

Computer Codes Predict Weld Quality, Improve Part Reliability

Development and control of welding has typically been done through trial-and-error experiments, with little in the way of scientific instrumentation or computer codes to help control the outcome.

But now, specialists in metallurgy, engineering, and computer sciences at Sandia, Livermore are designing computer codes that will greatly improve part manufacturability as well as the quality and reliability of welded components. Sandia is also cooperating with industry to transfer the technology to the private sector.

By modifying computer codes to predict temperature, fluid flow, and residual stresses in welded components, researchers are advancing the understanding of welding — the age-old process of applying heat to fuse one metallic part to another.

The information is as important to the manufacture of aircraft engines as it is to weapon components. Whether the weld is on a critical structural member in an aircraft engine or on a stainless-steel gas reservoir that holds tritium or deuterium in a weapon system, the weld must be strong, and the welded components must not fail prematurely.

Even though the welding process intrinsically produces discontinuities by melting and changing the properties of the surrounding material, engineers must often rely on welding for components subjected to high structural loads or that need to be leakproof. Component parts without joints are desirable, but rarely possible.

Codes Analyze Thermal History, Stress

The ultimate goals of the new computer models are to eliminate the need for costly trial-and-error experimentation and to successfully predict the distortion, thermal history, and residual stress distribution in a weld, explains metallurgist Kim Mahin (8312).

"In welding, I'm only melting a small region on a plate. Because of that, I get steep thermal gradients. This nonuniform temperature distribution introduces deformation and residual stresses. If I uniformly heated an unrestrained plate and then uniformly cooled it, I would have a minimal amount of stress left in the plate," she notes.

Computer and mathematical models of welding are complicated and difficult to develop because of the complex interaction between the arc (heat source) and the workpiece.

Ultimately, the numerical models, once they are verified, will be able to predict cooling rate, weld penetration, material distortion, residual stress distribution, and cracking for a particular component.

(Continued on Page Seven)



KIM MAHIN (8312, right) and Beth Fuchs (8342) prepare equipment for a welding experiment at Sandia, Livermore. The two are involved in the use of sensors to measure temperatures and displacements in real time during gas-tungsten-arc and gas-metal-arc welding.



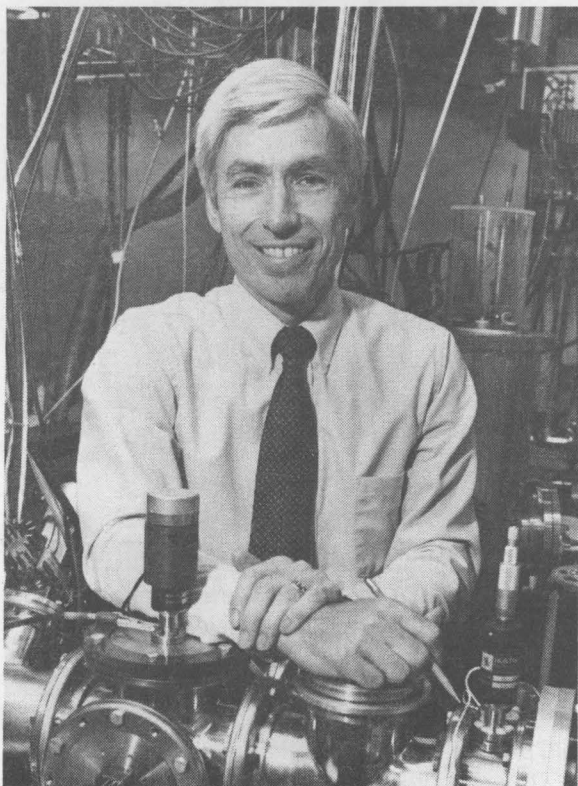
LAB NEWS

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SANDIA NATIONAL LABORATORIES

AUGUST 24, 1990

**Sandia and
The Future of
Nuclear Power —
Part 2 in a Series:
See Page 4**



TOM PICRAUX (1110) is Sandia's fourth Lawrence Award winner. He's being recognized for the development of ion channeling and related ion-beam techniques leading to new advances in materials science. The Lawrence Award is one of DOE's top awards for scientific achievement.

Tom Picraux Wins E. O. Lawrence Award

Tom Picraux, Manager of Surface, Interface, and Ion Beam Research Dept. 1110, has been selected to receive one of DOE's top awards for scientific achievement, the Ernest Orlando Lawrence Memorial Award. The award recognizes outstanding contributions in fields of science and engineering related to atomic energy.

Tom and five other US scientists will each receive a gold medal and a \$10,000 prize from Energy Secretary James Watkins at a ceremony at DOE headquarters in Washington in October.

Tom is Sandia's fourth recipient of the prize. Retired Executive VP Tom Cook won the award in 1971 for his studies of nuclear weapon effects. The mid-'80s saw two Sandia prize winners: Gordon Osbourn (1145) in 1985, for his work on the theory underlying strained-layer superlattices; and Gus Simmons (200) in 1986, for applying his advanced mathematics research to the command and control of nuclear weapons.

'An Exciting Surprise'

"This was really an exciting surprise," says Tom. "It's truly an honor to be able to bring the Lawrence Award to Sandia again. More important, it's a tribute to the really outstanding people at Sandia whom I've had the privilege of working with over the years. I'm deeply grateful to them all for making it possible."

Tom is being recognized in the materials research category "for the development of ion channeling and related ion beam techniques leading to new advances in materials science and new microscopic understanding of materials."

Since he joined Sandia in 1969, Tom has worked extensively on ion-beam analysis and modification. He developed both a theoretical description and systematic experimental understanding of a new ion-beam channeling behavior and applied this and related channeling techniques to the study of strained-layer superlattices and other artificially structured materials.

"Tom pioneered the development of detailed interstitial atom lattice location," notes Fred Vook (1100), "and he did the first detailed studies of hydrogen in solids. He's applied ion-channeling characterization and depth profiling to wide classes of disorder in materials, including dislocations and stacking faults in semiconductors, metals, and insulators.

"What's really significant about Tom's work is the development of a quantitative theoretical treatment for these processes. At Sandia, the applications are many — for example, in measuring the depth distribution of strain in strained-layer superlattices, determining the specific lattice location and stability of hydrogen in the near surfaces of

(Continued on Page Seven)

This & That

"Informal Friday" Follow-up - As I'm writing this, it's August 17 - "Informal Friday" - our experiment with Labs-wide casual dress for a day. Lots of Sandians observed the day, but many others chose not to go along. That's fine - the idea is simply to set aside a day that gives those who want to dress casually a common day to do so. We'll try to have some info in the next issue about possibly having more casual days.

* * *

Unfashionable Comment - I wore my "nondisruptive" jeans and a bright (OK, LOUD!) pullover shirt on Informal Friday. I thought I looked pretty darned spiffy until I walked into the Public Relations office and heard this comment from Will Keener (3163): "Hey, Perrine, nice shirt. Too bad they didn't have it in any men's colors."

My boss - even more confused than usual - wore his dressiest duds on "Informal Friday." He misunderstood and thought he was supposed to come "in formal" wear.

* * *

Sharp-Eyed Readers - Several Sandians pointed out that last issue's photo of Dan Hughes (7842) riding his bike across a city overpass depicted one rule violation and another safety problem. The rule violation: Bikes are supposed to be walked - not ridden - across overpasses. The safety problem: Dan wasn't wearing a helmet.

With the heavy emphasis today on proper ES&H procedures, we've heard similar comments recently about publishing workplace photos of Sandians who aren't wearing safety goggles or hard hats when they should be. We plead "a little bit guilty, but hear us out." We sometimes take a few liberties to get good photos - especially to show faces. You are such a fine-looking bunch of folks, and we hate to put your pictures in the LAB NEWS when your faces are covered with goggles, masks, helmets, etc. The way I see it, bank robbers caught by a hidden camera are about the only people who don't want their faces to show in a picture.

Our photogs have instructions not to put subjects or themselves in danger just to get a picture. If they are photographing a working scene where people need their safety goggles, for example, then that's how the picture will be taken.

* * *

Thanks, Phyllis - I tried to talk her out of it, but Assistant Editor Phyllis Wilson has decided to retire, and next week is her final one at Sandia. Phyl will also celebrate her 30-year Sandia anniversary next week just before leaving (she says she began work here at age 14!). We'll miss Phyllis for many reasons. For one, her "eagle eyes" have prevented lots of typographical errors in this paper. For another, because she has so many contacts and writes so many administrative stories for the LAB NEWS, Phyl just may know more about how Sandia works than anyone else at the Labs. If you've a mind to, give her a call on 4-7842 or drop by to say bye before next Friday. ●LP

Take Note

Joe Schofield (2622) was recently named a Certified Quality Analyst by the international Quality Assurance Institute. Candidates are required to satisfy two mandatory skills, the first in communications and the second in principles of quality, quality control, and quality assurance.

* * *

Dennis Mangan (5217) was elected Vice-Chairman of the Institute of Nuclear Materials Management at the recent annual INMM meeting in Los Angeles. The INMM focuses on safeguards, security, transportation, and storage of nuclear materials.

* * *

The New Mexico Chapter of the American Vacuum Society is offering two short courses in vacuum science and technology Sept. 24-28 at the Ramada Classic Hotel. "Basic Vacuum Technology" is a five-day course held Sept. 24-28. "Operation and Maintenance of Vacuum Pumping Systems" is a two-day course held Sept. 25-26. Course hours are 8:30 a.m. to 4:30 p.m. Registration deadline is Sept. 17. For registration information, contact C. K. Blair on 298-7101.

* * *

Professional Secretaries International, Albuquerque Chapter, meets monthly at the Holiday Inn Midtown (2020 Menaul NE). All secretaries are invited - new or experienced, male or female, and you don't have to be a Certified Professional Secretary. The next meeting is Tuesday, Sept. 11, and includes a social gathering, dinner, guest speaker, and business meeting. If you prefer, you can skip the dinner and attend only the speaker and business portions of the meeting. Dinner is \$9.50, and reservations must be made in advance. Deadline is 9 a.m. Monday, Sept. 10. Call Gloria Martin on 881-3050 or 275-1077 to make reservations.

* * *

The Alliance Française is offering French conversation classes for the fall session beginning the week of Sept. 17. For more information, contact Therese Mueller on 842-4266 or 345-1972.

Sandians Recognized by DOE For Contributions to Quality Initiative

During an award ceremony at the Library Mall last week, Nick Dienes, Director of DOE/AL's Weapons Quality Division, presented certificates

of recognition to 25 Sandians for their contributions to the Labs' quality initiative.

DOE, as part of its effort to continue a strong quality program throughout the weapon complex, began the awards program about a year ago. Managers throughout the complex were asked to nominate deserving employees for achievements in process quality management and improvement through team or individual work efforts.

Sandians recognized for improvements in the areas of cost, schedule, and performance of processes and products were Carl Peterson (1550), Vance Behr, Donald Johnson (DMTS), Donald McBride, Kenneth Ronquillo, Donald Wayne, Larry Whinery (all 1552), Marie-Elena Kidd (2337), George Steigerwald (2341), Michael Murphy (2362), David Begeal, Reuben Weinmaster (both 2512), Steven Barnhart (2513), Raymond Berg (2534), Jose Lopez, Robert Yuhas (both 2833), Michael Orrell (5132), Cliff Harris (5141), John Souza (5154), James Kannolt (DMTS, 7265), Paul Longmire (7310), Karl Ricker (7321), Patrick Walter (7526), Carl Pretzel (8154), and John Didlake (8163). ●

A Real Appetite-Whetter

Many airlines serve the captain or the co-pilot different meals from everyone else to reduce the chance of the entire crew getting sick from food poisoning. The Federal Aviation Administration says it doesn't require this, but considers it "good policy."

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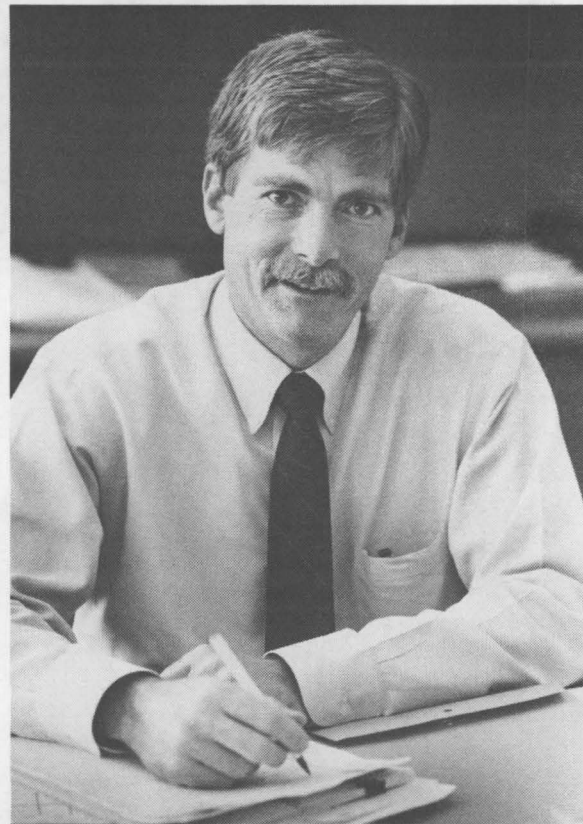
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ATTORNEY JOE LAWHON, new member of Legal Dept. 4010, joins Sandia after five years with AT&T Federal Systems in Washington, D.C. His legal experience includes contract negotiations, contract administration, claims, litigation management, and bid protests in the federal arena. Joe received his JD from Emory University and is a member of the District of Columbia Bar and the Georgia Bar. He enjoys golf and history and is a student pilot. He has two children and lives in NE Albuquerque. (Editor's Note: Among Joe's many Sandia duties will be reviewing the LAB NEWS copy before each issue. We hope he likes his picture.)

