

AROD Developed for Short-Range Aerial Reconnaissance

Military land battles are won or lost for many reasons. Leadership, training, weapons, supplies, and troop numbers are just a few factors.

But the outcome may hinge more on how much you know about the enemy before the battle. Exactly where is the other force? How many troops are there? Are they poised for attack or dug in for a defensive battle? Are they weak on any particular side? Do they have tanks or other heavy weapons?

Sandia has developed and demonstrated a tool that can help military field commanders answer such questions. It's an unmanned aerial vehicle (UAV) called the Airborne Remotely Operated Device, or AROD for short.

If AROD were a baby, only a parent would think it pretty. Its looks have been described in two national publications as an "animated fire hydrant" and a "flying washtub." But it was designed for function, not form, and Sandia is definitely a proud parent.

It's about five feet tall — including the protective roll cage (see photo, Page Four) — and 30 inches in diameter. It weighs 68 pounds empty and 85 pounds with a full load of fuel. A small generator supplies power for its stabilizing sensors and the computer.

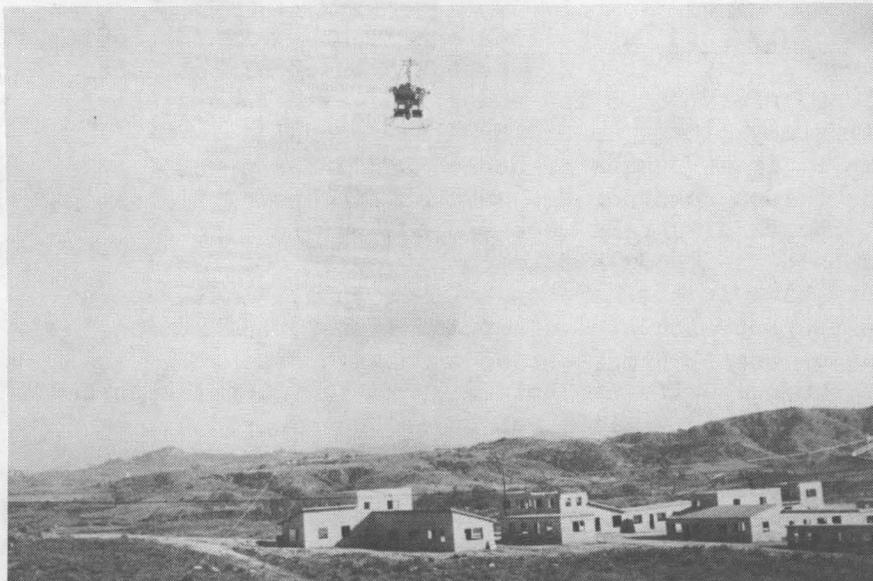
Project leader Duane Arlowe (DMTS, 5261) says Sandia designed, built, and demonstrated AROD for a simple kind of mission: short-range reconnaissance to give troops "a look over the next hill."

Although developed primarily for use in traditional battlefield situations, AROD might be used for other "lofty" missions, including surveillance of rooftops and other hard-to-reach places. It may also have some non-military applications — security surveillance around sensitive facilities and a quick response to prospective intruders, for example.

"Its looks and the noise it makes would probably scare off intruders," Duane says. "If you had never seen anything like this, it's a good bet you'd turn tail and run once it started buzzing around your head."

Hovers for About an Hour

AROD is an operator-controlled (via a fiberoptic cable) hovering device that can stay in the air for about an hour. The vehicle consists of a ducted fan, driven by a 26-hp, two-stroke, two-cylinder



A FLYING WASHTUB? Nope, it's AROD, Sandia's unmanned aerial reconnaissance vehicle flying over "Combat City," a battle-training facility at Camp Pendleton, Calif. This flight took place in January when 10 of the vehicles were delivered to the US Marine Corps for detailed flight testing.

engine. Lift is controlled by varying the engine and propeller speed (rpm). Four independently driven control vanes near the bottom of the vehicle provide directional control. Various sensors and an onboard computer provide automatic stabilization.

Developed primarily by Advanced Systems Dept. 5260, AROD is operated by someone at a ground control unit packaged in a portable suitcase-type container. Live television pictures taken by two miniature cameras on the AROD are displayed on a 9-inch screen on the ground control unit.

The high-resolution black-and-white cameras can be aimed in any direction, panned, and tilted by manipulating the ground controls. One camera has a field of view of 50 degrees — a "normal" perspective; the other covers 20 degrees — a close-up view.

AROD is designed to hover in winds as strong as 30 knots (nearly 35 mph). The automatic stabilization system (onboard computer) allows the operator to control the vehicle easily and quickly.

"That's one of its real beauties," Duane says. "We designed and built it so troops with minimum training could fly AROD and make it perform its intended tasks."

"A lot of credit for that goes to Bob Clem's group [Exploratory Systems Development 9100] and the Aerodynamics Department [1550]," Duane continues. "They did the software programming for the onboard computer that makes automatic stabilization possible. John White and John Phelan [DMTS] of 9132 did most of that work. And Bob Weir of the Aeroballistics Division [1551] helped considerably

(Continued on Page Four)



LAB NEWS

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AROD PROJECT LEADER Duane Arlowe (DMTS, 5261) checks out the ground control unit. The portable unit transmits flight instructions to AROD and pan/tilt instructions to AROD's two television cameras. Live TV pictures taken by the cameras are displayed on the 9-in. screen. Larry Fox and Barry Schoeneman (both 5261) did most of the development work on the ground control unit.

Romig Awarded Burton Medal

Alton Romig, supervisor of Physical Metallurgy Div. 1831, is the 1988 winner of the Burton Medal. The award is presented each year by the Electron Microscopy Society of America (EMSA) to "the outstanding young [under 35] scientist . . . adjudged to have made the most important contribution in the field of electron microscopy within the immediate preceding five years."

Since its inception in 1975, the Burton Medal has traditionally gone to a physical scientist one year and a biological scientist the next. It's named after Eli Burton, the University of Toronto professor responsible for building, in 1938, the first transmission electron microscope in North America.

Al first worked with electron microscopes as a grad student at Lehigh University (Bethlehem, Pa.) in the late 70s. In 1979, he joined Sandia's physical metallurgy division and continued his work in the field of analytical electron microscopy, a technique for measuring a material's chemical composition on a very small scale — a few hundred Angstroms (an Angstrom is a ten-millionth of a millimetre, or about four-billionths of an inch.)

"So it's a useful tool for studying several microscopic phenomena in, for example, metal alloys," says Al. "Our primary interest is phase transformations and solid-state diffusion." A phase transformation in a solid is not as obvious as the transformation

Antojitos

Sandian Singlehandedly Puts Out Yellowstone Fire! Well, not quite. But a vacationing Steve Falacy (2564) did attack a bunch of hot spots with his old Field Test safety boots and a dog-food dish (not a shovel, as reported in the AP story picked up by the Albq Journal).

"Yellowstone was a jigsaw puzzle of burned and green areas," he reports. "We were on a loop road and saw several batches of flames in an unburned section. No firefighters were around, and few other tourists. I figured that 'somebody had to put it out.' So I did."

A few days later, back in his hometown of Missoula, Mont., Steve was lunching at a restaurant with his mother and sister when someone brought in a clipping of the AP story out of a Spokane paper. "I was pretty surprised, although my wife had told me a Butte [Mont.] reporter had come by and talked with her while I was up on the ridge fire-stomping. But my mother and sister were more surprised -- I hadn't remembered to tell them about it."

For the record, this newspaper does not condone behavior that endangers the life, limb, and lungs of Sandia's human resources. But we don't condemn it either -- maybe it's something about Sandia's "can-do" ethos; maybe it's the way Steve put it: "Someday I'll be able to say I had a real hand in saving that chunk of forest!" No, Steve -- foot.

* * *

NOW What Do We Do When We Get Sick? Okay, all of us health-conscious Sandians are now watching our diet (and it's not the "seafood" diet -- "I see food, I eat it"), and we don't smoke (at least on the job), and we drink alcohol only in moderation. (Given the ubiquitous endorsements, I plan to open an upscale bar called "Moderation").

All that health stuff is great -- but it puts us into the dilemma that Mark Twain once described (I paraphrase here for lack of both space and memory). Said Twain: "I went to my doctor and told him I was feeling poorly. He gave me some medicine, but he said it wouldn't have a chance to do me any good -- 'You smoke those cigars all day, you drink a quart of bourbon every day, and you keep on seeing those lady friends of yours.'"

"Well, I gave up those delicacies for a week or so, and took to the medicine, and, sure enough, I felt well again. Then I happened on a married lady whose health had been going down and down. I told her I could cure her in a week. All she had to do was to give up drinking and smoking and associating with her men friends.

"'Why, Mr. Twain,' she said, 'I can't give those things up because I've never done any of those things!'"

"Well, there you have it -- she'd neglected her habits. She was a sinking ship with no freight to throw overboard."

* * *

The Preceding Is Prologue to a mini-tribute to Lois Amsden (2631). Lois hired into Sandia on Jan. 7, 1957. She retires today. And she's never taken a day of sick leave, a statement even Medical finds plausible. (I mentioned her in this column on her 30th service anniversary, and she's been just as healthy since then.)

"What's your secret?" I asked her. (Here's where the Twain selection segues smoothly into the story.)

"Smoking cigarettes, drinking booze, and chasing guys," she replied. (Actually, she attributes her record to a genetic predisposition to good health -- "choose your parents carefully," I always say -- a strong work ethic, jobs she enjoyed, and luck.) ●BH

Welcome

Albuquerque

Lynn Dosanjh (6423)

Arizona

Michael Ross (9212)

New Mexico

Jeffrey Carlson (9133)

Tennessee

Vicki Johnson (2648)

Congratulations

To Sandra Brown (8535) and Paul Simmons (8532), married in Reno, Aug. 27.

To Vera (8242) and Peter Revelli, a son, Scott Peter, Sept. 21.

Sympathy

To Ken Henry (8444) on the death of his father in Brookfield, Mo., Sept. 10.

To Ron Stoltz (8441) on the death of his mother-in-law in Atlanta, Ga., Sept. 12.

To Charles McCain (8535) on the death of his mother in Vallejo, Calif., Sept. 22.

Teacher: 'What I Did Last Summer'

IISME Gives HS Teacher Labs Experience

This summer, Sandia participated in a program to improve science education through the IISME (Industry Initiatives for Science and Math Education) Teacher Placement Program.

Martin Abrams, a teacher at John F. Kennedy High School in Fremont, worked under the tutelage of Mark Allendorf (8361) on software development for laser diagnostics. Martin wrote a program that synchronized two lasers, and updated commercial software used to operate an optical multi-channel analyzer.

"Martin was great," says Mark. "He was independent and a hard worker. And he was able to seek out the people and equipment he needed."

"This program is successful because it doesn't involve make-work projects -- he worked on problems that needed to be worked on. So Sandia benefited -- this task got done. And Martin benefited -- he returned to the classroom with extended knowledge and increased confidence in today's technology."

Later this year Mark plans to visit Martin's classroom in Fremont.

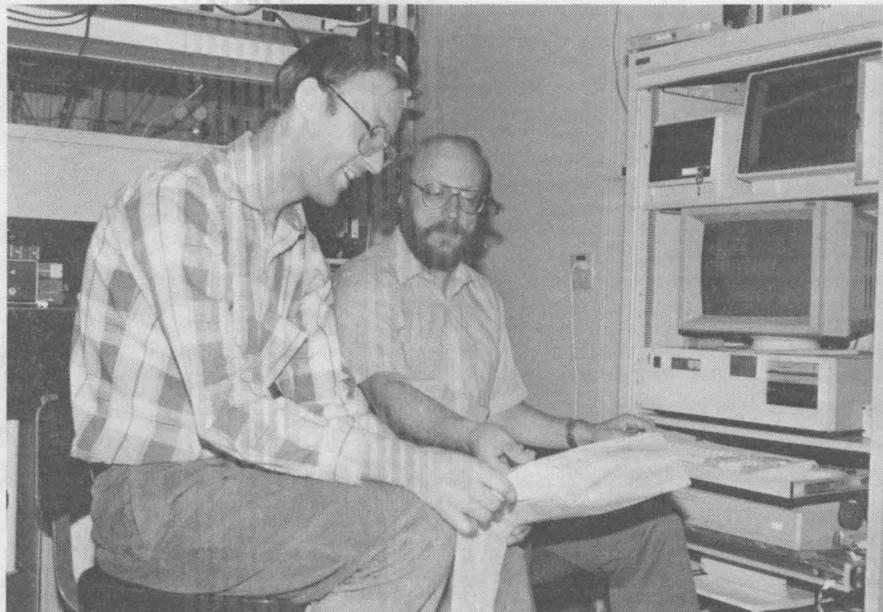
The IISME program began in 1985 as a response to the perceived US crisis in math and science education. IISME places teachers in industry and government research labs for the summer and helps them throughout the year to translate their experiences into curricula changes.

