

PERSHING II missile system is shown during final advanced development testing at White Sands. Phase 3 authorization was received recently for engineering development of the W85 (air burst/surface burst) and W86 (earth penetrator) warheads for the Pershing II system. The program calls for a three-to-four year labs wide effort.

W85 and W86

New Phase 3 Work Underway at Labs

With the recent Phase 3 authorization for engineering development of the W85 and W86 nuclear warheads for the Army's Pershing II surface-to-surface missile system, both Sandia and LASL are getting underway a three-to-four-year effort to provide an air burst/surface burst warhead (W85) and an earth penetrator warhead (W86) for the system.

Program management is centered in Systems Development Department III 4340 under Heinz Schmitt. Ray Reynolds, supervisor of Division 4342, is responsible for system project engineering and Sam Jeffers, supervisor of Division 4344, for system testing and evaluation. Many other Sandia organizations are involved as well.

The Pershing II is a two stage rocket system launched from a mobile launcher. The Army's Pershing Program Office at Redstone Arsenal, Huntsville, is managing the program. Martin Marietta in Orlando, Florida is prime contractor for the overall system.

The W85 warhead will be based on an adaptation of B61-4 components to be compatible with the Pershing II system.

The W86 penetrator is a unique weapon system which must survive missile/reentry flight as well as earth penetration environments. The nuclear package will be based on LASL-developed nuclear technology evolved over the years for artillery applications.

For both warheads, Sandia is responsible for electrical system design (including fire sets), mechanical and electrical interfaces, testing, evaluation and instrumentation. For the penetrator, Sandia has additional responsibilities for terradynamics, case design and fuze.

Eleven flight tests are planned for the W85 and 17 for the W86. Also planned are complete environmental testing of all

(Continued on Page Two)

LAB NEWS

VOL. 31, NO. 18

SEPTEMBER 7, 1979

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

A Testimonial

'It Works for All of Us'

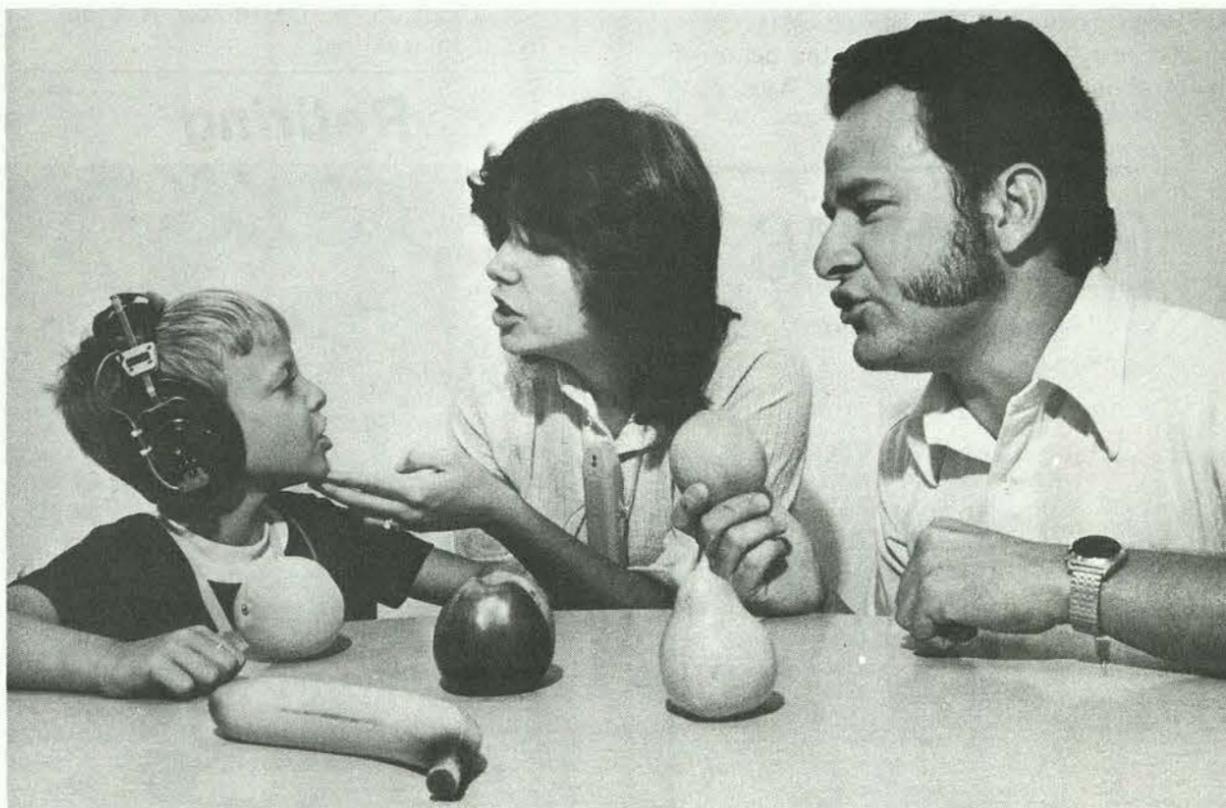
"It works for all of us," is the slogan of this year's Employees Contribution Plan campaign. Norberto "Bodo" Garcia (3618) is one Sandian who can give a testimonial for the effectiveness of ECP agencies.

Bodo's son Tim, now a healthy six-year-old, was born with a severe hearing handicap — he was diagnosed as being totally deaf.

"At that time," Bodo says, "the family doctor wasn't any help. My wife Rhonda and I were desperate. I had lost my job at the telephone company and was working as a janitor at the Heights YMCA while waiting for a clearance to join Sandia. We had no money for additional diagnosis, treatment or hearing aids. That's when the United Way agencies started helping.

"The greatest thing was knowing that someone cared enough to help. The agencies arranged for medical exams at UNM's medical school, and the Crippled Children's

(Continued on Page Three)



ECP POSTER — Bodo Garcia (3618), right, works with speech therapist Sharlette Redick to help his son Tim at the Albuquerque Hearing and Speech Center. Handicapped since birth, Tim is making progress as a result of the professional help from this United Way agency.

Afterthoughts

Off we go--Ever vigilant, the Air Force has countered a new threat to our (or maybe it's their) security. We quote from the KAFB Bulletin: "Flammable Aerosol Deodorants. Using Chemscope Corp. aerosol deodorant inside aircraft is not recommended... aerosol products are flammable under certain conditions... an aerosol product used inside an aircraft could result in serious consequences if ignited." My problem is that I love to watch those sleek Air Force fighters whoosh off into the skies and I know the pilot is wearing something more than a T-shirt, so how comes he to use an aerosol deodorant en route? Surely he's too busy to strip while doing wingovers and high-G dives and besides, whom is he going to offend anyway if he works up a sweat? It's a curious business...

* * *

"Science as we know it has two basic types of practitioners. One is the educated man who still has a controlled sense of wonder before the universal mystery, whether it hides in a snail's eye or within the light that impinges on that delicate organ. The second kind of observer is the extreme reductionist who is so busy stripping things apart that the tremendous mystery has been reduced to a trifle, to intangibles not worth troubling one's head about. The world of the secondary qualities, color, sound, thought, is reduced to illusion. The only true reality becomes the chill void of ever-streaming particles. . . . One can only assert in science, as in religion, that when one has destroyed human wonder and compassion, one has killed man, even if the man in question continues to go about his laboratory tasks." From an article by the late Loren Eiseley.

* * *

For preposition freaks--From George Steck (5641), this anecdote: "A boy was sick in bed upstairs and asked his mother to go downstairs and get a certain book so that she could read to him from it. Upon her return with the wrong book, the boy asked, 'Why did you bring that book that I didn't want to be read to out of up for?'" *js

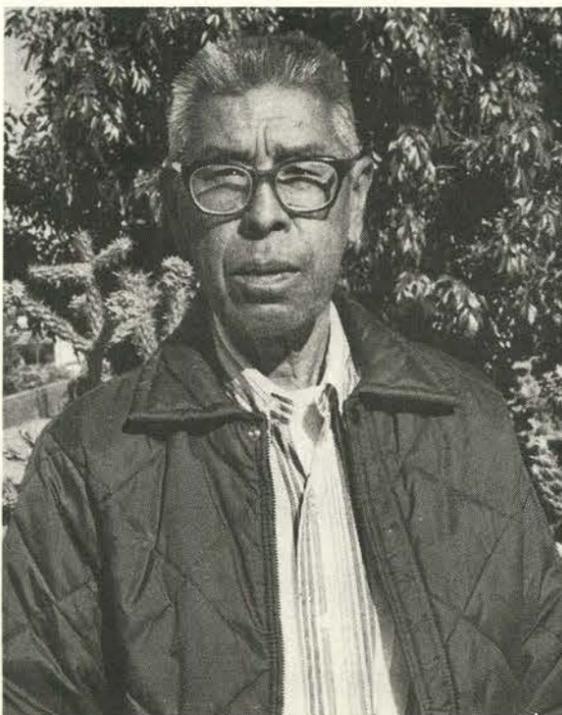
Sympathy

To Kenneth Peters (1471), on the death of his mother-in-law in Albuquerque, Aug. 22.
To Floyd Braaten (1473) on the death of his grandmother in Phoenix, Aug. 28.
To Shirley Dean (5000/5001) on the death of her father in Albuquerque, Aug. 14.
To Ann Michele (3100/3001) on the death of her father in Pennsylvania, Aug. 10.
To Roger Chavez (3426) on the death of his father-in-law in Albuquerque, Aug. 28.
To Jerry Fragua (1471) on the death of his father-in-law in Jemez Pueblo, Aug. 26.

Unusual Pet?

