

Labs Penetrators on Mars '84 Mission



MARS-man Eric Reece (1327) examines prototype penetrator following test drop in Mars-like soil.

Sandia Laboratories scientists have completed preliminary development and testing of instrumented penetrators which can be landed from orbiting spacecraft for subsurface scientific experiments on Mars. The two-year effort, funded by NASA's Ames Research Center, should result in penetrators on board a geology-oriented mission to Mars in 1984.

Sandia work included the dropping of several penetrators in earth materials—loess (or loam) and sand-covered lava—which resemble those on the Martian surface. The tests were conducted at McCook, Nebraska, and at Amboy Crater in California's Mojave Desert.

The Sandia Mars penetrator program is under the direction of Gus Simmons (5120), who first proposed using terradynamic vehicles as planetary landers. Eric Reece (1327) serves as project leader for development and testing of the penetrators.

The project also sought to determine how effects of penetrator impact will influence data obtained from the Martian experiments and to evaluate the design of critical system components such as the antenna, batteries, and umbilical cables. These complex components must be more reliable than those flown in earth-based penetrating vehicles.

Investigation of the Mars penetrator system drew heavily on high speed earth penetration studies—terrodynamics—which Sandia has conducted for 20 years in

connection with nuclear weapon programs. During these studies, Sandia has dropped or fired thousands of penetrometers into earth materials such as water, ice, sand, mud, permafrost, clay, sandstone, granite, and tuff. Penetration depths of over 200 feet have been reached.

Penetrators have been used to measure thickness of sea ice and ocean sediments and to emplace seismic and acoustic intrusion sensors. The Mars penetrator design is similar to the sea ice measuring system developed by Sandia for the Coast Guard.

In the proposed system for Mars, the penetrators would be ejected from a spacecraft near the apogee of an elliptical orbit. The penetrators, about three-and-a-half inches in diameter and four feet long, would be aerodynamically decelerated—in at least two stages with a final descent by parachute—to impact at about 500 feet per second, penetrating up to 45 feet below the surface.

Instruments within the hollow projectiles would record scientific data, which would be stored and telemetered back to Earth via the orbiting spacecraft. Operating life of the experiment package would be 400 days or more.

The subsurface emplacement of the instrument package would permit various measurements and experiments—heat flow, geochemical analysis, and detection

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LAB NEWS

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JULY 29, 1977

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

Labs' Participation In Savings Bond Campaign Up 10%

Sandia Labs' participation in the U.S. Savings Bond campaign jumped from 77 to 87 percent as a result of the recent drive, according to Randy Maydew (1330), campaign chairman.

Most impressive results were racked up at Livermore Labs where overall participation stands at 95 percent. Organizations 8200 and 8400 are both at 99 percent, the best record at the Labs.

In Albuquerque, Organization 5400 made the greatest gain in participation, increasing by 20 percent. The 5000 group increased by 15 percent.

One hundred eighty-eight divisions and 22 departments at both Labs have 100 percent participation.

Bill Martin (3430) will head the Savings Bond campaign next year.



LET'S HEAR IT FOR SANDIA POWER—When Wayne Gravening's daughter Susie latched onto the LAB NEWS T-shirt emblem and asked for several more, we said "sure" when we learned how they were to be used. Seems that Susie (at far right) and friends (from left) Katie, Stephanie and Debbie are cheerleaders at, appropriately enough, Sandia High. Emblem was best-seller and supply was soon exhausted. Second printing was run but it too is nearly gone. Follow directions carefully and use all-polyester T-shirt for best results (like Stephanie's, second from left).

Afterthoughts

What's all the fuss about?-- The neutron bomb is the center of a controversy that is rather difficult to follow. Opponents denounce a nuclear weapon that does more damage to people than to property. The corollary to this view would seem to be either (a) drop all nuclear weapons programs entirely for humanitarian reasons (which no one has suggested), or (b) alter the neutron bomb so that it becomes a "conventional" nuclear weapon which can raise equal amounts of hell with both people and property.

Many Sandians know that the so-called neutron bomb has been around for nearly two decades, that it evolved out of effort to develop a "clean" weapon which minimized radioactive fallout, and that the military became interested in it as a tactical weapon that minimized damage to property and civilians near targets such as enemy tank formations. A Washington Post article carries this cogent quote on the subject, attributed to a "senior weapons scientist": "Acutally, the enhanced radiation of a neutron bomb is achieved not so much by increasing the output of neutrons as by suppressing everything else. Radiation emitted by the proposed new Lance warhead is not much different in effect or quantity from the standard Lance warhead. But the other effects-- blast, fallout thermal effects, X-rays, and so on-- are all reduced by a factor of more than 10."

The media are sometimes criticized for their instinct for the melodramatic, and we submit that much of the current uproar is attributable to the exercise of that instinct. *js

Blood Services Says 'Thanks'

The Air Force and Blood Services parted company at the Base hospital, and Sandians wishing to donate blood were stymied for a while until Sandia Medical made some space available on Tuesdays, from 8 a.m. to 3 p.m. Turns out that more Sandians—62—donated blood that first Tuesday at Medical than in the past three years and a thank you letter from Blood Services to LAB NEWS states: "It may interest the workforce to know that during this particular week, twelve open-heart surgeries were performed in Albuquerque, each requiring at least eight pints of blood with five on standby." Want to donate? Show up at Medical any Tuesday between 8 and 3.

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J. R. Freeman, M. J. Clauser (both 5241), and S. L. Thompson (5166), "Rayleigh-Taylor Instabilities in Inertial-Confinement Fusion Targets," Vol. 17, Part 2, NUCLEAR FUSION.

M. L. Knotek (5155), "Comment on 'Correlation Effects in Hopping Conductor'," Vol. 35, No. 4, THE PHILOSOPHICAL MAGAZINE.

K. K. Murata (5151), "Directional Phase Instability on a Cubic Compressible Lattice Near a Second-Order Phase Transition with a Three-Component Order Parameter," Vol. 15, No. 9, PHYSICAL REVIEW B.

J. W. Nunziato (5131) and E. K. Walsh (Univ. of Fla.), "On the Influence of Void Compaction and Material Nonuniformity on the Propagation of One-Dimensional Acceleration Waves in Granular Materials," Vol. 64, No. 4, ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS.

R. D. Jones (5741), "Use of Tailored Return-Stroke Current Representations to Simplify Analysis of Lighting Effects on Systems," Vol. 1, No. 2, IEEE TRANSACTIONS ON ELECTROMAGNETIC COMPATIBILITY.

J. S. Pearlman (5214), "Polarization-Dependent Absorption of Laser Radiation Incident on Dense-Plasma Planar Targets," Vol. 38, No. 24, PHYSICAL REVIEW LETTERS.

E. A. Salazar (5811), J. G. Curro and K. T. Gillen (both 5813), "Physical and Chemical Stress Relaxation of a Fluorelastomer," Vol. 21, No. 6, JOURNAL OF POLYMER SCIENCE.

Sympathy

To Warren Arthur (9718) on the death of his mother-in-law in Webster Springs, West Virginia, July 11.

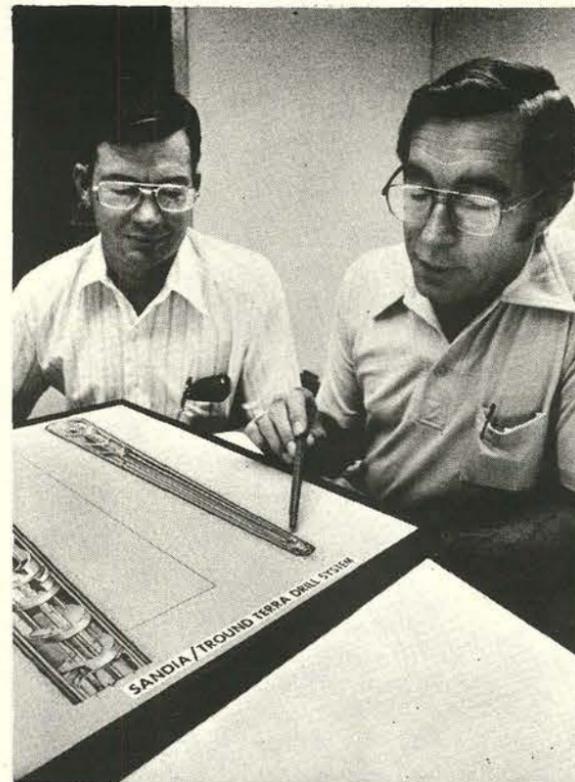
To Brick Dumas (1240) on the death of his father on June 20 in El Dorado, Ark.

To Frances Candelaria (3533) on the death of her mother-in-law on July 12 in Albuquerque.

To Joel Landrum (9500) on the death of his brother-in-law in Arizona, July 4.

To Joyce Coffee (9581) on the death of her mother in Texas, July 2.

To Gary West (9422) on the death of his father on July 19.



TERRA DRILL SYSTEM concept is reviewed by inventors Bob Alvis (5715) and Max Newsom (5735). The rotary bit is fitted to fire bullet-like projectiles to break up hard rock strata.

Sandia Drill Bit Concept Patented

ERDA has received a patent for a terra drill system invented by Max Newsom (5735) and Bob Alvis (5715). The device is basically a conventional rotary drill bit fitted to fire bullet-like projectiles into hard rock strata.

With the projectiles breaking up the rock, drilling rates increase, bit life is extended and costs for deep well drilling are reduced. The 9-metre-long system incorporates a 5000-load magazine for projectiles. Also developed is a ceramic projectile, strong enough to break up rock but which shatters on impact, saving wear and tear on the drill bit.

Sandia has built a test device to demonstrate the concept, using a small drill rig at Edgewood Test Site. Hard rock drilling rates were improved almost 100 percent.

Contract Optician Improves Delivery

New procedures adopted by Sandia's contract optician promise to speed deliveries and improve service. Unexpected high volume of orders for safety glasses resulted in delays in delivery in recent weeks. Orders for glasses during the first four months of 1977 were well ahead of the same period in 1976.

Improvements in procedures include special handling of Sandia orders during production, scheduling fittings to minimize waiting, and extending the optician's schedule to four days per week.

Employees using the service will be asked to complete questionnaires to identify other problem areas.

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Supervisory Appointments

BILLY SANDERS to supervisor of Gas Dynamics Division 8354, effective July 1.

Billy joined Sandia Livermore's Advanced Projects Division in June 1968 after graduating from UC/Davis with a BS in aerospace engineering. In 1969, he received an MS in aeronautical and astronautical sciences from Stanford University under Sandia's One-Year-on-Campus Program and, in 1974, a PhD in ME from UC/Davis under Sandia's Doctoral Study Program.

At Sandia, Billy has done aerodynamic and gas dynamics work associated with Phase 1 and 2 weapons system studies. For the last three years, he has performed research on internal combustion engines while continuing to provide aeroballistics analyses on various weapons projects.

A member of AIAA, Billy has held various offices in the local AIAA Mt. Diablo Chapter. For recreation he enjoys racquet ball and is a sports car enthusiast.

He and his wife Linda have three children, two girls and a boy. They live on Norma Way in Livermore.



DON HARDESTY to supervisor of Coal Combustion Division 8353, effective July 1.

Don joined Sandia Albuquerque in 1972 in the Explosive Physics Division where he studied the properties of homogeneous explosives. Since transferring to Livermore's combustion organization in 1975, he has worked on flame studies and diagnostics for measurements in gas turbine flows, and completed a study relating to rates and mechanisms of combustion of pulverized coal.

He received his BS from the University of Maryland in 1964, a PhD in aerospace and mechanical sciences from Princeton University in 1970, and completed post-doctoral work under the National Science Foundation at Imperial College in London, England. He is a member of the American Chemical Society and the American Physical Society.

Off the job, Don enjoys tennis and camping. He, his wife Carol, and their son and daughter live on Hazel Street in Livermore.



Thanks 8200 —

I would like to thank each member of Org. 8200 for their 100% participation in the recent Savings Bond Drive. I would also like to thank you for your diligence and care in remaining security infraction-free for the last eighteen months.

Sincerely,
Hilton DeSelm

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LIBRARIAN Earle Paxton (8266) explains computerized information retrieval to participants in the Atlanta University summer institute program. At center, Cheryl Goza, a librarian from Fisk University who is working at Sandia under the program.

Tech Library Has Working Visitor

A librarian from Fisk University in Nashville, Tennessee, is currently working in SLL's technical library under a program sponsored by LLL's Office of Equal Opportunity. She is Cheryl Coza, a Fisk University graduate who received her master's degree in library science from the University of Illinois in 1976.

The summer program is an outgrowth of workshops held at Atlanta University this past year. Designed to acquaint librarians

from low-budget and minority colleges with modern on-line information retrieval technology, the workshops gave participants hands-on experience with equipment in use in a modern library.

At Sandia, Cheryl works with reference librarian Earle Paxton (8266). She is becoming acquainted with access methods and the SLL reports data base, and is also receiving training on two on-line SLL systems, ERDA/RECON and the Lockheed DIALOG retrieval system.

Cheryl's work includes doing a literature search and making a comparative analysis of systems. "This will help us evaluate the systems," notes Earle. "For Cheryl, she gains experience with the systems analysis approach to on-line retrieval. If Fisk University computerizes its library systems, Cheryl's new knowledge will be immediately applicable."

Sympathy

To John Anderson (8166) on the death of his father in Raymond, Alberta, Canada, May 28.

To John Daniel (8265) on the death of his father-in-law in Salem, Oregon, June 8.

To Don Knapple (8433) on the death of his father in Livermore, June 13.



SLL WORK/STUDY PROGRAM STUDENTS SELECTED. Three graduating high school students who are working at the Labs this summer will pursue their college education at UC this fall under Sandia's Work/Study Program — (from left) Russell Tilleman, majoring in electrical engineering and computer science; Helen Ordaz, EE; and Alex Sugaoka, physics. Under the program, Sandia furnishes the students' tuition and other costs. A mentor from Sandia provides guidance and career counseling during the four-year program.

Mars Penetrator

Lobo Tennis Club—Tim Russel, coach of the UNM Tennis Team, dropped by the LAB NEWS office to relate details of this new club. Situated just south of Stadium Blvd. on University Blvd., the club plans 19 courts, including six with extensive seating facilities for tournaments, as well as the customary supporting structures. Tim is recruiting charter members for the Lobo Tennis Club under this schedule: couples at \$500 membership fee with monthly dues of \$25; individuals at \$250 membership fee with monthly dues of \$12.50. You can get more details from Tim on 883-4740 or 277-3760.