And Now . . . Here's Congressaurus!



Commenting on the Kiwanis International vote to admit women, NOW President Eleanor Smeal said that integrating women into "dinosaurs such as the Cosmos Club and the Bohemian Club and indeed the Congress . . . is just a matter of time." Congressional paleontologists, take note.

Wall Street Journal



HIGH SCHOOL TEACHER Martin Abrams (right) worked with Mark Allendorf (8361) on software development for laser diagnostics this past summer. Martin's tour of Sandia duty was arranged through IISME's (Industry Initiatives for Science and Math Education) Teacher Placement Program.

LAB NEWS

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Nichols and Team Honored for New X-Ray Microscope

A new scientific instrument developed cooperatively by Monte Nichols (8313) and his fellow researchers at Lawrence Livermore National Laboratory and West Germany's University of Dortmund has won an R&D 100 award (formerly called an I-R 100 award) from *Research & Development* magazine.

That means the instrument has been singled out as one of the nation's 100 most innovative products of 1988. It also means that Monte has been an award recipient in two out of the last three years.

The winning project centers on a three-dimensional chemical X-ray microscope developed by Monte and fellow researchers John Kinney and Quintin Johnson of LLNL's Chemistry and Materials Science Department, Allyn Saroyan of LLNL's Computation Department, and Ulrich Bonse and Rudolph Nusshardt of the University of Dortmund's Physics Department.

"The need by some of our advanced programs for high resolution in chemical characterization of materials was a driving force behind the development of this instrument," Monte explains. "It allows three-dimensional imaging of composition, crystallographic phases, and densities of materials at resolutions to five microns [a human hair is about 100 microns in diameter]."

"Although it's similar to the conventional 'CAT-scanning' technology used in the medical community, the new device has a resolution about 100 times better. It can provide three-dimensional visualization of chemical information in opaque samples — and do it nondestructively."

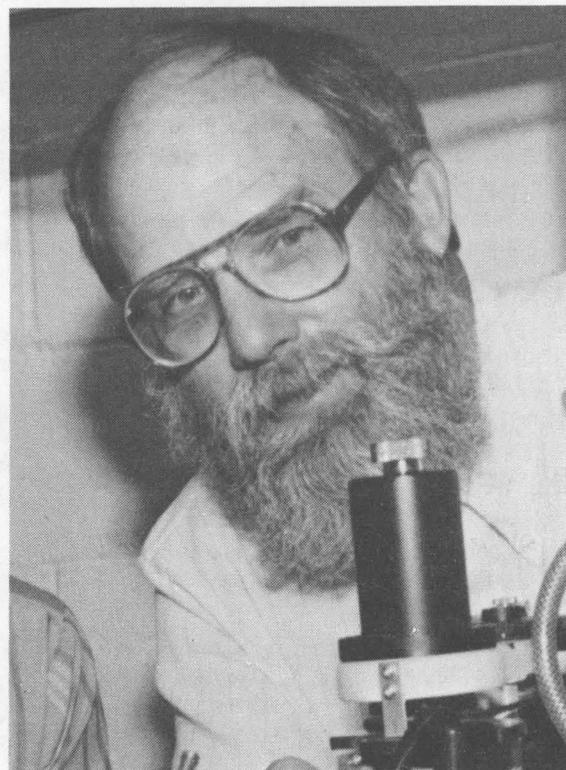
Sandia President Irwin Welber, in congratulating Monte and his colleagues, wrote: "I was especially pleased to learn that this is the second time in the past three years that your work has been recognized with an R&D 100 award. You are the first Sandian to receive more than one of these awards; you can be justifiably proud." Monte, along with Dale Boehme (also 8313), won the award in 1986 for developing an X-ray microanalyzer that measured various properties of micron-sized material samples.

The latest X-ray microscope provides a totally new capability for materials scientists. Typically, scientists must prepare samples before microscopic imaging is possible. According to Monte, sample preparation can sometimes greatly complicate the interpretation of images because the preparation changes the samples.

Furthermore, no tool was previously available for looking inside an opaque material to study the distribution of elements, phases, and networks. This three-dimensional visual simulation of the inspected material allows the user to "get inside" the materials in a way never before possible.

Monte received the joint award on behalf of Sandia during a banquet Sept. 22 at the Museum of Science and Industry in Chicago.

Research & Development magazine began the international competition in 1978. The R&D 100 awards recognize the top 100 products, materials, processes, software, programs, and systems of scientific origin from the previous year.



MONTE NICHOLS (8313)



Wanted: Some More Bucks, Lots More People

LEAP Campaign Expands Horizons

Sandians are being asked to dig a little deeper this year — to increase their pledges during the LEAP '88 campaign for human services agencies.

"The goal is set at \$145,000, just \$5000 more than last year," says LEAP chairman Louie Tallerico (8284). "Last year, we ended at 83 percent participation. I'd love to see 90 percent this year."

The employee-run LEAP (Livermore Employees Assistance Program) campaign kicks off Tuesday, Oct. 11, with the various agencies participating in a noontime LEAP Faire. LEAP contributions will help fund 30 charitable and nonprofit groups in the area, including the Combined Health Agencies of California and the United Ways of the Bay Area, San Joaquin, and Stanislaus counties.

"This year, we have an excellent employee committee that's full of enthusiasm," Louie adds. "The members took an aggressive role in realigning the selection of agencies, because they realized that more

(Continued on Page Five)

Come One, Come All!

Don't Miss the Greatest Show at Sandia

Ladies and Gentlemen! Boys and Girls! Children of All Ages! Welcome to the Greatest Show at Sandia!!

Yes, the Sandia Big Top is going up. More incredible circus performers have *never* been assembled.

Your genial ringmaster, Cliff Yokomizo, will introduce *unbelievable* — and executive-level — acts in the Center Ring: an impressive strongman, a daring tightrope walker (working *without* a net!), a courageous human cannonball, and a circus horse so clever you'd think it had a college degree.

Even *before* Circus showtime, you can join a fun run/walk around the Midway.

And then, while munching all-American hot dogs and popcorn, you can visit the Arcade and play in the game booths. Each directorate booth will feature an *easy* game of skill and/or chance. Prizes will be awarded in every booth! (You'll also have an opportunity to meet some of the LEAP agency reps strategically interspersed among the booths.)

And that's not all — clowns will wander

around *everywhere*. One clown not only juggles but also creates balloon animals! Watch for the clown on the unicycle too.

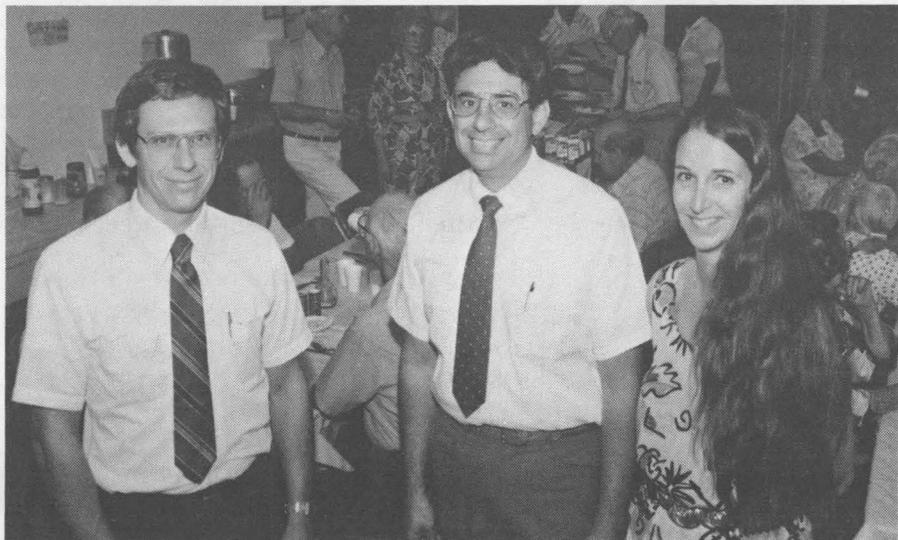
Be sure to stop by the Sideshow and have your fortune read by our *mysterious* gypsy fortune-teller, Madame Claire Voyant. And you just won't be able to stop staring at D. D. — half man, half woman!

After the spectacular center-ring events is a *colossal* raffle with many, many prizes for those of you who sign up early for "Fair Share" pledges. Once again, the grand prize — thanks to his continuing support and generosity — is VP John Crawford's parking space for a month. "It lets you arrive at 7:25" and still be at work on time!

As we go to press, LEAP Circus Chairman Sam Johnson is auditioning even more amazing acts for the Sandia Circus.

You won't want to miss this event. You'll see acts that Ringling Bros. and Barnum & Bailey could never have booked.

One performance only — Tuesday, Oct. 11.
Don't miss it! ●CEnglish(8522)



SENIORS' MEALS program at the Livermore Rec Center, sponsored by Spectrum Community Services, was visited by three LEAP workers (from left): Greg Evans (8245), LEAP Drive chairperson Louie Tallerico (8284), and Sandra Lormand (8524).



LEAP COMMITTEE members show off the posters promoting the Sandia Circus, which will include booths staffed by all recipient agencies. From left, standing, are Jack Bishop(8535), Sandra Lormand (8524), Sam Johnson (9284), and Greg Evans (8245). Seated are Sue Weber, Sandra Bowers (both 8284), Carol Verity (8535), Louie Tallerico (8284), and Cindy English (8522).

(Continued from Page One)

AROD

with wind-tunnel tests, aerodynamics tests, and propeller design."

AROD's automatic stabilization system maintains the vehicle's established altitude and heading if the operator has to leave the ground control unit while the vehicle is in the air. If the communications link between the control unit and vehicle is disabled for any reason, and the operator doesn't re-establish communications within 50 seconds, the vehicle automatically descends to a landing.

Developed for the Marines

The Labs developed AROD as a reimbursable project for the US Marine Corps. The effort was part of a Marine program for introducing ground and air "teleoperated" vehicles to the Corps. (Teleoperated means controlled by a remote operator viewing television pictures transmitted from cameras on the vehicle.)

Sandia developed the airframe and the propulsion systems in addition to the control system. The Naval Ocean Systems Center in Hawaii supplied the fiber-optic video and control link and an optional helmet-mounted display for the teleoperation aspect.

Duane emphasizes that the system is still experimental and is only one of many unmanned aerial vehicles that are being developed or tested for military use. Some have offensive capabilities, but AROD was designed primarily for reconnaissance missions on land.

There's been talk of using AROD for specialized missions over water. For example, it could be flown from the deck of a ship and used to spot ocean mines.

AROD's first free-flight took place at Sandia in the spring of 1987 after several tethered flights above safety nets. Based on the flight tests, several design changes were made and then incorporated into 10 ARODs that were built and delivered to the Marines early this year.

The 10 were for a detailed testing program, which was begun but suspended soon thereafter by the Marines because of a new Defense Department UAV master plan that covers all military services. It calls for all "close-range" UAVs to have a minimum 30-kilometre range.

"That doesn't mean that some version of AROD won't eventually be adopted by the military for specialized uses," Duane says. "We designed AROD to meet the range requirement defined by the Marines several years ago. But, as currently designed, AROD does not meet the new range requirement."

"The primary factor limiting its range is the fiber-optic cable that we used for communications between the vehicle and control unit," he says. "An enemy can't jam signals transmitted over fiber-optic cable. The UAV committee dropped that requirement, so we are now incorporating radio-frequency transmitters to extend AROD's range." ●LP

Some Anxiety in the Air with AROD

Flight tests of new aircraft involve risk and possible danger. Military test pilots, known for their steel nerves, would probably admit openly that their heartbeats increase noticeably when they fly a new prototype.

It's not quite the same with a new unmanned aerial vehicle like AROD, but AROD project leader Duane Arlowe (DMTS, 5261) says there was definitely some anxiety and apprehension in the air along with AROD during the early Sandia test flights.