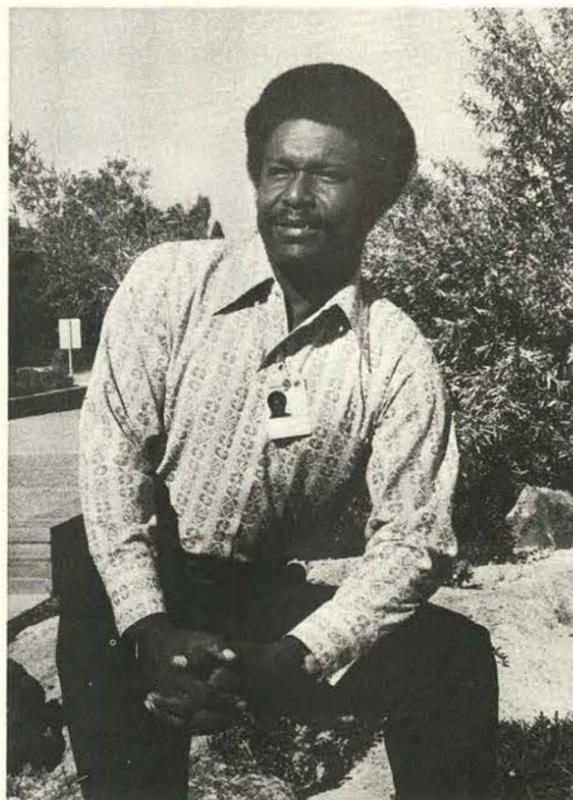
If you're especially proud of your pet muskox, then here's a chance to get a first class photo of yourself and the animal. LAB NEWS is planning a photo feature of Sandians who have unusual pets. "Unusual" means exotic, different or outlandish (not Fido carrying in the morning paper). Give us a call on 4-1053 to tell us about your unusual pet.

Retiring



Arsenio Baca (3742)

Supervisory Appointment



ART HARDEMAN (2626)

ART HARDEMAN to supervisor of Personnel Systems Division 2626, effective Sept. 1.

Art has worked in the computer organization since coming to Sandia in June 1965. He has performed systems analyses for the technical library and financial, technical support and personnel applications organizations. His work has also included the development and implementation of computerized systems.

Art earned a BS in mathematics and economics from Morehouse College in Atlanta, Ga. and an MS in computer science from UNM. He is a recruiter for Sandia's BS-MS program. Off the job, Art enjoys tennis, photography and music. Art lives in NE Albuquerque.

Speakers & Authors

R.L. Iman (1223) and J.M. Davenport (Texas Tech), "On the Adequacy of the Chi-Square Approximation for the Friedman Test"; R.L. Iman and W.J. Conover (Texas Tech), "Small Sample Sensitivity Analysis Techniques for Computer Models, with an Application to Risk Assessment," 139th annual meeting of American Statistical Association, Washington, D.C., August 1979.

W.J. Conover (Texas Tech), T.R. Bement (LASL), and R.L. Iman (1223), "On a Method for Detecting Clusters of Possible Uranium Deposits," Vol. 21, No. 3, TECHNOMETRICS.

Continued from Page One

New Phase 3 Work Underway

components plus system tests on rocket sleds in Area III and the Davis gun facility at Tonopah Test Range.

The Phase 3 authorization is the culmination of a three-year advanced development program which demonstrated the accuracy of the terminal guidance system and the feasibility of an earth penetrator weapon for the Pershing II system.

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ALBUQUERQUE, NEW MEXICO
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Editorial offices in Albuquerque, N.M.

Area 505 264-1053

FTS 475-1053

ZIP 87185

In Livermore Area 415 422-2447

FTS 532-2447

john shunny is editor

&

don graham ass't. editor

chuck cockelreas & norma taylor write

bill laskar does picture work

aided by gerse martinez

bruce hawkinson & lorena schneider report livermore.



POSTER MODEL — Angie Gurule (3152) didn't really expect to end up on the United Way poster that's being used throughout Albuquerque, but she did and United Way's Kathi Schroeder (center) came out to the Labs to express official appreciation. Gene Blake (1710), ECP Committee Chairman, beamingly approves.

Continued from Page One

'It Works for All of Us'

Society paid \$850 for hearing aids for Tim. We started therapy and treatment with the Albuquerque Hearing and Speech Center."

This is not yet a success story. Tim has continuing problems, but he is making progress. With hearing aids, Tim has almost normal hearing.

"There are other problems," Bodo says, "with children with hearing disabilities. There's physical things like coordination and balance. And emotional things. Normal children are social. Tim tries, withdraws, tries again."

Tim receives therapy at the Speech Center

two hours a day during the week. Bodo and Rhonda have received instruction there on how to work with Tim. They spend several hours each day with Tim in therapy sessions.

"It's emotionally difficult and demanding," Bodo says, "but he is making progress."

"We're grateful for all the help we've received. It makes you stop and think. There are hundreds — no, thousands — of people in Albuquerque who receive help from United Way agencies. And this help makes a difference in people's lives. It makes a difference in the quality of our community."

ECP Drive Starts Monday

Sandia's annual Employees Contribution Plan campaign starts Monday.

"This year's drive will be pretty much like last year's," says Gene Blake (1710), ECP committee chairman. "There are just two things that are important: first, the United Way goal is up some 21 percent over last year; second, we'd like to see more Sandians contributing a fair share."

Gene is quick to point out (with pride) that 85 percent of Sandia employees contribute to ECP and that the average annual gift per contributor is about \$120.

"That's generous," Gene says. "In Albuquerque, Sandia people provide about one-fifth of the total United Way budget."

United Way goal this year, \$3,500,000, will provide operating funds for its 39 agencies. In addition to the United Way agencies, ECP supports eight additional national health agencies.

About 52 percent of Sandia employees are contributing at the fair share level — one hour's pay per month. All Sandians will be contacted during the drive and asked to review their contributions.

"We have work to do," Gene says.

Fun & Games

Chess — Ever played chess by mail? The Bell System Postal Chess Tournament is beginning its 33rd annual round, and some 1200 Bell System people are currently participating. Players from the various companies are grouped into sections of relatively equal skill. Each player in a section then plays all other members of the section, simultaneously, about eight games at once. If you're interested, get an application form by sending a stamped, self-addressed envelope to: Chess Tournament Director, 195 Broadway, Room 1338, New York, NY 10007. You need to know chess notation to participate.

Biking — A number of Sandians took part in the annual Sandia Crest bike race last Sunday. The course was different this year, covering the 30 miles from the Western Skies Motel at the entrance to Tijeras Canyon up to the Crest, with an elevation gain of 4,500 feet. (Previously, it was Madrid to the Crest.) The leading Sandian was Jim Harrison (4311) with a time of 2:11. Others participating were Janet Brock (1415), Wilson Brooks (4362), Ron Malpass (1761), Ron Hartwig (4361), George Patton (1253), David Strip (4416), Bob Roginski (1233) and John Shunny (3162).

Running — All sorts of running events are coming up. On Saturday, Sept. 15, there's a KAFB 10,000 metre fun run that starts at 8 a.m. at the East Gym and heads south. The following day, Sept. 16, 5 and 10 kilometre runs are offered in the John Baker race at Kit Carson Park, 9 a.m. LAB NEWS has entry forms for both events. In October, the Albuquerque Marathon is set for Oct. 21 and, on Oct. 27, the first Coronado Club/Schlitz Light 10 kilometre run takes place here on the Base. Finally, the Triathlon of Albuquerque, the Jay Benson Memorial, is scheduled for Nov. 4.

Aerobic dance class — The C-Club's Skip Dougherty reports that the last one was so successful that another is being offered. If you're not familiar with aerobic dancing, the term refers to performing vigorous dance routines to music with a fast beat, the idea being that it's more fun that way. (We're reminded of that reference to ballet dancing being like running a 4-minute mile with a smile on your face.) The class begins Sept. 12, will run Mondays and Wednesdays from 5 to 6:15 p.m., and costs \$24 (payable at the first class). No more than 30 sign-ups, men and women, will be accepted; sign up by calling Skip on 4-8486. Donna Ness is the instructor.

Bowling — A Scotch Doubles Tournament has been set for Sept. 15 and 16 at the Fiesta Lanes. Call Dora Montoya, 4-4052, or Ron Van Theemsche, 4-4380, for further information.

Boating safety — The Coast Guard Auxiliary is again offering boating safety courses in both sailing and general power boating. The sailing and seamanship course began Sept. 6, and the boating skills and seamanship course starts Sept. 10. Both classes are held at the Christ Lutheran Church, Candelaria and Penn. NE, starting at 7 p.m. Call 292-4187 or 255-3483 to register. The \$7 fee includes cost of the textbook.

Isle of Man Is Isle of Mother

(Ed. Note: Have you taken an unusual vacation? Tell us about it — call 4-1053.)

Unusual vacations are not uncommon for Lucille (3152) and Roy (2632) Smith. They've gone to Switzerland to snowmobile, to Hawaii with a group of square dancers, made two trips to Haiti and the Dominican Republic to visit family, and traveled by motorhome to British Columbia, Canada and Nova Scotia. But vacation this year, according to Lucille, was a "bit of a surprise."

Last fall a local paper carried a small item stating that the Isle of Man Millennium would be celebrated in 1979. Lucille's mother had been born on the Isle of Man. When Lucille read that all descendants of Manx (from Scandinavian *manisk*, meaning a native of the Isle of Man or its Celtic language) people were invited for the celebration, she began to make vacation plans.

The celebration of Millennium Year notes the thousand year longevity of the Isle of Man parliament of Tynwald. Founded by the Vikings, the Tynwald is the oldest such assembly in the world. Most of the pageantry of the celebration was scheduled for June and July, so Roy and Lucille and her two sisters made the trip in May to avoid the large crowds. "We were mainly interested in seeing the places our mother had described to us and trying to trace our ancestors," Lucille says.

The small island, 227 square miles in area, is situated in the Irish Sea, close to England, Ireland and Scotland. After a few days in England, the Smith party made the trip from Liverpool to the island by boat. "It was a cold and windy four-hour trip and we decided then that our return would be by air," Lucille says.

"Our week on the island was delightful, in spite of damp weather," Lucille says. "We stayed at a small hotel in Douglas, the capital, where our favorite means of transportation was the horse-drawn street car. The country is geared to vacationers — it's a resort and playground for the entire British Isles. Trains take you through the beautiful countryside to visit historic sites: ancient monuments, prehistoric burial grounds, sites of Viking boat burials, Celtic and Norse settlements, Viking forts and castles, and runic crosses.

