

Feasibility Study Begins

Extracting thermal energy directly from underground bodies of magma is certainly possible theoretically, but whether it's feasible economically is another problem — one that Sandia plans to explore in a multi-year R&D project for the DOE that will concentrate on magma buried within five kilometers (about three miles) of the earth's surface.

Results of the project will help industry decide whether it wants to commercialize magma energy, says James Kelsey, supervisor of Sandia's Geothermal Technology Development Division 6241 and program manager of the magma energy engineering feasibility study.

The program is scheduled to conclude in the late 1980s with a full-scale field test that will involve drilling into a magma body and extracting usable heat. The site will be chosen from a list of about 30 potential sites; drilling and energy recovery equipment will be designed and built during the next several years.

"At some point during our research, however, it may become clear that we cannot demonstrate engineering feasibility," James says. "If that occurs, the project will end."

Magma — molten rock that has never come to the surface — is a long-range energy source, but one of such magnitude that it merits careful investigation even though the problems of reaching it and extracting its energy are extremely difficult. U.S. Geological Survey scientists estimate that the energy production capacity of magma bodies within 10 kilometers (16 miles) of the earth's surface in the continental U.S. is 800 to 8000 times the current annual U.S. energy consumption. Major magma bodies are in the western U.S., including Alaska and Hawaii.

(Continued on Page Four)

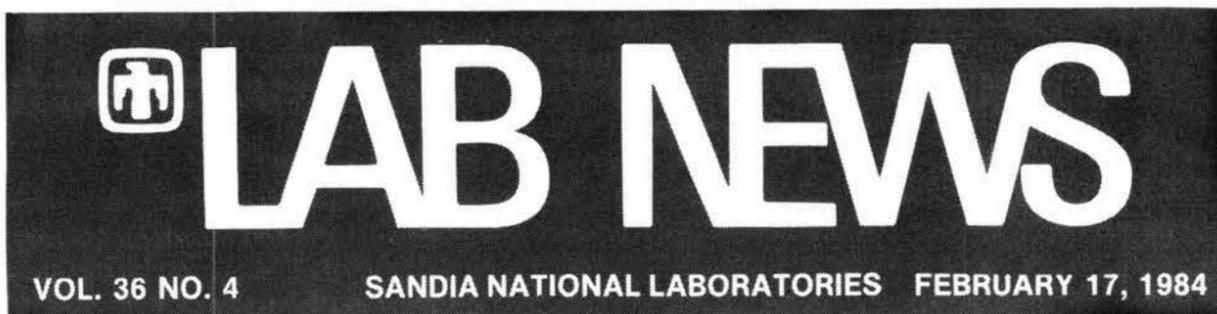
On the Factoring Front

Mathematicians Master Last Mersenne Number

It took longer and proved more difficult than they expected, but Sandia mathematicians Jim Davis and Diane Holdridge (1640) have once again extended their own world's record for the longest number factored with a general-purpose factoring routine. And they have done it on a famous 69-digit number — the last to be factored on a list compiled by French priest-mathematician Marin Mersenne in A.D. 1644.

After the two factored a 67-digit number in December (LAB NEWS, Dec. 16), they next set their sights on the last "Mersenne" number. The number had resisted all previous attempts to break it into the prime-number components.

Scheduling difficulties on Sandia's busy Cray 1S computer were compounded by a computer hardware problem just when the pair had been promised a weekend of computer time. This meant that the factoring operation had to be done in bits and pieces over a period of weeks. Finally, late on the morning of Feb. 2, after 32.2 hours of computer time and several trillions of opera-



DRILL BITS like this one are being tested under precisely defined simulated rock-cutting conditions to validate computer codes that will someday allow researchers in the magma energy project to predict their downhole performance with much more accuracy than can be currently achieved. Bit has a protuberance that can be struck with known force by a calibrated hammer. The dynamic response of the instrumented drilling assembly can then be used to verify the computer codes. Here, James Kelsey and Chuck Carson, two of the principals in Sandia's Magma Energy project, discuss the features of the bit.

ECP News

Two United Way agencies will participate in the Feb. 22 ECP Agency Awareness Program from 11:15 a.m. to 1 p.m.:

Adelante Development Center
Lobby of Bldg. 802

Child Guidance Center
Lobby of Bldg. 822

tions by the Cray, the answer came through: the 69-digit number 132,686,104,398,972,053,177,608,575,506,090,561,429,353,935,989,033,525,802,891,469,459,697 is the product of three prime numbers that are 21 digits, 23 digits, and 26 digits in length: 178,230,287,214,063,289,511 x 61,676,882,198,695,257,501,367 x 12,070,396,178,249,893,039,969,681.

"It's very satisfying," says Jim, with some understatement.

Diane echoed the sentiment — "You don't get a chance very often to solve a three-century old problem."

The work of the Sandia factoring group is drawing widespread media attention, including an article and photo on cracking the 69-digit number in the science section of the Feb. 13 TIME magazine. Understanding factoring is more than a mathematical challenge; it's important to Sandia's work in cryptography.

The next goal of the group: the curious and extremely difficult 71-digit number con-

sisting of 71 ones. Says department manager Gus Simmons: "It's something no one would have thought possible a little more than a year ago." For this attempt, Jim and Diane may borrow the use of Los Alamos National Laboratory's Cray XMP — essentially two Cray 1's linked back to back.

Antojitos

Addresses Again--I've forgotten the source, but a Sandian once shared with me his two-year-old daughter's frustration as the family was driving toward New Mexico where daddy had a job waiting at Sandia. She tried and tried to pronounce the name of her hometown-to-be, but "Albuquerque" was too much for her tiny tongue. She finally settled on a reasonable facsimile--"Apple Cookie."

What some of Sandia's correspondents settle on is rather less reasonable. Here's a current crop: Sandia National Labs (obviously intended for an energy-related industry in a hot, dry area); Sandiate National Labs, Albuquerque; San Dia International Labs, Albuquerque; San Dia National Labs, Albuquerque; Sandania National Labs, Albuquerque; Sandy Labs, 1515 Urbank Southeast, Albuquerque; Sandi Laboratory, Curtlin Airforce Base, Albuquerque; D. B. Hayes, Super Sandia Labs; San Dia Labs, Albuquerque. Then there's the one Bruce Hansche received from Philadelphia--perfectly addressed but with a customs sticker attached. But the one that hurts most is one from the US Dept. of Transportation--Sandia National Lavatories. Talk about our reputation going down the drain!

* * *

For Grammar Freaks--Misplaced modifiers offer more entertainment than do most grammatical errors. Here's one found by Murl Moore (3663) in a flyer advertising cheese packs: Cheddar Loaf--a fine inexpensive gift for someone you want to remember in a strong corrugated box. ●BH

* * *

Presto e bene, non si conviene. (Haste and quality do not go together --Italian)

Events Calendar

Feb. 17-19 — Shrine Circus, Tingley Coliseum, 247-0281.

Feb. 17-26 — "The Rose Tattoo," Classics Theatre Company, 8 p.m.; 2 p.m., Feb. 19 and 26; KiMo, 242-1214.

Feb. 18 — Elisabeth Kubler-Ross, lecture, 7 p.m., Popejoy.

Feb. 18-19 — Classic Car Show, Civic Auditorium, 766-7826.

Feb. 19 — Travel film, "Spring in Japan," 7:30 p.m., Popejoy.

Feb. 19 — 12th Annual Chama Chili Chase, cross-country ski classic, 9 a.m., Cumbres Pass, 1-268-4876.

Feb. 21 — The NM Jazz Workshop presents Byard Lancaster — multi instrumentalist; concert features a world's premiere of a work by Santa Fe composer Jack Fishman, written for soprano saxophone and string quartet; 8 p.m., KiMo.

Feb. 24 — Navajo Rug Auction: Crownpoint Rug Weavers Assn., viewing from 4 p.m., auction at 7 p.m., Crownpoint Elementary School.

Feb. 25 — Choral Fest Concert, NMSO Chorus, 8:15 p.m., First United Methodist Church, 843-7657.

Feb. 25-26 — UNM Opera Theater, "Abduction From the Seraglio," Mozart's comic opera, NM premiere, 8:15 p.m. on 25th and 3 p.m. on 26th; 277-3121 for reservations.

Feb. 25-26 — Annual Winter Carnival: dog-sled races and snowmobile, ski, ice skating, and snowshoe competitions; snowman contest. Chama, 1-756-2384.

Through Feb. 26 — "Under Milk Wood," Fri. & Sat., 8 p.m.; Sun., 2:30 p.m., Vortex Theater, 247-8600.

Feb. 27 — Albuquerque Philharmonia Orchestra concert, 8:15 p.m., Highland H.S. Center for the Arts, 864-2760.

Sympathy

To Frank Sanchez (7471) on the death of his father, Jan. 29, in Peralta.

To Ed Hansen (5242) on the death of his son, Feb. 5, in Farmington.

Supervisory Appointments

NINA CHAPMAN to Assistant to Vice President 3000, effective Feb. 1.

Nina received her bachelor's degree in business administration from New Mexico State University. For two years, she taught business courses at the Alamogordo High School before returning to NMSU. After receiving her MBA, Nina joined Sandia in June 1976 as a member of the administrative staff in the budgeting organization. She has worked in Personnel in general employment and in the recruiting group, and with both divisions in the Benefits Department 3540. Most recently, she has been the personnel representative for the 1000 vice presidency.

She enjoys sewing and outdoor sports. Nina and her husband Dick (144) have three children, with one at home. They live in the SE heights.

BILL SCHAEDLA to supervisor of Antenna Development Division 2343, effective Feb. 1.

Bill has been with the Radar Department 2340 since joining Sandia in December 1974. He's been a project leader for the B83 radar, the B83 system, and the MK5 radar for the Trident II system. Bill has done RF design work on both systems.

He received his BS, MS, and PhD — all in EE — from the University of Wisconsin. Bill is a member of IEEE. He enjoys photography, camping, and church activities. He and his wife Marilyn have two children — both attend Cibola high school. They live in Corrales.

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NINA CHAPMAN (3000)
and BILL SCHAEDLA
(2343)

Pedaling the Pyrenees

If you want to tour three countries in Europe without paying for ground transportation, carry only one change of clothes, and yet enjoy daily gourmet meals and homelike accommodations, talk to Gary Clark (8233).

His secret? Go by bike.

Last summer, Gary and his wife (former Sandian Lynn Minkler Clark) spent five weeks touring England, France, and northern Spain. They traveled some 1200 miles of scenic side roads and stayed in small hotels, bed and breakfast inns, and farm houses. They're both conversant in French and Spanish, so the language barrier was minor even in the out-of-the-way places they visited.

