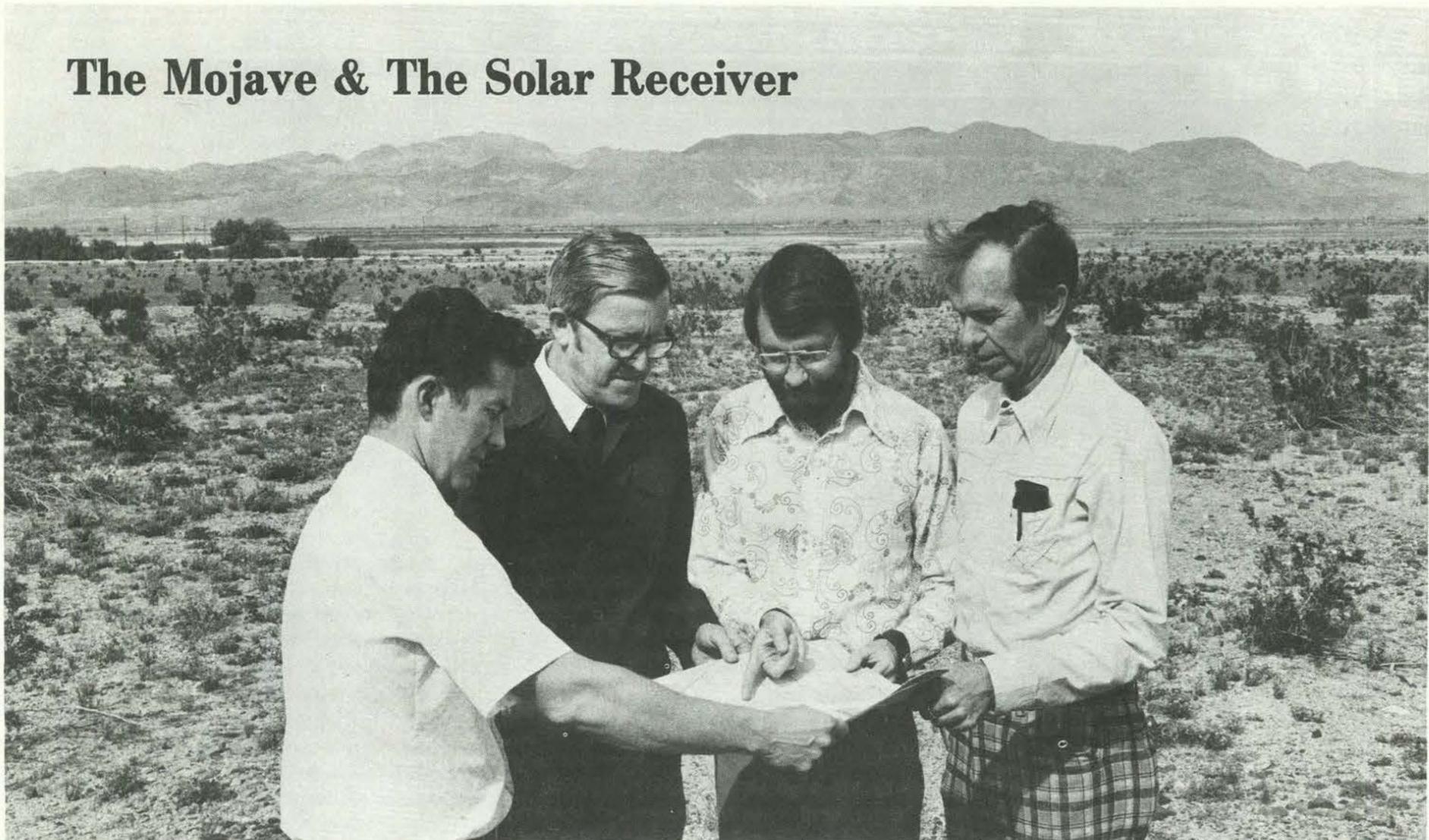


The Mojave & The Solar Receiver



REVIEWING plans near Barstow, Calif., at the desert site selected for ERDA's first solar electrical pilot plant are (from left) Norman DeHaven of Southern California Edison; Al Skinrood, supervisor of SLL's Solar Energy Technology

Division 8184; Richard Schweinberg, Acting ERDA Project Manager, Central Receiver Pilot Plant; and Robert Hughey, Program Coordinator, ERDA/SAN. (See article on page three.)

LAB NEWS

VOL. 29, NO. 6

MARCH 25, 1977

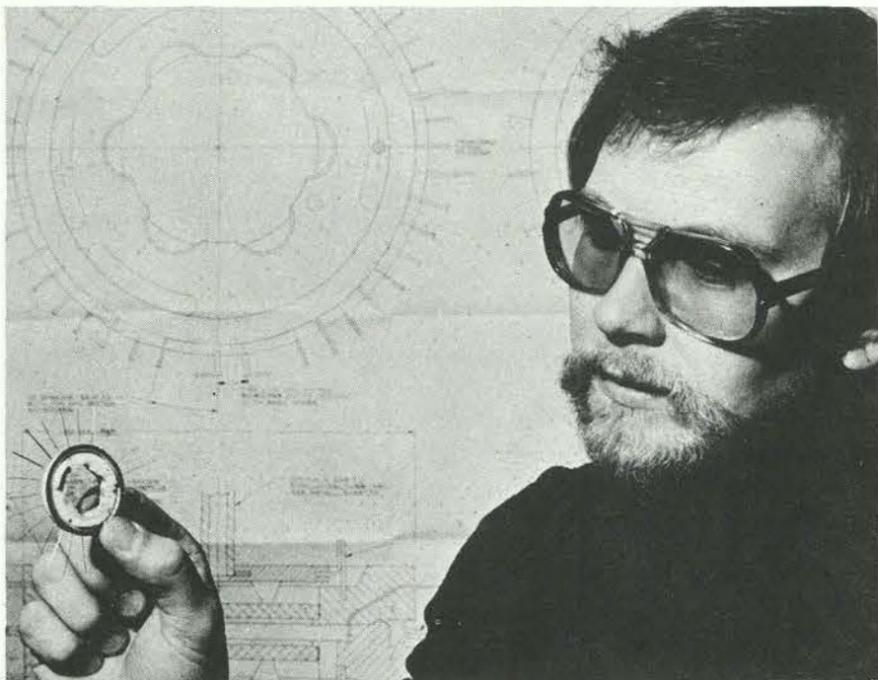
SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

SAVING TIME, MONEY

Unique And Useful — It's Glass Ceramic

A unique class of ceramic materials is being developed by Ceramics Development Division 5845. Called glass ceramics, the materials offer a new degree of design flexibility to Labs engineers — properties may be “tailor-made” to suit a particular application.

Glass ceramics are prepared by melting a mixture of metal oxide powders to form a homogeneous glass which is then crystallized or “ceramed” with a carefully designed heat treatment. Pyroceram cookware is a familiar glass ceramic. It has such a small thermal expansion that it can survive the thermal shock of direct transfer from freezer to oven.



CLIFF BALLARD (5845) displays a glass ceramic to stainless steel seal which provides for 56 separate electrical feedthroughs. The seal is part of a prototype device designed at LASL to operate within a nuclear reactor.

In developing new glasses and glass ceramics for Sandia applications, Division 5845 works closely with Ron Snidow's staff

in the Glass Formulation and Fabrication Laboratory 9571-4. Together these groups are making complex components for both weapons and energy applications from glass ceramics.

