

Sandians Help NASA Recover Big-Dollar Shuttle Boosters

What goes up, must come down. For nearly 20 years Sandian Dean Wolf (9113), well aware of this physical reality, has been studying how things come down, especially things that weigh 185,000 pounds and cost \$40 million.

The things he studies are NASA's solid-fuel rocket boosters (SRBs), two of which carry each space shuttle flight to an altitude of 150,000 feet, separate from the orbiter, and fall to Earth — tumbling at speeds reaching 3,000 miles per hour.

The two SRBs provide the propulsion necessary for a shuttle to leave the Earth's atmosphere. Each

Since the space shuttle program began 20 years ago, Sandia has helped advise NASA about bringing the SRBs back to earth gently and without substantial damage.

booster is approximately 12 feet in diameter and 150 feet long. Before lift-off, SRBs are filled with propulsion fuel. By the time they reach the Earth's outer atmosphere, however, each is a hollow canister something like a 12-story-high soda bottle.

Ever since the space shuttle program began 20 years ago, Sandia has helped advise NASA about bringing the SRBs back to earth gently and without substantial damage. NASA's solution: a complex three-stage parachute system that stabilizes and slows the boosters so they plunge into the Atlantic Ocean near Cape Canaveral at only 75 feet per second, a mere 50 miles per hour. At these speeds, the undamaged SRBs can be recovered and reused in another shuttle launch.

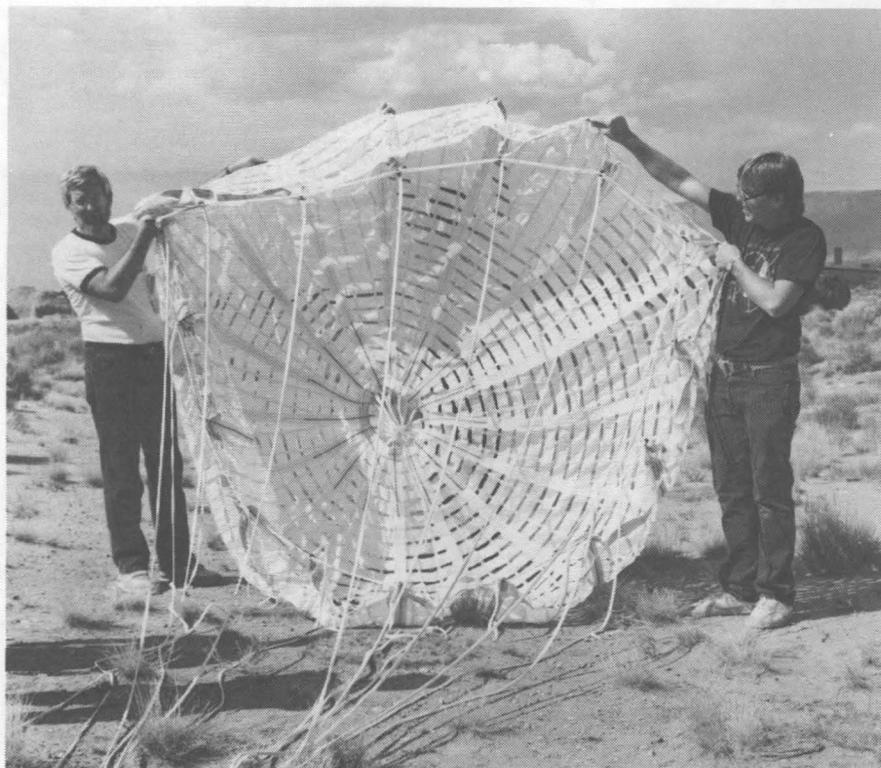
Sandia's Sled Track Shoots the Chute

In the SRB parachute system, a small 11.6-foot-diameter chute is ejected from the booster's nose cap. This chute, called the pilot chute, creates the force necessary for a larger chute to open and stabilize the tumbling rocket booster. Finally, at a prescribed altitude, three larger chutes open and slow the SRB to the speed at which it will hit the water. (See "Ups and Downs of Solid-Fuel Rocket Boosters" on page four for a description of the launch and recovery process.)

In August, Dean and a small group of Sandians tested one of NASA's pilot chutes at Sandia's 10,000-foot rocket sled track. The purpose of the test was to see if a stronger chute was needed in conditions similar to those found during SRB reentry.

"The conditions right at the point where the pilot chute deploys have become more severe — the boosters are heavier and some fly a more vertical trajectory now," says Dean. "The pilot chute must survive these higher speeds or the whole thing [SRB] is lost."

To replicate these conditions, Mark Garrett (7535), test engineer, and others loaded the pilot chute inside the tail of a rocket-shaped test vehicle, which was mounted on top of Sandia's "big ejection"



DISPLAYING AN 11.6-foot-diameter pilot chute like the one used by NASA in its solid-fuel rocket booster chute system are Bruce Rutledge (left) and Fred Hillebrandt (both contractors). The pilot chute creates the force necessary to deploy a larger drogue shoot, which stabilizes and directs the boosters. Both participated in the recent chute test along with Sandia scientists and NASA representatives.

tor" rocket sled. This sled, capable of speeds greater than Mach 2, accelerated down the sled track to a speed of 716 feet per second. "In our test, the sled reached top speed from a stationary position in less than four seconds," says Mark. "But it has a lot more capability than that."

When the sled reached top speed, the 1,300-pound test vehicle containing the pilot chute was ejected into the air with high-pressure air. "It works like a bicycle tire pump, except backwards," says Mark. "If you put air into the tire pump
(Continued on Page Four)



LAB NEWS

VOL. 42, NO. 22

SANDIA NATIONAL LABORATORIES

NOVEMBER 2, 1990

Large Staff Conference: 'Pursuing a Shift in Our Mindset'



Managing
Change

Like many other traditions around the Labs, the annual Large Staff

Conference changed this year.

Historically, these conferences have encouraged Sandia's administrators to engage in team building, contact making, information sharing, and general business updates. But this year, "instead of talking about how much better we manage the Labs, we talked about how to manage the Labs much better," says Dan Hartley, VP of Corporate Change Management 5.

The shift from steering to schooling is implicit

in the conference's title, "Managing the Change: Responding to the Challenge of the '90s," and explicit in Virgil Dugan's (6000) conference introduction: "Our focus will be on identifying the change processes, understanding the interrelationships between these processes, and *pursuing a shift in our mindset* to an empowered culture through a co-creative [cooperatively creative] process. Our objective is to leave the conference being better equipped, both individually and collectively, *to lead the change process* as we successfully respond to the challenge of the '90s" (emphases added).

Debate Time Is Past

In his kickoff remarks at the conference, held Oct. 9 through 12 in Santa Fe, President Al Narath emphasized that implementation of the Strategic

"We've burned the ships that brought us here."

Plan is moving ahead, and that the time to debate the desirability of change is past: "We've burned the ships that brought us here."

"Organizational change requires personal change," noted Dan, who summarized the mission of his new Corporate Change Management organization. "Our job is to encourage Sandians to change and to provide a process model for that change. People need to know what other employees and initiative groups are doing — in fact, our
(Continued on Page Five)



WARMING UP for an upcoming conference involving the three national weapon laboratories are Gerry Yonas (400, left), Lawrence Livermore Director John Nuckolls, and Dan Hartley (5, right). Their discussion took place at Sandia during a conference with LLNL on Oct. 17. Administrators from both labs discussed the future of the DOE weapon complex and the role of the national labs. The upcoming three-lab conference, including Los Alamos, will cover a similar set of topics and will be scheduled for later this year or early next year.

This & That

Victoria Saves the Day (Payday) – Victoria MacDonald (7170) saved the day – and the pay – for Sandia, Livermore employees recently. Livermore timecards are shipped via Federal Express to Albuquerque for processing, but a zip-code snafu caused a recent shipment to be misrouted. After getting a call about the missing timecards from the Albuquerque Payroll Section (152-1) on Friday, Oct. 11, Peg BonDurant (8523), Livermore budget assistant, reported the shipment as missing and had it traced. It was found in Las Vegas, Nev. Realizing that Sandia has an office there to support the Tonopah Test Range, Peg called Las Vegas for help, and Victoria answered. Victoria drove to Federal Express, paid the shipping costs with her personal check, took the package to the Las Vegas Airport, and put it on an Albuquerque-bound plane, again using her own money to pay for the shipment.

That's service, folks – *fine* service – from a caring Sandian.

* * *

Somewhere in the Cosmos – On a recent trip to New York, Gerry Yonas (400) heard the following from a rental-car clerk after she entered data from his driver's license into her computer terminal: "You know, it worked the first time even though you have a foreign driver's license!"

Marc Reich (contractor), when preparing several weeks ago for his Oct. 28 marriage in Atlanta, mailed a letter from his Albuquerque address to a Georgia court, inquiring about blood-test requirements. Excerpts from the reply: "Since you are in a different country, it is important that when you get to Georgia, you'll need to have your blood test transferred to a Georgia form . . . this form can only be used inside the United States."

Finally, I know that State of New Mexico promoters meant well when they put the following in a brochure, but I wish they had worded it a little differently: "Planning a Vacation? Come to New Mexico . . . there's no place like it on earth."

* * *

Oh Brother! – Early last month, Carol Kaemper (21-1) received a note from her newspaper carrier – a family operation. Carol says she finds the note charming, particularly in today's world of folks trying to do a better job. It reads, "Dear Subscriber, Your October payment is now due. Please enclose a check . . . in the envelope provided. If you prefer, I will be around to collect later in the week. For those of you who have missed a paper a day or two, please forgive my brother who delivers. I have been telling him and he should not miss any more of your papers. Your paper people, _____."

* * *

Grits Apparently Hard to Avoid – After reading my story in the last issue about a Texas waitress who demanded that I eat my grits, Don Schubeck (3412) sent a note saying that it reminded him of a trip to the southeast several years ago. Don's companion, a Northerner, didn't want grits with his breakfast and wrote in large letters "NO grits" on his meal order form. When his eggs were served with grits, the fellow asked the waitress, "Didn't you see my note?" She answered, "Yessir, but we don't have New Orleans grits, so I just gave you the regular Georgia grits." ●LP

Goal: A Healthier Workplace

New Smoking Policy Takes Effect Nov. 15, Same Day as Great American Smokeout

All buildings at Sandia will become smoke-free on Nov. 15, the day of the Great American Smokeout, an annual event when smokers are encouraged to get by for 24 hours without smoking.

The tightened restrictions will complete the implementation of a new smoking policy at the Labs that began last year, prohibiting smoking in most buildings.

However, employee concerns have persisted about environmental tobacco smoke carried from

Cardiologist's Lecture to Highlight Smokeout Activities

In conjunction with the Great American Smokeout, an annual event aimed at helping smokers to "kick the habit," Sandia's TLC (Total Life Concept) program is sponsoring a special lecture by a local cardiologist.

Dr. Frank Mowry will give a talk titled "How to Have A Heart Attack" at noon Nov. 12 in the Technology Transfer Center. All Sandians are encouraged not to smoke on Nov. 15, and are invited to attend the lecture to get some help with adjusting to the smoke-free policy.

designated smoking areas to other non-smoking areas through recirculating ventilation systems, notes Sandia Medical Director, Dr. Larry Clevenger (3300). Implementation of the second phase of the policy eliminates the need for employee petitions, memos, and significant management time in order to deal with such problems.

Phase II prohibits smoking in all Sandia facilities, buildings, and government vehicles. The policy pertains to all tobacco products, including cigarettes, cigars, and chewing tobacco. Outdoor areas will still be designated as smoking areas.

Recently, a survey of 1,000 randomly selected employees showed that only 5.3 percent of respondents smoked, says Larry. Of those who did, two-thirds smoked less than one pack a day.

Long-term benefits will include a reduction in smoking-related respiratory illnesses, resulting in increased longevity and health of employees, as well as an increased awareness of and sensitivity to a safe and healthful work environment, notes Larry.

Executive VP Lee Bray (30) notes that, according to a recent EPA study, passive smoke accounts for about 3,800 deaths a year. While Sandia's policy is not being implemented in response to that study, the data support the new policy, he says. ●



LAB NEWS

Published Fortnightly on Fridays

SANDIA NATIONAL LABORATORIES

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Sandia National Laboratories, a prime contractor to the US Department of Energy, is operated by Sandia Corporation, a subsidiary of American Telephone and Telegraph Co.