In preparation for this adventurous trek (averaging 50 to 80 miles a day), the Clarks did a lot of cycling around the Livermore Valley and spent a week in Idaho for a warm-up tour. Their bikes are specialized for touring — ultralight hand-built frames and 18-speed gearing.

They limited their baggage to 14 pounds apiece and carried it on racks attached to the bike frames. They kept the weight down by including only two sets of clothes, one for riding and one for evening wear. Laundry facilities at each night's stop made the scheme feasible. In addition to the bare necessities, they found room for two cameras, extra lenses, and 20 rolls of color slide film to record their travels.

Their ride began in Stratford-on-Avon, where they uncrated and assembled the bikes after spending several days touring the local attractions and attending a performance of *Twelfth Night* at the Royal Shakespeare Theater. Their route took them on a semicircle through southern England, passing through the Malvern Hills and a corner of Wales, then to Bath and across the Salisbury plain to Stonehenge. The final attraction before boarding a cross-channel ferry was a visit to the magnificent 13th-century cathedral in Salisbury.

Landing on the Normandy coast of France, they followed a coastal and rural route from Le Havre touring the D-Day landing sites before traversing the Cherbourg peninsula to the Atlantic coast. The favorable currency exchange rate made meals and lodging a bargain. They feasted daily on French seafood cuisine featured in five- and six-course meals and served with local district wines. Still, the Clarks each lost about 10 pounds during the trip; constant exercise is a great slimmer.

Because they couldn't predict the weather (it rained nearly every day in England), they made no advance room reservations. In May, the tourist season was not yet underway, so they had no problems in finding accommodations each evening.

The most adventurous part of the trip was climbing a 5000-foot pass over the Pyrenees into Spain. It took them almost two days on an obscure road to reach the



FORCED INTO A EWE-TURN, biker Gary Clark (8323) was slowed momentarily in the Pyrenees as the Clarks cycled into Spain.

summit. The first day's ride was punctuated with spectacular thunderstorms, requiring frequent stops for shelter. The fog was so thick on the second day, Gary recalls, that they rode amidst the constant clatter of sheep bells — without being able to see the sheep. Fortunately, few cars used the road, and they were able to inch along the edge without mishap.

The other problem they hadn't anticipated was the length of some European tunnels. Bike lights were not a part of their equipment, and once they were forced to dismount and feel their way along the wall of a dark tunnel.

Reaching Spain in the first week of June, they rode through scenic Basque villages tucked in the valleys of the Pyrenees. This section proved to be a bicycle tourist's dream, with negligible traffic, hilly, winding roads, and perfect weather. The high point of the trip, literally and figuratively, came at the end of the biking. They climbed steeply to the end of the road in the National Park of Ordesa, then spent a day hiking up a glacial valley. They spent the night in a mountain hut set amidst snow-covered 10,000-foot peaks.

From Ordesa, they took a combination of taxis and trains to reach Barcelona. Several days later they reluctantly packed the bikes for the return flight to San Francisco.

[Gary will present a slide show of the trip on Wed., Feb. 29 at 12 noon in Bldg. 912, Rm. 185. All Sandians are invited.]

Supervisory Appointment



PAUL VANDYKE to supervisor of Standards, Calibration and Photography Division 8416, effective Feb. 1.

Paul joined Sandia at Livermore in 1959 as an optical instrumentation photographer. He worked in photometrics over the years and has performed photo instru-

mentation for weapon tests at NTS and TTR. He was promoted to section supervisor in this same area in 1979.

Paul has an AAS degree in photography from the Rochester Institute of Technology and received other technical training at MIT, the University of Rochester, and USF. Before joining Sandia, he operated a commercial photo studio in Pueblo, Colo., where he also taught documentation of pathological specimens to the professional staff at Colorado State Hospital.

Paul and his wife reside in Livermore and have three grown children. His hobbies include photography, antiques, and Middle Eastern culture.

Sympathy

To Bob Crow (8426) on the death of his mother in Atlanta, Ga., Oct. 15.

To Dennis Pulsipher (8411) on the death of his father, Dec. 17, in Bountiful, Utah.



RETIRING — (from left): Don Gregson (8160), Dan Held (8262), Stan Pickens (8161), and Ken Finders (8254).

Magma Feasibility Study Begins

The feasibility study is funded by DOE's Geothermal Hydrothermal Technology Division. It follows an earlier Sandia study, supported by DOE's Office of Basic Energy Sciences, that established scientific feasibility of the long-term, high-risk, high-payoff energy option. At its conclusion in 1981, Sandia had demonstrated that no major theoretical or physical barriers invalidate the concept.

Sandia's magma energy concept represents a specialized branch of conventional geothermal energy. It involves drilling into a magma body — nominally 850°C to 1100°C (or 1562°F to 2000°F) — and keeping that borehole open so an energy extraction system can be inserted into the magma. Energy extraction could be done through chemical reactions using the high downhole temperature, or by a heat exchanger that converts water (or another fluid) to steam (or other gas). The gas would then return to the surface to drive a standard turbo-electric generator.

The new project, which received FY84 funding of \$850,000, has several major research areas: system integration, geophysics, geochemistry, materials, drilling technology, and energy extraction.

System Integration, Geophysics, and Geochemistry — The first task in this research area is to develop a detailed magma energy recovery system concept and a preliminary economic analysis. The second and third tasks will involve surface and laboratory tests, and possibly some shallow drilling. The work is designed to develop reliable ways to locate magma bodies. "This is a key to engineering feasibility," says Chuck Carson (6241), magma energy project leader. "Energy companies must have confidence that when they begin an expensive geothermal drilling operation they will drill into magma," he says.

Results of these tasks will also identify where the project's concluding field operation will take place.

Materials — This work will identify alloy and ceramic materials from which to construct equipment to drill into magma and maintain an open borehole. The amount and type of dissolved gases and the amount of silica found in various magmas will affect the choice of materials that can be used.

Drilling Technology — This research area will involve identification of a system — drill strings and bits, logging tools, casings, etc. — that will operate reliably in harsh geothermal environments. The final selection will depend largely on which site is chosen for the project's final field operation, and the type of magma expected to be found there.

Researchers already know that conventional oil and gas drilling systems will be of limited use in the magma environment. However, some techniques already developed by Sandia for high-temperature drilling may prove useful. They include a diamond coring bit fitted with nozzles capable of discharging water at speeds up to 90 meters a second (300 feet/second). Water from the nozzle cools the bit, removes chips, and chills the molten rock to a drillable consistency. Holes for a 1981 field

test of this technology were kept open with a moderate but continuous flow of water through the casing.

Energy Extraction — In this research area, the first task is to define a preferred technique for harnessing thermal energy trapped in magma, then to verify that system in laboratory experiments. Besides water, scientists may consider other types of fluids for injection into the downhole heat exchanger. A technique that eliminates a man-made heat exchanger and uses actual molten rock to heat fluid directly may also be considered.

* * *

Primary objectives for the project during fiscal year 1984 include choosing three sites that appear best suited for further field work (technical, institutional, and societal issues will all play a role in narrowing that list), determining the most important factors governing geophysical and geochemical research and development, performing a preliminary economic analysis of the concept, and developing a long-range plan to demonstrate engineering feasibility.

Sandia Draws on Deep Experience

In 1981 Sandia became the first organization ever to drill through a molten body hotter than 1000°C (1832°F), recover a complete core, and maintain an open hole so experiments could be conducted in the molten rock environment.

This extensive field operation represented the conclusion of the Labs' effort to determine scientific (but not commercial) feasibility of its magma energy concept. Experiments conducted at the time established that significant amounts of thermal energy can be extracted from magma and that materials used in energy extraction equipment can survive some magmatic environments.

Although this multi-faceted operation, carried out at the Kilauea Iki Lava Lake in Hawaii, represented a major technical accomplishment, it was only a starting point in harnessing magma energy. The drilling and energy extraction operation scheduled to conclude Sandia's new project — determining whether magma energy is feasible from an engineering standpoint — will be much more difficult: there are a number of significant differences between it and the 1981 event.

First, the 1981 operation was conducted at a site where scientists knew buried molten rock was located. By contrast, the drilling operation for Sandia's engineering feasibility project will test scientists' ability to locate a magma source through surface geophysical and geochemical tests and possibly shallow drilling (approximately 500 meters, or 1650 feet). Developing reliable techniques to locate such sources is a prerequisite for commercialization of magma energy. "Despite our best efforts, we will not be 100 percent sure that a magma body exists at our final field test site until we finish drilling," says Chuck Carson (6241), project leader.

Second, the molten rock encountered during the 1981 drilling operation was not true magma. It was a basaltic lava because it had actually come to the surface during a volcanic eruption and had lost its volatile gases. Magma is molten rock that has never encountered the atmosphere. This difference, and the fact

that magma tapped for the planned operation may not be basalt, could have a significant impact on the heat transfer efficiency of the magma and the performance of materials.

Finally, the 1981 field operation required a drilling depth of just 58 meters (less than 200 feet). The engineering feasibility field test is designed to probe a magma body between three and five kilometers (two to three miles) below the earth's surface. This means that much of the drilling equipment needed to prove engineering feasibility will have to be built from scratch. Equipment used to drill the shallow hole in Kilauea Iki Lava Lake incorporated a variety of advanced techniques that may prove useful in the new effort; however, it also used many conventional materials that are not expected to be useful.

"The part of that 1981 field operation that may have the most direct impact on determining engineering feasibility was the energy extraction test," Chuck says. Two techniques were used; one was a conventional closed heat exchanger and the other was an open one that involved injecting water directly into the molten rock.

In the closed system, a heat exchanger was inserted into a cased hole that ended about two meters (6½ feet) above the molten portion of the lava lake. The open heat exchanger, which proved to be the more efficient, consisted of a hole extending 16 meters (53 feet) into the molten zone, with the last six meters (20 feet) being uncased. Injecting water into magma around the uncased portion of the hole solidified and fractured the magma, creating an extended heat exchange area.

Energy extraction rates as high as 950 kW/m² were measured during transient operation of the open heat exchanger. During steady state water injection (water flowing downhole at a rate of one to two gallons/minute), energy extraction of 180 kW/m² was measured. Energy extraction rates were based on the surface area of the original borehole into the molten zone.

Making Waves

Many astronomical phenomena were discovered when astronomers developed new ways of looking at the universe. Quasars, for instance, were detected largely because radio astronomers picked up and analyzed radio waves emitted by celestial objects. Thanks to this history, astronomers have a keen interest in detecting new forms of radiation from the cosmos.