"We looked up birth, marriage and death records, found the graves of our grandparents and the farm where our mother grew up. It's called 'Gretch Voar,' Gaelic for 'farm on the hill.' The Manx have their own language, but many speak Gaelic, and most also speak English. The island is known for its sheep, woolen mills, Manx kippers, and the peculiar Manx cat which has no tail.

"The people were gracious and friendly and just a little superstitious. For instance, we often crossed a particular bridge while touring and were always cautioned to greet the 'wee people' who live under the bridge. The men tip their hats and everyone says 'good morning' or 'good evening,' thus forestalling bad luck."

Lucille and her sisters have Scottish grandparents and their father was born in Dunfermline, Scotland, so the third week of their vacation was spent in that country. Then back to London and home.

Logistics — Transportation was arranged with a local travel agency: round-trip air fare for two from Albuquerque to Chicago to London was \$956 and a Britrail Pass for three weeks (for two) was \$270.



LUCILLE SMITH (3152) stands atop the Laxey Wheel, a site her mother had often described. The wheel, built in 1854, operates pumps which extract water from lead mines under Snafell Mountain. Snafell summit is the highest point on the island (2036 feet) and is reached by an electric train. The Manx say that the view from Snafell, takes in six kingdoms — England, Scotland, Ireland, Wales, Man and the kingdom of heaven!

Accommodations in London were expensive (\$52/night), unless you can find B&B lodgings (bed and breakfast). On the Isle of Man, accommodations for two, including bed, breakfast (large) and dinner were \$12.50 per day, and in Scotland at a B&B, \$17/day. The plane fare from the Isle of Man back to Glasgow, Scotland, was \$40 each.

Lucille has a couple of suggestions: "Get your traveler's checks at the Albuquerque airport in pounds sterling. Because of the dollar decline, they will cost you less in this country and you won't have to find a bank in a foreign country to get them cashed." Lucille also passes along a tip given to her by a co-worker: color-code the straps of your luggage for easy identification at the baggage counter.



ROY SMITH (2632) purchased this Scottish plaid jacket and cap because of the cold weather on the Isle of Man. The Smiths made their trip in May, but later on the island's numerous beaches are crowded with bathers. Roy is making plans for their next vacation to New Zealand and Australia.

Take Note

The Dept. 3440 news notes for Aug. 14 note rather matter-of-factly that two rattlesnakes invaded their Bldg. 913 in Area II (the Pressure Safety Lab) during the previous week. The larger was some three feet long. As the CIA was once wont to phrase such action, both were terminated with extreme prejudice. The news note concludes with an interesting bit of snakeology: "These snakes are more active in August due to the mating instinct."

Tonight, Sept. 7, at the Kimo Theater will be held the Annual AUA Benefit Art Auction. "AUA" stands for Albuquerque United Artists, and the purpose of the auction is to raise funds for the benefit of the AUA Downtown Center for the Arts. Works by more than 30 local artists will be auctioned off, and a number of performing artists will provide music and dance. The reception and final viewing starts at 6, the auction at 8. The Kimo is at 5th and Central.

Speaking of the arts, on Oct. 2 a bond election will be held in Albuquerque, and voters will be asked to pass judgment on 13 propositions. Of the 13, 10 are directly advantageous to the arts community since they are concerned with cultural facilities and beautification of our city. Big money items on the bond election are street improvement, storm and sanitary sewers, and a water supply system. Parks & Recreation and the zoo are the major items relating to beautification, with art acquisition, the museum, performing arts theater, open space and the library accounting for most of the remaining propositions.

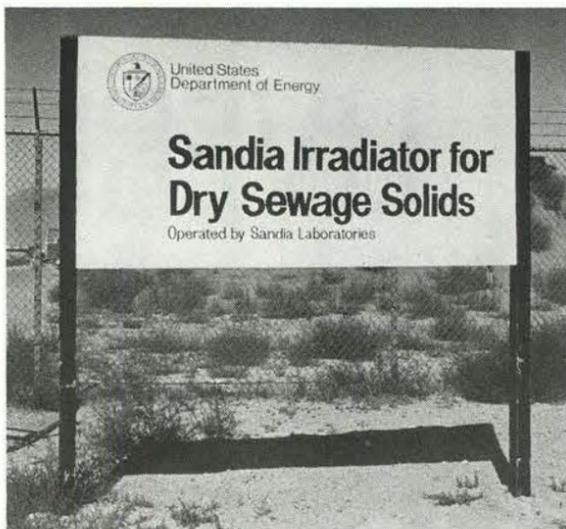
Ed Belknap of Big Brothers/Big Sisters of Albuquerque — a United Way agency — called to report an urgent need for more Big Brothers. Some 75 young boys are now on their waiting list. A Big Brother provides companionship for a few hours each week to his young friend, who usually comes from a fatherless home. They might go hiking, or to a ball game, or simply be with each other for a relaxed afternoon. If you're interested, call Ed on 266-8653 for additional detail. The agency has one other program aimed at adults who are not able to make a Big Brother's commitment, but who would like to help youngsters. Called Group Outreach, the program calls for an adult person to take three or four boys from time to time for a Saturday or Sunday outing. Ed has more information on this program too.

Many new employees and a few old-timers may not be aware that the Base people operate a thriving Thrift Shop which Sandians may patronize, both to buy and sell. The Thrift Shop is located on H St. about two blocks west of Wyoming, just across the street from the Bank of New Mexico. All sorts of things are sold at the Shop on consignment — furniture, clothing, sport equipment, books, appliances, etc. It's open Mondays, Tuesdays, and Thursdays from 10:30 to 2 and Wednesdays from 3 to 6.

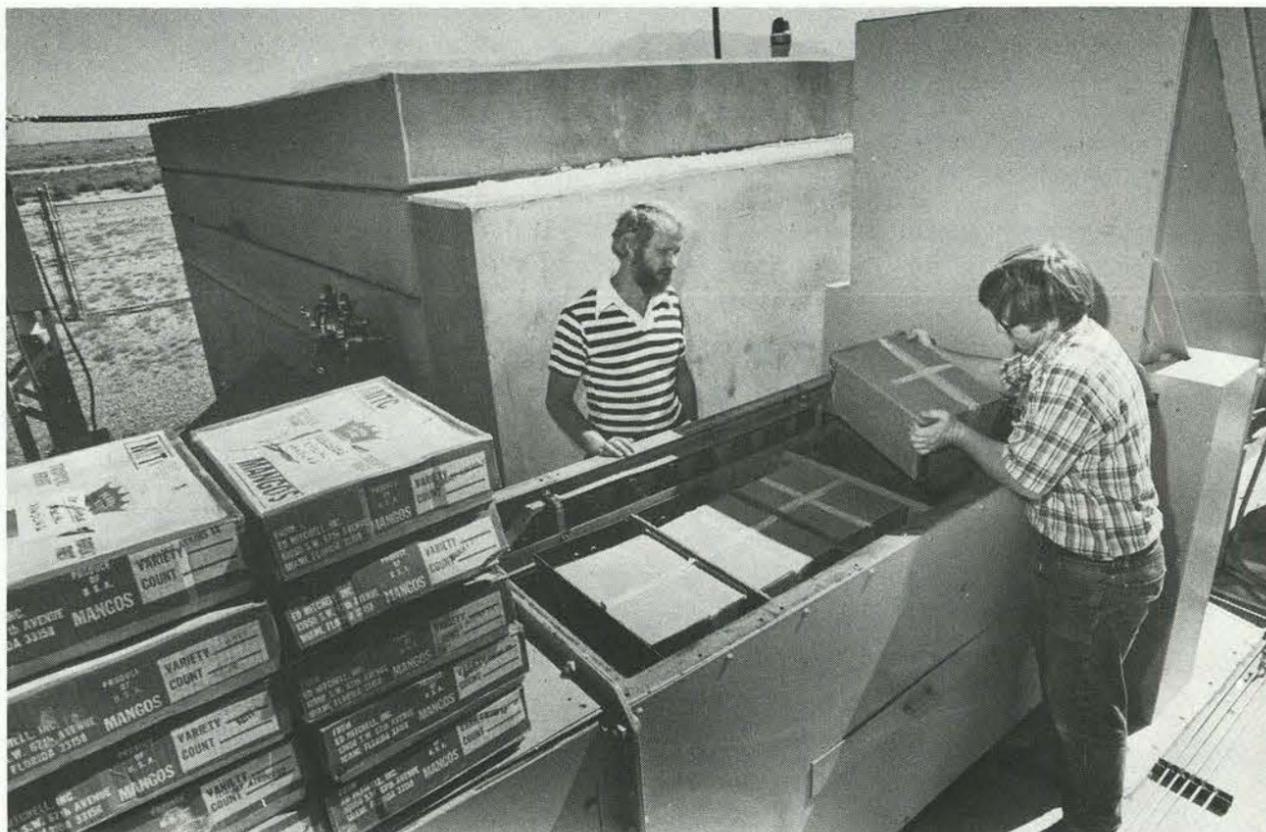
Congratulations

To Mr. and Mrs. Orlando Espinosa (1485), a son, Aug. 18.

To Mr. and Mrs. Greg Kolb (4412), a son, Nathan Leigh, Aug. 25.



WHEN SIDSS was designed last year, it's unlikely that the designers ever expected to be running fresh mangoes through the cesium-137 radiation chamber. But here scientists Jerry Brandon and Marv Morris, both of Applied Biology and Isotope Division 4535, load boxes of the fruit onto SIDSS's conveyor belt for a pass by the cesium source. The work is part of US Dept. of Agriculture project to determine if insect pests can be eliminated through irradiation.



Irradiation Facility May Sub for Fumigant Pesticide

Unless you're a farmer or a food processor, the chemical compound ethylene dibromide probably holds little meaning for you. But EDB does affect us all, and there's some likelihood that the grapefruit you had for breakfast, or the potato you eat at dinner tonight, bears some slight residue of this chemical. Some five million pounds of EDB are used annually, mostly as a fumigant pesticide. In the case of fruits and vegetables, EDB is used after harvesting to kill insect pests and their eggs.