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Sympathy

To Jerry Myers (5219) on the death of his father in Albuquerque, Oct. 17.

To Ernest Brickell (1423) on the death of his brother-in-law in Boston, Oct. 19.

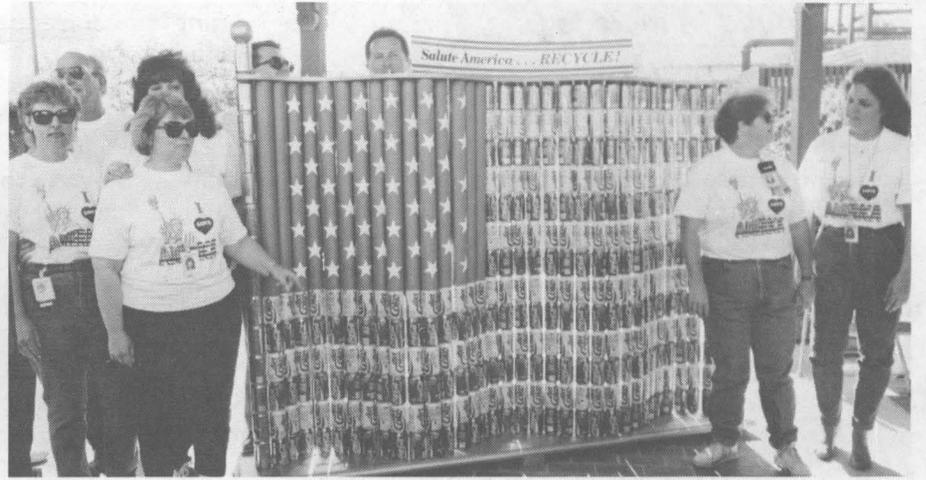
To Dave Skogmo (5212) on the death of his father-in-law in Albuquerque, Oct. 22.



PHYSICS TODAY — Sol Buchsbaum (right), Executive Vice President of AT&T Bell Labs and a Sandia board member, discusses the future of the national labs with Sig Hecker, Director of Los Alamos National Laboratory. The two were participating in a panel discussion with other science luminaries, including Sandia's Gerry Yonas (400), as part of a recent interview in Albuquerque. The discussion will be the basis for an article in the magazine *Physics Today*, a publication of the American Institute of Physics.



8100'S WINDMILL was built by (from left) Darlene West (8161), Jack Martinell (8163), Sheryl Johnson (8161), Lupe Alameda (8161), Brenda McFarland (8161), Al Mederios (8161), and Gale Hudson (8154).



8500'S AMERICAN FLAG is flanked by assembly team members (from left) Janet Brooks (8532), Lollie Nunez (8532), Laurie Farren (8532), and Kristy Sibert (8534).

LEAP Faire Shows 'Can-Do' Spirit

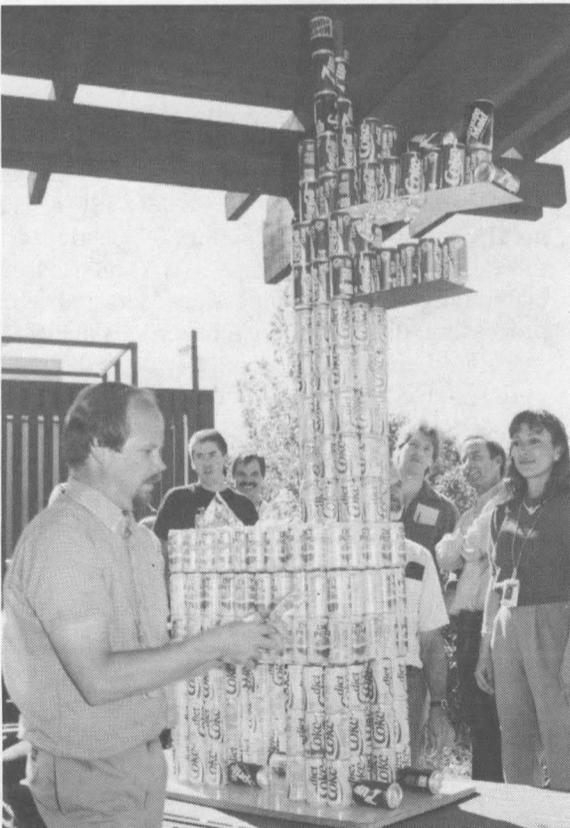
The 1990 Livermore Employees Assistance Plan (LEAP) campaign got off to a rousing start Oct. 16 with the noontime LEAP Faire, which included display tables set up by each of the non-profit human service organizations that LEAP supports. Two new features this year reflected the theme "Recycle the Human Spirit": a can-relay race, won by the 8200 team, and an aluminum-can sculpture competition among the five directorates.

The sculpture contest was won by 8200 for its tottering "Eye-Full Tower" creation, 23 feet high and constructed from 251 aluminum cans with a PVC pipe framework. Second place went to 8500 for its patriotic sculpture of the American Flag — 456 cans in flag colors with paste-on stars. Other entries were "TyCANosaurus Rex," designed by 8300; a working windmill built by 8100; and a giant abacus assembled by 8400 that spelled out

LEAP and added up to the total amount of the campaign goal — \$155,000.

During the week before the kickoff, each directorate collected aluminum cans for recycling, first place going to 8400. The combined total weighed 400 pounds, which resulted in \$360 being collected at the recyclers. That amount will go towards toys for needy children this holiday season.

Winners of the LEAP marathon were Carol Caldwell (8541) among the women, and (once again) Jim Reitz (8451) among the men. ●



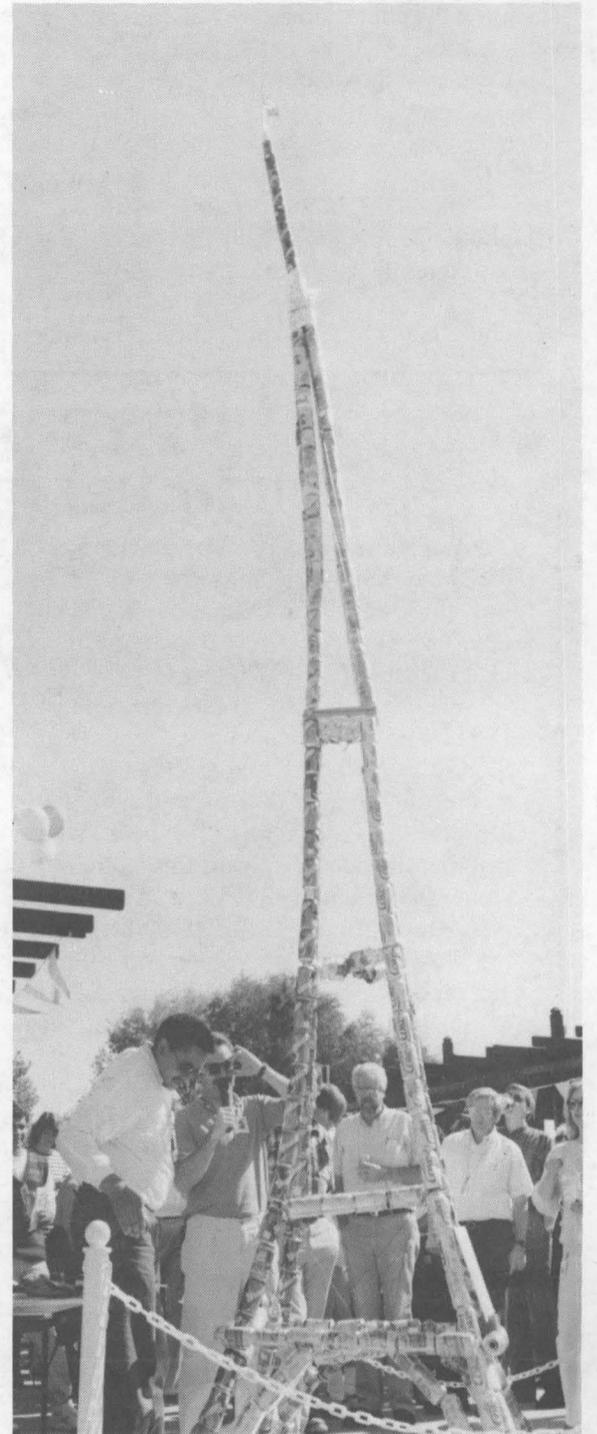
8300'S TYCANOSAURUS REX gets finishing touches from Duane Sunnarborg (8362).



8400'S ABACUS is admired by (from left) LEAP Faire emcee Mike Bell (8453) and builders Jim Gibson (8453), Jane Ann Lamph (8441), and Joe Damico (8441).



FASTEST RELAY TEAM was this 8200 group that dubbed themselves the "Ugly Mugs" for the root beer cans they carried: (from left) Bill Mason (8233), Jackie Chen (8244), Tracy Walker (8274), Jeff Rickey (8272), Mike Pendley (8210), and team captain Jerry Friesen (8236). Not shown: Mike Kanouff (8244).



WINNING SCULPTURE was 8200's "Eye-Full Tower," which was topped by a pinwheel. At left, LEAP Faire emcee Mike Bell (8453, holding microphone) talks with one of the tower designer/builders, Mel La Gasca (8236).

Comment on Environmental Impact Scheduled for Nov. 15

Sandia, Livermore, along with Lawrence Livermore National Lab (including Site 300, the remote explosives-testing area), will be the subject of a two-year environmental impact study and report conducted by DOE.

The last Environmental Impact Statement/Report (EIS/EIR) was prepared jointly at the two laboratories from 1976 to 1982. The new study, undertaken to fulfill DOE requirements, will assess the environmental impact associated with ongoing operations at Sandia, LLNL, and Site 300.

As a prelude to the process, a public scoping meeting will be held Thursday, Nov. 15, at the Livermore Holiday Inn. This meeting will provide an opportunity for the public and employees of both labs to comment on the nature and scope of issues that should be included in the study.

The sessions are scheduled for 10 a.m. and 7 p.m. and will last as long as needed to hear from everyone who wishes to speak. Written comments may be submitted to Susan Brechbill at the San Francisco Operations Office of DOE by Nov. 30.

Documents relating to the proposed EIS/EIR are available in the Building 911 lobby reading area and at the Livermore Public Library. ●



SANDIA
LIVERMORE NEWS

More Livermore News on Page Ten

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Booster Chutes

through the hose, the handle shoots up. That's how it works in our test. We used high-pressure air in the rocket sled, and the test vehicle shot up."

And shoot up it did — to an altitude of 145 feet above the test track. When the vehicle's trajectory reached its highest point, at a speed of 660 feet per second, the pilot chute was deployed. On-board tail-facing cameras recorded the event, as did high-speed motion-tracking cameras on the

"It works like a bicycle tire pump, except backwards."

ground. Other onboard instrumentation measured forces on the chute and test vehicle. In all, the test vehicle traveled 3500 feet through the air.

Dean and Mark looked on. "There's only 3-1/2 seconds between when the vehicle is launched and when the chute is deployed . . . the whole test takes only 10 seconds, but it seems like it takes forever," says Mark. "The onboard camera shots of the parachute opening are my biggest 'wow,' though — they're really spectacular."

The two tests were designed to measure parachute loads in the worst conditions expected

during booster reentry. The results will be used in studies to determine if NASA will design a stronger pilot chute. "The tests are very important," says Dean. "This chute must work if we are to recover each \$40 million booster. The tests are a small investment compared to the cost of replacing one of those boosters."