One of these potential new forms is gravitational radiation, or gravity waves, predicted by Einstein but as yet undetected. In a recent colloquium, Carleton Caves of the California Institute of Technology reviewed current efforts to detect gravitational waves.

First of all, what is a gravity wave? "It's a propagating space-time curvature traveling at the speed of light," says Caves. And what produces this radiation? Imagine a collection of massive objects, the size of stars or bigger. These objects could be individual stars or parts of one larger star about to evolve. Put them very close together. Now let these objects fly about madly, rapidly orbiting each other or chaotically collapsing toward each other. Such a violently evolving object or objects would be a source of gravitational radiation.

Candidates for gravity-wave sources include the collapse of a massive star into a black hole, stellar collapse to form a neutron star, and a binary system made up of two neutron stars.

Caves is a theorist who is interested in improving experiments in the area of gravity-wave detection. He concludes that something like three orders of magnitude in detection sensitivity and two orders of magnitude in amplifier noise reduction are needed before there is any probability of detecting the elusive gravitational radiation.

The detection of gravitational radiation is difficult. Gravity-wave detectors (long bars with detectors to measure the strain on the bar produced when a gravity wave causes the ends to oscillate) must measure the separations of masses with the required accuracy (one part in 10^{21} for the strongest conceivable gravity wave). That kind of sensitivity has yet to be achieved.

Caves described different types of gravity-wave detectors that experimenters are working on. First is the resonant-mass detector — a large cylinder that would be excited by gravity waves, as described above. A large number of these were built

between 1968 and 1975. Since 1980, smaller but higher quality detectors have been built, including one at Stanford that has a strain sensitivity of 3×10^{-18} (the strength of a gravity-wave signal is expected to be 3×10^{-19}).

Another type is a laser-interferometer detector with a potential strain sensitivity of 10^{-22} . Currently, two laser-interferometer detectors are in operation: one at Caltech and the other at MIT — both with a baseline of around 40 meters. There are plans to build an L-I detector with a 5-kilometer baseline that would be sufficient to detect gravity waves (if they are as strong as theorists believe them to be). One site under consideration for this super-detector is the Very Large Array near Socorro.

Recent technological advances in fabricating low-dissipation materials and low-noise amplifiers are bringing us closer to actually detecting gravitational radiation. "Successful detection is likely to require displacement sensitivities so good that the quantum mechanics of the masses become important," Caves points out. "New quantum measurements can achieve these displacement sensitivities better than the naive limit set by quantum mechanics."

Retiring



Bill Wing (2425)



Dick Turnbough (7482)



Ray Schultz (7260)



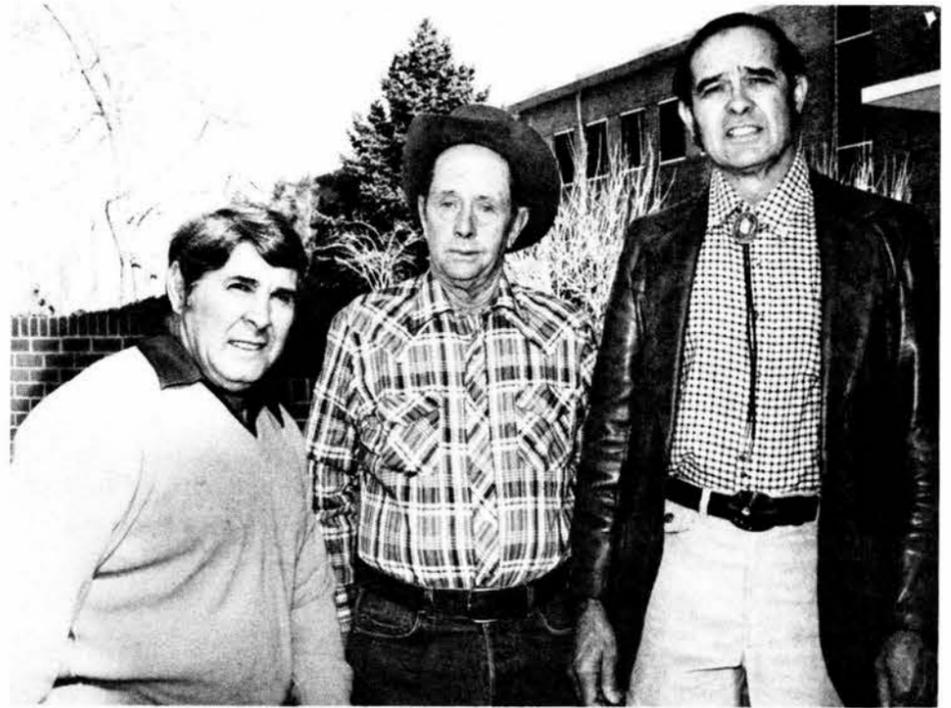
Al Schwarz (2515)



Lynn Rigby (3530)



Alma Mischke (151)



Tony Lopez (3423), John Sullivan (3618), Amarante Carabajal (7132)



Norman Smith (5263), Bob Boyd (3534), Gundy Gunderson (3436)



Bill Seaburn (7482), Vaughn Nogle (2345), Al Murphy (5336)

feed **feedback**

Q. Are not all MA positions supposed to be advertised via the post/bid system? And why does Sandia continue to hire people from outside at the MA level? Does Mr. Dacey approve of this practice?

A. The policy for nonrepresented jobs is that all job openings will be posted except for those suspended with the approval of the President. Also, "the posting policy will not apply to positions affected by functional transfers, reorganizations, or personnel ceiling adjustments; to loans or trades of personnel after mutual agreement of the supervisors and individuals involved; to priority placements or transfers approved by the Director of Personnel; to lateral movements of staff members, TSA, ESA, SAT or MA personnel within a directorate; or to vacancies covered by management-approved recruiting programs or corporation agreement" (p. B-4 of the Personnel Manual). Although there has been some MA hiring (1 in FY83), the majority of MA positions are posted and filled internally. For FY83, there were 99 MA level postings, of which 97 were filled, 1 withdrawn, and 1 left open.

J. R. Garcia - 3500

Q. On Tuesday, Nov. 29, 1983, at approximately 11:25 a.m., the alarms in Bldg. 892 (Tech Area I) started sounding in short blasts that lasted about three to five minutes. On hearing the alarm I thought it sounded different, so I looked on the inside cover of the directory under emergency signals. It reads, "A wavering tone or short blasts on horns or other devices lasting 3 to 5 minutes. Country is under attack." The building was evacuated as usual for a fire drill. No one that I've talked to noticed the difference in the alarm. The directory goes on to say, "This signal will be used only in the event of actual attack and will be used for no other purposes (except in Albuquerque during test of warning system at 12:15 p.m., the first Tuesday of each month)."

I have two questions: 1. What happened? 2. Was building evacuation the right step to take? If not, what?

A. On that date, the fire alarm bells in Bldg. 892 were sounded in short bursts as part of a fire evacuation drill, for a period of 5½ minutes, the time it took for the building to be totally evacuated.

Most buildings at Sandia have a non-coded fire alarm system where actuation of any fire alarm station causes continuous ringing of the fire alarm bells. The exceptions are Buildings 802, 840, and 892, which have coded fire alarm systems. With a coded fire alarm system, each individual fire alarm station sounds the bells with a different 2- or 3-digit numerical code, which is repeated four times. Therefore, when conducting a fire alarm drill in these buildings, a pulse signal must be used instead of the normal continuous ringing.

Fire alarm signals are rung on bells inside the buildings, whereas air raid signals are sounded by sirens mounted outside on the roof of a select number of buildings



ECP AT WORK — ECP committee member Ernie Aguilar (3425) observes children using headphones to listen to a story and, at the same time, follow the words in their book. The headphones were purchased as a learning device for St. Mark's in the Valley Day School with an allocation from the ECP Reserve Fund. Subsidized by United Way, the school provides services for children from low income families.

around the site. This should help clarify some of the confusion between fire alarm signals and attack signals.

During a fire emergency or a fire drill, building fire team members man fire extinguishers in the corridors and also check rooms, toilets, etc., for people who may not have evacuated. These fire team members are available to explain why the bells are ringing.

R.W. Hunnicutt - 3600

Q. It should be obvious to motorists and cyclists alike that there is a great need for more and better bike paths. The dangers of no bike paths are obvious. Why is there no such path on the Eubank exit? And what are the steps necessary to have a path installed?

A. We have tried to discourage cyclists from using Eubank because of the high-speed traffic and lack of bike paths and proper shoulders and curb and gutter. It is much safer to use the established bike paths through the Wyoming gate. The City of Albuquerque may make improvements to Eubank in the future, although we know of no such current plans. If and when improvements are made, it may be possible to include bike paths. You may wish to contact and work with the Albuquerque Bikeway Committee or the Sandia Bicycle Association. Ron Malpass (6-6850) is president of the SBA.

R.W. Hunnicutt - 3600

Q. Many drivers, most of them apparently Sandians, try to avoid the Eubank-Central traffic light during morning rush hour by using Southern instead of Central. They then proceed to endanger their own

lives — and the lives of others — by cutting into the lanes of traffic southbound on Eubank. Until they can cut in, they often travel south on the northbound lanes. Why can't left turns off Southern be prohibited during morning traffic?

A. Because the Eubank and Southern interchange is located on city property, Sandia has no control over it. There does appear to be a definite problem during morning rush hour traffic with westbound motorists on Southern who attempt to merge into the southbound lane of traffic on Eubank and at times use the northbound lanes of Eubank as a merging lane.

The City Traffic Engineering Department and APD Traffic Division have been contacted concerning this problem, and both agree that the most effective solution may be selective enforcement. The Traffic Division has begun to monitor the intersection of Eubank and Southern on a random basis. This action should make the intersection much safer during the morning traffic rush.

C.L. Brumfield - 3400

COMPUTER KIDS



Kids too young to drive a car are earning adult wages devising software programs for big corporations. According to some estimates, 15 people in the US under the age of 25 are now earning more than \$100,000 a year developing popular programs for home computers. Schoolboys are creating electronic games their teachers confess they couldn't make themselves. And with increasing frequency, computer BASIC is becoming the first language other than English that children encounter. . . . Fear of computers is a matter in which the generations differ. "Kids have no fears of computers at all — it hasn't been ingrained in them," in the opinion of Evan Katz, a 19-year-old who writes a column on computer chess and artificial intelligence for *Chess Life* magazine. "A person isn't scared of something unless he's taught to be. People who've grown up with the computer have a totally different attitude toward it."

