



SECURE—BUT NOT A GUARD IN SIGHT (OR ON-SITE). Sandia's Perimeter Sensor Engineering Division 1734 is evaluating several commercial sensor systems for possible use in the U.S. Air Force's Individual Resource Protection Plan. Aimed at providing 24-hour intrusion protection for resources like B-52s, the sensors will be permanently installed, though mobile versions are also being considered. In this photo, the parallel lines in the foreground mark the

path of the two buried coaxial cables which fully encircle the aircraft. The cables are the key elements of a perimeter intrusion radar system that would sense an intrusion and sound an alarm in a central control area. During the seven days the B-52 was available at Kirtland West, tests were also run on a commercial microwave sensor system and a bi-static radar system being developed by Sandia's Experimental Systems Division 1731.

LAB NEWS

VOL. 32, NO. 17

AUGUST 22, 1980

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

Exploratory Systems

Looking To The Near And Far Future

"He's ahead of his time," is a description sometimes applied to an individual. But an entire organization?

There's really no other way to describe Exploratory Systems Department 5620. Keeping ahead—often way ahead—is the name of the game.

"Some of the ideas and technology we're exploring now won't be used in weapon systems for five, ten, even twenty years," Max Newsom, manager of the department, told us, "but that's been the case since the very beginning. Many of Sandia's current projects grew out of analysis and research done years ago in Exploratory Systems.

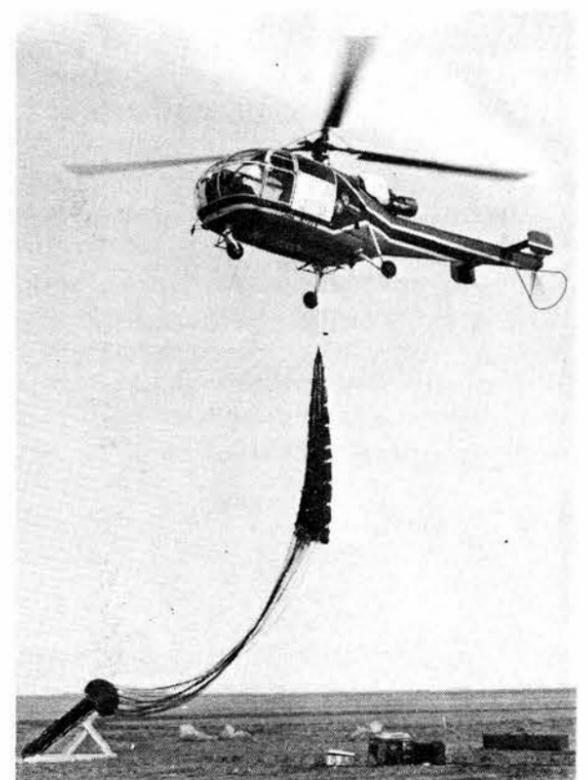
"Take Pershing II, for example, the Army's earth penetrator missile. The concept was originated here 20 years ago when we started testing to measure how weapon shape affects earth penetration. Pershing II is certainly an outgrowth of that work in terradynamics."

Any other examples?

"We proved the feasibility of small integrated safing, arming, fuzing and firing systems and incorporated them into miniature reentry vehicles. Coupled with

small warheads from LLL and LASL, this work led to the development of small RVs currently used on the Polaris, Poseidon and Trident." Max thought a moment, then continued: "In the mid-'60s, after early work with LLL, we demonstrated the feasibility of systems that prevent unauthorized use of a weapon by detecting tampering and then disabling the weapon. That concept of a secure container capable of protecting itself by detecting and responding to unauthorized entry has led to much of Sandia's current safeguards work, including the secure transport system and the unmanned seismic observatory.

"Our on-going research still provides much of the thrust in Sandia's advanced weapons technology. One idea, for example, is to use fiber optics in exclusion areas. If we can replace copper wire with fiber optics, we can eliminate the undesired effects that can be caused by electromagnetic radiation and spurious signals. If we can find a way to transmit electrical power as well as information



AS PART OF AN EXPLORATORY Systems study, helicopters dropped penetrators from different heights into soft terrain similar to marine sedimentation.

[Continued on Page Seven]



NEW SUPERVISORS: (l to r) Jim Jorgensen (2115), Jim Martin (1766), Wilson Barnard (2116) and, seated, Eloy Barela (1474-3).

Supervisory Appointments

JIM MARTIN to supervisor of Advanced Systems Development Division 1766, effective Aug. 1.

Joining the Labs in June 1963 under the Technical Development Program, Jim worked as a staff member in the aerospace nuclear safety program and was later assigned to the COIN project. He completed a one-and-a-half year assignment in Washington, D.C., with the Defense Special Projects Group—the DoD arm of the COIN project. Returning to Sandia, Jim worked on the Air Force's security and safeguards BISS program and the security upgrade program with Pantex. Last year he assumed project responsibility for Sandia's support of the security upgrade program for NATO sites in Europe.

Jim earned a BS in EE from Lamar Tech (Texas) and an MS in EE from UNM. Off the job he enjoys water sports, hunting and fishing. Jim and his wife Kaye have four children and live in the NE heights.

* * *

ELOY BARELA to supervisor of Electronic Fabrication B Section 1474-3, effective July 16.

Eloy joined the Labs in February 1952 in the cable fabrication section. Since 1954,

he has been a technician with the electronic fabrication group. Eloy has attended UNM and UA. Off the job he enjoys hunting, fishing and racquet ball.

He and his wife Mary have four children—two in college and two at home—and live in NE Albuquerque.

* * *

JIM JORGENSEN to supervisor of Microprocessor and Memory Design Division 2115, effective Aug. 1.

Since joining Sandia in July 1966, Jim has worked with the radar fuzing organization. More recently, his work on microprocessor and memory design has evolved into his new division.

Jim earned his BS and MS in EE from the University of Nebraska. As a member of the Labs' Doctoral Support Program, he received his PhD, also in EE, from UNM in 1974. He enjoys spectator sports and games and plays golf and softball. Jim and his wife Jeanette have two children and live in the NE heights.

* * *

WILSON BARNARD to supervisor of Custom MOS IC Design Division 2116, effective Aug. 1.

Wilson came to Sandia in July 1967 as a member of the Technical Development Program, working with the anti-ballistic missile Sprint project. For several years, he conducted radiation effects studies on components, communication systems and weapons systems. Since 1975 he has been assigned to the group designing C-MOS integrated circuits for weapon systems.

Wilson earned a BS in EE from Washington State and MS in EE from UNM. He is a member of IÉEE. His leisure time activities include woodworking and gardening. He and his wife Melanie have two children and live in Alameda.

Congratulations

Mr. and Mrs. Chuck Fuller (1243), a daughter, Ann Marie, July 30.

Mr. and Mrs. Larry Stephenson (5841), a daughter, Lindsay, Aug. 4.

Mr. and Mrs. Dean Manning (1481), a son, Jeremiah, Aug. 5.

Take Note

Omnia, Inc., a non-profit youth services project, is looking for people who will share some of their time and interests with teenagers. Omnia's goal is to establish a group of adult volunteers who will share what they enjoy doing—fishing, sewing, hobbies, sports, etc.—with a troubled or neglected young person. For more information, call 247-8853.

* * *

The Community School Program (CSP), an APS alternative educational system for high school juniors and seniors, is seeking volunteer instructors to supplement the faculty. CSP offers almost all high school subjects plus other courses that may not be available at some high schools; both college prep and basic skills are taught. Small classes meet two or three times a week. A teaching certificate is not required for volunteer instructors. For more information, call CSP, 296-5433.

* * *

Phil Owens (2433) was recently elected vice president of the New Mexico Society of Professional Engineers (NMSPE). Phil has served on numerous committees and held several offices at the local, state and national levels. He received the NMSPE Engineer of the Year Award in 1974. He is a member of ASME and is a registered professional engineer, licensed in New Mexico.

* * *

Conversational French classes, sponsored by l'Alliance Francaise d'Albuquerque, will be held Sept. 8 through Dec. 4. Both day and evening classes are available for beginner to advanced students. For more information, call 821-5788 or 298-1508.

* * *

Feria Artesana, featuring traditional and contemporary New Mexico Hispanic art, is being held this weekend at Tiguex Park (east of the Albuquerque Museum on 19th St. and Mountain Rd. NW). Hours of the fair, sponsored by the Albuquerque Museum and the Albuquerque Hispano Chamber of Commerce, will be 8 a.m. to 6 p.m. on Saturday and 9 a.m. to 5 p.m. on Sunday. Exhibits will include tin work, jewelry, santos, furniture, weaving, quilts, sculpture and paintings. These exhibits will be complemented by continuous performances by singers, dancers, bands, poets and dramatic groups. Free parking is available, and the Museum will have special hours for the weekend, open from 10 a.m. to 5 p.m.

[See photo on page 11]

The face is familiar: front row, Bill Boyes, Bob Devore, Ed Baldwin, Howard Viney, Jim McGovern, Bill McCord, Max Linn, _____, John Tillman, Ken Smith, Don Jenkins. Back row: Mel Merritt, Dick Dickinson, Harlan Lenander, Terry Miller, Bob James, Arno Leupold, Doc Cone, G. C. Hollowwa, Barney Goncher.

LAB NEWS

Published every other Friday

SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAHA, NEVADA

Editorial offices in Albuquerque, N.M.

Area 505 844-1053

FTS 844-1053
ZIP 87185

In Livermore Area 415 422-2447

FTS 532-2447

John Shunny is editor

&

Don Graham ass't. editor

Chuck Cockelrears & Norma Taylor write

Louis Erne does picture work

aided by Gerse Martinez

Barry Schrader & Lorena Schneider report Livermore.

Visiting Professors

Under a pilot DOE/American Society for Engineering Education summer faculty program, three visiting professors are gaining some hands-on experience at Sandia Livermore that they can share with fellow faculty members and students this fall.

The three men are among 25 faculty members participating in a new Solar Energy program at four US research and development institutions. Besides SNLL, the other installations participating are Sandia Labs Albuquerque (three faculty members), Jet Propulsion Laboratory at Pasadena, and Solar Energy Research Institute at Golden, Colo.

The three men at SNLL for 10 weeks of research—all on solar thermal projects—are Tai Chow, physics department chairman at California State College at Stanislaus, who will be moving to an administrative post at Humboldt State University this fall; Milton Larson, professor in the mechanical engineering department at Oregon State University at Corvallis; and James Nickel, chairman of the computer science and mathematics department at the University of Texas in Odessa.

Tai Chow has been studying the safety aspects of stowing large solar mirrors (heliostats) horizontally face-up during non-operational times instead of the current method of facing the mirrors downward when not in use. The summer program of work for faculty members is "probably of more benefit to the universities than to the Labs because of the hands-on experience gained here," says Professor Chow, who would like to see more cooperative or exchange programs between research labs and universities. Tai has been working with Tom Brumleve (8451) in the Heliostat Development Division, as has Jim Nickel.

Jim has been taking a close look at extensive tests on two prototype heliostats being considered for the Barstow Solar Central Receiver pilot plant to see if they can be more realistically characterized in

LEAP '80. Slogan, "LEAP is Caring . . . and Sharing," adopted by the Livermore Employee's Assistance Plan committee, reflects the theme for this year's fund raising campaign. Chairman Pat Gildea (8443), right, and 8100 representative Roger Everett display one of the campaign posters. Committee planning sessions and briefings by agencies are currently underway. Campaign will be held the first week in October.