* * *

Motorcycling—Helmets may no longer be required (except on KAFB and for those under 18), but did you know that state law requires eye protection for cyclists? It says: "Any person operating a motorcycle, motor scooter or motor driven cycle, not having a fixed windshield . . . shall wear an eye protective device which may be a faceshield attached to a safety helmet, goggles or safety glasses."

* * *

The Feds & The Bike—The June issue of *Bicycling* carries a survey of federal agencies that, in one way or another, have something to do with bicycling. The article also identifies the specific people in the agencies who are assigned bike-related responsibilities. We performed a head count and found that no less than 12 separate agencies and 19 people are involved, most of them in the monitoring of funded studies. The studies don't come cheaply:

"Conversion & Reuse of Abandoned Railroad Rights-of-Way"	\$300,000
"Health Effects of Bicycling in a Polluted Atmosphere"	85,000
"Identification & Feasibility of Demand Incentives for Non-Motorized Travel"	200,000
"New Designs of Grate Inlets to Maximize Bicycle Safety and Hydrolytic Efficiency"	250,000
"Pedestrian and Bicycle Considerations in Urban Areas"	70,000

And more. One suspects that many of these studies will conclude: a. it's safer to bike in the daytime than at night; b. in the winter, bikers get cold; c. in a bike/automobile interface, sometimes called a collision, the bike usually comes out second best; and d. mandating sealed beam headlights and turn signals for all bikes, plus protective clothing for the cyclist, will largely do away with most bike problems.

* * *

Running—La Luz approaches, Sunday, August 21. If this is your year to have a go at it, by all means do at least one practice run, if only to become less intimidated by the prospect. The 7½-mile, 4000-foot elevation gain race is as much a mental as a physical challenge. Entry blanks: LAB NEWS, 4-1053.

of subsurface water—which would be difficult, if not impossible, to conduct with surface instrumentation. Seismic measurements would also be greatly improved by subsurface emplacement of seismometers.

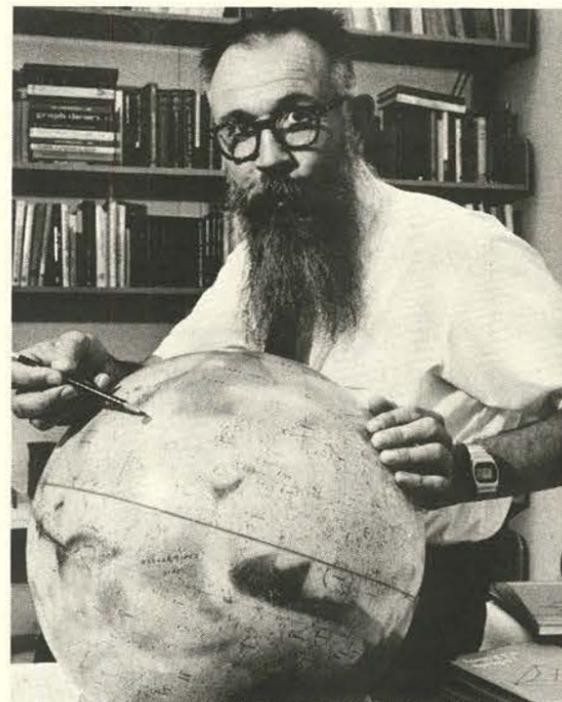
Aside from improving data acquisition, the penetrators have several other advantages. For example, they provide a much softer landing than non-penetrating hard landers, down to 2,000 Gs or less, a loading level for which several scientific instruments such as seismometers have already been successfully tested.

Penetrators are also relatively easy to emplace, being considerably less sensitive to altitude and terrain at point of impact than are retro-rocket-retarded soft landers. Because a soft lander must slow its descent to essentially zero at impact, there must be a precise determination of the vehicle's altitude above the surface during descent, plus an active retro-propulsion system to control the descent rate. A relatively level landing site is also essential.

The Mars system would consist of a penetrator with a detachable afterbody containing an antenna, transmitter, and command receiver. Sheared off by impact forces, the afterbody remains on the surface while the main portion of the vehicle, containing the experimental package, continues to penetrate below the surface. The two parts of the vehicle remain connected by a cable which plays out from the rear during penetration.

Mars penetrators would contain 45 feet of connecting umbilical cable, the maximum distance of fore- and afterbody separation expected if the vehicles penetrate wind-deposited loess—the softest material likely to be encountered on the Martian surface. Lava—the hardest surface expected—would stop the vehicles after they penetrate about 40 inches, just enough to bury them.

Preliminary penetrator design was based on use of a Pioneer spacecraft; however, the penetrators could be carried by most current spacecraft. The Mars mission would involve two orbiters, with one in polar orbit, with three instrumented penetrators in each orbiter. Upon command from Earth, the penetrators would



GUS SIMMONS (5120) points to landing site on Mars of previous Pioneer vehicle. Penetrators can land anywhere on Mars surface, a capability not possessed by other landers.

be ejected from the spacecraft and begin the descent to the Martian surface.

Each penetrator would begin gathering data during impact. As the forebody descends below the surface, an on-board accelerometer would generate a signal proportional to the deceleration. This signal would be stored and later transmitted to Earth to provide a vertical profile of the material through which the penetrator passes. This would give some indication of the physical geology of the impact site.

Other on-board experiments would begin producing data shortly after the penetrator comes to rest. Power for these instruments and for data storage would come from two radioisotope thermoelectric generators (RTGs) located near the front of the penetrator. In addition to providing power for on-board electronics, the RTGs would be used to recharge the batteries which provide power for data transmission.

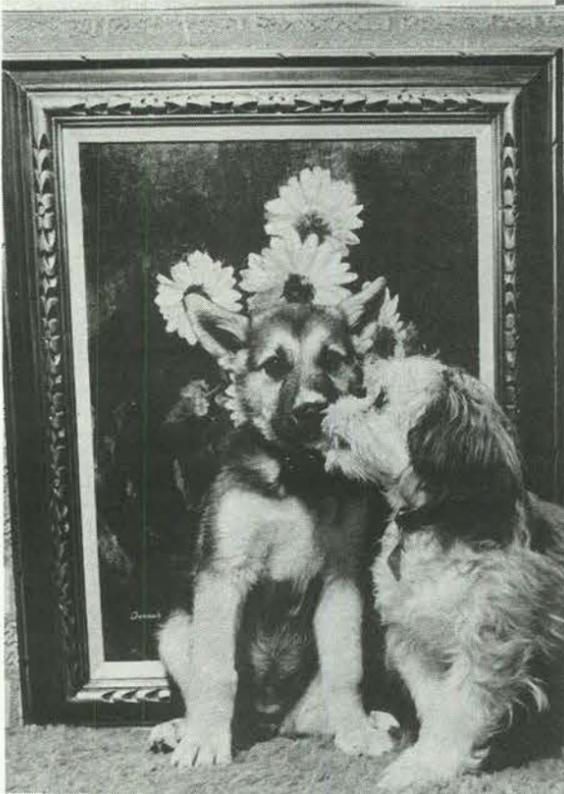
The various on-board experiments, to be designed by NASA scientists at several laboratories throughout the country, have not yet been selected. Seismometers and geochemical experiments, both of which will provide information on the internal structure, composition, and state of the Martian interior, will almost certainly be included. Probable experiments include those for making thermal measurements and for detecting water and, perhaps, the past or present occurrence of life. Several of the experiments would be conducted by opening a small door in the side of the penetrator wall to expose a sample of the surrounding strata to analytical instruments.

Data from the experiments would be stored and periodically telemetered to Earth. Most of the experiments would be concluded during the first week after penetrator emplacement; thereafter, the penetrator part of the mission would be primarily devoted to seismic measurements, with data from these measurements constituting up to 75 percent of the information recorded and transmitted by the system.

Horseshoes—The Labs' Horseshoe Pitchers Assn. holds its annual tournament Saturday morning, Aug. 6, at either the Los Altos Courts or at those of the Coronado Club, depending upon the number of entrants. Active and retired Sandians, as well as ERDAans are eligible. Entry blanks and further info: Leo Bressan, 4-7933.

Sandia Golf Assn.—The recent SGA 2-day tournament played over the Los Altos and Arroyo del Oso courses drew 40 entrants. Bill Gardner (2632) and Charlie Adams (1284) tied for the winning slot with low gross scores of 154. Low net winner was Larry Larsen (2622), scoring 126, while Jim Langenhorst was second with a 128.

* * *



FOR ART & THE DOGS—The shaggy one seems to be suggesting maybe a little puppy love, but he/she is really talking about the annual Benefit Art Show & Sale of the Animal Humane Association, scheduled for Sunday afternoon, Aug. 7, at the Sheraton Old Town Inn. Donated paintings and other objets d'art will be up for sale, as Denny Gallegos (3735) strolls with his guitar and Bob Banks (9000) with his piano (motorized). Funds raised help provide TLC for stray dogs, cats, and assorted fauna.

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Merritt Writes On Amchitka

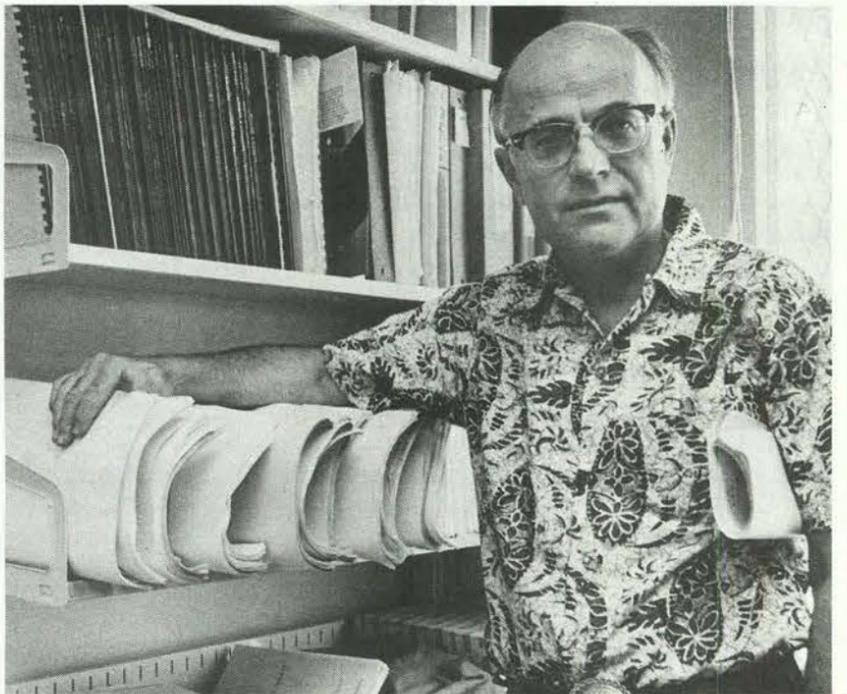
Mel Merritt (1151) has brought into being a new book. That is to say, he has written, compiled, edited, corrected, proofread, and indexed a book called *The Environment of Amchitka Island, Alaska*. It's due off the presses this fall.

Mel and his co-editor, Glen Fuller of the Battelle Columbus Labs, put together an anthology of scientific articles on Amchitka, one of the world's most remote and least habitable regions, the "land that God forgot."

Amchitka, one of the largest of the Aleutian Islands off Alaska, was discovered by the Russians in 1741. No one has lived on the island permanently since 1849, but it was the temporary home for as many as 5000 soldiers during the Aluetian campaign of WWII.

Since then, it was the site of underground nuclear test shots in 1965, 1969, and 1971. The book is based largely on the studies conducted as a part of those tests. The preface says it well:

We who spent intermittent periods of time for six years on Amchitka came to think of the island as a beautiful place in a grand, bleak way. I first went to the island in February 1968. One of the high points of that visit was a journey along the crest of the island on the old jeep trail while the wind swept great sheets of fine snow up the U-shaped valleys from the Bering shore and out in long horizontal fingers over the Pacific. We came to joke about the nearly constant summer fog, wondering if the plane would be able to make it in. Even then there was usually one day a week clear enough that the neighboring island to the north would show the seven peaks for which it was named Semisopchnoi. We recall with pleasure the



AMCHITKA EXPERT Mel Merritt shares his knowledge of the island in a 700-page book to be published this fall. He wrote two chapters, helped edit the rest. He's shown here with galley proofs of several chapters.

occasional clear, warm days in the fall when the crowberry and lichen were soft on the hills, spray twisted around the rocks at the edge of the intertidal bench, and sea otter played with their young in the water beyond.

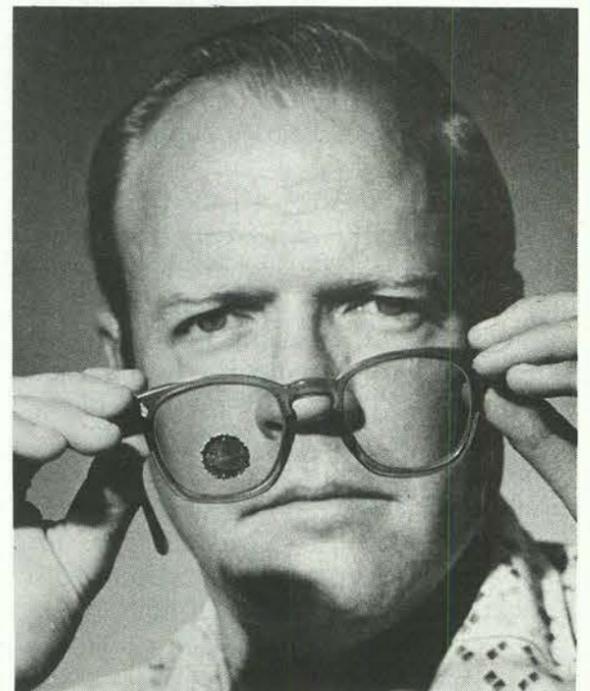
We were there for a purpose, a purpose that was stirring dissent and argument down where we came from and in the great state of Alaska, of which Amchitka is an outlying part. If there must be armaments in this less-than-perfect world, we wanted to know, as well as circumstances allowed, what we were doing in the testing of them, what sort of place we were into, and how we could minimize the effects of our intrusion. Programs in seismology, geology, hydrology, and the various subject matters included in the word biology were carried out to ascertain better what was there, to predict the effects of the nuclear tests to come, to minimize undesirable effects to the extent feasible, and to document what actually did happen.