—George Sweetnam in *Science Digest*

Fun & Games

Golf — If winter's getting you down, swing into spring by joining the Sandia Women's Golf Association. The SWGA's annual membership drive party offers a complimentary cocktail, hors d'oeuvres, and a chance for a door prize and a handshake with the 1984 officers and other members. The party is Feb. 22 from 4:30 to 6 in the El Dorado Room of the Coronado Club; if you can't make the party, call Mary Cocco on 4-3485 for inspiring words about why you should be a member anyway.

* * *

Bowling: — The Sandia Labs Women's Bowling League held its collective breath on Jan. 26 when Estella Creel (wife of Earl, 1622) rolled a spectacular 290 game. A newcomer to the League, she carries a 174 average and bowls with the Dreamers. She began her high game with a spare, then went on to strike all the way out. (Note to baseball fans: in bowling, that's good.)

* * *

Skiing — The Coronado Ski Club entered three teams in the Visitors' Club Race at Purgatory/Snowdown last month. Michael (311) and Sharon (7611) Fletcher and Max Sandoval (314) placed second in their age group in the team race and toted home some tote bag prizes. Placing fourth in their age category were Mitsuko and Kaz Oishi (5152) and Phil Dreike (1263); Mitsuko is Kaz's 7-year-old daughter. Michael Gonzales (1821), Sadie Hesseldon (7540), and Bill Conley (7471) placed eighth in their category. Teams were made up of two male and one female racers.

* * *

Boating — Albuquerque Flotilla 2-4 of the US Coast Guard Auxiliary is once again offering free instruction in both power boating and sail boating. Courses begin on Feb. 29 and run for about 13 weeks with a 1½-hour lesson each week. They're held in the Armed Forces Reserve Center (400 Wyoming NE, second floor). Registration is at 7 with instruction beginning at 7:30. A small fee covers cost of text and material. More info from Pat Bultmann on 821-0672 or Ben Gardiner (7471).

* * *

More Golf — Get to know your golf swing. Tijeras Arroyo Golf Course offers open group lessons to the KAFB community. Cost is \$25 for four 2-hour sessions that will cover all of the basics of the golf swing; for beginners and experienced folks. More info from Dave or Chris on 4-4427 or 4-8116.

* * *

X-C Skiing — The American Lung Association of New Mexico is sponsoring a 3-day Cross-Country Ski Trek for Life and Breath on the full moon weekend of March 16-18. Although basic X-C skiing ability is necessary, you don't have to be an expert or an experienced winter camper — training before the trek, all meals, trek leadership, and transportation to the trek site are provided by the Lung Association through a grant from Mutual of New York. All funds raised will benefit the Association's programs in lung diseases. Contact John Vitale at ALA on 265-0732 for further info.

* * *

Men's Golf — Annual membership meet-

Zia Wheelers

They Roll for the Goal

Given a chance, basketball fans will discuss their favorite team — high school, Lobos, or Silvers — with anyone at any time. But these aren't the only games in town.

If you'd like to discuss a team that's a bit less fan-intensive, take note of the Zia Wheelers, who represent Albuquerque in the Rocky Mountain Division of Wheelchair Basketball. They were the 1983 Division champions and they appear to be headed for this year's title. Vin Davis, a layout engineer in Planning Division 3664, plays either forward or center on the Zia Wheeler team.

Vin played basketball in high school and played for two years with an amateur league team. Then he was sent to Vietnam; when he came home, he was in a wheelchair. He attended college in New York but decided to come west. When he moved to Albuquerque, he enrolled at UNM and received a degree in architecture.

"A group of us at the University started to get together to play basketball in 1977," Vin says. "It was a recreational type of thing with no organization. We just enjoyed the game and got together for fun. Then we began to wonder if we could compete." The group became the Zia Wheelers and joined the Rocky Mountain Conference, encompassing teams from Wyoming, Colorado, and New Mexico, in 1980.

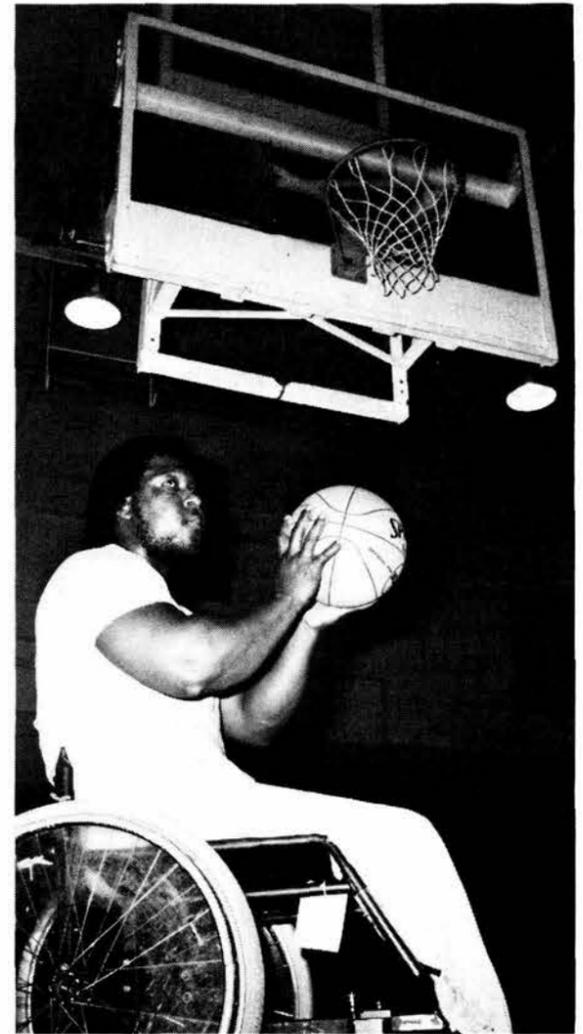
Wheelchair basketball is played on a regulation-size court under NCAA rules with only a couple of exceptions: players are allowed five seconds in the key instead of the regulation three seconds, and there is no double dribble rule. Vin explains: "A player has to push his chair and dribble the ball at the same time. Once you stop the dribble, you're allowed two pushes before you dribble again. More than two pushes is a traveling call."

The team has 14 members and practices twice a week at Carlisle Gym on the UNM campus. They're recognized as a good team by other wheelchair conferences so they've had several invitations to play against other teams. In addition to conference play, the team recently traveled to Las Vegas, Nev.,

ing of the Sandia Golf Association (SGA) is set for Wednesday, Feb. 29, at 5 p.m. in the Eldorado Room of the Coronado Club. Refreshments will be served. New members are cordially invited. Former members will be receiving the 1984 league literature the week of Feb. 20. Additional info available from Leon Chapman (6416), 4-9158.

* * *

Bicycling — The Rio Grande Racing Team holds its first meeting of the season on Feb. 29 at Strings and Spokes, 3222 Central SE, at 7 p.m. Anyone interested in bicycle racing is invited to attend. Subsequent meetings will be held on the second and fourth Wednesdays of each month. For more information, call Steve Davis (7473) on 892-5825.



VIN DAVIS (3664), captain of the Zia Wheelers, gets in some practice time at Carlisle Gym at UNM. The team routinely averages 65 to 70 points each game, and they're about to become conference champs for the second consecutive year.

and Long Beach, Calif., for games. On Feb. 3-5, they competed against the top 15 teams in the nation at the Kentucky Blue Grass Invitational. "We didn't play well in that tournament," Vin confesses. "We won only one game out of four."

Conference play finishes up in Colorado Springs this weekend. If the Wheelers win the title, the regional play-offs will be held in Albuquerque March 3-4. Then it's on to the sectional and finals, both in Kansas City.

"Most of the teams around the country have a sponsor," Vin says. The Zia Wheelers don't have one, although this season the team enlisted the aid of professional fund raisers. "That has helped a little, but the trips cost each of us a bundle," Vin says. "UNM has been very supportive, allowing us the use of Carlisle Gym and providing other assistance."

Vin reports that the crowds at the games are small but loyal — mostly families of the players. Financial support is a major necessity, but an audience to play for would be an added incentive.

The Zia Wheelers also give something back to the community. Every Thursday, team members conduct a clinic for disabled children at Mark Twain School. During the recent holiday season, the team co-hosted a Christmas dinner for needy children. And they play in the Civitan's annual charity game; this year the proceeds will go to the Cibola High School Scholarship Fund.

Take Note

For those who love their Shakespeare — and for those who would like to — John Gardner (3153) and Sue Ann Gunn (wife of Nigel Hey, 3161) have put together some “bits of the best of the bard.” Called *What You Will*, the show is comprised of the juiciest scenes from six of Shakespeare’s greatest hits. Cast includes Bruce Hawkinson (3162) and six other experienced actors. *What You Will* plays March 2-3 at Albuquerque High School and March 9-10 at Eldorado High School; show time is 7:30, and tickets are \$2.50. Call 898-3963 for reservations.

* * *

A tour of the Federal Aviation Administration facility climaxes the Feb. 23 meeting of the ASME. Non-members are welcome, but the size of the tour group is limited; call Gil Benavides (2543) on 4-6308 for info.

* * *

DOE/AL is observing National Black Month with a three-day/four-event program: 9 a.m. on Feb. 21 — guest speaker is Ernest Coleman of the Division of High Energy Physics, DOE Washington; 10 a.m. on Feb. 21 — a theatrical performance by Juba Production Enterprises entitled “Act II — Two Women”; 1 p.m. on Feb. 22 — fashion show by Lamé Productions; and 9:30 a.m. on Feb. 23 — gospel choir concert by the New Hope Missionary Baptist Church. All are invited.

* * *

If you’d like to play host to high school students from Europe, South America, or Asia during the 1984-85 school year, AISE (American Intercultural Student Exchange) wants to hear from you. The students, age 15-18, will arrive in the US in August, attend a local high school, and return home in June 1985. All are fluent in English. Or perhaps you know an American high school student who would like to spend a school year or five weeks during the summer with a host family abroad. Either way, contact Polly Scoutaris at 296-8024 right away.

* * *

A series of workshops sponsored by Parentcraft, Inc., is set for KAFB’s Que Pasa Recreation Center. Designed for the parents of young children, the series includes: Moving and Relocation, Feb. 27, 10-noon; Traveling with Young Children, Feb. 27, 7:30-9:30; Growing Up with Working Parents, Mar. 5, 10-noon; Separation, TDY, and the Young Child, Mar. 12, 7:30-9:30; Building Self-Esteem in Children, Mar. 19, 10-noon; and Discipline: Behaviors and Benefits, Mar. 26, 7:30-9:30. Workshops are free for those who work on the base and their spouses. Pre-registration is essential; call the Rec Center on 4-5420.