LIVERMORE NEWS

VOL. 32, NO. 17

LIVERMORE LABORATORIES

AUGUST 22, 1980



Discussing the summer work program at SNLL from left are Bob Gallagher (8124), Tom Brumleve (8451), Tai L. Chow, Milton Larson and James Nickel.

computerized field models and whether any of the heliostat specifications should be modified.

"When I return to my campus, I will be able to serve as guest lecturer in our contemporary natural sciences courses, as well as take part in public lecture series utilizing some of the knowledge I've gained this summer," he says. "The scope of the problems I have seen will provide relevant material for class discussions." He also hopes to develop ongoing research projects as a result of his experience in Livermore.

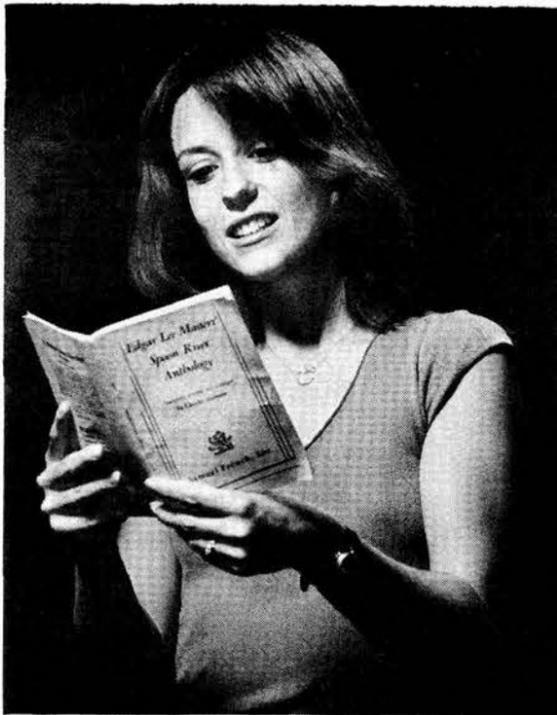
Milton Larson has been working in the Thermal Science Division with Bob Gallagher, John Kraabel and Marty Abrams

(all 8124). His project is to minimize the uncertainty of temperature measurement on an experimental solar receiver surface. He is making calculations that allow corrections to be made for the emissivity of the surface and the amount of energy reflected from the surface.

"The project I have here is very closely related to a graduate course that I'm teaching," Milt says. "I feel I have gained insight into how I may change the present course to improve the student's preparation for the kind of position I've had at Sandia."

One of the hosts for the three professors, Tom Brumleve, explains that both guests and hosts will be evaluating the pilot program at the end of this first summer. "The only problem I have found is defining tasks that one can begin and finish in the relatively short time available (9-10 weeks)," Tom says. "Aside from that limitation, the program is a very useful instrument. I see it in two ways—not only can we get new talent with fresh insight to help us on specific problems, but I think there are other potential benefits in getting universities involved in our projects. People in the academic community are made more aware of the kinds of problems we are grappling with, putting them and their students in a better position to contribute toward needed solutions. These are, I believe, two of the main purposes underlying the whole program."

Co-host Bob Gallagher adds that "we are definitely benefiting from the visiting faculty's time here. Some very timely calculations are being made for a major experiment."



ALLISON DAVIS (5813) is currently appearing in the Adobe Theater production of Edgar Lee Masters' *Spoon River Anthology*. The play—a collection of free verse epitaphs depicting the secret lives of former residents of a small midwest town at the turn of the century—runs through Sept. 7.

Fun & Games

Tennis—The 2nd Annual Coronado Club Tennis Tournament will be held the Labor Day weekend, Aug. 30, 31 and Sept. 1. The five events consist of women's singles and doubles, men's singles and doubles and mixed doubles. Matches, played at the Coronado Club, will be single elimination, best two of three sets. The minimum number of participants per event is six. Entry fee is \$2/event, and the deadline is Wednesday, Aug. 27. The tournament chairmen are John Stichman (2157) and Jim Solberg (1135). Mail entries to John Stichman.

* * *

Running—La Luz Plus Two takes off this Sunday, the 24th. LAB NEWS has entry forms for this as well as for the Old Santa Fe Trail Run, 5 and 10K, scheduled for Sept. 1.

Four Sandians were among the more than 1200 runners at Pike's Peak on Aug. 10. Runners had a choice of completing the 14-mile ascent (14,100') or making the entire 28-mile round trip. Completing the ascent were Jim Harrison (4311) with a time of 2:41 for 25th place overall; Pete Richards (5132), 2:44 and 30th; Terry Bisbee (2613), 2:50 and 42nd; and Joe Maloney (3542), 3:09 and 114th. Jim and Terry went on to do the round trip with a 4:30 for 24th place and 5:13 for 92nd place, respectively.

* * *

Hockey—Albuquerque's Senior Olympic Hockey Club, for ages 40 and older, will host an international hockey series at Iceland Ice Arena Sept. 12-15. The international feature will be provided by Ontario's Kitchener Old-Timers who will bring a veteran Canadian squad to the competition. Representing the Southwest will be Albuquerque's Senior Olympic Club and the Denver Centennial Stars. Rol Hewitt (1137), a leader in local amateur hockey and a former resident of Ontario, Canada, is coordinating the event.



**Sandia
National
Laboratories
Statement
of Policy**

**Employment of the
Handicapped,
Disabled Veterans
and Vietnam
Era Veterans**

in a continuing effort to treat qualified handicapped individuals, disabled veterans, and Vietnam era veterans without discrimination in employment, training, job placement and advancement, Sandia National Laboratories reaffirms its policy of equal opportunity for all its employees and applicants. We are committed to full compliance with the Rehabilitation Act of 1973, as amended, and the revised Vietnam Era Veterans' Readjustment Assistance Act of 1974. We will foster a general understanding of and sensitivity to the problems of the handicapped and veterans to assure that as openings become available for which they are qualified, we may be better prepared to provide meaningful employment and advancement opportunities.

The Acts cover individuals with physical or mental impairments which could affect their ability to secure, retain, or advance in employment, whether or not they have previously been identified as handicapped. The Readjustment Assistance Act assures the Vietnam era veterans that employers will offer them employment opportunities with the likelihood for advancement.

Therefore, employees and applicants who believe themselves covered by the regulations and who wish to receive consideration under our affirmative action program are invited, at their own discretion, to identify themselves through their supervisors, Personnel Representatives, or the Equal Opportunity and Affirmative Action Staff. The information submitted will be considered confidential and will be used only as required to meet the provisions of the Acts. Refusal to provide the information will not subject any employee or applicant to adverse treatment. Employees and applicants are also protected from coercion, intimidation, interference or discrimination for filing a complaint or assisting in an investigation under the Acts.

To assure the success of our policy and our continued compliance with applicable laws and regulations supervisors are reminded that it is the responsibility of each of us to provide equal opportunities for the qualified mentally or physically handicapped individual, disabled veteran, and Vietnam era veteran. Overall administration and monitoring of the program has been delegated to J.R. Garcia, Director of Personnel, and his staff.

Morgan Sparks 

Revised Affirmative Action Program Is Announced

The Equal Opportunity and Affirmative Action Dept. 3510 reports that a revised Affirmative Action Program for the Handicapped, Disabled and Vietnam Era Veterans (AAP-H/V) is now being published and will shortly be sent to all supervisors. A summary report of accomplishments accompanies the Program. Coincident with publication, President Spark's policy statement on this subject is included on a poster that will appear throughout the Labs and which is reproduced on this page.

The revised affirmative action program is available for review by all employees and applicants. If you wish to see the plan, contact your supervisor or your Personnel Rep., or you may review it in Dept. 3510.

Hazlet Edmonds is program coordinator and should be contacted (4-9481) about details of the plan and its implementation. She is also available for counseling for handicapped employees or veterans and for giving assistance to supervisors in matters relating to the program. George Banos, Manager of Dept. 3510, is overall program administrator.

The Department of Labor has asked that special efforts made by employers to accommodate handicapped employees be documented. At the Labs, supervisors who have made such efforts are asked to record them and to send a copy of such documentation to Dept. 3510. Examples

would include the purchase of special devices or making modifications in jobs, work schedules, equipment, or work areas (purchasing a Braille reader for a blind person; teaching sign language to a supervisor of a deaf worker; permitting a person in a wheelchair to park his or her car inside the technical area).

Many buildings and facilities used by all employees at the Labs have been modified and are accessible to handicapped people (ramps, curb cuts, restroom adaptations, wider aisles, etc.). Also, a large number of reserved parking spaces have been provided for handicapped individuals.

From October 1, 1978, through May 30, 1980, Sandia Albuquerque hired 28 persons who identified themselves as being handicapped or disabled veterans, for an applicant-to-acceptance rate of 24.1%. During this same time period, 98 Vietnam era veterans were hired for an applicant-to-acceptance rate of 11.5%. These individuals are on roll in a wide array of jobs, i.e., technical, administrative, clerical, and trades.

The Labs invites employees who consider themselves handicapped, or disabled veterans, or Vietnam era veterans to identify themselves. If you are eligible and wish to be considered under Sandia's affirmative action program, please call Hazlet. All information is kept strictly confidential.

Volleyball—The fall league begins play on Sept. 22 for approximately eight weeks. Individuals and teams should contact Al Spencer (4-3553) to sign up; only a limited number of teams will be able to play because of availability of the gym. The league needs a volunteer to handle schedules and standings for the upcoming season.

* * *

Bowling—Sandia's Tuesday Night Men's Handicap Winter League has openings for regular, sixth man and substitutes. The

league is open to employees of Sandia or DOE, both active and retired, as well as contractor employees at either facility. The league meets at Fiesta Lanes at 6:25 p.m. Call Dan Puetz (2612), 294-8545, for more information.

The Women's Sandia Labs Bowling League has openings for regular members and substitutes. Interested bowlers should contact Bonnie Roudabush (4-5647). A meeting for all members will be held Aug. 28, 6:30 p.m., at Holiday Bowl. League play begins Sept. 4.

Japan: Different, Scenic, Good Food, Expensive

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

Adela Cooke (2426) began thinking about vacation plans last fall. She had already visited Europe and South America. "I was seriously considering a trip to China when my friend Toyoko Lee (also 2426) said, 'I want to visit my family in Japan—why don't you come with me?' I didn't hesitate," Adela says, "I said, 'Let's go!'"

The women spent 22 days in Japan during this past May and June and both were delighted. Toyoko hadn't seen her parents for 10 years and Adela was able to experience living in that country as a member of a Japanese family.

Both agree that Tokyo is very, very expensive: \$100 per night for their hotel room, \$2.50 for a half-cup of coffee, the average dress costs \$100, a handbag goes for \$200. "The quality is good, and there are no duplications of color, size or style," Toyoko says, "however, the farther we got away from the large cities, the less expensive things were." After sight-seeing in Tokyo, they took the fast (100 mph plus) commuter train to Kawagoe.

"We stayed in Kawagoe for 10 days with Toyoko's sisters and their families," Adela says. "And we did lots of eating and sight-seeing—gardens, temples, shrines. One of her sisters has a home furnished in both Western and Japanese style—the home of the other sister is strictly 'the old way.'"

"My parents and two other sisters live on the island of Shikoku on the southeastern side of the big island," Toyoko says. "So we headed south again on the train to Kyoto where we stayed overnight in order to take a night-time tour that included a *geisha* theater. We went from there by train to Osaka and took a plane to Matsuyama, the capital of Shikoku. We were met by a friend and then went on to my parents' home in Yawatahama."

"None of Toyoko's family speak English," Adela says, "so she was busy interpreting for me. But they were great and we got along very well. I ate my first raw fish—tuna is excellent!—and Toyoko's mama made me try fish heads." Toyoko spoke up, "I never could eat them!"

