glass mirror, 55" x 45" x 1/4", unframed, \$45. Stang, 256-7793.

WOMAN'S BOWLING BAG, including bowling ball; 7 ft. traverse rod; 7 ft. drapery rod; miscellaneous items. Kasnic, 299-5583.

MOUNTAIN BIKE SUSPENSION FORK, Amp Research aluminum suspension fork, 1-1/8 in. threaded steer tube, \$250 OBO. Sartor, 858-2554.

TRANSPORTATION

'87 SUZUKI SAMURAI, red w/black top, 4-WD, runs and looks good, \$2,500. Anderson, 292-8432.

'88 YAMAHA MOTORCYCLE, DTSOU, 2-stroke, autolube oil injection, liquid-cooled, instrumentation, like new, red/white, asking \$550. Fitak, 275-5893.

'86 GMC CONVERSION VAN, must sell, consider all offers, AT, dual-air, V8, 3/4-ton, 305 engine, 70K miles, great condition. Aragon, 897-3878.

'71 KARMANN-GHIA, very nice, many new parts, \$4,500. Hartwigsen, 865-7836.

'59 AUSTIN-HEALY BUGEYE SPRITE, NM car, red/black interior & top, excellent condition, rebuilt engine & transmission, re-wired, \$6,000 firm. Bendure, 867-9099.

'86 RENAULT ALLIANCE, stout motor, good dependable car, \$600; 1-3/4 Chev. Luv truck, blown motor, straight body, camper shell, \$250. Crosby, 858-3128.

'90 HONDA CIVIC, 3-dr., 4-sp., AC, AM/FM cassette, \$5,700. Beer, 262-9873.

'94 HONDA LX, white exterior, fully loaded, front-wheel drive, 4-cyl., 4-year warranty, brand new, \$16,600. Reed, 821-5342.

'87 AUDI 5000S, power sunroof, PW, PD, PM, stereo cassette, 95K miles, immaculate condition, \$5,500. Smith, 856-1567.

'76 FORD F250 SUPERCAB PICKUP, 3/4-ton, towing pkg., bedliner, 97K miles. Quintana, 298-5621.

'85 CHEV. CELEBRITY, V6, AT, PS, 4-dr., very clean, runs well, 1 owner, 114K miles, \$1,800. Cox, 292-5997.

'60 BUICK LE SABRE, 8-cyl., AC, PB, AT, good body, not running, \$600. Axness, 296-4691.

'84 MERCEDES 300D, w/turbo, gold, 4-dr., 132K miles, excellent condition, previous records, \$6,500 OBO. Barger, 296-0676.

'90 HONDA ACCORD, 5-sp., excellent condition, documented maintenance, new tires, \$9,200. Clair, 281-9888, evenings, ask for Susan

'80 HONDA CX500, watercooled, shaft-drive, v-twin, w/fairing, trunk & tank bag, excellent condition, 29K original miles, \$700. Cates, 275-0143.

'85 FORD PICKUP F150, 4x4, AC, dual tanks, 89K miles, new clutch & oil seals, V8, w/EFI, \$4,000. Wernicke, 237-9332.

'72 PONTIAC LEMANS, \$500. Shapnek, 281-5913.

'92 FORD TAURUS GL, 3.8L, V6, all power & fully equipped, 38K miles, excellent condition, looks great, \$10,350. Hart, 292-5110.

'91 BUICK SKYLARK GS, loaded, silver, 48K miles, 3.3 V6, \$10,800 w/custom wheels, \$9,900 w/stock wheels. Baldonado, 248-0241.

'86 PONTIAC FIERO GT, V6, AC, 5-sp., sunroof, new clutch, brakes, ignition, emission system, 68K miles, \$3,900 OBO. Mauldin, 293-3763.

'92 MITSUBISHI ECLIPSE, 31K miles, 5-sp., 1 owner, alarm, burgundy, AC, excellent condition, warranty, \$10,500 OBO. Bianchi, 856-2003.