* * *

Also at Que Pasa, a couple of computer classes: Introduction to Computer Operations (five weeks on Thursdays beginning Feb. 23; cost is \$20) and Basic Programming 1 (seven weeks on Tuesdays beginning Feb. 28; cost is \$28 plus \$5 book fee). Both classes run from 6:30 to 9:30. Call Que Pasa on 4-5420 for more info.

* * *



THE MOVE into Bldg. 960 in Area IV started this week with furniture and equipment going into offices and light laboratories of the Pulsed Power Directorate 1200. About 135 Sandians in organizations 1201, 1230, 1250, and 1260 will occupy the new building. In foreground, Jim Salazar of Industrial Contractors checks with inspector Tom Sanchez (3631) on equipment location. The move should be completed in about five weeks. Construction of the \$5.8 million building started in March 1982.

The Bldg. 861 Sandia Cafeteria is giving away free cokes in honor of the Olympic games. They have all these special cups, so with any purchase of \$2 or more, you get a free coke until the cups are gone.

* * *

The South 14 Bookstand — “Never complain or hoist the white flag” was part of the cowboy’s homemade religion. So says historian Marc Simmons in his *People of the Sun*, published by the UNM Press. He illustrates that credo with a story. “William Timmons, who went to work at fourteen on the Texas range, tells of a cowboy he knew down in Donley County. Joe Cupell was his name and once he broke his leg in a run-in with a horse. Off to town he went to have the doctor set it. When the leg appeared to have healed, he stood up and discovered it wasn’t set straight. So when everybody else had cleared out, Joe Cupell wedged his game leg in the frame around the heater pipes in the bunkhouse. Then with his weight he broke it again, reset it, and this time the leg was straight. “That was the way a real cowboy

acted,” Timmons observed admiringly.” *People of the Sun* describes many other hardy types, and Simmons writes sensitively of our four cultures — Spanish, Mexican, Indian and Anglo. Great photography by Buddy Mays. Available at the LAB NEWS office, Bldg. 814, for \$14.95.

* * *

The Sandia Secretarial Committee is an advisory committee serving as a link between management and Labs’ secretaries. New appointments to the committee were recently announced: Virginia Dalin (5330), chairman; Sheila Guynes (400), Karen Anderson (1520), Fran Roelle (2600), Nancy Barr (3180), Carmen de Souza (6330), and Edna Otero (7230). Bob Garcia (3500) is the group’s sponsor, and Mary Campbell (3523), Carol Kaemper (21-1), and Shirley Dean (11-1) serve as *ad hoc* members.

* * *

Retiring this month and not shown in LAB NEWS photos are John Beyeler (7215), Bob Crain (2312), Juan Mata (1845), and Bob Durkee (8131).

Medical Corner

Breast Self-Exam Classes

by Susan Harris, 3330

Progress is being made every day against breast cancer, the number one killer of American women. The progress results from early detection: more women are regularly practicing the Breast Self-Exam (BSE), and more women are having routine mammography.

Dr. Judy Ewing, Sandia Medical, is offering BSE classes to all Sandia women and to wives and daughters of Sandia employees. Remember, progress is being made every day. Take advantage of it by learning more about breast cancer. Seven

classes are currently scheduled, including two evening sessions. In-hours classes run from 2:30 to 3:30; evening classes from 7:30 to 8:30. To enroll, call Susan Harris on 4-0713.

Breast Self-Exam Class Schedule

In-Hours Classes	Bldg./Rm.
Thursday, Feb. 16	802/229
Wednesday, Feb. 22	C. Club/B-5
Monday, Feb. 27	C. Club/B-4
Thursday, March 1	C. Club/B-5
Friday, March 2	C. Club/B-4
Evening Classes	
Monday, Feb. 20	C. Club/B-5
Wednesday, Feb. 22	C. Club/B-5

Touring Hawaii The Hard Way

"The Big Island Triathlon is an extremely strenuous event requiring great individual endurance and stamina." That quote from the "Ultraman" triathlon's guidelines would not be disputed by Jim Harrison (5111). Even so, he placed third in competition against some who were able to train fulltime for the event.

And this is not your everyday triathlon; in fact, it asks more from participants than Hawaii's famed Ironman: a six-mile ocean swim and a 65-mile bike ride on the first day; a 170-mile bike ride on the second; and a 52.4-mile run on the third. Not the kind of vacation most of us look for. But Jim isn't like most of us.

"When the alarm goes off at 4:30 a.m., you tell yourself that no one would know if you turned off and went back to sleep," says Jim. "But you'd know, and you know that if you don't train, you won't do your best — and in this one, you might not survive."

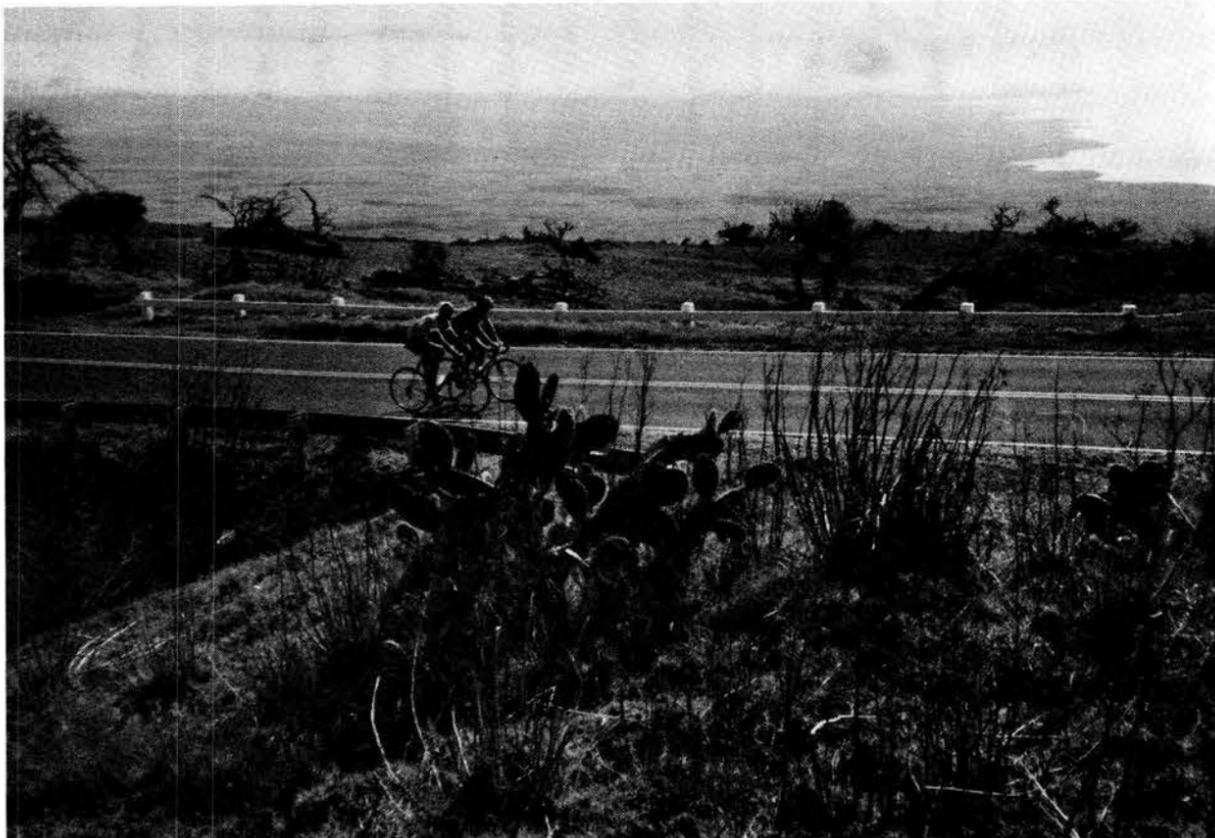
"I set the goal — to give this triathlon my best shot — last summer. On Monday, Wednesday, and Friday mornings, I'd run to the pool, swim from 6 to 7, then run to work. Running at noon and then running about 10 miles after work and ending at the pool for another swim workout finished the hard days. A plug here for Reed Barnitz — he's a fantastic swim coach. I started working out with him in October.

Tuesdays and Thursdays were the easy days — just 40 to 50 miles of biking and a swim workout on Thursday evenings. On weekends Harold Field, who was also training for the Big Island event, and I would usually find time for a long run, bike, and swim.

"Obviously we were going beyond the two to three hours of work per week that you have to do to diminish the chances of a heart attack. But I like swimming, I've been running to work for the last 10 years, and biking is fun. So it wasn't torture for me — more like time-consuming hobbies."

The event was held Dec. 29-31 on Hawaii (the "Big Island"). It began and ended at the Kailua Pier on the Kona coast and circled the island in a counterclockwise direction. Jim's wife Judy and Mike Stephenson (8116) served as Jim's and Harold's support team; the support team was mandatory for the ocean swim and was highly recommended for the other races. "Judy and Mike had the really tough job — putting up with our whining," reports Jim.

Jim's total time, 23 hours 39 minutes, bested that of all but two of the 37 competitors in the race. And many of those competitors, including the two who beat him, had been training in Hawaii since September. "Before the race, I thought more than once that just finishing at all would be an accomplishment. Coming in third was exciting. I've been impressed with the number of friends and other people I barely know who have gone out of their way to congratulate me.



STAGE TWO of the Ultraman triathlon was a 170-mile bike race from Punuluu through Volcanoes National Park to Hilo via Kalapana, then up to the Hamakua coast and over the Kohala Mountains to Hawi. The three-day event — swimming, biking, and running — circled the Big Island counterclockwise, with start and finish at Kailua. Jim Harrison found the scenery a welcome diversion from the rigors of the race itself.

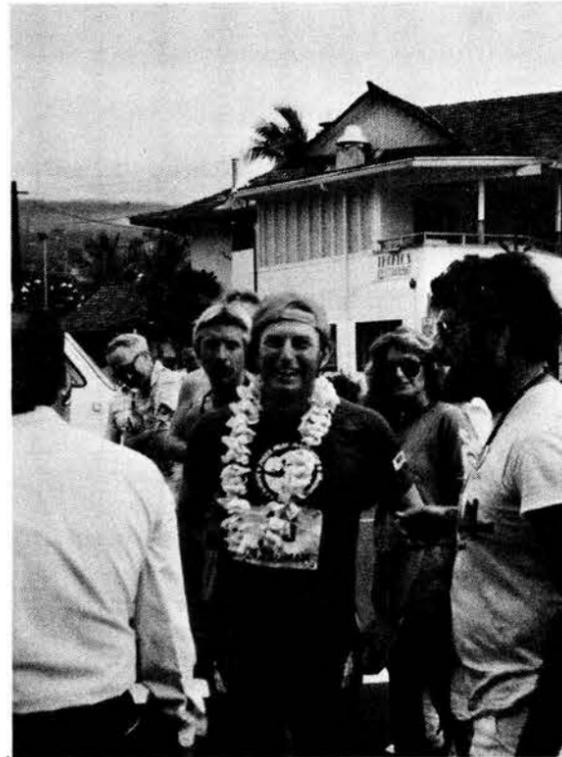


LOLLING ON THE GRASS — or the beach — is what most of us do in Hawaii. Jim (in rear) didn't loll much during the Ultraman.