Summer Hires Take Livermore Experience Back to the Classroom

Summertime, and the livin' was challenging for the 26 undergraduate and graduate students, plus a few faculty members, employed at Sandia, Livermore under six different summer programs.

Says program coordinator Jim Argyle (8522), "Our program provides summer hires with meaningful — often highly challenging — job assignments that can put their training and talents to a real test.

"Their experience may also interest them in a Sandia career. So these positions not only help students finance their education, but also help us identify people who might match our needs in the future."

Finding Summer Hires on Campus

Jim works with Sandia's line organizations to determine their needs for summer workers and encourages recruiters to look for potential summer hires when recruiters visit campuses. He also handles inquiries from students all through the year about summer employment opportunities. Once employment is offered, Carolyn Townes (also 8522) works with summer employees on housing needs and provides an orientation on Sandia policies and practices. "Since most summer employees don't have security clearances, we also offer a series of tours to acquaint them with work areas they normally don't see," Jim says.

Programs for summer hires include:

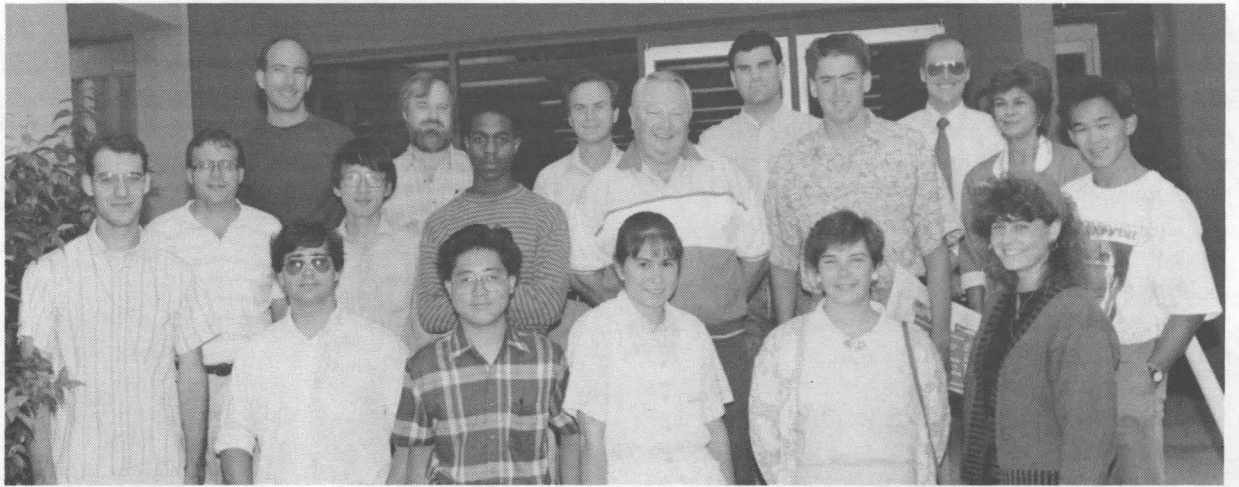
- *Outstanding Student Summer Program* — exposes outstanding undergraduate and graduate students to professional work at Sandia. Students in engineering or science fields are selected nationwide for this program.

- *Historically Black Colleges and Universities (HBCU)* — provides employment for students and faculty of black colleges and universities nationwide. Minority students in engineering and science work closely with Sandia staff on laboratory experiments and projects.

- *University Summer Faculty* — employs university faculty with capabilities to make meaningful contributions to Sandia's technical missions. Selected faculty typically are recognized authorities or have unique qualifications in a technical field.

- *Las Positas College Scientific Honors Program* — provides employment to local science and engineering students who may be financially disadvantaged to help fund their science and engineering studies at four-year institutions.

- *Teacher Research Associate Program* — involves secondary-school science and math teachers who are selected nationally and sent to various DOE facilities. Teachers work alongside sci-



SUMMER HIRES gathered recently for a tour of Sandia, Livermore. Front row (from left): Joe Koning, David Frye, Ken Chew, Liesl Little, Patricia Heid, and Elizabeth Swayne. Second row: David McDowall, Samuel Wang, Lucien Johnson, Larry Moye, Eric Harwood, Carolyn Townes (8522), and Wilson Ng. Third row: George Kaschner, Joseph Stieve, Gary Miller, Scott Dossa, and summer hire program coordinator Jim Argyle (8522).

entists and engineers in applying knowledge from their educational classroom experience.

- *Associated Western Universities (AWU)* — promotes cooperation and interaction between DOE facilities and university students and faculty. The goal is to provide staffing for energy research, to strengthen university curricula in technology and science, and to infuse DOE facilities with ideas and expertise. Included under the AWU umbrella are a postgraduate research program, graduate fellowship program, faculty participation program, and sabbatical leave program.

Traveling the farthest for summer work was Larry Moye (Teacher Research Associate Program), a high-school math and computer science teacher in Alaska. He had been teaching in Soldotna on the Kenai Peninsula, but for this school year transferred farther north to Barrow. Larry said his Sandia experience will help him prepare outstanding students for careers at places like Sandia.

Lucien Johnson (HBCU program) worked with Reggie Mitchell (DMTS, 8361) on coal char combustion research, collecting data for Reggie's experiments. Lucien attends Howard University, where he is a junior majoring in mechanical engineering. "Sandia has excellent equipment with which to conduct experiments, and I've learned a lot from Reggie," Lucien said. The North Carolina native plans to continue his studies in graduate school and pursue a career in robotics.

Eric Harwood, a Las Positas College scientific honors program student from Livermore, assisted Larry Baxter (8361) with coal combustion experiments that predict the kind of deposits left

by various coals in industrial-size boilers. "I learned so much — working with computers, lasers, oscilloscopes, and even the large, multi-fuel combustor," Eric said. He plans to transfer to UC Davis in January to major in chemistry or chemical engineering.

'Absolutely Incredible'

Liesl Little from Ohio State worked at Sandia under the Outstanding Student Summer Program. Her assignment is in computer programming with Gary Richter (8172). "The people I worked with were absolutely incredible — friendly, and very concerned that what I did was relevant for me," she said. A senior this fall, Liesl is majoring in electrical engineering.

Scott Dossa studied nitrogen radicals with Joe Durant (8353) and the part they play in producing acid rain. Says Scott, an elementary-school science teacher in Livermore who will also teach a junior-high class this fall, "My work this summer showed me exactly what it's like to set up an experiment; sometimes things go wrong, but you learn to start all over again." The experience, he says, gave him a better understanding of what goes on at the Labs, and he'll share that with teachers and students in the local district. ●BLS



**SANDIA
LIVERMORE NEWS**



ADDRESSING A GROUP of elementary and junior-high teachers during a week-long science seminar was Reggie Mitchell (DMTS, 8361). Sandians helped coordinate and teach one section of the summer educational program for teachers, which was sponsored by the LLNL Science Education Center and funded by a National Science Foundation grant. Other Sandia participants were Marvin Kelley (8442), Judy Tejada (8284), Jay Keller (8364), and Dennis Nelson (8133).



SANDIA, LIVERMORE'S physician, John Rhodenbaugh, retired recently after eight years at the Labs. Among those at the retirement party were (from left) retired Sandia Executive VP Tom Cook, Paul Brewer (8500), Dr. Rhodenbaugh, VP John Crawford (8000), and retired Sandia Livermore VP Dick Claassen. Also retiring this month is Dr. Mike Pfefer after five years as part-time physician at Sandia, Livermore.

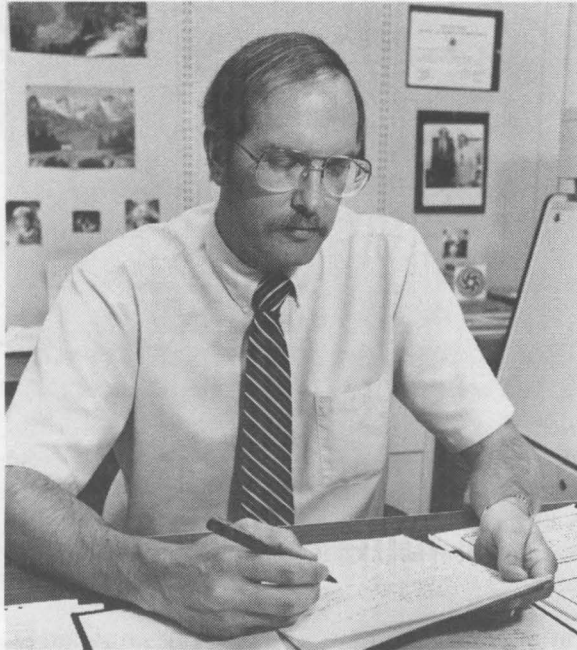
\$170 Billion at Stake**Evaluation Process Tackles License-Renewal Procedures for Nuclear Power Plants**

(Editor's Note: This is the second in a series of articles about nuclear power and related work by Sandia on nuclear plant safety, aging-management, and plant life improvement and approval procedures.)

In the year 2000, the operating license for the Yankee Rowe nuclear power plant in Massachusetts will expire. The event will mark the beginning of a wave of license expirations as the nation's nuclear power plants age.

A large number of the plants were built in the 1960s and 1970s, meaning their 40-year licenses — granted by the Nuclear Regulatory Commission (NRC) — will expire soon after the turn of the century. If the trend continues uninterrupted, the nation's inventory of nuclear plants would be depleted by four or five a year. Since nuclear power represents 20 percent of US generating capacity, the result could seriously affect utilities' ability to cope with energy demands.

In an attempt to avert such a situation, Sandia, on behalf of DOE, has taken a lead technical role in efforts to extend the useful lifetimes of the nation's 108 operating nuclear reactors. As part of that effort, David Carlson — now on assignment in Special Projects 6001 — has developed a way to



DAVID CARLSON (6001) developed a way to evaluate nuclear power plants' ability to operate safely for 10 to 20 years beyond their original 40-year licenses.

safety features, such as the reactor pressure vessel, major piping systems, and emergency core cooling systems, are identified for closer scrutiny.

"We believe the plant should be examined — through a systematic process — to determine the pieces of the plant that require closer evaluation," Dave says.

In the second stage, individual components important to the system's safety function are identified. Maintenance and inspection programs for the components are reviewed for thoroughness and adequacy, and an assessment of the potential for future age-related degradation is made. If potential shortcomings are noted, changes may be made to maintenance procedures, or the component may be replaced. (If certain nonreplaceable structures —

the reactor vessel, containment building, or building foundation, for example — have shortcomings, the utility would probably not seek license renewal.) Each step in the process is documented and subject to review by industry regulators.

Benefits of License Renewal

Upon completion of the evaluation, a decision will be made as to whether license renewal is feasible and for how long. Dave believes the life-exten-

Assuming a life extension of 10 years, the nation's existing plants could supply an additional 700 gigawatt-years of capacity.

sion period will probably fall somewhere between 10 and 20 years. The length most likely will be dictated by the plant's condition and economic considerations. Even a five-year license extension would be economically advantageous for both utility companies and consumers, he says.

Assuming a life extension of 10 years, the nation's existing plants could supply an additional 700 gigawatt-years of capacity — more than double the entire national electrical consumption in 1987, Dave says. The additional power could be obtained at a \$170 billion savings over the cost of replacement units.

"That amounts to a savings of almost \$165 annually for each US family for 10 years," Dave notes.

The approach is endorsed by the Nuclear Management and Resources Council, the industry association for US nuclear utilities. The methodology has been used as a starting point for negotiations between the industry and the NRC on regulatory policy.

In the meantime, officials at Yankee Rowe and at Monticello in Minnesota are using the evaluation process to inspect their plants and to prepare license-renewal applications for the NRC. While the first license doesn't expire until 2000, Dave says it's important to begin the process now in the event that license renewal cannot be achieved. Since average construction time for a nuclear power plant has recently been about 12 years, utility companies need enough time to decide whether a new plant is a better alternative.

"That's why there's some urgency in the license-renewal process," Dave concludes.

●JClausen(3161)

A large number of the plants were built in the 1960s and 1970s, meaning their 40-year licenses will expire soon after the turn of the century.

evaluate nuclear power plants' ability to operate safely for 10 to 20 years beyond their original 40-year licenses.

