# Nuclear Weapons Surveillance Program is vital 'foundation for managing the aging stockpile'

***Eighty Sandians are on the front line for finding potential problems with ever-aging nuclear weapons***

By Chris Burroughs

*Editor's note: This is the first in a series of* Lab News *articles covering Sandia's Nuclear Weapons Surveillance Program.*

In testimony before the US Senate Committee on Armed Services Strategic Subcommittee last year, Sandia President Paul Robinson said the nuclear weapons surveillance program is the "foundation for managing the aging stockpile."

Those words clearly show the high level of responsibility carried by the 80 people in Sandia's surveillance-related departments 2950, 2951, 2952, 2953, 2954, and 2955. They test and evaluate the safety and reliability of the nuclear stockpile and are the front line for finding potential problems and making recommendations for repairs and upgrades.

Weapons surveillance began in the US in the mid-1960s when weapons testing was done through underground explosions of nuclear devices. Such testing continued until the early 1990s.

"Since the cessation of 'live' nuclear weapons testing, our non-nuclear testing is one of the few ways we have to determine if the weapons will work when they are supposed to and not work when they are not supposed to," says Bill Norris, Level II Manager of Surveillance Group 2950. "We are vital to stockpile stewardship."

## Weapons testing

Weapons in the stockpile range from anywhere between 15 to 40 years old, and the likelihood grows every year that parts might start to fail as the systems age. The faulty parts must be found and replaced or repaired.

Of course, says Bill, it is impossible to test all weapons in the stockpile, so the testing is done at random. Every year 11 weapons are randomly pulled for testing from each of the nine enduring stockpile systems in the country: B61-3/4/10, B61-7/11, W62, W76, W78, W80-0/1, B83, W87, and W88 — making for about 100 weapons tested annually. Bill says that this level of random testing will uncover most defects that might exist in weapons in the stockpile.

TEST BED — Oscar Hernandez, left, Manager of Test Equipment Design Dept 2955, and Biu So review weapon component data from a test bed. Oscar's department is responsible for designing and building "testers" that will be used at Sandia's Weapons Evaluation Test Laboratory (WETL) at the Pantex Plant near Amarillo. (Photo by Randy Montoya)

"If there is a defect in 10 percent of the weapons, there is a 90 percent probability that a weapon with that defect will be in the sample every two years," he says.

Eight of the 11 weapons systems are typically sent to Sandia's Weapons Evaluation Test

*(Continued on page 4)*

## *State of the Labs presentations for employees set for Feb. 17 and 19*

Sandians are invited to hear President Paul Robinson and Executive VP Joan Woodard give their annual State of the Labs presentation next month.

The California session will be 2-3 p.m. Monday, Feb. 17, in the 904 Auditorium. The Albuquerque session is 10-11 a.m. Wednesday, Feb. 19, in the Schiff Auditorium.

Paul and Joan will update employees on some exciting technologies Sandia is developing, recent major achievements, special projects for the US military, future directions for the Labs, hiring and budget plans, and community involvement efforts. They will also answer employee questions after their presentations. The sessions are scheduled for one hour.

Because Sandia is a major contributor to homeland security and is well positioned to do more as the Department of Homeland Security begins operations in March, a special presentation about this has been added to this year's sessions. T. J. Allard, who manages Sandia's homeland security liaison office, will talk about how Sandia has organized efforts Labs-wide to pursue new opportunities. He will speak at both the Livermore and Albuquerque sessions.

An added attraction at the Albuquerque session will be a short presentation by Ireena Erteza (5912) on cutting edge work Sandia is doing in synthetic aperture radar.

The State of the Labs presentation will also be given to Albuquerque-area community leaders the evening of Feb. 20. — *Larry Perrine*


# Sandia LabNews

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Sandia National Laboratories


# NNSA restructuring creates Sandia Site Office at Labs, supporting Service Center

Sandians who deal directly with the National Nuclear Security Administration field entities in Albuquerque have some new structures and names to know.

NNSA, the semi-autonomous agency that carries out the national security responsibilities of DOE, moved officially to a new organizational structure Dec. 17. NNSA Acting Administrator Linton Brooks announced the details.

The most dramatic change is to the NNSA field organization. Previously, the site offices that oversee NNSA's contractor operations reported to headquarters through three operations offices, in Albuquerque; Oakland, Calif.; and Las Vegas, Nev. Beginning Dec. 17, all site offices report directly to the NNSA administrator through the principal deputy.

The Sandia Site Office is the new name of the NNSA entity (formerly called the Kirtland Area Office) for overseeing Sandia. It is located at Sandia (headquartered in Bldg. 802 but with some people also located in other Sandia buildings and areas). It is one of eight site offices that will report directly to NNSA. The others are at Livermore, Los Alamos, Nevada, Kansas City, Pantex, Savannah River, and Y-12. The Sandia Site Office has oversight responsibility for all of Sandia, including Sandia/California.

The site offices are responsible for all oversight and contract administration for site activities including the coordination of contractor oversight, the safe and secure operation of facilities under the purview of NNSA, the support of NNSA programs to ensure their success, and the long-term viability of the site to support NNSA programs and projects.

Brooks said each site office manager will serve as the formal contracting officer for their facility and will establish their own internal organization tailored to their own considerations; "there will be no 'standard' site office internal structure prescribed by headquarters."

*(Continued on page 5)*

## *Flying SnifferSTAR may aid civilians and US military*

By Neal Singer

A half-ounce 'sniffer' intended to ride on small aerial drones to detect possible gas attacks on cities and military bases has been created by researchers at Sandia in partnership with Lockheed Martin Corporation.

The patented device, which detects nerve gases and blister agents, operates on only half a watt of electrical power, says Doug Adkins (1764), who created the device with George Dulleck (1738) and Greg Frye-Mason (former Sandian).

While other gas monitors exist, "this is

*(Continued on page 5)*


3 Telemetry systems for flight test units become distributed sensor systems

►4 Bill Norris has special appreciation for nuclear safety from career on subs

# What's what

You don't have to be a poet or lexicographer or etymologist to appreciate the value of words. I'm none of those and I truly appreciate words — in any language, but mostly in English, because that's my language. Mark Twain had it exactly right when he wrote: "The difference between the right word and the almost right word is the difference between lightning and a lightning bug."

I was thinking about that recently as I endured the maddening frustration of voicemail instructions while trying to make an appointment with a doctor. "Please wait," droned The Voice, "for the next customer service representative."

Wait a minute! "Customer?" I thought I was a "patient" when I was dealing with a receptionist in my doctor's office. But no, to the acolytes of linguistic sterility, I'm a customer suffering through a disembodied electronic representation of my healthcare provider's helpperson at the medical center.

Been to the "money store" lately? Oh, you thought that was a bank? Or maybe your kid told you about the new books at his school "resource center" or "learning center?" (That's the library.)

Hearing the death rattle from the old clunker and thinking about a nearly new set of wheels? Well, just head down to the car store and one of the marketing representatives will be happy to show you through the previously owned inventory, and if you have a question about its functionality, one of the maintenance technicians in the diagnostic center will be happy to check it out for you.

Maybe in the digitized ecclesiastical universality of the World Wide Web we're all looking for the anonymity of samespeak; maybe it offers a little cover. But the beauty of language is its richness and precision. The androgynous Pat from the Saturday Night Live cast of a few years ago was a hoot, but — actor or actress? We didn't really want to know because not knowing "which" was the point. But if we *had* wanted to know, one or the other of those words would have told us.

Oh, well, I just hope these linguistic arbiters don't start calling the lab a technology development center, or a company, or a corporation, or a business. We're a *lab* (using the "we" collectively), and that makes us unique in the wider world, and isn't "unique" what diversity's all about?

* * *

Ever wonder just who beyond the lab campuses reads the *Lab News*? Well, Donna Bethell does. She's a physicist-lawyer-business executive and a member of the Sandia Corporation Board of Directors, and she weighed in recently on the matter of whether to capitalize the name of our planet.

"I enjoyed your item (What's what, December 13) about capitalizing Earth," she wrote. "You are so right. You asked about names for our sun and satellite. They are Sol and Luna, their Latin names." (Still remembers the physics training.)

But she hedged just a bit, writing that she'll "wait for a real astronomer to set me straight!" (That's the lawyer part!)

*— Howard Kercheval (844-7842, MS 0165, hckerch@sandia.gov)*


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LOCKHEED MARTIN


## Program seeks employees, retirees who suspect radiation exposure

Officials of the Energy Employees Occupational Illness Compensation Program will be available at a day-long session Jan. 30 to assist current and retired Sandia and DOE employees who have been exposed to radiation or toxic substances while working at a DOE weapons facility. It will be held from 9 a.m. to 4 p.m. at the Plumbers and Pipefitters Local Union 412 Union Hall, 510 San Pedro Dr. S.E. To make an appointment or for information call 1-866-272-3622.

## Reader Service information

The *Sandia Lab News* is distributed in-house to all Sandia employees and on-site contractors and mailed to all Sandia retirees. It is also mailed to individuals in industry, government, academia, nonprofit organizations, media, and private life who request it.