The AROD vehicle is designed for automatic stability in flight, but a couple of people need to grab and hold onto the roll cage as the vehicle lands to keep it from tipping over — especially when the ground is rocky or uneven.

Thanks, AROD Team

Div. 5261: Duane Arlowe, project leader; Karlan Boultinghouse, lead mechanical designer; Larry Fox, ground controller; Charlie Greenholt, mechanical design; Henry Harada, production coordinator; Dan Lowe, sensors design; Jeff McDowell, mechanical design; Larry Predika, electrical system design; Barry Schoeneman, ground controller; and Roger Showalter, electrical system support.

Div. 5215: Eloy Cota, electronic assembly. Div. 5268: Rick Mills, communications. Div. 1551: Bob Weir, aerodynamics. Div. 3153: Bob Gardner, flight documentation. Div. 9132: Fred James, John Phelan (DMTS), and John White, stability and controls. Div. 2542: Fred Opiel and Marc Polosky, dynamic mechanical design. EG&G: Margine Criddle, electronic assembly.

"Many thanks to these dedicated and durable Sandians who performed well beyond usual expectations. Their efforts were critical to the success and timeliness of the AROD project."

*Neil Hartingden
Supervisor, 5261*



UFO REPORTS are possible when the Sandia-developed Airborne Remotely Operated Device (AROD) flies. In spite of its ungainly looks, AROD is a sophisticated electronic hovering machine that does aerial reconnaissance by sending live television pictures back to the ground control unit. It has an onboard computer that provides automatic stabilization and two high-resolution television cameras. The computer, radio receiver, stability sensors, and other electronic components are housed in the white package surrounded by the protective roll cage.

Even though the propeller is enclosed and AROD can be maneuvered slowly, it's noisy and not something you would intentionally approach when it's operating.

The first flights were tethered flights over a safety net. But proving that AROD really worked as designed eventually required free-flights with no tether and no nets.

The soundness of the design and engineering work was borne out by the Sandia flight tests. "Although we had a few mishaps and did some minor damage to the vehicle during the early tests, we never really destroyed one during development," Duane says. "And most importantly," he adds, "no one was ever injured."



Helping the Helpless

Help Infirm Make Decisions

It's tough to be old, frail, or ill, and incapable of making decisions about your daily business affairs and medical needs. But it's even tougher when you don't have family or friends who are both able and willing to help you.

Unfortunately, many people — including some locally — are in that very situation. For any of several reasons, they are infirm and have no competent, caring person to help them make informed medical decisions or take care of business chores like writing checks, paying bills, and filing insurance claims and tax returns.

Desert State Senior Resources (DSSR), a statewide non-profit agency headquartered in Albuquerque, is looking for a few good Sandians (about 15) to help such people. Part of this effort is an outgrowth of the Medical Treatment Guardian Program initiated at UNM last year. DSSR has added that program to its existing services and has expanded it to include additional kinds of help for patients.

Dottie Hadley, medical treatment program director for DSSR, emphasizes that volunteers are needed primarily to help the patients with business and medical decisions and standard business-type chores. "We don't expect volunteers to provide primary medical or personal care," she explains.

A Real Need for Caring Helpers

"The need is much greater than we can meet," says Linda Siegle, DSSR executive director. "Most of those we need to help are older, incapacitated persons who have no relatives or close friends who can and will help them. Many are in hospitals or other institutions and simply don't have the physical or mental ability to manage their affairs. Some have been exploited or abused. They really need a caring person to help them."

Volunteer caseworkers from Sandia will work closely with DSSR and give the agency periodic updates about the patient's progress throughout the period of help. Besides assisting patients with business chores, volunteers are expected to help them with the following: determining appropriate medical treatment; checking with physicians, friends, and the patient; making recommendations to DSSR about appropriate patient care; and tracking down next of kin (if any). The DSSR will assume and retain all legal responsibility for the clients, according to Dottie.

Interested Sandians who complete a training program are expected to serve as volunteer caseworkers for anywhere from 30 days to 6 months for an individual patient on a one-to-one basis. The four-part training program will be conducted by DSSR beginning Wednesday, Oct. 19, and will continue each Wednesday through Nov. 9. Sessions go from 6 to 10 p.m. and will be held at St. Joseph Northeast Heights Hospital on Montgomery (near San Mateo).

Patients Matched to Volunteers

Desert State Senior Resources will work to match client (patient) needs to a volunteer's area of the city, available time, language, and other considerations, says Dottie.

Sandia's participation is being coordinated through the Volunteers in Action (VIA) program. "This is a chance to make a real difference in the lives of some New Mexicans who truly need help," says VIA coordinator Karen Shane (3163).

Sandians who think they may be interested in volunteering for this program can get additional information by contacting Karen on 4-3268.

Romig

from, say, water to ice. But a solid can change from one crystal structure to another, with accompanying chemical changes.

"For example, heat-treating an aluminum-copper alloy could push the copper into certain areas and change the alloy's crystal structure," Al explains. "That would be a phase change." (Depending on the material and its processing, solid-state diffusion may or may not induce a phase transformation.)

"Analytical electron microscopy is a powerful diagnostic tool in developing new alloys. It's also useful in understanding failures in existing alloys because it allows us to understand the changes in microstructure that occur during processing — heat-treating, welding, brazing, soldering, and so forth.

"It also helps us understand aging in alloy materials," Al continues. "It gives us answers to questions such as, 'What happens to the reliability of a solder joint after 20 years?'"

In addition to alloys, the technique is useful in gathering data on thick and thin films, soldered connectors and leads, and (a new thrust) aluminum interconnections on integrated circuits.

"It's fascinating work," Al concludes. "I see myself as using science to solve engineering problems. In a sense, I have the best of both worlds."

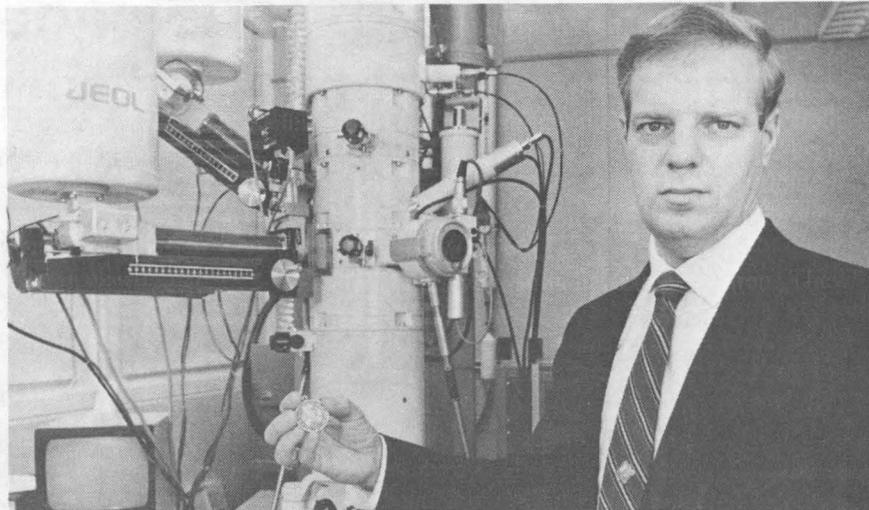
Rationale Behind the Burton

Contrary to popular opinion, one does not receive the Burton Medal for marrying Liz Taylor twice. Nominations for the award are submitted by members of the Electron Microscopy Society of America; the winners are selected by an awards committee and approved by EMSA's executive council.

Although the medal always goes to one person, Al is quick to point out that he received it for the work Sandia has done. Sandia has used analytical electron microscopy not only to measure phase diagrams and solid-state diffusion quantitatively but also, for the first time, to apply those techniques ("in a serious way," according to Al) to weld joints.

Other Sandians involved with these studies include microscopists Marty Carr, Tom Headley, Chuck Hills, and Bill Sorenson (all 1822). Al's work on aluminum-copper alloys was done with Darrel Frear (1832), and his work on weld joints with Mike Cieslak (1833).

In addition to the research, Al has been active in EMSA and other professional societies. He also co-authored and co-edited a book, *Principles of Analytical Electron Microscopy*, published in 1986.



BURTON MEDAL winner Al Romig (1831) shows off his prize. Behind him is the analytical electron microscope on which he and other Sandians perform quantitative materials studies.

Electron Microscopes: Laboratory Workhorses

The analytical electron microscopes (AEMs) that Al Romig (1831) and his colleagues use are most closely related to transmission electron microscopes (TEMs). But AEMs have features borrowed from other electron microscopes (scanning electron microscopes and their cousins, electron microprobes) as well.

TEMs work well in providing a look at the microstructure of bulk samples, but the sample has to be thinned — thinned enough that the electrons generated by the TEM can pass through the sample and provide an image of the sample's microstructure.

"Preparing a sample slice isn't easy," says Al. "Sample thicknesses range from a few hundred to 2000 Angstroms, or 0.2 micron [about a hundred-thousandth of an inch] at the most."

The TEM drives electrons accelerated to 100,000 to 200,000 volts — very fast — through a sample. "It's more or less like looking at the slides you studied in your biology class," Al explains. "Your microscope put light through your thin sample of amoebas on the slide. Here, the TEM scatters electrons, not photons [light]. But, like your old microscope, you get only an image — not numbers, not quantitative data."

AEMs are the latest generation in the electron microscope family. Much of the early work necessary to prove AEM capabilities was done

at Lehigh University, Al's alma mater.

"So I guess I was one of the first researchers to use AEM as a quantitative tool," says Al. "Those of us in the field, at Sandia and elsewhere, have learned that AEM is an extremely sensitive analytic technique. We can — with mathematical processing of the data [known as deconvolution] — detect portions of an atomic monolayer at a grain boundary.

"For example, a few weeks ago we were able to 'see' copper depletion at a grain boundary in an aluminum metallization line on an integrated circuit. It's the first time that's been done quantitatively."

What makes an analytical electron microscope analytical? It contains a device that detects X-rays from a sample, performs a spectral analysis, and provides a quantitative analysis of the sample's chemistry. "So an AEM does everything a TEM can do — and provides numerical data on chemical composition of the sample as well," says Al.

(Lehigh University is currently the central hub of a consortium that aims to develop a high-resolution microanalytical and microchemical AEM that will be the world's most advanced. In addition to Lehigh, the consortium includes Sandia and several other research laboratories.)

Congrats from VP 1000

Says Venky Narayanamurti, VP of Research 1000, "Al Romig's winning of the Burton Award is a very nice example of external recognition of Sandia's materials work in analytical electron microscopy, which has always been very closely tied to our internal applications.

"I know several of the earlier Burton Award winners [two of them have worked at AT&T Bell Labs, as Venky did before he came to Sandia], and Al is in very good company!

"My congratulations go out to Al on this achievement."

Take Note

For UNM's special "Centennial Convocation" on Oct. 20, several universities have asked local people to be their representatives at the event. Among them are Bob Woods (9225), representing Princeton; Joe Calek (400), representing the Illinois Institute of Technology; Marvin Taylor (9112), representing Iowa State; and Carlyn Iuzzolino (Geo-Centers contractor assigned to 1261), representing the Massachusetts Institute of Technology.

(Continued from Page Three)

LEAP

people live in San Joaquin and even Stanislaus counties than ever before.

"It's quite a learning process for the group — studying the various agencies and visiting some of them for the first time. It's important to remember that these agencies are helping our neighbors. And, in fact, they've helped many Sandians as well."

Vicarious Visits Via Video

"We've assembled a videotape on what we've seen at the agencies, and we hope it will give all Sandians the same insights and experiences we had when selecting groups to support," Louie says. The video will be shown at the five directorate solicitation meetings on Oct. 12.

Beginning in June, the committee interviewed all applicant agencies and visited some of them before making the final decision on which ones to support on behalf of all Sandia employees. (Sandians who wish to support groups not included on the list may designate their pledge to a specific agency by indicating it on the enrollment card.)

New groups added this year are Guide Dogs for the Blind, United Way of Stanislaus County, the Student Education Loan Fund in Livermore, the We Say No campaign against drug and alcohol abuse by young people in Livermore, and the Love Thy Neighbor

low-income support group in Manteca.