The methodology is being used by the industry and the NRC to shape regulations that will guide the license-renewal process. With Dave's reassignment, Larry Bustard (6471) now oversees Sandia's role in this effort.

Checking Safety One Step at a Time

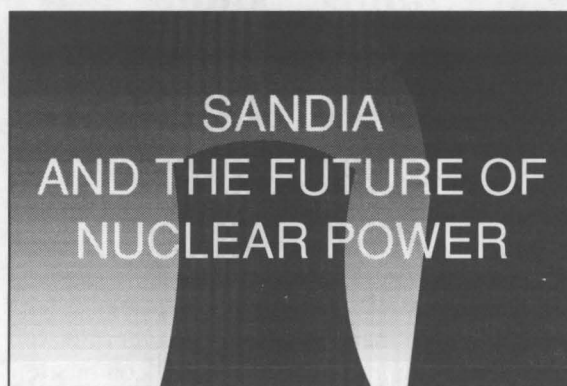
Nuclear power plants consist of thousands of vital components working in concert to produce electricity. Some of the components are very large, with some embedded in concrete and others not readily removable from the containment building. Others, such as valves and switches, are small but more prone to failure.

Radiation and time exert their effects on components in varying ways and degrees, all of which must be taken into account when considering license renewal, Dave says. In the methodology he developed when he supervised the Advanced Nuclear Power Technology Division, even a plant's administrative practices would be subject to review.

It might seem like an overwhelming task, but Dave's methodology breaks it down into manageable pieces. The process could be described graphically as an inverted pyramid, with systems and structures that affect plant safety included at the top. As incidental equipment is eliminated from further reviews, the pyramidal process gets narrower and more focused.

Crucial Components Get Closest Scrutiny

A key precept of the process is realizing that some equipment contributes to safety more than other equipment does. The evaluation focuses on systems, structures, and components that are vital for safe plant operation, that are subject to potentially significant age-related degradation, and that are not currently included in effective replacement, refurbishment, or inspection programs. Critical

**Fun & Games**

Bicycling — The Chamber Orchestra of Albuquerque is sponsoring the fifth annual Turquoise Trail Bicycle Tour on Sunday, Sept. 16. This family-oriented, 75-mile bicycle tour starts in Albuquerque, with the turnaround point just south of Madrid. The registration fee of \$15 includes a T-shirt if registration is made by Aug. 31. All proceeds benefit the COA's artistic and educational programs. For entry forms, call 881-0844.

Tennis — A tennis tournament jointly sponsored by the Coronado Tennis Club and Sandia Tennis Association will be held Sept. 7-9 at the Coronado Tennis Club Courts. Events include mens/womens singles, mens/womens doubles, and mixed doubles (attempts will be made to split levels if enough entries are received). CTC members, previous STA members, and guests are eligible. Volunteers are needed. Call the SERP office on 4-8486 for entry forms and to volunteer.

More Tennis — The Coronado Club's Men's 3.0 USTA Tennis Team recently won the Albuquerque City Championship with a 9-1 record. In mid-August, the team traveled to Phoenix, where they braved 110° temperatures and placed second in the Southwest Regional Tournament behind Phoenix and ahead of all El Paso and Tucson teams. Team members include Mason Blach (155), Jerry Cap (1522), Fred Cericola (DMTS, 7542), Phil Dreike (1264), Barry Hansen (6224), Mark Howard (2853), Dave Smallwood (7544), Jim Volkman (ret.), team captain Steve Wagner (2815), John Wolfe (9235), and Jim Wilson (KAFB).

Ice Hockey — Ice hockey league teams for players at least 30 years old are now forming for the season starting Sept. 9. Players of all skill levels are invited to join. Cost is \$8 a week. For information, call Dave Cady on 275-8382 or Rich Olson on 299-1628.

Relief for Tight Budgets**Property Reapplication Specializes in Reusables**

Need another piece of office furniture? How about a typewriter, computer, or oscilloscope?

Before spending scarce funds, it might be a good idea to check with the folks in Property Reapplication Div. 3414.

Previously known as Reclamation, Property Reapplication has undergone some significant changes. The division has opened a new 10-acre salvage yard and warehouse, Bldg. 996, next to Wyoming Blvd. on the road to Tech Area II. (The old warehouse south of Bldg. 870 will be removed.) Weather-sensitive items, such as computers, monitors, electronic instruments, and typewriters, are inspected and stored in the west end of Bldg. 957; all other property and material is held at the new facility.

"We do a lot more than reclaim the salvage or scrap value of discarded material," says Keith Chavez, Supervisor of Operations Sec. 3414-1. "Our main mission is to help Sandia organizations get items they need for their jobs. We're seeing property go full circle — if it's no longer needed by an organization, it's sent here and then goes to another organization that can make good use of it."

As discarded material arrives at the 10-acre facility south of Tech Area I, it's checked first for hazards, then unloaded and sorted into categories, such as office furniture or electronic hardware.

Keith encourages Sandians to check his stock before putting in an order for a new item. There's a good chance, for instance, of finding a desk, chair, or even a personal computer in excellent condition. And the items don't cost anything, except the time spent screening the items and completing the documentation.

That means that, faced with limited or uncertain budgets, Property Reapplication provides a way for an organization to conserve resources. The people at the yard will even help fill out the paperwork to assign the item and arrange for its transportation. Says Keith, "Our goal is to provide quality customer service."

Quick Turnover

"Another big improvement," says Keith, "is that, after being made available to DOE and other federal agencies, nothing remains in the yard for more than a few weeks." That short stay is a consequence of the new operating method. Sandians can come in anytime — all they need to do is identify themselves at the building at the east end of the yard and sign a visitors' log — to look for what they need. In addition, "screeners" from public schools and from federal, state, and local govern-



RECYCLED GOODS — Keith Chavez, Leigh Saunders, and Keith Reimholz (from left, all 3414-1) check the condition of computers, test apparatus, machinery, and other items available for recycling to other Sandians.

ments are permitted to visit twice a month, to look for items that match their needs and can be donated, notes Dan Poole, Supervisor of Property Reapplication Division.

"Our main mission is to help Sandia organizations get items they need for their jobs."

Whatever remains is sold at a monthly public auction. The first one was held last November; auctions are currently held at 9 a.m. on the second Saturday of each month at 1001 Prosperity SE in Albuquerque. The next one is Sept. 8. All auction proceeds go into the Sandia general fund.

Keith says that some auction customers represent companies — buying scrap metal for resale, for instance — but individuals are also welcome to attend to bid on items for personal use, such as typewriters and computer stands.

Please, No Hazards

Keith and Dan have just one word of caution for those who use the facility. To keep the new op-

eration working well — and thus help conserve Sandia budgets — the facility has to remain safe for workers and customers. It's not a place for discarding hazardous materials. The current form for requesting delivery of items to Property Reapplication includes information on whom to contact for help with items known (or suspected) to contain chemicals, radiation emitters, explosives, or other hazardous materials. (Up-to-date "Delivery of Nonhazardous Items to Property Reapplication" forms are available through Just-In-Time.)

"We have 12 or 13 people working here daily," says Keith, "plus 100 to 200 screeners twice a month, and other Sandia customers daily. If we were to let the facility become contaminated, we would be defeating its purpose. We're prepared to handle anything that slips through, but it's important that people sending material here do their part not to send hazardous material." ●CS

For more information about excess property/material disposal paths and reapplication procedures, Sandians can call Keith Chavez (4-7785), Carolyn Lucero (Supervisor of Property Reapplication Administrative Sec. 3414-2, on 4-2342), or Dan Poole (3414 Supervisor, on 4-3260).

Take Note

They're rounding up "Nodaks" in Albuquerque. No, they won't be corralled, but are invited to attend the first North Dakota Roundup on Sunday, Sept. 23, at Jeanne Bellemah Park (on Tomasita NE between Constitution and Lomas) from 1 to 5 p.m. The roundup includes music, contests, prizes, and N.D. trivia. Cost is \$3/person or \$5/family. Bring a picnic lunch and beverages for your family. Reservations required. If you have North Dakota roots, call Nels (7222) or Betty Magnuson on 821-5330 for information.

A women's barbershop chorus is forming in the east mountain area. Meetings will be on Thursdays at 7 p.m. at Roosevelt Middle School in Tijeras. The only requirements to join are an interest in singing barbershop-style and having an enjoyable time. All levels of singing experience (from none to advanced) are welcome. If you are interested in joining or would like more information, call Bill or Barb Giesler on 281-2906.



REUNION OF FORMER APPRENTICES: Sandians Tino Casaus (2512), David Staley (7471), Larry Kovacic (7476), John Lanoue (2514), and William Morgan (7413) got together for their 15-year Sandia anniversary at the Labs' main sign. Six of the original eight employees in their Materials Apprentice Program are still working at Sandia. Their apprentice class was photographed at the sign in 1975. Not shown is Patricia Appel (7413).

Drafting's Not What It Used to Be**New, Up-to-Date Drawing Courses Reflect Impact of Computers on Design**

It used to be that mechanical or electrical drawings were produced by drafters who used pencils, straightedges, horizontal bars, and triangles to create an image on a drawing board.

But no longer.

Over the years, like instant-teller bank transactions and electronic mail, drawing has become computerized. Today, a typical mechanical drawing is produced by a designer who selects a function, such as a circle or a straight line, and punches in the necessary numerical coordinates, or guides a hand-held "mouse" whose motions are traced on a computer screen.

A simple command changes perspective when viewing a three-dimensional drawing, so the part being designed can be viewed from the top, the side, the back, or any angle. Other commands tell the computer to draw an angle, chamfer an edge, or keep track of the distance between parts on a three-dimensional grid. The computer also calculates mass properties, such as volume, weight, center of gravity, and moments of inertia.

Of an estimated 220 drafters in Design Definition Dept. 2850 at Sandia (formerly known as the Drafting Department), only four or five still use drawing boards. Those few are contractors, notes Perry Cowen (2853), the coordinator of a new series of up-to-date design courses to familiarize drafters with the latest advances in computerized drawing.

Called D²RAW, for Design and Definition Review and Workshop, the training program is offered to new hires in the department, as well as to some veterans. The courses have been updated during the last year to reflect changes in the profession. The purpose of the program is to promote consistency in each drafter's approach to design problems, as well as to provide drafters with the latest in computer technology.

"It's quite a different process from working on a board. Some people adjust to it more quickly than others. If you're used to drawing on a board, you've got to go through a different mental process to learn to draw with a computer," says Ron Williams, program administrator and Supervisor of Project Design Definition III Div. 2853.

Often, drafters in the Design Department are sought after by other engineering groups at Sandia, and several people are transferred each year to

other divisions. "They come with a better knowledge of what Sandia's about than someone fresh out of college who might also fill the position," says Perry.

Variety of Skills Taught

In addition to mastering computerized drawing, trainees in the workshop learn to interpret and apply Sandia drawing systems, which are much more detailed, for example, for weapon parts than for other kinds of drafting. The systems facilitate better communication with Sandia's customers.

Although they continue to take traditional courses in subjects like geometric dimensioning, trainees in the updated program do not spend a lot of time in courses that are not germane to their particular specialty. For example, a drafter who pri-

"If you're used to drawing on a board, you've got to go through a different mental process to learn to draw with a computer."

marily produces mechanical drawings does not need to concentrate on electrical drawings.

In a brand-new course introduced this year by Perry, drafting trainees also practice making parts themselves by hand in the machine shop of Mechanical Processing Div. 7485. The course was made possible through the cooperation of two departments — Design Engineering 2850 and Mechanical Processing 7480.

Manufacturers produce parts on the basis of drawings. By attempting to make the parts themselves, drafters get a better idea of the degree of difficulty involved in manufacturing an item to meet specifications. They get a firsthand look at the process involved in machining parts.

The new slate of courses promotes consistency as well. It used to be that drafting skills were handed down to newcomers by old-timers, says Ron, but under this program, managers and veteran designers are freer to do other things, while drafters all receive the same training.

As part of the revamping, a record of all courses completed by each employee will be kept in the employee's personnel file. Perry worked with Peggy Smith of Education and Training

Dept. 3520 and Betsy Aronsson of Personnel Information Systems Div. 3532 to establish a computer linkup with Sandia's Personnel Department. The linkup makes course completion information available to anyone at Sandia who needs to hire a designer. In the past, the only way to find out who had received certain kinds of D²RAW training was to ask a supervisor.

Eventually, it is hoped that computers will even do some of the repetitive drafting work unaided by humans. An effort is under way to coordinate all of the computer-assisted design systems now in use to enable a computer to generate a drawing of, say, a printed circuit board based on specifications given to a designer by an electrical engineer.

Dept. 2850 also plans to offer the D²RAW program to new hires throughout the engineering community at Sandia to promote the use of a common language by both engineers and designers.

Instructors Volunteer Time

Perry took over the design training program a year ago. At that time, drafters were all trained in course modules that did not provide as much specific training and were still geared to the drawing board, which was quickly becoming obsolete.