**Retirees (only):** To notify of changes in address, contact Carol Wade, Benefits Dept. 3341, at 505-845-9705, e-mail cawade@sandia.gov, or Mail Stop 1021, Sandia National Laboratorties, Albuquerque, NM 87185-1021.

**Others**: To receive the *Lab News* or to change the address (except retirees), contact Michelle Fleming, Media Relations and Communications Dept. 12640, at telephone 505-844-4902, e-mail meflemi@sandia.gov, or Mail Stop 0165, Sandia National Laboratories, Albuquerque, NM 87185-0165.

# Have a story to tell about Sandia? Well, here's your chance

## 'Your Thoughts, Please' provides avenue for storytelling

By Rod Geer

One of the more popular topics of business and communications how-to-do-it-better books emerging from major publishers these days is the value of poignant, invigorating storytelling — and often the first-person variety. One of the newer ones is *Triumph Of Narrative: Storytelling in the Age Of Mass Culture*. Another is simply *Story$Sells*.

There are even websites touting the virtues of old fashioned storytelling. Check out "Storytelling, The Passport to the 21st Century," at http://www.creatingthe21stcentury.org/Intro6-benefits-story.html.

In a way, these books and websites have followed best sellers that are storytelling at its best. There was commentator Andy Rooney's *My War* about his covering WWII as a reporter. There was *All Over but the Shouti*ng by *The New York Times* Pulitzer Prize winner Rick Bragg about his upbringing in dirt-poor sections of the Deep South.

In fact, over the years there's been some pretty fair storytelling at Sandia. For an example search out someone who still has a copy of "Recollections for Tomorrow," a booklet sent to all employees on the occasion of the Labs' 40th Anniversary in November of 1989. It was filled with first-person vignettes by Sandians talking proud about the Labs, its birth, and how it grew into a multifaceted world leader.

Now the web-based employee comment program "Your Thoughts, Please" is offering a new opportunity for Sandians to take a crack at storytelling. (Reach the "Your Thoughts, Please" page through The Newscenter found at http://www-irn.sandia.gov/newscenter/news-frames.html.)

*Some recent best-selling, compelling, and poignant books — Tom Brokaw's* The Greatest Generation *is an example — follow a simple formula of reporting stories told to the author about occurrences during past wars, during follow-ups to the 9/11 attacks, and the like. Sandians have many inspiring stories. Over the years they've been printed in the* Lab News *and other official publications. There have been retellings about how Sandia/California was founded, how Sandia gained its credibility as a world leader in design and manufacture of radiation-hardened microelectronics and supercomputing, how Sandians contributed in extremely short turnaround times to prosecuting the Gulf War in the early '90s, how Sandians have been credited for solving crimes or for making some space missions possible, and how Sandians have given hours of personal time toward contributing to their communities and to those less fortunate than they. What stories do you have that exemplify Sandia or Sandians delivering exceptional service or demonstrating action of "extreme importance and urgency," as President Truman wrote to describe his vision of Sandia in a May 13, 1949, letter? Stories about others you admire are fine, as are personal vignettes about your own Labs career highlights.*

## Recent Patents

Kenneth Peterson (14171) and Robert Watson (11500): Bi-level Multilayered Microelectronic Device Package with an Integral Window.

Tina Nenoff (6233), Steven Thoma (14172), Carol Ashley (1846), and Scott Reed (14192): Composite Zeolite Membranes.

David Melgaard, Gregory Shelmidine (both 1835), and Brian Damkroger (8210): Control of Electrode Depth in Electroslag Remelting.

Jesse Roberts (6822) and Richard Jepsen (9134): Adjustable Shear Stress Erosion and Transport Flume.

# Telemetry systems for flight test units become distributed in stockpile life extension project

By Nancy Garcia

The newest design that lead telemetry designer Rex Eastin (8232) is working on serves a dual purpose.

The instrumentation to monitor the W76-1 warhead in flight will not only be used as a joint test assembly in the stockpile life extension program, it will also provide information to weapons systems engineers for weapons development purposes.

The design is notable, he says, because it is one of the first to move toward a new concept of distributed sensor systems rather than placing all the telemetry instrumentation in a single package. The new approach obtains more information while consuming less space, which is at a premium.

Customers — both DOE and military — would like more high-fidelity information from the flight test units. In addition, the two physics laboratories, Los Alamos and Lawrence Livermore, drive requirements for increased fidelity of their nuclear explosive systems, making less volume available for test instrumentation within the flight test units.

For instance, electronic circuits to monitor performance of the arming, fuzing, and firing (AF&F) system are being embedded within the system itself. Dept. 2331 is responsible for designing the instrumentation assembly that will provide the AF&F diagnostic information to the telemetry for retransmission. Using one interface for digital information instead of the previous approach of individual channels and circuits has helped shrink the data acquisition components.

COMPACT — Rex Eastin examines the substantially reduced telemetry subassembly of the W76-1 joint test assembly, JTA1. It is less than two-thirds the size of its predecessor. (Photo by Bud Pelletier)

## Less than two square inches

The new W76-1 JTA1 will also include a distributed telemetry module. This module allows the gathering of accelerometer data using a digital interface. The module contains the signal-conditioning circuitry, analog-to-digital conversion, control logic, digital interface, and power-conditioning circuits. All of the electronics cover less than two square inches of board space.

The overall volume of the new telemetry assembly takes up less than two-thirds the volume of the most current telemetry package in the W76 Type 2F. In two instances, three printed wiring boards have been shrunk to just one; that occurred with both the terminal data analyzer and the integrated telemetry processor. The processor is not only smaller, it will record more than double the previous number of channels (250 instead of about 100).

The changes are spurred in part because of the natural progression of technology, Rex says. That is also a factor that drives the stockpile life extension program. Replacing aging components with better technology enhances weapon surety and in some cases is required because manufacturers have quit making parts that were formerly used.

The ground station communication recording system will move to a digital interface because analog recording heads are no longer being made. The recording tapes will also be more compact to store, an added advantage.

Compactness is attractive since the push to obtain more data from fewer flights constrains available space. In the W76-1, for instance, the initial requirement for a reduction in volume was to free some space that will be taken up by an inertial measurement unit (first, one built by Sandia, and later one designed by Honeywell for the Navy).

## Passing major in-house tests

The laboratory test unit in December passed major in-house testing of circuits and environmental conditions, such as vibration and heating/cooling. Still to come is assembly of a complete telemetry unit in the reentry body for ground test qualification this year. The ground test qualification unit will be subjected to a mechanical and shock environment that will simulate a complete flight from launch to reentry. After the mechanical environment testing is completed, the AF&F will be armed and fire detonators. Along with the warhead functions that will be monitored, the detonator fire-down test will subject the terminal data analyzer to electrical noise and explosive shock environments that it must operate through.

Sandia CaliforniaNews

The first development flight, FCET-32, of the new AF&F and telemetry will occur in late 2004. There will be two more additional development flights, FCET-34 and FCET-36, before production begins in 2007. Design work on the telemetry began in 2002. The design team consists of Rex; Brett Chavez (8233), development tester design and terminal data analyzer software; Pete Royval (8233), lead mechanical engineer; Matt Johnson (8235), terminal data analyzer design and telemetry system software, and Michael Newman (2132), W76-1 JTA1 lead system engineer.

# *Employee deaths*

**David Chin**, of Engineering Design Services Dept. 8224, died Jan. 5.

He was 47 years old.

David was a technologist and had been at Sandia since 1975.

He is survived by his wife Karen Chin, daughter Arianna Chin, and son Aaron Lee-Chin.

DAVID CHIN

**Vern Barr**, team leader of Electronic Prototype Lab Dept. 8225-1, died after a heart attack Jan 13.

He was 65 years old.

Vern was in general technical management and had been at Sandia since 1967.

He is survived by his wife Bonnie.

VERN BARR

# *Retiree deaths*

| | |
|---|---|
| Betty L. Mowery (age 77) | Sept. 17 |
| Orville F. Padilla (82) | Sept. 21 |
| Ralph W. Whitson (88) | Sept. 22 |
| Clarence H. Meyer (93) | Sept. 23 |
| Willie C. Montano (89) | Sept. 24 |
| Herbert J. Bowen (87) | Sept. 26 |
| James R. Rego (65) | Sept. 26 |
| John M. Wahlenmaier (92) | Sept. 27 |
| Connie L. Soto (69) | Sept. 28 |
| Carl J. Klecotka (85) | Sept. 30 |
| Sidney J. Thomas, Jr. (76) | Oct. 1 |
| Kermit F. Lindell (87) | Oct. 2 |
| Charles B. Taft (87) | Oct. 6 |
| William B. Minser (85) | Oct. 7 |
| James Doerner (74) | Oct. 15 |
| Eva J. Kerns (71) | Oct. 15 |
| Ernest J. Tavasci (83) | Oct. 16 |
| Manuel R. Chavez (87) | Oct. 16 |
| David J. Timmer (77) | Oct. 16 |
| John V. Otts (69) | Oct. 17 |
| Lloyd C. Sandgren (78) | Oct. 19 |
| James S. Clabaugh (62) | Oct. 23 |
| Ralph E. Fisher (85) | Oct. 23 |
| Anne E. French (86) | Oct. 27 |
| Donald E. Fitchhorn (79) | Oct. 28 |
| Emma D. Hollingsworth (80) | Oct. 28 |

# Career as commanding officer of nuclear subs gives Bill Norris special appreciation for weapons safety

By Chris Burroughs

Bill Norris, Level II Manager of Surveillance Group 2950, has a special appreciation for keeping the nation's nuclear weapons safe and secure. He spent a good portion of his life living in close proximity to them on nuclear submarines as a commanding officer in the US Navy.