In the course of this very applied and pragmatic endeavor, a good deal of fundamental, and we hoped new, information was gained about a hitherto little-studied part of the world; it is the purpose of this book to bring together in one place a comprehensive summary of these results in the field of the life sciences.

Mel wrote two of the book's 20 chapters, one on the geographic setting, the other on Amchitka's history. Other chapters deal with topics such as the geology, soils, plants and animals (especially the sea otters), and the ecological consequences of the nuclear tests carried out there.



SANDIANS, 250 of them, were aboard the C-Club Limited last week near Chama, N.M. The railroad is otherwise known as the Cumbres & Toltec RR, the narrow gauge line that plies between Chama and Antonito. This outing proved so popular that another is planned for mid-September.



WISE OWL—Safety glasses saved Bill Hale's (9421) eye recently when he was soldering an electrical connection under the dashboard of his car. He was on his back working on the wires overhead when a large drop of solder fell directly on the lens of his glasses.

Miles and Miles on Motorcycles

Retiree Herschel Waldorf and his wife Maxine have put a lot of miles on motorcycles since he retired in October 1971. (He was a welder and machinist with Field Test organizations for 25 years.) Herschel has driven a BMW with a sidecar to California several times, into Washington State and Canada and, most recently, to Kansas—more than 50,000 miles. In addition, they've made several trips with Maxine driving a Kawasaki 400 and Herschel on a Moto Guzzi pulling a small camp trailer.

"We have more fun than most," Herschel says, "except when it rains."

The Waldorfs are members of the Retreads Motorcycle Club, an international organization whose membership loves motorcycling and whose age is 40 or older. The Club sponsors regional meetings throughout the country. "No formal business meetings," Herschel says, "just fun. We make new friends and keep in touch through newsletters."

Herschel and Maxine are directors of the local Retreads organization and publish "The Roadrunner" newsletter. The most recent issue describes their Kansas trip.

"We first went to Austin to join a Retreads-sponsored tour of the Texas hill country. Had a great time and were coming back to Lubbock to visit our kids when my Moto Guzzi conked out in Stephenville. Some nice folks helped us get off the highway but there was no local repair shop for the machine. We decided that Maxine would stay in a motel while I drove the Kawasaki to Albuquerque and then bring back my pickup to haul the



MOTORCYCLISTS—Retiree Herschel and Maxine Waldorf

Moto Guzzi. It gets complicated because Maxine was due in Kansas for her high school class reunion—something she'd looked forward to for a long time.

"Anyway, I brought the pickup back, picked up the bike, and we drove to Lubbock where Maxine boarded a plane. I then drove to Albuquerque. At 3:30 the next morning I left here on the BMW with sidecar and drive all the way to El Dorado, Kansas—more than 650 miles in a single day. I was beat; don't plan to do that

again. Still, we enjoyed the reunion, visited relatives and had a nice leisurely camping trip home. There are advantages to being retired."

Later, Herschel repaired the Moto Guzzi by replacing a \$1.05 part.

Last weekend, the New Mexico Retreads gathered in Albuquerque and visited the National Atomic Museum on KAFB. If anyone would like information about the organization, call Herschel or Maxine, 836-0642.

Preventive Maintenance: A 9000-Item Business At Sandia

Those of us who use Sandia facilities and equipment take it for granted that they'll perform properly. That they do—most of the time anyway—is no accident. It takes a complex preventive maintenance (PM) program that ensures that several thousand items are serviced on a regular basis. Al Smailer (9710) spearheaded the program's development.

Says Al, "First of all, we called in a team of preventive maintenance experts to meet with our people. We inventoried all the equipment, and we roamed all over buildings and other plant items—up on roofs, down into basements—listing each item and area. Then, with the help of the supervisor involved, we indicated what its maintenance schedule should be and what maintenance action should be performed—lubrication with a certain oil, for example. We set up a number system with an identifying sticker for each item.

"Then, with the aid of George Horne (2634), supervisor of the Data Center at the time, and Neal Gholson, a programmer in the Data Center, we fed into the Univac 1108 all of the items and areas and the maintenance plan for each one."

Now, the computer automatically issues



PROGRAMMER Ruth Dillon (9710)

work orders detailing the work to be done whenever the schedule demands.

"It's a big job," says Al, "and we couldn't do it without a computer. Most items are serviced monthly' quarterly, semi-annually, or annually. But others are seasonal—early spring and midsummer in the case of air conditioners—and are serviced on a non-uniform schedule issued automatically through the computer program."

Altogether, the program includes almost 9000 items and schedules 28,000 individual maintenance actions annually. The computer printouts include, when applicable, the specifications for lubricants, for fire extinguishers, vibration analysis, steam plant equipment, emergency lights, even roof inspections and treatments (and how long since service or last repair). Routine inspections are also included: elevators, towers, stacks, safety showers, mobile cranes, hoists, and the like.

Says Al, "The preventive maintenance program justifies its existence by giving us the best possible chance of having everything working properly. In fact, during the first year after the program's inception, we reduced emergency repair calls by more than half. On top of that, the program saves money—the dollars we'd spend fixing something on an emergency basis as well as the dollars we'd lose in downtime.

"While we rely on the Univac 1108 computer, the credit for a successful PM program really belongs to people—to craftsmen, to supervisors, and to Ruth Dillon (9710), our Maintenance Data Clerk who coordinates the entire PM effort on a day-to-day basis."

Take Note

Attention new hires: a release from New Mexico's Dept. of Motor Vehicles states that "non-residents who are gainfully employed in the state for more than the 90-day period will have to obtain NM registration." The same release states that bona-fide non-residents, e.g. tourists and seasonal visitors, may now drive their vehicles in the state for 180 days before obtaining NM plates.

* * *

And speaking of DMV, there's a new and stimulating procedure under which, when you go to get your driver's license renewed and the man finds through the magic of the computer that you have an outstanding, i.e. unpaid, traffic violation, well you just don't get your license until you've paid your debt to society. The procedure was adopted because of widespread failure to pay fines.

* * *

And for those who travel west from Sandia, that mile-long stretch of Gibson between Carlisle and Yale is finally to be upgraded to a 6-lane highway. Bids on the job were opened on July 22nd and the work is expected to take "200 good weather working days" to complete.

* * *

The Growers' Market has reopened for the season, running from 7 a.m. to noon every Saturday at the Civic Auditorium parking lot. This is the set up in which home gardeners bring their surplus produce out for the public to buy. The stuff is freshly picked and, usually, cheaper than that available in supermarkets.

* * *

Tel-Med has added three new tapes to their library; subjects are bubonic plague, leukemia and cancer of the prostate. Other tapes especially popular during the summer include: animal bites, bee stings, hay fever, snake bite and health hints for



LOOKS NORMAL—But look closely, as Safety's Marshall Tippy is doing. The walls aren't supposed to bow out that way, and note separation at door step. The Dave Tarbox (3400) family was asleep at home when they heard muffled boom and found their RV had experienced LP gas explosion, which virtually totalled the vehicle. Gas leak apparently permitted heavy gas to build up to level of pilot light in refrigerator, then accumulation exploded. Tippy's safety Rx for RV and trailer owners: (1) simplest and safest is to turn off gas at the source—the LP bottle, (2) check all gas joints and connections frequently with soapy water—bubbles betray leak, (3) drill a few holes to outside at low point, e.g. bottom of door, so that gas can drain out. Another measure is gas leak detector, cost about \$40, details available from Fire Prevention's Vern Duke on 4-1958.

campers. Tel-Med is a free phone health information service; sponsored by the Auxiliary to Presbyterian Hospital. Call 843-9660 Monday through Friday from noon to 8 p.m. to listen to any tape.

* * *

Call 247-8841 right now if you are interested in joining a busload of YWCA opera lovers going to Santa Fe tomorrow at 7 p.m. to attend Mozart's "Cosi fan tutte." The bus leaves from the YWCA parking lot, 316 4th SW, and returns after the performance. Cost (from \$18 to \$21.50) includes opera tickets.

* * *

At last, *the Walking Ass'n.*—Alan Swain (1222) has sent us a brochure the subject of which, if one thought about it, is predictable: the Walking Association. When more than three Americans perform some activity, well you gotta have an association. According to the brochure the association ". . . is for those who already walk as an avocation or occupation or for recreation, recuperation, self-preservation, and transportation." Great! LAB NEWS has made modest attempts to persuade Sandians to adopt foot power, and we're delighted to endorse any group with the same aim. If you're interested in this brochure, call us on 4-1053 for a copy.



FUN & GAMES, KAFB—There was a slight delay at the gates one day last week as the military enhanced security, and we learned that the apparent cause was a lightning-induced short circuit in an alarm system. We did some figuring and

calculated that this group of cars represents .003 (more or less) of the number of those who uncomplainingly waited in line.

St. Joseph, the U.S. Supreme Court, and Acoma and Laguna

Acoma Pueblo has the distinction of being, reputedly, the oldest, continuously inhabited village in the United States. It looks much the same today as it did in 1540 when Coronado's soldiers first saw it, perched fortress-like atop the mesa, some 350 feet above the plain. How old is it? No one knows. The Acoma believe that in the mythical long ago their ancestors built the sky city following the destruction of their homes on the nearby Enchanted Mesa (LAB NEWS, Aug. 20, 1976).

Acoma came under Spanish authority in 1598 under the rule of Don Juan de Onate. Its church was built in 1629 when Fray Juan Ramirez became the first permanent missionary. Some historians believe that the San Esteban Rey (Saint Stephen the King) Mission is that original church; others think the original building was destroyed during the Pueblo Revolt in 1680. The present church, circa 1629 or later, was remodeled in 1699 and is one of the finest old missions in the state.

Picture the construction of an adobe building 150 feet long, 40 feet wide, with walls 60 feet high and 10 feet thick. Difficult enough in the 17th century, but even more so when every scrap of material had to be packed on the backs of Indians, climbing a steep trail to the mesa top.

Legends and stories about Acoma and its people abound. One unusual story concerns a painting of Saint Joseph which is said to have been presented to Fray Ramirez by King Charles II of Spain. The missionary brought the painting to Acoma and placed it in his new church.

Through the years, the people came to believe that Saint Joseph had endowed the painting with miraculous powers, which accounted for their many years of prosperity.

Neighbors at Laguna Pueblo, suffering one catastrophe after another, longed for similar treatment from St. Joseph. So they asked to borrow the painting, and the people of Acoma agreed.

Good fortune descended upon Laguna and the months passed. But in the Sky City the people decided that enough was enough! St. Joseph must be returned. Messages to Laguna were ignored, negotiations failed, but finally a council was held and, following a solemn Mass attended by both parties, the people of Acoma jubilantly carried their painting home.

The festive air faded a few days later when the painting turned up missing. Presumably, it had found its way back to Laguna. Father Lopez, the resident priest, prevented a war between the two pueblos when he convinced the people of Acoma to let the U.S. District Court in Santa Fe decide the issue. The court decided in favor of Acoma, but Laguna appealed to the Supreme Court. Five years later, in 1857, the final decision again went to Acoma.

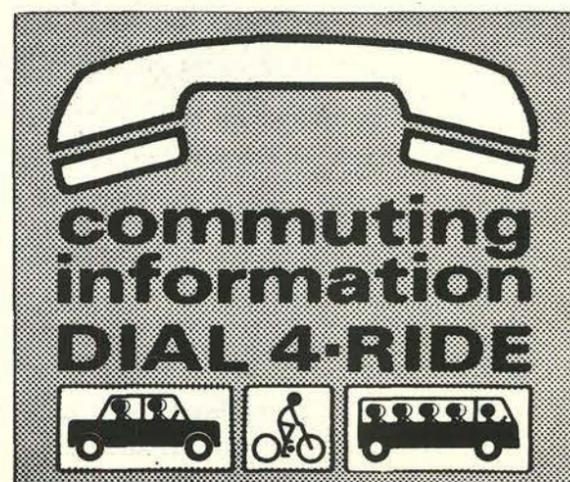
The painting had been lost to Acoma for many years and its return would be a ceremonial event. The appointed committee to retrieve the painting had traveled



THE SKY CITY CHURCH—San Esteban Rey Mission—is a 17th Century building marvel. Men and women of Acoma, trudging up and down a steep trail with packs on their backs, provided the building materials. The 40-foot-long roof beams were cut in the Cebolleta Mountains some 30 miles away.

about half the distance to Laguna when they discovered their beloved picture in the shade of a tree. They knew then that St. Joseph knew of the decision and was returning to Acoma. Becoming tired, he stopped to rest, knowing that his people would soon be joining him.

The painting of St. Joseph still hangs in San Esteban Rey Mission, though he must still have high regard for the people of Laguna—their uranium-rich lands have brought considerable prosperity to the Pueblo. •nt



feed back

To get a response to your comments and questions about Sandia Labs, complete a Feedback form [available near bulletin boards] and return it to the Feedback administrator. The substance of questions and responses of wide interest is published in LAB NEWS.

Q. A suggestion: Spectacular tests such as the nuclear fuel cask on a truck or the one involving a locomotive should be scheduled on Saturday to permit employees to see the tests.

A. Your suggestion would likely have wide appeal at the Labs, but conducting the tests on Saturdays would compromise some of the important objectives of the tests.

The primary purpose of these tests is to demonstrate the validity of analysis and scale model testing in predicting damage to transportation systems involved in real accident environments. Thus the transportation industry is particularly interested, and we invite those with specific professional involvement to observe the tests. The news media are invited to observe and report on the tests for the benefit of the general public. Most of those attending the tests for professional or media reasons travel from points throughout the U.S. Conducting the tests on a Saturday greatly inconveniences them.

Equally important, the program is on a very tight budget, and weekend testing with its attendant overtime significantly increases the costs. Generally, Sandians who have observed the tests are those involved in transportation related programs. Movies, from different angles and at different frame rates showing more than anyone can see at the test, can be scheduled to be shown to interested Sandia employees.

A. W. Snyder - 5400

Q. I suggest we return to the standard format calendar such as the "Personal Planner" that has been used in previous years. This year's calendar format [starts with Monday] is too confusing.

A. Your comments regarding the 1977 Planning Book are appropriate and well taken. The new style of planning book was selected because it meant a considerable cost savings; however, because of the problem you listed plus other legitimate complaints we have received during the past several months, we have already made the decision to return to the original format. The Planners have been ordered and will be in General Stores in time for the coming year's needs.