Courses in geometric dimensioning are now taught at three levels, says Ron: entry-level, intermediate, and advanced. Each level becomes steadily more difficult, with more complex parts. The courses also involve more one-on-one interaction with an instructor, along with handouts and demonstrations, as opposed to the old program, which relied more heavily on video presentations and lectures.

Instructors generally come from within the department, notes Ron, except in occasional instances when Perry invites an outside expert to teach a course at Sandia's expense.

"They do a lot of work on their own time, without financial benefit. But they're interested in improving the quality of design work and in giving the company better part definition," he adds.

The drafting courses are intended to improve quality, but they did not start as a result of the recent quality initiative at Sandia, says Perry. Instructors realized two years ago that courses needed to be changed because of their outdated orientation to drawing boards and increased reliance on computer-aided design.

Perry estimates that instructors will spend 3000 hours revamping the program.

The new slate of courses started this month.

Instructors teaching the courses on a volunteer basis are Wendy Cowen (2858), David Samuel (2855), Greg Neugebauer (2815), Sam Cancilla (2815), Finis Long (2853), Pat Musinski (2858), Dale Leonard (9243), Dan Vortolomei (2853), Carl Smith (2852), Alan Smith (2852), Dale Landis (2855), Tony Trujillo (2855), Elefio Montoya (2851), Larry Pucket (2851), Duane Benton (2857), Doug Hodge (2858), William Vonderheide (7485), Gerard Rodriguez (contractor), Yvonne Holling (contractor), Steve Wagner (2815), and Rich Robison (2815).

Course offerings include Standards and Specifications, Introduction to Design Definition Computer Systems (CAD), Basic Dimensioning, Geometric Dimensioning, Continuing Geometric Dimensioning, Mechanical Design and Definition, Electrical Definition for Mechanical Designers, Weapons Related Definition, Machine Shop Techniques, and MCAD Training.

•LD



SANDIA DESIGNERS Wendy Cowen (2858) and Greg Neugebauer (2815) study a detailed computer drawing of an injector test cavity. Computer-aided design has made drawing boards and pencils obsolete.



(Continued from Page One)

Computer Codes For Welding

The newest code in Sandia's weld analysis effort is called PASTA (Program for Application to Stress and Thermal Analysis) 3D, an upgrade of an earlier two-dimensional code, PASTA 2D, written by Bill Mason (8233) and Bill Winters (8245). A two-dimensional code assumes that variables remain constant in one dimension, explains Mike Baskes (8312).

PASTA 3D, written by Jim Lathrop (8233), is three-dimensional and allows the analyst to evaluate temperatures and stresses in more complex configurations. For example, the new code will be used to predict distortion and residual stresses in thin-section welded materials, notes Mike Kim and Beth Fuchs (8243), who specializes in sensor design, are now working with Jim to provide him with experimental data to compare actual temperature and stress with those predicted by the code, as part of the verification of the computer models.

PASTA 2D is a fully coupled thermomechanical code. Fully coupled codes model both heat conduction and the amount of deformation simultaneously. This is significant because, as Kim explains, as the temperature used to make the weld changes, so does the amount of deformation. PASTA 2D was used successfully to predict the residual stress distribution in an axisymmetric (stationary) gas-tungsten-arc weld on 304L stainless steel, a form of stainless steel widely used in the commercial world that is made mostly of iron along with chromium and nickel.

Other important welding codes under development at Sandia analyze fluid flow. Codes written by Lee Bertram (DMTS, 8243) and Mike Kanouff (8244) predict the shape of the weld pool (the shape of the molten material as it cools and solidifies) based on convective forces and temperature distributions in the liquid. Since both temperature and weld-pool shape affect residual stress in welded materials, fluid-flow codes are essential to understanding the welding process.

To make such predictions, researchers must develop a set of optimized computer codes together with models representative of the welding

Some Welding History

Welding, a coalescence of metals produced by heating, dates from the earliest uses of iron, according to the *Encyclopaedia Britannica*, when small pieces of iron were heated in a forge and hammered or pressed together. In the Middle Ages, skillfully welded blades were produced by Arab armorers in Damascus, Syria, who hammered wrought-iron bars until they were thin, doubled them back upon themselves, and hammered them again to produce a forged weld. The more times this process was repeated, the tougher the sword.

Also in the Middle Ages, welding was used to fabricate cannons by joining iron bands together, and to make steel-tipped bolts that were fired from crossbows.

Modern fusion welding techniques, such as gas welding, arc welding, and resistance welding, were developed at the end of the nineteenth century to produce continuous joints on large steel plates. The welded joints replaced rivets, which were less effective for enclosed containers such as boilers. World War I saw the first attempt to apply welding on a large scale. By World War II, arc welding, using a consumable electrode, was the preferred method, once the problem of brittle welds was solved by wrapping or coating bare wire electrodes with minerals and metals.

More recent welding techniques have included electron beam welding and laser welding.

process and material behavior.

"You want to be able to run these problems enough times that you understand what factors are controlling the welding process," Kim notes. "If I understand what influences quality, then I know what I need to control during the weld process to improve yield and improve quality."

"That's where the codes come in — I can change just one variable and look at the effect of changing that one variable, such as welding voltage or current or arc travel speed. I typically can't do that experimentally very easily. But with a computer code, I can."

Welding Codes Have Many Applications

The welding codes have a variety of applications in private industry (technology transfer

"If I understand what influences quality, then I know what I need to control during the weld process to improve yield and improve quality."

agreements are being negotiated) and in the DOE Weapon Complex.

Sandia is currently working with researchers at DOE's Savannah River (S.C.) plant to study cracking as a function of temperatures and stresses generated in helium-bearing 304L stainless steel. The integration of the modeling pre-

dictions with the metallurgy data will be critical to the repair of cracks in irradiated material should they occur in the production reactors at Savannah River.

In other work, fluid-flow studies are being conducted to determine how much oxygen can be introduced into the welding process to improve weld penetration.

Oxygen improves weld pool penetration, but excess oxygen forms oxides that can embrittle stainless steel bottles during reaction with hydrogen. Rick Blum (8312) has developed a gas analysis system that precisely monitors how many parts per million of oxygen are being introduced into the weld.

In another application begun two years ago, Sandia researchers have conducted neutron-diffraction experiments using a nuclear reactor at Chalk River in Ontario, Canada, to analyze residual stresses in gas-tungsten-arc welds on stainless steel. So far, agreement of computer code predictions with experimental data looks promising, says Kim.

As Mike notes: "Weapon requirements have forced Sandia to perform research to understand the welding process. And in doing that, we have developed some new techniques that have brought us international recognition for our weld modeling. This has enabled us to apply our expertise to the Savannah River program, to begin interacting with industry, and to work in the national interest to solve some of these problems." ●LD

(Continued from Page One)

Tom Picraux Wins Lawrence Award

materials such as those in the walls of tokamak fusion reactors, or analyzing the crystallographic perfection of silicon grown on a sapphire substrate as a function of distance from the interface.

"The Lawrence Award is a fitting tribute to the excellent research Tom has conducted for many years."

Tom has a BS in electrical engineering from the University of Missouri, an MS in engineering science from Caltech, and a PhD in engineering science and physics — also from Caltech. In 1965-66, he studied physics at Cambridge University under a Fulbright Fellowship.

He is a Fellow in the American Physical Society and a member of the Materials Research Society, Electrochemical Society, IEEE, and the Metallurgical Society. Tom received one of the DOE/Basic Energy Sciences Materials Science Awards in 1985.

The Lawrence Award was established in 1959 by the Atomic Energy Commission to honor the memory of renowned scientist Ernest Orlando Lawrence, who won the Nobel Prize for his invention of the cyclotron. Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory are named in his honor.

Other 1990 Lawrence Award winners are John Dorning, University of Virginia; James Norris, Argonne National Laboratory, Wayne Shotts, Lawrence Livermore National Laboratory; Maury Tigner, Cornell University; and Ward Whicker, Colorado State University ●PW

Welcome

Albuquerque — Inez Atencio (3211), Thomas Beller (141), Robert Berry (2514), Mabelle Davis (22-2), Toni Garcia (21-1), Vesta Iman (22-2), Gary Karpen (1126), Jacqueline Ramirez (22-2), Sherry Rice (22-2), Stephanie Silver (122); *Other New Mexico* — Mary Campos (21-1), Diana Sanchez (22-2), David Weigand (2523).

Elsewhere: *Colorado* — Lars Wells (9212); *Georgia* — Mark Adams (1112); *Illinois* — Ajoy Moonka (6471); *Kansas* — Loren Riblett, Jr. (5265); *Nebraska* — Phillip Kuhlman (6257); *Oklahoma* — Jeffrey Kalb (5144); *Texas* — Deborah Frank (5268); *United Kingdom* — Robert Leland (1424).

Take Note

Retiring and not shown in LAB NEWS photos: Elaine Howard (9210), Clarence Huddle (5213), and Theresa Phelps (152).

Retirement Seminar

Guy Trujillo of SunAmerica Securities, Inc., will present a seminar, "What You Should Know About Retiring Before You Retire," on Sept. 12 at the Coronado Club, Conquistador Rm., at 5 p.m. RSVP to Guy on 294-6655.

Congratulations

To Sylvia (1841) and Jeff (1141) Tsao, a son, Emil Jeffrey, June 18.

To Pauline (9241) and Dean (6461) Dobranich, a son, Alexander Michael, June 18.

To Janet and Robert (6315) Glass, a daughter, Laura McBride Hiensohn, July 21.

To Pamela and Randy (2814) Lober, a daughter, Danielle Sue, July 27.

To Mary and James (1531) Peery, a son, James Mac, Aug. 3.

To Mary (1556) and Larry (9222) Walker, a son, Michael, Aug. 3.

Supervisory Appointments

MIRIAM HALL to Manager of Purchasing Dept. 3720.

Miriam joined Sandia, Livermore in 1960 as a member of the Health and Safety Division, where she worked with nuclear material accountability and personnel dosimetry records. In 1974, she transferred to the Purchasing Division as a buyer. She was reclassified to MLS in 1975 and, in 1980, was promoted to Supervisor of



MIRIAM HALL

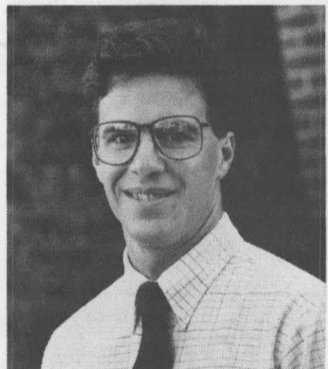
a Purchasing Section. In 1981, she was promoted to Supervisor of the Purchasing Division. Three years later, Miriam transferred to the Purchasing Planning Division in Albuquerque, where she was responsible for procurement policies and procedures.

She has a BS degree in business administration and an MBA degree in accounting from California State University, Hayward, and a Doctor of Jurisprudence degree from Golden State University. She is a member of the California State Bar Association, American Bar Association, Federal Bar Association, and the National Contract Management Association. Before joining the Labs, she was a chemist at Shell Oil Co. and office manager of the Federal Land Bank in Livermore.

Miriam enjoys gardening and furniture refinishing. She has one grown son and lives in the NE Heights.

PAUL YOURICK to Supervisor of Hazardous Material/ES&H Coordination Div. 3429.

Paul joined Sandia's Shipping and Receiving Division in 1984 as a hazardous-material packaging engineer. He was reclassified to MLS in 1987. In 1989, Paul was promoted to Supervisor of the Packaging and Shipping Section. He also served as team leader for the ES&H Compliance Initiative.



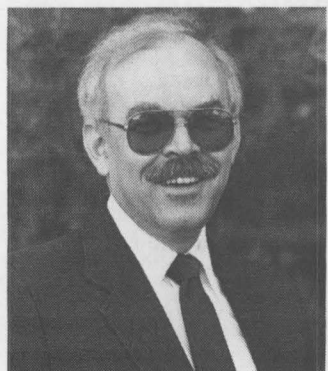
PAUL YOURICK

He has a BS in microbiology and public health and a BS in packaging engineering, both from Michigan State University, and an MBA in general management from UNM through Sandia's Educational Assistance Program.

Paul enjoys softball, flag football, and skiing. He and his wife Joan have one daughter and live in NE Albuquerque.

WALTER WOLFE to Supervisor of Aerospace Projects Div. 1555.

Walt joined the Labs in 1981 as a member of the Aeroballistics Division, where he worked on aerodynamic/hydrodynamic design of the Sea Lance nuclear depth bomb, and did numerical modeling of the internal fluid mechanics of fluid-filled projectiles. He has also done experimental and numerical research in high-speed water entry, flight dynamic analyses of ballistic vehicles, and numerical modeling of submerged-vehicle



WALTER WOLFE

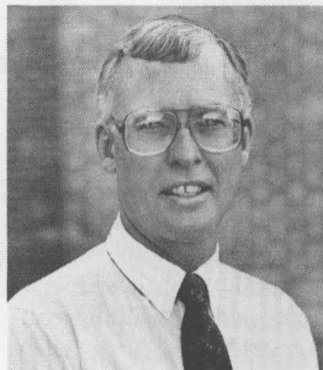
propulsion phenomena.