Between 1972 and 1989 he served on five submarines, first as a lieutenant junior grade division officer, then as weapons officer, engineering officer, executive officer, and finally commanding officer. The longest period he spent submerged was 89 days in 1983 when he was captain of the USS *Memphis*.

"You grow a great appreciation for nuclear when your vessel is powered by it and you are surrounded by nuclear weapons," Bill says. "Safety becomes the most important thing you can think of."

He was a member of the "silent service" of the Cold War — so named because the nuclear submarines quietly scoured the Atlantic and Pacific oceans, gathering intelligence but never wanting to let their presence be known. That meant no contact with anyone unless it involved a threat to the US. A transmission could result in the submarine's position being compromised.

THE LONGEST PERIOD Bill Norris spent submerged was 89 days in 1983 when he was captain of the USS *Memphis*. He's one of the officers seen in this photo.

BETWEEN 1972 AND 1989 Bill Norris served on five submarines, first as a lieutenant junior grade division officer, then as weapons officer, engineering officer, executive officer, and finally commanding officer.
(Photo by Randy Montoya)

Bill, a native of the 11,000-resident Iowa town of Oskaloosa, obtained his undergraduate degree in mechanical engineering from the US Naval Academy and his MS in nuclear engineering from the University of Illinois. After a year of naval nuclear power training, he was assigned to his first submarine, the USS *Francis Scott Key*. It was 420 feet long, 32 feet in diameter, weighed 8,000 tons, and carried 144 men. In two years on the ship, he did four 60-day patrols.

That's four 60-day stints underwater with no contact with family. How did he endure those patrols and the others that followed?

"Your life goes into a fixed routine and you don't think about it too much," Bill says. "You go on a six-hour watch, you work six hours, and you sleep six hours. You miss them, but you concentrate on what you feel is a very important national mission."

Bill became commanding officer of his first submarine, the *Memphis*, in 1983. It was under that command that the submarine was submerged for a record 89 days, the longest mission of that type.

"When we came back to port we had two days of meat left," Bill says.

One of his proudest moments was when he and his crew were awarded an "above-average" grade for the post-overhaul exam of *Memphis*, something not achieved in the previous three years. The overhaul was the first of the 688 class completed on time and under budget. While the submarine was being overhauled — meaning that everything was removed and the submarine was modernized — the reactor was monitored by the crew the entire time.

After 1987 he went back on land, taking on increasingly more responsible positions with the Navy. He was assistant director of Submarine Officer Assignment based in Washington; commander of Squadron 3 in San Diego, where he had responsibility for nine nuclear submarines; and director of the Nuclear and Counter Proliferation Plans and Policies for the Joint Chiefs of Staff in Washington.

In 1994, when he knew he was ending his Navy career, he met several Sandians who were giving demonstrations around the nuclear weapons complex. He liked what he saw and asked if Sandia hired "old people."

Bill joined Sandia in 1995.

"I worked with the best in the Navy," he says. "Now I am working with the best in the country at Sandia."

# Surveillance

*(Continued from page 1)*

Laboratory (WETL) at the Pantex Plant near Amarillo where they receive more than 400 tests. This includes 80 principal tests where the weapons are first examined as a whole, followed by 320 supplemental tests where both other fuzing options are tested and some independent components are examined. Some of these tests are conducted at the coldest and hottest temperatures for which the system is designed to verify proper operation in those conditions.

Engineers in Albuquerque write procedures for Pantex and WETL technicians about how to dismantle the weapons, what measurements to take, and what observations to make. The technicians are also instructed in what to do with each part. In some cases, they totally destroy parts such as batteries and explosive components to see how they would have really operated.

## WETL replacement

In addition, at least three weapons from each weapons system, roughly 40 a year, are flight-tested with the military. The weapons — minus their nuclear payloads — are deployed as bombs to be released from aircraft or in warheads loaded on cruise or ballistic missile systems. Because the missile systems are destroyed on landing, Sandia engineers have little or no actual parts to study to see what, if anything went wrong. At this point, a team does a "forensic investigation," using whatever evidence they have gained from telemetry or visual test observations. (See "Telemetry systems for flight test units become distributed" on page 3.)

The 40-year-old WETL facility where weapons are tested now houses about $90 million in equipment and is the only US facility that conducts systems-level, non-nuclear tests on atomic weapons and parts. It was constructed when some of the early weapons were first built, and the building has become inadequate. Thanks to congressional project approval three years ago and follow-on appropriations, that is about to be altered. By late 2004 the 18 Sandians at the Pantex site will be working in a new $22 million state-of-the-art facility that will replace the old building. The construction contract should be awarded in early February and the groundbreaking ceremony will occur shortly thereafter.

Gone too will be the old test equipment that was built when the weapons were constructed, replaced by $24 million in new "testers" being designed and built by engineers in Test Equipment Design Dept. 2955 in Albuquerque. This work should be complete by 2009.

## Anomalies

If tests on a weapon system show an anomaly — a possible problem with a part that could jeopardize the system operation — with a Sandia-designed part, a Sandia system evaluation engineer (SEE) is notified. It is the SEE's job to determine if the anomaly could affect the surety (safe use) or reliability of the weapon. If the SEE makes that determination, he/she opens a "significant finding investigation (SFI)." As chair of the investigation the SEE brings in technical people who understand the weapon to figure out the source of the failure.

The responsibility of the investigation team is to determine the cause and impact of the defect and to make recommendations for corrective actions. This information is eventually turned over to the design groups in Centers 2100 or 8200, which make the decision on whether repairs are needed and how to go about making those repairs.

Bill notes that making those repairs is becoming more and more difficult as the systems age. "Spare parts" for the older systems dating back to the 1960s simply don't exist. Some old radars, for example, still use vacuum tubes. Replacement parts are less of a problem for the circa 1980 weapons because many extra parts were built and stored.

## Better databases

One of the other problems surveillance teams run into is poor documentation of some of the older weapons systems.

"In the old days you could generally turn to the actual engineer who designed the part or someone with personal knowledge about the weapon design," Bill says. "Many of these people kept the designs and their basis in personal notebooks. And as long as the engineer was around, you could talk to him and look at the original notebook. Now many of the designers of the early weapons are retired and the team has to go back to scratch and recreate."

He adds that many designs and test information have been stored in boxes in the Manzano Mountains for many years.

One whole surveillance department, Dept. 2954, is devoted to building up a database of testing results of the weapons. Department members are digitizing the old information and developing ways to retrieve data — even down to a single component.

"All these advancements are moving the surveillance program toward a predictive capability that will allow us to replace components in our aging stockpile before they affect reliability," Bill says.

# SnifferSTAR

*(Continued from page 1)*

small, lightweight, low power, and offers rapid analysis," says Doug. "Rapid analysis is currently not possible with any other package near this size."

Called SnifferSTAR, the invention consists of a series of tiny sensors on a platform about the size of a pat of butter, atop a microprocessor board smaller than a credit card. The forward motion of the vehicle forces air through the device.

Material in the sampled air is absorbed and concentrated. It is then thermally released (desorbed) to pass over thin stripes of coating materials, to which it temporarily sticks.

The coating stripes are located on a quartz surface that vibrates at pre-set frequencies when minute amounts of electricity pass through it. The mass of incoming stuck particles changes the frequencies of the vibrations of each stripe.