"The sea food is super," says Adela. "Biggest shrimp I've ever seen. But the most delicious meal we had was squid steak cooked on a charcoal grill. And one of our most unusual meals was at a restaurant up in the mountains. Diners sit on the floor around a table which has a little canal of fresh water meandering around the table. Floating by in the water is *somen* (thin and thread-like, similar to spaghetti). You catch the *somen* with your chopsticks, place it in your bowl and then season it from numerous dishes of herbs and vegetables."

Fish is the mainstay of the Japanese diet—beef sells for \$20-\$25 per pound. "And, of course, we had rice with every meal. First thing every morning the rice is placed in a steamer to cook and is available any time you want it. I didn't once see



TOYOKO LEE AND ADELA COOKE (both 2426) demonstrate their ability with chopsticks. "Adela learned to use them by the second day," Toyoko says. "I kept asking her if she wanted a fork. She always said no."

potatoes or bread served with a meal," Adela says.

"The houses and gardens are beautiful," she continues, "and the cars on the streets all look new and clean." Toyoko explains that every auto is scrupulously inspected every second year. Even dents and scratches must be repaired before the car is approved.

In the residential sections, streets are narrow and houses close together. Many of the old-style homes have rice-paper sliding walls and, at night, these are closed and shutters drawn over them. "I got used to the sleeping mats being pulled out every night," Adela says. "They were very comfortable, but I found it a little awkward to get up from the mat or up from the table (where you sit on the floor) without something for a support."

"I had one embarrassing moment at the home of Toyoko's sister," Adela says. "The routine for taking a bath is to lather, rinse off, and then immerse yourself in a deep tub full of very hot water. I had been in the bath for quite a long time when Toyoko and her sister came to check on me—they thought maybe the water was too hot and I had fainted. They started yelling at each other in Japanese and finally started laughing. I wondered what I had done wrong—I hadn't broken anything and I had cleaned the bathroom when I finished. It turned out that I had cleaned it all too well! I had drained all the water from the communal tub to scrub it. But it seems that everyone taking a bath that day uses the same water in the tub and then finally it's used for laundry. Toyoko's sister said that no wonder I was in there for so long—there was a very large amount of water in that tub."

* * *

Logistics—Round-trip plane fare from Albuquerque to Tokyo was \$778 (however, tickets at that price were purchased last September). The flight on Japan Airlines was 11 hours non-stop from LA to Tokyo. The fast commuter trains were more expensive than flying in Japan. The trip from Tokyo to Kyoto took three hours and



A SHOPPING MALL IN Toyoko's home town of Yawatahama.



NISHI HONGANJI (West Temple) in Kyoto.

cost \$45 (9800 yen). The train is fast, up to 150 mph. For foreigners, train travel can be difficult: numerous transfers, street names and signs in Japanese, and few redcaps. Both Adela and Toyoko suggest limiting your luggage unless you enjoy lugging suitcases about. •nt

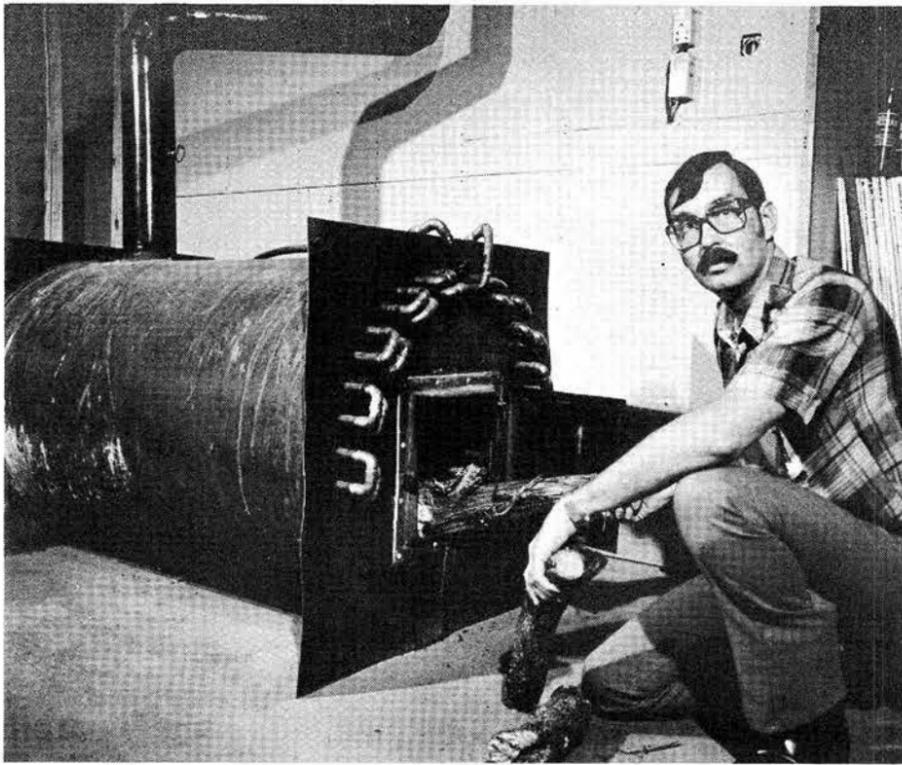
Death



Clifford Witten of Switching Devices Division 2328 died Aug. 6 following surgery. He was 49.

He had worked at the Labs 14 years.

Survivors include his widow, a daughter and two sons.



WHEN THE COST OF ELECTRICITY took a quantum leap, Russell Smith (3155) designed and installed a wood-burning stove to supply hot water to his baseboard heating system. A circulating pump moves cool water through network of copper tubes inside the fire chamber and delivers hot water into the main line. Russ fires up the stove when he gets home from work and again at bedtime to keep the house's 3500 square feet at a comfortable 70°F.

RUSSELL (3155) and KAREN (1762) SMITH take the morning sun on the south-facing balcony of the home they built near Cedar Crest. The window wall behind them is a passive heat source that keeps the house warm when the sun shines.

High Heating Bills

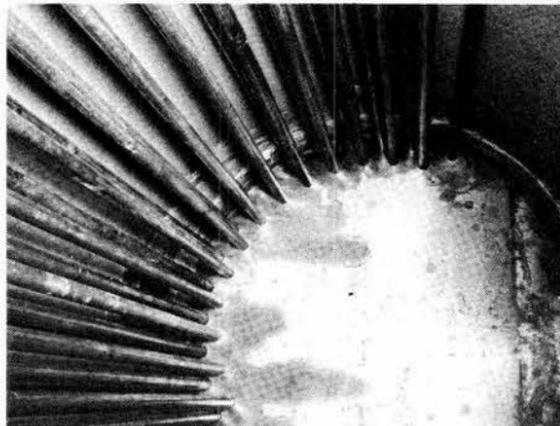
Running The Cost Down With Wood

When he built his 3500-square-foot hideaway in the mountains near Cedar Crest, Russell Smith (3155) designed it with a lot of glass so that the sun would provide part of the heat. Knowing that winters tend to be more severe east of the Sandias, Russ also installed an electrically-heated hot water baseboard system. At the time he built, Russ had no way of knowing that quantum leaps were ahead in the price for electricity. Two winters ago when his heating bill hit \$175 a month, Russ decided the time had come to find another way.

His search for a less expensive heating system led him right back to the woodstove—but one with a network of copper tubing that carries cool water into the stove, zigzags it through the fire box and returns hot water to the main line of the baseboard heating system. So successful was the design effort that Russ's heating bill dropped to \$20 a month this past winter—\$20 and a cord of wood he cut and split himself. The total cost of the stove was just under \$400 and it paid for itself in one season.

Generally speaking, sunlight heats the house during the day. When Russ and his wife Karen (1762) get home from work, Russ stokes the stove. He fills it again at bedtime, which keeps the house at a comfortable 70°F.

The stove is constructed from a four-foot length of 30-in. diameter steel pipe with square end plates welded on to complete the burning chamber and support the stove. The door and flue connections came from a commercial kit designed to convert

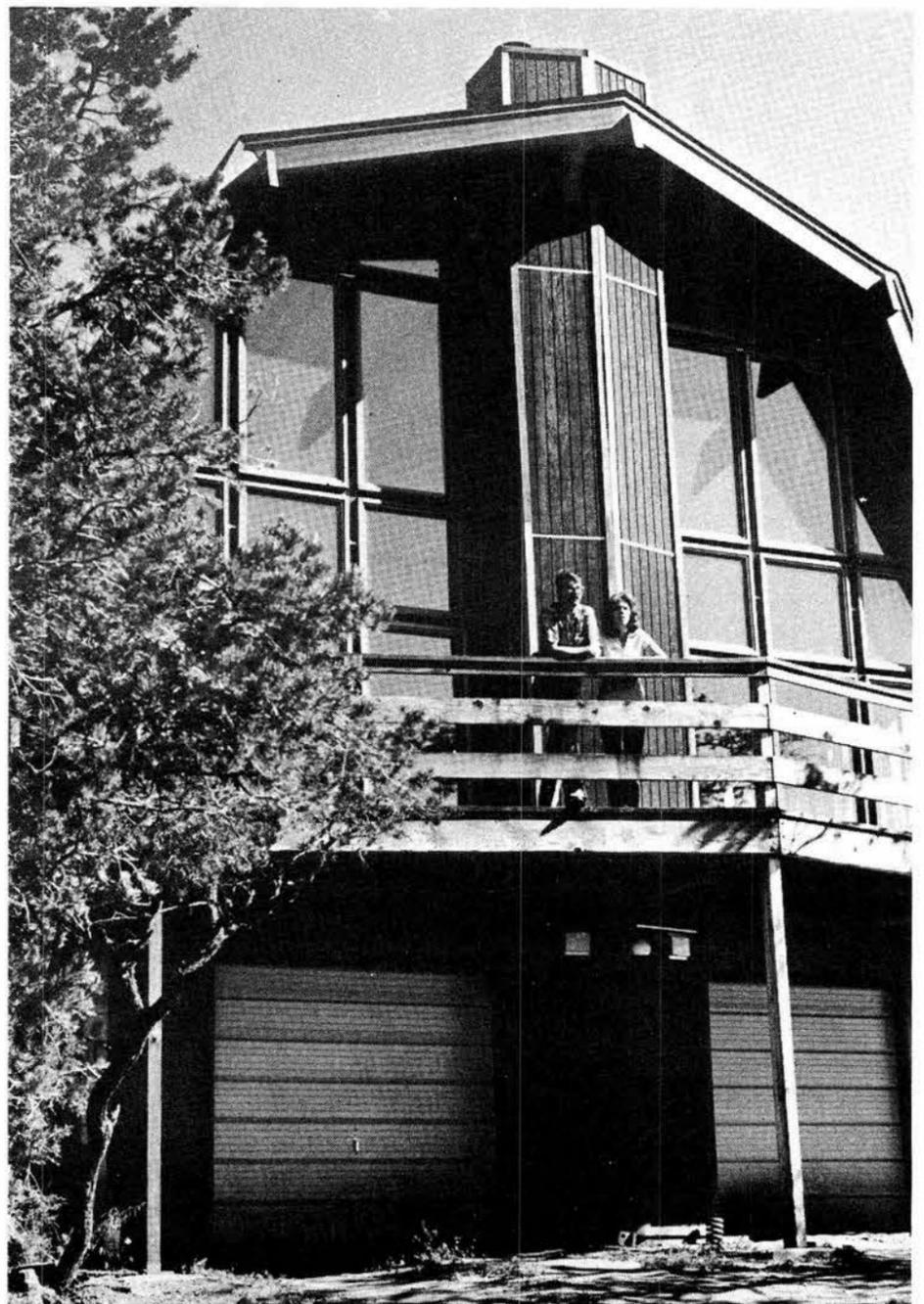


COOL WATER FROM THE BASEBOARD heating system circulates through this network of copper tubes inside wood-burning stove.

oil drums to stoves. Copper T-lines connect the stove to and from the main water line.