Enter scientists from the Environmental Protection Agency who have made studies of EDB. Their conclusion: EDB may kill bugs but it may also be carcinogenic, cancer causing on a scale sufficiently large to prompt the Animal & Plant Health Inspection Service

of the Dept. of Agriculture to look for alternatives.

And that's why Sandia's Shipping & Receiving organization has recently accepted shipments of grapefruit and mangoes. The shipments, under refrigeration, were quickly sent to Jack Sivinski's Applied Biology & Isotope Utilization Division 4535 for processing in SIDSS (Sandia Irradiator for Dried Sewage Solids). In an experimental procedure, the fruit is being exposed to cesium-137 radiation to determine if such exposure will kill insect pests, yet not alter the taste or other qualities of the foods. The work is funded under a memo of understanding between USDA and DOE.

The irradiation project is still underway, and results thusfar are tentative but

encouraging. A USDA report entitled "Sensory Evaluation of Irradiated Grapefruit" states, in part, that "no flavor differences from control were found for irradiated fruit except in the pasteurized juice samples . . .". USDA estimates that to treat the grapefruit crop by this method, irradiation facilities would be needed that could handle at least 100 tons of fruit per hour. In one year, over 200,000 tons of this fruit were fumigated in Florida alone. Cost and planning data have been requested by USDA on the design and construction of irradiation facilities.

It's still too early to assess the final outcome of this project. But if irradiation proves an acceptable alternative to EDB, then nuclear science will be able to scratch one more up in the "win" column.

Fool's Gold Looking Good For Coal Liquefaction

A 10 to 15 percent increase in the amount of liquid fuel that can be recovered from bituminous "eastern U.S." coal may be possible by adding controlled amounts of pyrite — fool's gold — to coal before processing, Sandia Laboratories studies indicate.

Sandia's bench-scale studies of the past three years show that coal which contains at least three to five percent pyrite (iron disulfide) is significantly more amenable to liquefaction than coal with smaller amounts. Although pyrite occurs naturally in most bituminous coals, the percentage may vary from less than one percent to more than seven percent.

Goal of Sandia's work, one portion of a DOE research program, is to identify an inexpensive, disposable catalyst that can be added to coal to increase its yield of liquid fuel. Pyrite, which is actually discarded as waste by some industries, appears to meet some of these requirements.

Liquefaction involves crushing coal, mixing it with an appropriate solvent, and heating the resulting slurry to 400-450°C, under hydrogen pressure, where catalysts help convert the coal into liquid fuel while non-combustible minerals and unconverted coal are removed.

The resulting fuel can be blended into existing refinery crude stock, be used as a fuel oil for industrial or home applications, or perhaps be used as a chemical feedstock.

Present liquefaction techniques yield two to three barrels of oil per ton of coal, but costs are higher than for oil recovered from wells.

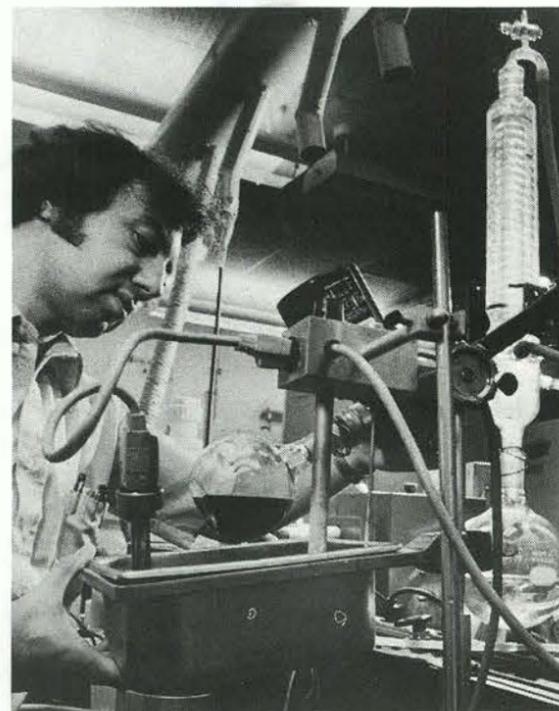
Although coal has been liquefied for years — Germany used the process in World War II — the process is expensive and still not thoroughly understood. Also, variations in organic composition, mineral matter, and other characteristics of coal make the liquefaction process hard to define.

Sandia's tests involve heating powdered coal, solvent, and pyrite in an autoclave reactor at liquefaction conditions of 1800 psi and 425°C. The effects of added minerals, such as pyrite, are evaluated for yield of distillate fuels and consumption of hydrogen. A chemical model of mineral effects on coal liquefaction will be developed to guide further process studies and catalyst development.

"Conversion increases are noticeable with just small amounts of pyrite added," says Barry Granoff (4731), project leader. "However, the increases seem to plateau at about five to seven percent pyrite," he adds.

Because five-percent-pyrite added seems optimum, future Labs studies will try to determine if pyrite from very reactive coals (ones which naturally contain eight to nine percent pyrite) can be added to refractory coals (two percent or less pyrite) to increase their liquid fuel conversion.

Studies will also be conducted to determine if naturally occurring and chemically synthesized pyrites have the same



BARRY GRANOFF (4731) works with laboratory apparatus for coal liquefaction. Recent experiments show that small amounts of pyrite act as a catalyst to increase the yield of liquid fuel from some coals. Under optimum conditions, about 2½ to 3 barrels of liquid fuel can be recovered from a ton of coal.

effect on coal liquefaction and to determine why some coals with similar pyrite contents display different conversion characteristics.

Labs Runners In Corporate Cup

Sandia's runners competed Aug. 11 against several hundred other employees of Northern California companies in the Corporate Cup Relays. Wearing T-shirts designed especially for the occasion (and which met all corporate regulations), they

finished a respectable 20th out of 46 overall. Best Sandia performance was an 8th place finish out of 32 in the pyramid relay. Members of that team were: Dale Boehme (8313), Dan Dawson (8314), Sandy Mondot (8264), Tim Sage (8314), and Joan Woodard (8326).



SANDIA PARTICIPANTS (from left) in the Corporate Cup were: Top Row - Rob Rinne (8201), Hanloy Quock (8333), Tom Arndt (8312), Art Kellom (8461), Tom Jefferson (8332), Mike Stephenson (8116), Karen Quock (8261) and Bill Spencer (8100). Middle Row - Day Bray (8461), Gerry Williams (8272), Tim Sage (8314), Carolyn Kramer (8313), Sandy Mondot (8264), and Steve Robinson (8314). Bottom Row - Larry Brandt (8328), Dan Dawson (8314), Doug Henson (8116), Pat DeLaquil (8324), Christy Wilson (8313), Dale Boehme (8313), Dona Crawford (8332) and Joan Woodard (8326).



CHRISTY WILSON (8313), center, in lead off, two-mile leg of women's relay.



DAVE BRAY (8461) on opening two-mile leg of master's relay.



MASTER'S relay members Bill Spencer (8100), Art Kellom (8461), Dave Bray (8461), and Karen Quock (8261) in pre-race strategy session.

LIVERMORE NEWS

VOL. 31, NO. 18 LIVERMORE LABORATORIES SEPTEMBER 7, 1979



U.S. REPRESENTATIVE from California William Royer met Ralph Cozine (8160) on a plane and accepted his invitation to visit the Labs. Here he discusses Solar Central Receiver systems with Rick Wayne (8450). Royer is a member of the Science and Technology and Public Works and Transportation committees.

Speakers

Larry Rahn and Pete Mattern (both 8342), "Coherent Antistokes Raman Spectroscopy (CARS) with Background Rejection in a Flame" and A. Ouyoung (4214) and Larry Rahn, "High Resolution Inverse Raman Spectroscopy in a Methane Air Flame," IEEE Conference on Laser Engineering and Applications, May 30-June 1, Washington, D.C.

Prof. A. Emery (Univ. Wash.) and Linn Derickson (8152), "The Effects of Moisture and Temperature Upon the Behavior of an Unsupported Coal Mine Roof," 20th U.S. Symposium on Rock Mechanics, June 4-6, Austin, TX.

Dan Hartley (8350), "New Developments in Diagnostic Methods in Engine Combustion," University of Wisconsin Fourth Engine Combustion Workshop, July 22-24, Madison, WI.

Charles Oien and Lutz Dahlke (both 8444), "Photographic Effect of Secondary Electron Emission from Metal Foils During Radiography," American Society for Nondestructive Testing, July 31-Aug. 2, Asheville, NC.

Louie Tallerico (8452), "Solar Central Receiver Program," and Carl Hiller (8124), "Development and Testing of the Sulphuric Acid/Water Chemical Heat Pump/Chemical Energy Storage System," 14th annual Intersociety Energy Conversion Engineering Conference, American Chemical Society, Aug. 5-10, Boston.

Congratulations

Jennifer Brown (8347) and Donald Masquelier, married in Livermore, Aug. 18.

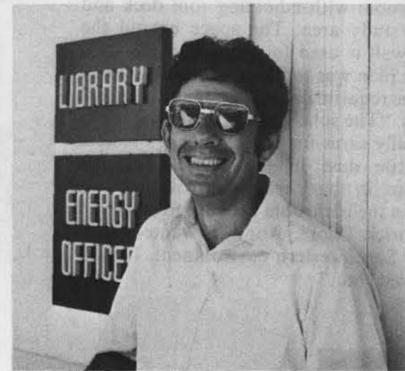
Bruce Hawkinson (8265) and Lynda Langlois, married at Lake Tahoe, Sept. 1.

Sympathy

To Dick and Diane Shimada (both 8271) on the death of his father in Los Angeles, Aug. 15.

To Walt Maupin (8255) on the death of his mother in Okmulgee, OK, Aug. 13.