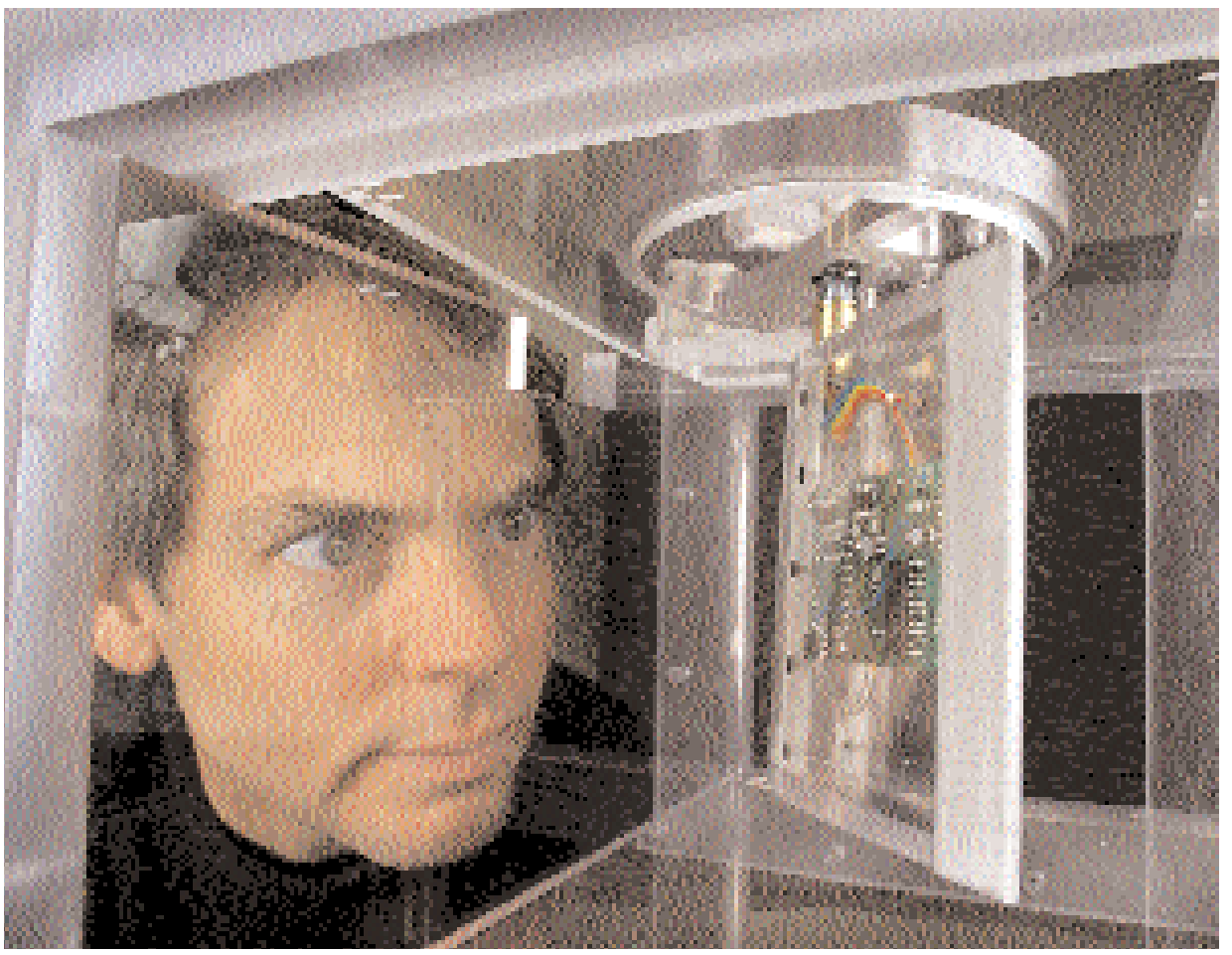
## Few false positives

The altered frequency data is passed to a processing unit on the SnifferStar module. The data is then relayed to a processor on the drone or radio-linked to a main data processor on the ground. The information is automatically compared against a library of the patterns created by a range of gases.

"We have very few false positives," says Doug. "The device ignores most common interferents."

The sampling process is repeated every 20 seconds, with 15 seconds intake and five seconds for analysis. The inrush of air then clears the device sensors for the next reading.

Immediate analysis is critical in warning an endangered population of an attack or in surveying sites after alleged incidents.



SPEAK TO ME — Doug Adkins observes the wind tunnel performance of components of SnifferSTAR, a device intended to fly on drones and immediately detect airborne blister agents and nerve gases.

(Photo by Randy Montoya)

Discussions are underway with a US company that produces drone aircraft to include the device among sensors designed to detect biological and radiological threats.

The device also has possibilities for use in or near the ventilation systems of buildings, or, with addition of a small pump, on posts surrounding military bases.

# Restructuring

*(Continued from page 1)*

Karen Boardman is the manager of the Sandia Site Office. She has been with DOE 19 years, most recently as deputy manager for programs and technical support at the former Albuquerque Operations Office (DOE/AL). Patty Wagner is her deputy. She most recently has been deputy manager for business and administration at the former DOE/AL.

The Sandia Site Office has several assistant managers responsible for key site office activities including Oversight & Assessment, Facilities & Project Management, Security, Business & Contract Management, Production and Quality Assurance, and Nuclear Facilities.

KAREN BOARDMAN

The operations office system will be eliminated. This means the Albuquerque Operations Office no longer exists by that name. It is replaced by an entity known as the NNSA Service Center, located in Albuquerque. The NNSA Service Center will provide support to all eight site offices, and Headquarters program offices, in such areas as procurement, human resources, and other business and technical support services, using the expertise and (in most cases) personnel of the former operations offices.

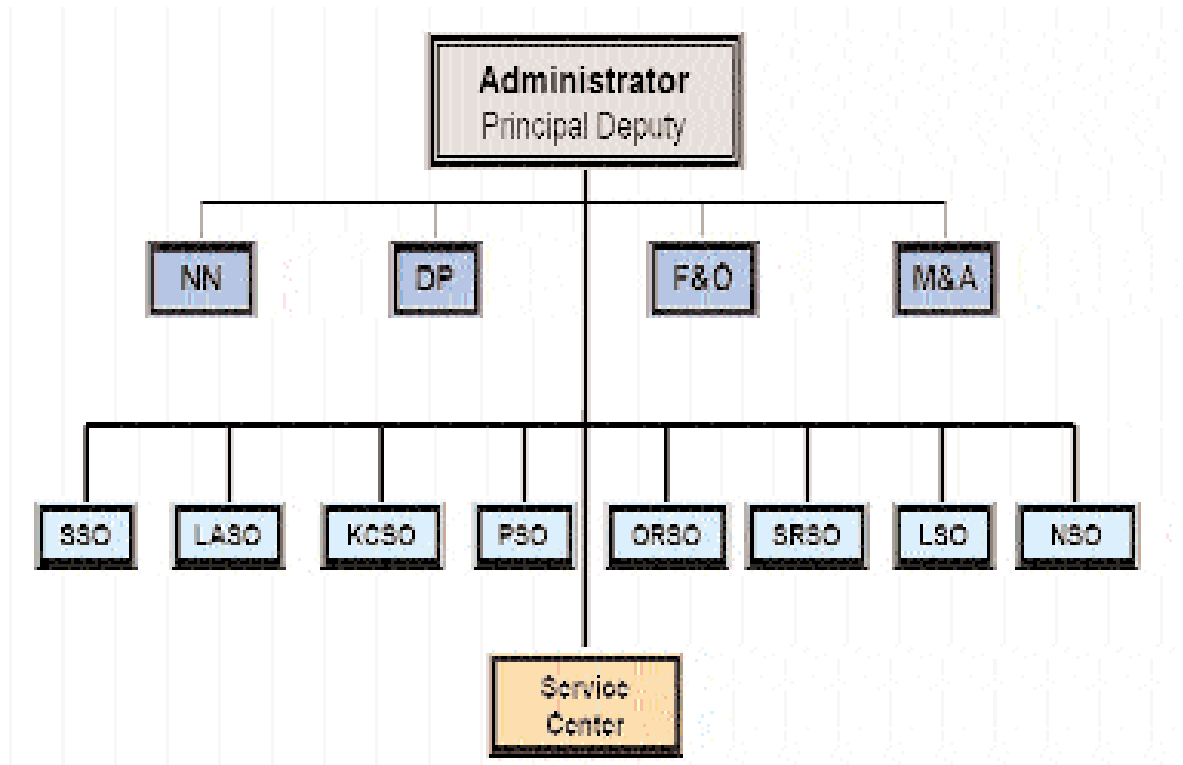
PATTY WAGNER

There will be some consolidation of personnel. That consolidation will be completed by the end of FY '04, after which the Oakland office will close and the Nevada office will be reduced in size and concentrate on management of the Nevada Test Site.

James Hirahara will head the NNSA Service Center, with the title Director. Ken Powers will serve as Principal Deputy. The Service Center will have four major components: Technical Services, Federal Services, Business Services, and Field Financial Management. Physical consolidation of the Service Center in Albuquerque is expected to be completed by Sept. 30, 2004.

"The decision to establish the NNSA Service Center in a single location [Albuquerque], to close the Oakland office, and to convert the Nevada office into a significantly smaller Site Office was intended to ensure NNSA achieves the necessary efficiencies and to preclude the need for another consolidation in the future," said Brooks in his message.

Overall, he said, NNSA has worked hard over the past year to make sure the reorganization is done right. One goal, he said, is "ensuring that the NNSA of the future will have a world-class business environment that eliminates duplication and micromanagement and provides more effective federal oversight." — *Ken Frazier*




THE NEW NNSA STRUCTURE — The Sandia Site Office (SSO) is one of eight NNSA site offices reporting directly to Washington. The others are at Los Alamos, Kansas City, Pantex, Oak Ridge (Y-12), Savannah River, Livermore, and Nevada. Operations Offices will be replaced by a single Service Center, in Albuquerque.