For safety's sake, Russ never leaves the stove burning when the house is empty. "That's my cardinal safety rule," he says. "As a safety precaution, I also clean the flue every couple of weeks to prevent creosote buildup," Russ says. "I also made a warning buzzer to let me know if there's a power failure. Since the circulating pump is electric, it wouldn't take long for the water to boil if the power went off. And that could present an interesting problem, to say the least. I keep a hose by the stove to put out the fire and a flashlight by the bed in case the power failure occurs at night."

Russ admits that heating water with wood is a bit more cumbersome than using a standard heating source. "But the extra effort really pays off," Russ says with a warm smile. "Every time I look at my electric bill, I'm aware of just how much."

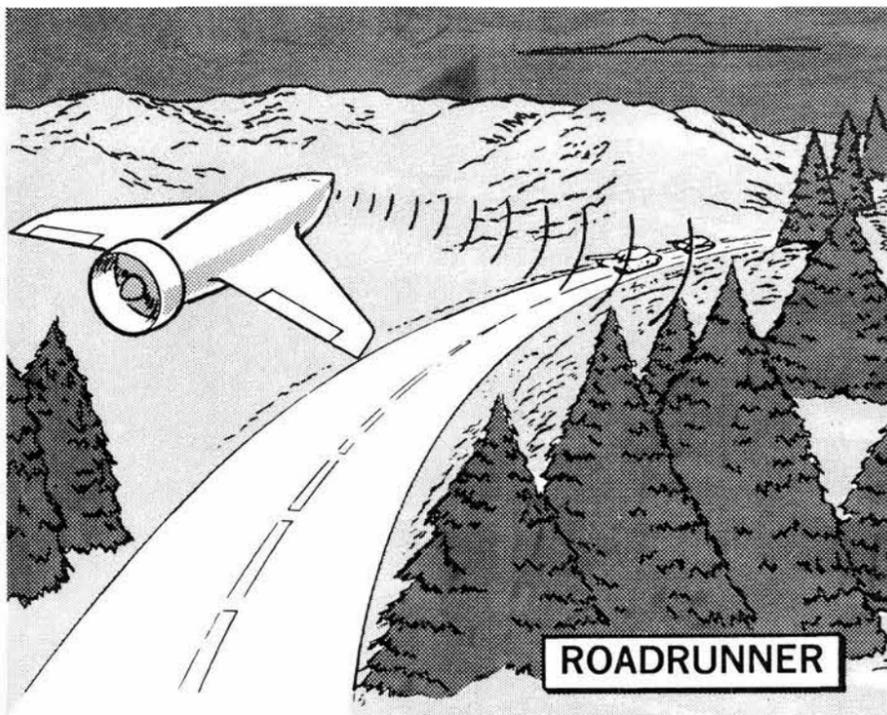


Events Calendar

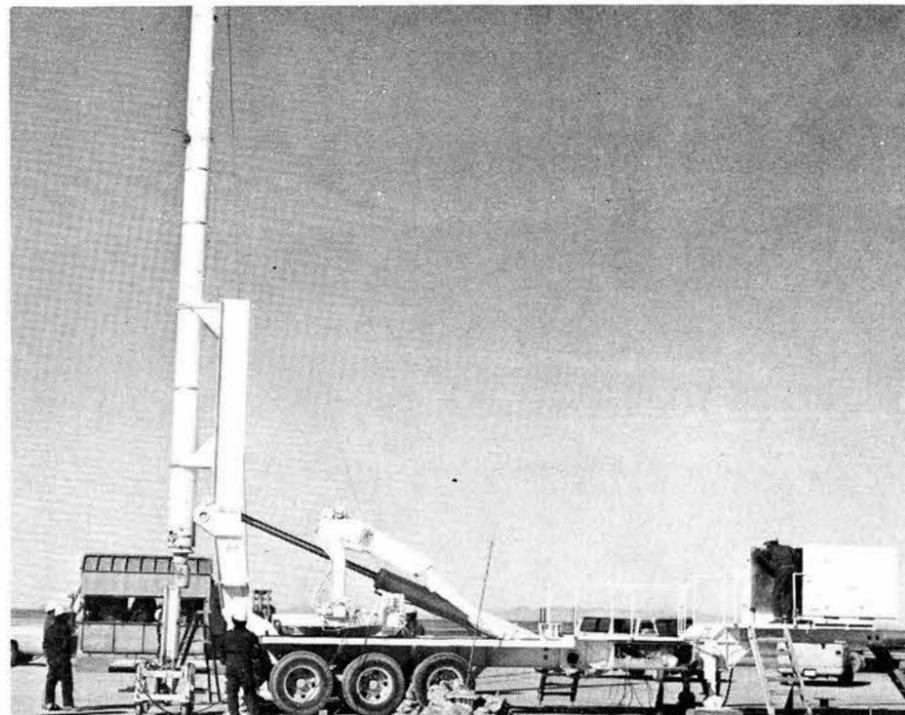
- Aug. 22-24**, *29-31**, *Sept. 5-7**—Albuquerque Civic Light Opera, "Pippin," 8:15 p.m., *2:15 p.m. matinee, Popejoy.
- Aug. 22-Sept. 7*—(Thursdays-Sundays), Adobe Theatre, "Spoon River Anthology," 8:30 p.m., 898-3323.
- Aug. 23-24*—"Feria Artesana," NM Hispano Artists exhibit, Albuquerque Museum, Tiguex Park, 2000 Mountain Rd. NW, Sat. 8-6 p.m., Sun. 9-5 p.m.
- Aug. 24*—The Chamber Orchestra of Albuquerque, 4 p.m., Keller Hall, UNM.
- Aug. 31*—6th Annual Old Time Banjo and Fiddle Contest: bluegrass music, 10 a.m., Santa Fe fairgrounds.

Sympathy

- To Jim Van Meter (1172) on the death of his sister in Mendota, Ill., July 16.
- To John Matsko (1472) on the death of his brother in Cincinnati, Aug. 1.
- To Mike Hosking (5836) on the death of his father in Albuquerque, Aug. 2.
- To Tony Saavedra (1481) on the death of his father in Albuquerque, Aug. 4.
- To John Brane (2454) on the death of his father in Wabash, Ind., Aug. 7.
- To Seyfred Toledo (1472) on the death of his brother in Albuquerque, Aug. 9.



THE FEASIBILITY of Project Roadrunner is under investigation by Exploratory Systems Department 5620. The key is a radar system that can discriminate between concrete, asphalt and highway shoulder material. Such a system could guide this tactical weapon along a road to report back or to attack if it locates a second wave enemy attack involving tanks, trucks or armored weapon carriers.



OLD TECHNIQUE, NEW SETTING. The Davis Gun, one of the mainstays in terradynamic studies that laid the groundwork for earth penetrating weapons like Pershing II, is now being adapted by Exploratory Systems Department for use at ocean depths of 20,000 feet to drive instrumented penetrators 150 to 300 feet into the ocean floor. On-board instrumentation measures and transmits data to surface.

Continued From Page One

Looking To The Near And Far Future

through fiber optics, then a true exclusion region is feasible."

The Exploratory Systems group has other missions, too: "Part of our job is to define good, weapon-related projects for Sandia and then stimulate design and test groups to develop the technology required to support these projects. We're looking at lots of new ideas, most of them weapon oriented. But we're also looking at projects that run the gamut from ocean bottom analysis to lifeboats for space."

Could you describe some of your current projects?

"Let's start with SITAN, the Sandia Inertial Terrain-Aided Navigation System. Like TERCOM, the guidance system now used in cruise missiles, SITAN measures distances to the ground and compares what it sees with a stored topographic map. The critical difference," Max explains, "is that SITAN makes readings and corrections every 30 to 50 metres, far more often than TERCOM. The result is a significant increase in system accuracy, to the order of six to 15 metre CEP."

"We're adapting SITAN for use in advanced cruise missiles and maneuvering reentry vehicles, too—and we're working on a variation called 'Poor Man's SITAN.' In this, the expensive inertial guidance system would be replaced by a simple altimeter, a magnetic compass, and an airspeed indicator."

Another project, this one for DOE, is called Instrumented Sediment Penetrator. An old technique here crops up in a new setting. The Davis gun, a mainstay in terradynamic studies, is being adapted for use at 20,000 feet under the ocean, where it will be used to drive an instrumented penetrator 50 to 100 metres into the ocean floor.

"Our first job is to develop the required velocity," Max explains, "but we also have to communicate with the penetrator since

it cannot be recovered. On-board instrumentation is being designed to measure and transmit data on deceleration, shear strength, composition, and dynamic soil properties."

Another priority project is the Continuous Monitor and Control System (CMCS), informally known as the "smart warhead." This system was first proposed in the 1960s, but the required technology wasn't available. Now it may be. Advances in the electronics technologies have made it possible, according to Max. Key elements are small, low-power microprocessors and memory devices with very large storage capacity.

What will the CMCS do?

"Just about anything you want," Max comments. "It will provide warhead state-of-health indications, for example. Sensors will supply data that tells if the weapon has been exposed to storage environments—heat, cold, humidity—that exceed those for which it was designed. It could also tell you if it had been dropped or injured or if someone had been tampering with it."

Another guidance system is called Roadrunner. "This is a tactical system that will be used to detect and interdict second wave enemy attacks," Max explains. "When tanks, trucks, and armored weapon carriers are on the roads leading to the front, Roadrunner will be sent up the road, flying low and slow, reporting back or attacking what it sees."

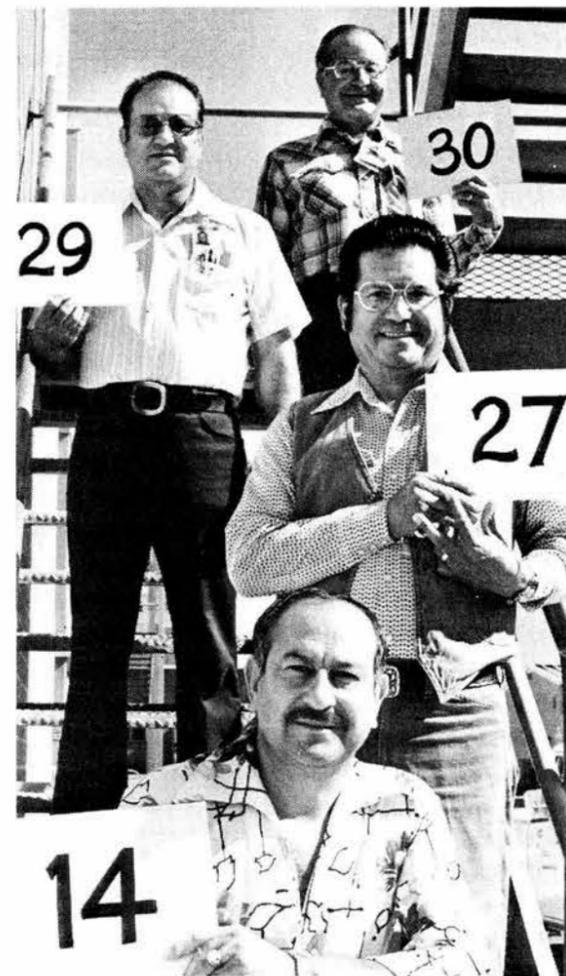
"The basic idea is to guide the system with a radar capable of sensing the difference in reflectivity between concrete, asphalt, and typical highway shoulder material."