He has BS, MS, and PhD degrees in aerospace engineering from West Virginia University. Before joining Sandia, he was a lecturer and research associate in aerospace engineering at West Virginia University. Walt was a Navy aviator from 1971 to 1976 and flew anti-submarine patrol aircraft. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

Walt enjoys hiking, bicycling, golf, and reading. He and his wife Betty have two children and live in the NE Heights.

JOHN CUMMINGS to Manager of Fluid and Thermal Sciences Dept. 1510.

John joined Sandia in 1975 as a member of the Experimental Fluid Physics Division, where his work included Raman spectroscopy of chemical lasers, hydrogen diffusion flames, and atomic fluorine. In 1976, John took a four-month leave of absence to work on a cryogenic fluid mechanics project at the Max Planck Institute for Flow Research in Göttingen, Germany.



JOHN CUMMINGS

He joined the Advanced Laser Physics Technology Division in 1977, and transferred to the Laser Physical Chemistry Division in 1979. In 1980, he moved to the Reactor Safety Studies Division, where he was project leader for hydrogen combustion programs.

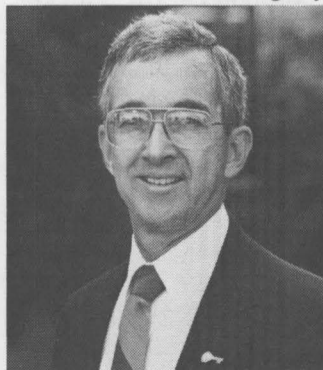
John was promoted to Supervisor of the Fluid Mechanics and Heat Transfer Division in 1983. Earlier this year, he transferred to the Systems Performance Assessment Division, working on performance assessment strategy for the Yucca Mountain Project for geologic storage of high-level radioactive waste.

He has a BS in engineering and an MS and PhD in aeronautics, all from Caltech. Before joining Sandia, he worked for TRW Systems, Inc., in Redondo Beach, Calif. He is a member of the American Physical Society and the JANNAF (Joint Army, Navy, NASA, Air Force) Propulsion Systems Hazards Subcommittee.

John enjoys reading, music, fitness activities, fishing, and church activities. He and his wife Ellen have two children and live in NE Albuquerque.

PHILIP STANTON (DMTS) to Supervisor of Thermomechanical and Physical Div. 1534.

Phil joined Sandia in 1961 as a member of the Advanced Firing Systems Development Division, where he designed explosive planewave generators. He left the Labs to attend graduate school in 1964, and then rejoined the Exploratory Projects Division in 1971, where he worked on non-nuclear weapon concepts. He transferred to the Explosives Physics Division in 1974 and studied shock loading behavior of lithium niobate. He's also been a member of the Detonating Components Division and the Explosive Projects and Diagnostics Division. Phil designed and developed slapper detonators for several weapons, including FOG-M and Patriot. Most recently, he helped design the fixed-cavity VISAR interferometer system.



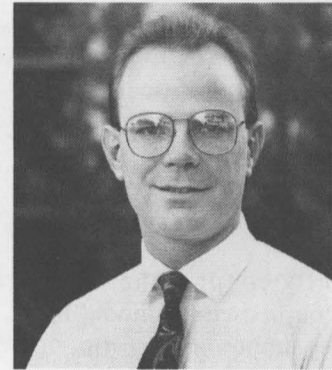
PHILIP STANTON

He has a BS in mechanical engineering and MS and PhD in engineering mechanics, all from the University of Texas/Austin. He is a member of Tau Beta Pi and is a Registered Professional Engineer. He has been a tutor and will teach physics this fall at Sandia High School.

Phil enjoys golf, tennis, hiking, building mountain cabins, and photography. He and his wife Lois have two children and live in the NE Heights.

DAVID GANGEL to Supervisor of Experimental Systems Div. 5231.

Dave joined the Labs in 1978 as a member of the Facility Systems Engineering Division. He designed a perimeter security system for a DOE facility in Richland, Wash., and led a security communications project for upgrading response-force communications at DOE facilities.



DAVID GANGEL

He transferred to the Systems Engineering Support Division in 1985, and took a two-year assignment at Hanscom AFB, Mass., to serve as technical advisor and Sandia liaison to the Physical Security Systems Directorate of the AF Electronic Systems Division. In 1987, Dave joined the Verification Technology Division, where he was the Org. 5200 project leader for the Technical On-Site Inspection Program that developed and delivered a monitoring system to verify Soviet compliance with the INF Treaty. This system is now operating at the Votkinsk Motor Production Facility in the USSR.

Dave was a technical advisor to the US Special Verification Commission in Geneva, Switzerland, during negotiations to establish implementation details for the INF Treaty. Dave was also a member of a US delegation to Moscow that negotiated agreements for using the Cargo-Scan imaging system at the Votkinsk facility. He was also chairman of a subgroup for the joint DOE-laboratories framework study of potential verification provisions for a conventional forces treaty between NATO and the Warsaw Pact.

He has a BS in electronics engineering technology from Missouri Institute of Technology and an MS in electrical engineering from UNM.

Dave enjoys family activities, team sports, tennis, reading, and coaching youth athletics. He and his wife Elaine have two children and live in the NE Heights.

CAROL YARNALL to Supervisor of Quality and Technical Coordination Div. 9002.

Carol joined Sandia in 1989 as a member of the Survivability and Security Systems Studies Division, where she was a member of the joint DNA/DOE-sponsored Future Look study team. Before joining the Labs, she was Deputy Director, Space and Strategic De-



CAROL YARNALL

fense Initiative Programs, Air Force Secretariat, the Pentagon. While there, she planned, directed, and controlled more than 50 space, strategic defense, and communications systems such as the Global Positioning Satellite, Defense Support

(Continued on Next Page)

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Supervisors

Program, Milstar, and launch vehicles.

From 1985 to 1986, she was commander of Clear Airforce Station, Alaska, and the ballistic-missile early-warning radar system there. She's had various assignments in research, development, testing, and project management at the Air Force Weapons Lab, AF Operational Test and Evaluation Center, and the AF Materials Lab. She also served as military assistant to the Defense Science Board at the Pentagon. She served 26 years with the Air Force and was a colonel when she retired in September 1989.

Carol has a BS in chemistry from Wheeling Jesuit College and an MA in public administration from UNM. She's a member of the Society of Women Engineers, the Air Force Association, and the Sandia Science Advisor Program.

She enjoys tennis and bowling. Carol and her husband Bill live in the SE Heights.

Retiree Deaths

Geoffrey Haycraft (77)	.....	July 2
Harrison Young (77)	.....	July 4
Reo DePew (73)	.....	July 20
Virginia Barrett (69)	.....	July 24
Anne Barrett (85)	.....	July 26
Mike Bucklin (86)	.....	July 27
Shannon Houck (57)	.....	July 27

Sympathy

To Vernon Koonce (5122) on the death of his mother-in-law in Albuquerque, Aug. 13.

Honored for Work in Safeguards and Security

Williams Named Fellow of INMM

James (J.D.) Williams, Supervisor of Advanced Systems Integration Div. 5261, was recently named a Fellow of the Institute of Nuclear Materials Management.

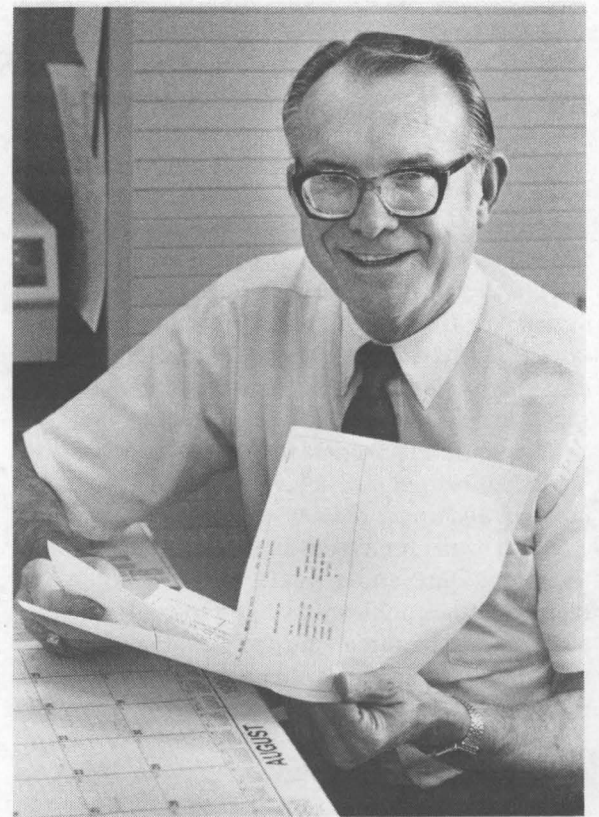
He was honored in an official declaration for "his distinguished contribution to the field of safeguards and nuclear materials management." The Institute promotes efficient management and safeguards of nuclear materials.

James Jacobs, Director of Nuclear Security Systems 5200, says, "J.D. is an internationally recognized expert in the physical security arena, and especially in intrusion detection. The honor is well deserved."

In 1987, J.D. also received a Distinguished Service Award from the Institute. A nomination letter cited his engineering skills and management abilities, which resulted in the development of intrusion detection and assessment technology used not only at Sandia, but at other laboratories and in the private sector.

In addition to establishing programs for research into exterior and interior sensors and closed-circuit television systems, J.D. led efforts to compile the Intrusion Detection Systems Handbook, a manual used extensively in the US and elsewhere.

In 1981, he became chairman of the Physical Protection Working Group of the INMM, helping to organize several workshops annually in the areas of intrusion detection, closed-circuit television assessment, entry control systems, personnel identification, contraband detection, active and passive barriers, safeguards control and communication systems, and security personnel training.



J.D. WILLIAMS (5261) was recently named a Fellow of the Institute of Nuclear Materials Management.

J.D. was later appointed to the International Electrotechnical Commission, composed of members from nine European countries, Japan, and the US, to prepare performance standards for intrusion detection sensors. ●LD

feed iback

Q. I have just spent an hour trying to help our new division secretary import an ASCII file of a memo of mine into MASS-11. She had never been trained about how to do that. After getting the file transferred, there were sections where the cursor would not move, and no editing could be performed. MASS-11 was of no help in publishing this memo.

Is it the intention of management that technical staff spend time learning this awful software? How could such an argumentative piece of software have been selected as a standard?

A. It's unfortunate you experienced so much difficulty in converting an ASCII file into a MASS-11 document. A MASS-11 hot line (phone 5-8782) is maintained to assist secretaries and staff in such instances. Four off-site experts are on hand to respond, as are two on-site experts who will come to your office on a charge-back basis.

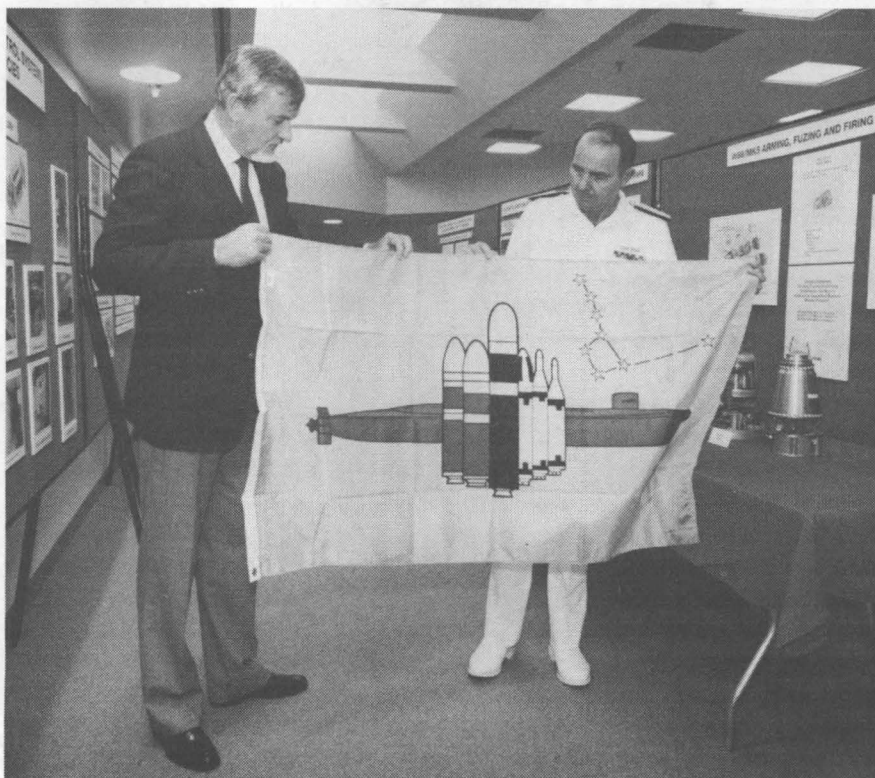
In October 1986, the Office Automation Subcommittee (OAS), at the request of then-President Irwin Welber, undertook the task of selecting a software standard that would accommodate all needs of all secretaries — and, ultimately, all staff, since they are the secretaries' "customers." A very thorough and scientific needs analysis was conducted Lab-wide to determine just what criteria must be met to be an acceptable software. As you can imagine, the software had to be a very sophisticated one. It had to be able to run on the VAX and to do technical (equation) typing, multiple-column printing (to accommodate journal-article submissions), and list processing, among other requirements. The other charter directed to the OAS by the committee sponsor, Larry Bertholf (now 7300), was that only the two "soft standard" softwares currently in use at Sandia (Word Marc Composer and MASS-11) could be considered. No outside vendors were to be evaluated, since Com-

puting Directorate 2600 staff people had already evaluated much of the software on the market. An evaluation script was written and provided to the experts for both Word Marc and MASS-11 so that the evaluation would be as unbiased as possible. The overwhelming "winner" was MASS-11.