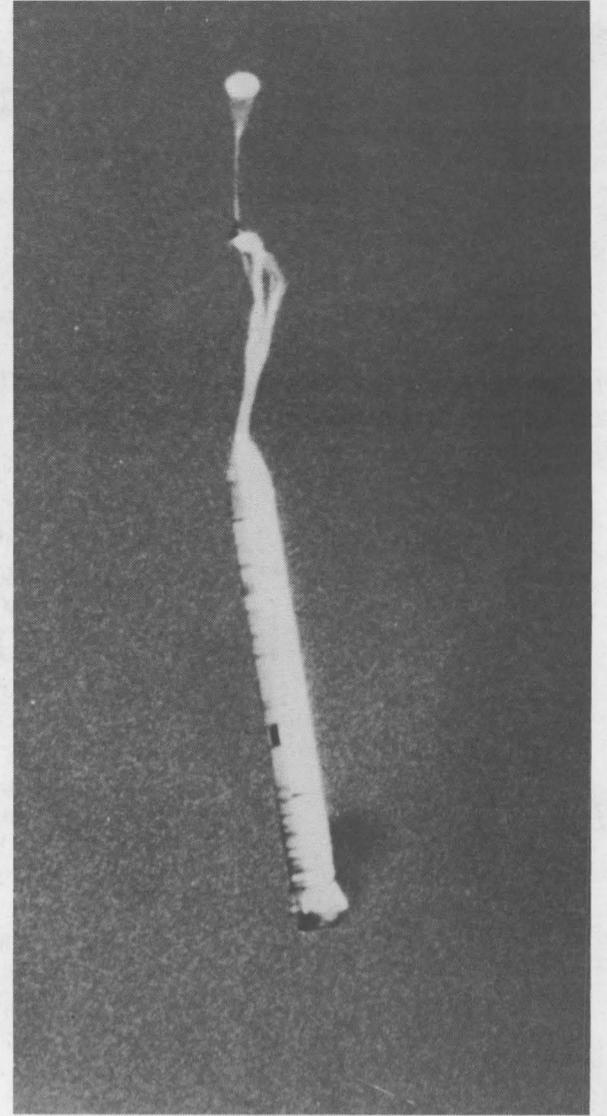
Sandia's Advisory Role

Dean has been part of SRB parachute research since the outset of Sandia's advisory effort for NASA. In the past 18 years, NASA has used such Sandia facilities as the big centrifuge, water impact facility, and both rocket sled tracks. Because of the Labs' weapon system expertise and test capabilities, Sandia was a natural for advising NASA on chute development says Dean, although Sandia's role in the overall space shuttle program was limited.

"We certainly didn't design any of the chutes," says Dean. "But we advised NASA on their designs and we performed tests on them. Sandia has a variety of capabilities in a single location, which makes doing tests here convenient."

Other Sandians who participated in the test included Dave Bickel (7535), Stan Reynolds, Ed Garavaglia, Duane Patrick (all 7535), Ken Bauhs (7532), Diana Helgesen, Alan Sehmer (both 7556), Bob Gardner (3153), and Don Goodrich (7137).

●JG



TUMBLING TO EARTH at 500 feet per second, a NASA solid-fuel rocket booster (SRB) begins its chute sequence from 16,000 feet above sea level. The pilot chute (top) and nose cap are seen here ejecting from the SRB's frustum. The photo was taken by Navy aircraft after a shuttle launch in 1983.

Ups and Downs of Solid-Fuel Rocket Boosters

While most people's attention is focused on the space shuttle orbiter as it climbs into space, something equally as dramatic is happening below. Two huge solid-fuel rocket boosters tumble to earth from 230,000 feet.

Each booster is 150 feet long and weighs 185,000 pounds when empty. From lift-off, the SRBs fire for about two minutes, burn out at an altitude of 150,000 feet, and separate from the shuttle. By this time they are traveling so fast that they coast upward for another 80,000 feet before peaking and falling towards earth.

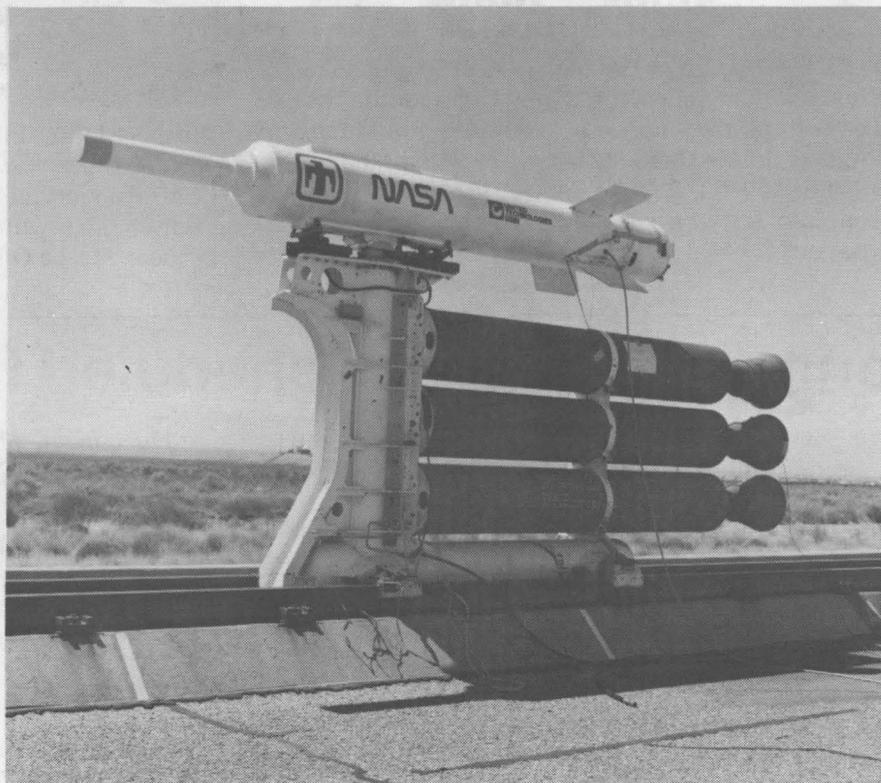
After falling almost 220,000 feet and being slowed by the air to a speed of 500 feet per second (350 miles per hour), the booster begins its three-stage parachute sequence. At 16,000 feet above sea level, the nose cap is ejected from the booster and the small 11.6-foot-diameter pilot chute is released (see photo). The sole purpose of this initial chute is to drag the next larger drogue chute from its protective packaging.

At about 10,000 feet, the 54-foot-diameter drogue chute, now fully deployed, stops the

booster from tumbling, aims it tail-down, and slows its descent somewhat. Ten seconds later, the three main chutes, each weighing more than a ton and measuring 136 feet across, are released from inside the booster's frustum. (The frustum and nose cap together form the cone-shaped booster tip.) By the time the main chutes are fully opened, the booster is at an altitude of 2,000 feet and falling at only 75 feet per second (50 miles per hour).

Only seven minutes after shuttle launch, the boosters plunge into the ocean 150 miles off the Florida coast. The chutes, now detached, float with the help of buoys, and the boosters, now hollow, bob up and down vertically in the water.

NASA recovery teams haul in the chutes and tow the boosters back to port, where a complex process of parachute cleaning, drying, repairing, and repacking takes place. When the chutes are ready for reuse, they are inserted in the booster's tip for another shuttle launch.



FAST TRACK — The Nike rocket sled and test vehicle stand ready for a parachute test in July at Sandia's 10,000-foot rocket sled test track. The sled was propelled down the track to a speed of 716 feet per second. High-pressure air in the forward portion of the rocket sled shot the test vehicle (top) into the air. The rear compartment of the test vehicle (behind the "fins") contains the pilot chute used in NASA's shuttle booster chute system.

Take Note

Technical papers are now being solicited for the 13th Annual Ideas in Science and Electronics Exposition/Symposium (ISE '91, May 14 through 16, Albuquerque Convention Center). ISE's Technical Committee seeks papers — particularly those involving applications — in 11 areas: artificial intelligence, communications, data and signal processing, directed energy, hazardous materials, integrated circuits, instrumentation and testing, optics, pulsed power, printed wireboard technology, and quality engineering. Anyone interested in presenting papers at ISE '91 should send a one-page abstract by Dec. 31 to Charles Christmann, ISE Inc., 8100 Mountain Rd. NE, Suite 207, Albuquerque, NM 87110 (phone 262-1023).

Employee Deaths

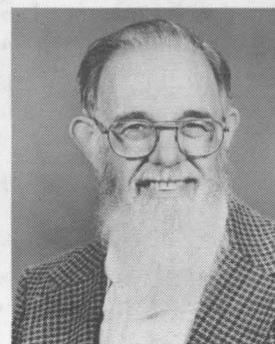


Gene Bowling of Electronic Assembly Quality Div. 7322 died Oct. 5 after a long illness.

He was 46 years old.

Gene was a senior member of the technical staff and had been at the Labs since 1986.

Survivors include his wife and two sons.



Paul Miller of Video Production and Film-Processing Div. 3153 died Sept. 17 after a long illness.

He was 62 years old.

Paul was a senior technical aide and had been at the Labs since 1961.

He is survived by his wife, daughter, and step-daughter.

Hazardous Waste Management**Governor Carruthers, DOE Sign Cleanup Pact at Sandia**

New Mexico became the eighth state to enter into an agreement with DOE to monitor cleanup and ongoing environmental activities when Governor Garrey Carruthers visited Sandia last month to sign the document.

The DOE/New Mexico agreement provides DOE funding to allow the state to hire staff to oversee the cleanup effort. DOE facilities in New Mexico are in Albuquerque, Los Alamos, and Carlsbad.

"This agreement comes from an initiative called for in April 1989 by a group of 10 state governors with DOE nuclear facilities within or adjacent to their states," the Governor said during the ceremony.

"I view this agreement as an important step in DOE Secretary James Watkins' 10-point plan for full accountability in the areas of environmental protection and public health and safety," said Bruce Twining, Manager of DOE's Albuquerque Operations Office.

Oversight of cleanup activities will be handled by the state's Environmental Improvement Division (EID). The agreement ensures access to DOE facilities as promised by Secretary Watkins to allow state employees to effectively monitor cleanup activities.

Under the agreement, EID will hire 15 full-time employees to handle on-site monitoring. DOE will provide approximately \$3 million a year to the state for hiring and training staff and for purchasing equipment.

The State Department of Public Safety will also hire an emergency response coordinator to develop emergency response plans. EID will meet regularly with DOE and will make plans for

oversight and monitoring available to local and tribal governments for their review.

At Sandia, hazardous wastes such as plating bath solutions, spent solvents, certain cleaning fluids, and commercial chemical products are repackaged and stored at the Labs' Hazardous Waste

Management Facility prior to off-site disposal.

The facility began operation in 1988 as an alternative to earlier practices of landfill disposal, and is located about a mile south of Sandia's main headquarters building. It is one of the facilities that will be monitored under the agreement. •



GOVERNOR TOURS — New Mexico and DOE formalized an agreement for monitoring hazardous waste handling and cleanup recently during a signing ceremony at Sandia. Before the ceremony, Gov. Garrey Carruthers (right) toured Sandia's Hazardous Waste Management Facility with Nestor Ortiz (left), Director of Environment, Safety, and Health 3200, and Bruce Twining, Manager of DOE's Albuquerque Operations Office.

(Continued from Page One)

Large Staff Conference

rate of change will be limited only by our ability and willingness to communicate."

Dan then summarized Sandia's 20-plus "change initiatives." Later in the conference, after Jim Powell (9300) talked about "interrelated processes," the directors heading four of the initiatives provided evidence that the projects are indeed interrelated: Larry Bertholf (7300) spoke about Quality; Nestor Ortiz (3200) about ES&H; Herman Mauney (7200) about Project Management; and Ralph Bonner (3500) about Rewards and Recognition.

Gerry Yonas's (400) presentation, "Doers, Dollars, and Deals," showed how economics, leaders, and alliances bring about global changes — and how those changes, in turn, affect Sandia.

The stage-setting portion of the conference ended with a brainstorming exercise headed by Peter Mattern (8300). Small groups created listings of Sandia's "burdens, constraints, strengths, and opportunities," all of them aspects of Sandia's culture. The large group then selected by vote the dominant examples in each category.

Strategy of Complex Change

Much of the remaining conference activity focused on the strategy of complex organizational change. As Pace VanDevender (1200) put it when introducing the formal change facilitators, "We have to mobilize our thinking about change."

"Managing 'in-betweenity'" is what Linda Ackerman-Anderson saw as a major challenge faced by Sandia's executives. "You're in between trapezes with nothing to hold onto," she noted as she differentiated between developmental, transitional, and transformational change —

"Sandia exemplifies the latter." Linda is part of Sandia's on-site change consultant team, which is providing a model for the process of corporate change.

Her partner, Dean Anderson, explored "The Co-Creative Approach to Empowering People: What It Is and How to Do It." As the participants learned, empowerment of oneself is not a simple concept. Successful empowerment of others, which is what executives are expected to be able to do, is even more difficult. In Dean's words, empowering others means "setting the conditions in

... our rate of change will be limited only by our ability and willingness to communicate."

yourself, the environment, and other people by which the empowered person is most likely to discern and take positive action despite their feelings or circumstances.

"You can empower others only to the degree to which you operate in an empowered way yourself," Dean emphasized. And empowerment is not anarchy, *carte blanche*. "It's each manager's individual responsibility to give people clear boundaries within which they have the freedom to work," he noted.