"Personally, the most satisfying reward was seeing the training — especially the swimming — pay off."

Jim credits his genes — "My body seems to be good at long-distance stuff, but that's probably only because I train for it. I like challenges, and this triathlon was certainly that plus a chance for us to see the Big Island. Triathlons and training are something I enjoy. And Hawaii, with its diverse, constantly changing scenery, was a beautiful setting for the event. My only regret is that Harold pulled his Achilles tendon and had to withdraw during the run."

For those who want to compare their levels of fitness, Jim's times: Day 1 — swim 6 miles in 2:52 and bike 65 miles in 3:22; Day 2 — bike 170 miles in 9:30; Day 3 — double marathon in 7:45.



THIRD PLACE FINISH was an achievement Jim's proud of. He was competing against some who spent three months in Hawaii training for the triathlon. Jim trained before and after work at Sandia.

LOOKING BACKWARD: WHAT PSYCHICS PREDICTED FOR 1982

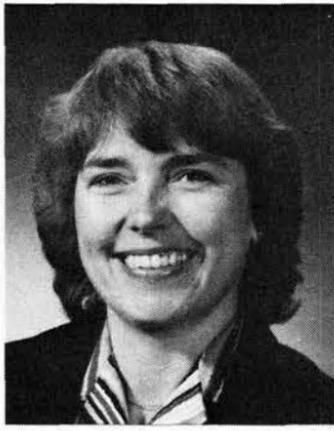


The following psychics' predictions for 1982 were published in the *Star*, the *Weekly World News*, the *Globe*, and the *National Enquirer*:

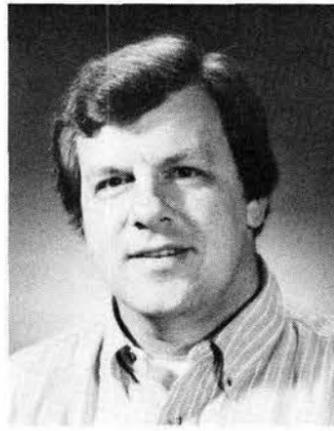
- Startling new evidence of pyramids and massive statues on Mars will convince scientists that life flourished there millions of years ago ...
- Cuban President Fidel Castro [will be] overthrown in a major uprising ...
- Chrysler Corp. will ... go out of business ...
- [Singer] Linda Ronstadt and [former] California Governor Jerry Brown will marry in 1982 ...
- Sugar Ray Leonard will fight again. (He retired.)
- An impeachment effort will be launched against one or more Supreme Court justices ...
- A UFO will land ... right beside the White House.
- A controversy will break out when it's discovered that a man-made explosive device sank the Titanic ...
- Ex-astronauts Neil Armstrong and Buzz Aldrin will blow the lid off a UFO coverup by the government.

Kendrick Frazier (3161) in *Skeptical Inquirer*

MILEPOSTS
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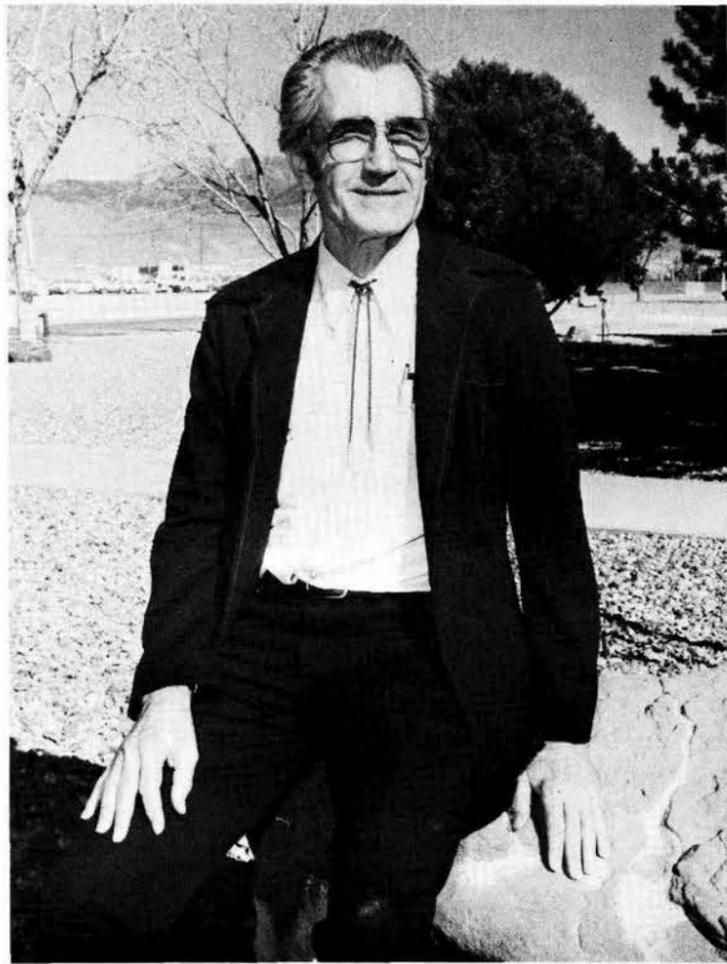
Pat Childers (301) 20



Dan Puetz (2634) 10



Helen Finley (2120) 15



Alan Bolles (5336) 35



John Zubersky (6451) 10



John Williams (2625) 25



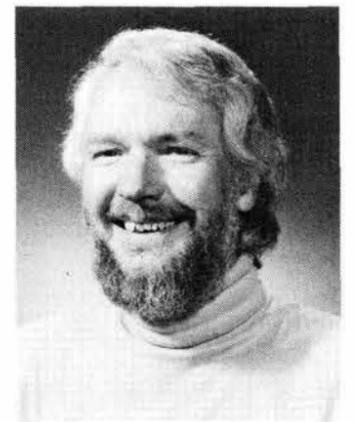
Larry Garrison (141) 20



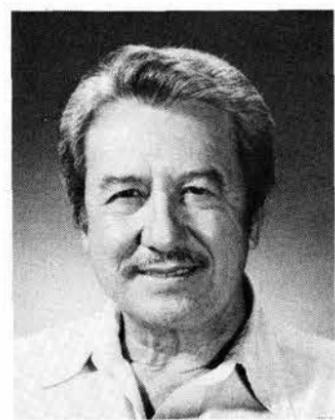
Gary Ferguson (2543) 15



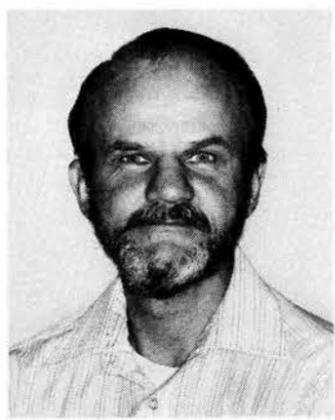
Juan Ramirez (1245) 10



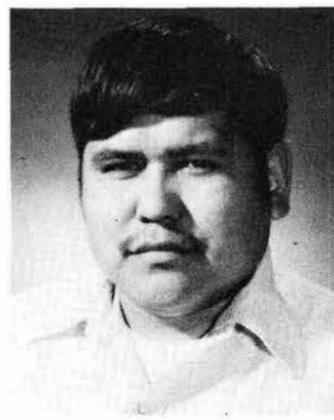
Oscar George (1652) 20



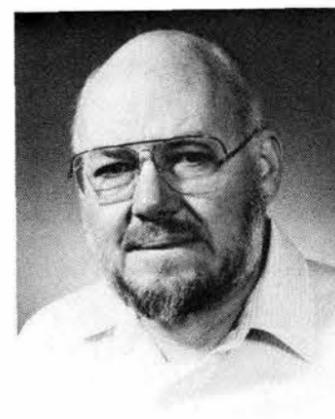
William Brady (3413) 30



Harold Roberts (7131) 25



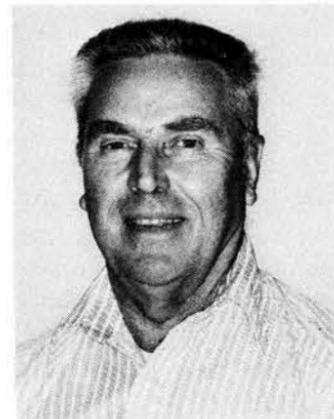
Johnson Morgan (7472) 10



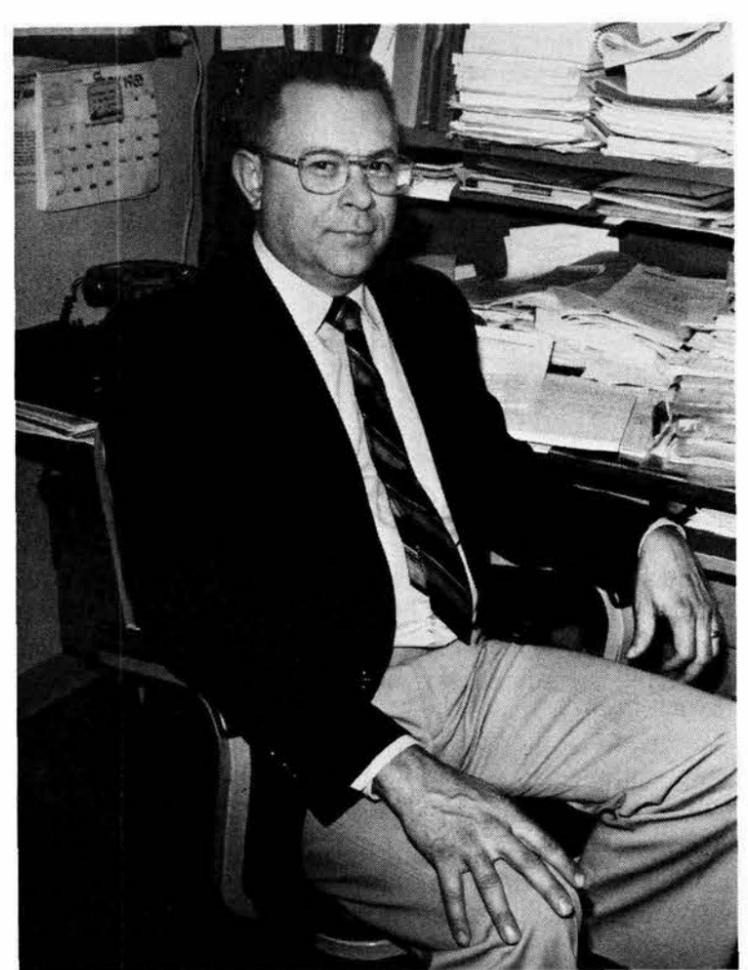
Jack Puariea (5313) 25



Roy Diesing (1651) 25



Ed Hake (7131) 35



James Metcalf (3312) 15

Credit Union Announces New Officers

Elected to the board of directors at the recent annual meeting of the Sandia Laboratory Federal Credit Union were Helen Davison (1600), Carlos Griego, Jr. (7500), Joe Ruggles (3661), and C.R. Barn-cord (ret.).