It has never been the intention of management or the OAS to ask secretaries or staff to struggle with learning a software. All new-hire secretaries at Sandia are extensively trained on the software standard (28 hours of class time). Since the adoption of MASS-11 as the software standard for secretaries at Albuquerque (June 1,

1987), Individual Development Div. 3521 has sponsored many mini-courses (four hours) for both staff and all levels of secretaries. These courses continue to be offered periodically and are advertised in the *Weekly Bulletin*. Enrollment is open to all on a first-come, first-served basis. At the outset, each line organization had the option of selecting one person as an expert/trainer and having this person trained by Microsystems Engineering Corp — the firm that developed MASS-11. There are also many "area experts" who are more than willing to help in a crisis.

Mary Courtney (22-2), OAS member



DURING CEREMONIES earlier this month, Rear Admiral Kenneth Malley (right), Director of the Navy's Strategic Systems Program Office, presented President Al Narath a Trident flag in recognition of Sandia's Trident II program accomplishments. In his remarks preceding the ceremony, Adm. Malley noted that "on a day-to-day basis, our strategic submarines, with their submarine-launched ballistic missiles, provide the most cost-effective and single greatest deterrent to nuclear war."

feed back

Q. How can Sandia meet requirements for good quality control and/or zero defects when data is being collected from instruments that have never been calibrated at the Labs? DOE does not recognize manufacturer calibration; rather, it requires calibration by approved labs. During a survey of more than 200 new instruments submitted to Sandia's standards laboratory, I found that 8 percent of them didn't work and had to be returned to the manufacturer. Some 35 percent of these instruments fell outside the manufacturers' specs and had to be adjusted.

Some Sandia organizations have their instruments calibrated only when they are going to be audited, and aren't seen again until the next audit.

A. Thanks for asking an important and timely question. Our Sandia Quality Policy Statement clearly defines our responsibility to conform with all customer requirements and establishes the responsibility for quality with each organization and individual. This is supplemented by the Strategic Plan objective to become the national leader in quality and quality progress.

Your question gives me the opportunity to remind Sandia employees that we will be audited by a DOE Tiger Team sometime in the near future and that one item the team will examine is our compliance with requirements for calibrated instruments.

Sandia's calibration policy states that each group establishing design specification, gathering data from or for War Reserve systems evaluation, performing final acceptance tests, or doing health protection activities will properly identify its measuring and test equipment requiring periodic calibration. This policy follows DOE quality-criteria guidelines and a new quality document addressing quality criteria for research, design, development, and testing within the nuclear weapon complex.

DOE is also revising its standards and calibration program to expand calibration activities within the complex. All these documents require users to institute the proper control of measurement and test equipment to meet technical requirements. Division 7414 in Albuquerque and Division 8285 in Livermore operate a standards and calibration program; both comply with all DOE requirements. Sandia is also rewriting its

calibration policy to be in accordance with the revised and expanded DOE Orders and quality practices.

Each of us should assess how we are performing these and other requirements of our customers and should ensure that we are in compliance. Divisions 7414 and 8285 stand ready to help, and will place your instruments in the periodic recall system if requested to do so.

Herman Mauney — 7200

Q. As I understand it, the amount of flight insurance carried on each Sandia employee traveling on company business is \$50,000, without any additional insurance being added by CTC. Personal credit cards normally provide common carrier insurance when the cards are used to charge the ticket. This amount can be as large as \$500,000 and costs the credit card company very little. The company credit card does not provide this benefit.

Since flying on company business is an added risk, it seems only fair and/or prudent that Sandia allow employees to charge airline tickets on their personal credit cards or provide comparable insurance. If existing policy or contracts preclude these options, some effort should be made to change the situation.

A. Sandia understands and appreciates the extensive traveling that many employees do as part of their jobs. We do not agree that flying on company business is an added risk.

However, because of extensive travel by Sandia employees, Sandia has included "Special Risk Accident Insurance" in the standard package of employer-provided life insurance. This insurance pays \$50,000 in the event of accidental death due to, for example, an airline disaster. Also, our designated travel agent (CTC) provides standard corporate life insurance benefits of \$100,000 for both business and personal travel. In addition, through Sandia's credit card relationship with Diner's Club to pay CTC for ticket purchases, Diner's Club provides \$150,000 for business travel only. Sandia policy does not permit employees to purchase airline tickets with personal credit cards mainly because government travel fares are

not available under that arrangement.

Total life insurance benefits available, including both Sandia-provided and travel-specific coverage, should, in most cases, exceed those available on most personal credit cards.

Paul Stanford — 100

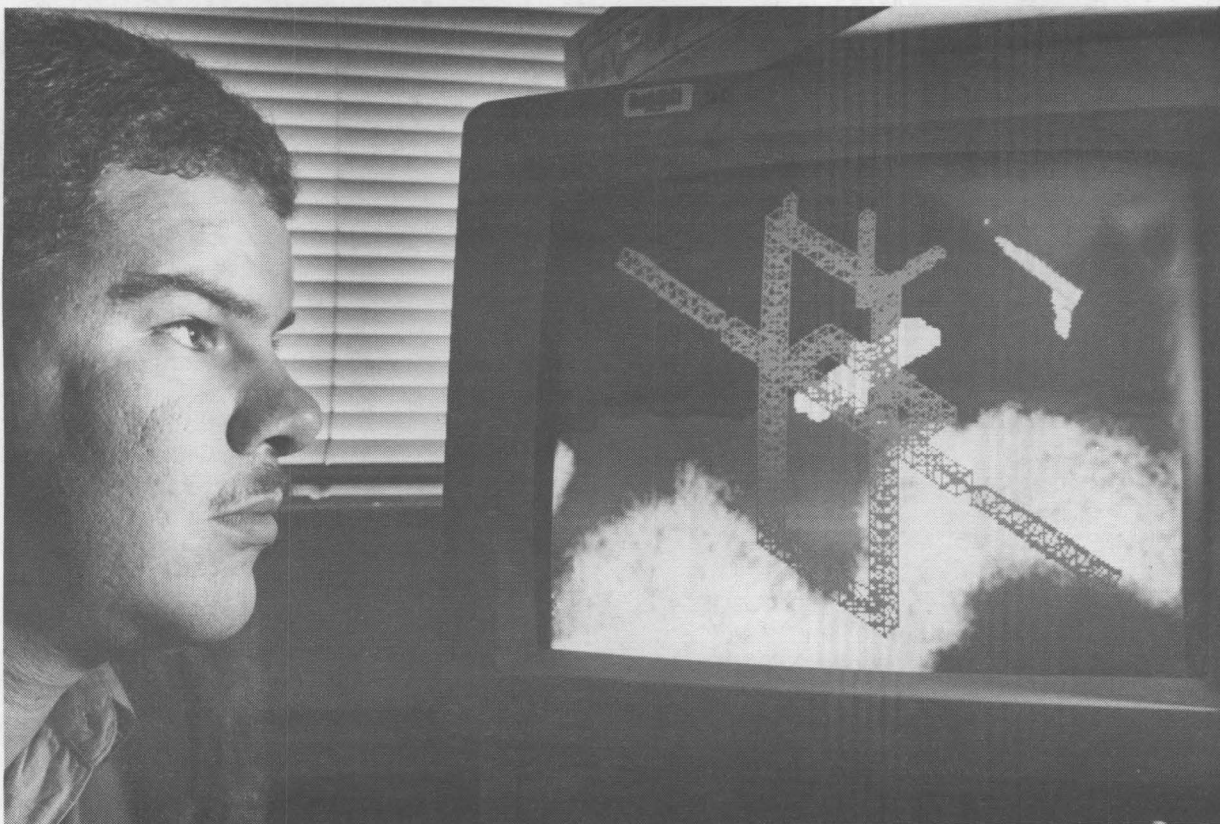
Q. Soon I'll be moving to a new residence and will also be having a baby. Is there a comprehensive list containing the names and telephone or mail-stop numbers of the various Sandia organizations requiring this information? I know that the medical, life, and accident insurances must need this kind of up-to-date information, but who else should be notified?

A. Most employee record changes can be accomplished with Form SF 4010-EH, "Employee Location and Personnel Data Changes." This form is generally prepared by division secretaries whenever there are changes in an employee's work location, office phone number, home address and phone number, etc. Changes made using this form are automatically reflected in other data bases (payroll, medical, and security, for example) used at Sandia.

A comprehensive list of people and organizations to contact regarding other types of changes is not produced at this time; however, the feasibility of publishing such a list will be reviewed. Periodic articles with the appropriate contacts and telephone numbers are published in the *Weekly Bulletin* by Personnel, Benefits, Payroll, and other organizations to remind employees to update employee records if changes have occurred.

When there are changes in the number of dependents, employees should review benefits coverage and beneficiaries, savings bond beneficiaries, and W-4 payroll exemptions for possible changes. Staff people in Benefits Administration and Employee Services Div. 3543 and Payroll Sec. 152-1 are available to answer questions and offer assistance in making these and other changes. Personnel Representatives — assigned to all vice-presidencies — can also assist employees in initiating and processing employee record changes.

Ralph Bonner — 3500



JEFF ANASTASIO (2857), a drafter who joined Sandia in June, shows off a computer animation sequence that won first place in a contest sponsored by *CADalyst* magazine. Jeff designed the 3-1/2-minute graphics program together with another student at San Juan College in Farmington. The animated sequence, which shows a space shuttle taking off from a launch pad and building a space station, placed first in animation and second in the still-picture category.

Fun & Games

Fun Run — Carrie Tingley Hospital Foundation will hold its Ninth Annual Fun Run on Sunday, Sept. 16, at 8 a.m. at Carrie Tingley Hospital (1127 University Blvd. NE). There will be a 5K run, a one-mile walk, a "Celebrity Walk," and a new category, the Centipede Division. Five-member "centipede" teams may enter either the run or the walk and must be connected together in some way (string, rope, etc). Connecting strings are to be no longer than 5 feet between team members. Costume and theme attire are encouraged. For information, call 243-6626.

Rodeo — Calf-dressers and cow-milkers are invited to participate in timed events at this year's KAFB Ninth Annual MWR (Morale, Welfare, & Recreation) Labor Day Weekend Rodeo Aug. 31-Sept. 2. You may enter one three-person team in the calf-dressing event. The object is to catch and dress a calf in attire provided. You may enter one three-person team in the cow-milking event. The object is to catch a cow and milk her using the container provided in the fastest possible time. Performance times of the rodeo are from 7 to 10 p.m. each night. Entries are due by Aug. 28. For more information, contact Doug Hendrix on 4-5420.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

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

MISCELLANEOUS

- GUITAR, Cortez Les Paul copy, \$125; Peavey decode amp, \$50. Chun, 299-4207 leave message.
- SEARS CRAFTSMAN LAWN MOWER, rear bagger, 5 height adjustments, \$125 OBO. Zirzow, 281-9896.
- SCHERL & ROTH STUDENT VIOLIN, w/case, \$200; Bell & Howell slide projector, w/remote control, \$40. Magnuson, 268-5955.
- HEPA PORTABLE ROOM AIR FILTER, Enviracaire, on roller stand, cost \$350, sell for \$100. Muench, 867-5115.
- DRESSER, \$175; bureau, \$175; Tappan microwave, cost \$600, sell for \$175; 2 bookcases, \$10/ea.; round table. Reed, 294-1009.
- SEARS WEIGHT-LIFTING BENCH, new, assembled, 130 lbs., weights and bars, \$50. Guttman, 888-5114.
- NFL TICKETS (in Phoenix): 47 yd. line, Redskins, Bears, Giants, \$120/pr.; Patriots, Colts, Packers, \$100/pr., call for dates. Schofield, 292-7220.
- 17" RCA COLOR TV, \$85; Pioneer SX-850 stereo receiver, 65W/ch, \$75. Chael, 294-8757.
- WHEELCHAIR, walker, cost \$722, both/\$250, or will sell separately. Kerschion, 281-1671.
- METAL DESK, w/filing drawers, \$25. Sherman, 889-9746.
- KING-SIZE WATER BED, four-poster, cherrywood, full-size railing pads, heater, liner, waveless mattress, w/6 drawers, 1 yr. old, \$350. Tweet, 275-9257.
- TRIPOD, new. Burton, 275-9483.
- WINDSURFER MISTRAL SAIL, beginner-intermediate, \$150. Durkee, 255-4211.
- KING-SIZE CALIFORNIA WATER BED, new mattress, Hibernation series, 45% waveless, 6-drawer pedestal, padded head and foot boards, \$150. Pompeo, 266-7930.
- YAMAHA ALTO SAXOPHONE, w/case, \$300 OBO. Splichal, 256-7046.
- BUNDY CLARINET, w/case, 1 owner, \$175 OBO. Taylor, 889-3022.
- QUEEN-SIZE SOFA SLEEPER, beige tweed, \$250. Beardsley, 292-5910.
- '86 PROWLER FIFTH-WHEEL TRAILER, 24', sleeps 8, AC, \$7995. Steele, 281-5186.
- DRY BAR, new upholstery, black and maroon leather drawers, half-round ice chest. Rael, 884-4778.
- FIVE KITTENS, available mid-Aug., free. Brigham, 889-9691 after 5.
- ELECTRIC TYPEWRITER, Brother AX15, includes hard cover w/handle, instruction book, extra ribbon, \$100 OBO. Prins, 821-0490.
- DOOR, hollow-core, \$5; tires, 13", \$3; birdhouse, \$2; book & magazine racks, metal, \$5-\$20. Foster, 299-6240 after 5.
- GYM SET, galvanized steel, swings, trapeze bar, rings, hand-over-hand bars, \$25. Witek, 296-5198.