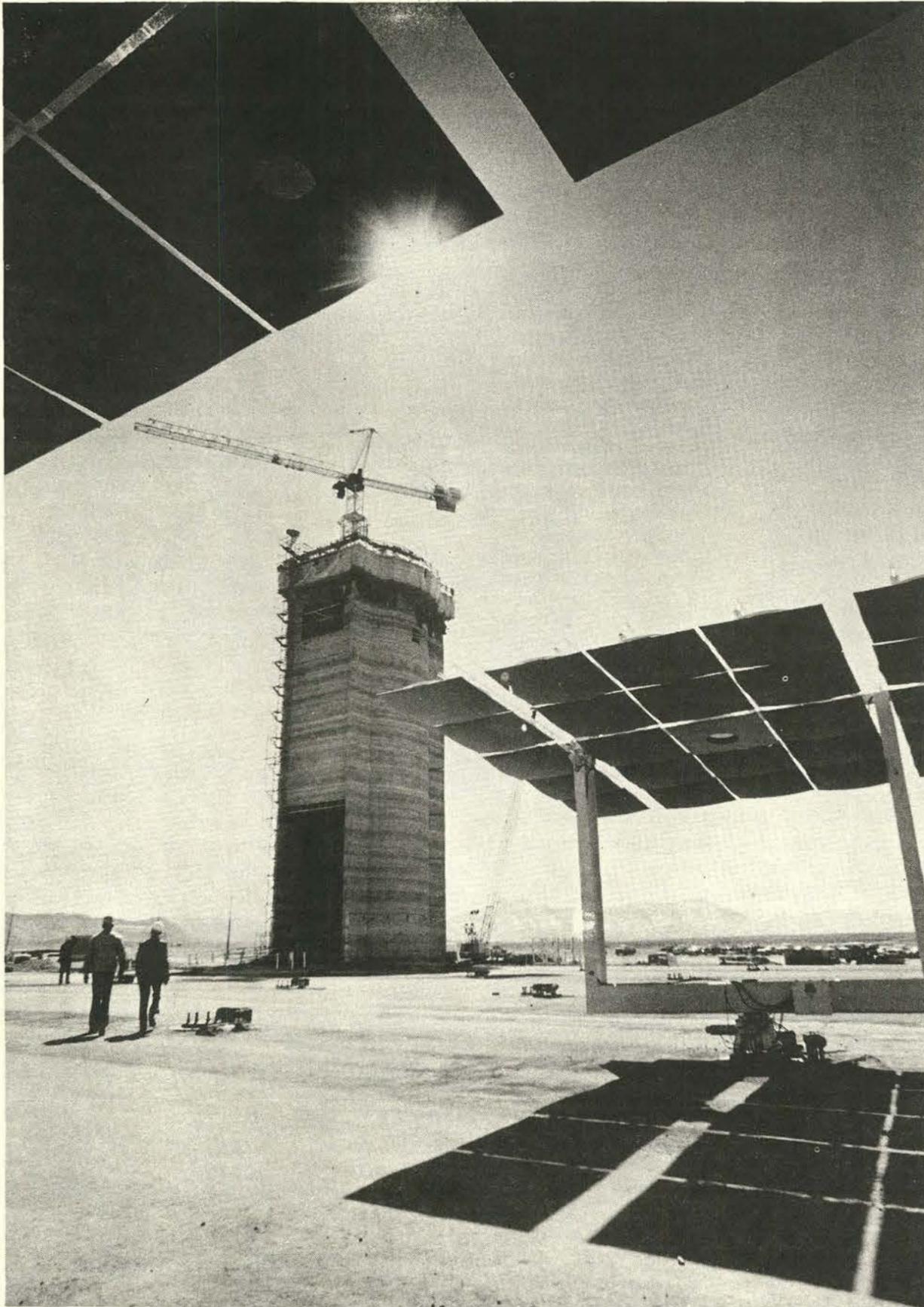
Bob Eagan, Division 5845 supervisor, says, “Cost reduction, reliability and ease of fabrication are the primary motivations for developing new glass ceramics. Our prime interest to date has been making glass ceramic-to-metal seals. We feel that we can provide a better product, using glass ceramics, at about half the cost of conventionally brazed ceramic seals.”

First Sandia application of glass ceramics is a neutron tube designed by John Crawford's Vacuum Tube Department 2350. This glass ceramic seals directly to molybdenum, matching its thermal expansion exactly.

More recently, Cliff Ballard (5845) has developed a new family of materials that illustrate the design flexibility offered by glass ceramics.

“To survive severe environments many of

[continued on page four]



"SLIP FORMING" is method used to construct the power tower of Sandia's Five MW Solar Test Facility south of Area III. Form near top is jacked up after each concrete pour and positioned for the next. Progress: about 2 metres per day. Completed tower will stand 60 metres high (the height of a 20-story building). Through the door at ground level, 17 metres high, will pass the solar receiver which then will be elevated to perch on top of the tower. Five heliostats, of planned 222, are now positioned. Facility should be completed in October.

Sandia Announces Shorter Route to Masters Degree

For outstanding employees who now hold a bachelors degree, the route to a masters (and possible reclassification to staff member) has been shortened. The Labs' Education Committee under VP Gene Reed (2000) has revised the graduate education program to provide two new paths to the masters degree. Time to complete degree requirements under this program revision now ranges from one to two years; under the Educational Aids Program, work on a masters degree normally takes about three years.

Selection requirements for the new program are high. Besides a BS degree, applicants must have three years of Sandia service. Work performance at Sandia as well as prior academic work must be outstanding. The eligible fields of study include engineering and engineering-related disciplines but not mathematics, physics or chemistry. Nomination is by the employee's director to the Univ. Programs Committee, which then makes selection for the program.

Successful applicants will pursue one of two courses of study. The University Part Time program calls for enrollment at a local university, aiming at matriculation in two years while employee works at least half-time (full time during the summer). There is no reduction in salary. Under the One Year on Campus program, the employee attends a university full-time for one academic year, which is normally sufficient to gain the graduate degree. The school is selected jointly by the employee and his or her supervisor. Salary is \$700/month while the participant is in school.

Upon successful completion of the masters program and reclassification to staff level, the employee's salary is adjusted to a rate reflecting MTS/MLS/MAS status, educational level, and professional experience.

Further details on the new masters program are carried in Sandia Bulletin, Vol. 29, No. 8, dated March 17.

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lorena schneider reports on livermore