# Nominations sought for 10th annual Employee Recognition awards

"Here's your chance," says Executive VP Joan Woodard of the Employee Recognition awards (ERA) program, "to call special attention to Sandians who have gone the extra mile and whose work or contributions you believe have been exceptional. Last year, we had record participation with coworkers nominating 699 individuals and teams for their exceptional contributions." She wants to do it again. "To me, just being considered for this award is a great honor. I encourage you to take this opportunity to acknowledge a deserving individual or team."

## Deadline is Jan. 31

Nominations may be submitted through the web through Jan. 31. The ERA program commends superior results in four general categories. One is for teams. Three categories are for individuals — technical excellence, exceptional service, and leadership. If you would like to acknowledge an individual for exceptional people skills, the Leadership Category is where you can do this.

## It's easy to nominate

To nominate a person or team is an easy click away. Nomination forms with detailed instructions are available from the Web at Sandia's internal Web Homepage or at http://www-irn.sandia.gov/era/03era.htm. If you are unable to personally submit your nomination electronically, contact your Division ERA Coordinator who can direct you to someone who can help you. (See "2003 ERA Division coordinators," above right.)

The primary requirement of the nomination process is to describe the nominee's accomplishments in 250 words or less. You may add an optional one-page supplement for supporting evidence. Individual nominees must be current, regular, Sandia employees on roll since before December 2001. Team members may include non-regular employees and contractors.

Anyone may nominate individuals or teams. A separate nomination form must be submitted for each individual and team nomination.

The review process and final selections take place in each division. Divisions are allocated slots for awardees based on their division on-roll population as of December 2002. A combined total of 122 individuals and teams will receive corporate Employee Recognition Awards.

All nominees are recognized at division celebration events. Last year 2,891 individuals participated in division ERA recognition events. ERA individual winners and designated representatives from winning teams will be recognized at the Corporate Employee Recognition Night, Saturday, June 28.

## NOVA awards, too

From Sandia's 2003 ERA winners, Paul Robinson and Joan Woodard will select the two nominees who will represent Sandia in the Lockheed Martin NOVA awards program. This prestigious annual awards program honors 50 individuals and teams across the Lockheed Martin Corporation who have made outstanding contributions to Lockheed Martin Mission Success. NOVA awardees will attend a Lockheed Martin Corporate celebration in Washington, D.C.

## *2003 ERA Division coordinators*

| Organization | Name(s) | Phone |
|---|---|---|
| 1 & 2 | Linda Hicks | 844-1282 |
| 4000 | Helena Chavez | 844-2441 |
| | Cecilia Anderson | 844-8680 |
| 5000 | Lucy Ilgen | 845-8011 |
| 9000 | Dori Lerum Tooper | 844-4118 |
| | Jocelyn Abeyta | 845-1479 |
| 9000 | Aida Garcia | 284-5718 |
| 6000 | Rebecca Armijo/Jo Chambers | 844-5433 |
| 7000 | Julie Walker | 845-8567 |
| 8000 | Bonnie Green | 294-3163 |
| 9000 | Linda Hacs | 845-7612 |
| | Eva Wilcox | 844-6260 |
| 10000 | Doug Cox | 844-9041 |
| 11000 | Sheila Daley | 845-8110 |
| 12000 | Debbie Johnson | 844-3570 |
| 14000 | Joanne Bishop | 844-3088 |
| 15000 | Maxine Rossiter | 844-7842 |
| 16000 | Carrie Johnson | 844-8683 |

# FY02 fourth quarter report of Sandia's financial health

Here is the FY02 fourth quarter report of Sandia's financial health. Frank Figueroa, VP 10000 & CFO, and his folks in the Controller's Organization 10500 developed these charts to show Sandia's financial trend data. The charts are derived from the latest revenue, cost, and affordable FTE projections generated by the SBUs/SMU for Mission Council (July for the FY02 projections and October for the FY03 and out-year projections).

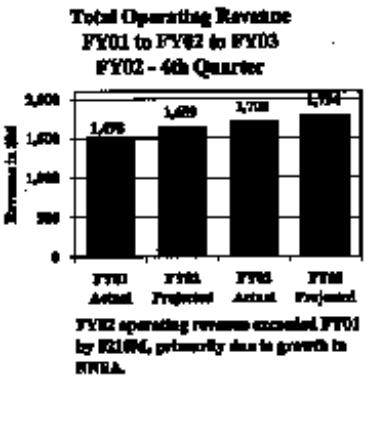
The first chart compares Sandia's total operating revenue for FY01 (actual), FY02 (projected & actual), and FY03 (projected). Our FY02 actual revenue of $1,708M exceeded the previous year's actual revenue by $210M, exceeded the last FY02 projection by $69M, and is projected to increase by $86M to $1,794M in FY03. This increase is primarily due to growth in the Nuclear Weapons SBU and in response to the war on terrorism.

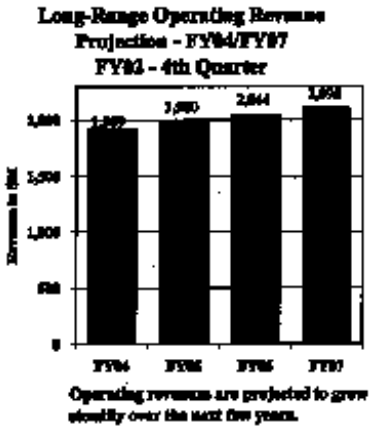
The second chart compares Sandia's long-range operating revenue projections from FY04 to FY07. Our revenues are projected to increase to $2,095M in FY07, primarily due to growth in the Nuclear Weapons SBU and in response to the war on terrorism.

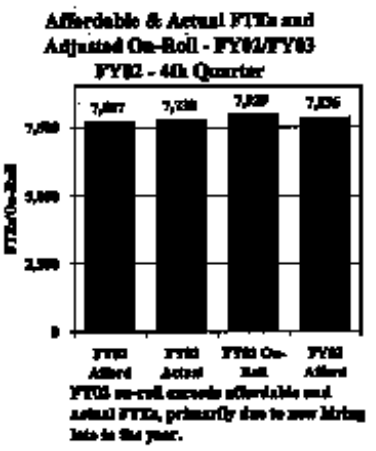
The third chart compares Sandia's FY02 affordable FTEs, actual FTEs, and adjusted on-roll count along with FY03 affordable FTEs. Our end-of-year on-roll count of 7,929 exceeded affordable and actual FTEs, primarily due to new hiring in the last half of the year, and, accounting for anticipated retirements, leaves us well-positioned to reach our FY03 affordable level of 7,836 FTEs.

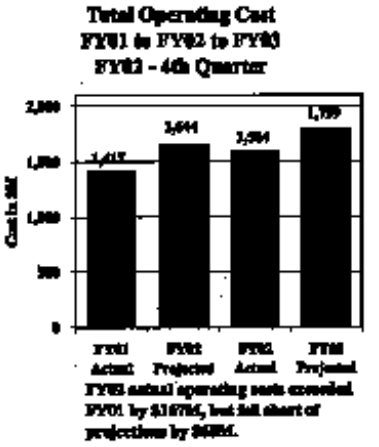
The fourth chart compares our total operating cost for FY01 (actual), FY02 (projected & actual), and FY03 (projected). Our FY02 cost of $1,584M exceeded FY01 by $167M, but fell short of projections by $60M, primarily due to new hiring occurring late in the year and concerns over the impact of continuing resolutions on our FY03 funding. We are projected to increase our total operating cost by $215M to $1,799M in FY03, primarily due to growth in the Nuclear Weapons SBU and in response to the war on terrorism.

These charts are updated and published each quarter. They are intended to keep you informed of the Labs' financial health.



# Sandia Classified Ads

## How to submit classified ads

**DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:**

- **E-MAIL: Michelle Fleming (classads@sandia. gov)**
- **FAX: 844-0645**
- **MAIL: MS 0165 (Dept. 12640)**
- **DELIVER: Bldg. 811 Lobby**
- **INTERNAL WEB: On Internal Web homepage, click on News Center, then on Lab News frame, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Michelle at 844-4902. Because of space constraints, ads will be printed on a first-come basis.**

### Ad rules

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

## MISCELLANEOUS

10-IN. CONTRACTOR SAW, Delta, 30-in. Unifence, mobile base, DADO insert, carbide blade, used little, $550. Stronach, 294-1013.

WEBER PERFORMER TOUCH & GO GRILL, charcoal, w/gas lighter, w/cover, chimney starter, immaculate, retail $460, asking $275 OBO. Lyon, 980-1889.

BASKETBALL, Jordan vs. Suns, in Phoenix, 3/21, seats together, $20 ea. or all 4 for $60. Pacheco, 304-4526.

BICYCLE CARRIER, 3-rail, Yakima brand, fits small cars, $50 OBO. Marchi, 291-9681.