Supervisory Appointment



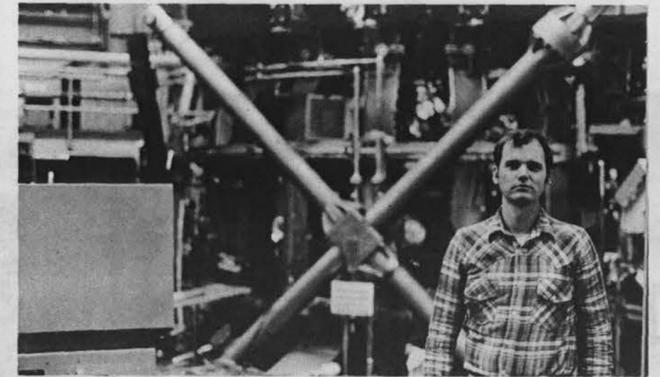
LOU TALLERICO to supervisor of Joining Model Laboratory Division 8425, effective Sept. 1. After joining the Labs in 1965, Lou worked on explosive valves and actuators and then in a weapon systems design group. He spent two years with MBAssociates, then returned to Sandia in 1970 and worked in component development. He has spent the last two years in the Solar Central Receiver program.

Lou holds a BS from San Jose State University and an MS from Stanford, both in mechanical engineering. He's a member of ASME and of Tau Beta Pi, the national honorary society for engineers.

Off the job, Lou enjoys viticulture, enology, hunting, and fishing, though not necessarily in that order. He, his wife Diana, and their two children live near Manteca where Lou is an active supporter of St. Anthony's School.

Sandians Help in Tokamak Research

The "first wall problem" in tokamak fusion machines is of concern to fusion physicists throughout the world. Sandians of Ion-Solid Interactions Division 5111 under Tom Picraux recently completed a series of measurements that are contributing new insights into the nature of the problem. The Sandians are working on impurity control and hydrogen recycle in tokamaks with the Princeton University tokamak research team under a DOE program.



BILL WAMPLER (5111) is working with the Princeton University tokamak research team on measurements of plasma impurities. In the background is Princeton's new PDX tokamak machine.

In a typical tokamak — a large device in the shape of a doughnut, or torus — a magnetic field is created which confines the hydrogen plasma that flows during a discharge. The idea is to keep the plasma centered in the torus without touching the walls. But some hydrogen ions and atoms nevertheless escape from the plasma and strike the wall. These interactions with the materials of the wall result in the release of trapped hydrogen and impurities back into the plasma. These particles, to a large extent, determine the plasma characteristics achieved during the discharge. Impurities injected into the plasma can severely reduce the plasma temperature. The temperature of the plasma must be about 100,000,000°C to achieve fusion.

Tom Picraux explains:

"To get the desired operating conditions in present tokamaks — and to avoid problems in future devices — it's important we understand these interactions between the first wall and the plasma. The first thing one needs to know is the flux of hydrogen isotopes and impurities to the wall. This is not easy to predict, and measurements must be made in operating tokamaks. There are few diagnostic techniques which can provide this information and, until recently, there have been little data available.

"At Sandia we've developed a diagnostic capability for this which involves first exposing material samples of known composition to discharges in the tokamak, and then analyzing the samples using a variety of techniques. From our measurements on the samples we've been able to gather new information on the flux and energy of hydrogen isotopes as well as the flux of impurities at the plasma boundary."

The samples — strips of carbon and silicon — are exposed at Princeton by positioning them inside the torus. The samples "catch" particles moving in the boundary layer between the plasma and the wall.

After exposure, the samples are brought back to Sandia for analysis using energetic ion beams produced in the Labs' Van de Graaff accelerator facilities in Bldg. 884. The techniques being used by principal investigator Bill Wampler (5111) include ion backscattering spectroscopy, nuclear reaction analysis and elastic recoil detection.

Another tokamak diagnostic technique being developed at Sandia by Gary Kellogg and John Panitz (both 5114) involves exposure of small needle points of material to tokamak discharges at Princeton and Oak Ridge. This unique diagnostic technique, which is capable of resolving single atoms, makes use of field ion microscopy and imaging atom probe mass

spectrometry laboratories in Bldg. 806.

"Our results demonstrate the value of quantitative analysis of surface impurities in the wall region," Tom says. "This better understanding of mechanisms and origins of impurity behavior suggests to tokamak researchers possible methods of control, and the goal of fusion power comes that much closer."



In the name of comfort, American males have been giving up neckties in increasing numbers. Their comfort might be costing them more than they realize.

John Molloy, a New York fashion columnist, recently ran an experiment. Dressed in a three-piece suit, polished shoes, a white shirt (with *no* necktie), he spent an hour stopping sympathetic looking commuters in Grand Central Station. After explaining that he'd left his wallet at home, he asked for 75 cents for trainfare. Without a necktie, he netted \$7.23. Then he donned a necktie and spent another hour telling the same sad story in the same sad way. During the second hour he collected \$26.00. Not only that, but two men insisted he take extra money to buy a newspaper to read on the way home.



WELL, WELL — When driver George Gurule of Transportation Division 3421 was asked to make a pickup from a store in town, he was a bit taken aback when it turned out to be a mannequin. Lou figured it would hardly do to throw the lady into the back of the pickup so, with a certain aplomb, he graciously shared the cab with her, producing more than a few wide-eyed looks as he drove through the Tech Area. The mannequin is being used in a Safeguards experiment.



SOLAR HOUSE — Maureen (3522) and Steve Baca (2653) built much of their new two-story adobe home in Sandia Heights themselves. A solar greenhouse and trombe wall is combined with an active solar system for winter heating.

Hot air from the solar collector heats a rock bed, buried underneath the entire first floor, which in turn radiantly heats the house through a concrete slab and brick floor.

Solar House

Steve & Maureen Baca Build Home with Active/Passive System

(Ed. Note — This is another in a series about solar projects of Sandia employees. If you have an operating system, call 4-1053.)

Steve (2653) and Maureen Baca (3522) moved into their new two-story adobe home at the base of the mountains in Sandia Heights last December. Neither house nor solar system was finished at that time.

"We were not uncomfortable then," Steve says. "We had the solar greenhouse, a cast iron wood-burning stove and fireplaces going for us. Within a month the solar system was finished and operating and the fireplaces were no longer needed."

The solar system has a 400 sq. ft. flat plate collector which forms the south wall of the second story of the house.

The collector, filled with expanded metal lath painted black, is a sealed system which heats air. A fan drives the heated air through ducts into a rock bed some 16 inches deep under the entire area of the first floor — 1950 sq. ft. Fist-sized cobblestones, 105 tons of them, fill the rock bed. Concrete was poured to form a slab over the rock bed. A brick floor was laid over the slab. The house is heated radiantly through the slab and the brick.

"We've had quite a bit of operating experience by now and have found that the house temperature is around 72 degrees any day the sun shines," Maureen says. "Without sun for five days, the temperature will drop to about 65 degrees. Then we start the stove. But in New Mexico we very seldom have more than five days without enough sun to turn on the collector fan, which is thermostatically controlled and set at 90 degrees."

The house remains warm for several reasons: the insulation — R-40 or more in the roof, an insulated north wall, perimeter insulation and double glazed windows. Steve believes the mass of the house contributes too. It's about 500 tons.

"Our electric bill averaged \$55 a month last winter," says Steve. "This is our only fuel bill because the house is all-electric. Our neighbors with comparable size homes

averaged between \$150 and \$300 for gas and electricity. The system should pay for itself quickly. After federal and state solar tax credits and rebates, we spent about \$4000 more for the solar system than for a conventional heating system. We hope to gain more economic advantage by growing some of our own vegetables during the winter in the greenhouse."

The solar greenhouse dominates the south side of the house inside an adobe-walled patio. The double glazed structure heats a 24-in.-thick adobe trombe wall and a flagstone floor. Opening vents circulate heated air into the living room of the house. In summer, foam plastic panels are used to shade the greenhouse and hot air is vented to the outside.

Maureen and Steve designed the house with Danny and Renee Martinez of Casa del Sol Construction Co. During all phases of construction, the Bacas contributed their labor.

"We laid adobes," Maureen says, "gathered and stripped ponderosa saplings for the latilla ceiling, wired the house for sound, sealed interior wood, painted walls, cut and laid bricks for the floor, did nearly all of the Mexican ceramic tile installation and helped with other odds and ends. We still have some finishing work to complete on the second floor." This 600-sq. ft. area contains a large guest bedroom with adjoining roof deck and an office/study area. The space behind the collector wall is used for storage.

"Our plan was to build a low-technology solar home requiring minimum maintenance," Steve says. "The solar heating system is simple and virtually cares for itself. Since it's sealed, there's little dust in the house. The tile countertops in the kitchen and tile tub and counters in the bathroom are easy to clean. So are the brick floors. And we wanted it to reflect its Southwestern environment. I think we achieved that."



PAM YOSHIMURA, data processing manager of the Credit Union, was honored recently by the National Association of Federal Credit Unions. She was named "Federal Credit Union Professional of the Year." A graduate of Southern Oregon College, Pam has worked at the Credit Union for almost 10 years. She was nominated for the award by the Credit Union's board of directors in recognition of her work in data procession and programming. Husband Richard works in Division 4552.