An all-time record of \$93.6 million in assets was announced in the annual report, which detailed another year of successful Credit Union operations.

Following the meeting, the board met to elect officers for the coming year. Marv Daniel (2113) was reelected president. Joe Ruggles (3661) is vice president; Robert Luna (9781), secretary; and Red Turner (Credit Union general manager), treasurer.

The board appointed Ellen Cronin (6330), Charles Craft (9445), Robert McIntosh (142), and Jerry Wackerly (8423) to serve on the supervisory committee.



A NEW ATM (Automatic Teller Machine) for the Sandia Laboratory Federal Credit Union is now installed and operating in the entrance to Bldg. 822. This is the third ATM for the Credit Union — the first is at the Credit Union Branch at Wyoming and Candelaria and the second is near the entrance to Cafeteria Bldg. 861. The machines provide cash withdrawals, transfer funds between savings and share draft accounts, and take deposits. Testing the new machine are Wayne Presser (right) and Pat Calahan of the Credit Union staff.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

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

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. No more than two insertions of same ad.
8. Include name and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

RABBITS: 2 does, one buck, reg., all for \$16. Navalesi, 344-0598.
 PIMENTEL rosewood guitar, \$1600. Luther, 293-4462.
 WINGBACK chair, \$30; Boston rocker, \$50; police scanner, \$80. Gendreau, 268-3436.
 LUGGAGE: American Tourister, 26", soft side. Buss, 298-1589.
 ELECTRIC 40-gal. water heater, 4 yrs. old. Fowler, 292-2490.
 OLD Hammond church organ case w/bench, no organ, wood, \$100. Hubbard, 842-9431.
 TWIN Holiday Rambler mattresses from new 5th-wheel trailer, \$65 ea.; twin elec. mattress pads, \$25 ea. Gregory, 268-2022.
 ELECTRIC guitar. Gonzales, 344-4933.
 1-PHASE electric motor, 110/220 HP, 1750 or 3450 RPM. Silverman, 298-1308.
 G-78 14 snow tires, \$50. Jackson, 293-0988.
 HERITAGE Formal dining room suite: oval table w/two 24" leaves, 6 chairs, lg. lighted china cabinet, solid pecan wood. Hezlep, 296-2962.
 DOUBLE kitchen sink, 22x33, white cast iron, no chips, w/single lever mixing faucet, and disposal, \$45. Rainhart, 821-3690.
 CALCULATOR: new HP-15c scientific, programmable, w/matrix capacity, advanced functions handbook, new \$120, sell for \$80. Bainbridge, 265-4184.
 CANOE motor mount for small out-board, clamps to gunwale, \$15. Holmes, 292-0898.
 ROTARY slide trays, hold 100 2x2 slides, fits 9 different projectors in-

cluding Sawyers, GAF, Sears, Wards, Anscomatic, etc., \$2 ea. Hewitt, 299-6592.
 REAR WINDOW louvers for '82-84 Firebird or Camaro, factory, \$85. Long-fellow, 299-7062.
 '73 16' camping trailer. Chavez, 867-2213.
 TIRES: 14 & 15" radials, \$5-7 ea.; standing clock, \$25; chest of drawers, 32x24x14, \$30. Martin, 294-8010.
 GUNS: Remington 12 g. Mod. 870, vent rib, \$200; Winchester 94 30-30, pre-1964, \$175. Johnson, 884-1249.
 PIMENTEL guitar w/case, \$150; Virtuoso accordion w/120 bass & 2 shifts, w/case, \$125; 4 \$8 bus tickets, \$25. Smith, 299-6873.
 QUEEN-SIZE bed, mattress, box springs, wood, head & foot boards; couch; toaster ovens; dressers, make offer. Jarrell, 293-9671.
 SOFA & loveseat, \$200; coffee table & 2 end tables, \$75 each. Brunner, 296-6617.
 ALFALFA, \$2.50/bale, 150 bales, sell all. Johnston, 865-4004.
 BLACK loveseat sofa; chandelier light fixture; red velvet full length drapes, 3 long coffee tables, best offer. Tripp, 822-8580.
 SAVAGE FOX, B-SE, 12 gauge, M/F, 28", vent, single trigger, selective ejectors, walnut, hand check, new, \$260. Kureczko, 298-1577.
 ANTIQUE walnut tiered table, chest w/nightstand. Sturm, 345-2071.
 CHOPPING block w/wine rack below, pot hooks above, \$200; TEAC 350 cassette deck, \$50. Higgins, 268-6886.
 SNOW TIRES: two 185/70-13 radial steel belted, mounted on 13x5 wheels, suitable for VW or Audi, \$100. Lipkin, 881-6038.
 STEREO, Sansui, remote, graphics equalizer, programmable turntable, plus more, cost \$2400, sell \$1200. Mills, 292-5560.
 AIR CONDITIONER, Arctic Circle, down draft, 36" sq., \$150. Benton, 877-2473.
 SCHNAUZER puppies, 3 females, 1 male, pure-bred, no papers, born 2/3, avail. 3/10, \$125 ea. Helmick, 292-3718.
 STEREO: Realistic AM/FM stereo tuner/amp; Realistic stereo cassette; Pioneer turntable; Sound Design stereo 8 track, \$150. Hobbs, 268-6461 after 5.
 BSR McDonald 4800 turntable, \$35; handmade black 5-piece dining set, \$60; kit-built computer terminal, \$40 OBO. Martinez, 299-5728.
 POWER PLANT, Onan portable, 2500 watts, \$375. Hopkins, 255-8902.
 '83 World Book encyclopedia set.

Plein, 884-3749.
 GAS CANS, metal 5-gal. w/spout, \$7.50 each. Brammer, 266-5158.
 SMITH & WESSON Model 27, .357 mag., 4", \$350; Model 41, .22 cal., 7", \$330. Nowak, 292-8132.
 10-SPD. bike, \$50 OBO; small chest of drawers, \$15; misc. car parts, household items, toys, etc. Shaw, 299-8524.
 MICROWAVE, Hardwick Touch control, \$175; Sears 26" 3-spd. girl's bike, \$25 OBO. Freshour, 266-1662 after 6.
 SKY LIGHT, 24x48, flat roof, \$80. Sanchez, 897-0743.

TRANSPORTATION

'71 VOLKSWAGEN 411, AT, 4-dr., \$600. Robles, 298-2456.
 '79 SUZUKI 750, whole or parts, everything but frame O.K., \$350. Wilkins, 281-1869.
 '72 VW bug, rebuilt engine; new paint, seat covers, brakes; AM-FM cassette, many extras, \$2495. Gendreau, 268-3436.
 '37 CHRYSLER Roadster, 75% restored, \$7K. Perryman, 281-3020.
 '83 TOYOTA pickup, 32 mpg, \$5200. Garcia, 898-8919.
 '78 T-BIRD, AC, moonroof, loaded, \$2600 OBO. Sena, 296-5619.
 '55 CHEVY pickup, new motor, 2000 miles, Lovato, 243-0195.
 '73 MAVERICK, 2-dr., V-8, AT, way below Blue book, \$550. Leif, 265-5379.
 '76 DODGE Aspen coupe, \$1500. Barton, 268-7349.
 '74 CHEVY pickup, 8-cyl., 350 eng., LWB, 4-spd., dual gas tanks, 55K miles, \$2350. Garcia, 888-4735.
 '61 LANCIA FLAVIA, first Lancia front-wheel drive, for restoration or parts, \$500 OBO. Yaniv, 294-4490.
 '80 DATSUN 210, 2 dr., sedan, AC, 5-spd., 26K miles, \$4000. Kelly, 299-7190.
 '75 TOYOTA Corona stn. wgn., many extras; '70 Datsun truck. Jaramillo, 255-8288.
 '81 YAMAHA YZ465, \$1075 OBO; Pacific 00-7 reloading press & deluxe powder measure, complete less dies, \$100. Healer, 298-6967.
 '72 TRIUMPH 650 Bonneville motorcycle, rebuilt & customized w/lots of chrome, \$1900 OBO; '65 Dream Honda 250CC, \$200. Gonzales, 344-4933.
 '83 SUZUKI GL550-L, garaged all winter, 1800 miles, \$1800, includes helmet. Clausen, 266-4439.
 '83 HONDA 1100 motorcycle, V65 Magna, w/\$150 helmet, \$3695. Ulibarri, 881-3551.
 '77 DATSUN B210 hatchback, 5-spd., AC, new paint & battery, 30+mpg