QUEEN-SIZE SLEEPER SECTIONAL SOFA, L-shaped, earth tones, \$400; hi-fi cabinet, radio works, \$25. Simmons, 891-2475.

WHIRLPOOL 30" ELECTRIC STOVE, continuous-clean oven, off-white color, \$250; cat door panel for sliding glass door, \$35. Sackett, 292-1048.

KITTENS, black & white, 7 weeks old, free to good home. Babb, 293-0736.

ANTIQUA OAK ICE BOX, White Mountain Grand, \$500; teak dresser, \$175; full-power Toshiba microwave, \$75. Petersen, 275-7467.

MINIATURE DACHSHUND, 3-1/2 yrs. old, red, registered, \$150 OBO. French, 892-3247.

QUEEN-SIZE WATER BED, solid wood mirrored headboard and frame, 6-drawer, w/linens, cost \$600, sell for \$295. Lindsay, 881-0709 nights or weekends.

REDWOOD PICNIC TABLE, w/attached benches, needs paint, \$15; 5-piece drum set, everything included, \$195. Dickason, 299-8125.

ELECTRIC TYPEWRITER, Smith-Corona Enterprise, w/carrying case, best offer. Edwards, 275-7611.

MIRROR, 28" x 38", \$25; metal closet, \$55; recliner, \$35; bookcase, \$18; maple shelf table, \$60. Joseph, 299-6989.

BASSETT BEDROOM SET, 4 pieces, queen-size bed, \$550; glass coffee and end table, \$85; china set, service for 8, \$125. Miner, 298-4779.

BERETTA 92F, 9mm; 27" Sony Trinitron, w/remote control and stereo; 6' satellite dish; 6' x 2.5' oak showcase. Bray, 292-2410.

GLASS-TOP TABLE, round, 42", w/4 chairs, \$100. Berg, 884-5229.

TRAIN SET, HO-gauge, double loop track on board, 9 cars, 2 engines, \$40. Bradley, 293-9586.

KENMORE MICROWAVE, 21 cu. in.; Whirlpool refrigerator; GE built-in range, w/2 ovens. Wymer, 294-0605.

KITTEN, female silver tabby, 9 months old, has all shots, free to good home. Frazer, 881-6574.

GYM MEMBERSHIP, Tom Young's, expires 7/31/91, \$150. Sanchez, 255-7763 after 5.

ARMSTRONG FLUTE, student model, \$250; Nike Shark football shoes, size 9; turf shoes, size 13. Anderson, 294-8451.

COPPER PIPE, 1-1/2" diameter, \$2.50/ft. Mozley, 884-3453.

GARAGE SALE: electronic components & equipment, power supplies, oscilloscopes, computers & peripherals, bicycle parts, 12644 Yorba Linda SE, Aug. 25. Mayer, 294-3368.

INFANT CAR SEAT, \$30; Kenmore vacuum cleaner w/Power Mate, \$45 OBO; quart canning jars, \$2.50/doz. Liguori, 256-3613.

CRAFTSMAN SELF-PROPELLED MOWER, w/rear bagger, \$160. Levan, 293-0079.

19" COLOR TV, \$115; Sony receiver, \$60; Fisher tape deck, \$90; Scott turntable, \$25; Frigidaire microwave, \$120. Skemp, 255-8185.

VITO RESOTONE CLARINET, w/case, \$125; GM 4-spd. automatic transmission, 700R4, \$200. Thalhammer, 298-8521.

GARAGE SALE, Aug. 25, 7416 Patricia NE, north of San Antonio, between Wyoming and Louisiana. Tripp, 822-8580.

LAWN MOWER, unmotorized push-type, w/grass catcher, \$15. Shirley, 821-0480.

19" TOSHIBA COLOR TV, w/remote, cable-ready, w/stand, \$175; queen-size hide-a-bed sofa, newly upholstered, rust color, \$100. Pershall, 299-9682.

MINI-BLINDS, Delmar Grand Clasique, 37" x 50" L, 34" x 49" L, new, still in box, fawn color. Diitz, 899-0372.

WESTINGHOUSE FREEZER, upright, \$80; Hammond organ, home model, \$250. Anderson, 298-0477.

PROFESSIONAL STAGE SPEAKER CABINET, Crate Model GC-412S, no speakers, \$200 OBO. Rea, 296-4620.

GARAGE/MOVING SALE, two-family, furniture, women's clothing, more, Aug. 25, 7 a.m.-3 p.m., 5368 Thomas Pl. NE, 1 blk. west of Juan Tabo, 1 blk. north of Spain. Trembl, 292-9219.

PIANO, 1904 Kimball upright, \$800. Carpenter, 256-0614.

KITTENS, 3 female & 1 male. Vonderheide, 842-9568.

TOW DOLLY, Demco K260, new departure hubs, 2 sizes straps, Scout II springs, shocks, transfer case, \$850. Brooks, 299-1884.

PIANO, Staube spinet, \$700; 3 chairs, \$25/ea.; 42" trampoline, \$25. Mills, 299-2130.

PICKET FENCE, cedar, 6' x 100', fourteen 7' sections, \$100; playpen, \$20; AT&T 6300 keyboard, \$50. Falacy, 293-2517.

FIBERGLASS CAMPER SHELL for Ford pickup, \$200 OBO or trade for firewood; electric wall oven/microwave unit, \$200 OBO. Chavez, 294-2650.

FISHER 26" MONITOR, \$100; Yamaha cassette deck, \$50; Yamaha 80W/ch receiver, \$100; all for \$225. Laguna, 298-1732.

DOLONA ROBERTS SERIGRAPHS, signed and numbered, three 29-1/4" x 23-1/4", framed, 2 vertical, 1 horizontal, appraised at \$650/ea., sell for \$300/ea. Laval, 898-9112.

MacGREGOR DX TOURNEYS, 3-4-5 woods, 3 through 9 irons, wedge, putter, bag, accessories; Tyrolia Pre 1200 skis, 200cm, \$140. Davis, 263-5263.

Early Deadline

Because of the Labor Day holiday, the deadline for ads and other submissions to the Sept. 7 LAB NEWS is noon on Thursday, Aug. 30.

SEALY ORTHO-REST MATTRESS, box spring, Hollywood frame, 47" x 72", \$90 OBO; DP Body Tone rowing machine, \$40 OBO. Bouchier, 298-5845.

FULL-SIZE MATTRESS and box spring, \$30 OBO. Langkopf, 293-4076.

VHS VIDEOTAPE CASSETTES, blank, Scotch EG T-120, unused, most never opened, \$3.50/ea. or \$16/five. Schkade, 292-5126.

OAK COFFEE AND END TABLES, \$325; Sears Eager-1 power mower, \$60; two 4' macrame hanging plants, \$30. Schubeck, 821-3133.

PIANO, student console by Gulbransen, \$400 OBO; white Hush Puppie oxfords for band student, size 9, worn once; Cobra 14-channel CB radio, 2 microphones. Smith, 293-3296.

WORK BENCH, desk, desk organizer, Kodak slide projector (110-size), cartop bicycle carrier, life jackets, household items. Muir, 883-7933.

REFRIGERATOR, 20 cu. ft., side-by-side, will trade for smaller refrigerator or sell for \$200. Willems, 294-9711.

DINETTE, gold, chrome, oak Formica, \$75; AT&T 6300 computer, w/2 floppies & 20MB external disk, Epson printer, manuals, \$1200 OBO. Pruett, 268-2946 before 9 p.m.

BIRD CAGE, 18" diam., \$15; microwave, w/under-cabinet mount, \$120; 9' x 12' rug, med. blue, \$75; shoe rack, \$10. Walthers, 823-1946.

KNABE CONSOLE PIANO, considered classic, double sounding board, original ivories, matching needlepoint bench, recently appraised at \$2495. Kaiser, 828-1660.

TRANSPORTATION

'78 LINCOLN TOWN CAR, 59K miles, dark bronze w/beige velour interior, 460 V-8, all amenities, \$3250. Kerschion, 344-3397.

'82 SUZUKI GS750; '76 KZ 900 Kawasaki, recent overhaul. Bray, 292-2410.

'76 DODGE PICKUP, 4x4, AC, SWB, 400 CID, \$1250 firm. Davie, 296-3950.

'71 BLAZER, 307, 4-spd., overhauled, new tires. Overmier, 268-4992.

'77 MUSTANG NOTCHBACK, 107K miles, PS, PB, AT, AC, new tires, passed emissions, body needs work, \$1500. Weber, 275-3719.

'76 CHRYSLER NEW YORKER, red leather interior, new tires, recent overhaul; '78 New Yorker for parts, \$1500/both. Smith, 384-5182.

'73 OLDS. CUTLASS SUPREME, 2-dr., V-8, AT, AC, \$1200 OBO. Peterson, 296-9443.

'87-1/2 FORMULA FIREBIRD, red, 34K miles, 5-spd., 5.0 L, V-8, T-tops, power package, new tires, loaded, \$8250. Miner, 298-4779.

'83 BUICK RIVIERA, \$3000 or make offer. Corley, 281-1349.

'85 300ZX, 5-spd., tinted glass, T-top, car alarm, \$9800 OBO. Leal, 298-8661.

'88 YAMAHA MOTORCYCLE, 2.2K miles, turquoise, Model DT507L, city/off-road rated, \$425. Rayborn, 298-1732.

'87 YAMAHA BIG WHEEL 80 ATV, 2-wheel, 3-spd. transmission, automatic clutch, oil injection, \$600 OBO. Wasson, 281-2722.

'80 PLYMOUTH HORIZON, AC, AM/FM cassette, rear-window defrost, standard, 150K miles, \$550. Sena, 865-4360.

'84 FORD F-150 PICKUP, 4x4, V-8, 351 CID, AC, cruise, AM/FM cassette, shell, 33K miles, \$6900. Baney, 294-8970.

'71 VW SUPER BEETLE, sunroof, new Michelins/clutch/battery/upholstery, \$850. Smith, 256-0861.

'66 FORD PICKUP, 20K miles on rebuilt 352, headers, mags, new parts, extras, \$2700. Winowich, 255-2611.

'85 MALLARD MINI-MOTORHOME, 26', roof air, awning, microwave, \$19,500. Pullen, 291-0666.

'79 RX-7, one owner, AC, AM/FM cassette, new transmission/clutch/tires, partially restored, garaged, not driven last 3 years, \$3500 OBO. Rea, 296-4620.

REPO: Pontiac LeMans, 105K miles, needs repairs, subject to prior sale, bids accepted through Aug. 28, we reserve the right to refuse all bids. Sandia Lab FCU, 293-0500.

'83 FIREBIRD, AC, AM/FM, T-tops, louvers, new paint & floor mats, 5-spd., \$3600. Ellis, 869-3582.

MOUNTAIN BIKE, Miyata Ridge Runner, 18", \$500 new, sell for \$250. Mayer, 294-3368.

'75 OLDS. STARFIRE, 4-spd., AC, V-6, 77K miles, \$900. Jorgensen, 298-9834.

'85 IROC Z-28, AT, PB, PS, stereo, 305 CID, multi-port injection, responsible-adult-driven, 63K miles, \$800 below book, \$7400. Schaub, 299-5867.

MOUNTAIN BIKE, 18-spd., \$95; semi-off-road bike, 5-spd., fenders, \$45. Hufnagel, 294-5949.

'86-1/2 TOYOTA SUPRA, loaded, AT, new tires, \$11,200 OBO. Smith, 888-7928.

'85 OLDS. FIRENZA, 4-dr., AC, 5-spd., PS, PB, cruise, AM/FM, one owner, \$3400. Roybal, 867-6643.