PLAYSTATION 1, controller, memory card, Tomb Raider game, $65; student chair, blue upholstery, $15, both excellent condition. White, 294-5692.

CAMPER SHELL, white, screened windows, locks, carpet, bed, storage kit, Ford Super-Duty, new condition, $750. Mignardot, 797-8028, ask for Ed.

DOG TRAINING COLLAR, Igloo doghouse, inside sleeper bed, portable kennel, chain link dog run, all very cheap offers. Welch, 292-2706.

LANDSCAPING ROCK, medium-sized, gray "riverbed" type, free. Spear, 865-6335.

AQUARIUMS, 20-& 29-gal., w/custom-built stand, $150; 19-in. color TV, $50. Pasterczyk, 710-7939.

NORDICTRACK, like new, cost $650, asking $175; elliptical walker, cost $350, asking $250. Kranz, 822-0174.

UTILITY TRAILER, heavy-duty, 4 x 8 bed, 2-in. ball hitch, $500. White, 256-3095.

SOUTHWEST RAPID REWARDS, expires 11/15/03, drink coupons included, $300. Casias, 463-0069, ask for Adrian.

BUNK BED, twin top, bottom full-size futon, makes into couch, w/both mattresses, white, $150; recliner, $25. Luna, 872-0193.

SOUTHWEST AIRLINE VOUCHER, roundtrip, expires 3/5/03, $300; child's easel, chalkboard 1 side, whiteboard other, $30. Cocain, 281-2282.

CD PLAYER, Sony, 5-disc, instruction manual, remote, $75; Larson storm door, 36-in., glass & screen, $35. Naru, 821-7490.

ELECTRIC COIL-TOP RANGE, GE, beige, 5 yrs. old, $200. Sherman, 293-0186.

HOME GYM, California Muscle, spa quality, can e-mail pix, $400 firm. Hudson, 821-3968.

OAK ROCKER, antique, cane seat, $125; walnut desk, antique, beautiful, leather top, $425; futon, black, $50. Barr, 281-1858.

REFRIGERATOR, Kenmore, side-by-side, 6 yrs. old, $350; Ford F-250 alloy wheels, good condition, w/spare, $125. Charles, 275-2090.

STATIONARY RECUMBENT BIKE, 4 yrs. old, like new, paid $400; asking $200 OBO. Tardiff, 293-0462.

QUEEN BEDROOM SET, Henredon, $500; sectional sofa w/recliners, earthtones, $150; washer & dryer, $200 both. Romero, 286-6325.

MICROWAVE OVEN, rotating glass plate, large cavity, works great, $50. Mills, 823-4484.

TORO ELECTRIC LAWN EDGER/TRIMMER, 12-in., self-feed, excellent condition, $15. Vigil, 271-1328

TIMESHARE, Pagosa Springs, deeded, 2 units, not fixed week, flexible, 189K points, utilized throughout the US. Yawakie, 294-6855.

COMFORTER W/COVER, German goose down, 2, full-size, never used, $200 ea. Phelan, 869-6094.

SOUTHWEST AIRLINES TICKET, Rapid Reward, expires 5/25, w/drink coupons, $300. Young, 821-9852, ask for Mary.

REFRIGERATOR, GE, side-by-side, in-door ice dispenser, 8 yrs. old, white, 22-cu.-ft., excellent condition, $350. Dwyer, 271-0741.

DAY/TRUNDLE BED, wrought iron, $150; small oak table, w/4 chairs, $150; refrigerator, almond, water, icemaker, $300. Wells, 286-6325.

CUTTING TABLE, folding, for sewing or crafts, $50. Seager, 244-0097.

COMPUTER DESK, heavy laminate, casters, keyboard tray, CD rack, shelves, 31-1/2" x 19-1/2" x 55", $50 OBO. Tyler, 255-4849, ask for Jessica.

HOT TUB, 3 yrs. old, seats 7, 2 motors, excellent condition, $4,500. Seyl, 292-2397.

RANCH MINK COAT, size 8, excellent condition, $400; vertical blinds, beige, for patio door, $10. Simon, 299-8468.

SKIS, Saloman Xscream 700s, w/Saloman 600 bindings, used once, Nordica boots, $300 OBO takes all. Jensen, 892-8761.

ASHFORD SPINNING WHEEL, 1965 vintage, w/accessories, free starter lessons, $75. Dykhuizen, 281-6892.

ESTATE SALE: couch, $350; hutch, $250; china, $200; crystal, $100; platform rocker, $50; coffee & sofa tables, $125 ea.; console TV, $50. Frei, 281-2145.

HENCKELS KNIVES, 6 asst., sharpener, wood block, plus Solingen cleaver, lightly used, $100. Scheunemann, 898-5493.

COMPUTER, Pentium 233mmx, 96MG RAM, 3+ GB HD, USB ports, 56K modem, 17-in. monitor, $175. Mounho, 299-0883.

UPRIGHT PIANO, excellent condition, $700; roll-top desk $100 OBO. French, 899-3116.

YARD TOOLS: electric trimmer/edger, $25; 20-in. electric hedge trimmer, $25; 2.3 ci chainsaw, $50, all in working condition. Bonsack, 872-1102

CONDO, Fairfield Pagosa (Pagosa Springs), available 2/23-3/1, 2 self-contained sides, sleeps 8, $500. Danneels, 858-0479.

OAK DESK, light, 4' x 2', front drawer, no side drawers. Sprauer, 275-0092.

AVIAN COMPANIONS: sulfur-crested cockatoo, $1,500; Goffins cockatoo, $700; rose-breasted cockatoo, $2,000; yellow-collar mini-macaw, $500 OBO. Shamblin, 293-2568.

SOUTHWEST AIRLINES TICKETS: 1 valid through 6/1/03, $290; 1 valid through 12/4/03, $300. Lewis, 294-0766.

WASHER & DRYER, GE, matching set, white, older models, excellent condition, $250. Holmes, 839-8154.

KITCHEN DINETTE SET, $50 OBO; black vanity, w/gold trim, large mirror, $75. Poulter, 291-0607.

BUNK BED, black frame, w/ladder, twin-size top, full-size futon bottom, converts to couch, $100 OBO. Wolfe, 821-2684.

MONITOR, 19-in., ViewSonic Model A90, 0.27-dot pitch, max resolution 1600 x 1200, w/manual & software, $125. Pelletier, 884-3726.

BABY JOGGERS, double, $150; single, $100; microwave, $25. McKenna, 298-2467.

CHILD'S TWIN BED, w/headboard, footboard, light-colored wood, mattress in excellent condition, $150. Greear, 294-5339.

SLEEPER COUCH, 3/4 upright freezer, exercise bike, all older, good condition. Leach, 821-9124.

NINTENDO 64, 3 controllers, 2 rumble packs, 6 games, Tony Hawk 2, Super Smash Brothers, more, $100 OBO. Simon, 286-6492.

GAS STOVE, antique 1940's Wedgewood, 36-in., 4 burners, w/griddle, great shape, $450. Jones, 869-3150.

PRINTING, copying, binding equipment, plus lots, lots more, all at great prices. Corwell, 831-0601.

KITCHEN SINK, faucet & garbage disposal, great for second kitchen, garage, workshop, free. Ottesen, 292-7147.

POOL TABLE, Bristol, excellent condition, $1,000; Sundance spa, 3 yrs. old, beautiful, paid $5,000, asking $2,500. Girven, 899-8573.

WORKING MOTHER'S BREAST PUMP, complete w/all parts, cooler paks & carry case, $175. Martinez, 265-5920.

LOVEBIRDS, 2, 1 male yellow pied, 1 female sea green, w/cage, $150 OBO. Dobbs, 293-8338.

LADIES CLOTHING: career casual, dressy, reasonably priced, sizes 12-16, excellent condition. Ellis, 363-0952 or 296-0575.

SEWING MACHINE, antique Singer Treadle, in wood & steel stand, still sews. Barnard, 771-4620.

CANON 35MM SLR, EF 75-300 mm, 21-35mm lenses, separately or $375 total. Laird, 766-7696.

FURNITURE: girl's bed, w/box spring, bed, canopy, $350 OBO; love seat, $150. Moonka, 856-1110.

SOUTHWEST AIRLINE TICKET, 1 round trip, Rapid Rewards, anywhere Southwest flies, expires 4/4/03, $250 OBO. DiPrima, 275-3479.

VARIABLE RESISTANCE CLIMBER, Tunturi, programmable digital display, good condition, $25 OBO. DePriest, 922-4864.

CURIO CABINET, $250; wicker chair, $15; glass & brass coffee table, $30; bedroom set, $250. Lahusen, 792-0990.

SKI RACK, Barrecrafter rooftop, FITS 22-42 in. wide luggage rack, $50. Hickox, 299-0772.

BRIDAL VEIL, beautiful, brand new, never worn. Menke, 299-4266.

OAK FILE CABINET, antique, 4-drawer, new sides, $200. Filter, 823-1232.