'84 LINCOLN TOWNCAR, loaded, leather seats, excellent highway or long commute vehicle, maintenance records, immaculate, \$3,100. Connor, 821-4349.

MERCEDES BENZ 420 SEL, black/black, loaded, transferrable warranty, can arrange financing, beautiful condition, safe family car, \$40,000. 296-0899.

'87 TOYOTA CAMRY, 5-sp., gray in/out, new tires, AM/FM cassette, AC, 4-dr., hitch, 98K miles, single owner, \$4,900 OBO. Dubicka, 296-6557.

'82 KAWASAKI 550 LTD, 16K miles, new tires, flexifairing, great condition, \$1,100. Keener, 294-0856.

'80 SUBURBAN, 3/4-ton, 4x4, AT, AC, PB, AM/FM, CB, 400, extras, one owner, 85K miles, \$3,995. White, 294-5692.

'89 DODGE GRAND CARAVAN SE, blue, PB, PS, AC, luggage rack, window tinting, good condition, \$8,100 OBO. Keese, 299-1327.

'91 YAMAHA VIRAGO XV1100, 8K miles, excellent condition, lots of extras, \$4,600. Williams, 884-7853.

'86 FORD F150, 4x4, 4-sp., 300 cu. in., 6-cyl., AC, PS, 105K miles, 1 owner, clean, \$6,500. Guthrie, 899-8075.

'75 DODGE D-100 PICKUP, 1/2-ton, AT, AC, cruise, excellent condition, 2nd owner, \$3,000 OBO. Torres, 294-7273.

'78 BMW 320, sunroof, 4-sp., Alpine stereo, new tires, tune-up, \$2,100 OBO. Slettom, 255-8822.

'79 MERCEDES 300SD, excellent condition, cream w/buckskin interior, sell or trade, \$5,200. Salazar, 281-0560.

RECREATIONAL

MOUNTAIN BIKE, Research Dynamics, 18.5 Coyote, 2.21-sp., MTB Cro-Movl frame, SSK duo-track suspension forks, brand new, \$350. Welter, 881-0268.

'82 NUWA HITCHHIKER-II 5TH WHEEL, 31-ft., rear LR, AC, twin beds, tub/shower, awning, great condition, \$8,950. Quintana, 298-5621.

CABOVER CAMPER, 9-ft. high, for full-size pickup bed, hydraulic jacks, \$800. Wernicke, 237-9332.

'75 LASER SAILBOAT, and '92 trailer, \$950. Shapnek, 281-5913.

CHILDREN'S BIKES: boy's 20-in. (stunt), \$45, scooter, \$25, girl's 12-in. w/training wheels, \$20. Moonka, 856-1110.

WINDSURFERS, excellent stability, \$165/ea., buy both, will add extra booms & double sail bag. Gage, 293-1707.

'88 NUWA HITCHHIKER-II 5TH WHEEL, Model 24RL, fully equipped, no smoking, no pets, one owner. Whalen, 822-0413.

FISHING BOAT, 16-ft. aluminum, 48-hp Johnson motor, excellent condition. Richards, 265-8101.

MOUNTAIN BIKE, \$175. Eikelberg, 296-0899.

TWO SAILBOARDS: 1 Mistral Superlight, 1 Mistral Maui, two sails, two masts, 1 mast bag & accessories, booms missing, \$250/ea. or \$400/both OBO. Olson, 296-1918.

GIRL'S MOUNTAIN BIKE, 24-in. Diamondback, green, 18-sp., Shimano brakes & gears, excellent condition, \$105. Rockett, 298-2589.

GLASSMASTER TRI-HULL, 16 ft., 100-hp Johnson, power tilt & trim, trolling motor, fishfinder, trailer, extras, \$2,995. White, 294-5692.

PADDLE BOAT, water wheeler junior, \$300; Huffy Town-N-Stroll jog behind baby stroller, \$50; alto saxophone, Conn, \$300. Keefe, 832-6652.