C. R. Barncord - 3200

Q. Bldg. 894 is so cold in the mornings that it is uncomfortable. This seems to be energy wasted. Also, I've noted temperatures in 805, 806, 807, 802 seem to be excessively low.

A. The cold conditions you are experiencing are not due to excessive air conditioning. The supply fans in Bldg.

894, 802, 806 and most of them in 807 are shut down during non-operational hours. Building 805 must operate because of the hazards in the laboratories of this building. Temperatures in these four buildings drift lower at night and rise in the daytime as people and lights add internal heat gain. Spring and fall are the most difficult seasons to regulate because of the extreme night and day temperature difference. Heat is needed in the morning and cooling in the afternoon. We were varying the turn off and turn on times and temperatures trying to determine the proper settings at the time you originated your inquiry.

R. E. Hopper - 9700

Q. I'm disturbed to find that the Bond-A-Matic payroll deduction plan is available only if we first drop the regular bond-a-month plan. I can see nothing which is incompatible between the two plans.

A. Bond-A-Matic, first introduced nationally in 1976, was discussed with Employee Accounting 3252 and Personnel Management Systems Development 2626 in early April (when the Savings Bond Committee was appointed) to incorporate it into the 1977 Drive. We also discussed a third option, "Regular with Bond-A-Matic" (as you suggest in Feedback) for the 1977 Bond Drive. However, the time scales and programming workload in Division 2626 precluded this option in 1977. However, we plan to offer it next year.

"Regular with Bond-A-Matic" can be implemented by each employee this year by submitting a revised payroll deduction card after FICA deductions are completed followed by another revised payroll deduction card in December 1977.

R. C. Maydew (1330), Chairman
1977 Sandia Bond Drive

Q. I have four separate pieces of Sandia identification:

1. Tech Area Badge.
2. Continuing Handcarry Authorization.
3. Service Gate Pass.
4. Employee Identification Card.

I can see the need for a separate ID card but why can't the handcarry authorization and the service gate pass be combined with either the tech area badge or the ID card? The tech area badge would seem to be the more likely choice. This would save time, money and materials.

A. The tech area badge is designed solely for personal identification which is necessary before an employee is authorized to enter a security area. The Identification Card was devised to discourage the use of the tech area badge for reasons of personal identification *other* than that required to

enter a security area, e.g., cashing checks, opening charge accounts, etc.

We appreciate the suggestion to combine the handcarry authorization card with the service gate passes and the ID card and will examine ways that our Security and Property Management procedures can be streamlined. The new badge system, scheduled reissue for early 1978, may provide us with techniques of data storage and retrieval on a laminated card which might make it practical to consolidate a number of current credentials into a single card.

D. S. Tarbox - 3400

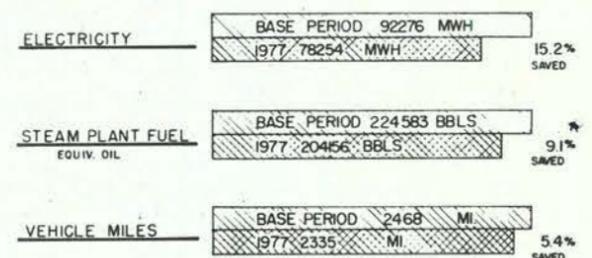
Q. In order to save energy why don't we discontinue use of the many electric fans now in use?

A. We have always discouraged the use of fans and have tried to limit their use to areas with little or no air conditioning such as shops and warehouses. We have had many requests for fans since the initiation of our energy conservation program resulting in higher building temperatures during the summer season. These requests have been turned down. Since the number of fans does not appear to be excessive, we do not believe it is necessary to take further action at the present time.

R. E. Hopper - 9700

ENERGY SAVINGS

COMPARED WITH USAGE IN BASE PERIOD - JULY 1972 THRU JUNE 1973
CURRENT REPORTING PERIOD ENDING JUN '77



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LAB NEWS
JULY 29, 1977



Death

Donnie Miller of Materials Analysis Division I 5821 died July 19 after a long illness. She was 32.

She had worked at the Labs since August 1971.

She is survived by her husband.

Speakers

J. W. Nunziato (5131) and E. K. Walsh (U. of Fla.), "On One-Dimensional Acceleration Waves in Granular Materials"; H. J. Sutherland and A. M. Bedford (both 5167), "Reflection Coefficient for a Laminar Plate Composite"; B. M. Bulmer (1333), "Base Drag Correlation for Axisymmetric Bodies in Low-Speed Flows" and "Heat Transfer Measurements in a Separated Laminar Base Flow"; D. W. Lobitz (5431), "Non-linear Analysis of Forced Vibrations of Irregular Plates," Canadian Congress of Applied Mechanics, May 31 - June 4, University of British Columbia, Vancouver, B.C., Canada.

R. A. Langley (5111), invited paper, "Coatings for Impurity Control in Fusion Reactors"; R. R. Rye (5114), invited paper, "Reaction of Thermal Atomic Hydrogen with Carbonaceous Material"; A. C. Switendick (5151), invited paper, "Electronic Structure of Transition Metal Hydrides"; R. K. Quinn (2516), "Electrochemical and Surface Analysis Characterization of Titanium Hydride Electrodes"; S. J. Niemczyk (5151), "H₂O Xa Auger Energies"; S. G. Bear and P. J. Hommert (both 5732), "Descriptions of Reverse Combustion Linkage and Forward Gasification During Underground Coal Gasification," joint meeting of the American Chemical Society and the Canadian Institute for Chemistry, May 29 - June 2, Montreal, Canada.

A. Owyong and E. D. Jones (both 5214), "Coherent Detection of Raman Modes by CW Stimulated Raman Gain Spectroscopy" and "Simultaneous Active and Passive Q-Switching of a Nd:YAG Single Mode Oscillator"; R. P. Sandoval (5214), "Time-Sequenced Energy Extraction on the High-Gain Xe Laser"; M. A. Palmer (5214), "Use of an Electro-Optical Streak Camera System at Iodine Laser Wavelength"; P. J. Hargis and J. P. Hohimer (both 2541), "Sub-picogram Detection of Aqueous Atomic Species by Fluorescence Spectroscopy with Dye Laser Excitation"; G. A. Fisk (5215), "Requirements for Optimum Chemical Recoverability in Photolytically Pumped Atomic Iodine Lasers"; J. B. Moreno (1261), "Theoretical Study of Parasitic Oscillations in High-Gain Laser Oscillators and Amplifiers"; T. D. Padrick (5215), R. E. Palmer (5216), M. A. Palmer (5214) and M. E. Riley (5211), "Performance Characteristics of the Sandia Atomic Iodine Laser (SAIL-1)," Conference on Laser Engineering and Applications, June 1-3, Washington, D.C.

E. P. EerNisse (5133), "The Force-Frequency Effect in Doubly Rotated Quartz Resonators," 1977 Frequency Control Symposium, June 1-3, Atlantic City, N.J.

F. J. Zanner (5833), "High Strength Maraging Steel Development Program, Part I—Melting, Solidification and Fabrication"; J. W. Munford (5832), "Stress Corrosion Cracking of HP 9-4-20 Steel: Status Report"; J. L. Jellison (5833), "Pulsed Laser Welding of Molybdenum"; T. V. Nordstrom (5832), "Stress Relaxation and Microdeformation of Electrical Spring Contact Alloys"; H. Rack (5832), "Thermomechanical Processing of 6061 Aluminum"; K. H. Eckelmeyer (5832), "The Effect of Alloying on the Shape Memory Phenomenon in Nitinol," JOWOG 22 meeting, May 17-19, SLA.

H. C. Monteith (5411), "UFO's and Their Mission to Earth," May 6, Downtown Optimist Club.

R. M. Jefferson (5430), "Our Powerless Society," May 6, N.M. Radiologists Society Annual Meeting; "Electricity and the Energy Crisis," May 19, Northwest Optimist Club.

J. A. Kenagy (9580), "Metrics," May 10, Emerson Elementary School Parent-Faculty Club and May 17, Printing Craftsmen, Albuquerque Chapter.

J. H. Scott (5700), "Sandia's Energy Programs," May 11, Associated General Contractors.

L. P. Robertson (1756), "Brasil—A Sleeping Giant," May 12, Los Altos Kiwanis Club.

G. E. Tucker (3313), "Radiation Detection Fundamentals," May 12, Sandia High School advanced chemistry class.

G. H. Miller (5216), "Science History—Fact and Fancy," May 17, Sandia High School advanced chemistry class.

A. J. Clark (9330), "New Techniques for Simulating Environmental Test Conditions," May 18, Belen Rotary Club.

O. L. Wright (retired), "History of Sandia Base," May 19, Northwest Optimist Club.

G. C. McDonald (9636), "Why Wilderness?" May 25, Belen Rotary Club.

T. F. Marker (6010), "The Oil Industry: Fact and Fiction," May 26, Los Altos Kiwanis Club.

A. M. Fine (1758), "Physical Attributes of Potential Adversaries to U.S. Nuclear Programs," 2nd Annual Symposium on Role of Behavioral Sciences in Physical Security, March 23-24, Gaithersburg, Md.

R. M. Jefferson (5430), "Electricity and the Energy Crisis," Farmer's Electric Cooperative, Inc., May 21, Clovis, N.M.

R. A. Assink (5811), "The Study of Domain Structure in Polyurethanes by NMR," Physical Chemistry Seminar, Univ. of Ill., Feb. 28, Urbana, and Materials Science



Connie Gonzales (3141)

Virginia Hamblett (3141)



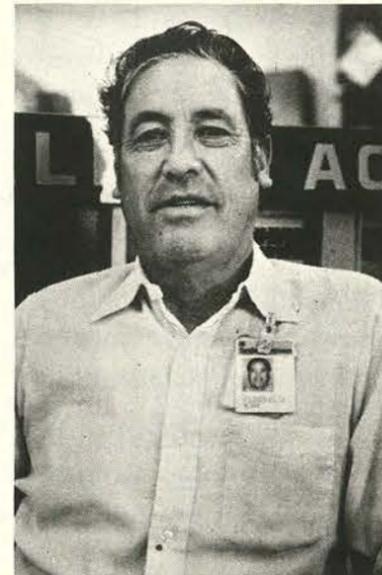
Dan Fenstermacher (2541)



Ruth Adams (4325)



Frances Hale (9636)



Florencio Mora (9562)

Seminar, Princeton Univ., Feb. 24, Princeton, N.J.

P. M. Richards (5132), "Hopping Conductivity and Diffusion in One-Dimensional Superionic Conductors," invited seminars at University of Calif. at Santa Barbara, April 20, and Xerox Research Center, April 22, Palo Alto, Calif.

E. A. Aronson (2642), "Simulation of a Solar/Wind Energy System," ACM spring meeting, May 20, LASL.

V. E. Blake (1710) and F. O. Luetters (1716), "SNM Transportation System Goals," American Nuclear Society Symposium, June, Florida.

C. J. Leedecke (5845), "Viscous Flow in Binary Borate Melts," University Series on Glass Science, Boron Conference, Alfred University, June 5-8, Alfred, N.Y.

M. E. Riley (5211), "Semiclassical Exchange Approximation for Inelastic Electron Scattering," 11th Great Lakes Regional Meeting, ACS, June 6-8, Stevens Point, Wis.

E. C. Boes (5719), "Hourly Direct-Normal Solar Radiation Data Tapes for the United States," ISES 1977 Annual Meeting, June 6-10, Orlando, Fla.

J. F. Ney (1754), "Nuclear Safeguards," Energy in Perspective: An Orientation Conference for Educators, June 7-11, Tempe, Ariz.

G. B. Krefft (5112), "Material Design and Defect Studies in Insulators by Ion Implantation," invited paper, Corning Glass Works, June 10, Corning, N.Y.

J. S. Philbin (5424) and S. A. Dupree (5231), "Subcriticality Design Considerations for LMFBR Spent-Fuel Shipping Casks"; D. A. Powers (5831), "Large-Scale Melt/Concrete Interactions Tests," and "Empirical Models for the Thermal Decomposition of Concrete"; G. A. Carlson (5432) and H. G. Plein (5422), "Material Compatibility Studies for PAHR In-Core Molten Pool Experiments"; A. J. Toepfer (5242), "Electron Beam Technology and Electron-Beam Target Experimental Results"; R. B. Pole, G. C. Allen and J. M. Freedman (all 5431), "LMFBR Spent Fuel Transportation Technology Development"; D. M. Talbert and D. R. Anderson (both 5444), "U.S. Seabed High-Level Radioactive Waste Disposal Feasibility Study"; R. W. Ostensen (5425), "The Role of Fission-Gas in Development of the Transition Phase"; J. W. Hickman (5412), "Response of Concrete to High Heat Fluxes"; R. W. Conn and K. Okula (both Univ. of Wis.) and A. W. Johnson (5216), "Minimizing Long Term Radioactivity in Fusion Reactors by Isotopic Tailoring"; R. L. Knight and D. A. Dahlgren (both 5411), "A Computer Model of Heat and Mass Transfer in Concrete"; J. A. Brammer (1136), "Mobile Helium Cooling Loop System for In-Reactor PAHR Experiments"; W. A. Von Reisemann (5431), "Nuclear Regulatory Commission Structural Technology Programs for Shipping Containers"; L. S. Nelson (5443) and L. D.

Buxton (5412), "The Thermal Interaction of Molten LWR Core Materials with Water," American Nuclear annual meeting, June 12-17, New York, N.Y.

K. H. Haskell (2642) and R. R. Hanson (5122), "An Algorithm for Linear Least Squares with Equality and Non-negativity Constraints"; D. L. Hicks (5162), "Stability of the Artificial Viscosity Method of von Nuemann & Richtmyer for Rate, Dependent Material Relations"; F. R. Norwood (5166), "Mathematical Modeling for the Spark Drill Problem in an Acoustic-Elastic System"; L. A. Bertram and L. Romero (both 2642), "A Non-Sturmian Eigenvalue Problem II," SIAM 1977 National Meeting, June 13-15, Philadelphia, Pa.

W. B. Gauster (5111), "u⁺SR Diffusion Studies at LAMPF," IV International Conference on Hyperfine Interactions, June 13-17, Madison, N.J.

D. B. Longcope (1281) and D. E. Grady (5163), "Early-Time Response of A Rock Penetrator," ASME 1977 Summer Applied Mech./Bioengineering/Fluids Engineering Conference, June 15-17, Yale University, New Haven, Conn.