They join 23 other groups that have been supported at least once in the past. These include American Indian Center, Anthopos/Nautilus, Buenas Vidas Youth Ranch, Hope Education Center, Hope Hospice, Horizons youth counseling program, Kaleidoscope Activity Center for the handicapped, Emergency Fund Center, Livermore Area Recreation & Park District's Extended Student Services, Livermore Association for Guiding and Teaching Students (LAGATS), Ministry to the Aged Through Community Help (MATCH), Nursery School Scholarship Fund, and Nurses Welfare Fund for needy children.

Other agencies are The Center for counseling, Family Crisis Center, Tri-Valley Community Fund, Twin Valley Learning Center, Agency for Infant Development, the Eden Express work experience program for the mentally disabled, M-2 Sponsors prison visitation program, Northern California Society to Prevent Blindness, Parental Stress Service, and Spectrum Community Services (which includes job training and placement, seniors' meals program, and weatherization of homes for seniors).

In addition to Louie, members of the LEAP committee this year are deputy chairperson Carol Verity (8535), Bill Rorke (8131), Greg Evans (8245), Reggie Mitchell (8361), Sandra Lormand (8524), Sandra Bowers (8284), Don Adolphson (8431), treasurer Mel West (8523), publicist Cindy English (8522), administrative assistant Sue Weber (8284), Faire chairman Sam Johnson (8284), and artists Jack Young and Jack Bishop (both 8535).

In the Eye of Hurricane Gilbert: Sandian Weathers the Storm in Cozumel

A week-long vacation in a "tropical paradise." Sounded great to Karl Ricker (7253). Given a bent for scuba diving — and the need to use some vacation days before the end of September — he didn't need much urging.

On Sept. 12, a Monday, Karl headed for the island of Cozumel — located in the Caribbean some 15 or 20 miles off the coast of Mexico's Yucatan Peninsula. "Yes, I was aware of a tropical disturbance in the Atlantic named 'Gilbert,'" Karl says. "But forecasts indicated that Gilbert would most likely veer north and run out of steam. So off I went."

Karl didn't know it at the time, but the week he chose to visit Cozumel had seen, historically, a higher incidence of Caribbean hurricanes than any other week in the year. He knows now.

When Karl checked in at the Club Caribe, he couldn't help but notice the choppy sea and the intermittent showers. He wasn't very concerned, though, until he learned that the hotel owner had flown down from Miami that same day (Monday) to brief the guests on Gilbert that evening.

"At that first meeting," says Karl, "we heard that Gilbert, now with seemingly increasing intensity, might be headed for some land targets further east in the Caribbean — among them, Jamaica and the Cayman Islands. Information on Gilbert's strength and direction was sketchy at that point, so we were asked to show up the following afternoon for an update."

Tuesday was marked by torrential rains, followed by clearing skies, followed by more rain. Though they received word that the airport had been closed that morning, and there was no way to leave the island, the 200 Club Caribe guests remained surprisingly upbeat, according to Karl. "It was almost a party atmosphere, a 'who — me worry?' kind of feeling," he recalls.

The mood, however, turned somber at that afternoon's meeting, when guests heard that Gilbert — now classed as a Level 4 hurricane (one notch from the top on the intensity scale) — had zeroed in on Jamaica that day, leaving death and destruction in the storm's wake.

"We got the word that Gilbert was heading for the Cayman Islands, picking up steam along the way, and that the Yucatan Peninsula — including Cozumel and Cancun — was next in line," says Karl.

Here Comes the Big One

With the word that the Big One was on its way, Karl and the other guests received preparation instructions from the Club Caribe management. "I give the hotel people all the credit in the world," says Karl. "They really covered the bases."

Guests were assigned rooms in a 10-story building — a 13-yr.-old section of the resort built to with-



ROCK-LITTERED LOBBY of hotel evidences Gilbert's destructive force.

stand 200-mph winds. "I had a room on the sixth floor in the building's southeast portion — a relatively safe area, since Gilbert was expected to blow in from an easterly direction, with winds in a counterclockwise motion," says Karl.

Guests were advised to observe an 8 p.m. curfew that night and to stay in their rooms until the storm had passed. Other instructions: Place mattresses against windows and pull the drapes (to blunt the effects of shattering glass, should that occur); stay in the bathroom during the storm (bathrooms afforded masonry protection and had no windows).

Karl followed the advice and went one step further. He barricaded the door to his room with heavy Spanish-style furniture to ensure that the door, which opened to a breezeway, would not blow open and turn his room into a wind tunnel of sorts.

Though Cozumel was not to feel Gilbert's full brunt until the following morning, conditions continued to worsen throughout the night on Tuesday and into the wee hours Wednesday. Winds were much stronger by 10 p.m., and electric power went out at midnight.

Karl, settled in on his makeshift bed on the bathroom floor, began to hear the sound of breaking glass about 4 a.m. Wednesday. "At that point, I moved to the bathtub," says Karl. "I figured that was the safest place to be."

"I think I was overly optimistic when I thought I'd be able to sleep through Gilbert," Karl says in retrospect. "There isn't any way, with events like that going on, that you're going to take a snooze." From the relative security of his bathroom retreat, Karl waited for the full force of Gilbert to hit — which happened between 7:30 and 8:30 a.m.

When you're riding out the largest hurricane on record — a Class 5, with winds between 165 and

225 mph — what are you thinking and observing? "My ears were popping from the air-pressure drop — like in a plane," says Karl. "I could feel the building, for all its sturdiness, swaying; the pipes were creaking in the shower."

"That's when I thought 'Can the building take this?' I could visualize all sorts of things happening — beams buckling, walls cracking and breaking up, you name it. I prayed the building would hold up. I can't deny I felt fear; but at the same time, somehow, I never thought I wasn't going to make it."

Guests — "looking shell-shocked," in Karl's words — ventured out of their rooms to survey the damage about 9 a.m., as the hurricane's eye passed over and winds dropped to a relatively mild 40 or 50 mph. About that time, too, Karl was pleasantly surprised to see the hotel staff begin delivering food — melon, sandwiches, and chicken — to the guest rooms. "The pause that refreshes" took on a differ-



BATHROOM-FLOOR BED was where Karl Ricker (7253) optimistically thought he'd catch some sleep during Hurricane Gilbert.

ent meaning for Karl, as he washed down the food with the water and soft-drink ration he'd been given the night before.

Once Gilbert's eye had passed Cozumel (about 10 a.m.), Karl and the others retreated to their respective bathrooms to wait out — for the next 12 hours — the last half of the hurricane.

As he looked around afterward, Karl understood why no guests had been assigned rooms on the first and second floors of the building. "During the storm," he says, "waves got as high as the bottom



DURING AND AFTER — Photo at left shows a view (during the storm, and blurred by rain) of the scene from Karl Ricker's (7253) hotel-room window: downed palm trees, surrounding surf, and the tennis court — with what was left of a net. Photo at



right shows much the same view after the weather had cleared — with a netless tennis court and a new shoreline.

of the third floor. In fact, the surf surrounded the building and moved inland hundreds of yards from the normal shoreline."

Some other observations: mud-filled hot tubs and swimming pool, a tennis court minus the net and other trimmings, rocks everywhere — in the hotel lobby, in lower-floor rooms, and in the beach area (where the imported sand no longer existed).

Aftermath Frustrations

Beginning the next day (Thursday), another set of problems and frustrations confronted Club Caribe guests and other "vacationers" on the island — about 2000 people all told. Food storage freezers had been flooded, and both purified water and bathing water were not available. Results: a food-ration of one cup of ice and one cup of juice per day for hotel guests, plus one meal a day — eggs, sausage, canned ham, melon, and bread. Cleaning up meant a dip in the ocean in the company of a bar of soap.

Thirst, hunger, and cleanliness problems notwithstanding, perhaps the biggest frustration was the slow evacuation procedure. "Here were 2000 people — experiencing a high discomfort level — with one thought," says Karl. "They wanted to go home."

The rumor mill generated stories, none based on fact. Some of them: Military transports would be used to evacuate vacationers; US and Canadian air carriers would arrive Thursday. People traveled to the airport, hopes high, only to return disappointed and disgruntled.

"By Friday, the anxiety level was high," Karl reports. "People became almost tribalistic; little groups would go into town for supplies [food and water], then hoard them in their rooms. The greed factor was definitely at work."

Karl's people-observations continued at the airport, where he spent Friday afternoon waiting in lines



KARL RICKER (left) smiles as he waits in line at the Cozumel Airport on Friday afternoon. But military transports that were supposed to evacuate vacationers didn't show up, and Karl spent that night sleeping on the airport floor.

for military transports that didn't arrive. "About 50 or 60 of us decided to wait it out — and not to return to the hotel," he says. "The Mexican general in charge of airport security — maybe because he admired tenacity — agreed to let us sleep there overnight."

The next morning, the overnights, after many uncomfortable hours on the floor, had first shot at

the luggage check-in lines for the flights that would arrive from the US — finally — about 5 p.m. "People were pushy, aggressive, and short-tempered as they crowded into the plane," recalls Karl. "Three days of waiting and disillusionment had taken their toll."

Will Karl return to Cozumel, or has he had enough? "Sure, I'll go back," he says with a grin, "but next time I'll pick a different time of year!" ●PW

State's Newest National Monument

El Malpais: Window into New Mexico's Geologic Past



There's something new in the valley of Rio San Jose near Grants. Work began on it millions of years ago and may not be finished yet. Even so, it's open to the public.

Volcanic activity began in the valley three and a half million years ago, blasting cinders into the air and sending dark rivers of lava across the valley floor. Over the centuries, it happened again and again, producing this spectacular lava-filled valley.

Last year, Congress officially designated 114,000 acres of the valley — south and southeast of Grants — as El Malpais National Monument. The 262,000-acre area surrounding it is El Malpais National Conservation Area. Plans are in the works for visitor centers and other facilities.

Young Lava

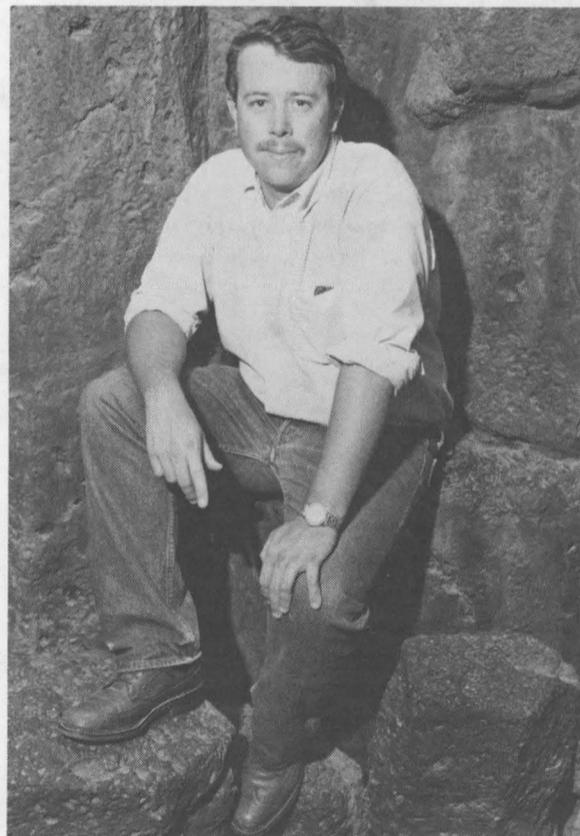
Of special interest at the new national monument are the extensive and young lava flows — some as young as 400 years — that are the basis of its name, "bad land."

To tell Sandians more about Malpais, Spencer Lucas, curator of paleontology/geology at the New Mexico Museum of Natural History, will present the next community focus lecture, "El Malpais: New Mexico's Newest National Monument," on Tuesday, Oct. 18, at 12 noon in the Tech Transfer Center.

"El Malpais is one of the youngest volcanic fields in North America," says Lucas. "Tales of its volcanic activity still abound in the legends of the Indians of the area."

He'll describe the classic volcanological features that can be observed at Malpais: grooved lava, squeeze-ups, pahoehoe (pronounced *pah-hoy-hoy*), aa (pronounced *ah-ah*), ropes, collapse depressions, pressure ridges, and spatter cones. He'll also talk about La Ventana arch (the largest natural arch in New Mexico), the ice caves, and the 17-mile-long lava tube (the largest in North America) — parts of which can be walked through.

Lucas, a nationally recognized lecturer, is responsible for the new seacoast exhibit at the Museum of Natural History. His special research interest is the use of fossils as geologic-time indicators, par-



SPENCER LUCAS

ticularly rocks of the Mesozoic and early Cenozoic eras (about 200 million to 50 million years old).