How far along is this project?

"The University of Kansas has done some preliminary testing for us that seems to establish that radar can do what we want it to. We're developing a pod right

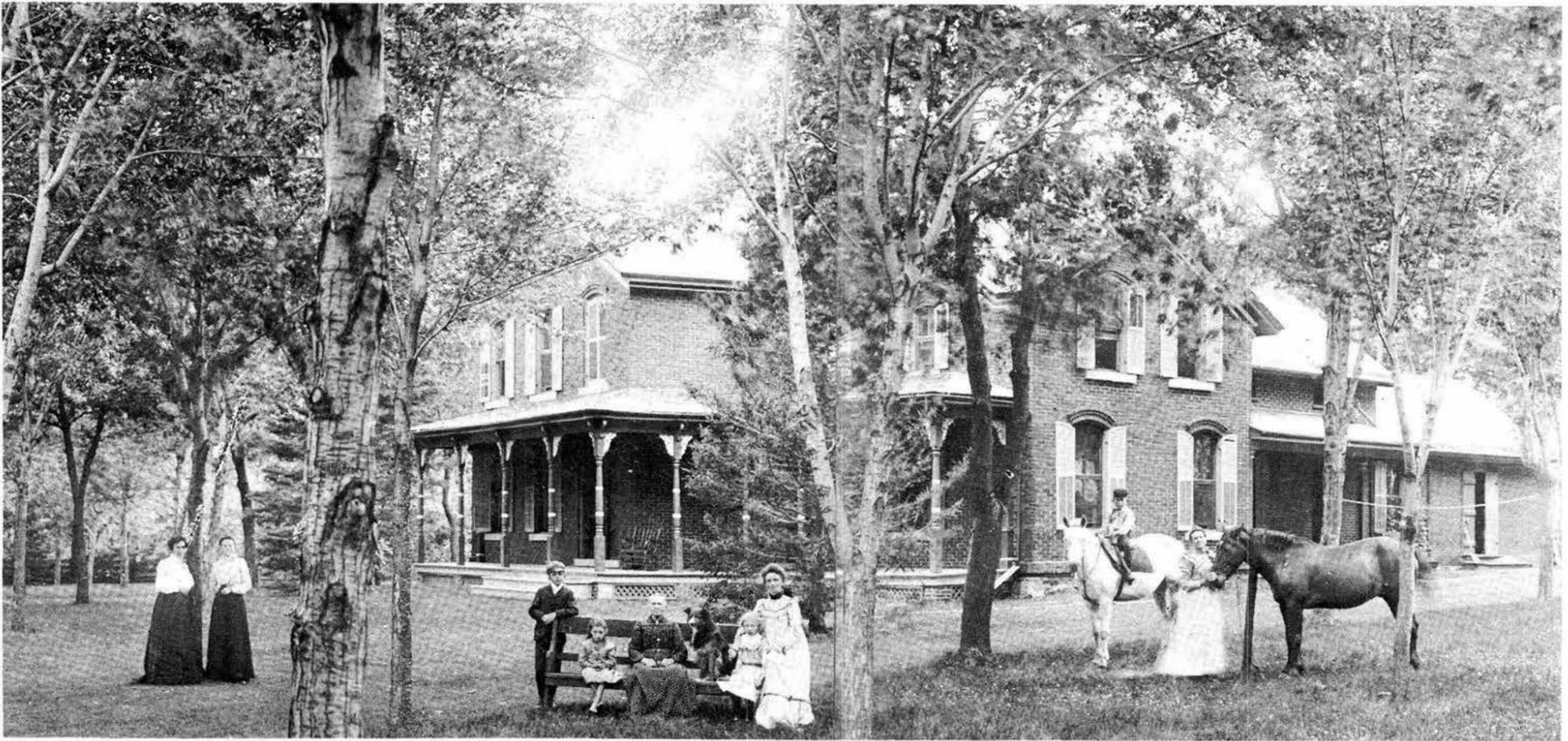
now that will fit under a helicopter so we can make some 'real world' measurements of our own. We can't say yet that Roadrunner is feasible, but it appears to be."

[Editor's Note: Exploratory Systems Department 5620 is also deeply involved in advanced RV work for the Air Force. That work will be the subject of a future article.]



14 + 29 + 30 + 27 = 100 YEARS AT SANDIA for the Cordova brothers. From the top: Sesarío (3613) is leadman for support services, Ernest (1482) is a machinist, Leo (3411) is a property coordinator, and Al (1482) is in the fabrication group of a branch machine shop. Leo explains: "Sesarío liked Sandia so well that he got Ernest to apply; they both talked me into joining them, and then I encouraged Al to move back to Albuquerque from California and join us. We do have two more brothers but they were already into different work when we came to Sandia." when retirement time rolls around, the four Cordova brothers plan to return to the area of their family home at La Joya.

My Favorite Old Photo: [Got an old photo that means a lot to you? Bring it over to LAB NEWS and tell us about it.]



IT TOOK MY WIFE'S GREAT-GRANDFATHER Borene, an emigrant from Sweden, five years (1878-1883) to complete this 14-room brick house in Woodbury, Minnesota—five years and \$5000. In the spring of 1902, an itinerant photographer took this carefully posed picture, creating a mood as evocative as any ever put on film by the great Swedish director, Ingmar Bergman. The matriarchal figure at the heart of the photo is Isabella Borene, my wife's

great-grandmother. Grandmother Clara May Munson, pregnant then with my wife's mother, is at her left. The other figures are neighbor children and at least two more of Isabella's daughters. The longer I look at this photo, the less I see family. These people are part of the saga of emigration and of wresting a new life from a difficult earth. They are strong and they are there to stay, their commitment to the future symbolized by that solid old home of brick and wood and stone. (Chuck Cockerleas - 3162)

feed back

Q. Concerning the "green label" procedure for tapes in the Central Computing Facility, the only thing to which I can certify is that:

a. I have written nothing classified on the tape.

b. The tape contains no classified data to the best of my knowledge and belief.

My question: Am I expected to certify that there is no classified data?

Obviously, I cannot do this unless I keep the tape in my possession at all times, mount it myself, etc.

A. Your point is well taken. We do not, in fact, expect you to certify by your signature anything except that the tape, to the best of your knowledge, contains nothing classified. In response to your comment, we are changing the user responsibility declaration to read, "I assume responsibility for ensuring that these data are unclassified and contain no classified or private information, to the best of my knowledge and belief." We would like users to be aware of security considerations to a more comprehensive extent, however, and have added the note, "You should take reasonable steps to avoid any potential security problems by requesting degaussed tapes and by preventing uncontrolled use of tapes. If you have any reason to suspect a problem, the CCF can provide, on request, a sample listing of tape data or a new tape."

L. E. Hollingsworth—2600

Q. What can be done about the watering schedule near the Wyoming gate? This is the second day this week that the rainbird sprinkler was shooting across the east bicycle path between the housing area and O.C. Road.

A. As you probably know, the area around the Wyoming gate and the watering schedule is under control of the KAFB Base Engineers. We spoke to the Deputy Chief of Operations and Maintenance about the problem of sprinklers being on when people were coming to work and throwing water across the bicycle path. He has advised that during the summer they will start the watering adjacent to the bicycle paths at 5 a.m. and it should be off well before people come to work.

R. W. Hunnicutt—3600

Q. Building 821 in the mornings has been generally 80°F before the air conditioning has been turned on. Would it be feasible to bring in outside air early in the morning, say 3-4 a.m., to cool the building down before the next work day begins?

A. Your suggestion to pre-cool our larger masonry buildings with cooler night air is a good one. The Plant Operating group is experimenting with the various operating modes built into 821 and has not yet gotten to the one you suggest.

Meantime, Plant Engineering is trying out a similar scheme in their building (887). Experience gained there will be evaluated and the findings used on larger structures such as 821.

Thank you for the suggestion and I hope that you will continue to share with us your ideas on energy conservation.

R. W. Hunnicutt—3600

Q. How come Sandia will buy items such as safety boots for employees whose job involves visits to NTS, yet there is no recompense for suitcases worn out on company-required travel?

A. Your concern of items of personal use (clothing, boots, etc.) which are supplied by the Laboratories on certain assignments is understandable. The policy of the Laboratories is that where an unusual work assignment requires protective gear or clothing, the company provides the items needed. Supervisors are responsible for implementing this policy.

Your request for a company-paid suitcase on the basis that the job requires you to travel is not valid. Although the job has an indirect effect on this issue in that it requires appropriate clothing, suitcases and other such items, these items, in fact, are a part of the personal effects required in today's society and business environment. Upkeep and replacement of these items are a part of everyone's living expenses.