REAL ESTATE

NEW CORRALES HOME, Southwest style, vigas, tile, radiant heat, great views, 2,600 sq. ft., paved road, natural gas, CTV. Karler, 298-3265.

RAMMED EARTH HOME, passive solar, new 3,700 sq. ft., 2 wooded acres, South 14, excellent well/septic, 85% complete, \$190,000. Armistead, 237-0805.

(Continued on page 12)

Sandia News Briefs

Sandia to be major exhibitor at ISE '95

The 17th annual Ideas in Science & Electronics (ISE) technology trade show, showcasing the latest products and technologies in science, engineering, research and development, computers, manufacturing, purchasing, and information management, will be held Tuesday, May 9, 9 a.m.-5 p.m.; Wednesday, May 10, 9 a.m.-5 p.m.; and Thursday, May 11, 9 a.m.-4 p.m., at the Albuquerque Convention Center. Sandians will demonstrate technology developments in manufacturing, information, electronics, and pulsed power, and will feature collaborative efforts between industrial partners, universities, and other national labs. ISE '95 will also offer half-day short courses on Neural Networks and Virtual Reality; each course costs \$225. Admission is free to the trade show. Preregister by fax on 265-1143 or register at the door. For more information, call 262-1023.

DSP Technology presents Sandia with 1994 Commercialization Award

In recognition of Sandia's significant contributions to furthering competitiveness of US manufacturing through technology transfer, DSP Technology Inc. last month presented Sandia with its 1994 Commercialization Award. DSP Technology — a world leader in advanced instrumentation and control systems for the automotive, aerospace, and laboratory markets — recognized Sandia for developing an automated calibration system that significantly reduced the time needed to collect and analyze data. The system was originally developed to calibrate measurement equipment in Sandia's Mobile Instrumentation Data Acquisition System. William Uncapher of Transportation Systems Dept. 6642 was the principal investigator for the automated calibration system technology, which General Motors Corp. purchased to calibrate data-collecting systems for its automotive crash-worthiness tests. The technology has decreased the time required to certify vehicle systems and has improved the competitiveness of US auto manufacturers.

Three national labs, four industrial partners sign CRADA

Sandia, Lawrence Livermore, and Los Alamos national laboratories will join Coloray Display Corp., FED Corp., SI Diamond Technology, Inc., and Silicon Video Corp., in a \$1 million cooperative research and development agreement to develop an advanced flat-panel display manufacturing technology for phosphor screen manufacturing. Sandia will be the lead lab for the project. Optoelectronics Characterization/Sensor Development Dept. 2231, managed by E. Paul Royer, will be responsible for most of the project characterization and coordination, with Jonathan Weiss (2231) as principal investigator.

Richard Diver recognized for best paper in testing and measurement

Richard Diver of Solar Thermal Technology Dept. 6216 was recognized by the American Society of Mechanical Engineers, Solar Energy Division, for "Best Paper, Testing and Measurement" at the March 19-24 International Solar Energy Conference in Maui, Hawaii. Richard presented "Mirror Alignment and Focus of Point-Focus Solar Concentrators."

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

Sandia Classified Ads Sandia Classified Ads

(Continued from page 11)

- 5 BDR. BRICK HOME, pitched roof, 3,200 sq. ft., on 1/3-acre lot, 10 minutes from Tech Area. Axness, 296-4691.
- 3 BDR. TOWNHOUSE, 1,900 sq. ft., Sandia Heights, view, decks, many extras, must see, affordable. Dobrian, 856-7396.
- 4 BDR. HOME, 3 baths, 2,200 sq. ft., fireplace, 2-car garage, Eubank & Montgomery, \$139,000. Wernicke, 237-9332.
- 3 BDR. HOME, 2 full baths, 5 minutes from base, custom built, new, 1,850 sq. ft., \$155,000. Jelinek, 898-4997.
- 2-1/2-ACRE LOTS, Cibola County, near Ramah, NM, 2 hrs. from Albuquerque, \$5,900 each OBO, \$11,000 takes both. Holloway, 294-5815.
- 3 BDR. HOME, 2-3/4 baths, 2,600 sq. ft., Ridgcrest area. Huston, 265-1831, after 7 p.m., after noon Sat. & Sun.