J. G. Fossum (2144), E. L. Burgess (5719) and F. A. Lindholm (U. of Fla.), "The Performance of Silicon Solar Cells in Concentrated Sunlight," Photovoltaic Concentrator Systems Workshop, May 24-26, Scottsdale, Ariz.

J. C. Fossum (2144), "The Physical Behavior of Silicon Solar Cells in Concentrated Sunlight," EE Seminar, Univ. of California, Berkeley, June 6.

A. W. Snyder (5400), "Alternatives for the Management of Waste and Spent Fuel from Nuclear-Electric Power Generation," Texas Atomic Energy Research Foundation, June 6, Dallas.

G. J. Simmons (5120), "Surface Penetrators: A New Type of Planetary Probe," Sandia Weapons Colloquium, June 8, SLA.

L. S. Nelson (5443) and L. D. Buxton (5412), "Steam Explosion Studies with Molten Reactor Core Materials," Aluminum Association meeting, June 16-17, New York City and Pittsburgh.

D. Emin (5151), invited presentation, "Itinerant versus Small Polaron Hopping Motion in Solids," 1977 Gordon Conference on Physics and Chemistry of Solids, June 19-24, Plymouth, N.H.

G. L. Kellogg (5114), "Electronic Properties of Single 5-d Transition Metal Atoms Adsorbed on Metal Surfaces," Physical Electronics Conference, June 20-22, Stanford, Calif.

D. P. Peterson (9624), "Computer/Interactive Clean-up of Non-Gridded PWB's After Automatic Routing,"

[Continued on Next Page]

Speakers

14th Design Automation Conference, June 20-22, New Orleans, La.

P. E. McGrath (5413), "An Overview of the Reactor Safety Study Consequence Model," International Conference on Nuclear Systems Reliability Engineering and Risk Assessment, June 20-24, Gatlinburg, Tenn.

T. D. Padrick (5215), R. E. Palmer (5216), M. A. Palmer (5214) and M. E. Riley (5211), "High Power Atomic Iodine Laser Characteristics," presented by Padrick at 4th Colloquium on Electronic Transition Lasers, June 20-24, Munich, Germany.

A. C. Schwarz (2513), "A New Technique for Determining the Shock Initiation Sensitivity of Explosives," Conference on the Standardization of Safety and Performance Tests for Energetic Materials, June 21-23, Picatinny Arsenal, Dover, N.J.

M. Friedman (Texas A&M) and M. Newsom (5735), "Mechanism of Chip Formation in Spark Drilling of Unconfined Rocks," to be presented by Friedman; M. E. Kipp (5162) and E. G. Young (5163), "Calculations of Damage Accumulation Generated by a Column of Explosive in a Borehole"; R. R. Boade (5734) and R. P. Reed (1116), "Stress Waves Measured and Calculated for In Situ Explosive Rubblization Experiments in Oil Shale"; J. Lipkin (5162), D. E. Grady (5163) and J. D. Campbell (Oxford Univ.), "Dynamic Flow and Fracture of Rock in Pure Shear"; R. A. Schmidt (5163), "Fracture Mechanics of Oil Shale—Unconfined Fracture Toughness, Stress Corrosion Crack, and Tension Test Results," U.S. Symposium on Rock Mechanics, June 21-24, Keystone, Colo.

A. H. Treadway (2642), "Comparison of Numerical Methods for the Solution of the Transport Equations of Multicomponent Radionuclide Ion Migration in an Adsorbing Media," Second International Symposium on Computer Methods for Partial Differential Equations, June 22-24, Lehigh Univ., Bethlehem, Pa.

R. B. Pettit (5842), invited presentation, "Optical Testing Equipment for Solar Materials," Workshop on Optical Fabrication and Testing, June 23-24, Danbury, Conn.

R. R. Eaton and R. L. Fox (both 1261), "Computation Methods for Flows Involving Trace Elements and Disparate Masses," AIAA Third Computational Fluid Dynamics Conference, June 27-28, Albuquerque.

R. A. Kiehl and E. P. EerNisse (both 5133), "Device Physics of Optically Controlled TRAPATT Oscillations," 35th Annual Device Research Conference, June 27-29, Cornell Univ., Ithaca, N.Y.

D. Emin (5151), invited presentation, "The Hall Effect in Amorphous Semiconductors," and "Small-Polaron Model of the Low Temperature Optically-Induced Properties of Chalcogenide Glasses"; M. L. Knotek (5155), "Magnetoresistance of Impurity Conduction in Transmutation-Doped Ge to 110 kOe," Seventh International Conference on Amorphous and Liquid Semiconductors, June 2 - July 1, Edinburgh, Scotland.

S. T. Picraux (5111), "Statistical Equilibrium Spatial Density in Planar Channeling," "Low Concentration Oxygen Profiling and Interface Detection," and "Channeling Analysis of Stacking-Defects in Epitaxial Si Layers"; R. A. Langley and D. K. Brice (both 5111), "Energy Straggling of Protons in Materials"; Brice and Langley, "Analysis of Straggling Measurements by the Backscattering Technique"; J. A. Borders (5111) and J. M. Harris (2353), "Carbon and Oxygen Profiles in Solids Using the $^{12}\text{C}(\text{d,p})^{13}\text{C}$ and $^{16}\text{O}(\text{d,p})^{17}\text{O}$ Reactions"; R. S. Blewer (2353), "Using the Proton Backscattering Method of Light Element Profiling to Achieve Tailored Low Z Impurity Distributions in Solids"; R. S. Blewer, et al., "Profiling Hydrogen in Materials Using Ion Beams"; R. A. Langley, "Interaction of Low Energy He with Beryllium," Third International Conference on Ion Beam Analysis, June 27 - July 1, Washington, D.C.

D. A. Powers (5831), "Interactions Between Molten Nuclear Reactor Core Materials and Structural Concrete," International Colloquium on Refractory Oxides for High-Temperature Energy Sources—Symposium on Chemical Reactivity at High Temperatures, International Union of Pure and Applied Chemistry and the Centre National de la Recherche Scientifique, June 28 - July 1, Odeillo-Gont Romen, France.

J. A. Panitz (5114), "Near-Surface Depth Profiling with Angstrom Resolution," Joint Japanese-American symposium on the Applications of the Field-Ion Microscope to Material Science," June 1977, Cornell Univ., Ithaca, N.Y.

E. P. EerNisse (5133), "A Comparison of Gamma-Induced Degradation and Forward Bias-Induced Degradation in GaP:Zn,O LEDs," and "Stress in Ion-Implanted CVD Si_3N_4 Films," Electronics Materials Conference, June 29 - July 1, Cornell Univ., Ithaca, N.Y.

E. D. Niper (1327), "Project SEASWAB: Real-Time Acquisition-Reduction of Submarine Sediment Data," Ninth annual Offshore Technology Conference, May 2-5, Houston.

Supervisory Appointments

Recent promotions announced by Security Standards and Operations Department 3430, include:

ARCHIE ARCHULETA, Shift One Lieutenant, 3432; CARL KING, Administrative and Training Lieutenant, 3432; and BILL RADER, Shift Three Lieutenant, 3431.

Archie and Carl both came to the Labs in October 1950. They have worked the entire time in the Security organization. Both men served in the military during WWII—Archie in the Army and Carl in the Army Air Force.

Before coming to Sandia, Archie attended watchmakers school; he pursues this interest off the job making clocks. Archie, his wife Virginia, and two children live at 5520 Rosemont NE.

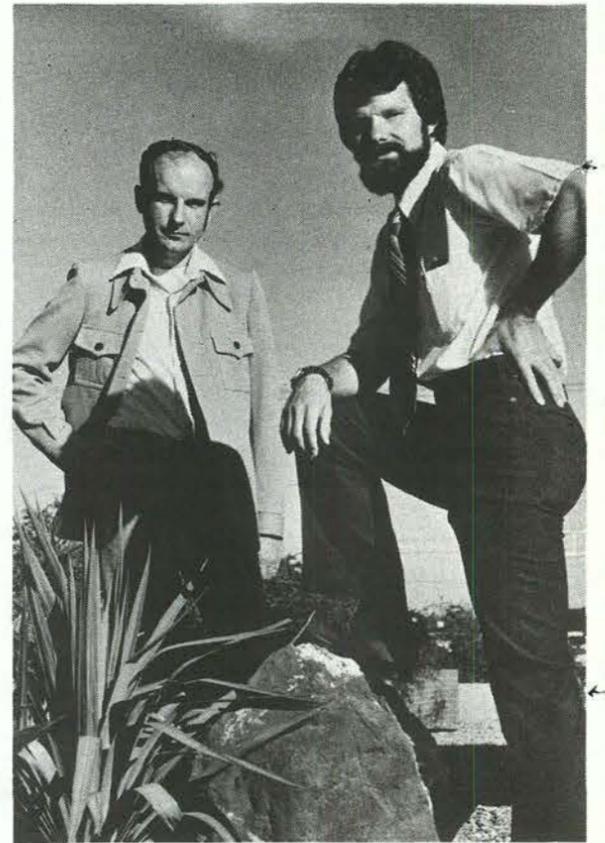
Carl attended UNM before coming to Sandia. His favorite leisure-time activities are hunting and fishing. Carl and his wife Norma live at 3108 Constitution NE.

Bill joined the Labs in February 1974 following his retirement from the Air Force. He was in the Air Force for 22 years and was primarily concerned with explosive ordnance disposal. Bill's interests include baseball, jogging and backpacking. He and his wife Patricia have six children and live at 1100 Florida SE.

WENDLAND BEEZHOLD to supervisor of Beam Source Application Division 5232, effective July 16.

Wendland joined Sandia in January 1970 as a staff member in Radiation and Surface Physics Research Department 5110. From 1964, when he received his MS in physics, until 1969, when he got his PhD, he taught physics at Seattle University and was employed by the radiation effects laboratory at Boeing Company. His degrees are from the University of Washington.

In 1975 Wendland was on leave of absence from Sandia serving as director of Montana State University's magnetohydrodynamics (MHD) program. He returned to Sandia in April and will now supervise the



Paul Lemke (2641) and Wendland Beezhold (5232)

division responsible for Sandia's weapons effects simulation work using electron, x-ray, and neutron sources. The division is also concerned with development of improved or new radiation simulation sources.

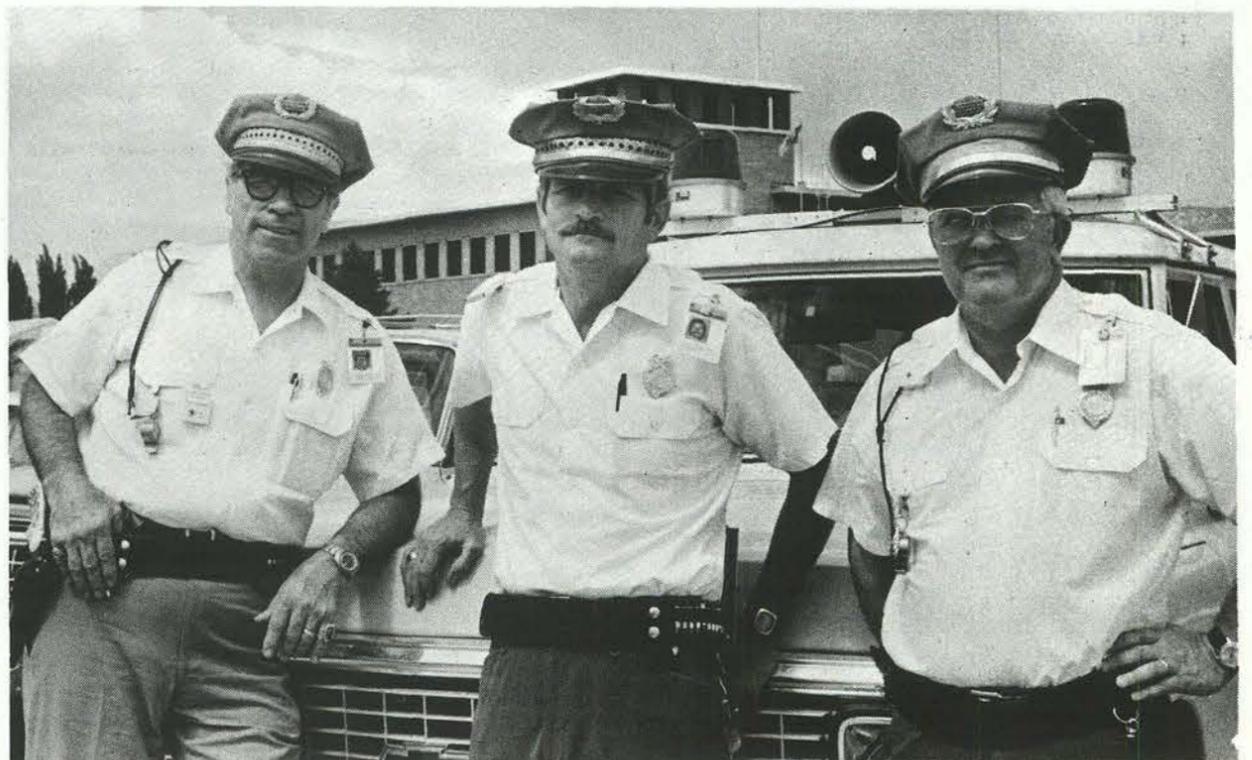
Wendland is an enthusiast of a wide variety of sports. He, his wife Jeanne, and their two children live in northeast Albuquerque.

PAUL LEMKE to supervisor of Scientific System Software Division 2641, effective July 16.

Paul has worked in the computer software group since he joined Sandia in April 1967. In the nine years preceding, he used computers in the design of machine tools at a General Motors facility in Saginaw. He also took courses leading to his 1965 masters in EE from the University of Michigan.

Paul is a member of the Association for Computing Machinery. His spare time involves machinery too—wood-metal working tools and fishing rods.

Paul, Betty Jean, and their two sons live in northeast Albuquerque.