C. R. Barncord—3200

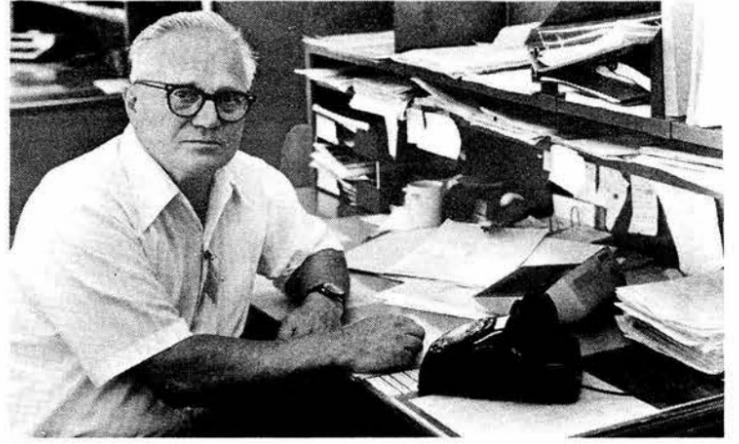
MILEPOSTS

LAB NEWS

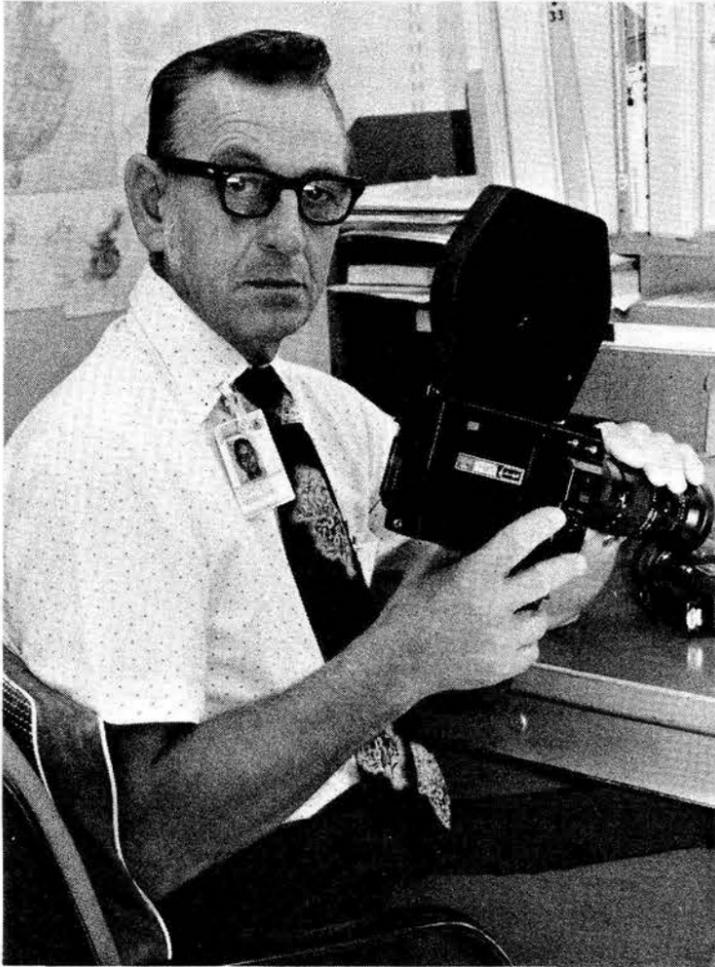
AUGUST 1980



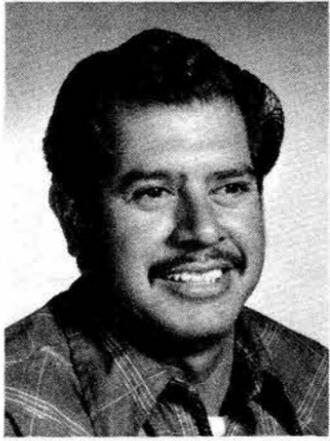
Jerry Slusser - 1132 20



Joseph Suknot - 1485 25



Clayton Henderson - 1754 15



Luciano Molina - 3618 10



Jesus Romero - 3612 10



Richard Berg - 1764 25



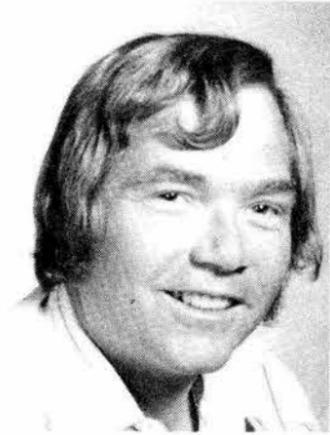
John Logan - 3141 30



Bruce Van Domelen - 2514 20



Curtis McMurtrey - 3432 30



Jeff Tingley - 2141 10



Vaun Atkins - 3612 30



Ed Sims - 3432 30



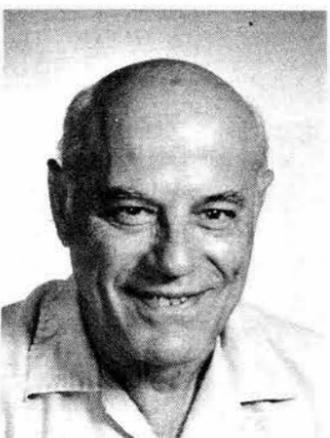
Jake Gonzales - 1481 25



Mary Gilliland - 2452 20



Don Lewis - 2533 30



Oscar Fligner - 4341 30



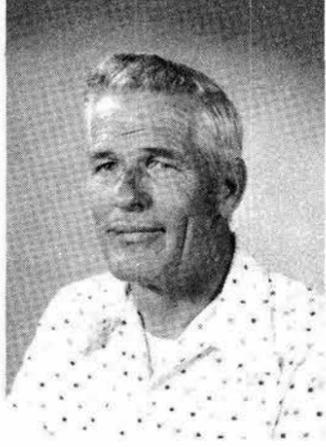
Lucille Sanchez - 4216 10



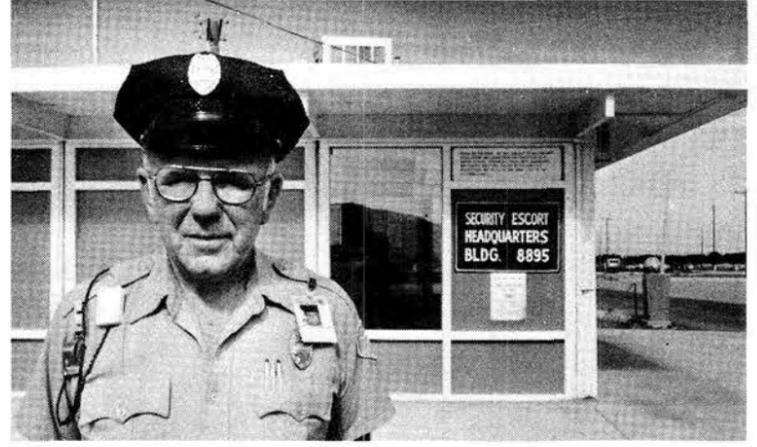
Helen Agats - 1474 25



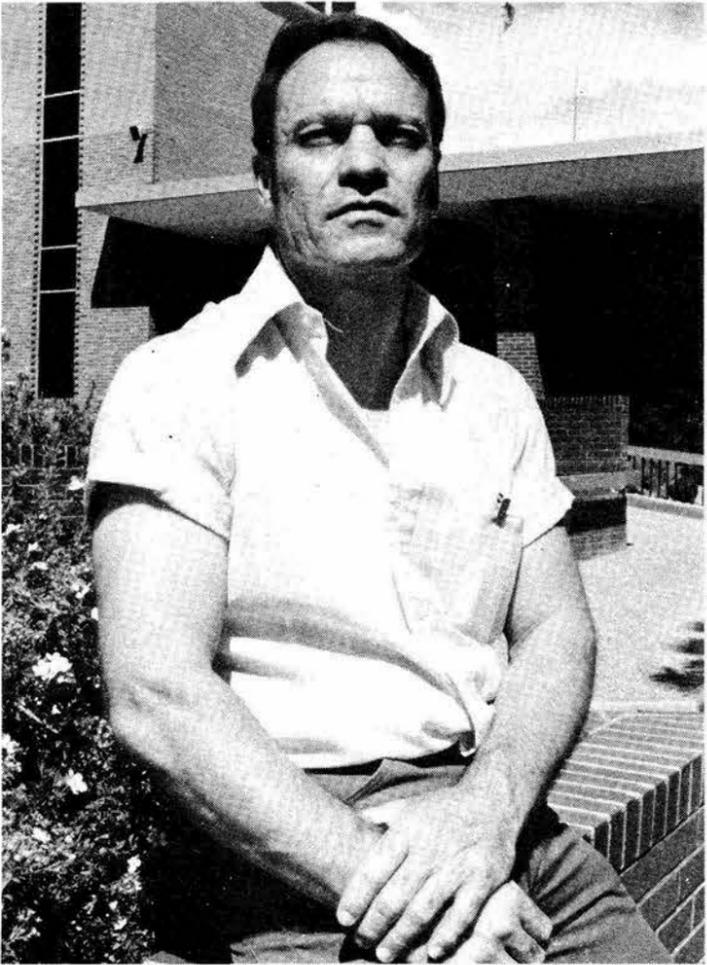
Glenn Guist - 2456 20



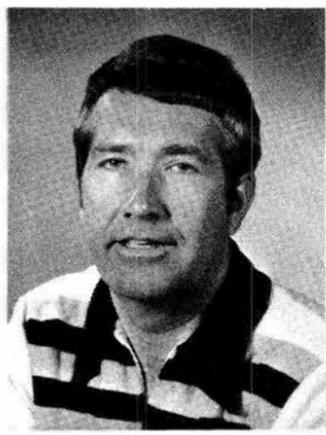
Bob Parker - 1553 25



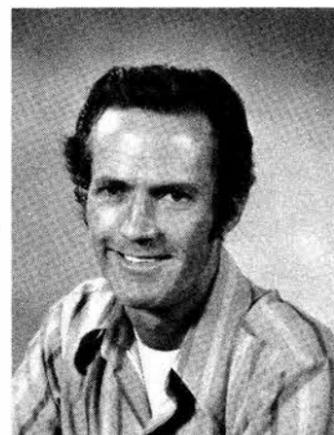
Bob Stewart - 3432 30



Joseph Maestas - 3426 30



Marvin Reichenbach - 2533 20



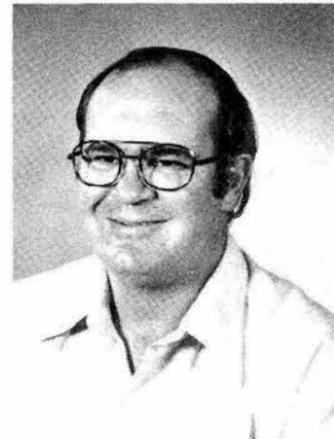
Don Greene - 1481 20



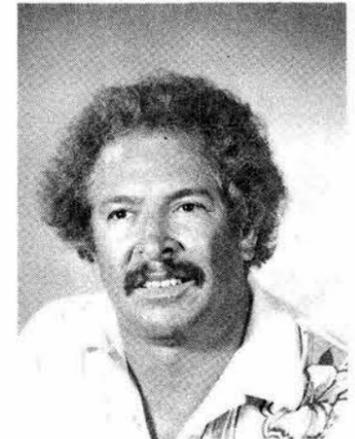
Christine Baca - 3721 25



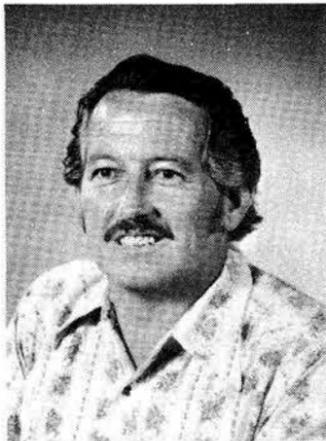
Jim Murray - 2520 30



Robert Cox - 1482 10



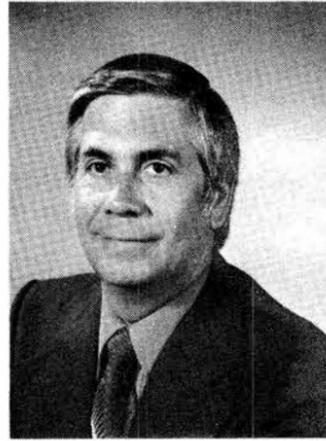
Eddie Torres - 3618 10



Bill Lynch - 2323 20



Gene McGuire - 4211 15



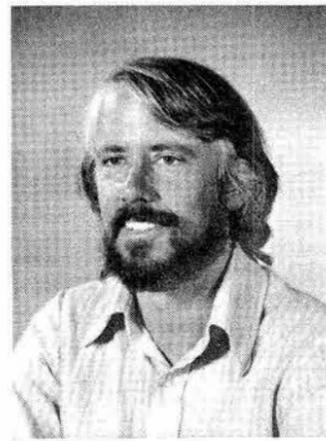
Jake DeVargas - 3241 25



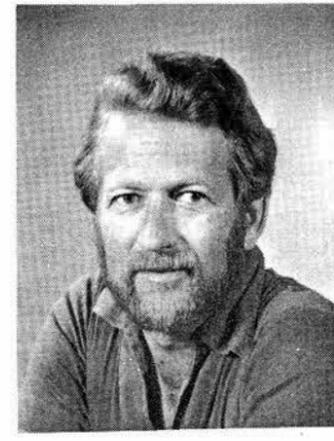
Fred Salas - 3613 15



Verne Honeyfield - 3432 30



John Olsen - 4244 10



Ed Shoaf - 1759 15



Leroy Holmes - 3425 10

THE FACE IS FAMILIAR . . . but the hairline is different. Looking through some LAB NEWS historical stuff dating back to 1958, we came across this shot of a group of DMs at a Bishop's Lodge management conference. How many can you identify? (Answer on page Two.)



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 (M0125).

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 & organization.
9. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

BIKE TIRES (2) & tubes (3), 27x1 1/8, \$8. Dippold, 821-5750.

REFRIGERATIVE air conditioner for vertical window, Penney's 8000 BTU, used 6 wks. Watkins, 883-7071.