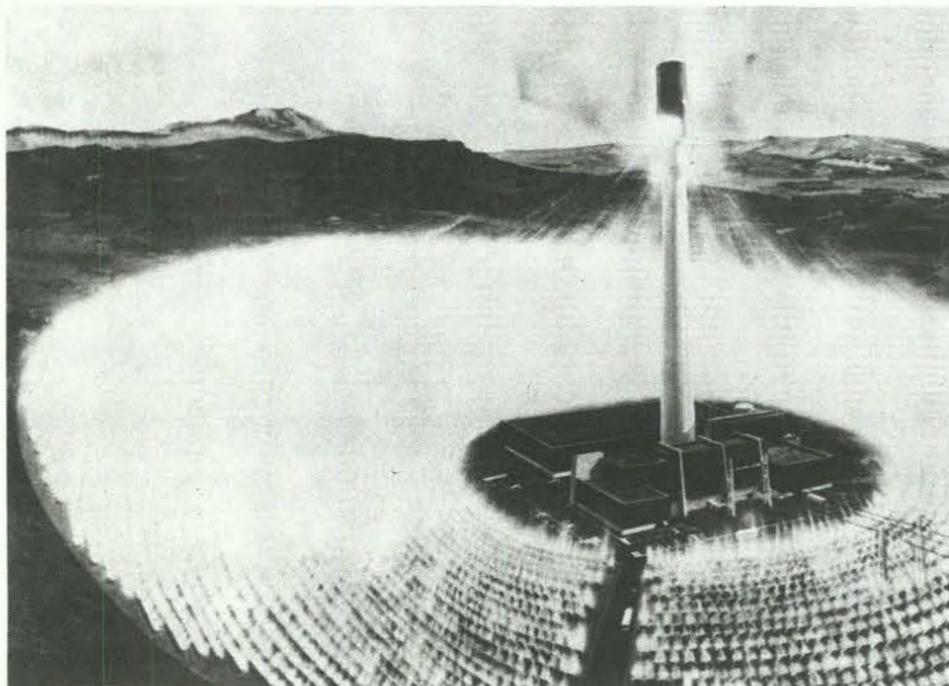
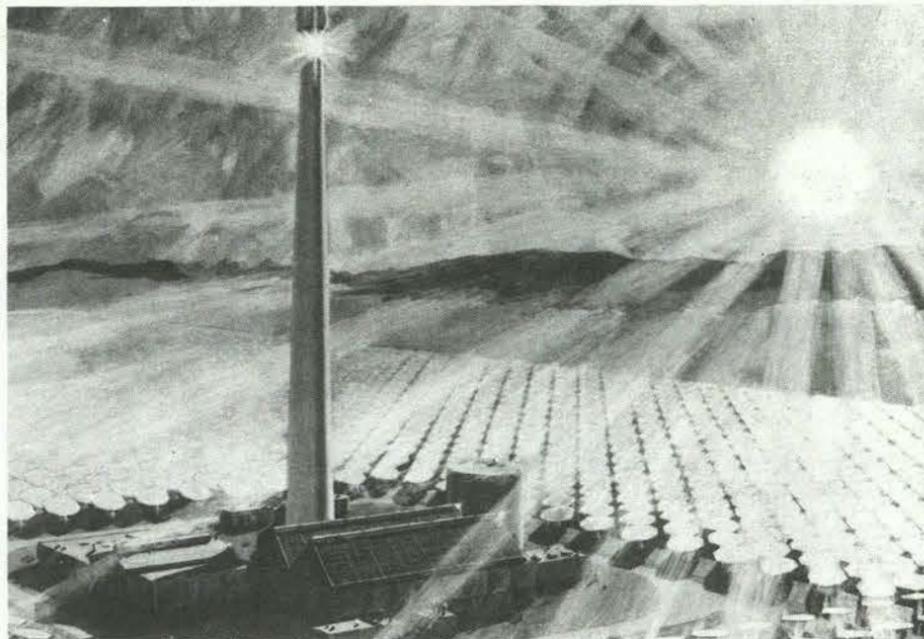
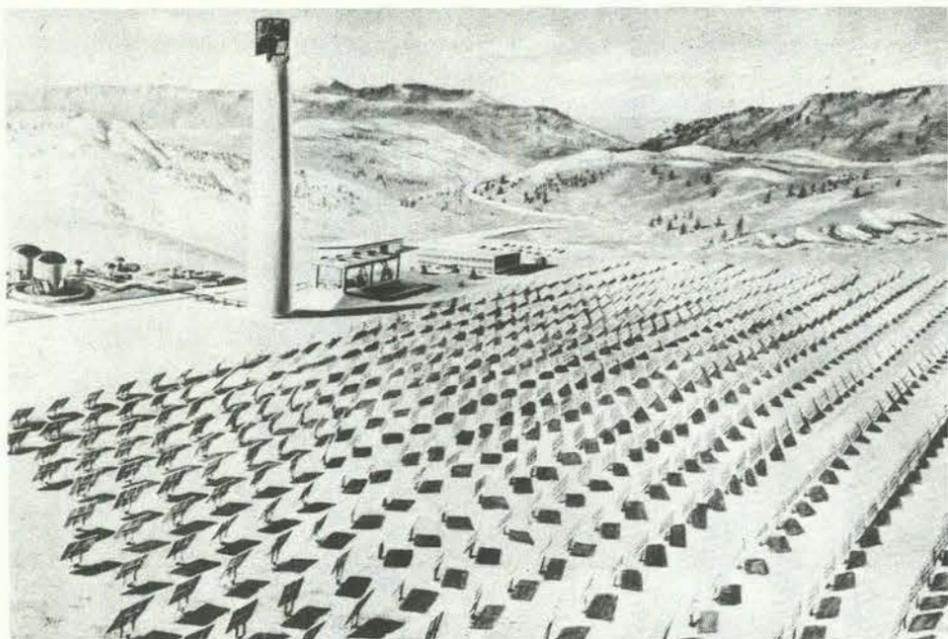
Retiring



Woody Wood (9571) Ellen Wood (9753)



Betty Pickel (3700)



THREE CONCEPTS for the central solar receiver: Martin Marietta's (upper left) receiver is north-facing while thermal storage tanks are at left and electrical generation system is in open structure near base of tower. In the McDonnell Douglas design (above), the heliostat field surrounds the thermal storage tank, tower, and electrical generation subsystems. Honeywell's design (left) places the electrical generation subsystems and thermal storage at the base of the tower. Sandia will recommend one of the three concepts by July.

LIVERMORE NEWS

VOL. 29, NO. 6 LIVERMORE LABORATORIES MARCH 25, 1977

SLL IS TECHNICAL MANAGER

Mojave Desert Is Site For Central Solar Receiver

A site in California's Mojave Desert near Barstow has been selected by ERDA for its first solar electric pilot plant. Technical management of the development phases of the project is being provided by Sandia/Livermore.

A team of utility companies headed by Southern California Edison is providing the site and will operate the 10-megawatt electrical generating plant when construction is completed in 1980. Other participants include the Los Angeles Department of Water and Power and the California Energy Resources, Conservation and Development Commission.

The solar pilot plant is a first step in the demonstration of the central receiver concept: an array of individually guided mirrors (heliostats) redirect the sun's energy to a central receiver or boiler mounted on top of a tower. In the receiver, the radiant solar energy heats a circulating fluid which then drives a steam turbine generator (to produce electricity), or the fluid is transferred to a storage system for later use.

Project Manager Cliff Selvage (8180) states, "From the pilot plant, we'll get operating and economic data both for a plant of that size and, by scaling, for future commercial-size plants."

Selection of the team of utility companies was made from a field of three finalists after evaluation of proposals based

on criteria which included site characteristics, proposer participation, ability to meet required schedules and cost sharing.

The utility team is providing the required 130 acres of land, steam turbine generator and electrical switching equipment. The team will operate and maintain the facility for two to five years, participating with ERDA and SLL in design of the entire plant, selection of the solar portion of the system, preparation of pilot plant test program, and evaluation of data from the tests.

Currently, Cliff's group at Livermore, headed by Al Skinrod (8184), is giving technical direction to the work of the four contractor teams developing the components and preliminary designs for the plant. The Honeywell and McDonnell Douglas teams envision a tower surrounded by a heliostat field, while the Martin Marietta approach is to locate the tower on the south edge of the field. Boeing, developing only heliostats, is using the McDonnell Douglas system approach with its collector field configuration.

After the final system design recommendation is made by Sandia in July,

verification of the receiver portion of the design will be undertaken in tests conducted at the five-megawatt solar thermal test facility now under construction at Sandia Albuquerque.

Total capital costs for the project are expected to be more than \$100 million.

Sympathy

To Chris Fultz (8256) on the death of his father-in-law in Oakdale, Calif., Feb. 25.

To Gordon Ross (8212) on the death of his mother in Knoxville, Tenn., March 4.

To Val Cowan (8300) on the death of her father in Santa Clara, Calif., March 6.

Congratulations

Dennis Sartori (8432) and Joanne Della Santana, married in San Francisco, Jan. 9.

Mr. and Mrs. John Keilman (8122), a daughter, Heidi Marie, Feb. 6.

Jeff Tong (8431) and Elaine Yoshitomi, married in Carmel, Calif., Jan. 22.

Mr. and Mrs. Jim Pergrossi (8365), a son, Brett James, Feb. 28.

Mr. and Mrs. Rocky Bouscal (8257), a son, Jess Daniel, Feb. 15.

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LAB NEWS
MARCH 25, 1977



Glass Ceramics

our components must be fabricated with high performance alloys," says Cliff. "An example is a prototype switch housing being developed by Stan Spray's Safety Assurance Studies Division 1232. The device requires a ceramic which coats, seals and electrically insulates a high performance alloy at elevated temperatures. Superalloys achieve their high strength — about twice that of stainless steel — from special thermal treatments. Temperature excursions during brazing of conventional ceramic insulators to superalloys destroy alloy strength. We have developed glass ceramic compositions which bond directly to the superalloy surface and ceram using a thermal sealing process which is compatible with superalloy strengthening procedures. We're now able to seal the glass ceramic and strengthen the metallic portions of the component in a single firing operation. This saves time and money."