"Why empowerment?" was a basic question asked of Dean, with the condition that he go beyond the fact that "Achieve an empowered culture" is Sandia's number-one objective, according to the Strategic Plan.

Empowerment Has Personal Benefits

His reply pointed out the desirability of increasing productivity, improving response times, and sharpening customer focus. But, he said, the real benefits of empowerment are personal ones — increased creativity, greater job satisfaction, fewer bureaucratic hassles, and closer and more efficient teamwork.

The concepts of empowerment and of individ-

ual responsibility for action became the stimuli for accepting "challenges to change" on the conference's final day. Much of it was spent working the ES&H issue — how to involve individuals and groups on more than the compliance level.

During the final session, each executive was asked to choose a few specific actions from a "menu" prepared by groups brainstorming possible actions in five categories: quality, project management, ES&H, rewards and recognition, and communication. "The goal here was to get every participant involved in the change process on an individual level," said Heinz Schmitt (5000), who headed the "Leadership in the Change Process" session. "We wanted to avoid the 'As a leadership team, we're going to do X, Y, Z collectively.' Rather, we wanted each one to take on a personal responsibility for a specific action. That's what the training emphasis of the conference has really led up to."

"That's the kind of personal dedication to the change process that reassures me," said Al Narath in summing up the conference. "I had worried that this group needed someone standing over it to crack the whip. But I now feel the change process will be self-sustaining. It was a most outstanding conference. We're off and running!"

Members of the committee that designed the conference include Pace VanDevender, Ralph Bonner, Heinz Schmitt, Larry Bertholf, Peter Mattern, and Jim Powell; Virgil Dugan headed the group. Kathy Eyster (3743) was conference coordinator.

•BHawkinson(5)

Welcome

Albuquerque — Mary Garrity (22-2), Marjorie Hedges (22-2), Edwina Lopez (21-1), Elizabeth Manning (3426), Donald Plymale (7484), Susan Richardson (22-2), Audrey Scholl (21-1), Rita Simon (21-1), Virgil Thompson (3426); *Other New Mexico* — Adam Waquie (3426).

Elsewhere: Massachusetts — Michael Newman (7222).

Outstanding Materials Specialist

Al Romig Named Fellow of ASM International

Al Romig, Metallurgy Dept. 1830 Manager, has been named a Fellow of ASM International, an honor reserved for two percent of its 54,000-person membership. ASM, formerly the American Society for Metals, is an international materials information society.

ASM fellowship recognizes members for outstanding contributions in materials science and materials engineering. Al's selection was based on his "major contributions in analytical electron microscopy and the application of quantitative microanalysis to diffusion, phase equilibria, and transformations in engineering materials," according to an ASM spokesperson.

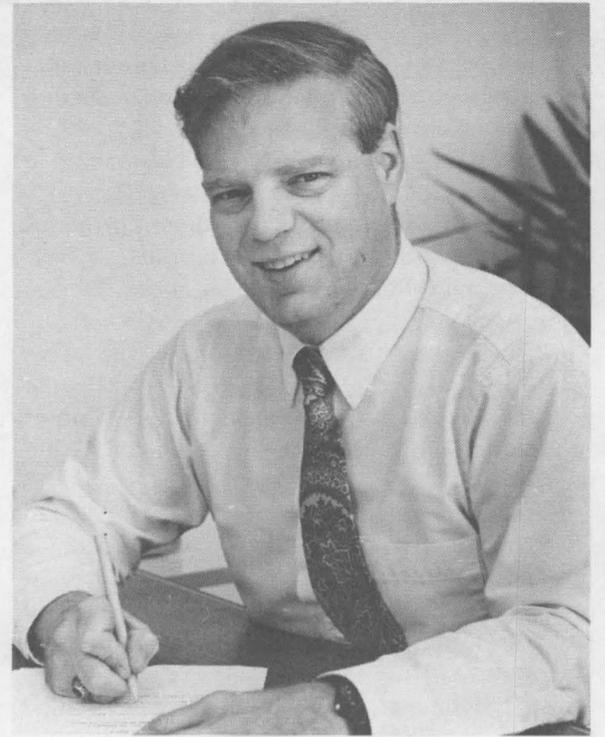
"I am pleased and honored, of course," says Al, "but my Sandia colleagues provided the encouragement, resources, and environment that made it possible."

Al joined Sandia in 1979 after receiving a PhD in Materials Science and Engineering from Lehigh University. He served as a staff member until 1987, and then became supervisor of Physical Metallurgy Div. 1831. His research interests include high spatial resolution X-ray micro-

analysis, solid-state diffusion, and phase stability. His technical interests include interactions between substrates and solders, alloy welding, and evaporative/condensation phenomena.

Two other Sandians have been named Fellows of ASM: Charles Bild (ret.) and Al's colleague, Mark Davis (1880). Mark says of the appointment, "Al has demonstrated all the characteristics one expects of a Fellow of ASM. His enthusiasm never lags, and he is an asset to any group he is working with. He has been an outstanding contributor to a number of Sandia programs in the field of physical metallurgy."

Until last year, Al taught courses in electron microscopy and microanalysis, phase transformations, diffusion, and thermodynamics at the New Mexico Institute of Technology in Socorro. He is chairman of the ASM Atomic Transport Activities Committee and vice chairman of the *Journal of Phase Equilibria* Editorial Committee. In 1988, he was awarded the Burton Medal by the Electron Microscopy Society of America as the outstanding young scientist under age 35. He was also 1989-90 president of the Microbeam Analysis Society. ●



AL ROMIG

Sandians Teaching Sandians

INTEC Honors 36 Instructors

The catalog for the INTEC program — In-Hours Technical Education Courses — has grown since 1972. In fact, the courses taught in calendar 1990 outnumber the students of INTEC's first academic year, 1972-73.

That first year, seven courses were completed by 230 students. For 1990, the totals come to 6,168 students in 231 courses, taught in Albuquerque and Livermore.

INTEC originally aimed to convey knowledge and skills applying strictly to students' technical assignments. Since 1977, however, the program has also offered courses that develop broad technical and analytical capabilities, often in new scientific and engineering areas needed to keep Sandians up-to-date as knowledge advances.

The widening spectrum of courses has drawn more and more Sandians into the program as instructors. This year, 36 Sandia instructors are teaching INTEC courses as part of their official work assignments.

The instructors were recently honored at a luncheon hosted by Education and Training Dept. 3520 and the Continuing Professional De-

velopment Committee. President Al Narath was the speaker, and Glen Cheney (2000 VP and chairman of the Sandia Education Committee) also attended.

The 1990 INTEC instructors are Dick Brodie (25), Steve Burchett (1521), John Marcon (2313), T. J. Williams (2361), Paul Wilcox (2515), Ruben Urenda (2542), Bill Greenwood (2545), Sharon Trauth (2545), Bob Yuhás (2833), Joe Lopez (2833), Chris Madigan (3151), John Gardner (3153), Joe Abbin (5130), Bob Alvis (5154), Kent DeJong (5268), Allison Davis (6315), Dick Prairie (7220), Bob Easterling (7223).

Also, Floyd Spencer (7223), Heather Allen (7223), Frank Muller (7266), Dave Bushmire (7311), Patricia Wormington (7311), Allison Kane (7311), Greg Mann (7311), Hugh MacDougall (7322), Mike Blackledge (7324), John Franklin (7324), Eric Tomlin (7324), Lynn Ritchie (7324), O'Neill Burchett (7551), Dennis Nelson (8133), Gerry Priebat (8274), George Schils (8435), Paul Beck (9216), and Olden Burchett (9333).

Instructors' supervisors were also recognized for granting the instructors time for teaching. ●



HOSTS AND HONOREES at a luncheon for INTEC instructors included (from left) Nick Magnani (2520), member of the Continuing Professional Development Committee; Heather Allen (7223), instructor; Maureen Baca (3520), member of the Continuing Professional Development Committee; T. J. Williams (2361), instructor; Joe Abbin (5130), instructor; and Allison Davis (6315), instructor.

Fun & Games

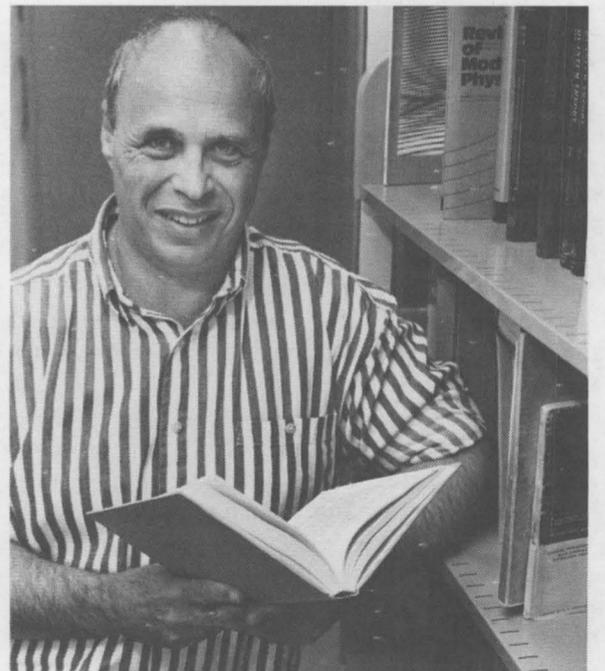
Swimming — Kirtland Aquatic Club, a year-round competitive swim team for boys and girls ages 4 through 18, is offering a learn-to-swim program starting Nov. 5 at the Kirtland Olympic pool. Classes for adults and children are available. A student/instructor ratio of 5 to 1 or better ensures individual attention. Call Vincent Baum on 293-4532 for more information.

Congratulations

To Debbie and Brian (9113) Schwaner, a daughter, Lauren Brittany, Sept. 17.

To Kim and Stephen (7413) Spiak, a son, Stephen Robert, Oct. 12.

Tonya (112) and Don (122) Wichhart, twin sons, Derek Jan and Geoffrey Taylor, Oct. 16.



DOUBLY DISTINGUISHED Sandian David Emin (1152) recently served as an Associated Western Universities (AWU) Laboratory Distinguished Lecturer, representing Sandia during the inaugural year of the lectureship program. David is also a Sandia Distinguished Member of Technical Staff. He spoke at Brigham Young University, South Dakota State University, and the University of Alaska — Fairbanks. Four other distinguished scientists from Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the Solar Energy Research Laboratory, and the Inhalation Toxicology Research Institute also traveled to several western-state universities to exchange ideas and describe research at the nation's laboratories.

Supervisory Appointments

ROBERT BLAIBLOCK to Supervisor of Employee Expense and Deduction Sec. 152-2.

Bob joined Sandia in 1983 as a member of the Internal Auditing Division, where he performed financial and operational audits of business areas for compliance with SLIs (Sandia Laboratories Instructions) and DOE orders. He transferred to the Financial Systems Division in 1986 and to the Policies and Procedures Division in 1988.

Bob has a BS in accounting from the University of Colorado, an MBA from Northern Arizona University, and is a New Mexico licensed CPA. From 1969 to 1982, he was comptroller and assistant to the VP for finance at Northern Arizona University. He was supervisor of research and grants accounting in the comptroller's office at UNM from 1962 to 1968. He's a member of the New Mexico Society of CPAs and the American Institute of CPAs.

Bob enjoys travel and investment club activities. He and his wife Grace have three adult children and live in Belen.

RAYMOND SHAUM to Supervisor of Corporate Policies Process Sec. 113-1.

Ray joined Sandia, Livermore in 1982 as a budget analyst in the Budget and Financial Division. He worked on the Cost of Living study, the Strategic Planning overview, and modernizing financial-transactions reporting. In 1985, he became a contracting representative and was involved primarily with Sandia's solar program.

Ray was on temporary assignment from 1986 to 1988 in Albuquerque as a contracting representative supporting Directorate 5200. When he returned to Livermore in 1988, he was a contracting representative for construction and services.

Other assignments have included serving as purchasing coordinator for the Technical On-Site Inspection facility, giving administrative support to the Budget Options Group, and administering line-item construction contracts.

Ray has a BS in mathematics and an MBA, both from UNM.

He enjoys team sports, camping, skiing, and reading. He lives in northeast Albuquerque.

BILLIE GARCIA to Supervisor of Accelerated Procurement Systems Sec. 3741-1.