SOFA, Henredon, extra long; dining room set, Drexel, hutch-chest, 4 chairs, expandable oak table. Skilern, 298-5150.

LONG WIDE BED for a '69-'72 3/4-ton Ford truck, you pick it up, \$30. Chavez, 842-6374.

SEARS auto air conditioner: condenser, compressor, dryer, evaporator & fan, all hoses, \$130. Paul, 299-6387.

LAWN MOWER, J. C. Penney's, 2 yrs. old, back throw w/grass catcher, \$80. Oleson, 296-2535.

FORD 2-barrel carb., 351 valve covers; 351 Cleveland exhaust manifolds; Amaco motorcycle shock absorbers, best offer. Lewis, 299-7217.

COUCH, 5-piece tan vinyl, \$100. Conklin, 298-8217.

FULL size German violin, 70 yrs. old, \$500; Ibanez mandolin, \$400. Downs, 293-9320 or 294-5283.

CAMPER, 10 1/2' overhead, self-contained, heater, running water, \$650. Padilla, 877-2116.

SOLID OAK stock rack for pickup, fits SWB, \$75. Martin, 869-2049.

MAPLE TABLE & chairs, \$50; 55-gal. drums, \$5; TI 30 calculator, \$10. Patrick, 255-5944.

TWO SEARS Guardsman Ice Trac snow tires. Size: B-78-13 (2-ply), almost new, \$35 for pair. Petersell, 292-0378.

ROTARY TILLER, 5hp, \$200 or trade for ham radio equipment. Fitzpatrick, 294-4758.

BACKPACKING equipment: 1 pack w/frame, 1 Gray goose down sleeping bag & misc. equip. Stewart, 247-2654 after 6.

POOL TABLE, Brunswick 8' w/ball return, cue sticks & balls, \$400 or best offer. Arellano, 298-3938.

SAFETY SHOES, 2 pr. black oxfords, size 11A & 11B, \$12 ea. Sheaffer, 255-9473.

GORDET OBOE, 11 yrs. old, overhauled in '78 by A. Laubin. Wawersik, 884-3940.

SHOT-SHELL WADS Rem. R 12L, \$6/500; HD rear bumper for Datsun or other small pickup. \$50. Svensson, 898-3078.

RAFT, 6-man, reinforced bottom, plywood floor, \$100. Luette, 292-5328.

AUTO roof racks, convert to luggage carrier, \$10; adjustable child's booster chair (auto or home), \$5. Barnard, 256-7772.

TROMBONE, Reynolds Medalist w/ case & music stand, \$150. Durkee, 255-4211.

FALL WEDDING DRESS, New York design, classic style, w/veil, size 9, \$400 new; \$200 now. Hawkinson, 281-5239.

RUG, 12x14, 3/4" nylon pile, pad included. Rhoads, 298-6157.

DUAL 1209 auto. turntable w/audio technica cartridge elliptical stylus, \$35; Unwox steel string acoustic guitar, \$75; lawnmower. Orear, 256-1941.

REFRIGERATOR: deluxe 14.6 cu. ft. Frigidaire, frost free refrig./freezer, copper-tone, \$200. Benson, 268-3586.

HANGING TABLE, redwood burl, gloss finish, macrame hanger. Hesch, 881-9874.

MAGIC CHEF free-standing gas stove, 1 1/2 yrs. old, \$175, will deliver. Kovacic, 281-1754.

LOVESEAT, matching chair, \$150 for both. Helling, 345-0678 or 884-9324 after 5.

TWO UNM basketball season tickets, Section 24, Row 17, Seats 10 & 11. Treadwell, 884-4221.

NEW 600x16 Goodyear 4-ply w/tube on Plymouth, Dodge wheel, \$10 or trade. Stuart, 299-9190.

2 HONEYWELL slave Strobonairs (studio lights), \$90 ea.; Mamiyaflex twin lens reflex camera w/60mm wide angle lens, \$150. Bailey, 299-0184.

LOBO basketball tickets, 2 for '80-'81 season, Section 15, Row 6, Seats 7 & 8. Iverson, 869-2527.

CUSTOM QUILTED king size bedspread, white w/gold & green floral pattern, \$35. Mead, 869-6124.

FLEXIBLE HVAC DUCT, 12" dia., 50' lengths, new, boxed, UL listed, \$50/box. Rowe, 821-1982.

PANASONIC desk lamp, \$5; child's pinball machine, \$6. Robertson, 299-7561.

HUMMEL PLATES, lg. German Shrunck, \$2800; antique Grandfather clock, \$2400. Harvey, 265-3055.

4 EA. 9.50x16.5 Goodyear Traker tires, 8-hole white spoke wheels, 2 hwy. tread, 2 m&s tread, used 4000 miles, \$350 for all. Lewis, 255-3483.

FREE to good home: 1 yr. old dog, female, spayed, sweet tempered, good w/children. King, 281-5832.

BIG MOUTH canning jars. Noel, 266-4669 or 256-3273.

FREE, 6-wk.-old kittens. Walters, 293-5381.

SUNTAN BOOTH, \$35. Smith, 255-5662.

15' TRAVEL TRAILER, ice box, stove, oven, closet, storage, \$1050. Sheives, 296-9780.

TIRES: 4 General JR78-15's on GM 5-hole stock rims, 1 BF Goodrich 195-70 HR-14 w/o rims, \$5 ea. Boettger, 293-5168.

RCA console color TV, wood cabinet, needs picture tube, \$50. Goetz, 293-0893.

CAMPER SHELL, factory fiberglass Ford, equipped w/sliding side windows & overhead light, will fit LWB Ford or Chev., \$350. Snelling, 294-5751.

DREMEL, moto-tool drill press model 210, \$50; Paymaster check writer & projector, \$30; stripped camper for 3/4-ton pickup, w/boot, \$225. O'Neil, 898-5753.

TECH AREA aerial photos, 11"x14", \$3.50; 16"x20", mounted, \$12; Sandia Labs caps, \$4.25. LAB NEWS office, MO-125/Bldg. 814.

REFRIGERATOR, 17 cu. ft., Sears, frostless, top freezer, ice maker, adjustable shelves, humidor, copper-tone, \$300. Rowe, 299-0961.

FOUR Big Foot tires, mounted on deep dish chrome wheels w/baby moons, 6-hole Chev. O'Connell, 836-3700.

TWO Hollywood bed frames, \$16 &

\$18, both adjustable twin/full. Nelson, 265-7482.

HAM RADIO antenna, 4-band vertical trap 40 20 15 10 meter w/radials, \$45. Jensen, 821-6178.

HOLIDAY TRAVELER travel trailer, 20' long, fully self-contained, \$3250. Kepler, 298-5652.

BUILT-IN DESK, 2-dwr., dark oak, formica top, \$30. Luna, 296-5123.

STAMPS: singles, plate blocks, coils, regular issues, commems. & air mails. Rohwein, 298-8391.

CHILDREN'S storybooks, dolls, Matchbox cars & roadway set, bunkie boards, quilting scraps, & more items. Kaye, 293-0499.

PARAGON KILN w/furniture, many extras. Rodriguez, 883-8424 after 5:30.

GARAGE SALE: 10-5, Aug. 23-24, 1101 Georgia SE, furniture, boy's bike, clothes, & misc. Bennett, 268-3726.

GARAGE SALE, Saturday 8/23, 9 to 5: 10-sp. bike, small boards for painting, clothes, books, games, etc., 3407 Georgia NE. Garrison.

ALUMINUM patio furniture; work bench top; AM/FM tuner w/amp; 2 black dial telephones; alum. ice chest. Zucuskie, 881-4086.

PACKING CARTONS, lg. number various sizes, \$25; 36" round table w/leaf, \$20. Sherman, 292-3297.

DRAPERY w/hardware, for 70w x 78h glass door, \$25; 62w x 47h window, \$15; 62w x 34h window, \$15. Hendrick, 296-2163.

BASKETBALL TICKETS, two Lobo season tickets, \$140, section 17. Hawn, 298-1231.

TRUMPET, Bundy student model w/case, \$195. Gammill, 299-4702.

BAR; AM-FM radio w/turntable & more. Sandoval, 262-1011.

STIHL CHAIN SAW, Model 015, w/extra chain, case, sharpener, \$110. VanDenAvyle, 898-6474.

WATER SKIS, Bassett Honeycomb, Graphite 7000 65", Bassett vest, adult extra small, used 3 times, \$175 or best offer. Broyles, 262-0530.

COUCH, French Provincial, \$150; fertilizer spreader, \$15; antique elec. calculator, \$10; Frieden elec. calculator, \$25; wine rack, \$10. Botner, 298-6007.

TUXEDO SOFA; area rug; red Lazy Boy chair; mathematics, literature & children's books; horse models; wood table, chair. Boes, 292-1690.

RUGER model 77 30.06, new \$289, sell \$200. Montano, 898-9127.

TRANSPORTATION

'79 MAZDA RX7-GS, silver, air, alloy wheels, 19,000 miles, \$8500 (\$1800 under '80 model). Dippold, 821-5750.

'71 OPEL, 1900cc engine, 4-spd., \$800. Jones, 292-2787.

'69 OLDS Cutlass, \$200. Chavez, 842-6374.

'68 CESSNA 150, 2500 hr TT, 900 hrs SMOH fresh annual, Coronado Airport N22329, \$6200. Bass, 821-6365.

'80 BMW 320i, AT, AC, AM-FM-cassette, alloy wheels, Perelli's, bug screen, 6000 mi., white/tan, \$16,500. Rodriguez, 294-0403.

MOPED, Smily 50cc two stroke, auto. clutch, 500 miles, \$350 or trade for amateur radio equip. Fitzpatrick, 294-4758.

'68 BUICK convert., Electra 225, PS, PB, AC, \$2800 or best offer. Pryor, 344-2931.

'79 DATSUN 280 ZX, 5-spd., reg. gas, AM-FM, AC rear window defogger, best offer. Shay, 299-2634.

'72 NOVA 2-dr., 307 engine, one owner, complete records, \$750. Sheaffer, 255-9473.

'78 OLDS wagon, Custom Cruiser, loaded, low mileage. Sherwood, 299-2169.

'71 FORD LTD convert., totally rebuilt, AC, PS, PB, stereo, bucket seats, 9000 miles, \$2200 firm. Yaniv, 881-8085.

'79 PONTIAC Bonneville 4-dr., AT, AC, AM-FM-stereo cassette, take over payments. Sheffield, 293-5237.

'72 VW BUS, AM-FM-tape, SB radials, extra studded snow tires, top rack, front spare, dual port 1800cc, \$2250. Baxter, 344-7601.

'72 KINGSWOOD 400 stn. wgn., AT, AC, PS, PB, \$600. Westmark, 296-0198.

'71 AMC Hornet, std., 4-dr., green, AC, reg. gas, 41,000 miles, \$1400 or best offer. Martin, 296-8249.

'74 SUZUKI motorcycle, TS-185 Enduro, 7950 miles, street and/or dirt, turn signals, luggage rack, knobby rear tire, \$450. Schkade, 844-5385.

'61 HARLEY Sportster, many improvements, make offer. Senglaub, 299-6255.

'75 TOYOTA Celica ST, 38,000 miles, AC, AM-FM-stereo, \$2750. Burnett, 294-4555.

'71 VEGA, cylinders have been bored, sleeved, make offer. Mikkelsen, 881-3921.

'66 CORVETTE, 2 tops, new radials, 327 cu. in. Hawkins, 298-6321 after 6.