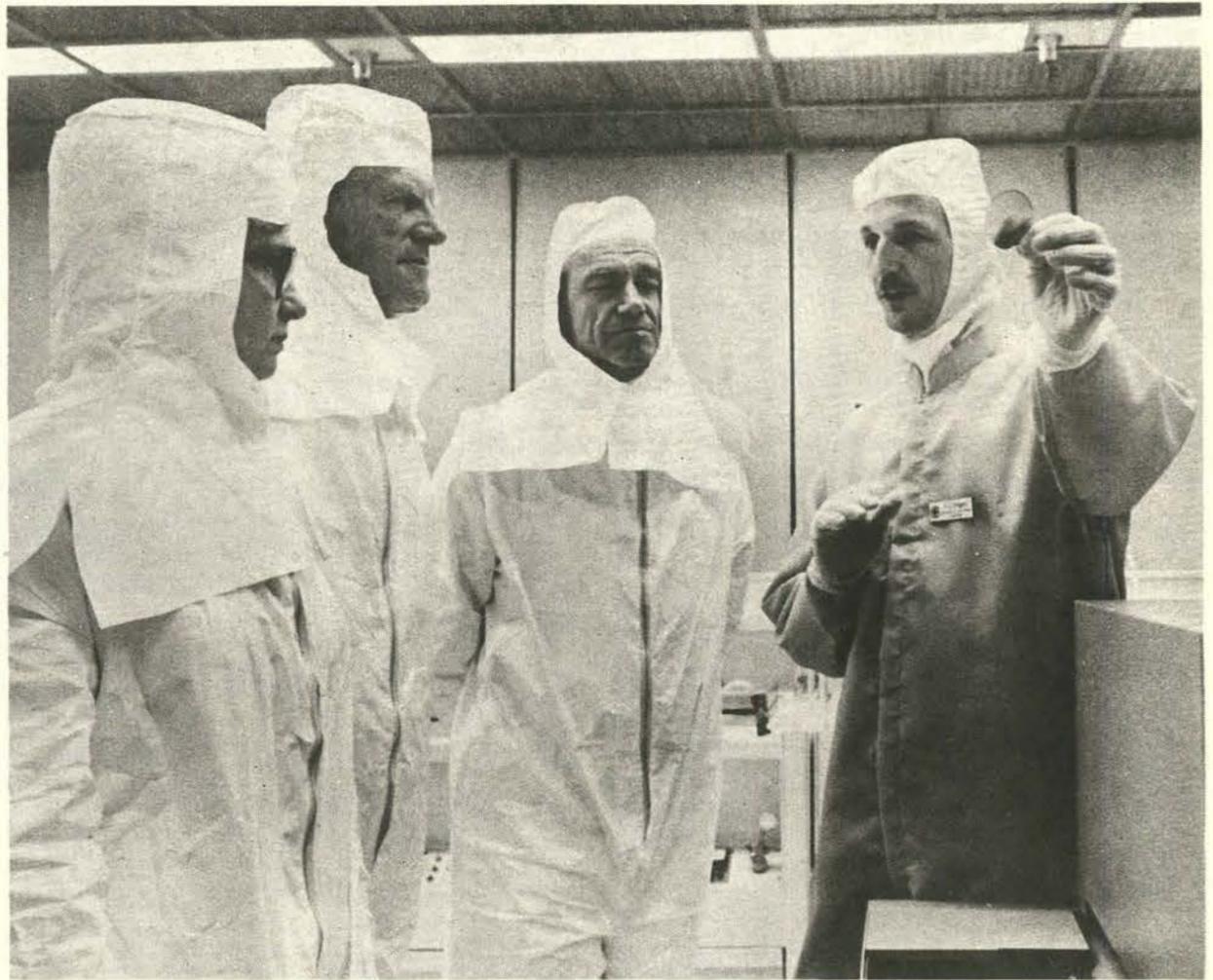
The first component likely to use Cliff's new materials is a ring connector igniter designed in Dave Anderson's Explosive Components Department 2510. In this component, a complex glass ceramic shape insulates electrical feedthroughs and forms a high strength, hermetic seal with the header case.

"We began work on this program about three months ago, starting with glass ceramics developed for other applications. Simultaneously we began developing new materials to meet the high strength requirements of this component," Cliff says. "Our research paid off. Seals with the new materials are twice as strong as we expected, and the best part is that by using glass ceramics instead of alumina ceramic seals, production costs will probably be cut in half."

Glass ceramics also show promise in energy applications. Steve Depp and Byron McCormick of Los Alamos Scientific Laboratory (LASL) are developing electronic tube circuitry to operate inside nuclear reactors or deep in geothermal wells where temperatures often exceed 600°C. The device must be enclosed in a refractory vacuum tube envelope which enables precise alignment of the solid state circuitry and provides for 56 separate electrical feedthroughs.

After 18 different tube manufacturers rejected the design as "impossible," Bob Cowan of LASL contacted Division 5845. "This project has really tested our capabilities," Cliff says. "It's taken a tremendous team effort; Ray Bland, Donn Stewart — we've all contributed. This is probably the most complex device ever made with glass ceramics. I don't think it could be made without these materials. We hope to be testing complete units in April."

"Glass ceramic-to-metal seals are just the beginning," Bob Eagan says. "In our



REPRESENTATIVES Marjorie Holt, Dan Daniel and Samuel Stratton of the House Armed Services Committee visited Sandia last week, and their tour included a briefing by Bob Gregory (2140) about work being done with integrated circuits in the semiconductor development lab. President Sparks, Bob Peurifoy (4300) and Bill Spencer (2100) also participated in the briefings.



THESE SANDIANS have been elected to top national (or international) office in their professional societies. Ed Roth (1314 and left) is president-elect of the Society of Manufacturing Engineers, a 46,000-member organization in 35 countries. Ed will reign for a year beginning May 9 in Detroit. Len Beavis (2353) is president-elect of the American Vacuum Society, a subsidiary of the American Institute of Physics and the largest professional organization in the vacuum field. John Heightley (2116) is the new chairman of the program committee for the 1978 International Solid State Circuits Conference, sponsored by IEEE. He'll organize the program and coordinate the efforts of US and foreign subcommittees.

division, Charlie Leedecke is working on high dielectric constant glass ceramics while Sherry White is studying direct metallization techniques. We also anticipate additional use of these materials in other energy applications.

"Glass ceramics are also excellent materials for corrosion-resistant structural members. Cliff has made and tested

materials which are unaffected by more than a week of exposure to molten sodium metal. Glass ceramics are hard, abrasion-resistant and chemically stable, suggesting use as liners or coatings for high temperature reaction vessels or in mineral transport systems. These properties, combined with stability at high temperatures, make them a logical choice in many applications."

Heart Film Set

A second showing of "How Long Do You Want To Live?" has been set up for those who missed the first, which played to a full house. Prepared under the Stanford University Heart Disease Prevention Program, the 45-minute film offers a quiz that enables you to calculate your risk of a premature heart attack and, at the same time, suggests ways to reduce that risk. The video tape will be shown in Bldg. 815, outside the Tech Area, on Tuesday the 29th at 4:45 p.m. Dr. Ewing from Sandia Medical will be on hand for discussion afterwards.

Fun & Games

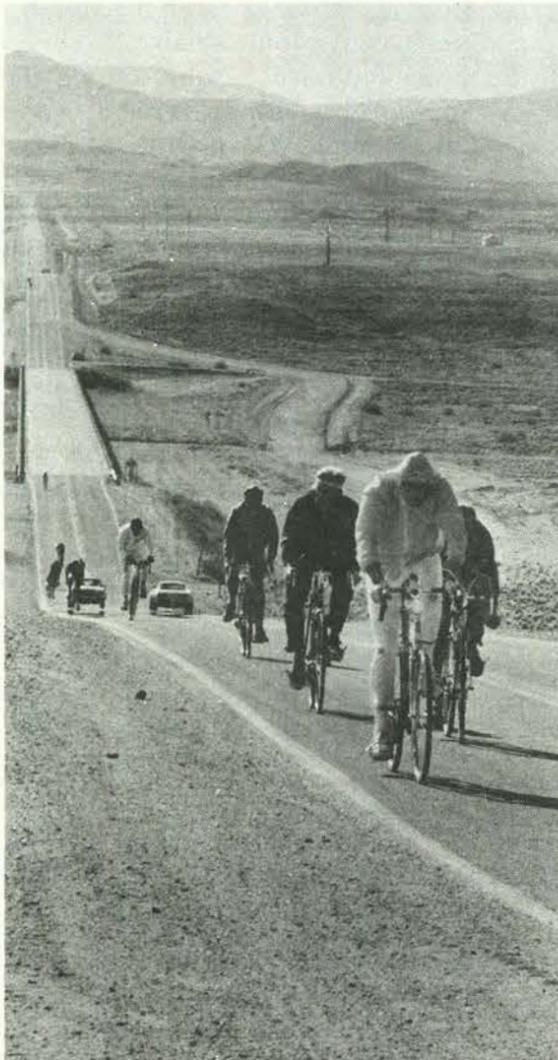
River Running — Mark Percival (2351) reports that seven or eight more people are needed to fill the boat for a trip down the Grand Canyon of the Colorado. The 10-day trip leaves July 6, costs \$335, gets into the river at Lee's Ferry and out at Lake Mead. The outfitter is John Cross River Trips. Mark's daughter Edith is handling arrangements — 299-0535.