Billie joined Sandia's Design Information Processing Division in 1975 as a specification typist in the clerical trainee program, transferred to the Safeguards and Security Services Department in 1976 as a service clerk, and became a travel agent in the Travel Division in 1982.

She joined the Design Information and Specifications Division in 1983 as a specification clerk and

in 1984 joined the Environmental Protection and Hazardous Waste Management Division as records manager. She became a buyer in the Accelerated Procurement Division in 1988 and was the division's local-area network system manager. She was named Buyer of the Year for Dept. 3740 in May 1990.

Billie is currently working on a BA in business administration at the College of Santa Fe. She enjoys skiing, golf, and dancing. Billie has one daughter and lives in the NE Heights.

BRUCE MALM to Supervisor of Information System Development Div. 5174.

Bruce joined the Labs in 1983 as a member of the Scientific Network Design Division, where he designed network protocols for the Central Computing Network. He transferred to the Advanced Systems Development Division in 1986 and worked on software for the automated technical control of the Modular Building Block (MBB) program. He led development of an emulator for the automated technical control system and the next generation of MBB systems, the Core Support Module (CSM), based on emerging industry and government standards. He was the technical lead and project liaison person for the development of the CSM for the Air Force Electronic Systems Division.

Bruce has a BS and MS in electrical engineering and a PhD in computer engineering from New Mexico State University.

He enjoys wallyball, hiking, camping, and family activities. He leads a Royal Ranger scout troop. Bruce and his wife Naomi have three children and live in the NE Heights.

JIM SEARCY to Manager of Materials and Environmental Sciences Dept. 1820.

Jim joined Sandia in 1974 as a member of the Initiating and Pyrotechnic Components Division, where he helped develop explosive materials. He transferred to the Environmental Research Division in 1977, where his work included compilation of a handbook about hazardous

properties of materials used in solar heating and cooling technologies.

He joined the Exploratory Batteries Division in 1979 and led a long-life thermal battery project. He transferred to the Storage Batteries Division in 1984, leading several projects to develop batteries for electric vehicles.

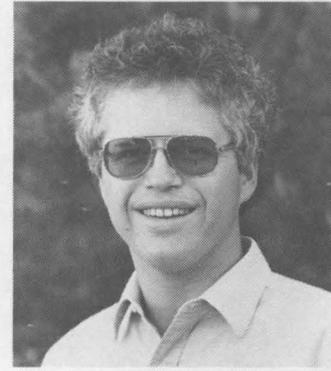
Jim was promoted to Supervisor of the Exploratory Batteries Division in 1986, working in lithium battery research, development, and production.

He has a BS in chemistry from Lamar State College of Technology (Beaumont, Tex.) and a PhD in physical chemistry from Purdue University. He did post-doctoral work at Yale University as a chemical engineering instructor. He's a member of the Electrochemical Society. In 1984, he shared a DOE Award of Excellence for significant contributions to weapon programs.

Jim enjoys gardening. He and his wife Ursula have two children and live in the NE Heights.

JOHN MAENCHEN to Supervisor of Extraction Diode Research Div. 1231.

John joined the Labs in 1983 as a member of the Target Experiments Division, where he was project leader of the intense ion beam generation and focusing experiments on the Particle Beam Fusion Accelerator I (PBFA I). In 1987, he transferred to the Advanced Diagnostic Development Division, where he designed



JOHN MAENCHEN

ablation-proof intense ion beam diagnostics, integrated the PBFA II beam diagnostics into a single unified package, designed two generations of ion-beam-generating diode hardware, and developed numerical data analysis tools.

John has a BS in mathematics and a BS in physics from the University of California (Santa Cruz), and an ME in physics, MS in applied physics, and PhD in electrophysics from Cornell University. Before coming to Sandia he worked for Physics International Co. in San Leandro, Calif., and was a consultant. He is a member of the IEEE Nuclear and Plasma Sciences Society (currently serving a four-year term on the Administrative Committee) and the American Physical Society's Plasma Physics Division.

John enjoys fencing (he's the 1990 New Mexico foil champion), carpentry, and family activities. He and his wife Vicki have one child and live in NE Albuquerque.

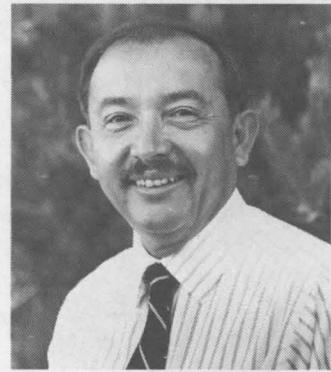
ART TRUJILLO to Supervisor of Best Practices Benchmarking Div. 7313.

Art joined Sandia's Experimental Aerodynamics Division in 1965, conducting aerodynamic testing in Sandia, commercial, and government wind tunnels. In 1975, he transferred to the Systems Analysis Division and worked under NRC sponsorship on the review and development of training, materials, and programs for transportation and fixed-site security inspectors protecting nuclear material.

In 1979, Art joined the Transportation Systems Technology Division, where he was project leader for developing technology for designing and fabricating shipping casks for transporting radioactive materials. He was also secretary for the American National Standards Institute National Standards Committee that's responsible for developing radioactive-material shipping standards. In 1984, he transferred to the Facility Systems Engineering Division, where he was responsible for establishing insider protection philosophy and developing technology to address the insider threat.

Art has a BS and an MS in mechanical engineering from UNM. Before joining Sandia, he worked for Aerojet General Corporation in Sacramento, Calif.

He enjoys sports and outdoor activities. Art and his wife Lucia have three sons and live in the NW Valley.



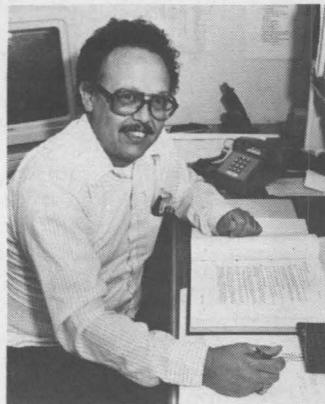
ART TRUJILLO



Volunteers in Action

Sandian Enjoys Rewards of Working with Young People

John Ulibarri (9141) has worked with young people at their best and at their worst.



JOHN ULIBARRI

Substance Abuse, and Addictions.

John is himself an Eagle Scout and credits

As a long-time member of Volunteers in Action, a program coordinated by Community Relations Div. 3163, John has devoted significant amounts of his personal time to the Boy Scouts and to the University of New Mexico Center for Alcoholism,

scouting with giving him a sense of community service. His work with the Boy Scouts is rewarding, he says, because he enjoys watching kids feel good about accomplishing goals.

But he doesn't get that kind of reward from working with young people who are substance abusers. In fact, he never really knows if he has been able to reach any of the young men he meets in group sessions on Monday evenings.

"There are moments when you see kids responding," John says. "Physically, you can tell when they're not abusing drugs and alcohol. Then their attitudes begin to change. It's a little scary. You never know if you reach these kids, but you've got to be optimistic. It would be devastating if I went there thinking this was of no use."

John became involved with the adolescent substance abuse program several years ago when group

session coordinator Ann Rutherford asked him to sit in on the group for males. It had been difficult to recruit males to be facilitators for the sessions, and she wanted more males to serve as role models.

He began working with a group of young Native American adults referred to the program by the courts. It is a four-month program designed to reduce or eliminate the drinking or drug-use habits of participants. Most of those involved have been screened by the National Council on Alcoholism or other groups. He has also worked with family groups in which kids, parents, and siblings try to work out problems.

"You see the whole spectrum in this kind of volunteer work," John says. "Peer pressure seems to be a big factor among the abusers. They seem to have problems in school and many drop out, which gives them more time to get into trouble. In most cases, I work with young men picked up for DWI. Many times these kids don't even remember being arrested. Most are dual-substance abusers, but they get picked up for their drinking. They have lost their cars, their licenses, and have had to pay property damage. They're on a real roller coaster and getting nowhere."

Role playing is a major part of group sessions in which participants are put in the role of parents. They are also given drug-abuse and sex-education classes.

"My own kids are grown now," John says. "I thank everyone — my kids' teachers and everyone else involved with them — that I didn't have these kinds of problems as a parent."

Kathie Wright, the program's clinical supervisor, says, "John's volunteer service over the last several years has been invaluable to our organization and to the families he has worked with. We have great appreciation for the time and effort he has so generously donated."

"Despite the frustration of not knowing whether you've really helped a particular kid, I get a good feeling from doing this," John says. "The program could use more volunteers. There are other non-counseling things that can be done."

John says he is a true believer that there is a cause in the community for everyone.

"There's a group that can use you if you ask them," he says. "It's nice that we have Volunteers in Action at Sandia, but there are many ways to get involved if you really want to be of service to your community. There are many Sandians who do that already, but more of us could help. Another reason to volunteer is that you meet people who have a lot of insight and a lot to offer to you personally."

●AStotts (3163)

Volunteers Focus on Education

Working with students has always been a popular volunteer activity for Sandians, but new and expanded opportunities for education outreach have increased the numbers of people who are volunteering their time and talents to the schools.

In a recent memo, Executive VP Lee Bray (30) asked employees to tell him about their education outreach activities. Paul Page (35) compiled a list of 120 responses from Sandians that ranged from science demonstrations in elementary schools to teaching graduate students.

Here's a small sample of what people reported:

- Marlin Aker (7842) volunteers about 16 hours a week working with Laotian refugee students, including tutoring.
- Fred Vook (1100) is a member of the Engineering Advisory Council for the University of Illinois.
- Judy Mead (7212) divides her volunteer time among several programs including the Sandia Speakers Bureau, Expanding Your Horizons, honors classes, and science fair judging.
- Ed Schaub (9135) has been a member of the Los Lunas Public Schools Board of Education.
- Barry Granoff (2131) is a lecturer at the University of New Mexico.
- Brien Bopp (2857) is a member of the Industrial Advisory Committee for Engineering Technology at New Mexico State University and serves on advisory committees for San Juan

College in Farmington and Albuquerque Technical-Vocational Institute.

- Patricia Martin (3722) spends six hours a week as a literacy volunteer.
- Leo Gomez (6342) gives talks in schools on oceanography and other subjects.
- Steve Ortiz (9216) gives talks in schools through the Sandia Speakers Bureau, works with the Hispanic Outreach Committee, and has been a judge at the regional science fair.
- Sabina Jordan (5210) works with Expanding Your Horizons, the Network for Women in Science and Engineering, and mentors summer youth hires.
- Marvin Kelley (8446) counsels Oakland School District officials and students about career opportunities for minority students in science, math, and technology. He also works with disadvantaged and "problem" teens, motivating them to stay in school.
- Chris Madigan (3151) is president of the board of CONTACT, a telephone crisis intervention program that works with youths and adults.
- Several Sandians give demonstrations at and help organize the "Expanding Your Horizons in Math & Science" career conference for girls held every March in California, including Glenda Muir (8451) and Lois Johnston (8317), co-chairpersons.
- Several Sandians work as docents at the New Mexico Museum of Natural History.



GOING IN STYLE — Ted Schmidt (left, 6450) was mighty surprised on Tuesday, Oct. 16 — Bosses Day — when a stretch limo with chauffeur showed up just before lunchtime in Area V. Department 6450 secretary Alex Ryburn, seen here playing the role of celebrity with Ted, had entered and won a drawing by an Albuquerque radio station; the prize included lunch for two at a local restaurant and a trip there and back in a limo. Through a little creative sneakiness, Alex kept Ted unaware right up until the limo arrived, but let plenty of other Sandians know about it ahead of time, obviously including the LAB NEWS.



FOR THE SECOND YEAR IN A ROW, a group of 15 Sandia employees and retirees won the CQ Western Electric amateur-radio contest. Gary Harms (6516), seen here with his radio setup, also won the trophy for being the top individual operator. Operators compete by contacting, via radio, as many different operators as possible within a specified time period. They also get points for contacting operators at different Bell Telephone work locations. For information about this year's contest, which takes place Nov. 10 and 11, contact Jim Baremore (6610) on 4-3690.