'73 CHEVY 1/2-ton pickup, 454-4661, 8' bed, dual tanks & exhaust, AT, AC, PS, PB, 87,000 mi., \$1400. Boettger, 293-5168.

'78 280Z, AC, AT, AM-FM stereo, new BF Goodrich radial T/A's, Keystone mags. Season, 293-4820 after 5.

SCHWINN Varsity 27" 10-speed w/generator headlight, \$55. Cox, 255-4753.

SCHWINN 20" boys' bicycle, Motocross equipped, \$38; Huffy 20" boys' bicycle, \$18. Snelling, 294-5751.

'71 GMC Jimmy, 2-wd, 58,000 miles, V8, 4-spd., HD radiator & clutch, limited slip. Abel, 296-6089.

'73 SUZUKI GT 380, 6400 miles, \$500. Rowe, 299-0961.

'70 CAMARO, 6-cyl., AM radio, new tires, black vinyl top, \$775 or best offer. Carlson, 296-1370.

'74 PEUGEOT 504 stn. wgn., 4-spd., radio, radials, metallic green, \$2475; '66 Volvo engine. Nelson, 265-7482.

'70 LEMANS Pontiac, \$500. Peoples, 877-3942.

'72 MONTE CARLO, reg. gas, PB, PS, AT, AC, radio, \$1350. Clark, 298-4913.

'71 HONDA TRAIL 90. Boeck, 298-6495.

'71 CHEVY DUMP TRUCK, rebuilt trans., \$1000; take over payments; rebuilt '72 Ford eng., 351c, \$500; misc. parts. Apodaca, 831-5534.

'77 HONDA CVCC, 5-spd., yellow. Ripi, 884-4683 after 5.

BICYCLES: 26" women's 3-spd., \$75; boys' 20" dirt bike, \$55. Hawn, 298-1231.

'78 CHALLENGER, 2.6 litre, 5-spd., AC, AM-FM-tape stereo, 27 mpg city. Clay, 265-5188 after 6.

'79 CAPRI RS Turbo, PS, PB, AC, AM-FM cassette stereo, 4-spd., 18,000 miles, new tires, \$7500, flexible. Roberts, 265-3281 evenings.

REAL ESTATE

HOUSE, NE, \$16K down, \$53K total, assume loan. Ortiz, 299-3372.

ONE ACRE North El Cerro Loop, easy access, utilities & irrigation, terms available. Gallegos, 266-8884 after 5.

MOBILE HOME, 1979 Redmann, 14'x60', 2-bdr., 1 1/2 bath, completely furnished, storm windows. Blaine, 869-6584.

CORNER LOT in NE, sidewalks, curb-gutters already in. Sheffield, 293-5237.

JEMEZ MOUNTAIN land, 1.2 acres near Cibola Creek & fish hatchery, elec. service available. Jensen, 884-5318.

ASSUME 9 1/8 non-escalating mortgage on 4-bdr. Territorial in New Holiday Park, FR w/fp, DR, \$78,500, 4809 Danube NE. Davidson, 293-9486.

2200+ SQ. FT. HOME on lg. lot Paradise Hills, \$59,900, 10185 Norwich Ct. NW. Skender, 898-5647.

3-BDR., many trees, 2-car garage & more, near Lomas & Tramway, \$57,000; 1/4 acre 1/2 mile N & E of Bella Vista, elec. & water. Gallo, 296-0112.

MOBILE HOME, 3-bdr., walk-in closets, 2 bath, LR w/fp, carpeting, family section Four Hills, \$28,500. Tye, 293-6961.

VALLEY HOME, lg. passive solar family room, fenced yard, landscaped 0.3 acre, 1780 sq. ft., assume 8 1/2 loan. Stephenson, 296-9330.

3-BDR. HOME, new roof, 9 1/2% assumable loan, 1321 Erbbee NE, \$47,800, \$312 PiTi. Lanes, 294-7635.

3-BDR. HOME, mountain view, 1700 sq. ft., Wyoming bus line to Labs, \$72,000, can finance. Ronan, 268-0726.

BRICK 3-bdr. custom home, side yard access, wood floors, \$85,000, negotiable down, 10408 Chapala Pl. NE. Barth, 299-2668.

'79 MOBILE HOME, 3-bdr., 2 full baths, skirted, porch, all appliances, coolers, Morgan shed, landscaped, Four Hills MP. Banach, 292-0788.

FOR RENT

ROOM in private house, share plenty of living space, \$100/mo. plus share of utilities, college age preferred. Menaul-Eubank area. Cosden, 296-1220 or 881-1412.

WANTED

1967 EL CAMINO pickup front end (hood & fenders); will trade for '64 El Camino front end. Gonzales, 836-0224.

PICKAXE, grub hoe, 2" pipe cutter, 1/2" break-over socket handle. Windham, 293-8107.

AMATEUR RADIO, 5-band SSB transceiver & power supply or beam antenna & rotor; would like to trade for moped & rotary tiller. Fitzpatrick, 294-4758.

WISH to rent motorhome in Albuquerque Oct. 25, 1 week; please call or write 1462 Vancouver, Livermore CA 94550. Tapp, 415-447-7251.

14' ALUMINUM boat w/trailer. Lenander, 256-0777 or 255-0272.

GOLF CLUBS, men's right-handed, need woods & irons. Kelsey, 266-6460.

CAMPER JACK, a pair for use w/compact truck camper. Kepler, 298-5652.

SINGLE WOMAN to share Bear Canyon Townhouse w/elderly lady, private suite, prepare evening meal, free room & board plus payment. Broyles, 344-3872.

CORVETTE, prefer '73 or newer, willing to trade '79 CJ5 Jeep. L'Esperance, 821-2872 after 5.

SHARE-A-RIDE

INTERESTED IN GETTING INTO CAR POOL, reside on Sunset Rd. SW, 1/2 mi. S of 5-Points area. Pederson, 844-1004.

La Ultima Plays Tonight

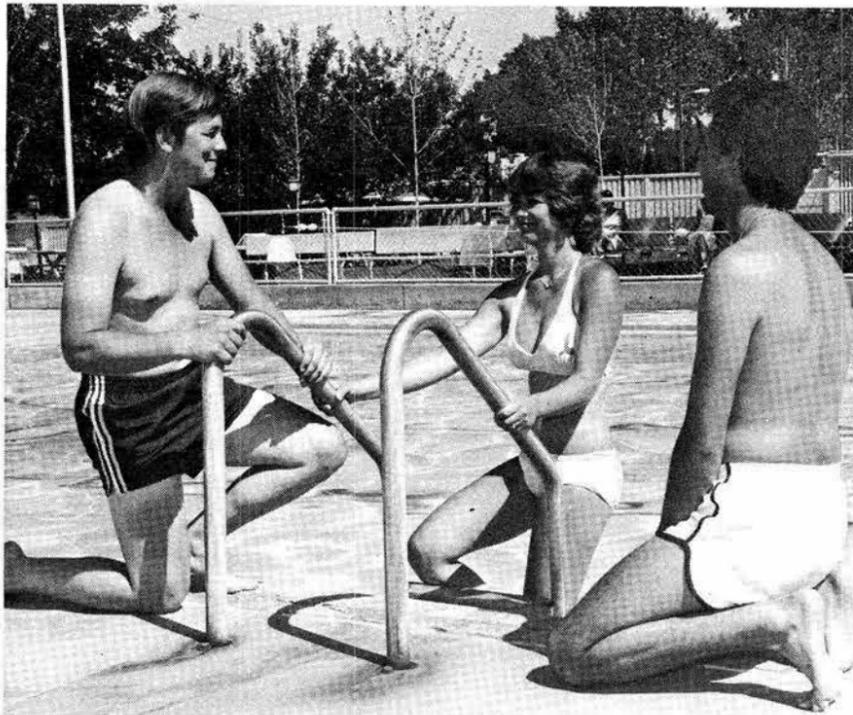
TONIGHT at Happy Hour, La Ultima—one of the most danceable musical aggregations in the city—plays the ballroom from 8 until midnight. Terriyaki beef kabobs are featured on the buffet menu. Next Friday's Happy Hour sees the Scotsmen Quintet on the bandstand, Gene Corbin in the lounge, and steamboat round of beef on the buffet. To reserve buffet tickets, call the Club office, 265-6791, by mid-week.

TOMORROW is a 1950's special at the Club as the membership celebrates its 30th birthday. Youngblood plays music with melodies and words you can understand, the dinner spectacular is veal a la Oscar, and a birthday cake and champagne are part of the planned festivities. Call the Club office *right now* to find out about reservations.

REGISTRATION for the Club's first Annual "Fun" Golf Tournament closes *today* at 5 p.m. Pay your \$5 entry fee at the Club office. Tournament Director Ivars Gals (1725) promises an unusual and fun-filled meet loaded with laughs and lots of prizes. The match starts "around noon" at Tijeras Arroyo golf course and ends with a cocktail party in the El Dorado Room at the Club that evening.

CORONADO GRAND SQUARES graduates their latest beginning square dance class at a party at the Club on Monday, Aug. 25. Club dancing is scheduled from 8 to 10 p.m. with John Lewin calling. Special party refreshments are planned. Guest dancers welcome.

The Grand Squares' Fall 1980 program starts Monday, Sept. 15, with a new format offering (for those who took a summer vacation) a chance to get back into the



SWIM SEASON ends Labor Day, Sept. 1, with a pool and patio party at the Coronado Club starting at 11 a.m. Games and contests for kids, teenagers and adults — diving for coins, water balloon races, biggest splash contest, and family sand castle building — are planned to run all day. Inviting you to the festivities are Dave Mills, Charlene Argo and Eddie Lopez (all 3154-3).

square dancing swing. John Lewin will conduct a workshop from 7 to 8 p.m. each Monday evening followed by club dancing from 8 to 10. Contact Marti and Wayne Bell, 821-7148, or Marv and Nadyne Plugge, 299-5634, for details.

1-5, has been reduced to \$568/person, double occupancy; reservation deadline is Aug. 29.

See Travel Director Frank Biggs in the Club lobby tonight between 6 and 7 for the full scoop and information brochures.

THE CORONADO CLUB Jr. Bowling League organizes Saturday, Sept. 6, at San Mateo Lanes starting at 8:45 a.m. Youngsters age 8 through high school are welcome. The league bowls every Saturday morning. Three lines cost \$2. For more details, call Cis Kelly (3542), bowling coach, on 255-8011 after 5.

ANNUAL MEETING of the Coronado Club membership is scheduled Sept. 8. Eight members for the Board of Directors will be elected.

TRAVEL PACKAGES offered by the Club include Mesa Verde and Canyon de Chelly ruins tour, Aug. 30-Sept. 1, \$120; Canada, Sept. 25-Oct. 4, \$941; Cumbres & Toltec Scenic Railroad excursion, Sept. 27, \$43; Rose Bowl Parade/Disneyland/Animal Safari Trip, Dec. 28-Jan. 4, \$315.

Cost of the Washington, D.C., trip, Oct.



LA ULTIMA plays for dancing tonight in the C-Club ballroom. The group also has a new recording—"Volver, Volver" and the flip side, "El Himno Guerrero de la Republica." Sandians in the group are Yolanda Armijo (3001), Bob Ezell (3155), Pete Gallegos (2327) and Paul Metoyer (3430).



TOM LENZ is the new Recreation Manager for the Coronado Club (replacing Skip Dougherty, now a denizen of Gardenswartz Sportz). Tom comes here from UNM where he was a teacher in the recreation program. Previously, he worked for BIA as a recreation specialist. At the C-Club he'll be handling the many sports programs offered to employees—you can reach him on 4-8486.