MILEPOSTS

LAB NEWS

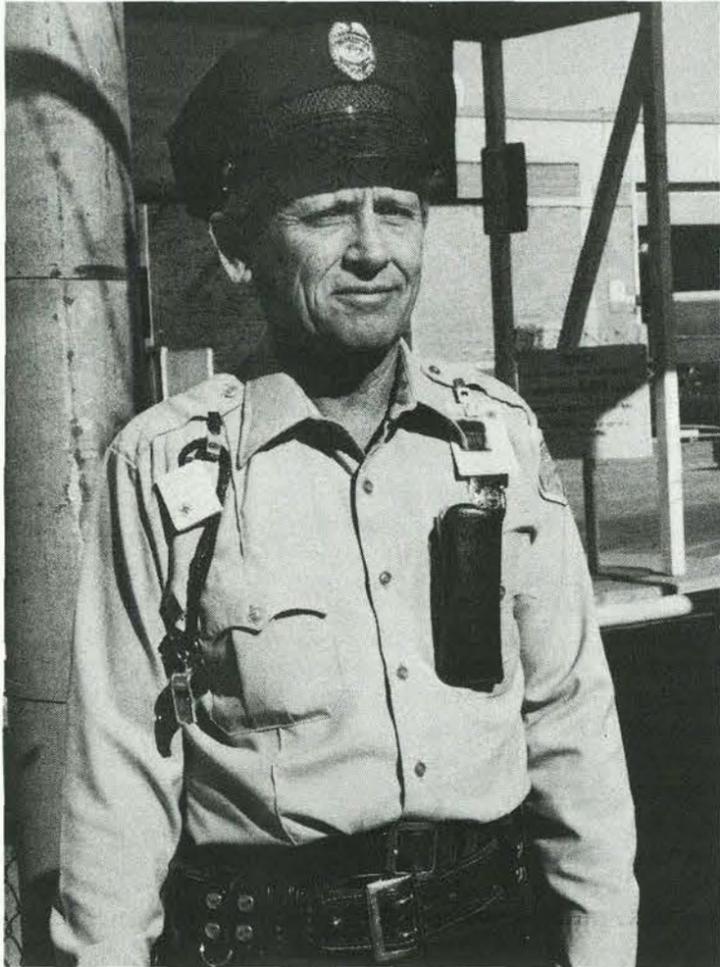
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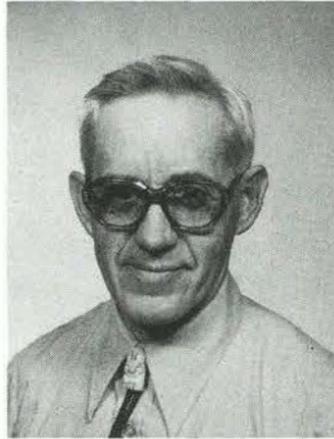
Gene Aas - 8266 30



Mary Walker - 2637 20



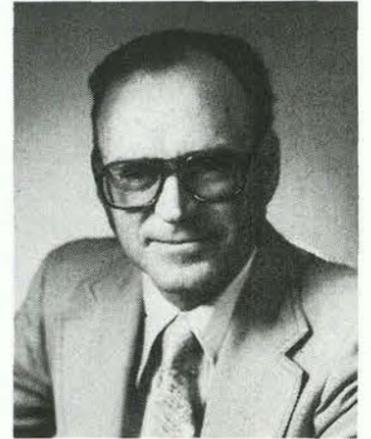
David Werme - 3432 25



Merlin Manteufel-3434 25



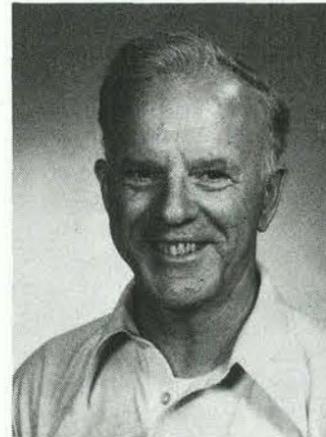
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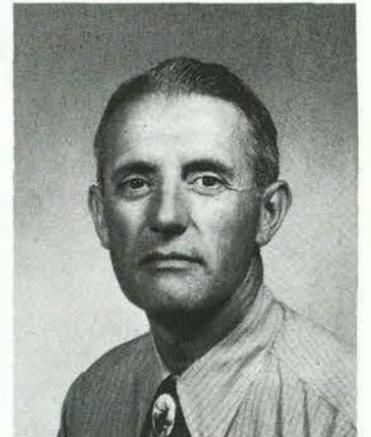
Arlyn Blackwell - 8200 20



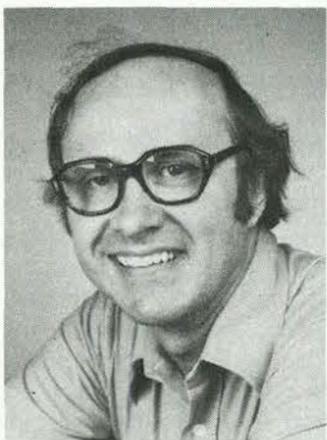
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George Janser - 2514 25