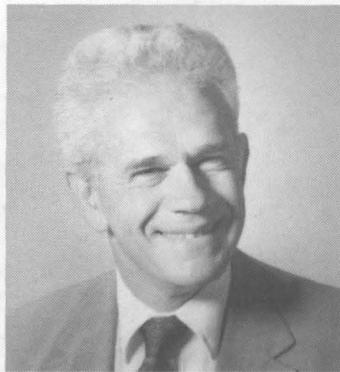
MILEPOSTS

LAB NEWS

November 1990



John Tenbrink
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Frank Halasz
8524 25



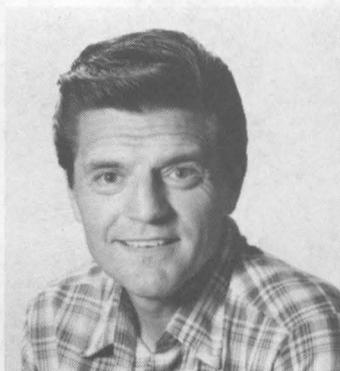
Jay Gilson
8130 35



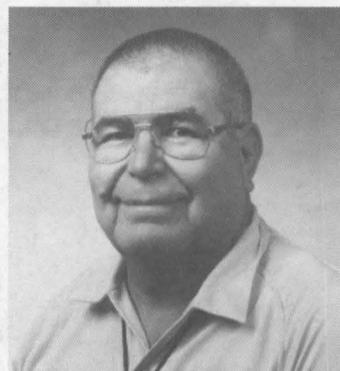
Doyle Morgan
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Robert Luna
6320 25



Jim Reitz
8451 25



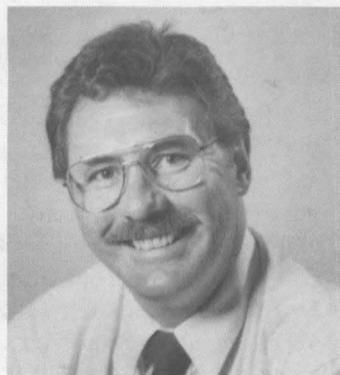
John Anaya
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Dick Roy
8164 25



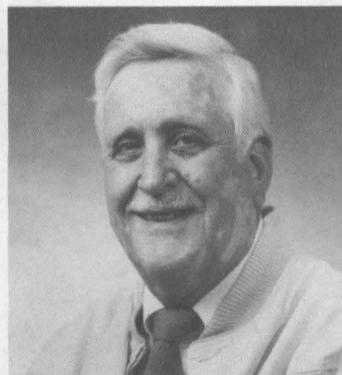
Pat O'Brion
8542 15



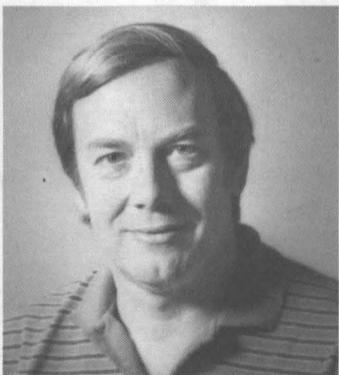
Steve Vasey
8163 20



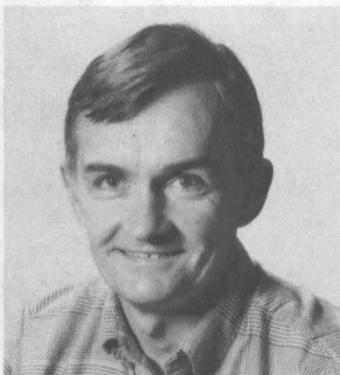
Kathleen Branagan
2551 15



Bob Fleming
7414 40



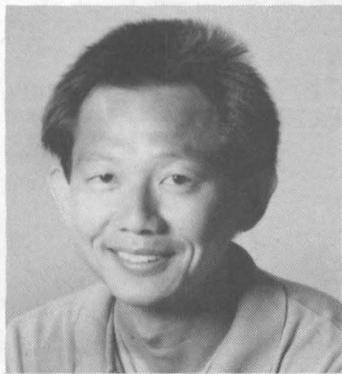
Ron Gorniak
8237 20



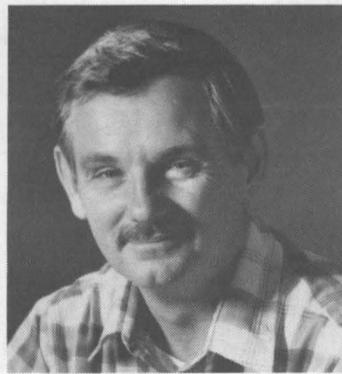
Bob Bradshaw
8313 15



Jon Barnette
2545 30



David Chin
8272 15



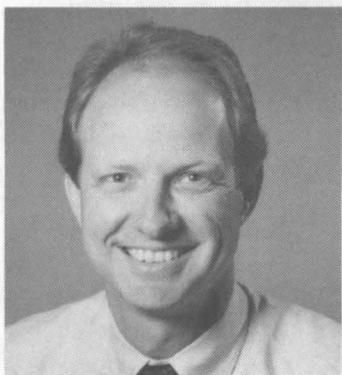
Bob Tirnetta
8513 25



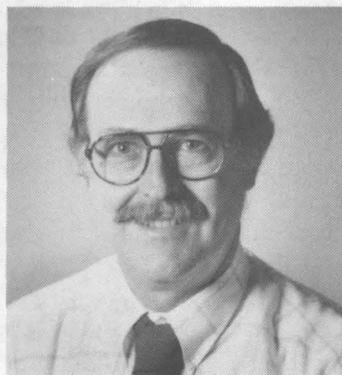
Benjamin Bader
5101 35



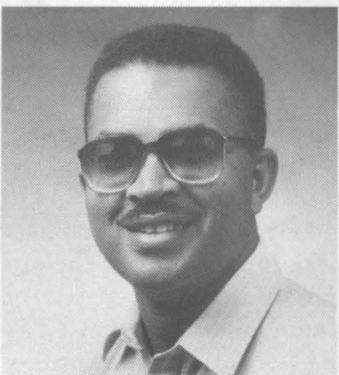
Johann Seamen
1263 20



Mike Dyer
8300 15



Mike Neuman
8133 20



Leroy Holmes
7414 20



RETIREES, SPOUSES, and Sandia staffers gather for the traditional group photo before the annual Livermore retiree dinner at Castlewood Country Club.

Livermore Retiree Dinner

Retirees and spouses turned out in force for the 25th annual Livermore retiree dinner recently at Castlewood Country Club. The traditional October get-together attracted 154 retirees plus guests and Sandia staffers, for a total of about 300 folks. Out-of-state retirees attending included Walt Dzugan, Hal Faulkner, Art Kellom, Bob Marmon, Vern McNabney, Bud Pearson, Iona Ratcliff, Don Richardson, Roy Tackett, and Joyce Willford.

Special guests from Albuquerque included Leon Smith (ret. director) and Necah Furman (7231). Necah authored *Sandia National Laboratories: The Postwar Decade*, published earlier this year. Leon served on the history review board and made numerous contributions to the book.

The 1991 Livermore retiree dinner is scheduled for Oct. 9.

(Photos by Bud Pelletier, 8285)



LONG-TIME FRIENDS (from left) Vivian Lenz, Helen Bond, and Betty Barnhouse.



SOCIALIZING before dinner are (from left) Tom Jones, Charles and Amy Drummond, Joe Vanderpoorten, and Merle Snyder.



RECALLING OLD TIMES are (from left) Bob and Trudy Martin with George and Marion Cosgrove.

Congratulations

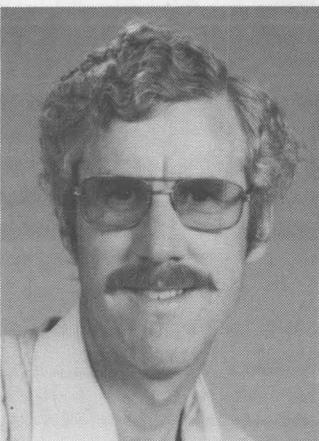
To George (8351) and JoAnn Sartor, a son, Austin Asa, Oct. 9.

To Conrad and Shelia (8541) Daigle-Beard, a daughter, Shawneka Ella Antonette, Aug. 18.

DMTS Award Started Science Grants

Energy Secretary Commends Carl Melius

Secretary of Energy James Watkins recently commended Carl Melius (8353) for helping the Livermore schools by providing grant money to assist teachers with science programs and materials.



CARL MELIUS

Some three years ago, Carl donated his DMTS (Distinguished Member of Technical Staff) cash award to the Livermore Valley Joint Unified School District with the proviso that it be used to advance

science education. Because the initial gift was used up in the first two years, Carl has supplemented it with personal donations in subsequent years, including FY91.

In a personal letter to Carl, Secretary Watkins wrote, "You set an impressive example by donating the funds from your DMTS award, an example made even brighter by the funds you supplemented from your personal account. This contribution and the message it sends indicates you are the kind of individual the President envisions when he speaks of 'a thousand points of light.' The mission of the Department of Energy to strive for excellence in math and science education is clear. You know only too well that rewarding that excellence with a grant to teachers can mean a lot — money for a field trip, equipment, or supplies

that bring inspiration and satisfaction to both teacher and student."

The school district established a grant program in Carl's name to provide an award to elementary teachers for significant contributions to science education. Each year, administrators, teachers, and parents are invited to nominate someone who has developed innovative teaching strategies or special projects in the field of science. The winner is chosen by the district's Science Advisory Panel, four of whose members are Bob Carling (8300A), Karen Scott (8526), John Vitko (8300A), and Jim Smith (ret.).

As a result of the grant program, several teachers have been able to attend science seminars or purchase classroom materials to supplement their science teaching.

feed back

Fun & Games

Q: Contractors and consultants to Sandia frequently travel on Sandia business, yet they are denied government rates for air fare and hotels. Sandia is a subcontractor to DOE, yet has these privileges. Why aren't the same privileges extended to Sandia contractors and consultants? I know one consultant who has a letter from another DOE facility permitting him to receive government rates when he travels on DOE business.

A: Thanks for your interest in reducing travel costs for Sandia's contractors and consultants.

Although Sandians on business travel currently enjoy some cost savings through government rates and air fares, our vendors have been unwilling to extend these discounts to contractors and consultants.

We will continue to negotiate discounted rates whenever possible and would appreciate any recommendations.

Bob Zaeh (3700)



Golf — Winners in the Men's Sandia Golf evening leagues have recently been determined. First-place winners of the Handicap League are Phil Fajardo (2313), Norm Padilla (contractor), Ed Bernal (contractor), and Dan Thomas (2314). The C-Scratch winners are Lou Bartel (6258), John Garcia (7532), and Rand Rozelle (2857). The B-Scratch winners are Mark Grohman (9128), Dave Kendall (7265), Gary Rivord (2818), and Tom Welch (9243). A play-off for the league championship was won by the B-Scratch team.

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.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

- GOOSE-DOWN JACKETS, western-style, size med., black, blue, brown, \$45/ea. Kramer, 294-0488.
- BRIO TOY SET, Swedish-made: wooden train, service station, more, pieces cost more than \$500, sell complete set, \$200 OBO. Weagley, 821-4263.
- APACHE POP-UP TRAILER, hard-side, self-contained, \$1500. Wilsey, 864-3125 after 4:30 p.m.
- WHEELCHAIR, small adult size, \$200; 2 walkers, \$25/ea.; adjustable raised toilet seat, \$15. Richardson, 296-8787.
- OAK DESK, \$400; Gregory internal-frame backpack, \$100; Smith-Corona electric typewriter, \$50; drafting table w/parallel edge, \$30. Edwards, 275-7611 evenings.
- YUCCA PLANTS, you dig out, free. Mozley, 884-3453.
- ARABIAN MARE, 5 yrs. old; half-quarter horse (bar stock) colt, 7 mos. old; Circle-Y saddle, some tack. Conklin, 847-2280.
- BICYCLE RACK, trunk-mount, \$10; trailer hitch, \$10; ceiling light fixture, \$10. Hudson, 884-7621.
- SHOEI RF200 HELMET, size 7-1/4 to 7-1/2, white, worn 6 times, cost \$200, sell for \$125. Crenshaw, 296-8948.
- CLARION CAR STEREO, auto-reverse cassette, theft protection, unit removable from chassis, automatic presets, \$100 OBO. Gwinn, 281-9897.
- KITTENS, half-purebred Persian, born Aug. 31, \$5. Chemistruck, 281-8789.
- NOSE BRA for '84-'85 Toyota Celica, Wolf, \$40; Australian premium sheepskin seat covers, blue, \$70. Beckett, 884-5237.
- GARAGE SALE: Whirlpool super-capacity washer, \$200; bedroom set, \$300; more, Nov. 3 and 4, 8 a.m.-5 p.m., 11605 Phoenix NE. Cernosek, 299-2252.
- EXERCISE BIKE, 34-in. trampoline, exercise rowing machine, \$50/all. Roberts, 255-9527 evenings.