Recently, he and a group of UNM graduate students have been documenting fossil evidence from the middle Triassic (a relatively short geologic period from about 230 million to 245 million years ago), an era long believed by geologists to be missing from New Mexico's geologic record. Until Lucas's discovery, the mid-Triassic rock stratum (formed by hardened layers of mud or sand) was believed never to have formed in New Mexico or to have eroded away.

Though not born in New Mexico, Lucas was reared in Albuquerque and attended primary and secondary schools here. He has a BA from UNM (1976) and an MS (1979) and PhD (1984) in geology, with an emphasis in paleontology, from Yale. Curator of geology at UNM from 1984-88, he has published more than 100 scientific articles — most of them on the rocks and fossils of New Mexico — and has co-edited five books.

ECP '88 — The Need Grows

1988 ECP Campaign Kick-Off

The 1988 ECP Campaign kicks off Monday, Oct. 10. Through United Way of Greater Albuquerque, the Employee Contribution Plan supports 43 human service agencies and 74 programs, which — collectively — offer a wide variety of services to the community.

"Our goal this year is to see an increase of 6 percent to meet the growing needs of our community," says Dennis Miyoshi (5240), 1988 ECP chairman. "It's especially important this year because of the layoffs at PNM. Those of us who are lucky enough to still have jobs and who believe in community support will have to dig a little deeper."

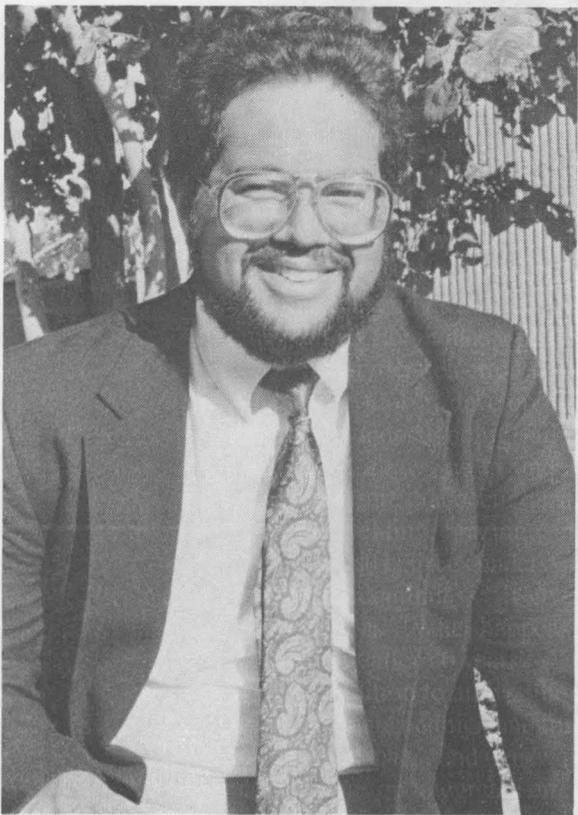
In 1987, 88 percent of Sandians participated in ECP, 45 percent at the Fair Share level or greater. From Dec. 1, 1986, through Nov. 30, 1987, ECP sent \$1,036,734 to United Way of Greater Albuquerque (\$115,022 to donor-designated agencies). In addition, \$12,985 was distributed through one-time contributions, and \$10,472 was given through the ECP Reserve Fund.

Two new agencies have joined the United Way family of member agencies. Cornucopia, Inc., provides day care for handicapped adults and the frail elderly. HomeCare Resources offers homemaker services for homebound persons; it's a nonprofit subsidiary of the Hospital Home Health Care program, administered by Presbyterian and St. Joseph hospitals. Both agencies will be eligible to receive United Way funding in 1989.

ECP contributions are used for crisis and emergency assistance; care for the homeless, the handicapped, the elderly, troubled teenagers, and their families; day care; and physical and mental health services.

As Dennis puts it, "It's comforting to know help is available if we should need it. And it's comforting to know that we're helping United Way help others through our ECP contributions." ●JW

Supervisory Appointments



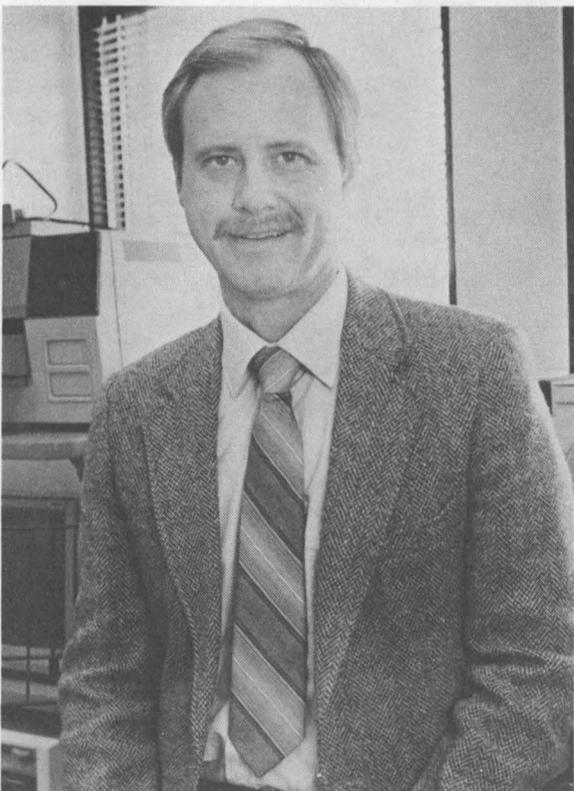
EVARISTO BONANO to supervisor of Waste Management Systems Div. 6416, effective Aug. 16.

Tito has been a member of the the Waste Management Division since he joined Sandia in July 1983. He has been principal investigator for programs on performance assessment for high-level waste disposal.

Before coming to Sandia, Tito worked for Xerox Research Center in Rochester, N.Y. and the Institute of Paper Chemistry in Appleton, Wis.

He has a BS in chemical engineering from the University of Puerto Rico, and an MS and PhD in the same field from Clarkson University in New York. He is a member of the American Institute of Chemical Engineers, and the American Geophysical Union. He is an adjunct professor at UNM's Chemical and Nuclear Engineering Dept.

In his spare time, Tito enjoys walking, playing volleyball, reading, and building model airplanes. He and his wife Nilsa have two children. They live in the NE Heights.



DOUGLAS BLOOMQUIST to supervisor of Accelerator Experiments Div. 1266, effective Sept. 1.

Doug joined Sandia in June 1978 as a staff member of the Shock Wave and Explosives Physics Division, where he did basic work with granular explosives and helped develop power supplies for neutron generators. In 1983, as a member of the Pulsed Power Research Division, he was involved in research and development of PBFA II. He was project scientist for the Saturn accelerator until the Phase I project ended in 1987. He then headed the positive polarity HELIA experiments for the Laboratory Microfusion

Facility (LMF), and conducted basic pulsed-power research.

He has a BA from Northwest Nazarene College and a PhD from Washington State University, both in physics. He is a member of the American Physical Society.

In his spare time, Doug enjoys camping, fishing, and working on old cars.

He and his wife Julia have two children. They live in the NE Heights.

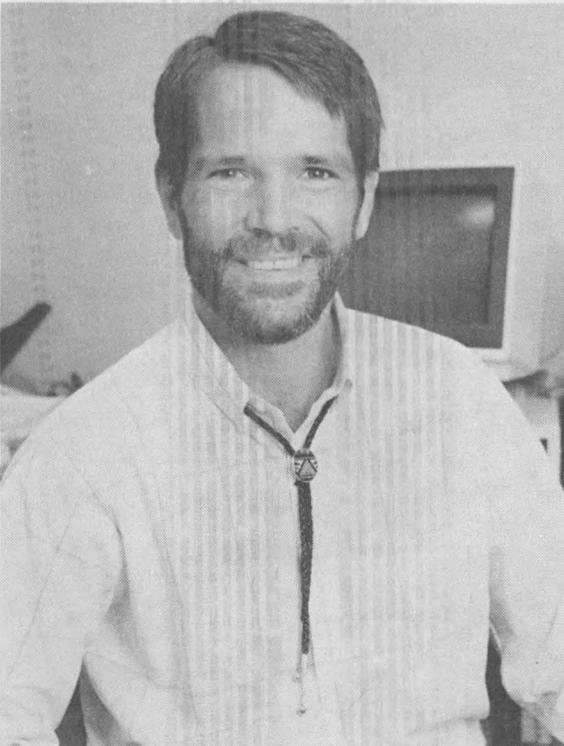


PAUL ROSENKOETTER to manager of Business Planning and Management Results Dept. 110, effective Sept. 16.

Paul joined the Labs in July 1976 as a systems analyst with the Personnel Systems Division. In 1978, he was named supervisor of the Production Control Section of the Computer Operations Department. He was a financial analyst with the Controller Directorate from 1980 to April 1983, when he was appointed supervisor of the Administrative Support for Computing Division. In October 1985, he transferred to Purchasing's Computer Procurement Division. Paul supervised the Programmatic Support Division in Budgeting from 1987 until August 1988, when he transferred to the newly created Business Planning Division.

He received a BS in math and experimental psychology from the University of California at San Diego, and an MBA from UCLA. Paul is chairman of the board of Sandia Laboratory Federal Credit Union.

His spare-time activities include hiking and skiing. Paul and his wife Gayle have one son. They live in Sandia Heights.



LES SHEPHARD (6315)



SHIRLEY WALLACE to supervisor of Administrative Policies and Procedures Div. 132, effective Sept. 16.

Shirley joined the Labs in 1971 as a secretarial trainee. In 1978, she transferred to the Security Standards and Investigations Division as a service clerk. She joined the Safeguards and Technical Security Division as an accountability clerk in 1979. She entered the MAS (now MLS) Training Program in 1980, and was reclassified to Member of the Administrative Staff in March 1983.

She was an administrative assistant in the Safeguards and Security organization from 1983 to 1985. She's worked in the Programmatic Support, Management Information and Results, General Accounting, and Customer and Supplier Accounting divisions. In April 1987, she was promoted to supervisor of the Systems Analysis Section.

Shirley has a BS in accounting from the University of Albuquerque and an MBA from Highlands University. She is immediate past-president of the Albuquerque Chapter of the National Assn. of Black Accountants and was a member of that organization's national Board of Directors. She is a member of Sandia's Black Outreach Committee.

Her spare-time activities include fishing, gardening, and sewing. Shirley and her husband Vernon have two children and live in the NE Heights.

* * *

LES SHEPHARD to supervisor of Geoscience Analysis Div. 6315, effective Sept. 16.

Les joined the Labs in January 1981 as a member of the Seabed Programs Division, where he helped to evaluate the feasibility of the sub-seabed disposal concept for high-level nuclear waste. He transferred to the NNWSI Geotechnical Projects Division in April 1986, where he was principal investigator in the *in-situ* rock mechanics experiments involved in characterizing Yucca Mountain as a high-level waste repository.

He has a BS in geology from the State University of New York, and an MS and PhD in geological/geophysical oceanography from Texas A&M. He's a member of the American Assn. of Petroleum Geologists, the American Geophysical Union, the Society of Economic Paleontologists and Mineralogists, and the US Committee on Rock Mechanics.

In his spare time, Les enjoys collecting 18th-century Dutch tiles, jogging, and racquetball. He is also active in children's athletic programs. He and his wife Darlene and their three children live in the NE Heights.

Congratulations

To Rita and Johnson (7472) Morgan, a daughter, Jennifer Jaynie, Jan. 1, adopted July 12.

To Rhonda and Charles (5249) Ringler, a son, Lee Edward, Sept. 22.



"BALLOON GLOW" last Sunday evening, a part of the Albuquerque International Balloon Fiesta that ends Oct. 9, was captured by LAB NEWS photog Gerse Martinez (3162). Gerse used T-Max film (ASA 3200) and a 24mm lens on his camera, which he had to set on automatic at f8 because it was too dark to read the meter. (Shutter speed was slow; note foreground blurs.)

CPR Pays Off — Again

Small Candy, Big Trouble

Shortly after lunch on Tuesday, September 20, machinist Tom Gutierrez walked down an aisle in the Heavy Machining Section of Bldg. 840 to call fellow machinist Irl Vance (both 7482-2) to the phone.

He probably saved Irl from choking to death.