* * *

Softball — The season begins next month and the teams need a few more members, especially the men's slow pitch teams. Call Tom Massis (2516) if you wish to play.



HOT ROCKS — Tom Massis (2516) and Pete Modreski (5831) ogle pet rock. The two urge people to attend spring show of Gem & Mineral Club on April 2 & 3 at State Fair Grounds.



TRIATHLON of ALBUQUERQUE, held on Base last Sunday, was dominated by Sandians. Event called for 10 miles of biking, 5 miles of running and a quarter-mile swim, all back-to-back. Ron McCurley (5431) was 1st overall in 65:53, while Jim Harrison (4361) was 2nd. Pete Richards (5132) gained a 1st in the 40-49 bracket, while Larry Johnson (4323) and O. J. Foster (retired) were 1st in the 50-59 and 60+ brackets respectively. Triathlon attracted 33 entrants, including two women. Bikers here take on hill near Tijeras Canyon arroyo.

Gem & Mineral Club To Hold Spring Show

The annual spring show of the Albuquerque Gem and Mineral Club will be held April 2 and 3 at the Floriculture & Industrial Building at the New Mexico State Fair Grounds. It's called the "Show You How" show and features hobby and craft demonstrations, exhibits, slide shows, a fluorescent display and special programs and speakers.

Pete Modreski (5831), club president, and Tom Massis (2516) are co-chairmen of the show. "This is the club's eighth show," Pete says, "and every year it gets better. People who visit the show seem to have fun. The demonstrations are popular, especially gem cutting, crystal growing and gold panning. We even furnish gold-bearing sand so you can try your luck."

Get Forms Now For T-VI Signup

Pre-registration for T-VI's summer trimester runs from March 28 through April 7, while registration itself takes place April 27 and 28 for those accepted into classes.

Sandians may enroll in T-VI evening courses on a cost-free basis provided the course is job-related or relates to a job to which the employee may logically aspire.

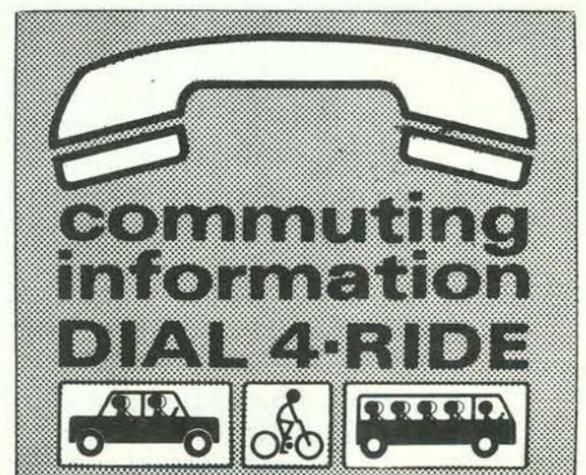
Pre-registration forms and T-VI catalogs may be obtained from Ruth Brooks of Education and Training Division 3521, Bldg. 632. The T-VI forms as well as Sandia enrollment cards must be validated by Division 3521 if you wish to take the course at no cost. T-VI classes start May 9.

One of the featured speakers will be Merrill Murphy (1731) who will talk about "The Many Approaches to Lapidary."

In addition to special gem and mineral exhibits, the show includes competitive exhibits from this and other clubs. Loyd Keller (4337) is director of exhibits.

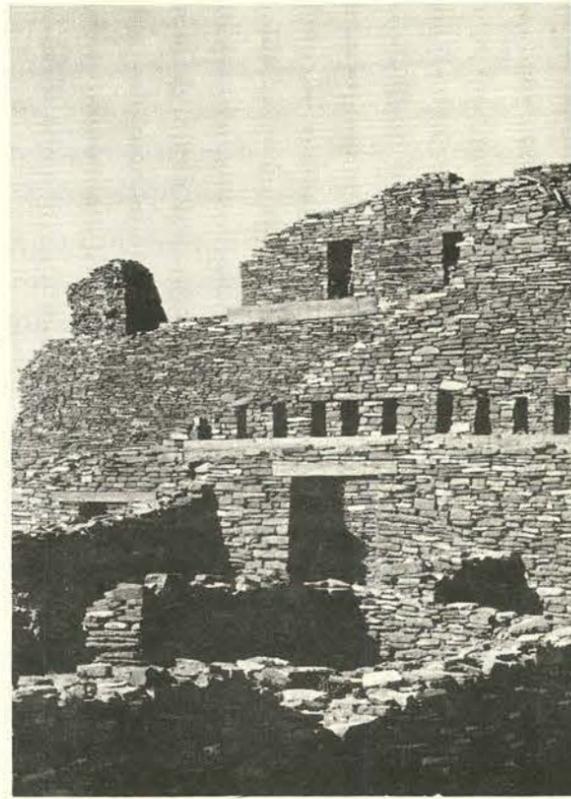
The club, a nonprofit, educational organization, also sponsors the gem and mineral hobby exhibits each year at the State Fair. Members often give lectures, demonstrations and donations of specimens to schools and community groups. They have established a scholarship fund for earth science students at UNM. Club activities include a monthly meeting, workshops and field trips.

Other Sandians who are members include Bob Ault (9331), Norm Brown (2516) and Dean Wise (retired).





WALLS of the church at Quarai rose to a height of 40 feet. Stone is red sandstone and gray limestone.



ABO dates to the early 1600's, had over 1500 ch. among nearby pueblos. Drought, pestilence and side of Manzano Mountains.

VISTA NEW MEXICO

Manzano Foothills Locale of Rich, Tragic History

An aura of time past pervades the foothills on the east side of the Manzano Mountains. Ancient place names like Chilili, Tajique, Quarai and Abo conjure up visions of Indian pueblos astir with men, women and children harvesting grain, patiently laying stone upon stone to raise the walls of massive churches, laughing, singing, living, dying; or robed Franciscan friars zealously laboring to establish Christianity; of the four or five lonely Spanish soldiers at each pueblo who know that even with their horses, their leather armor and their weapons they are but a pitiful few to protect several hundred people; and of the enemy — Apache raiders sweeping down from the Llano Estacado on the east and the Gila country to the west.

This string of pueblos — Chilili, Tajique, Manzano, Torreon, Quarai, Abo, Tenabo, Tabira and Las Humanas (Gran Quivira) — were called the Province of the Las Salinas because of their proximity to the salt lagoons near Willard, N.M., and were inhabited by Tiwa and Tompiro Indians. Present-day Tiwa-speakers include the Indians of Isleta and Sandia pueblos. Archeological finds in the area have produced remains dating from around A.D. 1300. The first Spaniards to venture into the valley were led by Capt. Francisco Sanchez Chamuscade in 1581-82.

With arrival of the Franciscans about 1610, missionary work accelerated. Churches and friaries were built at all the pueblos. The churches in the Salinas pueblos were constructed of red sandstone and gray limestone. By this time the Spaniards realized that the only treasure in New Mexico was that to be gained by exploiting the lands and the labors of the Pueblo Indians. Unfortunately, the various money-making projects of governors, government officials, priests and colonists required gang labor. The forced labor in

the Salinas area accounted for a continuous stream of carts laden with salt, piñon nuts, hides and woven materials, usually destined for Mexico City. Many Indians were reported seriously ill as a consequence of this constant, heavy labor.