- ROSSIGNOL CM SKIS, 185cm, Nordica boots, size 9-1/2 to 10, Look bindings, \$85; chest waders, size 10, Red Ball Masters, \$45. Westman, 881-0471.
- STAR NX-10 DOT-MATRIX PRINTER, w/paper, \$75 OBO. Hernandez, 266-5395.
- BROYHILL COUCH, love seat, coffee table, corner table, end table. Martinez, 345-2149.
- FIREPLACE HEAT EXCHANGER, black, w/glass & brass bi-fold doors, screen, \$50; Mediterranean-style 5-bulb chandelier & lanterns, \$20. Mackoy, 281-8606.
- MINOLTA x-700 CAMERA, lenses (2.8mm/f2.8 and 70-205mm/f3.8), power winder (single to 3 fps), timer (5, 30, 60 sec., 5 min.), \$450/all. Mitchell, 299-5144 evenings.
- GAS RANGE, Montgomery Ward, avocado-colored, \$65. Palmer, 256-3164.
- MACINTOSH COMPUTER, 512K, internal and external floppy drives, software, \$450; w/ImageWriter printer, \$800. Rondeau, 294-1741.
- SPEAKERS, Marantz Imperial 7, \$50/pair; child's bicycle safety seat, \$10. Roesch, 296-8248 after 6 p.m.
- TRAVEL TRAILER, 31-ft. Avion, aluminum, new heater, battery, faucets, water lines, \$5500. Dye, 293-8100 from 8 a.m. to 4:30 p.m. or 828-2217.
- FISHER CONSOLE TV, 25-in., 5 yrs. old, \$350; queen-size sofa sleeper, brown velour, \$250. Bronkema, 821-2119.
- AIRLINE TICKETS, 3 round-trip coach to Hawaii, in your name, good most times, depart Albuquerque before Oct. 1991, \$400/ea. Hagerman, 275-3326.
- REFRIGERATOR, Frigidaire, 13-cu.-ft. to 15-cu.-ft., apt.-size, white, \$150. Leatherman, 265-0243.
- APPLE IIc PLUS, 5.25 drive, software, Logo, diskette case, \$395 OBO. Blaich, 271-8470.
- ANTIQUUE CRADLE, wrought-iron, w/wrought-iron stand, brass corner pieces, \$175. Katz, 821-8061.
- COCKER SPANIEL PUPPIES, 7 weeks old, tails clipped, \$90/ea.; Pre skis, 204cm, poles, size-11 boots, pants, ski rack. Apodaca, 294-5525.
- DELTA DRILL PRESS, 5-spd., 1/2-hp, costs \$309 at Woodworkers Supply, sell for \$250. Zownir, 256-3753.
- ULTRASONIC ROOM HUMIDIFIER, Hanksraft Whisper Mist, 1.5-gal. reservoir, 16- to 24-hour operation, humidistat, volume controls, \$45. Schkade, 292-5126.
- TWIN BED, w/trundle frame, two mattresses, painted headboards, \$50. Newcom, 293-5180.
- SOFA, contemporary layered look, 6-ft., beige, \$225. Mason, 299-2836.
- UPRIGHT VACUUM, Kenmore, 1-1/2 yrs. old, power cord, auto height adjustment, \$75 OBO. Thomas, 268-1532.
- COMMODORE 64, w/printer, software, \$275; World Book Encyclopedia, \$200; children's furniture, \$200. Salisbury, 268-7113.
- LAWN MOWER, self-propelled, \$75 OBO. Rodacy, 293-2668.
- CARTOP BICYCLE RACK, Thule, fits cars w/gutters, lockable, \$60; Barre Crafter ski rack, \$20. Smith, 243-0714.

- ICE SKATES, woman's size 5, \$15. Bruch, 275-1553.
- ACOUSTIC GUITAR, Yamaha model FG-410, w/case, \$285 value, sell for \$200. Kinney, 823-1246 evenings.
- ESCORT/LYNX OIL & AIR FILTERS, 8 new spark plugs for GM 350 V-8, all free. Berg, 296-2695.
- BABY BICYCLE SEATS, \$5/ea.; young children's bike helmets, \$10/ea.; Thule ski rack, \$30. Anderson, 897-2772.
- LOVE SEAT, \$150; 13-in. studded snow tires, \$45; new quilting frame, w/extension, \$50; twin-size bedframe/spring, \$15. Burstein, 899-8971.
- CHURCH OR HOME ORGAN, retired teacher's instrument, make offer. Purdue, 275-7503 afternoons and evenings.
- QUEEN-SIZE WATERBED, w/6-drawer pedestal, dark pine, \$100; cane-back chair, \$35; desk, \$15; Stutz camper shell, \$100. Thibeau, 281-5143.
- AQUARIUM, 45-gal., w/stand, extras, \$300; Sears exercise treadmill, \$250. Shurtleff, 296-7870.
- AIRLINE TICKET, one-way, Albuquerque to Philadelphia, Nov. 20, \$182. Hartman, 296-7924.
- TRAILER HITCH, frame-mounted equalizer, easy-lift style, \$45. Neil, 884-4461.
- MINK AND LEATHER JACKET, size 12, recently cleaned and glazed, \$500 OBO. Newman, 299-2729.
- DOUBLE BED, folding frame, mattress and box spring in boxes, \$35. Auerbach, 296-1489.
- RADIAL-ARM SAW, w/table, \$175; Corning Megapure still, \$150; assorted electronic test equipment; lithos by C. Bragg (set). Duncan, 281-8792.
- MINIATURE DACHSHUND PUPPIES, AKC-registered, \$200. Puccini, 255-0568.
- ENTERTAINMENT CENTER, oak cabinet, 67"W x 60"H x 22"D, holds 27-in. TV, stereo, VCR, records, VCR tapes, additional storage, \$350. Schindewolf, 831-1940.
- GRAPHITE FLY ROD, Orvis, custom-built, 8-1/2-ft., for 8-weight line, \$225; Jennings split-T bow, quiver, sight, 20 arrows, \$175. Ortiz, 869-3278.
- COLOR TV, 9-in., AC-DC, \$175; receiver hitch for Ford pickup, \$50 OBO. Garcia, 293-3937.
- TWO WOODEN DESKS, \$25 and \$35; 4-in. jointer/planer; Hammerlund HQ-170A receiver. Richards, 281-9471.
- WATERBED, super-single, 3-drawer base, heater, liner, needs mattress, \$125 OBO. Jones, 881-1918.
- BOXER PUPPIES, AKC-registered, dark fawn and brindle, parents on premises, \$200 to \$225. Owenby, 281-9688.
- FURNITURE GIFT CERTIFICATE, worth \$500 at Scandinavian Interiors, no expiration date, \$400. Palmquist, 281-5951.
- ZENITH LAPTOP COMPUTER, 80C88 processor, 1MB RAM, serial port, parallel printer port, battery pack, internal modem, warranty, \$1000. Caffey, 296-1942.
- AT&T 6300 PC, w/math coprocessor, 360K floppy drive, 20MB hard disk drive, color monitor, \$750. Carson, 281-5115.

TRANSPORTATION

- '88 KAWASAKI DIRT BIKE, KX80 Big Wheel, \$750 OBO. Marquez, 836-5153.
- '88 OLDS. CUTLASS SUPREME, V-6, red, 2-dr., AT, AC, AM/FM, 21K miles, under extended warranty, \$9300. Barker, 831-5055.
- '86 FORD F-150 XLT, loaded, one owner, camper shell, 68K miles, maintenance records, \$7800. Ferguson, 292-3824.
- '67 CAMARO, stock bench seat (rare), new alternator, carburetor, heater, hoses, \$2800. Lewis, 291-8181.
- '83 COUGAR, maintained, options, \$2975. Perryman, 281-3020.
- SPORT/TRAINING BICYCLE, Specialized Allez SE, \$200. Crenshaw, 296-8948.
- '85 MERCURY MARQUE, 59K miles, loaded, \$3000; '76 Chev. pickup, 4-spd., 2 tanks, \$2500 or trade for tractor. Lackey, 869-9333.
- '90 HONDA CR125 DIRT BIKE, 30 hours running time, \$2200. Sceiford, 298-6396.
- REPOS: '89 Ford Probe, '83 Camaro Z28, '79 Dodge Ram, '82 Chev. Beauville van; bids accepted through Nov. 7, we reserve the right to refuse all bids, subject to prior sale. Sandia Lab FCU, 293-0500.
- '80 LINCOLN MARK VI, 4-dr., white, moon roof, new tires, 20-mpg. Blaich, 271-8470.
- '84 HONDA XR200R TRAIL BIKE, 6-spd., \$750; helmet, boots, gloves, elbow pads, shoulder pads, truck ramps. Vigil, 296-3590.
- '88 YUGO, take over payments, \$95/mo. Lovato, 884-0521.
- '88 CHEV. PICKUP, 4x4, extended cab, Silverado package, 1/2-ton, 38K miles, camper shell, trailer package, \$13,000. Ferguson, 281-9864.
- '85 FORD F-150 XLT EXPLORER, V-8, 4-spd. AT, 34K miles, loaded, original owner, \$7950. Myers, 298-2677.
- '81 CHEV. CHEVETTE, 4-cyl., 4-spd., 30-mpg, \$850. Graf, 266-7885.
- HONDA HOBBIT, needs some work, \$110 OBO; '82 Suzuki GS750E, \$850; '79 K10 Blazer, \$2500 OBO. Bray, 292-2410.
- '83 FORD E250 VAN, 30K miles on engine, 78K miles on chassis, 5.8L engine, AT, HD cooling and electrics, \$3700. Mendel, 265-3840.
- YAMAHA ROUTE 66 MOTORCYCLE, 250cc, 5K miles, \$1850. Hartman, 296-7924.
- '89 JAMBOREE RALLYE MOTORHOME, 23-ft., Ford V-8 F350, AC, generator, bed, bath in rear, 6K miles, \$30,000. Key, 298-9103.
- '87 FORD PICKUP, F250XL, 351 engine, AT, AC, PS, cruise, new tires and battery, 42K miles. Billmaier, 296-6332.
- '88 GMC C2500, 3/4-ton, 4.3L V-6, AC, AT, OD, cruise, PS, PB, transmission cooler, 23K miles, white, \$9750. Spence, 266-0924.
- '84 BUICK CENTURY STATION WAGON, loaded, \$300 below book, \$3150. Hartwigsen, 865-7836.

REAL ESTATE

- 4-BDR. HOFFMAN HOME, near Wyoming and Menaul, all brick, 2000+ sq. ft., dining room, 1-3/4

- baths, den, \$86,800. Salgado, 892-5130 or 888-1508, leave message.
- 4-BDR. HOME, NE, den, living room, 1-3/4 baths, double garage, greenhouse w/lap pool and spa. Beasley, 298-3398.
- 1.5-ACRE HOMESITE, in Forbes Park, 1/4 mile from national forest boundary, near Fort Garland, Colo., \$8500. Tischhauser, 293-9768.
- 3-BDR. HOME, 1-3/4 baths, living room, den, completely remodeled, near park & schools, corner lot, NE Heights, \$69,800. Luther, 296-4464 or 271-0174.
- 2-BDR. MOBILE HOME, 14' x 70', 1 bath, appliances, DW, AC, washer/dryer, in Four Hills Park, yard, mountain view, \$12,500. Thomas, 268-1532.
- 2-BDR. MODULAR HOME, South Valley, 2 baths, 1300+ sq. ft., 1-1/3 acre, assumable, \$12,000 down, \$476 monthly. Garcia, 873-4337.
- 3-BDR. MOBILE HOME, '86 model, 28' x 40', 2 baths, appliances, 12' x 16' porch, below book, \$20,000. Jones, 865-1544.
- 1/3-ACRE LOT, Blake SW, \$16,000. Puccini, 255-0568.
- 2-BDR. WOOD BROS. PATIO HOME, 2 baths, 2-car garage, off Spain between Morris and Juan Tabo. Biringer, 821-8741.
- 4-BDR. HOME, remodeled Mossman, 1890 sq. ft., 20' x 27' 2-car garage, hardwood floors, covered patio, 6301 Natalie Ave. NE, \$108,500. Barnett, 293-8040.