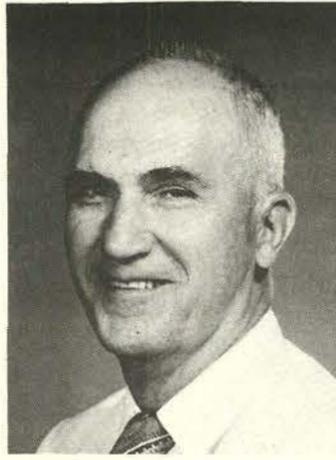


THE NEW LIEUTENANTS: Archie Archuleta, Bill Rader & Carl King

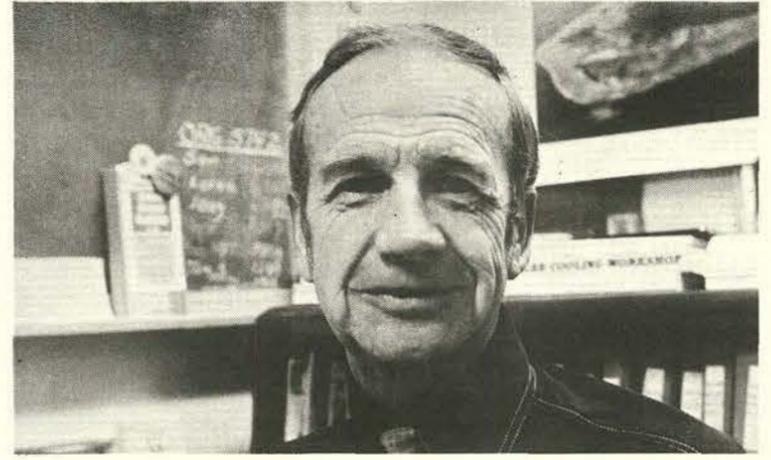
MILEPOSTS

LAB NEWS

JULY 1977



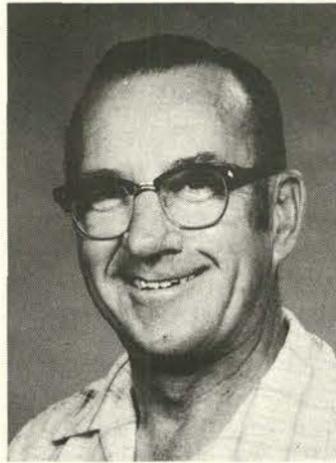
Frank Koletar - 2553 20



Walt Adams - 5742 25



Abel Anaya - 3172 10



Joff Myers - 3424 25



H. E. Hansen - 1756 25



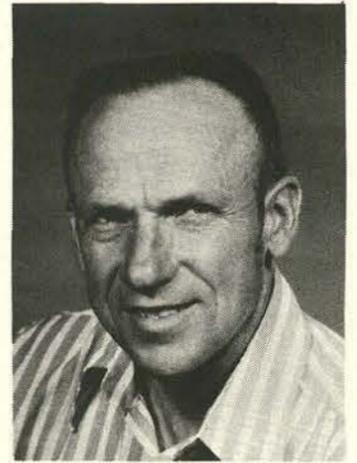
Charlie Winter - 4010 25



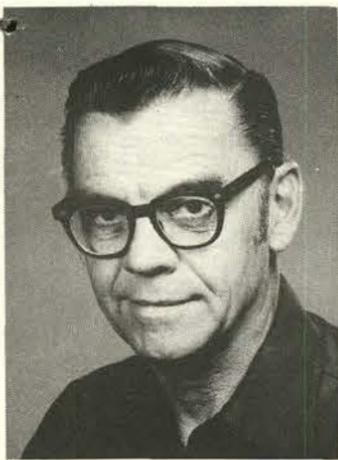
Carlin Newcom - 1715 10



David Harstad - 2534 10



Charles Gebert - 2314 20



Al Hurford - 1737 25



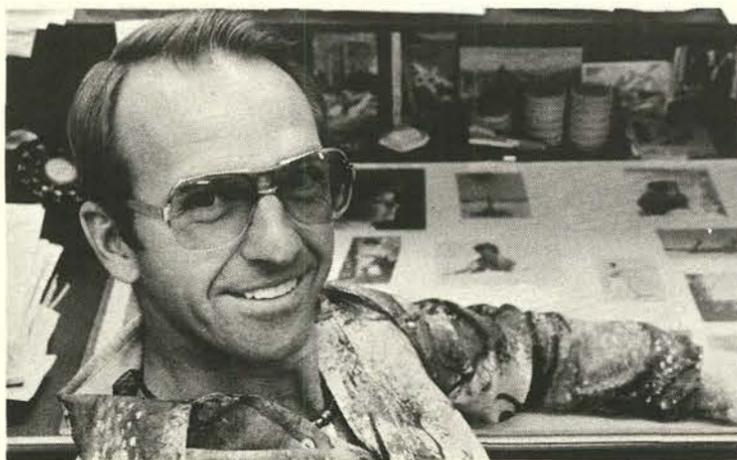
E. E. Alexanderson - 1323 20



Richard Beckmann - 1322 10



Virginia Chapman - 4338 10



Dave Bushmire - 2152 20



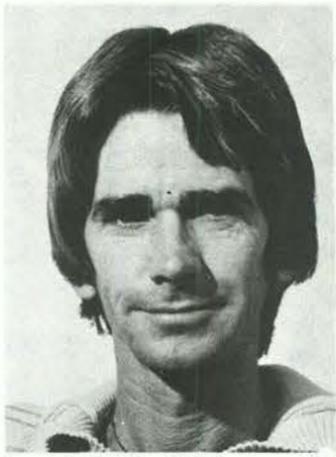
Norm Elliott - 2551 25



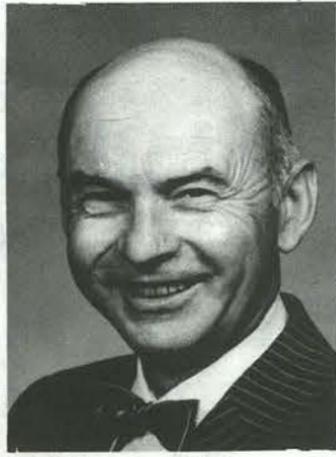
Miller Cravens - 1750 20



Bill Roherty - 1311 25



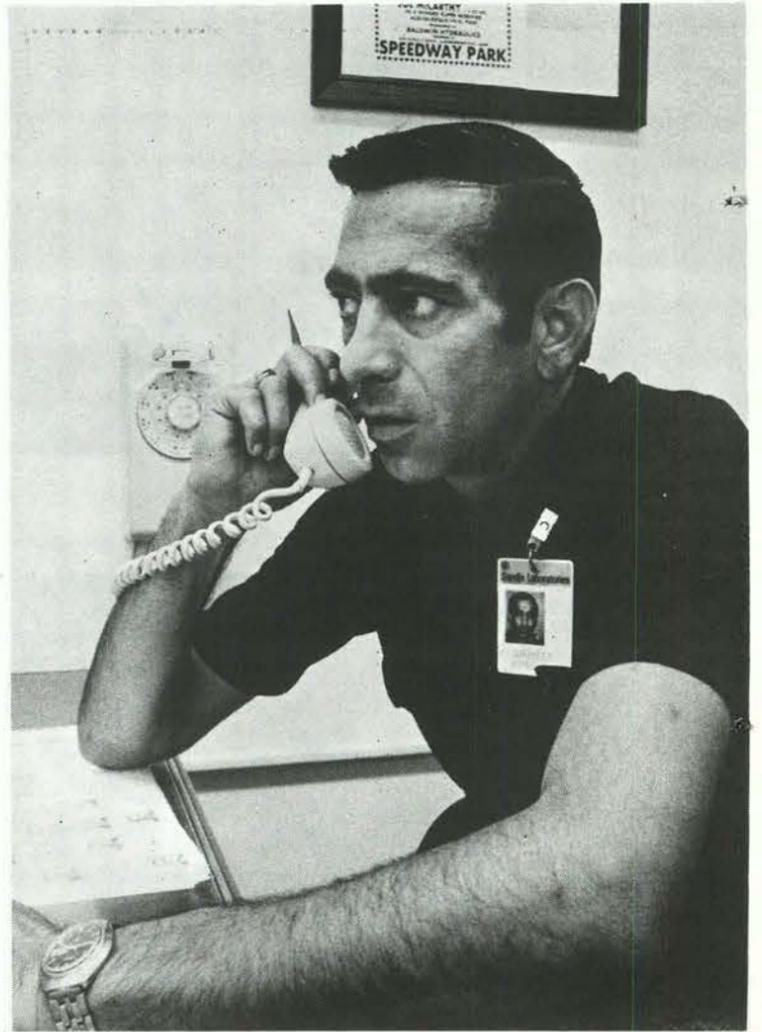
Joseph Smith - 5832 10



Bob Sylvester - 9573 25



James Opalka - 1115 10



Shawkeet Hindi - 3172 20



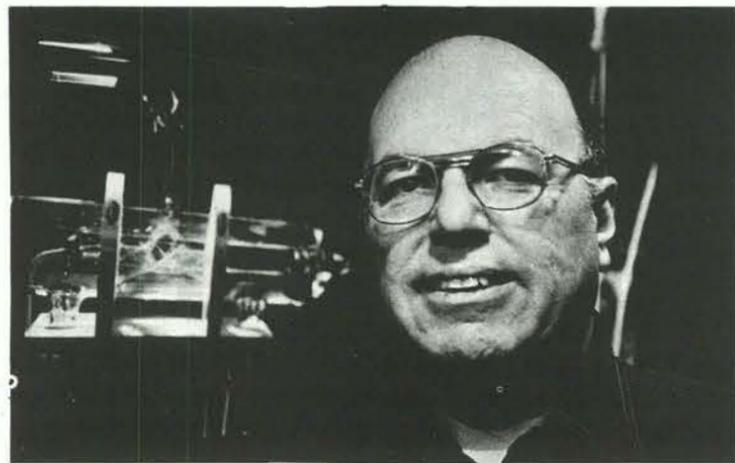
Tom Oglesby - 1213 15



Bob Roginski - 1233 10



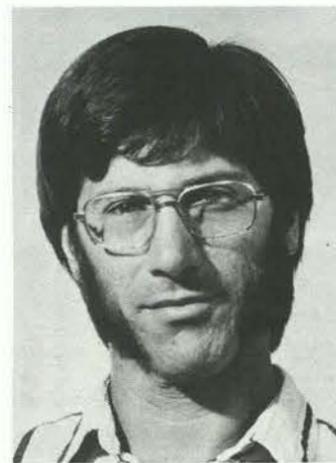
Donald Amos - 5122 15



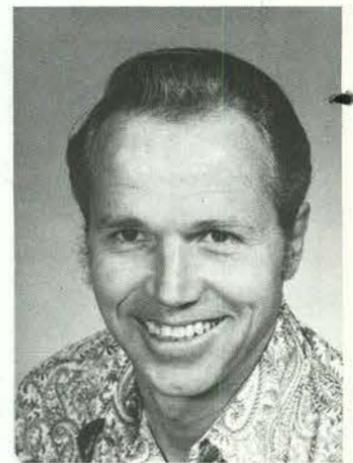
Willie Garcia - 3163 25



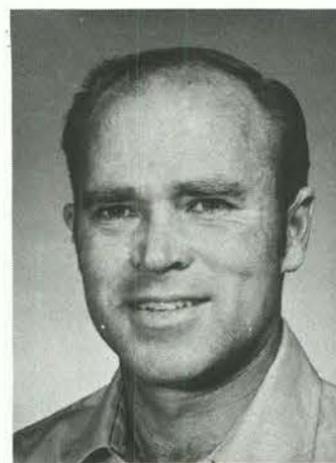
Don Carnicom - 2328 20



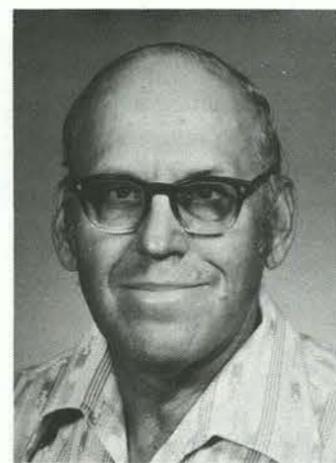
Bill Andrzejewski - 5821 10



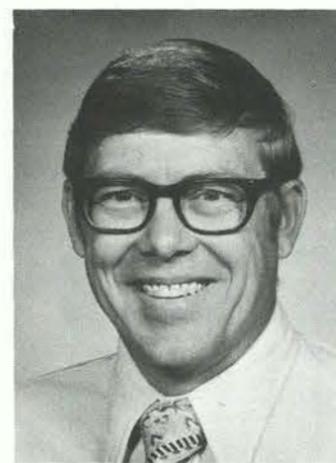
George Ingram - 2542 20



Andrew Sayers - 9487 20



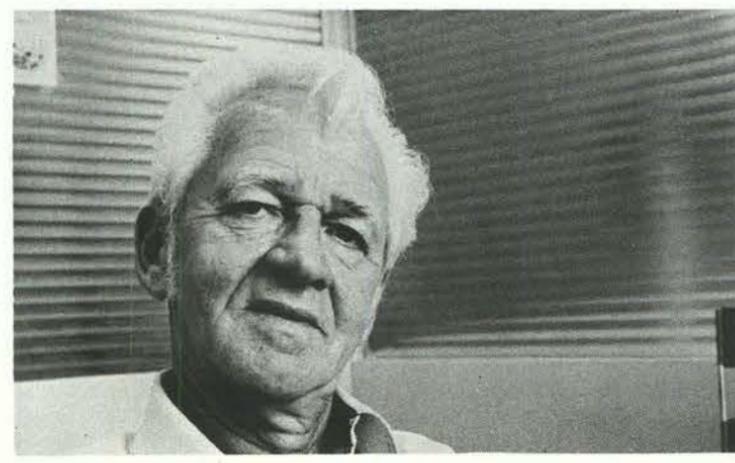
Robert Tant - 9582 25



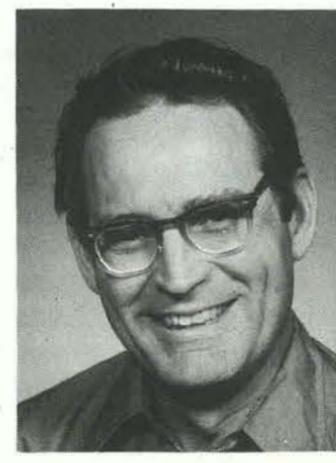
Tommy Donham - 2317 20



Henry Passmore - 1131 25



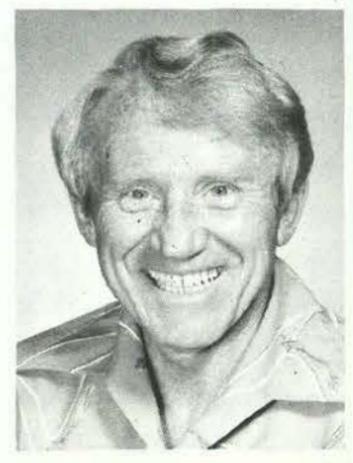
Ed Connelly - 3723 25



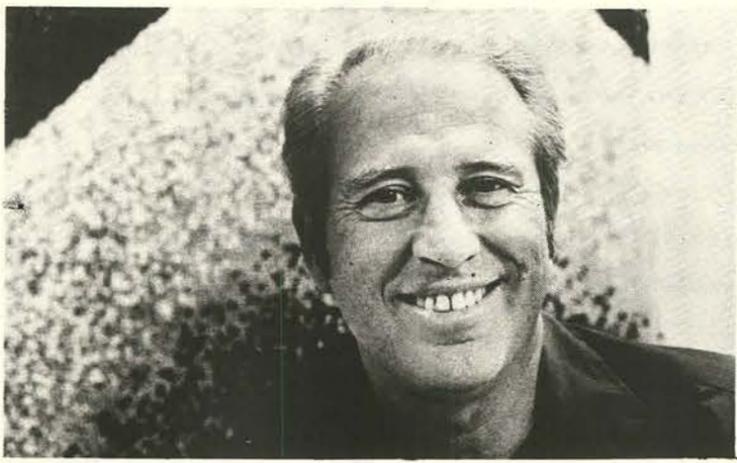
David Holt - 1242 15



James McCreight - 2627 20



Jack Rex - 3412 25



Leon Hobbs - 9486

25



Earl Simonson - 4121

25



Marcella Madsen - 5162

15



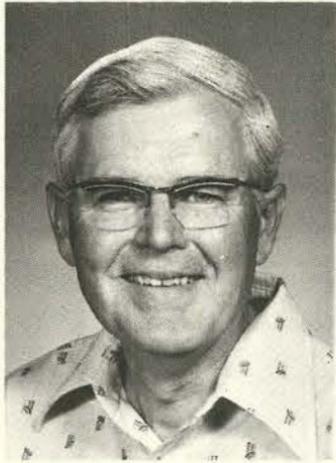
James Gallagher - 1323

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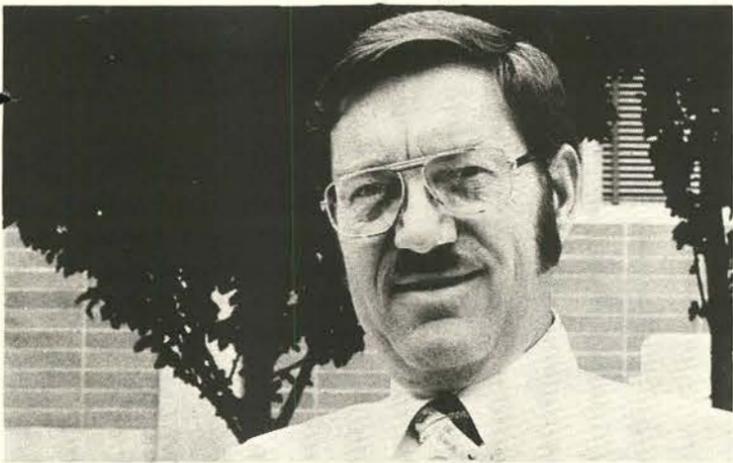
Charles Gwyn - 2142

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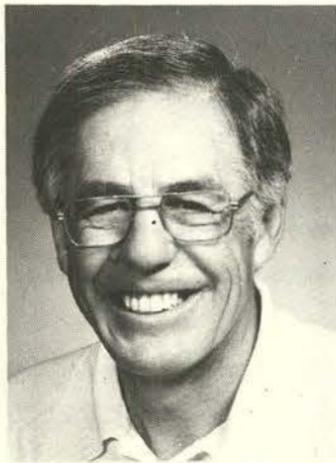
Charles Lee - 1751

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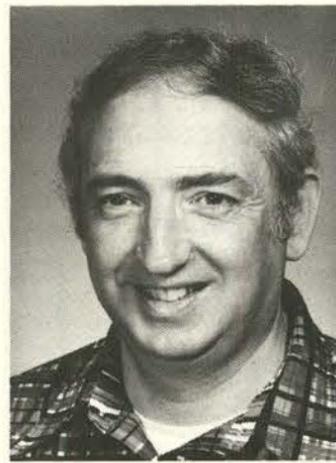
J. D. Jones - 4322

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Joe Black - 1282

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Bob Pinkham - 2328

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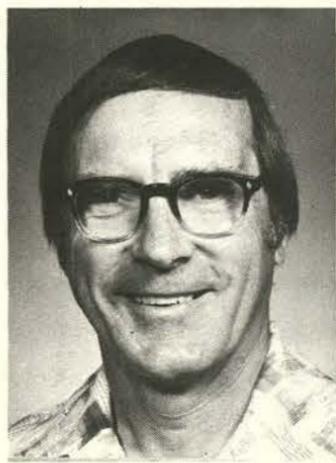
Dave Skogmo - 2112

15



Bruce Barth - 1735

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Albert Tucker - 1712

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Bob Fox - 2325

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Jim Manweller - 1323

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Bernadine Hoffheins
3413

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Louis Archuleta - 9632

10



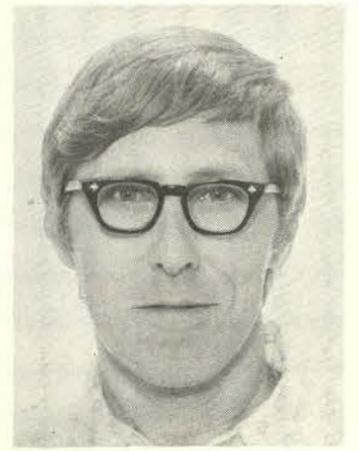
Ralph Wenzelburger
3727

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Dave Shirey - 9355

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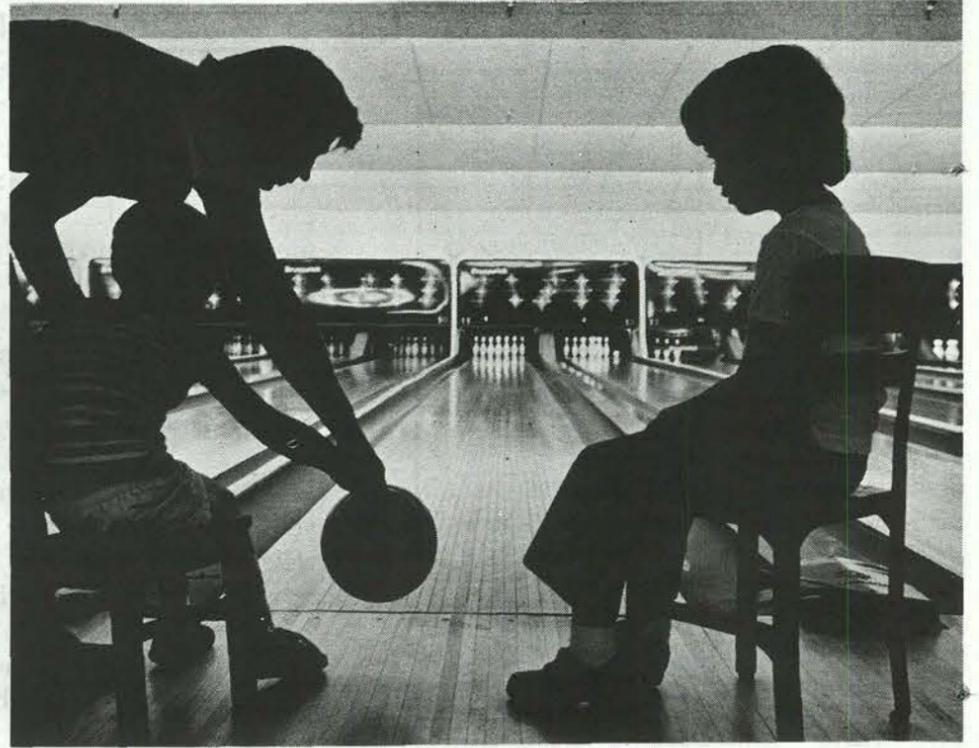


G. S. Lis - 9524

15



DIFFERENT STROKES—Henry Street (5844) has been pursuing a grass roots effort this summer to provide a meaningful activity to groups of youngsters with physical disabilities. Working through Civitan, of which he is a member,



Henry rounds up the youngsters once a week for a morning of bowling. Kids use special apparatus and get a little assist with the heavy balls. That's Henry behind the wheelchair bowler.

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 (814/8).

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 ERDA 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

- GE FREEZER, 12 cu. ft., 1 1/2 yr. old; kitchen cabinet, metal; large metal wardrobe cabinet; fan, 20", \$20; love seat, \$20. Mueller, 299-1079.
- HIDE-A-BED, attached end tables; 2 occasional chairs, pink, French Prov; girls' antique white canopy bed and matching desk; chair. Morris, 298-8664.
- GIRLS BIKES, chrome fenders, \$40 each. Stuart, 265-7315.
- ST. BERNARD cross puppies, 7 wks. old, \$10. Dishman, 296-2457.
- DACHSHUND miniature puppies, \$150; adult female, \$95; champion sired stud service, \$75. Sonnenberg, 873-0147.