SOUTHWEST AIRLINE TICKET, roundtrip, valid until 3/9/03, $250 OBO. Kimberly, 293-5835.

FUTON, wooden, queen-size, 10-in. mattress, green; sleeper sofa, queen-size, white/green, good condition, $250 ea. Graham, 896-2231.

SECTIONAL, white, like new, extra pillows, $500; 2 beige Lane recliners, $150 ea., small recliner, $75. Cooper, 888-0967.

EXERCISE BIKE, w/computer readout for time, distance, speed, etc., paid $200, asking $50. Young, 323-9961.

COUCH/LOVE SEAT, lighter colors, Southwest design, set contains 4 recliners & blanket storage. McDuffie, 292-0459 or 350-8008.

X-COUNTRY SKIS, 2 sets, 200/185cm, poles, 140/125cm, boots, M10/W8, used 3 times, moving, $100. Thompson, 323-0200.

SKI LIFT TICKET, Durango Mountain (Purgatory), good any day through 4/7, $25. Wong, 856-1050.

HOT TUB, FunSpa, 80" x 78" x 37", hard-top, ozonator, 110v/220v, wood exterior, tile decoration, $1,500. Sutherland, 345-1183.

COMPUTER, 1.4GHz, 30GB-HD, 256MB-RAM, 15-in. monitor, optional upgrade DVD/CDRW, $325; 10-in. 100-W subwoofer, $70. Noble, 856-0955.

TELESCOPE, 400 power, 60mm refractor, tripod, 3-power Barlow lens, 800mm focal length, new, $85. McCampbell, 797-1979.

SOUTHWEST AIRLINE TICKET, round trip, valid until 2/19/03, $300. Williams, 342-9222, ask for Michelle.

COUCH/LOVE SEAT COMBO, low-back, neutral Southwest colors, great condition, must see, only $300. Poitras, 293-4885.

OAK DRESSER/CHANGING TABLE, w/hutch, $350; washer & dryer, $300; coffee table, $25; garage door, 12x10, $300. Howard, 873-3038.

CAMBRIDGE AUDIO D300, black, 20-bit, w/1-m pair Vampire Wire CCC-II interconnects, excellent condition, $175. Davis, 268-0768.

TRUMPET, antique?, $30; bass clarinet, good condition, $700 all OBO. Johnson, 792-9432.

COMPUTER, 1.2 GHz, 512MB SDRAM, Geforce 420MX video, Audigy sound, w/Firewire, 45GM HD, 10/100 NIC, keyboard, $350 OBO. Yao, 797-3612.

FORMAL DINING TABLE, w/china cabinet, $300; 5-shelf wicker stand, $25. Harris, 821-3001.

WRITER'S DESK, w/bookcase, $75; child's backpack carrier, $50; crystal lamp, $45. Levan, 293-0079.

MANTEL CLOCK, full-chime, square, oak veneer case, doesn't work, free to any home. Hunter, 294-2877.

QUALITY TREADMILL, heart rate control, excellent condition, 10 mos. old, 5-yr. warranty, $2,000 new, asking, $1,300. Balsam, 350-3914.

MONITOR, 21-in. NEC E1100, Nov. 98 mfg., $150; HP-3c/HP-IicX SCSI scanners, $20/10; external SCSI Zip100, $25; cables available. Jarek, 821-2720.

QUEEN-SIZE BED, maple headboard & footboard, like new, $150 OBO; Baldwin Bravura organ, excellent condition, $175 OBO. Polito, 298-3859.

COUCHES, 2, sofa bed; 3-keyboard Lawry organ; dining table w/4 chairs. Gallegos, 797-8773.

21-IN. MONITOR, Viewsonic P815; 1800x1440@76Hz, 0.25mm dp, 250 MHz RAM DAC, INVAR Shadow Mask, $325 OBO. Sackinger, 281-5555.

DRUM SET, 4-pc., w/hi hat, crash, & ride, cymbals, good condition, $300. Kottenstette, 797-7496.

SKI PANTS, Obermeyer stretch pants, black, size 12, never worn, cost $199, best offer. Treml, 275-5477.

BRASS LAMPS, w/shades, $25 ea.; blue recliners, $50 ea.; sliding-glass dog door, large, $75. Foster, 292-5044.

## TRANSPORTATION

'87 FORD PICKUP, F-150, ext. cab, 4WD, 4-spd., BP, PS, AC, 112K miles, $3,750. Valerio, 884-5400.

'98 LEXUS GS300, gold premium package, 50K miles, excellent condition, below bluebook, $21,000. Hillhouse, 296-0642, ask for Adam.

'01 MAZDA MIATA LS, midnight blue, loaded, w/extras, maintained, immaculate, 6,700+ miles, call for details, must see, $18,000 OBO. Yip, 294-8124.

'92 ISUZU TROOPER, 4x4, 4-dr., AC, 170K miles, great condition, needs new transmission, $2,000. Pattengale, 764-2874.

'93 TOYOTA 4-RUNNER, new engine 8/2002, 4x4, V6, all power, ski rack, tow pkg., loaded, $9,000 OBO. Sanchez, 550-1001.

'99 TOYOTA 4-RUNNER SR5, 4WD, loaded, 5-spd., less than 30K miles, excellent condition, $20,000. Bonaparte, 296-4916.

'97 JEEP WRANGLER, Sahara, 6-cyl., AT, hard top, AC, AM/FM/CD, 48K miles, $12,900. Patrick, 271-9133, ask for JD.

'99 CADILLAC CATERRA, loaded, warranty, dealer serviced, black, leather, sunroof, new tires, 25K miles, $16,000 OBO. Lathon, 858-0706.

'90 CHEVY CONVERSION VAN, 3/4-ton, excellent mechanical condition, captain's chairs, TV/VCR, power, 167K miles, clean, $2,000. Cummins, 307-1390.

'97 SUBARU LEGACY L, sedan, 4-dr., AT, cruise, AWD, AC, great condition, burgundy, 68K miles, $9,500 OBO. Carmignani, 839-4203.

'85 HONDA PRELUDE, 1 owner, nonsmoker, 84K miles, looks good, runs well, reliable, $1,750. Horton, 883-7504.

'98 LINCOLN NAVIGATOR, fully loaded, leather, moon roof, 5-disc changer, tape player, excellent condition. Montoya, 710-5159, ask for Myra.

'97 DODGE INTREPID ES, runs but needs work, good family car, $1,000. Baca, 299-8691.

'83 EL CAMINO, 305 V8, 108K miles, real clean, $5,000 OBO. Adcock, 873-1821.

'90 FORD F-150, 351, AWD, XLT Lariat, AT, 92K miles, excellent condition, extras, all receipts, $5,500. Miller, 296-0095.

'98 LINCOLN NAVIGATOR, fully loaded, excellent condition, ready to sell, under book, $22,000. Serna, 899-2905.

'00 FORD EXPEDITION, Eddie Bauer, 1 owner, fully loaded, all service records, Jan. NADA Whls., $22,000. Martin, 869-1212.

'75 DATSUN 280Z, black, excellent body, mechanically sound. Valerio, 898-4744.

'02 NISSAN XTERRA SE, V6, 4WD, AC, security, towing, 5-disc CD, +more, 10K miles, $24,000. Manginell, 298-6188.

'70 CHEVY C-10 PICKUP, AT, PS, rebuilt 348 C.I.D., many extras, runs excellent, $5,000. Lopez, 836-1946.

'02 Z28 CAMARO LS-1, hard top, adult-owned, well maintained, 15K miles, $19,500 OBO. Hughes, 281-2854.

'99 CHEVY SILVERADO 1500 Z71, ext. cab, Vanworks conversion, blue, lots of extras, 64K miles, $16,500. Patton, 833-2941.

'91 NISSAN 300ZX, TwinTurbo, 5-spd., T-top, many mods., excellent condition, over 400-hp, $17,500. Sperli, 400-7303, http://hometown.aol.com/pbsperli/myhomepage/index.html

'97 FORD ESCORT LX SPORT, 4-dr., AT, AC, very clean, great gas mileage, 26K actual miles. Morrow, 281-5949.

'97 HONDA CRV, green, excellent condition, 1 owner, $9,500. Simon, 281-7888, ask for Kristen.

'98 TOYOTA TACOMA, 4x4, TRD, SR5, ext. cab, black, all power, CD, 64K miles, $14,900 OBO. Snedigar, 332-9238.

'96 FORD EXPLORER, 4-dr., 2WD, V6, 4-spd. w/OD, AC, PS, blue, 90K miles, $4,600. Youchison, 237-2391.

'00 MITSUBISHI ECLIPSE RS, white, new brakes & tires, alloy wheels, 58K miles, great condition, $12,000. Butler, 352-9027.

'01 DODGE RAM 3500 QUAD, AT, AC, CD, 4-dr., ext. cab, leather, power, bed liner, must see. Maldonado, 342-1276.

'80 DATSUN 280ZX, great parts car, never wrecked, T-top, wheels, sell whole or parts, $300 OBO. Trent, 899-1847.