WANTED

- SWINGSET/JUNGLE GYM and/or outdoor playhouse, good condition. Velasquez, 248-0526.
- ROOM TO RENT, for OSSP student, May-August, near Sandia, \$100-200/month, will do yard-work, etc. Dunkel, 296-5643.
- PRESSURE CANNER, canning supplies, produce scale, garden out of hand! Spires, 275-3655.
- PIANO, Baldwin, Yamaha or Kwai; ladder, 28-ft. or greater. Moonka, 856-1110.
- CHEV. EL CAMINO, '80 or newer, 350 or smaller engine, must be dependable transportation, smooth running engine. Sorenson, 892-6823.
- LIVE-IN, prefer elderly lady or young man, trustworthy, to share expenses, in 3-bedroom home, near Wyoming & Indian School. Archuleta, 836-3764.
- TRAILER, small, 5' x 8', w/side walls (removable if possible), for light jobs. Schriener, 856-0805.
- BABY BACKPACK CARRIER, Kelty or Tough Traveler brands. Floro, 286-1237.

- HOUSEMATE, non-smoker, nice residential area, mountain views, private entrance, bedroom, bath, kitchen privileges, \$350/mo. Smith, 298-7365 or 292-1976.
- TO RENT, small house or condo, quiet neighborhood, non-smoking post-doc, no children or pets. Nicholl, 293-2977.
- COPY of National Geographic Explorer "Animal Minds," from April 16; "Saturday Night Live" from April 15. Kureczko, 281-8206.
- SIMMS FOR IBM COMPUTER, 30-pin, need 4 ea., 1 MB, 70 nsec. Harris, 344-6640.
- FORD MUSTANG CONVERTIBLE, '64-1/2-'66, V8, no rust, must be in good running condition. Dominguez, 275-7957.
- MANDARIN SPEAKERS to form conversation group, want to rebuild fading fluency, meet and chat 1-3 times weekly. Kercheval, 864-6549.
- RESPONSIBLE high-school or college student, preferably w/own mower, to do regular lawn mowing & other yard work, Ridgcrest area. Richards, 268-8010.

LOST & FOUND

- LOST: man's prescription safety glasses, without side shields, Area I. Reckaway, 869-2131.

WORK WANTED

- HOUSESITTER available for summer, from end of May to September, college student working for summer, references supplied. Moulton, 835-4676.
- HOUSESITTING, one-two years, by reliable responsible married couple, will care for house, yard & pets, if needed. Halbgewachs, 268-1584.
- BABYSITTER, w/own transportation, to care for daughters, ages 3 & 6, Monday-Wednesday this summer, in our home. Blanford, 296-6039.

Coronado Club

April 28 and May 12 (Fridays) — Kids' bingo nights. Buffet, 5 p.m., with cartoons and movies. Bingo starts at 7 p.m. Free hot dog and soft drink for all kids playing bingo.

May 4, 11, 18 — Thursday bingo nights. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

May 5 (Friday) — Cinco de Mayo Fiesta, all-you-can-eat Mexican buffet, 6-9 p.m., \$8.95. Music by Lumbre, 7-11 p.m.; special appearance from Miquel Caro and his Mexican Dance Company, floor show 8-8:30 p.m. Reservations recommended.

May 7 — Sunday brunch buffet, 10 a.m. - 2 p.m. \$7.95 adult members, \$8.95 guests, \$2.95 for children 4 to 12, free for children 3 and under. Music for buffet by Bob Weiler and Los Gatos, 1-4 p.m.

May 14 (Sunday) — Mother's Day Brunch. Baked ham, turkey, baron of beef, breakfast items. Adults \$8.95, children 4-12 \$4.95, children 3 and under free. Reservations are required and will be taken for 10 a.m., 12 p.m., and 2 p.m. only. All moms receive a flower.