city, \$2000. Lifke, 298-5045.
 '78 MINI-RV: Toyota Chinook pop-top, 51K miles, fits into garage, 3-way refrig., furnace, 2 batteries, new Porta-Potty, \$7800. Rainhart, 821-3690.
 '75 280Z, 4-spd., AC, AM-FM cass., new upholstery, weekdays at 4926 Jefferson NE. Stablein, 881-4639.
 '48 WILLYS Jeep, CJ2A, Ford V8, roll bar, skid plate, new battery, red, \$1500. Crompton, 299-5569.
 '77 TRIUMPH Spitfire convert., low miles, FM stereo cass., red. Zurawski, 884-3862 after 5.
 '80 SUZUKI GS850G, 11K miles, fully dressed, w/AM-FM Cycle sound, \$2500. Wilde, 881-6910 or 345-7456.
 '80 CHEV. Luv, long bed, 4-spd., AC, AM, Mikado pkg., under 14K miles, \$4800. Harness, 299-6639.
 '68 VW bug, AM-FM cass., new seat, \$650. Gonzales, 256-0551.
 '74 BMW 750, R75/6, 35K miles, vet-ter bags, \$2400; '71 Honda 450, \$300; Finn class sailboat, equip., trailer, \$1250. Zurzolo, 292-2642.
 '80 YAMAHA XS1100, set up for serious touring, \$2950. Rody, 299-6084.
 '72 WINNEBAGO Brave, 18', Archuleta, 296-7244 after 5.
 '82 DATSUN MVP 4x4, PS, PB, AM/FM radio, king cab, 24 mpg, 18K miles, \$7K. Kaneshiro, 864-8966 (Belen).
 '81 SUZUKI 850, windjammer, back-rest, full cover, 15K miles, \$2300 OBO. Schluter, 299-2968.
 BMX boy's bicycle, hand brakes, new chrome handlebars, tough neck, grab-ons, seat, Calif. lite pads, \$60. Baca, 266-3789.
 '60 STUDEBAKER Lark, 6-cyl., 3-spd., restorable. Brett, 881-8533 after 5.
 '71 BOAT, 19' Larson Shark I-O 350 Chev. V8, OMC outdrive, CB, depth finder, tandem trailer, \$4500. Tobyas, 877-0354 after 6.
 '78 HONDA Express 50cc, low miles, repair manual, \$225 firm. Stamm, 255-2640.
 '83 HONDA XL600R, 500 miles, rack & trunk, \$1500. Brooks, 296-6870.
 '70 IHC Travelall, 392 motor, PS, PB, AT, AC, AM, tow pkg., 64K miles, \$1000. Elder, 821-6158.
 MOTOR HOME — Ford van, stand-up conversion, fully self contained, many extras. Taggart, 881-3864.
 '72 GRAND Torino Ford, 4-dr., \$1200. Romero, 294-0192 after 5.
 '79 DATSUN 200SX, 5-spd., AC, AM/FM, reg. gas, blue w/white striping, \$3475. Wilkinson, 281-3835.

REAL ESTATE

1.3 ACRES El Pinar Estates, 14 miles off frontage road, wooded, electricity, phone, \$8K. Perryman,

281-3020.
 HOUSE, foothills east of Tramway near Lomas, great rm. w/fp, 3-bdr., 2 bath, assume FHA, \$82,900. Kelly, 299-7190.
 FOUR lots at Moriarty by school, all utilities connected, city ordinance, clear title, \$10K. Sanchez, 877-5231.
 3-BDR., 1 1/4 baths, 2-car garage, fenced back yard, Academy Acres, \$68K, assumable loans. Douglas, 821-8551.
 10 ACRES, unimproved land southwest of city, title insurance, \$12,500, \$1500 down, 10% interest. Mauldin, 293-2079.
 2-BDR. Townhouse, NE location, will consider trades, low \$80s. Dean, 299-3281.
 2-BDR. townhouse, beamed ceilings, kiva fp, skylights, patio, community pool, sauna, hot tub, exercise room, etc., \$72,900. Sturm, 345-2071.
 1 ACRE, Manzano View Estates, off South Loop (Valencia & Los Lunas area), electricity, gas, phone, restricted covenants, \$17K. Gonzales, 265-9031, 842-9604.
 MOBILE HOME: '78 Nashua 14x70, 2 bdr., 2 bath, assumable loan 12 1/2%. Jones, 281-1186.

WANTED

SEEKING Sandians interested in exchanging pet care on occasional basis (Candelaria & Tramway—handsome & undemanding cat). Kuehn, 292-7852.
 CB antenna, magnetic mount for car. Coleman, 884-5009.
 WILL the owner of the black early model T-bird that is for sale contact me—very interested. Underhill, 294-5774 after 5.
 PASSENGER side front fender & window for '75 Camaro XL, could use 2 other bucket seats. Duran, 867-3629.
 WHIRLPOOL bath (over-the-tub style). Bauhs, 281-2688.
 TO RENT RV that can comfortably sleep 4 & has full kitchen, first 2 weeks in Aug. Cohn, 266-5031.
 TWO 20" bicycles, boy's, usable condition. Byrnes, 869-6937.
 1 or 2 ROKON Rangers or Trail-breakers, complete or partial. Horine, 266-4534.
 LADIES golf clubs & bag. Headley, 293-4930.
 METRONOME. Picraux, 345-2032.
 ROOMMATE: need third person to share lg. 4-bdr. house near Snow-heights & Eubank, fp, yards, no pets. Stablein, 294-8930 after 5.
 ROOMMATE to share 2-bdrm., 2 bath apt., Adams & Candelaria, \$225/mo. 1/2 utilities. Burns, 881-4159.

Kiddie Karnival Tomorrow

TONIGHT at Happy Hour, a group called The Fifth String holds the bandstand playing country and western style. Karen Edwards instructs free western dance lessons from 7:30 until 8:30. Happy Hour prices (very reasonable) are in effect from 4:30 until 8:30 when the music starts. The dining room features either a seafood or beef entree buffet or regular menu service, and serves from 6 until 8:30.

Next Friday, Feb. 24, Spinning Wheel returns to the Coronado Club bandstand. This variety and show band is one of the better groups around the city and always draws a crowd. Reservations might be a good idea. Call 265-6791.

TOMORROW is a big day for kids. The Club's annual Kiddie Karnival starts at 10 a.m. with all kinds of fun, games, and prizes. At 1:30, Ronald McDonald, world-famous clown and magician, presents a magic show. Game booth tickets, good for eight games, sell for \$1.25, with 25 cents donated to the Ronald McDonald House. Door prizes will be awarded. Super sandwiches, cokes, popcorn and all that good stuff will be available throughout the day.

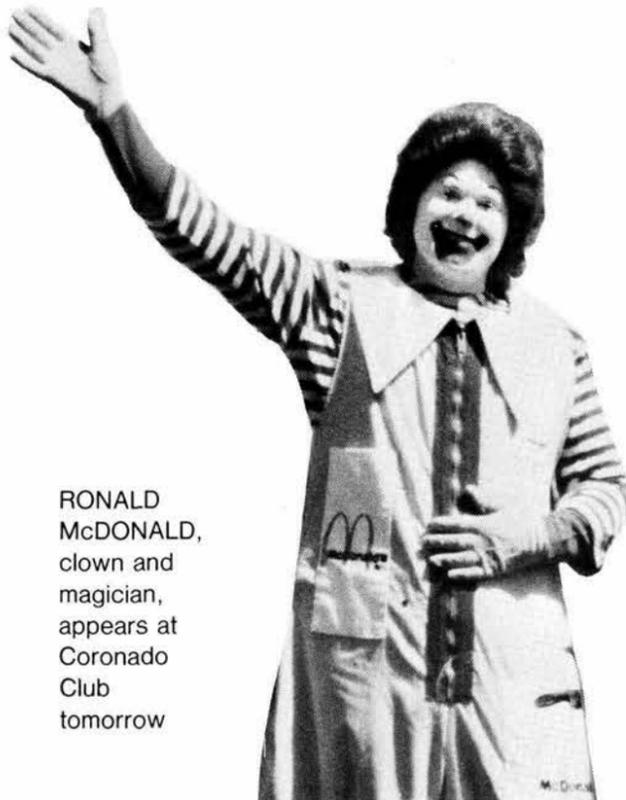
ON THURSDAYS, try the fresh seafood at the Coronado Club. Manager Mitch Griffin is building a reputation as the man who knows seafood. He also knows the right people to call back in his old New England stomping grounds to find out how the catch is going each week and to get the best selections flown to Albuquerque. Ask someone who was there last night. The Club offers the best and freshest seafood around, and at the best price - \$7.25 for adults, \$4.25 for kids under 12. Visa and Mastercard are accepted for dining room tabs of \$10 or more.

CORONADO SKI CLUB meets Tuesday, Feb. 21, at 7 p.m. for Ski New Mexico night. Speaker is Carol Hill. The usual Ski Club merely-terrific door prizes will be given away. Refreshments are very reasonable.

THREE ITEMS coming up on the March calendar are worth marking now. On Saturday, March 3, Variety night will feature the Walt Disney movie, *The Ugly Dachshund*. It's free admission for members and families. Food service is available at 5 p.m.; the entertainment starts at 6.

After the success of the champagne brunch last Sunday, another is scheduled in March — on the 18th starting at 11 a.m. and continuing through 3 p.m. Chef Henry outdoes himself for these events, and the word is getting around. Reservations are a good idea. Call 265-6791.

ALSO, and this calls for making a very careful note, the Club is celebrating St. Patrick's Day in grand style — the patron



RONALD McDONALD, clown and magician, appears at Coronado Club tomorrow

saint of engineers will not be neglected. On Saturday, March 17, Happy Hour starts at 2 p.m. and continues until 6 p.m. Bob Banks and the Trio with guest star Tommy Kelly (the original Irishman) will play and sing the old Irish songs — the kind that break your heart if you're even close to being Irish — from 4 to 6 p.m. Free munchies and goodies will be served. From 6 until 8:30 the dining room will serve the world's greatest corn beef and cabbage dinner. Then Together takes over to end the evening with dancing. The Coronado Club is where it's happening.

A NEW TRIP to Hawaii is scheduled by the Club for May 12-19. It's seven days on Waikiki Beach in Honolulu with your choice of either of two luxurious hotels. Prices range from \$484 to \$584, and several interesting side trips and options are offered at nominal extra cost. See travel director Charlie Clendenin (2611) at the travel table



Here is a volunteer opportunity for Sandia employees, retirees, and families. If you are interested, call Karen Shane (4-3268).

PRESBYTERIAN HOSPITAL and its satellites have a dynamic volunteer program. They can use volunteers in a wide range of in-hospital services, including admitting escorts, baby photos, book carts, and surgery hostesses. Community outreach programs include health care legislative issues, L.P.N. scholarships, telephone health education, and tours.

in the Club lobby early on Thursday or Friday evenings or stop by the Club office for more information.

You can also sign up for the New Orleans trip at World's Fair time May 25-29 for \$562. The trip includes airfare, four nights at the New Orleans Marriott Hotel, two days admission to the fair, dinner at the Andrew Jackson restaurant, and a riverboat ride.

COMING UP on March 3 is a membership drive. That means a chance for all Sandians and DOEans to stop by the Club, admire the newly redecorated facilities, consume some free refreshments and hors d'oeuvres, enjoy some great entertainment, and maybe win a door prize. More details later.



UNIVERSITY OF CALIFORNIA'S Scientific and Academic Advisory Committee visited Sandia recently to become better informed about relationships and interfaces among the three weapons labs; the committee reports to the U of C president and regents on the quality of scientific and technical work done at the two U of C labs at Los Alamos and Livermore. Here, Gerry Yonas (1200, right) discusses Sandia's Particle Beam Fusion program with several committee members.