- NAVAJO RUGS, \$200-\$550, including a Two Grey Hills. McMaster, 296-7881.
- AQUARIUM, 50-gal., w/wrought iron stand and misc. accessories. Naranjo, 294-7714 after 6.
- 10-SPD BIKE, 27-inch Pugeot, bicycle car rack included, \$95. Urist, 821-6679.
- VACUUM, Hoover upright dialomatic, w/attachments; Ronson electric rotisserie w/hood and griddle. Lundergan, 299-8368.
- 5-GAL CANS w/power spout, \$2 ea. Stuart, 299-9190.
- HUMIDIFIER, 3-spd., automatic humidistat, 12 gal. per day, Sears, \$45. Coleman, 299-2377.
- SHOTGUN, mod. 1400 VR-FC; guitar; water skis; machete w/case; Sony 8-track; Heathkit fish finder. Rack, 296-2922.
- STEREO, Magnavox AM/FM combo., walnut cabinet, stereo needs work, 38 1/2" x 28" x 18 1/2", \$85. Borgink, 898-3086 after 5:30.
- DALMATION, 6 yr. old female, \$25. Steck, 299-2313.
- VIDEO GAME, color, four player controls, w/target pistol, \$70; 100 step programmable scientific calculator, reverse polish, \$32. Campbell, 298-9265.
- HACKNEY PONY, \$200. Broyles, 344-3872.
- GUITAR, Guild Mark IV, classical,

- hard case; Karlson enclosure, blond, 15" coaxial speaker. Eyer, 299-4580.
- RECLINER, Naugahyde, \$25; red swivel rocker, \$15, upholstered chair, makes into a bed, \$25; blond coffee and end tables. Evans, 255-0162.
- WINDOWS, twin eight lite wood frame, 23" x 36", \$15. Schubeck, 294-5666.
- DOOR, exterior, mahogany, 36 x 80, w/brass hardware and door jamb, \$15; steel wheel; fits Ford Mustang and others, \$6. Daut, 255-2529.
- MITER-ARM attachment for portable circular saw, use for dado or rabbet cuts, Sears, new \$25. Stevens, 299-6086.
- AIR CONDITIONER, 2 ton, fresh air control, 3-spd., 220 volt, single phase, \$175. Ruminiski, 256-0770.
- REFRIGERATOR, Kelvinator, overhead freezer, white Penney's chest type 20 cu. ft. freezer; green plaid couch and loveseat. Prevender, 299-5253.
- AQUARIUM, 50-gal. Odell, glass top, stand, fluorescent bar, Supreme outside power filter, gravel, \$110. Wilcoxon, 298-8420 after 5 pm.
- KITCHEN CABINETS, metal, both upper and lower; white double sink, make offer. Laskar, 299-1024.
- BEGINNER'S FLUTE, Bundy, case, \$60. Roeske, 296-3946.
- CAIRN TERRIER PUPPIES, 7 wks. old, ready to go. Gammon, 268-1032.
- DYNACO STEREO, 120 amp. and pat-4 preamp EICO tuner, all 5 years old, \$250. Kovacic, 268-6630.
- SLIDING CLOSET DOOR SET, 60 x 80, with all hardware, \$15; 2 fully louvered doors, 30 x 80, all hardware included, \$15.00 each. Peterson, 299-1821.
- TRAIN TABLE, 4' x 6' with folding legs, \$4; heated dog house for small dog, \$2. Coalson, 298-0061.
- MEDITERRANIAN couch, 6 drawer dresser, bookcase headboard beds, dinette sets, nylon chairs, mattress set, upholstered chairs (need covers). Whitham, 832-1216.
- TOOL KIT, for VW, tools fitted in round case to fit hub or spare, VW jack, \$25. Crompton, 299-5569.
- PING-PONG table, 4-piece sectional, student violin, Waring blender, Toastmaster oven. Bernhard, 299-6597.
- COUCH, 8' green & brown plaid, \$85. Costales, 299-1414 after 5.
- BICYCLE, 3-speed, easy, rider, ridden two miles, \$65; Super 8 movie camera, manual zoom, \$25; Topcon 135 mm telephoto lens, \$65. White, 293-2219.
- BACK PACK, w/accessories & frame, used twice, \$45; ski rack, \$15; 5-speed bicycle, \$50; love seat sofa, \$100. Gray, 293-7914.
- PUPPIES, 6 weeks old, cocker spaniel and labrador retriever cross, \$20.

- Pedro, 345-6157.
- MAN'S LEATHER JACKET, lt. tan, MacGregor, size 42, never worn, worth \$100, asking \$50. Sedlacek, 268-7994.
- HP-97 programmable calculator, 9 mos. old, accessories plus extras, \$650 or best offer. Madrid, 293-5954 after 5 pm.
- BOAT TRAILER, \$80; 124 camera \$30; one box ammo \$10; small S&W holster \$6.50. Watterberg, 294-6759.
- DESK, dresser, bookcase, couch, chair, end tables, coffee table and lamps, make offer. Sorrell, 268-8310.
- HEALTH SPA membership, take over payments. Woodson, 265-5483.
- '73 PEERLESS double-wide, 2 bedrooms, den, sewing room, refrigerated air, new carpet, drapes. Syme, 898-3532.
- TEAC 3605 cassette deck, \$200. Garrison, 881-1851.
- SWIMMING POOL HEATER, 250,000 BTU/HR gas, used 2 1/2 seasons on 16 x 32 pool, \$200. Holmes, 292-0898.
- TENT TRAILER, sleeps 4. Hart, 299-8832.
- HAMMOND ORGAN, full-size, mod. E100 w/built in rhythm attachment, below book, \$1500. Henderson, 298-6125.