Larry Miller - 2337 20



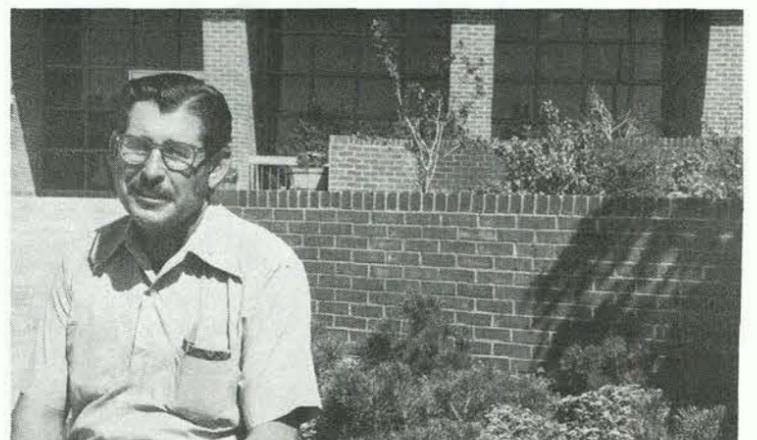
Lee Radosevich - 8452 10



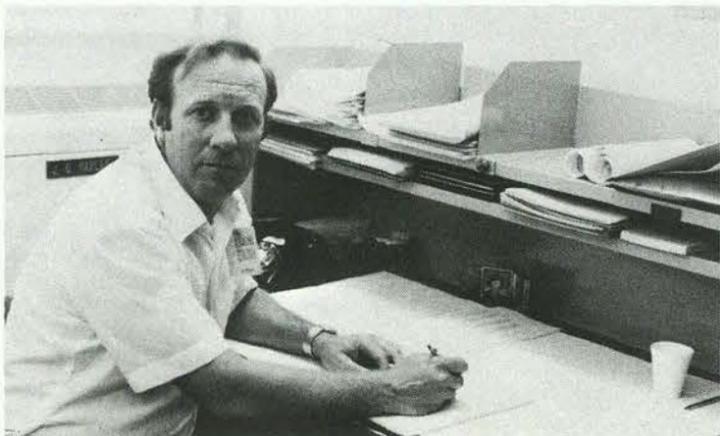
Red Madlener - 2521 25



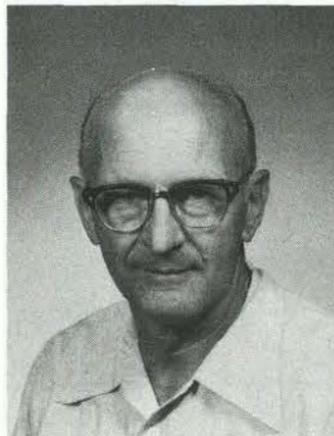
Hugh Sumlin - 4541 25



Antonio Salazar - 3618 30



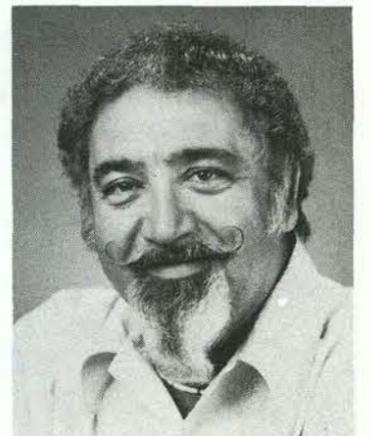
Jere Harlan - 2513 15



Jesse Rehberg - 1247 30



Tess Reis - 3212 30



George Perry - 8257 10



Mike Stephenson - 8116 15



William Abel - 2531 10



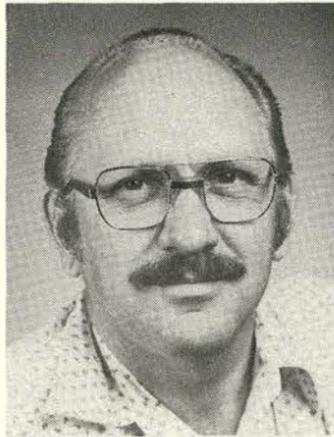
Pete Thoma - 1757 20



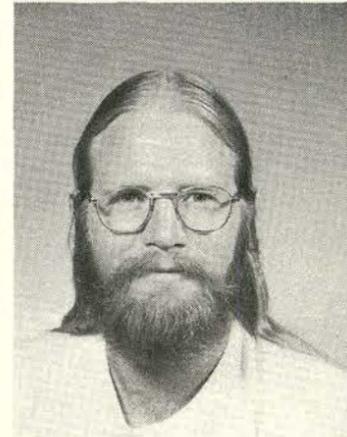
Vincent Strascina - 1717 25



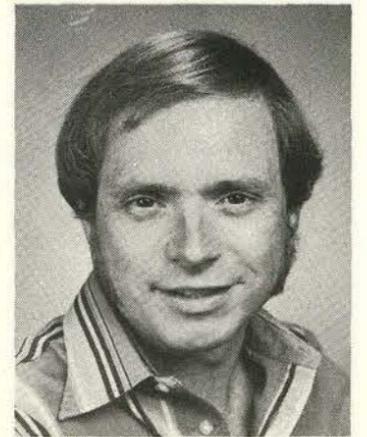
Glenn Baker - 3426 15



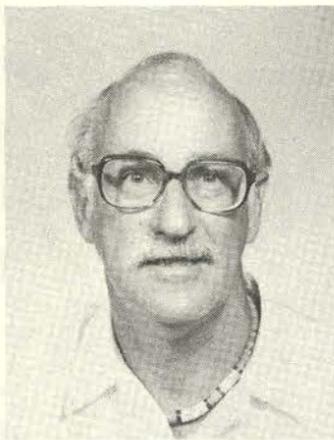
Ollie Rohrback - 8413 15



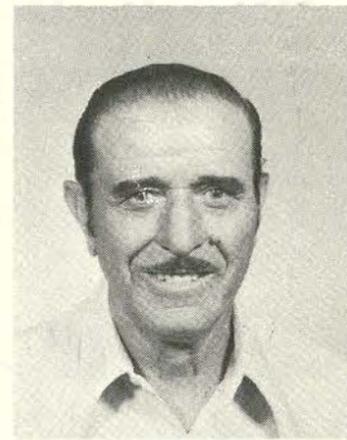
Ron Sorley - 1482 10



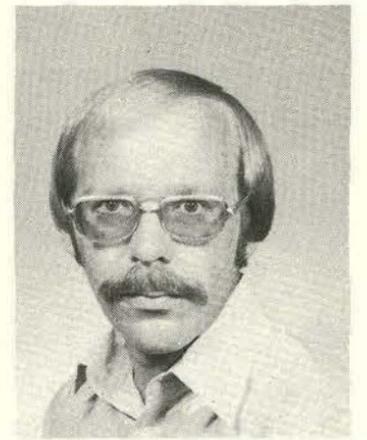
Ed English - 8442 15



Al Switendick - 5151 15



Filiberto Sanchez-3614 15



Bill Kass - 5845 10



Steve Breeze - 2452 10



Jesus Silva - 3742 10



Joe Trembl - 8424 20



John Gardner - 3140 15



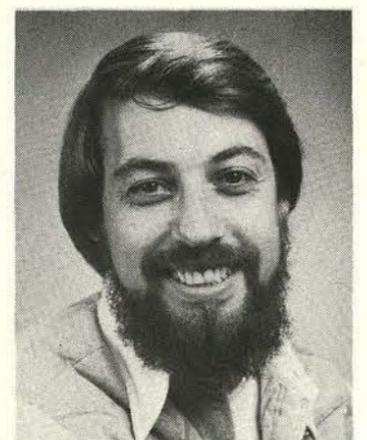
Robert Corey - 3742 25



Robert Berry - 1713 25



Gertrude Hall - 1126 20



Al Ducharme - 8255 10



LA LUZ hill toppers from Sandia and DOE gathered for this photo after completing the nine-mile race a couple of Sundays ago. Our list of names is incomplete but these did the run with distinction: Bob Nellums (4715) was first of the Sandia group, 12th overall with a 1:31 (he's far right, sitting); Pete Richards (5132) was first in the 40-49 group with a 1:36 (top, 4th from left); Pat Allen (2629) took a first in the womens' 30-39 with 2:15 (she's sitting, 4th from left); and Larry Johnson (4323) took 2nd in the 50-59 with a 1:55 (3rd from right, sitting). Over 300 runners participated. Winner, Al Waquie of Jemez, ran La Luz-plus-two in 1:14.

JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (814/6).

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. Include name and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

SANDIA LABS CAPS sold out again. New shipment Sept. 24. S. Hwy. 14 Village Project, LAB NEWS.
 GE PORT. dishwasher; GE 15 cu. ft. white refrig.; '74 2-dr. Capri, FM tape deck. Salazar, 255-1301.
 '78 WHIRLPOOL refrig., 20' frostfree, almond, scratch-resistant finish, 3-yr. compressor warranty, \$375. Stronach, 266-6417 before noon.
 CHINA, 96-piece set, Noritake, pink & gray flower pattern, never been out of box, \$150. Yost, 293-5289 after 6.
 TRAILER tongue lock 2 5/16 ball, water regulator, both new, hydraulic trailer tongue jack, Mercruiser SAE 40 oil. Windham, 293-8107.
 FREEZER, Wards 20 cu. ft. chest type, \$195. Bates, 256-0152.
 GOLF BALLS, 25¢ ea., 5/\$1. Krahling, 268-8126.
 HAY, about 50-50 alfalfa & grass, \$2.20/bale. Higgins, 898-0409.
 29-GAL. aquarium, complete, almost new, includes stand, pump, under gravel & outside filters, hood reflector, decorations, plants, fish, \$85. Gleicher, 881-7099.
 WASHER & DRYER, white, elec., matched set from Sears, \$150 for set. Jarrell, 293-9671.
 TRUMPET, \$75. Nogle, 299-3863.
 GENUINE exercycle, \$300 firm. Hudson, 296-3484.
 JEEP WHEELS, set of 4, 15" 6-hole white for Cherokee or Wagoneer, \$25. Cox, 293-5518.
 HUMMEL PLATES, 1971-1979. Fitzgerald, 265-3055.
 '63 FRIGIDAIRE refrig./freezer, 2-dr., 12 cu. ft., \$150. Stephens, 299-8231 after 5.
 TIRES, four L78-15 mud & snow; have about 300 miles on them. French, 821-3711.
 TIRES, two Peerless L78-15 radials, \$45 for both; three L78-15 radials, all for \$30. Arnold, 296-5712.
 RUGER .22 target pistol w/2 extra magazines, \$95; Colt Trooper .357, 6" barrel w/ holster, \$185. Marder, 268-9643.

FISHER STEREO control-amplifier KX200 35 watts/channel, \$50; 19" port. TV, B&W, \$35. Nowak, 298-3039.
 BALDWIN Orga-Sonic concert organ w/Leslie speaker, solid walnut cabinet & bench, \$750, consider offer. Lyon, 299-9423 or 884-8515.
 TWIN BED frames, maple headboards & box springs, \$35 ea. set or \$65 for both. Hall, 296-2622.
 WOOD STOVE, box heater type, cast iron, \$50; various sizes of vinyl garden hose, 5/8"-3/4". Martin, 869-2049.
 KROEHLER 81" sofa, green vinyl, \$85. Petruno, 265-1826.
 20th CENTURY English saddle, stirrups, pad & bag. Klafke, 869-6877.
 FORD-DELCO car stereo radio, 4-spkr. controls, \$75; AM only, car radio, \$15. Hartzell, 292-5726.
 KIRBY upright vacuum w/unused attachments, \$70. Moyer, 881-3879.
 COLOR TV, 23" Motorola console, needs little work (\$50) & TV antenna (\$7). Denman, 296-6851.
 NORTHWESTER JUNIOR golf clubs, irons 3-9, woods 1, 3 & 4, putter, \$75. Gasser, 255-4562.
 FRAME TENT, \$40; 250-gal. propane tank, \$250; Dumont oscilloscope, \$35; Hoover port. washer, \$175; stereo, \$50. Rupe, 281-1694.
 REFRIG, Whirlpool frostfree w/freezer above & auto. ice maker, white, \$200; 36" outside door, \$15. Laskar, 299-1024.
 TWO Michelin radial tires, 185x14, 2500 miles, need tubes, \$15 ea.; ice box for built-in van or camper, \$15. Schneider, 299-6243.
 PEMCO 30-gal. aquarium w/stand & accessories, \$35. Silverman, 298-1308.
 '75 ASPEN 16' travel trailer w/gas-elec. refrig., wall heater, water heater & other extras. Johnston, 299-2189 after 5.
 REMINGTON 270, Model 760 w/Bushnell 4X scope, sling, case; hiking boots, Fabiano, size 10. Kessler, 268-8343.
 UNIMAT lathe, \$140; Olds Clarinet, \$75 or trade for flute; Garrard AT90 turntable, \$25. Jones, 268-5236.
 BUMPER POOL TABLE, size 3x5, cues, balls, etc., \$80 or make offer; take apart regulation size ping pong/multipurpose table, see & make offer. Lane, 298-3366 after 5:30.
 BROWNING B-S/5 deluxe dbl. barrel shotgun, 20 ga. IC&M choke, single selective trigger, selective ejectors, new \$310. Klett, 884-8354.
 MATTRESS & box springs, new, king size, Beauty Rest, extra firm, reg. \$575, sell for \$450, you haul. Blossom, 299-6709 after 5.

UNIQUE hanging bed, complete, \$125; chest of drawers, \$30; Farberware rotisserie, \$25; contemporary swivel chair, \$125. Scully, 299-1083.
 CEMENT MIXER, Sears 2 1/2 cu. ft. w/elec. motor, \$150; Bundy trumpet, \$75. Nagel, 298-2779.
 CAMPER AWNING, \$20; Coleman stove, \$15; elec. ice cream freezer, \$10; forced air heater, trailer jack, cot. Shieler, 881-8723.
 CHASTAIN SHADOW louvers, fit Monza, Starfire, Skyhawk any year, hinged & locking. Champe, 299-0066.
 BEGINNERS BIKE w/training wheels, \$20; secretary typing chair, needs reupholstery, \$10; Sears 19" B&W TV, needs repair, \$10. Atkins, 298-5762.
 MARTIN student trumpet w/case & stand, \$115. Nogales, 247-1178.
 SELMER Signet, all wood clarinet, \$150; Yamaha flute, \$100. Lawrence, 268-5479.
 NIKON FM body, \$180. Passman, 821-4999.
 ANTIQUE ORGAN, Hamilton bellows type pump, solid walnut, \$500. Walton, 298-8342.
 GREEN SHAG CARPET, w/pad, 14x16", \$50 or offer. Norwood, 292-0072.
 PIANO, baby grand, \$1795; RCA B&W TV console, \$100; Farberware "Open Hearth" broiler, \$25; clotheslinenpoles, \$10; swingset, \$10; free firewood, you cut. Ripi, 298-5170.
 AKC BOXER pups, adoptable Sept. 9; 20" girls bike, extra seat, handlebars, training wheels, \$20. Miller, 344-7725.
 SOFA, 80", gold Herculon, wood trim, \$70; mirror; old, baroque gold frame, 30"x44", \$60. Molecke, 296-5850.
 SUPERWINCH, 4000 lb., 12 volt, w/cable guide & remote switch, suitable for import pickups, \$75. Womelsduff, 281-1693.
 8' POOL TABLE, 16 balls, 7 wooden cues. Sanchez, 292-3852.
 NEW Chromcraft dinette set, 4 cane-back chairs, tan vinyl seats, 48" butcher block table w/leaf, \$300. Chavez, 821-0488.
 COLOR TV, 25" Magnavox, new picture tube, 2 yr. warranty, \$225. McConnell, 255-2488.

TRANSPORTATION

AMF moped, new, \$350. McDaniel, 299-6189.
 '72 VW CAMPER, pop-up top, sleeps 4 adults, ice box, storage. Scott, 293-2536.
 '73 OLDS Cutlass, 350 V8, AC, PS, AM/FM radio, new tires, \$1300. Sanchez, 836-1762.