The peak of the missionary work was reached during the 1630's. This report, dated 1641, gives details:

"The pueblo of Chilili (La Natividad de Nuestra Senora) has a very fine church and friary, choir and organ; in this pueblo there have been assembled many people from the other pueblos; there are 250 souls . . ." Chilili was the northernmost pueblo of the Salinas. The mission was established in 1613-14 by Fray Alonso Peinado who was buried there in 1662. The site of the pueblo is south of the present town but no ruins remain.

"The pueblo of Tajique (San Miguel) has a very good church and friary, choir and organ, and there are 484 souls . . ." Tajique is probably phonetic Spanish for the Tiwa *Taskike*, name of the old pueblo, No ruins remain.

"The pueblo of Cuarac has a very good church, an organ and choir, and very good provision for public worship; there are 658 souls . . ." Cuarac is the 17th-century spelling of Quarai, now a state monument. Fray Estevan de Perea, who served there in the 1630's, held a powerful post — head of the Holy Office of the Inquisition in New Mexico.

The church ruins at Quarai are spectacular. The cruciform structure features red sandstone walls that were 40 feet high, an interior 100 feet in length, a nave 27 feet across, and transept 50 feet wide. Large carved vigas spanned the walls. Adjacent to the church are ruins of the friary, whose stone walls have long since been razed for building material by nearby villagers. The mission is surrounded by unexcavated pueblo ruins.

"The pueblo of Abo has a church and

friary, organ and choir, and provision for public worship. It has two *visitas*, the one for the Humanos (San Buenaventura), the other is Tabira. It has 1580 souls . . ." A friary was established at Abo at least as early as 1662. Located 10 miles west of present-day Mountainair, Abo became the center for mission work among the other Tompiro pueblos of Tenabo, Tabira and Las Humanas (Gran Quivira). The export market was helpful for Abo; proceeds from the sale of piñon nuts paid for "a fine organ for the convent of Abo." Old reports describe Abo as one of the most beautiful of all missions, with beams two feet square, handsomely carved. The ruins at Abo are also a state monument, administered by the Museum of New Mexico. Because of lack of funds to stabilize the walls, the ruins are enclosed by a high fence. One can still look and marvel at the dark sandstone walls, but the signs of vandalism, the crumbling walls and high fence create a melancholy atmosphere.

By the 1660's disaster and misery engulfed the pueblos of the Salinas and, sometime after 1669, the pueblos were abandoned because of drought, pestilence and the Apache. That year Fray Juan Bernal wrote ". . . this kingdom . . . is nearly exhausted from suffering two calamities which were enough to put it out of existence, as it is even now hastening to its ruin . . . the whole land is at war with the widespread heathen nation of the Apache Indians, who kill all the Christian Indians they can find and encounter. No road is safe; everyone travels at risk of his life, for the heathen traverse them all . . . The second misfortune is that for three years no crops have been harvested. In the past year, 1668, a great many Indians perished of hunger, lying dead along the roads, in the ravines, and in their huts. There were pueblos (as instance Humanas) where more than four hundred and fifty died of hunger. The same calamity still

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. I've been told by the maintenance engineers that when Bldg. 806 is occupied and the lights and equipment are turned on that more than enough heat is generated to keep the building warm — even on winter days. Further, a net amount of chilled air must be pumped in to cool the building to a comfortable level. How come?

A. Building 806 was constructed in 1962 and contains a high velocity, double duct air conditioning system. Hot air and cold air are delivered to a mixing box and combined to provide the proper temperature air as called for by the thermostat controlling that zone. Excess heat in one zone cannot be transferred to another zone calling for heat. The operation of this system cannot be changed unless a complete redesign and retrofitting project is undertaken. Funds are not available for this purpose at this time.

To minimize the consumption of energy we have raised the cold air temperature to the highest point possible to produce acceptable temperatures in the hottest zone. Conversely, we have lowered the hot air temperature to the lowest point possible to produce 65° temperatures in the coldest zone. Thermostats in perimeter office areas are set at 65°, thermostat settings in laboratory areas that produce excess heat are being set higher than 65° so that additional energy is not used to cool these areas to 65°.

R. E. Hopper — 9700

Q. Many of our buildings have solar screens on the windows to keep sunlight out. Can the screens be removed during the winter to allow sunlight into the rooms? The screens are made to slide to facilitate washing the windows. Though it appears doubling the screens over half of the windows would give the same net results in transmitted heat, I do not believe that this is actually true, since the screens effectively screen out all of the sun. If the screens are doubled over half of the windows, we still will gain sunlight transmitted through the uncovered windows.

A. Late in 1973 we received a Feedback suggestion to remove the cool shades on all buildings during the winter, and replace them during the summer. Plant Engineering did a feasibility study and discovered that the labor cost to handle the shades, and the estimated damage to the shades during storage and handling, overshadowed the energy saving such that the procedure would be uneconomical.

We did, however, suggest to the building occupants that they slide back the shades (as you have suggested) in the fall, to benefit from winter solar energy, then slide them back in place in late spring. Sometimes, unfortunately, the building

occupants forget to operate the shades as necessary.

Since it is too late to accomplish much this heating season, Plant Engineering will ask Maintenance to slide back the cool shades next fall and replace them the following spring. This policy will be continued in successive years.

R. E. Hopper — 9700

Q. Current practice is to check swing shift parking spaces at 12:00 noon. Approximately 30% of employees have an assigned lunch break at 12:30 to 1:00 pm. Why not delay checking the swing shift parking spaces until 12:45?

A. Thanks for your suggestion. It sounds like an excellent idea. We will change the signs from 12:00 noon to 1:00 p.m.

D. S. Tarbox — 3400

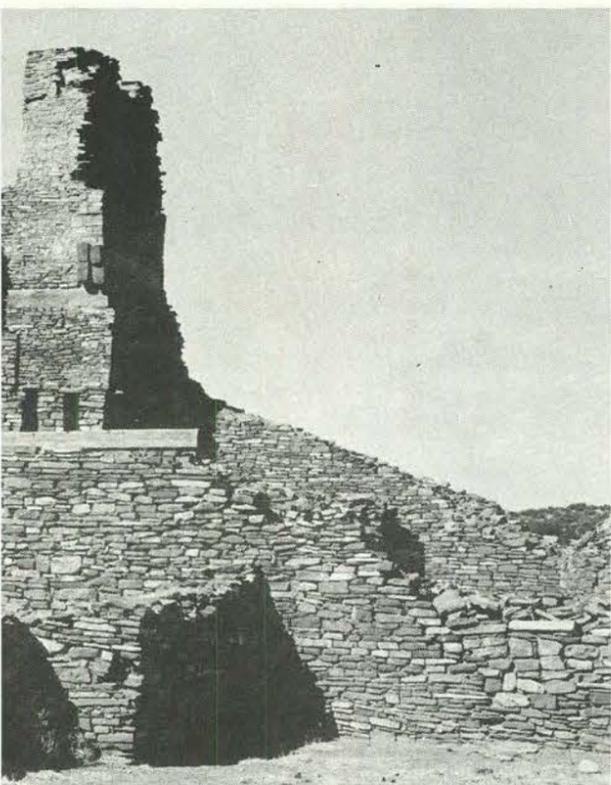
Q. A recent 2-part series in the "New Yorker" has noted the dangers of microwave radiation [even mentioning Sandia Labs in the first part]. The author indicates that many of these dangers have been downplayed by the "military/industry complex." Could I have the assurance of Laboratories' management that employees are not exposed to radiation of a potentially hazardous nature from work undertaken at the Laboratories?

A. I welcome the opportunity to briefly describe our activities in an area which we feel has significant health-related side effects.