'96 CHEVY S10, AT, AC, emerald green, New Mexico truck, garaged, 34K original miles, $5,800. Moss, 856-5268.

'91 CADILLAC DEVILLE, sedan, black, w/gold trim, 86K miles, $5,950; RZ67 professional camera system, $5,400. Luther, 822-1187, www.rluther.com/4sale

'87 HONDA ACCORD LXI, 4-dr., CD/stereo, good tires, clean, low mileage, $2,400 OBO. Lucero, 292-0356.

'93 CADILLAC SEVILLE STS, NorthStar, loaded, regularly maintained, 125K miles, $7,000. Terry, 294-2002.

'77 CHEVY IMPALA WAGON, in working condition, w/great AC, $500. Chen, 821-6242, ask for Kenneth.

'92 DODGE CARAVAN, new tires & brakes, ultra clean, well maintained, 192K miles, must see, $1,950. Tonnesen, 254-0390.

'94 ISUZU RODEO, 4WD, AT, 1 owner, excellent condition, 101K miles, $7,000. Dalton, 296-4947.

'84 ALPHA ROMEO SPIDER, cheap topless Italian fun, silver, runs well, but must go, make way for new Mercedes, $3,100. Collins, 883-2597.

'00 FORD RANGER, extended cab, 4x4, 3.0L V6, excellent condition, $12,950 OBO. Carpenter, 263-9565, ask for Mike.

'86 EL CAMINO, 305 V8, gray, well maintained, equipped, new air, good tires, shell, 107K miles, $4,850. Coy, 292-7320, leave message.

'99 FORD WINDSTAR, silver, 50K miles, rear AC, runs perfect, looks great, $13,000. Lujan, 822-0205.

'98 GMC JIMMY, 4WD, 6-cyl., 2nd owner, Kenwood radio/CD, new tires, red/gray, 67,700 miles, excellent condition, $13,100. Ortiz, 292-5589.

PONTIAC 6000, runs well, needs a little work, 122K miles, $500 OBO. Gutierrez, 869-3823.

'99 OLDSMOBILE ALERO GLS, PW, PL, PS, PB, AC, AM/FM/CD/cassette, gold, leather, garaged, extended warranty, 47K miles, $10,200 OBO. Goodson, 286-1267.

'95 DODGE INTREPID ES, FWD, AT, all power, leather, sun roof, trip computer, platinum/quartz, 107K miles, $3,500 OBO. Erwin, 379-3103.

'91 NISSAN 300 ZX, AT, pearl white, T-top, well maintained, excellent condition, 85K miles. Corbin, 296-4121.

## RECREATIONAL

ATVs: '02 Kawasaki Mojave, $4,100 OBO; '03 Kawasaki Bayou, $3,600 OBO; only 6 hrs. both. Rohl, 833-3697.

'03 HARLEY DAVIDSON XLH 1200 SPORTSTER, saddlebags, warranty, extras, 3K miles. Rodriguez, 994-8546.

PIPER CUB LOOKALIKE, RANS S-4 taildragger, Rotax 503DC, 2 wing tanks, 110 hrs. TT, licensed experimental. Woods, 299-6928.

RALEIGH 700 DIRT BIKE, medium, only 280 miles, plus excellent trainer, $600 both OBO. McDonald, 268-5005.

'03 HONDA 954RR SPORT BIKE, 200 miles, heated grips, 3-yr. maintenance plan, take over payments. Lovato, 980-1888.

## REAL ESTATE

2-BDR. HOME, 2 baths, 2-FRP, 2-car garage, large living, kitchen, den, small basement, yard patio, yellow brick, Ridgecrest area. Smith, 232-9838.

.31 ACRE, corner lot, Tierra Viva, north of Montano, east of Anderson Field. Krein, 897-2565.

4-BDR. HOME, 2-1/2 baths, great room, 2,700 sq.-ft., pool, hot tub, improvements, Juan Tabo/Commanche, 3804 Camino Sacramento, $209,000. Lujan, 299-2218.

3-BDR. HOME, 1-3/4 baths, fully landscaped front & back, 1,285 sq. ft., clean, Unser/Ouray, $104,000. Ramirez, 839-2676.

3-BDR. HOME, 1,300 sq. ft., parquet/carpet, near base, 200V work shed, gazebo, hot tub, large yards, FSBO. Davis, 294-2566.

2.2+ ACRES, Paa-Ko lot 287, 15 Tewa Ct., Entranosa water, utilities, views, near golf course. Merkle, 286-4986.

LOT, North Albuquerque Acres, beautiful view of mountains. Trujillo, 344-6084, after 5 p.m.

3-BDR. HOME, 1-3/4 baths, 2,000 sq. ft., Sandia High area, 7205 Ottawa Road, new updates. Foucher, 883-8638.

40 ACRES, East Mountains, subdivided into 10-acre tracts, off 217, east 1 mile on Gonzales Rd. Rowe, 259-5386, leave message.

4-BDR. HOME, 2 baths, 2-story, 2,716 sq. ft., great neighborhood. To, 797-1309.

3-BDR. HOME, 1-3/4 baths, 2-car garage, storage building, lovely backyard, excellent condition, $179,000. Bentz, 232-2558.

4-BDR. HOME, 1-3/4 baths, LR, DR, FR, FP, 2-car garage, 1,910 sq. ft., 2x6 construction, huge lot, Taylor Ranch, appraised $135,000. Lin, 821-6183.

## WANTED

MOTORCYCLE HELMET, Snell Sa-95 or SA2000, medium cheap for spare. Callahan, 298-6674.

TENNIS INSTRUCTOR, needed for beginner students, Lynnwood Park tennis courts. Sotelo, 298-0358.

METAL/WOOD CABINET, 2-dr., storage in garage, good condition. Rodriguez, 238-5198.

BABY/PETITE GRAND PIANO, good condition. Sorenson, 272-4546 or 298-1593, ask for Mary.

PIANO, preferably upright, good condition, reasonably price, or willing to take payments. Burgin, 299-6730.

GOOD HOME, 3-yr.-old male, golden lab, needs bigger place to run. Williams, 293-3994.

GOOD HOME, 2, 2-yr.-old tabby cats, orange, moving soon, can't keep. Encinias, 615-1202.

TENORS, The Enchanters SATB choral group, practice Tuesdays 7:30-9:30 p.m., perform twice monthly. Piscotty, 296-2518 or 299-6506, ask for Pat.

ROOMMATE, 3-bdr., enclosed backyard, 2-car garage, Ridgecrest, near UNM, Sandia-Kirtland area, $600/mo. + utilities. Mares, 220-6886.

STARTER DIRT BIKE, for teenager, 125cc or less, any condition considered, as rebuilding. Flores, 291-0512.

BABY FURNITURE. Beaver, 323-2748.

HOUSEMATE, MBR/suite, well-maintained home, near Albuquerque Academy, garage, high-speed Internet, $550/mo. Tyson, 252-1048, ask for Scott.

RETIREES, join us for monthly luncheon, w/Sandia Lunch Bunch. Brown, 884-8581.

## LOST & FOUND

FOUND: black umbrella, in Bldg. 801 before holiday break, claim in 701/1109. Treml, 284-4253.

LOST: pin/pendant, sun, gold/silver metal, white face, near parking lots NE of T-Bird Café, $25 reward. Chirigos, 845-8645.

FOUND: gold "J"-style hoop earring, pierced, w/filagree design. Turner, 845-0480.

LOST: December, in Medical, .5 carat diamond, surrounded by blue sapphires, white gold ring, $1,000 reward. Lacy, 845-0501.

## SHARE-A-RIDE

LIVE IN CORRALES AREA?, would like to carpool from 4th/Alameda to Research Park. Frames, 890-4943.

SANDIA NATIONAL LABORATORIES

# New sensors provide remarkable powers

*Three microsensors, which have the ability to collect, concentrate, and analyze a gaseous chemical sample weighing less than a single bacterium, fit inside a pea pod.*

**Sandia is a world leader in developing sensors that see, hear, and feel events and substances thousands of times more sensitive than humans can. Today, Sandia sensors:**

- **Monitor the health of weapons**
- **Protect facilities**
- **Monitor nonproliferation treaties**
- **Detect radiological, chemical, biological, and explosive agents.**

**These sensors—using everything from gravity to sound to advanced physics effects—are becoming part of our everyday life, from communications to medical care.**

*Sandia's hydrogen sensor can detect leaks in rocket engines and refineries as well as monitor expensive equipment for corrosion. The technology is a 1993 R&D 100 winner.*

*Sixth in a series of 10 posters on "Stockpile Stewardship: Strength Through Science" prepared by Public Relations & Communications Center 12600 (design by Mike Vittitow; photo by Randy Montoya) in cooperation with the Nuclear Weapons Strategic Business Unit. All 10 posters are on display in the Bldg. 800 corridor.*

NOTE: This poster was prepared prior to the 9/11 terrorist attacks on the US. Subsequently, Sandia sensor technology has found growing application in counterterrorism and homeland security.