"Just as I reached Irl," Tom recalls, "he made a gurgling sound and turned very red in the face. It looked like he couldn't breathe. When I asked what was wrong, he pointed toward his throat but wasn't able to say anything."

Tom whirled Irl around, threw his arms around Irl's waist, and — grasping his fist with his other hand — pulled his fist toward Irl's rib cage with several quick inward and upward thrusts.

"On the fourth or fifth thrust, Irl drew a long breath, and we just stood there staring at each other for a while," says Tom.

The technique Tom used on Irl is known as the Heimlich maneuver (after Henry Heimlich, 20th-century American surgeon).

"It's probably the most used of all CPR techniques," says Elaine Squyres, American Heart Association employee and Sandia CPR instructor. "It's also probably the simplest."

"Tom was right on the mark to determine first that Irl was unable to speak or cough before he applied the technique. It's probably best not to interfere if a choking victim can still speak, cough, or breathe."

Tom learned the Heimlich maneuver some time ago in a CPR training class sponsored by Medical. He's taken several recertification classes since then.

"I first signed up for the class after an infant in our family died of SIDS [Sudden Infant Death Syndrome]," he says. "I got to worrying that if something should happen to my own children, I wouldn't know what to do. This is the first time I've ever had to use this particular technique, but I'm glad I learned it."

So is Irl.

Small Piece, But . . .

"It's strange," says Irl, "but I've always imagined that for a person to choke as badly as I did, the piece of food would have to be large enough to close off the throat completely. The piece of candy I choked on was very small — it didn't seem large enough to

have blocked my throat so completely."

Elaine agrees that most instances of choking involve larger pieces of food or objects: "But it's important to remember that there is always the pos-

sibility that even a small bit of food or a very small object can lodge in the throat in such a way as to cause dangerous choking." ●DR



"NO THANKS," says Irl Vance (right) as Tom Gutierrez (both 7482-2) offers him another piece of the same kind of candy that lodged in Irl's throat recently. Tom used the Heimlich maneuver, possibly saving Irl from choking to death.

CPR Classes Teach Heimlich Maneuver



The Heimlich maneuver for dislodging an object or food from a choking person's windpipe is one of the techniques taught in CPR

classes offered by Sandia's Medical organization.

To perform the maneuver, stand behind the victim with your arms around the victim's waist. Grasp one fist with the other hand and place the thumb side of your fist in the midline slightly above the victim's navel (see arrow in drawing). Pull your fist hard against the victim's body with a quick inward and upward thrust, forcing air out of the lungs. Repeat until the object or food is dislodged.

Beginning CPR classes are offered twice monthly, usually from 8:30 a.m. to 3 p.m. All Sandians and their spouses are eligible — so are dependents, if they're at least 14 years old.

October's CPR classes will be offered on the 19th and 26th.

To sign up for one, call instructor Elaine Squyres on 4-7169.

Better Air Campaign: 'Walk to Work Once a Week?'

The Lone Ranger Rides Again! (Monday-Friday, 7-8 a.m.)

The new TV season is beginning, but this isn't an ad for the revival of the popular western of the 50s.

It is, however, a show of sorts — it can be seen every workday at the entrances to Sandia's parking lots.

This Lone Ranger is the typical Sandian arriving alone in a vehicle. Some 9000 people — employees and contractors — come to work at the Labs on a typical morning. Records suggest that all but about 1000 are Lone Rangers.

And it's this Lone Ranger that the Better Air Campaign has targeted. (The BAC is a voluntary effort spearheaded by RIDEPOOL, Sun Tran, and the City Environmental Health Department's Air Pollution Control Division). The campaign, aimed at metropolitan Albuquerque, runs from Oct. 17 through Feb. 28, 1989.

"Our goal is to persuade Lone Rangers to leave their cars at home one day each week during the campaign and to use alternate modes of transportation — carpools, buses, bicycles, or their feet — to get to work," says Sandra Escarcida of RIDEPOOL.

Fifth Worst in the Nation

Under BAC's voluntary plan, metropolitan-area drivers will be assigned one weekday per week, based on the last number of the license plate, when they will be asked not to drive. The system: Monday, 0-1 and personalized plates; Tuesday, 2-3; Wednesday, 4-5; Thursday, 6-7; Friday, 8-9.

"Albuquerque area residents must become more dedicated to reducing the high levels of carbon monoxide [CO] air pollution," Sandra adds. "The EPA [Environmental Protection Agency] identifies Albuquerque as the fifth worst city in the nation when it comes to CO in its air."

"If we could reduce commuter traffic throughout the Albuquerque metro area by 20 percent [basically what BAC wants Lone Rangers to accomplish for themselves] for a year, we'd make major advances in our EPA compliance situation," adds Bernie Zak (6321).

He should know — during the winter of 1983-84, Bernie directed the Albuquerque Winter Visibility Study for the City. Conducted with EPA funding, the study identified heavy commuter traffic and wood-burning fireplaces as the primary CO sources.

And that's still the case. The most recent studies show that 75 percent of metro Albuquerque's CO pollution is caused by gasoline-powered motor vehicles.

Also, slow-moving, in-town traffic spews more emissions into the air than does highway traffic. For example, a vehicle traveling at 20 mph emits approximately 40 grams of carbon monoxide/mile; a vehicle traveling at 55 mph emits 10 grams/mile.

More information about becoming a member of a car- or van-pool is available from RIDEPOOL at 243-RIDE. And Sun Tran (764-1553) has schedules for the five special buses that serve Sandians.

•RGeer(3161)

Take Note

The 25th annual Apple Festival, sponsored by All Faiths Receiving Home Auxiliary, is set for Oct. 21 from 10 a.m. to 2 p.m. at First Presbyterian Church (215 Locust NE). Silver anniversary activities include a chile lunch served by Linda Thorne (KGGM-TV), an arts and crafts bazaar featuring items by NM artists, a bake sale, and a raffle for a pair of round-trip tickets to Washington, D.C., donated by TWA. Costs for lunch and raffle tickets are \$3.50 and \$10, respectively. Proceeds benefit All Faiths (a United Way agency), a nonprofit facility that provides temporary and emergency care for neglected, abandoned, or abused children. For more information or advance tickets, contact Ann Riley (3714) on 6-9882.

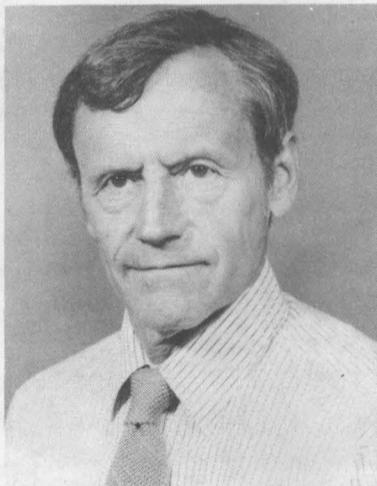
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Ever wonder how to put together those bright red chile ristras and wreaths that show up every fall? Here's a do-it-yourself learning session. Ko Shari Garden Club is sponsoring a ristra- and wreath-making demonstration on Oct. 13 at 7 p.m. at the Albuquerque Garden Center (10120 Lomas NE). Margaret Wagner of Wagner Farms in Corrales is instructor. There's no charge for the class, but bring along one bushel of red chile and a ball of lightweight cotton string for a ristra — or 3/4 bushel of chile and stiff wire or coat hangers for a wreath.

Temporary Schedule for Provident Rep

During October and November, the Provident representative, SNLA's on-site representative for the Medical Care Plan, will be available only on Tuesdays and Thursdays. Hours remain the same: 8 to 11:30 a.m. and 12:30 to 4:30 p.m.

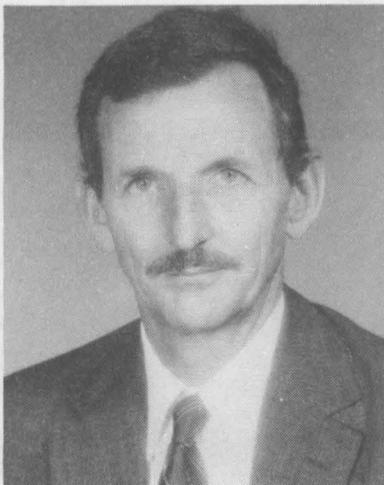
Retiring



Jack Tischhauser (2850) 35



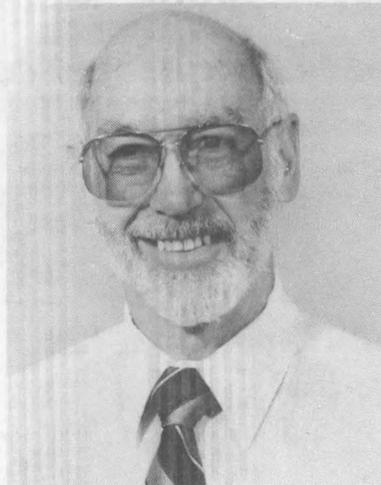
Jim Hayes (3155) 37



Bob Gregory (2700) 25



Bob Esterly (400) 30



Gerald Villane (5123) 30

Spare Your Wastebasket

If you're about to retire or leave the Labs, don't toss your historically valuable records.

Corporate Historian Necah Furman (3141-2) is looking for audiotapes, records, and photos. Call her on 6-9619.

ECP Campaign Kickoff Oct. 10!

For Your Benefit

Bridging the Gap In Dental Care

Sandia is attempting to manage the rising cost of dental care for both Dental Expense Plan participants and Sandia.

In about two weeks, all participants will be mailed an information packet that contains detailed information about a nationwide network of dentists who have contracted with Metropolitan Life Insurance Company (Sandia's Dental Expense Plan administrator) to provide dental services for a negotiated fee, generally lower than their usual fee. This network of dentists will be available to Dental Expense Plan participants on Nov. 1.

The Dental Expense Plan as it exists will not change.

If you do not receive your packet by Nov. 7, call Doris Mason at 844-3545 or Jann Levin at 844-6135.

Growing Up is Hard to Do



A lighthearted survey by TDK Electronics Corp. asked 1900 teens what they want to be when they grow up. The vote among multiple choices: 16 percent for "doctor," 13 percent for "lawyer," and 63 percent for "I don't want to grow up."

Karen Slater, *Wall Street Journal*

Sympathy

To Margie Box (2622) on the death of her father-in-law in Abilene, Tex., Sept. 6.

To Matt Bustos (3425) on the death of his wife in Albuquerque, Sept. 16.

To Wayne Trump (3521) on the death of his brother and to Douglas Trump (7533) on the death of his uncle in Blue Springs, Nebr., Sept. 21.

To Walt Errickson (5165) on the death of his father-in-law and mother-in-law in Albuquerque, Sept. 25 and Sept. 28, respectively.

To Steve Falacy (2564) on the death of his father in Missoula, Mont., Sept. 29.

Bosses treat secretaries on Secretaries' Day. Now there's a chance to reciprocate by taking your boss to the annual Executives' Breakfast, sponsored by Professional Secretaries International (PSI), on Oct. 14 at KAFB Officer's Club East. Breakfast is from 6:45 until approximately 8 a.m. and costs \$7 per person. All secretaries are invited to bring a boss; you don't have to be a member of PSI. Guest speakers are Congressional candidates Democrat Tom Udall and Republican Steve Schiff. RSVP deadline is Oct. 11. For more information, contact PSI coordinators Mae Gardner on 4-5733 or Roselyn Baca on 4-9434.

Take Note

Retirement Planning

Guy Trujillo of Financial Network Investment Corp. will present "Asset Allocation," a high-tech approach to developing a portfolio consistent with your needs and changing economic conditions, at 5 p.m. on Oct. 12 at the FNIC office (One Executive Center, 8500 Menaul NE, Suite A-301). RSVP to Guy at 291-8585.

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

MARCY WEIGHT FITNESS SYSTEM, wall-mounted; pickup bed trailer. Burchett, 299-1689.

FIVE-PIECE COUCH, end table, floor lamp, \$50/all. Burton, 296-1912 or 766-8203.

POP-UP TENT TRAILER, '76 Jayco, sleeps 7, stove, icebox, 2 dining areas, \$1800. Ferguson, 281-9864.

KACHINA COLLECTION, approx. 20 yrs. old, \$80/ea. Mason, 281-3052.

FREEZER, 15 cu. ft., chest-type, white, 30-day money-back guarantee, you haul, \$100. Berg, 296-2695.