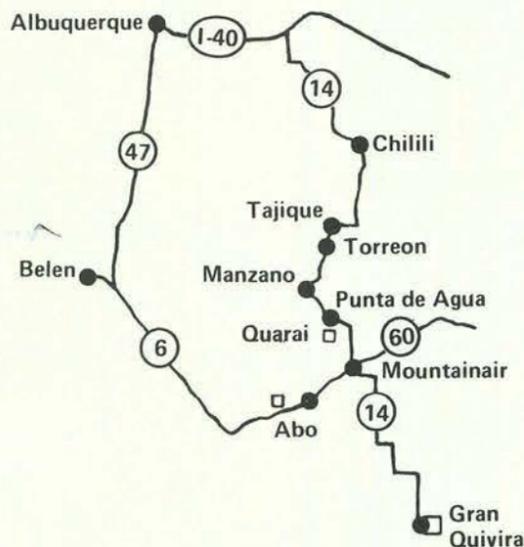
Our program has received national attention since 1951 when Dr. F. G. Hirsch recognized and recorded an incident which for the first time correlated ocular cataracts with environmental exposure to low levels of microwave energy. As a result of this incident, which was referenced in the literature, Sandia's policy has been one of extreme caution. Historically, we have maintained the state-of-the-art in field survey equipment for accurate environmental evaluations; we have maintained accountability of sources of microwave energy including microwave cooking ovens; and we have been well aware of the lack of biological data supporting the 10 mw/cm² exposure standard. When surveying a source of exposure, we recommend it be shielded or otherwise controlled to reduce the exposure level to as low as possible.

Sandia has had a favorable history of cooperation with the Air Force, and they have diligently briefed the Environmental Health Department about many operations where health protection has been of mutual concern.

S. P. Bliss, M.D. — 3300



members, and became the center for mission work. Attacks by the Apaches led to demise of pueblos on east



QUARAI, GRAN QUIVIRA & ABO offer spectacular ruins. The sites can be visited in a one-day circle drive south on Route 14, returning to Albuquerque via Mountainair and Belen.

prevails, for, because of lack of money, there is not a fanega of corn or wheat in the whole kingdom, so that for two years the food of Spaniards, men and women alike has been the hides of cattle which they had in their houses. To make them edible they toast them, and then eat them. And the greatest misfortune of all is that they can no longer find a bit of leather to eat, for their herds are dying . . ."

Quarai was the first pueblo to fall. The people first fled to Tajique, but it too had to be deserted. One source places the demise of Chilili and Quarai around 1677. Survivors joined their kinsmen along the Rio Grande. Some joined the Spaniards on their retreat south during the Pueblo Revolt of 1680. The Spaniards returned in 1692 but did not attempt to resettle the Salinas until the first half of the 19th century. The Indians never returned. As late as 1890, a southwestern historian recorded that "If the people of the village of 'Isleta de Sur' (just south of El Paso) on the Texan side of the Rio Grande are asked whence their forefathers came, many of them point to the north in reply saying, 'From Cuarac.'"