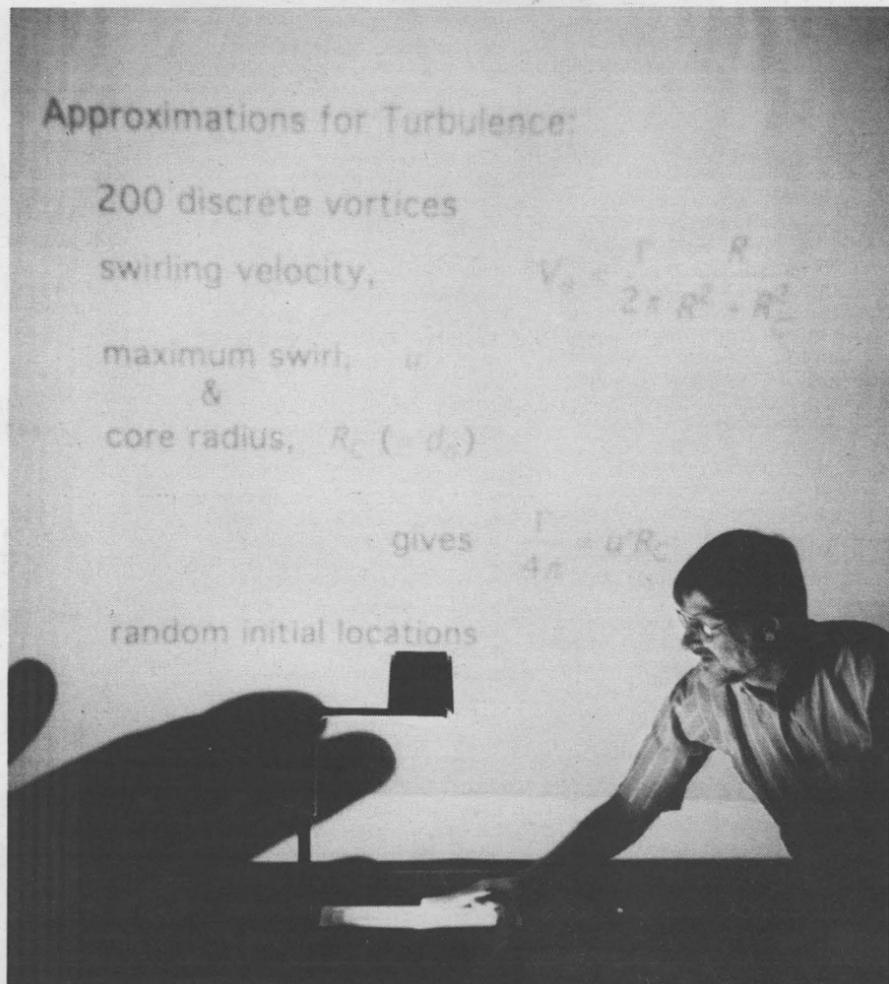
May 20, 21 (Saturday, Sunday) — Preseason swimming pool open house. Pool open 11 a.m.-5 p.m.

May 25 (Thursday) — Coronado Club is closed for Sandia retirees' picnic. Music for picnic by Bob Weiler and Los Gatos, 4-7 p.m.

Recent Patents

Vince Hietala and Thomas Zipperian (both 1322): Superconducting Flux Flow Logic.

Mohsen Shahinpoor (1433): Spring-Loaded Polymeric Gel Actuators.



SWIRLING TURBULENCE — Bill Ashurst of Diagnostic and Reactive Flow Dept. 8351 shows a viewgraph at the recent Sandia-organized Forum on Vortex Methods for Engineering Applications. At the vortex conference, at the Albuquerque Marriott, 40 leading researchers from five countries exchanged information on recent advances in the development and application of vortex methods and discussed challenges to their broad use for engineering simulation. Engineering Sciences Center 1500 and Combustion, Materials Science, and Technology Center 8300 hosted the conference. Photograph by Randy Montoya