'86 WINNEBAGO MOTOR HOME, 20', gas engine, 18 mpg, FWD, PS, AC, generator, toilet, shower, stove, refrigerator. Tyler, 299-3467.

'88 TOYOTA TERCEL, 5-spd., AM/FM cassette, tilt, rear defrost, reclining front bucket seats, 37K miles, \$4995. Eldredge, 298-3905.

11' SAILBOAT, Pepsi sail. Bray, 292-2410.

'81 PLYMOUTH RELIANT SW, white w/beige vinyl interior, AC, new tires, recently rebuilt engine, \$1500. Hueter, 242-1620.

NISHIKI 10-SPD. BICYCLE, 30", \$140. Mills, 299-2130.

'83 HONDA CIVIC, 2-dr., burgundy, 60K miles, one owner, new upholstery, \$2000. Rockwell, 884-4206.

'85 SUBARU WAGON, 4-WD, AC, \$2400. Sweet, 293-4358.

'78 SCOUT II, 76K miles, Warn winch, Rancho suspension, AT, AC, roll bar, new tires & brakes. Brooks, 299-1884.

'85 MAZDA 626 LX, 2-dr. coupe, 5-spd., sunroof, PS, PB, PW, AC, electronic dash, aluminum wheels, AM/FM cassette. Miller, 883-0218.

'81 THUNDERBIRD, AT, AC, \$1800. Whitham, 266-9313.

ROAD BIKE, Fuji Grand Tour, 18-spd., Suntour, 24" frame, Mercedes green, accessories, \$125. Davis, 263-5263.

REAL ESTATE

3-BDR. HOME, 1-3/4 baths, FHA-assumable, in Taylor Ranch. Lucero, 898-5532.

2-MBR. SPANISH-STYLE TOWN-HOME, 2 baths, FP, wood beams, garage w/opener, Sandia Heights, \$69,900, \$5000 below appraisal. Coffey, 299-9527.

3-BDR. HOME, new stucco/paint/carpet, NE area, \$59,900 OBO. Higgin, 298-5661 leave message.

3-BDR. HOME, in the woods, 2-1/2 baths, decks, 1 acre, \$160,000. McDowell, 281-3027.

2-BDR. MOBILE HOME, '74 Holiday Town & Country, 14' x 80', in Four Hills Park, \$16,000 OBO. Leal, 298-8661.

1-BDR. MOBILE HOME, w/Expando, in Five Star Adult Park. Southwick, 281-3782.

2-BDR. CONDOMINIUM, 2 baths, NE area, all appliances, luxury unit w/mirrors, remote-control lights & fans, \$79,000, assumable. Epperson, 299-0789.

2-BDR. HOME, security bars, storage, terraced yard, fully fenced, SE area. Paulos, 764-0238.

5-BDR. HOME, 3 baths, 3-car garage, 3000 sq. ft., views, 2 yrs. old. Mak, 415-426-7108.

2-BDR. TOWNHOUSE, 1-3/4 baths, FP, skylights, covered patio, brick patio, landscaped, Spain/Juan Tabo area, 1200 sq. ft., 2-car garage, \$82,900. Trembl, 292-9219.

3-BDR. HOME, 1-3/4 baths, near Winrock, carpeted, venetian blinds, utility room, patio, automatic sprinklers, new air cooler. Mills, 299-2130.

3-BDR. HOME, in Peppertree, corner lot, fully landscaped, security system, views, 3 yrs. old. Nuckolls, 298-4393.

WANTED

TOOLS AND ACCESSORIES for Craftsman lathe. Zirzow, 281-9896.

HOME FOR FEMALE CAT, found in Wyoming/Montgomery area, long hair, gray and apricot. Grosshans, 293-2937.

HOUSECLEANER, light work only, approximately 3 hrs. per weekend, near Tanoan, references required. Barr, 821-5870.

BATHING SUIT PATTERN, girl's stretch-n-sew, size 12. Owens, 294-6470.

UPGRADED IBM XT OR AT, 256K, 10M or better, no compatibles; IBM or Epson 910 letter printer, will pay cash. Hunke, 298-0667.

VENTURE 17 SAILBOAT, any condition. Colp, 255-0228.

SCUBA DIVERS, interested in diving New Mexico lakes. Schiller, 275-7508.

PHYSICIAN'S BALANCE BEAM SCALE, w/measuring rod; child's sit-in & push plastic car. Langkopf, 293-4076.

ELECTRIC LAWN MOWER, w/grass-catcher, brand unimportant but must effectively "vacuum" grass clippings, must try out before buying. Schkade, 292-5126.

SHARE-A-RIDE

PART-TIME AND FULL-TIME VAN-POOL SEATS AVAILABLE, along N-14, Frost Rd., Tijeras. Yelton (281-2893) or Burns (281-3922).

NEED RIDE regularly to/from work, Louisiana/Constitution area to Bldg. 832. Schultz, 255-0686.



Coronado Club Activities

Don't Labor on Labor Day — Relax at Summer's Last Wingding

SAY ADIOS TO SUMMER at the Labor Day close-down-the-pool party on Monday, Sept. 3, from 11 a.m. to 6 p.m. Enjoy some mighty fine food from the BBQ buffet (served from noon to 5) and some nonlaborious dancing to the music of Sonny and Company from 2 to 6. A full schedule of games (with prizes) and activities for children and adults is planned, and Kangaroo Katie — the magical clown — will entertain kids between 1 and 2. Admission is free for all C-Club members, \$3 for guests.

THE YEAR'S MOST IMPORTANT EVENT — the C-Club Annual Meeting — is Monday, Sept. 10, right after work. Members will elect seven Board members; the top four vote-getters serve two-year terms, while the others serve one year. Cast your ballot at the meeting between 4:30 and 5:30 p.m.; on weekdays (11:30 a.m.-1 p.m.) from Tuesday, Sept. 4, through Monday, Sept. 10;

or Friday night, Sept. 7, from 6 to 8. Current board members seeking re-election are Carolyn Lange (123) and Mike Quinlan (7852). Other nominees include Paul Graham (142), Art Hasenkamp (ret.), Jackie Kerby (5240), Eusebio "Eddie" Montañó (ret.), Mary Nation (3712), and Frank Villareal (113).

THE EVER-POPULAR BOB BANKS TRIO plays for dancing tonight, Aug. 24, from 8 to 11 p.m. Beforehand, dinner entree choices include filet mignon (\$8.95), prime rib (\$7.95), chicken breast with lots of green chile (\$5.95), and poached flounder (\$6.95). Bonus: a half liter of house wine, gratis, for each couple having dinner. Dinner reservations recommended (265-6791).

LAST OF THE AUGUST BRUNCHES, served from 10 a.m. to 1 p.m. Sunday, Aug. 26, features a great array of food: French toast or pan-

cakes, bacon, baron of beef, turkey or ham, potatoes, streusel or Danish pastry, scrambled eggs, green chile stew, and more. It costs just \$5.95/adults, \$2.50/children ages 3 through 12, and free/toddlers under 3.

A REAL BARGAIN is yours next week on Aug. 31 if you're eating one of the Friday-night specials: prime rib, chicken teriyaki, poached halibut, or stuffed cod. Shell out \$8.95 for the first meal, and the second meal is just \$4. Afterward, the band with the noteworthy name, Trio Grande, belts out c/w stomp music from 8 p.m. to midnight. Make that dinner reservation right now.

T-BIRD CARD SHARKS put their cards on the table again on Sept. 6, starting at 10 a.m. Here's your chance to catch up on what all your friends did on their summer vacation (at least the parts they can talk about).

Events Calendar

Events Calendar items are gathered from various sources. Readers should confirm times and dates of interest whenever possible.

Aug. 24-25 — Opera performances, "The Miraculous Staircase" (set in Old Santa Fe) and "Another Accident" (English murder mystery), both by Albuquerque composer Alan Stringer; 8 p.m. (both operas on both evenings), First Congregational Church (Lomas & Girard NE), 296-9215.

Aug. 24-26 — "Servant of Two Masters," eighteenth-century classic comedy by Carlo Goldoni set in the early twentieth century, mistaken identities, misled characters, sight gags; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

Aug. 24-26 — Los Voladores & Aztec Dancers, breathtaking performances high atop an 80-ft. pole with flyers soaring down and around the pole until they reach the earth; call for times, Indian Pueblo Cultural Center, 843-7270.

Aug. 24-Sept. 14 — Exhibit: "Raymond Jonson: Geometric Form in the Pursuit of a Unifying Principle"; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. evening; UNM's Jonson Gallery, 277-4967.

Aug. 24-Oct. 14 — "Georgia O'Keeffe and the Stieglitz Circle," exhibition examining the group of artists (including O'Keeffe) who were affiliated with Alfred Stieglitz, the photographer, gallery owner, and champion of early twentieth century avant-garde art; 9 a.m.-4 p.m. Tues.-Fri. (5-9 p.m. Tues. evening), 1-4 p.m. Sun.; Upper Gallery, UNM Art Museum, 277-4001.

Aug. 24-Oct. 16 — "Birds/Portraits," exhibit of 40 oil portraits of birds seen in the Southwest by Austin, Tex., artist Benita Giller; 9 a.m.-5 p.m. daily, New Mexico Museum of Natural History, 841-8837.

Aug. 25 — Summerfest '90: Fiesta de Colores, food, entertainment, arts & crafts, dances; noon-10 p.m., free, Civic Plaza, 768-3490.

Aug. 25 — "Golden Legends," music and dance performance by dancers from the Arthur Murray Studio to benefit the American Lung Association of New Mexico, featuring dance renditions to the music of Elvis, Sinatra, Fred Astaire, Judy Garland, Julie Andrews, Liza Minelli, Michael Jackson, Madonna, and Paula Abdul; 7:30 p.m., Rodey Theatre, 265-0732.

Aug. 25 — Concert, Zimbabwe & Jazz Culture; 8 p.m., South Broadway Cultural Center, 848-1320.

Aug. 28 — "Introduction to Mushrooms," class by longtime Master Gardener and garden club member Ruth Bronson, sponsored by the Council of Albuquerque Garden Clubs; 7 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.

Sept. 7-22 — "Amadeus," provocative play revolves around a confrontation between genius and mediocrity in the eighteenth-century world of Antonio Salieri and Wolfgang Amadeus Mozart; 8 p.m. Thurs.-Sat., 2 p.m. Sat.; Albuquerque Little Theatre, 242-4750.

Fun & Games

Golf — Sandia Women's Golf Association held an 18-hole tournament Aug. 4 at Arroyo Del Oso Golf Course. Awards were presented to the following winners: Flight A — Shirley Kendall, first low net; Delores Worley, second low net; Barbra Ford (5151), first low putts; Ginnie Moore (2100) and Jackie Blackburn (2343), tied for second low putts; Flight B — Marlene Shields (7542), first low net; Teri Carpenter (3731), second low net; Maria Feliz (3733) and Jean Rogers, tied for low putts. Maria Feliz was tournament director.

A Par-3 Tournament was held July 28 at Ladera Golf Course. Winners were: Carmen Allen (2611), first low net; Mike Fitzpatrick, second low net; Jo Cunningham (3722), first low putts; and Janice Montoya (153), second low putts. Kit Colman (152) had the longest drive on the eighth hole. Jo Cunningham won Closest-to-the-Pin on the second hole, and Mike Fitzpatrick won Closest-to-the-Pin on the fourth hole. Beverly Quinlan was tournament director.

A "9-Hole, 4 Clubs, and a Putter" Tourna-

ment was held Aug. 10 at Tijeras Arroyo Golf Course. Prizes were awarded to the following winners: Flight A — Liza Herrington, first low net; Deborah Reichman, second low net; Karen Vargas, third low net; and Mary Gonzales (6316), fourth low net; Flight B — Lupe Massoth (2632), first low net; Teri Carpenter, second low net; Barbara Doremus (7841), third low net; and Kathy Kemm (DOE/OCAD), fourth low net. Closest-to-the-Pin was awarded to Deborah Reichman. Participation awards were presented to Jo Cunningham and Georgianne Huff (7842). Longest Drive winner was Mary Gonzales. Best 5-Par winners were Betty Worley (ret.), Shirley Kendall, and Delores Worley. Karen Vargas was tournament director.

Contact Beverly Quinlan on 256-0342 for information about tomorrow's Par-3 Tournament to be held at Tierra Del Sol in Belen. The 9-Hole Championship Tournament is scheduled Sept. 15 and 16. For information about the tournament schedule and SWGA participation, contact Teri Carpenter on 256-0614.



A CENTRALIZED SYSTEM for tracking classified documents by computer, called the Laboratory Document Accountability System (LDAS), will be installed at Sandia, Albuquerque during the next two years. The system — the same as one in use at Sandia, Livermore — will eliminate duplicate data entry, centralize backup functions, and reduce the chance of errors. Training and planning sessions got under way in August under the leadership of Jennie Negin (3140), manager of the Technical Library. In the above photo, Sharron Norris (8524), coordinator of document accountability training at Livermore, talks to Albuquerque employees about LDAS. To the right of Sharron is Lucille Robinson (3140), who is coordinating the Albuquerque training.