FOUR BRIDGESTONE TIRES, steel-belted radials, ER-78-14 tubeless, \$25. Noel, 884-4491.

ORIENTAL-STYLE RUG, 6' x 8', rust & beige, \$80. Garcia, 294-8210.

DUCKS, \$5/ea. or will trade. Lackey, 869-9333.

MAINTENANCE MANUAL for '85 Chrysler, Dodge, Plymouth, 3-vol. set, \$20. Rainhart, 821-3690.

PORTABLE VHS VIDEOCASSETTE RECORDER, tuner/timer unit, \$250/both; color video camera, \$275. Hale, 298-1545.

FISHER-PRICE CAR SEAT, \$45; bathtub, almond, fiberglass, 4' x 5', w/step, new, cost \$320, sell for \$125. Cibicki, 877-7098.

WOOD-BURNING STOVE, \$300; AKC-registered chow puppies, \$200. Baca, 864-8331.

AIRCRAFT ENGINE, snowmobile, air compressor, lawn mowers, weed-eaters, evaporative cooler. Stott, 294-2292.

CARDINAL TRAVEL TRAILER, 13', sleeps 3-4, heater, 3-burner stove, icebox, port-a-potti, 1120 lbs., \$1500. Burns, 281-2793.

WIND TRAINER for 10-spd. bicycle, "Specialized-4000," \$50. Gorman, 898-9300.

FURNITURE, appliances, miscellaneous items. Russell, 292-3279.

MAN'S RIGHT HAND RACQUETBALL GLOVE, small, Excellon Tackified, used twice, \$10. Barr, 821-5870.

JENNY LIND CRIB, mattress, changer, \$150; wall hanging, mobile, bumpers, ruffle, head-guard, comforter, sheets, \$75. Silva, 867-4152.

WOOD STOVE, Weso German dark brown ceramic tile, \$800 OBO. Biringer, 821-8741.

ELECTRIC SMOKELESS GRILL, West

Bend, \$15. Bland, 265-6286.

WALNUT HUTCH, upright, \$325; Haviland china, service for 12 plus accessories, \$325; clear plastic, 14' x 85' x .006", \$15. Searls, 891-9423.

SKI BOOTS, Nordica 785, size 10, used two seasons, \$200 new, sell for \$50 OBO. Rosinski, 294-1908.

QUEEN-SIZE WATER BED, waveless, 2 yrs. old, headboard and frame not included, \$150; pop-up camping trailer, '87 Palomino Colt, sleeps 5, \$2400.

LAWN MOWER, 4-hp, used three times, \$190 new, sell for \$150. Cuthrell, 764-0356.

KITCHEN CABINETS and counter tops; O'Keefe and Merritt gas stove w/2 ovens, broiler and vent hood. Thompson, 292-2877.

LAWN MOWER w/bag, \$55; 15-pair shoe rack, over-the-door style, \$3.50; 2 Ford snow tires, w/rims, \$75/both. Carter, 293-6750.

MATERNITY CLOTHES, fall and winter styles, sizes 14 and 16. Loudermilk, 299-4621.

DOGHOUSE, 3'7" x 3'11", cost \$300, sell for \$75. Blackledge, 294-6030.

CANVAS COVER for down-draft evaporative cooler, \$10. Jackson, 293-0988.

CHIMNEY PIPE, triple-wall, 8" x 36", Sears 42KY84327N, new, \$18; chimney cap and flashing for 8" triple wall, \$12. Talbert, 298-9036.

'74 FORD SHOP MANUALS; Realistic AM/FM stereo, 8-track, w/record player, best offer. Geck, 299-5095.

'83 CHEV. TRAILER HITCH, \$25; Ford Mustang clutch, 10-in. pressure pump/disk, \$25. Brion, 298-1761.

GIUITAR AMPLIFIER, Fender Twin Reverb, w/Mesa boogie tubes, \$350. Brown, 823-9155 after 6.

APPLE II+ COMPUTER, 64K, green screen monitor, 1 disk drive, assorted software, \$250. Girard, 821-5529.

CELLO CASE, vinyl, cost \$72, sell for \$30; Weber charcoal cooker, 14", \$8; 78-rpm records, 20s through 50s. Dalphin, 265-4029.

STUDIO PIANO, Conover, 15 yrs. old, walnut, \$650. Burgess, 294-3009 evenings.

TAPE DECK, Teac reel-to-reel, tape monitor, fade control, includes 15 reels of 3-hr. length tape, \$45. Lagasse, 293-0385.

GARAGE SALE: outboard motor, other large items, girl's bike, toys, 8609 Aztec NE, Oct. 8, 9 a.m.-1 p.m. Skogmo, 292-9773.

HYBRID ROSE BUSHES, mature, free (you dig). Hines, 821-8592.

CAMERA, 35mm Olympus, \$60. Tripp, 822-8580.

COMMODORE 64 COMPUTER, 1541 disk drive, cartridge word processor, printer interface, \$250 OBO. Hansche, 281-5623.

STOCK RACK FOR PICKUP BED, 4' x 8', heavy-duty, w/over-cab extension, \$75. Esch, 298-8914.

BASKETBALL BACKBOARD, fiberglass, w/goal, \$30; ping-pong table, 3/4" top, folds up, w/net & paddles, \$70. Muir, 883-7933.

CUSTOM DINING ROOM SET: table, 6 chairs, \$900; Ford limited slip assembly, \$150. Stone, 298-4641.

STORM DOOR for 36" opening, all hardware, free. Van Deusen, 291-8196.

SHELTIE PUPPIES, AKC-registered, sable and white, shots, 7 weeks old, 2 females, \$150/ea., 1 male, \$125. Essenmacher, 865-7066.

COMPOUND BOW, Browning Drake Flightmaster, 55-70 lbs., arrows, broadheads, quiver, peep sight, glove, arm guard, string silencer, more,

\$300. Clark, 294-8978.

CONTROLLER CARD for PC/XT, \$40. Stoker, 821-3354.

X-COUNTRY SKI OUTFIT: child's 135cm Trak skis, size 33 (about US size 1) boots, bindings, poles, \$30. Tyner, 294-5289.

TWO WROUGHT-IRON BAKER'S SHELVES, brass trim, new, \$55/ea., \$100/pr.; wrought-iron bird-cage stand, new, \$45. Ferrell, 883-8595.

GASOLINE CANS; two 5-gal. Jeep tanks, \$5/ea.; two 6-gal. OMC outboard tanks, \$12/ea. Holmes, 292-0898.

BENCH-TYPE ROTARY PARTS BIN, \$20; 3/4-hp Exp. proof motor, \$45 OBO. Silverman, 298-1308.

OSCILLOSCOPES W/MANUALS: Techtronics #531, \$70; Bell & Howell, Heathkit solid-state, \$60. Meikle, 299-4640.

TRUCK TIRE, 6:70x15 mounted on 5-hole rim, \$25. Nelson, 881-0148.

JUNIOR GIRL SCOUT UNIFORM, includes skirt, belt, blouse, tie, knee socks, belt-purse, worn 4 times, cost \$35, sell for \$20. Brunacini, 345-4811.

CONCRETE BLOCKS, 1 dozen, 6" x 12" x 12", \$4; fluorescent fixture, w/extra bulbs, \$5; kettle-type gas grill, \$50; King trombone, w/F-key, \$150. Eley, 255-2617.

YARD-SALE: handyman items, water bed, built-in oven, countertop stove, clothes, Oct. 8-9, 9 a.m.-4 p.m., 1017 Florida SE. Baczek, 255-3429.

RADIO-CONTROLLED TRANSMITTER, new receiver, 2-channel, \$45. Trujillo, 299-9351.

LIVING ROOM SOFA, Early American, \$100; stereo console, Early American, AM/FM, turntable, \$65. Sabisch, 298-8350.

WINCHESTER 1400 SHOTGUN, semi-automatic, 12-ga., walnut, early model, \$160. Erickson, 299-6824.

WIND TRAINER, Avemir, \$50. Johnson, 293-3864.

COCKER SPANIEL PUPPIES, AKC-registered, male, buff, 5 weeks old, select now, available after Oct. 24, \$110. Oberkamp, 292-4366.

DOUBLE STROLLER. Jones, 293-5778.

TRANSPORTATION

'65 DODGE DART, 2-dr., 6-cyl., 120K miles, \$300 OBO. Barry, 296-1912.

'83 VOLVO TURBO SW, standard w/OD, AC, stereo, luggage rack, \$7500. Caton, 294-4490.

'80 MERCEDES-BENZ, white, original leather interior, 105K miles, \$8400 OBO. Cibicki, 877-7098.

'80 DATSUN 210, one owner, 5-spd., 70K miles, new tires, needs body work, \$1600. Doughty, 296-4142.

'86 TOYOTA TRUCK, X-tra cab, long bed, 37K miles, AC, 5-spd., stereo, \$5950. Mott, 266-4153.

MAN'S 10-SPD. BICYCLE, 27" Motobecane Mirage Sport, \$50. Gorman, 898-9300.

'84 PLYMOUTH HORIZON, 4-dr. hatchback, 2.2L engine, 5-spd., new struts, regulator, tires, \$3000. Mitchell, 298-1267.

'85 NISSAN 300ZX, T-tops, stereo tape, alloy wheels, recent major service, below book. Kjeldgaard, 268-8835.

MAN'S SHELIA BICYCLE. Marchi, 291-9681.

'56 AUSTIN HEALY 100-4, \$8500 OBO. Amsden, 298-7267.

'74 FORD F-350 PICKUP, 1-ton, 89K miles, \$2500; '79 Chev. pickup, 1/2-ton, 6-cyl., \$875. Klafke, 869-6877.

'78 VW SCIROCCO, new engine and

tires, no dents, needs paint; '78 Chev. pickup, tan. Johnson, 299-1475.

MOUNTAIN BIKE, 20" CRMO frame, race and mountain tested, full component listing available, \$450 OBO. Goodson, 294-8179.

'68 PLYMOUTH VALIANT, V-8, PS, AC, AT, \$500. Muench, 867-5115.

'81 LE SABRE DIESEL, 4-dr., 45% off book, one owner, all maintenance records, will trade. Bridgers, 296-4218.

'85 TOYOTA COROLLA, AC, PS, sunroof, AM/FM cassette. Arzigian, 281-1154.

'85 VW GOLF, AC, 5-spd., 4-dr., extras, \$5200 OBO. Stavig, 291-9043.

'81 PONTIAC GRAN PRIX, V-6, PS, PB, AC, AT, tilt, 53K miles, \$2500. Sisson, 296-3883 after 5.

'74 HONDA MOTORCYCLE, 350cc, \$150 OBO. Carter, 293-6750.

'80 TOYOTA CELICA HATCHBACK, AC, AT, PB, PS, 60K miles, \$2800 OBO. Patterson, 822-1196.

'88 SUBARU XT, loaded, AT, PS, PB, AC, 4-cyl., 1800cc, 1.3K miles, \$11,500. Hobart, 255-7749.

'77 BMW 5301, white, moonroof, leather interior, AC, PW, AM/FM cassette, alloy wheels, Pirelli tires, tinted windows, \$4900 OBO. Trump, 296-1984.

'74 TOYOTA COROLLA, new tires, \$500 OBO. Mitchell, 293-8746.

'83 KAWASAKI MOTORCYCLE, 550 Specter, 16K miles, \$1200. Turman, 298-3460.

'63 CHEV. PICKUP, step-side, AM/FM, 4-spd., 6-cyl., new Pathfinder tires, \$1250. Esch, 298-8914.

'84 NISSAN SENTRA SW, 5-sp., AM/FM cassette, \$3595. Neal, 299-4956.

HUFFY BOY'S BICYCLE, 20", still in carton, blue, \$80 OBO; girl's 10-spd. bike, red, Sears, \$60. Quintana, 268-2080.

'81 CHEV. CITATION, 4-dr. hatchback, V-6, AT, PS, PB, cruise, tilt, 30K miles. Boston, 298-9727 or 291-8810.

'79 FORD SUPERVAN, trailer special, captain's chairs, convertible bed, new radials, \$4500; '77 Cherokee Chief, new transmission and radiator, \$2500. Barnette, 281-2154.

MOUNTAIN BIKE, 18", Univega Alpina Sport, TR tubes, paid \$430, sell for \$350. Ashment, 293-2295.

BOY'S DIAMONDBACK BMX BIKE, 20", \$50. Tyner, 294-5289.