WANTED

- SWIVEL RECLINER, clean, comfortable. Worobey, 255-5912 evenings.
- NORDICTRACK, models Pro or Achiever. Shepherd, 299-9066.
- BICYCLE HANDLEBARS, touring or mountain (not drop) style, w/appropriate brake levers, for converting old 10-spd., will pay \$10 maximum. Schkade, 292-5126.
- CORAL for saltwater aquarium. Cropp, 296-1877 after 6 p.m.
- BUNK BEDS, sturdy construction, solid wood, w/rails & ladder, with or without mattresses. Bott, 823-2821.
- HOME for long-haired white cat, short tail, blue eyes. Vest, 255-7886.
- HOUSEMATE, share 3-bdr. home, 2 baths, 2-car garage, near Montgomery and Morris, male nonsmoker preferred, \$340 plus 1/2 utilities. Moreno, 296-1435.
- HOUSEMATE, male nonsmoker, share 3-bdr. townhouse, located two miles from KAFB, \$250/mo. Hesch, 268-6122.

SHARE-A-RIDE

- RIDE NEEDED from Carlisle and Constitution for a few weeks. Hansen, 265-3987.
- CARPPOOL DRIVERS NEEDED, from Rio Grande and Griegos to Bldg. 802 and back home again, from 8 a.m. to 5 p.m. Krantz, 345-4075.



Coronado Club Activities**Walk, Jog, or Run to the C-Club**

THE SEASON OF SELF-INDULGENCE is approaching fast, so work up an appetite dancing to the music of Bob Banks and his Trio tonight. Kitchen cuisine includes prime rib, poached halibut (both two-for-one-priced at \$14.95), filet mignon (\$8.95), chicken breast smothered in green chile (\$5.95), and pan-fried catfish (\$7.50). From the bar, try martinis, Manhattans, or stingers (all \$1.75). Reservations recommended (265-6791).

KIDS, HERE'S YOUR CHANCE to play bingo and win great prizes, Sunday, Nov. 4, beginning at 2 p.m. The grand prize will be Nintendo's "Game Boy," and a low-cost buffet will be offered starting at 1. Bingo costs only \$2.50 per player, so bring your friends.

SEE THE WHITES OF THEIR EYES on the big-screen TV while you watch your favorite teams

play every Monday night. All month, the Club lounge features Monday Night Football, munchies, drink specials, and great NFL giveaways.

AND BINGO WAS ITS NAME. Say goodbye to regular Thursday-night bingo because Nov. 8 and 15 will be your last two chances to play until January. Card sales begin at 5:30 p.m., early-bird games begin at 6:45, and regular bingo starts at 7. The usual great-tasting buffet fare will be available.

BRING-YOUR-BOLO BONANZA takes place Friday, Nov. 9, from 8 p.m. to midnight, as Trio Grande plays some down-home dance music. Mike Coughenour will give dance lessons from 7 to 8 to help you get off on the right foot, and anyone wearing a bolo tie gets a free drink. Menu selections include chicken-fried steak, poached cod (both two-for-one-priced at \$10.95), prime rib,

fried shrimp (both \$7.95), and T-bone steak (\$8.95). Call ahead, please.

BREAKFAST, LUNCH . . . AND ARTS & CRAFTS? That's right. Next Sunday's (Nov. 11) C-Club brunch features an arts & crafts fair along with its regular brunch menu: scrambled eggs, omelets, sausage, bacon, french toast, pancakes, ham, turkey, and the Club's special green chile stew. Adults eat for \$5.95, kids (age 4 to 12) for \$2.50, and toddlers for free.

HEY DEALER! Why are there *six aces* in this deck? Ask this question and many more at the T-Bird card sharks next meeting. Meetings for November take place Thursday, Nov. 15, and Thursday, Nov. 29, both starting at 10 a.m. Come out for lively conversation and crafty card playing.

Take Note

A PVDF Shock Sensor Workshop will be held Dec. 11, 12, and 13 at Sandia. The workshop is a joint effort supported by Sandia, Ktech Corporation, Institut de Saint-Louis (France), and Metravib. The workshop objective is to provide basic information on shock sensor operation with emphasis on applications and hands-on demonstrations. Specific accomplishments and current work will be discussed, and PVDF sensor fabrication facilities will be toured. For information, call Lloyd Bonzon (2514) on 5-8989.

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The Society of Women Engineers (SWE) will hold its annual convention in San Diego June 25-29, 1991. Papers are requested on technical and professional development topics related to the convention theme, "Engineering Our Future: Enhancing the Quality of Life." Papers from non-members are welcome. Deadline for abstracts is Dec. 15. For more information, call Jan Williams (7823) on 6-6428 or Margie Whipple (6221) on 6-7742.

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To celebrate National Career Development Month, the Albuquerque Chapter of the New Mexico Career Development Association is sponsoring a forum, "Albuquerque Careers 2000." The forum will be held Nov. 14 at the TVI Auditorium (717 University Blvd. SE) from 7 to 10 p.m. Topics include wage scales, potential growth and new industries within New Mexico, small business/entrepreneurial trends, special options for minority employment, nepotism issues, incentives for graduates to stay in the city or state, reshaping career skills and available resources, and defederalization's effect on the area's future job opportunities. A moderated panel addressing these topics includes Congressman Steve Schiff, Albuquerque Chamber of Commerce President George Friberg, and representatives from the Department of Labor, KAFB, management training firms, Women's Executive Self-Sufficiency Team, health-care professionals, TVI, and UNM. Reservations are required. Call 888-7368 for information.

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A new six-part series, "Korea: The Unknown War," will air Nov. 12 through 14 at 9 p.m. on KNME-TV, Channel 5. New evidence is presented about the controversial aspects of the conflict: the outbreak of hostilities, the extent of Soviet involvement, alleged atrocities against civilians in both North and South Korea, the treatment of prisoners of war, the debate over potential use of the atomic bomb, and allegations that America used germ warfare.

Events Calendar

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

Nov. 2-4 — "The Impresario," by Mozart, and "Spencer, or a Tempest in a Teapot," by Jeffrey Bishop, double-bill one-act operas, presented by Opera Unlimited; 8:15 p.m. Fri. & Sat., 2:15 p.m. Sun.; Popejoy Hall, 277-3121.

Nov. 2-11 — "Man and Superman: A Comedy and a Philosophy," by George Bernard Shaw; 8 p.m. Tues.-Sat., 2 p.m. Sat. & Sun.; KiMo Theatre, 243-4500.

Nov. 2-17 — "She Loves Me," Broadway musical comedy set in an elegant European parfumerie in the 1930s; 8 p.m. Thurs.-Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

Nov. 2-17 — "Memorandum" by Vaclav Havel, witty assault on the madness of efficiency peculiar to total bureaucracy, winner of the 1967-68 Obie Award for best foreign play, presented by Theatre-in-the-Making; 8 p.m., CenterStage (3211 Central NE), 260-0331.

Nov. 3 — Bountiful Autumn Bazaar, crafts, gifts, food; 9 a.m.-6 p.m., Kirtland East Officers Club (east of Wyoming Gate).

Nov. 3-4 — Forty-first Annual Hollyberry Fair, Christmas bazaar; 9 a.m., St. Mark's on the Mesa Episcopal Church (431 Richmond Pl. NE), 262-2484.

Nov. 4 — Concert No. 1, Albuquerque Philharmonic Orchestra, featuring all-Russian program with works by Dmitri Kabalevsky, Modest Musorgsky, and Tchaikovsky; 7:30 p.m., UNM Continuing Education Building (Indian School & University), 881-7281.

Nov. 4 — Fine Arts Series: operatic tenor White Eagle (member of the Sioux Indian Reservation in South Dakota); 4 p.m., First United Methodist Church (4th & Lead SW), 243-5646.

Nov. 6 — Subscription Concert II, Chamber Orchestra of Albuquerque, w/guest artist Eric Ruske (formerly associate principal horn of the Cleveland Orchestra), program includes "Hymn and Fuguing Tune No. 2" by Henry Cowell, "Horn Concerto No. 4 in Eb Major, K. 295" by Mozart, "Symphony No. 3 — Camp Meeting" by Charles Ives, and "Concertino for Horn in E Minor, Op. 45" by Carl Maria von Weber; 8:15 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

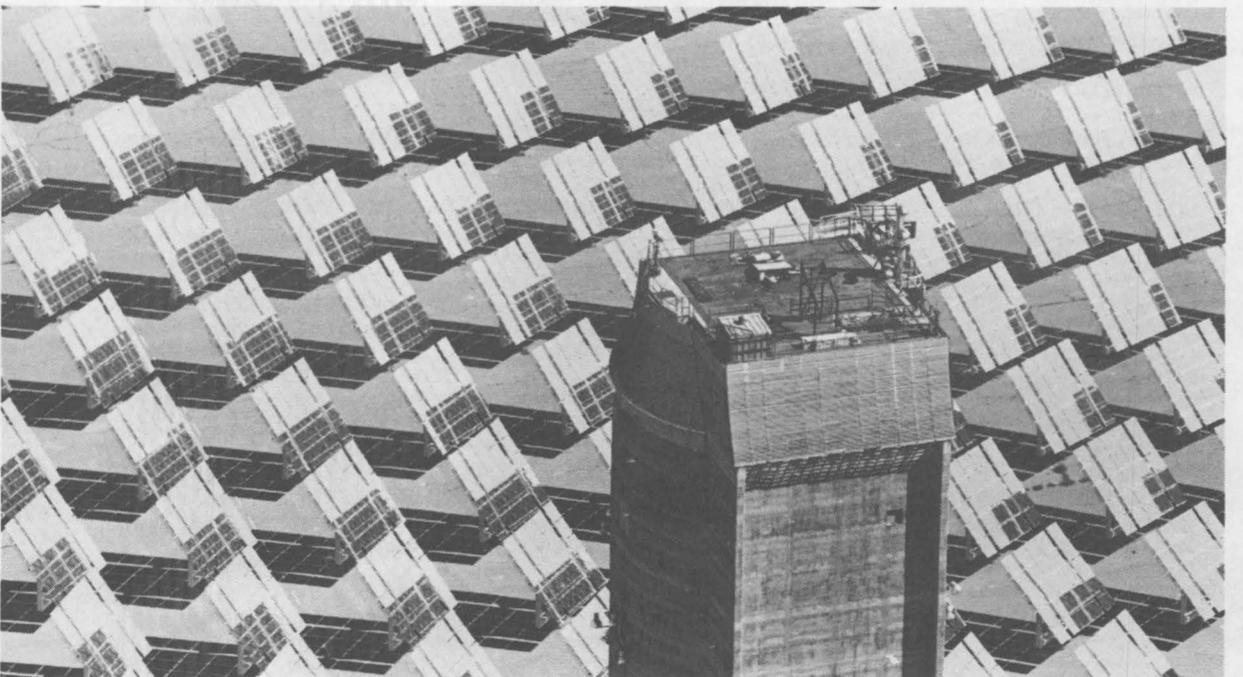
Nov. 7 — "Coppelia," Royal New Zealand Ballet; 8:15 p.m., Popejoy Hall, 277-3121.

Nov. 8, 9, 10, 15, & 17 — "As You Like It," comedy by William Shakespeare, presented by the UNM Department of Theatre and Dance; 8 p.m., Rodey Theatre, 277-4402.

Nov. 8-11 — Southwest Arts and Crafts Festival; 10 a.m.-10 p.m. Fri. & Sat., 10 a.m.-6 p.m. Sun.; Exhibit Hall, NM State Fairgrounds, 262-2448.

Nov. 10 — "African Allure — Fashions for the 90s," African fashion show and sale, presented by the National Council of Negro Women and the African Studies Department at UNM; 7:30 p.m., UNM Continuing Education Building auditorium, 839-4335.

Nov. 15-18 — Tenth Annual Holiday Ogle, holiday arts and crafts show and sale, sponsored by the Junior League of Albuquerque; 7-10 p.m. Thurs. (preview night, \$25/person), 10 a.m.-8 p.m. Fri. & Sat., 10 a.m.-5 p.m. Sun.; East Exhibit Hall, Albuquerque Convention Center, 247-1800.



OUT STANDING IN ITS FIELD — Sandia's Solar Tower Facility stands out in a field of heliostats. The heliostats (motor-driven mirrors that adapt to the changing position of the sun) focus sunlight on the top of the tower where high-intensity-light and thermal experiments are conducted.