'57 FORD 2-dr. HT, reconditioned, \$1800. Seamster, 883-4012.
 BICYCLES: men's 10-spd. Western Flyer, 24" frame, new brakes, \$35; men's 2-spd., J.C. Higgins, needs work, \$15. Quigley, 299-7325 after 5.
 VOLKSWAGEN Type 411 4D, low mileage, \$1600. Moody, 292-2975.
 '73 OLDSMOBILE Cutlass, 4-dr., PB, PS, \$900. Staley, 299-9364.
 '72 DODGE Commander Class A motor home, 22', self-contained; '75 motorcycle, 100 cc, 425 miles. Zucuskie, 881-4086.
 '72 OLDS Delta 88, \$800. Hardin, 293-5679.
 '70 OPAL G.T., 4-cyl., \$1750. Keady, 298-5285 after 6.
 '71 FORD Galaxy, 351 cu, PS, PB, AT, \$200. Wrobel, 255-3062.
 '74 4-WD POWER WAGON, crew cab, 60,000 mi., AC, PS, PB, SWB, camper shell, \$3600 or best offer. Paylor, 877-8953.
 '75 VW BUS, 7-pass., AC, radio, sun screens, trlr. hitch, carpeting, \$4500 or best offer. Pryor, 344-2931.
 '78 FORD Club wagon van, \$6500; '72 Chev. 3/4 ton Suburban, \$2000. Konkel, 299-5108.
 BICYCLE, 23" Schwinn Paramount P-13 complete, \$500. Downs, 293-9320.
 '76 MGB, 19,500 miles, \$4400. Jones, 268-5236.
 '69 FORD Mustang 302, AT, AC, ET radial wire mags, AM/FM 8 track, Big Foot 60 tires, \$2000 or offer. Martin, 344-4871.
 '66 CHEVROLET pickup w/'69 350 V8 engine, R&H, \$600. Gallegos, 293-9545.
 '76 SOUTHWIND motorhome, 22', 10,000 miles, loaded, uses reg. gas, 351 eng. Heider, 897-0752.
 '50 WILLYS JEEP, \$400. Gallegos, 881-1363.
 '76 CHEVY Nova hatchback, 6-cyl., AC, AT, PS, PB, below Blue book, white w/blue interior. Brooks, 299-1884.
 BICYCLE, 27" French 10-sp., new tires, recent maintenance, \$110. Luna, 296-5123.

FOR RENT

APT., 2-bdr., water paid, 2 blocks north of Wyoming gate, \$185/mo. Montoya, 255-2193.
 RENT/LEASE: new 2-bdr. unfurnished apts., fp, carpets, drapes, all major kitchen appliances, \$250/\$275/mo. + gas & elec., \$150 DD. Taylor, 292-0496.
 AUSTERE vacation cabin in forest by stream near Mora, \$25/week. Cooper, 298-6183.

WANTED

RIDE from UNM to Sandia, M-W-F at 10 a.m. Fischbach, 256-7349.
 EXTRA WEIGHTS for exercise set. King, 298-2628.
 MOTHER who has children in kindergarten at Mark Twain Elem. school who could drive 5-year-old to & from school. Wilson, 268-6287.
 BORROW May 1979 issue of Stereo Review. Caskey, 294-3218.
 GOLF CLUB for a beginner. Jarrell, 293-9671.
 NATURAL GAS space heater suitable for garage or workshop. Evans, 268-7039.
 1974/1975 Chevy or Ford 1/2-ton pickup. Teta, 821-5172.
 TWO WHEEL utility trailer, 4'x6', 7' or 8'. Wolfe, 281-5746.
 STROLLEE WEE-CARE car seat. Hoover, 821-0876.
 FOUR-DRAWER legal-size file cabinet, does not need to lock. White, 266-9519.
 PASSENGERS to share expenses of 4- to 5-hour weekend/holiday flights to Austin/Houston area in Cessna-182. Dates negotiable. Schkade, 265-5473.
 CHILDCARE by mother of 2 toddlers, in my home, near base, pickup can be arranged, \$25/week. Wrobel, 255-3062.

REAL ESTATE

'76 MOBILE HOME, 14x70, 2-bdr., 1 1/4 bath, all appliances plus washer & dryer, 4-Hills adult section. Curtis, 293-5114.
 1/3 ACRE corner lot on Ridgecrest in Siesta Hills, underground utilities, \$52,000. Fitzgerald, 265-3055.
 BUILDING LOT Sandia Mtns., 20 miles from Abq., La Madera Heights, Sandoval County, \$2000, write to: V.S. Gallagher, 11330 E. Riverside Dr. #17, Bothell, WA 98011.
 ACADEMY ACRES, 4-bdr., w/study conversion in 4th bdr., 1730 sq. ft., landscaped, \$69,500. Bissegger, 821-7845.
 1 1/2 ACRE build. site in Jemez Mtns., \$15,000. Heidrich, 345-7653.
 3-BDR. BRICK, Parkland Hills, den, LR, DR, utility, new kitchen, 2 1/2 baths, dbl. garage, many extras, 2020 sq. ft., \$89,000. Puccini, 265-2232.
 ELKHART mobile home, 1235 sq. ft., 2-bdr., workshop, covered patio & carport, 4-Hills adult section, financing available, \$18,950. Roelle, 299-8478.

'Fair Conditioner' Set Sept. 15

HAPPY HOURS — Tonight ravioli and spaghetti — all you can eat — are featured on the buffet spread, Natural Persuasion holds the bandstand. Next Friday, Sept. 14, Jeanne Rich and Friends make the happy music while the Club's kitchen staff goes all out serving 16-oz. T-bones or lobster tail. To reserve buffet tickets, call the Club office, 265-6791, by mid-week.

VARIETY NIGHT tomorrow offers a distinct treat — theater in the round. A group from UNM's Department of Theater Arts presents a short play, "When We Grow Up." The movie is the classic "Treasure Island." Super sandwiches are available at 6, the show starts at 7.

EVERYBODY loves the State Fair, right? Right. So the Club offers a "Fair Conditioner" on Saturday, Sept. 15. This one is a boot-stompin' country western bash with the danceable sounds of Elton Travis and the Westernaires from 8:30 to 12:30. Admission is free to members, guests pay \$1.

ANNUAL MEETING of the Coronado Club membership is set for Monday, Sept. 10, at 7:30 p.m. Nominated for the board of directors are Bob Banks (5000), Frank Biggs (4231), Nina Chapman (3533), Charlie Clendennin (2651), Pat Crane (DOE), Frank Gallegos (4500) and Dick Shepardson (3242). Refreshments will be served after the meeting.

SANADO WOMEN meet from 10 until noon on Tuesday, Sept. 11, at 7426 Arroyo Del Oso. This is the annual membership coffee with a program designed to welcome anyone interested in joining the group. Sanado's many interest groups will be discussed.

SKI CLUB meets Tuesday, Sept. 18, at 7:30. Ernie Blake of Taos Ski Area is the featured speaker. A big "freebie" door prize will be awarded.



HONORS FOR STUDENTS — Melecita Sanchez (5844) and Kevin Marbach (4719) are third-year participants in Sandia's Work/Study program. They attend NMSU and work at Sandia during the summer. Melecita, a junior, was the recipient of the NMSU Chemistry Faculty award to the outstanding sophomore student in chemistry. Kevin, a senior, was elected president of Tau Beta Pi, engineering honor society, for the 1979-80 school year.

Events Calendar

- Sept. 7-23 — New Mexico State Fair:
- Sept. 7-23 — Daily pari-mutual horse racing, 1 p.m.; Daily livestock & horse shows, beginning at 8 a.m.
- Sept. 15 — Parade, 8:30 a.m.
- Sept. 12-23 — Contemporary Crafts show, Hobby Bldg. 9 a.m.-9 p.m.; Sheep to Shawl demonstrations, Los Aranas Spinners & Weavers Guild, Cattle Barn;
- All-Star rodeo, nightly Sept. 13-22, Tingley Coliseum, 8 p.m.;
- Indian village, Spanish village, opera house entertainment, midway, flower shows, fashion shows, home canning demonstrations, quilt display & demonstration, baking contests, knitting contest, State Fair Queen contest and, animals — cattle, goats, poultry, rabbits, dogs, sheep, swine & horses — hobby, agricultural & fine arts exhibits.
- Sept. 8 — Lobo football vs. Oregon State, UNM Sports Stadium, 7:30 p.m.
- Sept. 14-15, 21-22 — "On A Clear Day You Can See Forever," musical comedy, Tiffany Playhouse, 8 p.m., Sheraton Old Town Mercado Mall.
- Sept. 21-22 — New Mexico Symphony season opener, Emanuel Ax, pianist, 8:15 p.m., Popejoy, 265-3689.

school on the Coronado Club junior bowling league. The group meets Saturday mornings at San Mateo lanes, participates in city and state tournaments, wins large numbers of trophies. Register tomorrow morning at 8:45 at San Mateo Lanes. Call Ciss Kelly (3542), 255-8011, for more info.

FRIDAY	SATURDAY
7 — HAPPY HOUR All the ravioli & spaghetti you can eat Adults \$3.50 Under 12 2.00 NATURAL PERSUASION	8 — VARIETY NIGHT Theater in the Round "When We Grow Up" Movie — "Treasure Island" Super Sandwiches 6 p.m. Entertainment 7 p.m.
14 — HAPPY HOUR 16-oz. T-Bone or Lobster Tail Adults \$7.00 Under 12 3.50 JEANNE RICH & FRIENDS	15 — DANCE "Fair Conditioner" ELTON TRAVIS & THE WESTERNAIRES 8:30 — 12:30 Members Free

TRAVEL — The club offers package tours to Europe, Hawaii and Disneyland plus a Caribbean cruise. Also, there's an excursion on the Cumbres and Toltec scenic railroad scheduled Oct. 6. See travel director Ed Neidel in the lobby tonight between 6 and 7 or stop by the Club office for literature.

SINGLES MINGLE, party and play tonight starting right after work in the El Dorado Room. There's goodies, music, dancing, fun, etc.

And then to serious business on Tuesday, Sept. 11, at 5 p.m. All members are urged to attend the general meeting and elect officers for the upcoming season.

JUNIOR BOWLERS — There's a few spots left for youngsters age 7 through high