'85 HONDA SCOOTER, 150 Elite, 6.7K miles, \$600 OBO. Homer, 836-5043.

'87 HYUNDAI GLS, 5-spd., AM/FM cassette, 38 mpg, \$6000. Stibick, 1-384-5307.

MAN'S 12-SPEED RALEIGH MARATHON, 19" frame, 27" wheels, ridden 10 miles, \$170. Johnson, 293-3864.

REAL ESTATE

14' X 70' WAYSIDE MOBILE HOME, on 1/2 acre in Peralta, detached garage, \$40,000. Vigil, 869-6870.

4-BDR. CUSTOM HOME, 2021 sq. ft., Jacuzzi, Lomas/Tramway area, assumable ARM (10%), \$120,000. Gonzales, 298-0190.

LAND. Lake, 888-4581.

3-BDR. HOME, UNM area, 1-3/4 baths, FR w/FP, DR, wood floors, \$6500 down, assumable FHA loan (\$75,400). Sype, 255-3365.

3-BDR. HOME, Heritage Hills, 1-3/4 baths, open floor plan, 1540 sq.ft., great room w/FP, 2-car garage, assumable FHA w/no qualifying, 7904 Puritan Ct. NE. Pyo, 822-9056.

3-BDR. MOBILE HOME, '81 Breck, 14' x 80', Edgewood, 2 baths, FP, \$13,500. Anderson, 281-1786.

3-BDR. HOME, 1-3/4 baths, great room w/FP, pool, new roof, 1205 Hupmobile NE (Lomas/Tramway area), \$78,500. Ater, 822-9697.

4-BDR. HOME, 1829 Illinois NE, den, LR/DR combo, single garage, storage bldg., hardwood floors, Mark Twain school, \$81,000 (possible REC). Frye, 255-8364.

3-BDR. HOME, 1-3/4 baths, SE location, game room, hot tub, stone FP, wet bar, new roof, stucco, and heating system, \$77,900. Gallegos, 255-5102.

3-BDR. HOME, 1 bath, carpet, range, fresh-air filtering system, covered patio, 11304 Hannett NE, \$63,000. Nielson, 294-1281.

2-BDR. MOBILE HOME, 2 baths, in family park. Quintana, 292-4367.

12.8 ACRES, Northern Taos County, near Ski Rio, Valle Vidal, Latir Lakes, Rio Grande box, \$7000. Stone, 298-4641.

3-BDR. HOME, Chelwood/Indian School area, 1-3/4 baths, 1276 sq. ft., backyard access, 8.25% assumable loan. Henfling, 292-0794.

3-BDR. TOWNHOUSE, FP, 1-3/4 baths, greenhouse, fenced, landscaping, near Chaparral school and Ladera Shopping Center, \$68,500. Bertram, (415) 829-0832.

3-BDR. TOWNHOME, NE, new, 1-3/4 baths, 1450 sq. ft., FP, 2-car garage, neighborhood security, near La Cueva HS, mid-\$90,000s. Fienning, 298-0734.

HOUSE LOT, Rio Communities (Belen), near Country Club, cul-de-sac, mountain views, \$19,900. Fjelseth, 296-2257.

WANTED

FEMALE HOUSEMATE, non-smoker, 3-bdr. home in Indian School Rd./Wyoming area, \$300/mo. plus 1/2 utilities. Beeler, 275-7340.

HOUSECLEANER to do light cleaning, approx. 4 hrs./week, Academy area, \$100/month. Patterson, 822-1196 after 5.

LEROY LETTERING SET; large light table, at least 24" x 36". Dell, 291-0274.

SLIDE, 10' long, no ladder required. Sellers, 292-0466.

FACTORY MANUAL for '64 Chevelle. Prevender, 296-8586.

MANUAL for TRS-80, Model 1. Shea, 884-9105.

HOUSEMATE, mother of one wishes to share NE 3-bdr., 2-bath home with another working woman. Byers, 889-8065 between 6 and 10 p.m.

LUGGAGE RACK for '83 BMW R65 motorcycle. Talbert, 298-9036.

MINOLTA MD LENS, 28/f2.8. Rosinski, 294-1908.

PLAYMATE for 3-1/2-yr.-old girl, Juan Tabo/Menaul area. Falacy, 293-2517.

COPY OF MASM. Stoker, 821-3354.

AB SWITCH for switching color/monochrome monitors on Leading Edge PC. Shephard, 298-4879.

X-COUNTRY BOOTS, size 36, plus X-C equipment for 3-yr.-old; will trade X-C boots, size 38/39 and skis for 10-yr.-old. Norwood, 266-2717.

SHARE-A-RIDE

SECA VANPOOL RIDERS WANTED, Edgewood/Tijeras area, regular or occasional. Hansche, 4-3469.

Hit the High Road At CSC "Walkdown"

HELP SHAPE UP THE SLOPES at the Coronado Ski Club's annual Sandia Peak "walkdown" this Sunday, Oct. 9. Meet your fellow trail-tidiers at the ski lodge at 9 a.m., then take the chair lift to the top of the ski area and walk down your favorite slope, picking up debris along the way. Starting at 11:30, you can stoke up on hamburgers, hot dogs, and a variety of beverages. Cost is \$1 for members and \$3 for non-members. More info from Carolyn Lange (6-0916).

RENOVATION RUNDOWN: Early next month, Club functions move back inside to spiffy new first-floor facilities, as the renovation crew rolls on to Phase II — the downstairs area. Meantime, Friday night dinners are on hold. We know this news will disappoint the snow-dancers out there, but that's just the way it is. Mark your calendar for the members-only grand reopening bash, set for Nov. 18 (more news on *that* later).

EFFICIENT ELECTIONEERING paid off for seven people elected members of the Board of Directors at the annual meeting on Sept. 12. Elected to two-year terms were Alice Maese (133), Mike Quinlan (7833), Jack Mortley (7521), and Carolyn Lange (123). Charlie Kaspar (ret.), Ruben Muniz (143), and John Otts (6222) will serve one-year terms. Joining them on the Board will be holdovers Ed Neidel (ret.), Mike O'Bryant (2858), Steve Ross (3437), and Dick Fairbanks (3521), who have one year remaining on their two-year terms.

CARD-CARRYING BINGO PLAYERS get together again on Thursday, Oct. 20, for a night of fun and cash prizes. Card sales start at 5:30 p.m.; a single package (15 games) costs \$5, while double and triple packages go for \$9 and \$13, respectively. Count on chucking the culinary chores, because reasonably priced soup and sandwiches are available throughout the evening.

Fun & Games

Run/Walkathon — Todos Amigos (the DOE/AL employee association) and Vietnam Veterans of America Chapter 318 are cosponsoring a run/walkathon on Oct. 22 to help defer expenses for Erica Wolfe, five-year-old daughter of Anna Wolfe (AL). Erica has acute lymphoblastic childhood leukemia. Each entrant is asked to find sponsors who will pledge donations based on the number of times the entrant can circle a 5k loop on KAFB in three hours — from 8:30 to 11:30 a.m. Entry is \$6 (includes a T-shirt for the first 150 participants registered). Entry forms may be picked up at the Que Pasa Recreation Center or the East or West Gyms. For more information, call Mary Regan on 6-1325 or 298-1167.

And the Cuckoo for State Bird?



California has been topped. As [we] reported recently, the legislature in California is agonising over whether or not the banana slug should be declared the state mollusc. In Florida, meanwhile, the legislators have equally weighty problems. They're trying to decide whether beach sand should be declared the state soil and whether key lime pie, a delicacy from the Florida Keys, should be declared the state pie. "These things happen in an election year," said one frustrated Florida politician.

New Scientist

Events Calendar

- Oct. 7-Nov. 6 — Exhibit, "Focus on Faculty: New Work by William Gilbert"; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues.; UNM Art Museum, 277-4001.
- Oct. 7-Nov. 11 — Exhibit, "The Natural Mind: Roger Sweet"; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues.; Jonson Gallery, 277-4967.
- Oct. 7-Dec. 22 — "A Poetic Vision: Spanish Colonial Painting," exhibition of religious paintings from the 17th-19th centuries, on loan from the Institute of Iberian Colonial Art; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. (gallery talk by guest curator Gabrielle Palmer 5:30 p.m., Oct. 11); UNM Art Museum, 277-4001.
- Oct. 8 — Dance performance by Zuleikha: combines Kathak, oriental forms, and contemporary expression; 8 p.m., South Broadway Cultural Center, 848-1320.
- Oct. 9 — "Dances and Dancers Alive," benefit performance for NM Special Olympics Gymnastics, featuring Middle Eastern, modern, Hawaiian, and flamenco dances; 6 p.m., KiMo Theatre, tickets available after 3 p.m., Mon.-Fri., at Albuquerque Gymnastics School (10280 Comanche NE), 292-6805.
- Oct. 9 — "A Baroque Offering," 17th century music for soprano, recorder, flute, viola de gamba, oboe, and harpsichord, performed by Musica Antigua de Albuquerque; 4 p.m., St. Thomas of Canterbury Episcopal Church (425 University NE), 842-9613.
- Oct. 11 — Concert, UNM Symphony Orchestra; 8:15 p.m., Popejoy Hall, 277-2111.
- Oct. 12-13 — Keith Terry, one-man "neo-post-new" vaudeville revue; 8 p.m., KiMo Theatre, 848-1370.
- Oct. 14 — Crownpoint Rug Auction: rug viewing 3-6:45 p.m., auction 7 p.m.; Crownpoint Elementary School, 786-5302.
- Oct. 14 — Canterbury Concert Series: music for flute, viola, and harp; 4 p.m., St. Thomas of Canterbury Episcopal Church (425 University NE), 247-2515 or 836-6775.
- Oct. 14-15 — The Paul Taylor Dance Company, co-sponsored by Ballet West and NM Symphony Orchestra, featuring "Airs" to music by Handel, "Sunset" to music by Elgar, and "Esplande" to music by Bach; 7:30 p.m., Popejoy Hall, 843-7657.
- Oct. 14-31 — "Kingdom Come," by Nancy Gage, premiere drama of love and life on the Navajo Reservation; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.
- Oct. 15 — Tom McVeety, performing new sounds

- in music using electric cello, synthesizers, and a computer; 8 p.m., KiMo Theatre, 848-1320.
- Oct. 15 — "Mademoiselle Ooh-La-La Circus," one-ring circus fun; 1 & 3 p.m., South Broadway Cultural Center, 848-1320.
- Oct. 16 — Keller Hall Performance: Roberta Gary of the Cincinnati Conservatory of Music; 4 p.m., Keller Hall, 277-4402.
- Oct. 17 — St. Margaret Mary Feast Day: Harvest and social dances; Laguna Pueblo, 1-552-6654 or 843-7270.
- Oct. 18 — Concert Chorale and University Chorus concert, 8:15 p.m., Keller Hall, 277-2204.
- Oct. 18 — Subscription Concert I, Chamber Orchestra of Albuquerque conducted by David Oberg, featuring guitarist Peter Segal; 8:15 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

- Oct. 21 — "Rainbow Serenade," benefit concert for Casa Esperanza, featuring the New Mexico Chords Barbershop Chorus; 8 p.m., Hoffmantown Baptist Church (8800 Harper NE), 821-1305.
- Oct. 21 — Bluegrass concert by the BCH Acoustic Group, 7:30 p.m., First United Methodist Church (4th & Lead SW), tickets available at Riedling, Pimentel & Sons, and Encore Music.
- Oct. 21-22 — Classical Concert II: "Hymns to the Human Spirit," NM Symphony Orchestra plays Mozart and Stravinsky; 8:15 p.m., Popejoy Hall, 842-8565.
- Oct. 21-22 — Premiere performance of original works by Tim Wengard & Company, featuring modern dance and classical ballet pieces, including "Blue Mesa" performed by Tom McVeety; 8 p.m., KiMo Theatre, 265-1087 or 848-1374.



SURROUNDED by the tools of their trade are Sandia's latest Certified Professional Secretaries (CPSs): (from left) Connie Lou Soto (1553), Marti Morgan (6429), Sheila Guynes (400), Phyllis Boehme (6421), and Carol Kaemper (21-1). All were graduates of Sandia's CPS Review class that began in June 1986. Becky Jerome (2310) was also a member of the class but passed her CPS examination last November. And three "floater" secretaries who recently hired in — Barbara Saya, Sue Hansen, and Betty Hilgartner (all 21/22) — are CPS holders.