TRANSPORTATION

- '73 OLDS Delta 88 Royale, AC, AT, PS, PB, PW, 4800 miles, radials, below book. Benzley, 294-1217.
- '71 HONDA, 350SL, 2 cyl., street legal, 4100 miles, \$425. Sutherland, 266-1734.
- '71 VW SQ. BK. SEDAN, new paint, 2 new tires, factory air, needs recharging, 78000 miles, \$1350. Sedlacek, 268-7994.
- '73 VOLKSWAGEN "Thing," roll bar, customized, \$1500 or best offer. Weber, 255-5653 or 299-1389.
- '74 IH Extra HD 1/2 T PU, with camper, AT, PS, PB, 2400 miles, 15-16 mpg, many extras. White, 293-2219.
- '66 MUSTANG, 8 cyl, standard, new clutch, new tires, new brakes, \$1300. Blossom, 299-6709.
- '71 CHEVY station wagon, PS, AC, PB, luggage rack, make offer. Nuttall, 821-2895.
- '73 PORSCHE, 2.0, 914, AM/FM, instrument group, needs body work, \$3500. Sonnenberg, 873-0147.
- '69 OLDS Delta 88, AT, AC, 55,000 miles, \$1000. Harnar, 299-3400.
- '72 CAMERO, 307 V-8, PS, PB, radial tires. Clem, 296-5204.
- '67 CUTLASS Supreme, 4 dr, AC, PS, PB, AT, 330 V-8, 15-17 mpg, Chapman, 255-5263.
- '66 PONTIAC Lemans, PS, PB, AT, AC, new brakes and battery, 88,000 miles, \$400. Demmel, 299-5639.
- '56 MERCEDES, 190SL Roadster, hard and soft tops, \$4900. Zipprich, 299-2173.

- '74 NOVA, hatchback, Mag wheels, manual, "economy-6," cream color w/stripes; 75 Yamaha DT400, 9000 miles, \$875. Hall, 299-0009.
- '77 RANCHERO GT, PB, PS, AC, cruise control, alarm system, wide tires, 6100 miles, \$5900. Chavez, 869-3849.
- '59 VW VAN, low mileage, make offer. Lyons, 296-8866.
- '72 HONDA, 175 cc, 4 cycle twin, \$250. Marchi, 299-3653.
- '76 HONDA MT-125, under 500 miles, \$575, Harrington, 292-2034.
- '73 SUZUKI GT-750, new tires, fairing, bags. Jeff, 296-8295 5-6 pm weekdays.
- '70 YAMAHA 250, new engine, \$400 or best offer. Montoya, 865-4941.
- '72 MAZDA, 4 dr, RX-2, below blue book. Tjeltweed, 299-0032.
- '74 YAMAHA 360, Enduro, 3800 miles, \$575 firm. Armijo, 268-7645.
- '69 TOYOTA Corona, 57,000 miles, \$950. Nielson, 255-8077.
- '71 BISCAYNE Chevrolet, AC, PS, AT, PB, AM radio with FM converter, \$1200 or best offer. Johnson, 298-7020.
- '73 MAZDA, 4-dr, RX-2, AC, trailer hitch, 8-track stereo. Murfin, 255-4332.
- '66 FORD, Galaxie, 4-dr, PS, PB, AT, AC, white w/black top, \$350. Crompton, 299-5569.
- '73 CUTLASS, 1 owner, low mileage, PS, PB, air, automatic. Syme, 293-9735.
- '67 CHEVY Impala, 4-dr, AC, PS, 327 engine, \$550. Puccini, 255-0568.
- '63 CHEVROLET, 4-dr, 283 V8 small engine, powerglide transmission, R&H, \$195. Zurawski, 294-1078.
- '75 BLACK BMW, R75/6 matching windjammer and lowers, extras, \$2,250. Williams, 293-3630.
- NSU R080, 4-dr, German Auto GT, Wankel rotary, front wheel drive, AC, PS, PB, AM-FM, 28,000 miles, extras. Daffron, 299-5921.
- '72 LAND ROVER, broken axle & timing chain. Orear, 256-1941.
- '75 MOTOR HOME, 18.5 ft., 10-12 mpg, PS, PB, air, auto., CB, \$8000. Landue, 877-0915.

- man, accessories. Bush, 281-3773.
- COLLAPSIBLE BABY STROLLER w/canopy. Watts, 298-8451.
- REFRIGERATOR, frost free, avocado, GE or Frigidaire, will consider others. Weber, 883-0529.

WORK WANTED

- BABYSITTING, Glenwood Hills, Glenwood Hills South, 16 yrs. old, sitting experience, references. Morris, 299-4389.

FOR RENT

- 4-BDR HOUSE, lrg. den w/fireplace, LR, DR, 2 1/2 baths, school district, walled yard, NE Heights, available August 1. Morris, 298-8664.
- 3-BDR HOUSE, unfurnished, 1 1/2 bath, single garage, carpeted, drapes, walled yard, lawn with trees, lease only. Schwobel, 298-4295.
- LAKE FRONT CABIN, Vallecito Lake, near Durango, modern 3 bedrooms, fireplace, reserve for Sept. or Oct. weekend. Croll, 881-7235.
- 2 BDR apartment, in 4-complex, outside storage, laundry facilities, near Kirtland, 136 Gen. Arnold NE. Cashwell, 292-1150.
- 1 BDR apartment, furnished or unfurnished, utilities paid, enclosed patio, 541 Espanola SE. Aragon, 293-3238.

REAL ESTATE

- UNM—NETHERWOOD PARK, 4 bdr., DR, LR, den, game rm, fp, some h/w floors, near park, 2440 sq. ft., upper 50's. Blackwell, 265-4242.
- 3-BDR custom, corner lot, 1 1/2 baths, den w/tp, large kitchen, trailer parking, Holiday Park. Miller, 299-4208.
- '72 FLEETWOOD, 3 bdr., 1 1/2 baths, Four Hills, assume loan, \$3600 down. Madrid, 293-5954 after 5.

LOST AND FOUND

- LOST—man's black-handled pocket knife, 2 in. long w/Craftsman seal; ladies' sunglasses w/red & white striped frames; silver clip earrings w/dangling kachina; silver Mechanical pencil; Rx safety glasses w/white metal frames & smokey-gray lens; man's Rx glasses w/brown frames, steel band across top in brown case; brown lunch sack w/3 small thermos bottles; plastic grey raincoat in pouch.
- FOUND—ladies' Rx sunglasses w/brown lens, grey frames; ladies' Rx glasses (AO) marked "AT"; black-rimmed Rx glasses in black case; gold bracelet w/Spiedel-type band & bar across top.
- LOST & FOUND, Bidg. 832, 4-1657.

WANTED

- PIANO, used, console or spinnet, Schmitt, 296-3267.
- OUTBOARD MOTOR, 5 to 7 1/2 HP, Merritt, 299-1482.
- FILING CABINET, wood, preferably oak. Dawson, 243-6829.
- SOFA, Chippendale or traditional, 72" or 81" long, good condition, color unimportant, reasonably priced. Adams, 881-6836.
- OFFICE furniture. Whitham, 836-1216.
- HUNTING RIFLE, 30-06 bolt action, prefer Remington, Savage or Winchester, will consider others. Talley, 296-5078.
- CANOE, aluminum, preferably Grum-

SPAIN • C-CLUB • BROWN SUGAR • SWINE • AMSTERDAM • NIX PICNIX • SPINNING WHEEL

FRIDAY	SATURDAY
29—HAPPY HOUR STEAK FRY IV Adults \$4.50 (Snack Bar Open) Linda Beatty in Lounge THE FOUR KEYS	30—SOUL SESSION 9-1 BROWN SUGAR Members Free Guests \$1
5—HAPPY HOUR BBQ RIBS BUFFET Adults \$3.75 Under 12 1.92 AUGUST II	6—VARIETY NIGHT 3 Swine of Most Small Stature and Tortoise & Hare Revisited - ACT CINDERFELLA Food 6 Show 7 Free to Members

WHEN—4:30 arrives today, you have an hour and a half to prepare for the savory delights of Steak Fry IV. It's not difficult—put yourself anywhere in the vicinity of the Club and let the aroma of charcoal-broiled ten-ounce New York-cut steaks waft up your nostrils. After Steak Fry IV comes the *IV Keys* featuring Hank Chinisci. What can we say but "Sally IVth to the Club tonight"?

YOU—want another reason to stop in and/or stay at the Club tonight? It's Linda Beatty, and she's there to christen some new tables and chairs in the Lounge. She christens with a voice that would send Linda Ronstadt back to Famous Singers Correspondence Courses.

FIND—three bucks and more a little much for a movie? The Club now stocks discount tickets for Cinema I II III (near I-40 and Louisiana) and the Mall Cinema (in the Wyoming Mall) at \$2.15. They're good for any and all movies there whether they're \$2.50, \$3, or \$3.50, and they expire in July 1978. They make what was a little much less much.

YOURSELF—your spouse or loved one (loving one?), and your kids can have a



great time in the Park-Patio-Play Area-Pool at Picnic Nights almost every Wednesday. "Almost" because other activities on August 3 and 10 preclude picnicking then. But come out with your picnic basket on the 17th, 24th, or 31th.

LOSING—members are the ones who have to miss Soul Session tomorrow night. What they're losing is exposure to *Brown Sugar!* And that's almost indecent.

A—week from tonight is *August II*. No, your calendar's right—it's August 5, but *August II* is back on the Stage making music. (Ever miss the slow pace of yesteryear? Why, just to leave town, people did it in stages.) On the buffet tables, it's barbequed ribs and other good stuff that will stick to yours.

LOT—of talent in those Albuquerque Childrens Theatre people. They'll share some with you in the 6th as they perform their comedy version of the Three Little Pigs (entitled "Three Swine of Most Small Stature") and the Tortoise and the Hare (entitled "The Tortoise and the Hare—Revisited"). The celluloid feature features Jerry Lewis as *Cinderfella*, another comedy version of a kiddy classic.

PERHAPS—this is a good place to bury the news that *Spinning Wheel* is returning. (This way only devoted—or desparate—back page readers know about it and can get tickets while tickets can still be got.) Yes, the Spinning Wheel Spectacular, featuring concert, dance, and prime rib is August 20. Tickets are \$6 and \$8, and don't wait till the 13th deadline to get them.

IT'S—*Quincy*. It's Teen Dance. It's the 11th. It's half a dollar for members and a dollar for guests. It's 7:30 to 10:30. It's necessary for parents to get tickets early or at the door. It's fun.

TIME—to begin flexing those knees, skiers. Start with a party in the melted snow of the Twin Pools, where the flexing comes easy, on the 16th. Afterward enjoy the snack bar, the social half hour (featuring free popcorn, soft drinks, and beer), and the meeting (featuring intrepid balloonist Ben Abruzzo arguing that all this talk of a transatlantic balloon flight is just a lot of hot air); Walt Westman explaining how land use legislation may affect skiers—when he talks about getting to the bottom line, he isn't referring to the curves in a tight pair of ski pants; and Skiprez Caryl Peterson awarding a junior season lift ticket or its equivalent toward an adult ticket at Sandia Pique. Come on out, prospective members: Your dues (\$7 till

Oct. 18) give you free swimming and eligibility for the drawing at the party and discounts on ski trips all season long.

TO—whet your travel appetite, Paul Robertson who lived there will dazzle you with Brazil (dazil with Brazzle?). His slides of exotic Rio de Janeiro are magnificent, and he's a most entertaining and knowledgeable narrator. Travelogue Night is Aug. 17.

REEXAMINE—your current Club travel options in the remainder of this column, and then make your choices. Spaces on the Mazatlan trip are filling fast, but there's still room. It's Oct. 31 till Nov. 7 at the Playa Mazatlan; it includes RT airfare, a cocktail party, a fiesta party, and gamboling in the water; and it's \$279.

YOUR—jetset friends will tell you that Manzanillo is THE place where all the Beautiful People go in the western hemisphere, dahling. Well, it's high time all us Ugly Folk found out why (so we can shut it down if they're actually having fun). Join the Nov. 7-14 tour—seven nights at the Club Santiago Condominiums (condominia?), continental breakfasts, lunches or dinners, cocktail party, golf, tennis, lots of wet stuff, and RT airfare for only \$329.

CONCEPT—of Hong Kong colored by reruns of *World of Suzie Wrong*, *Soldier of Fort Chun*, and *Love is a Many-Splintered Thing?* Seek the truth—sign up for the Hong Kong package: 14 nights at the Hyatt Regency or Hong Kong Hilton, champagne breakfast, rum punch party, farewell cocktail party and Chinese banquet, lots of optional Oriental tours, RT airfare, and more for \$909 (up slightly because we've got to leave from Oakland instead of LA so no peanut fares). Dates: Nov. 18 - Dec. 4.

OF—course Spain is a Mexican Mecca for most of us. First class hotels with continental breakfasts—four nights in Madrid, two nights in Seville, and seven nights in Torremolinos on the Costa del Sol. Price is \$829. Deadline is Aug. 12. (\$30 discount if you deposit \$340 and space is still available in the cheapie fare category to New York.)

WINNING—readers (the ones who survive this far) deserve a hitherto unannounced travel treat: airfare only to beautiful, historic, and sinful Amsterdam for only \$477 from LA. More info on this one and other travel from Ed-in-the-Lobby Fridays 6-7 or from the Office.

MORE INFO—265-6791.

• MELTED SNOW • MANZANILLO • SUSIE WRONG •

Events Calendar

Through Aug. 14—"Never Get Smart With an Angel," Barn Dinner Theatre, 281-3338.
 Aug. 5-7, 12-14, 19-21—"You're A Good Man, Charlie Brown," Vortex Theatre, 106A Vassar SE, 8:00 p.m.

Aug. 7 - Oct. 2—"Indian Art Today," Museum of Albuquerque.
 Aug. 11-28—"Effect of Gamma Rays on Man-in-the-Moon Marigolds," Corrales Adobe Theatre, 898-3323 (Thurs-Sun).