• MT

MILEPOSTS

LAB NEWS

MARCH, 1977



William Minser - 9582 25



Art Verardo - 3411 25



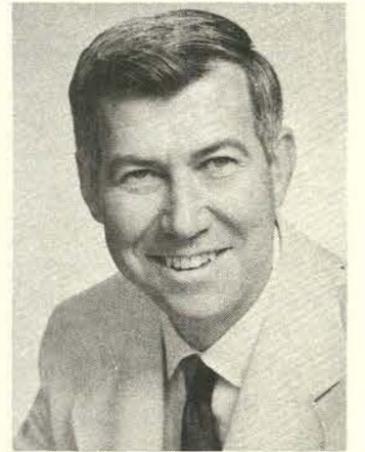
Ray Garcia - 3172 20



John Loukota - 1123 10



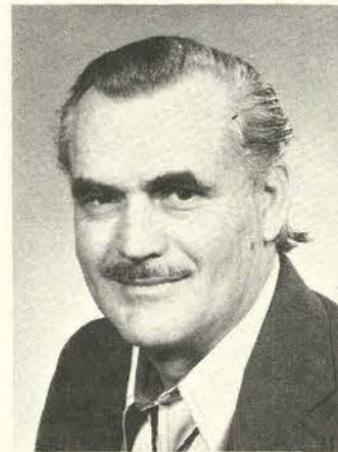
Henry Baisdon - 9561 25



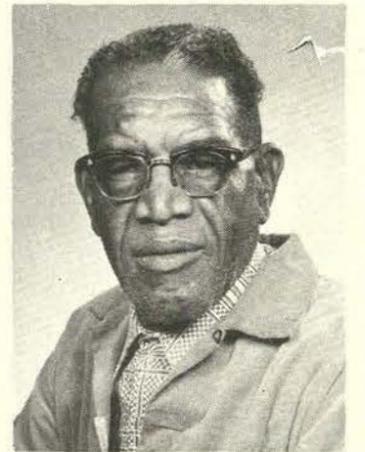
Joe Ambrulevich - 8213 10



Glen McFall - 2553 25



Tom Heaphy - 3150 25



John Carter - 3172 15



Jane McClure - 8214 10



Elmer White - 9411 25



Henry Hanser - 8157 10



Onefre Perea - 3727 25



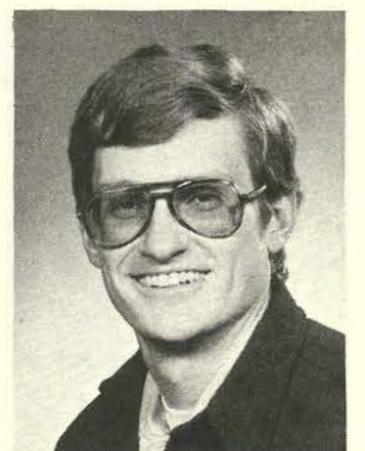
Rudy Martinez - 3171 15



Jay Andrews - 9571 25



Tim Roudebush - 8256 10



Ragon Kinney - 2326 10



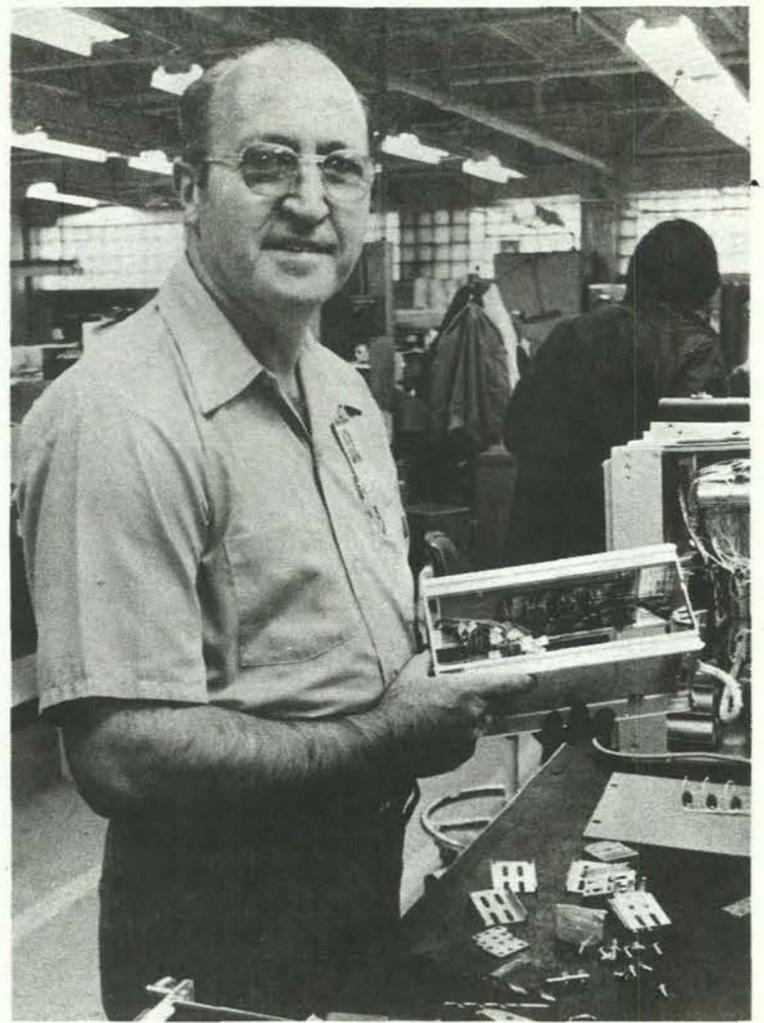
Joyce Willford - 8432 20



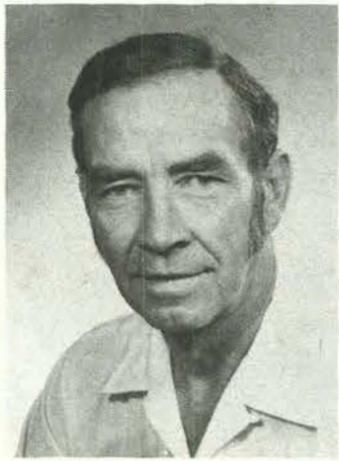
Thomas Moody - 2153 25



David Lee - 1262 10



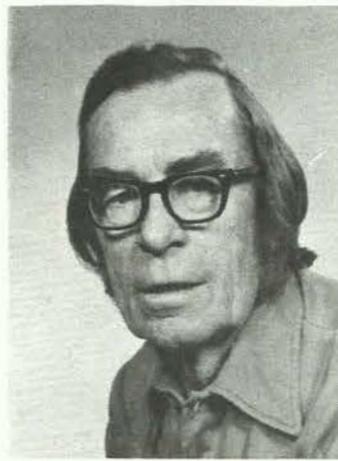
Del Salazar - 9563 25



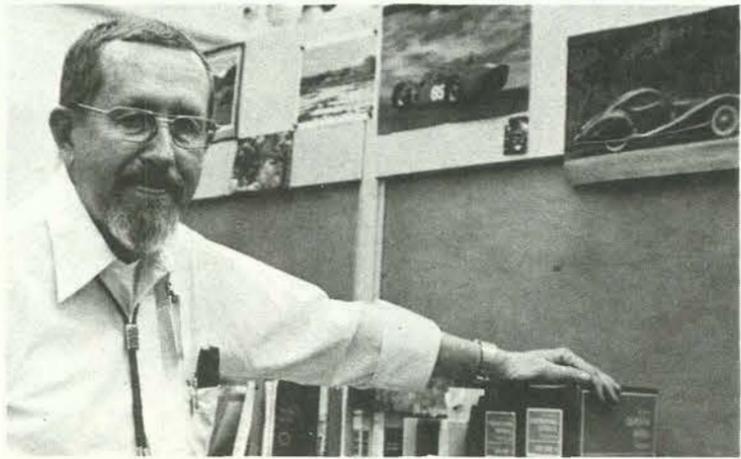
Cliff Shaw - 9584 20



Dell Houser - 8423 15



Orrin Caudill - 9343 20



Dave Berry - 2122 25



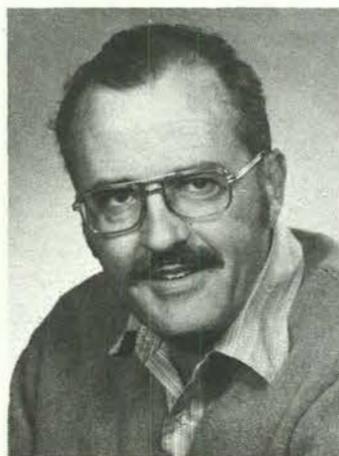
Chuck Thomas - 8346 20



Dale Young - 2622 25



Bruce Affeldt - 8423 15



Hugh Church - 5443 20



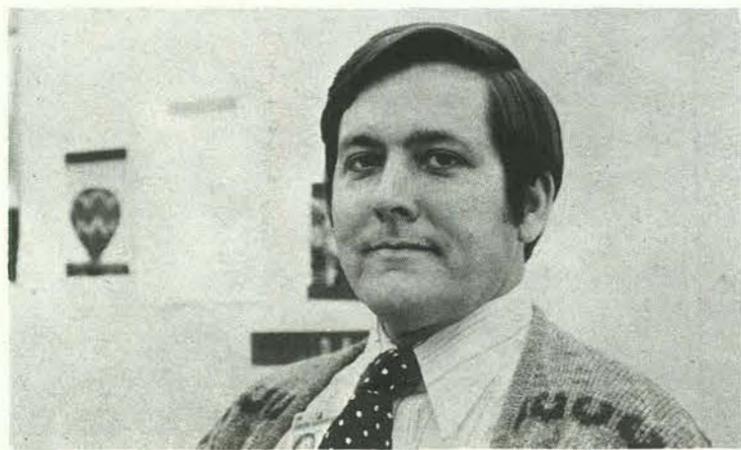
Bob Nelson - 8254 10



Jack Westbrook - 2631 25



John Southwick - 2551 30



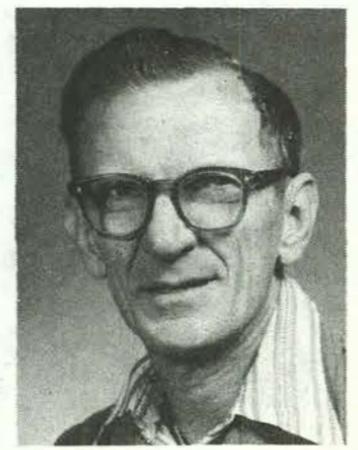
Dennis Hayes - 2513 20



Clarence Coats - 2316 25



Maurice Coil - 8433 10



Charles Kyger - 1212 20



Wynona Sexson - 5000

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Glen Fowler - 1714

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Florence Moore - 3152

20



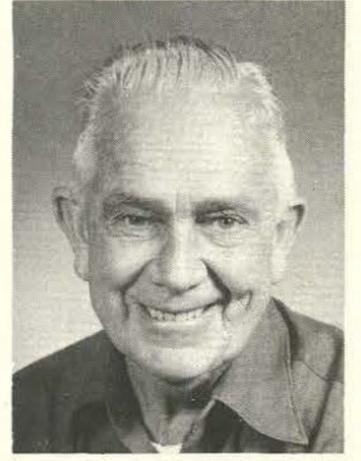
Sandi Chrisman - 8181

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Robert Jaramillo - 9563

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William Smith - 9718

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Clifford Elson - 2551

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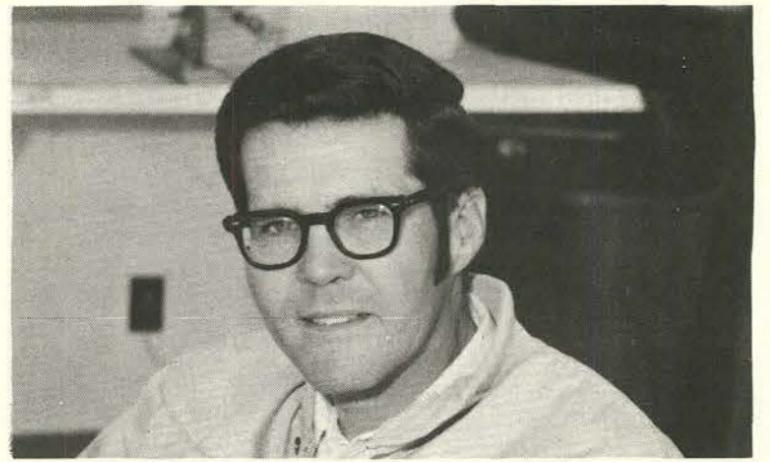
Betty Pajari - 8430

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Donald Bunten - 9582

25



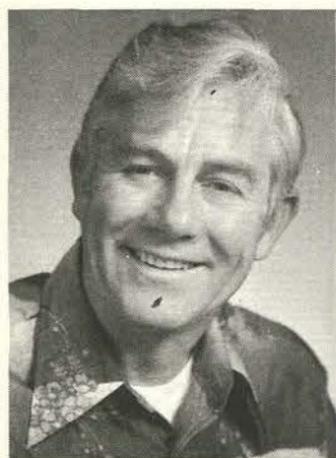
James Clemons - 9473

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Clara Blasyk - 3411

25



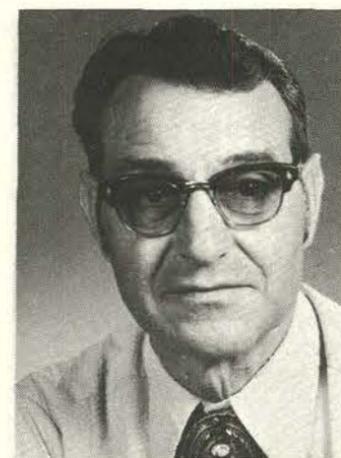
Art Kellom - 8181

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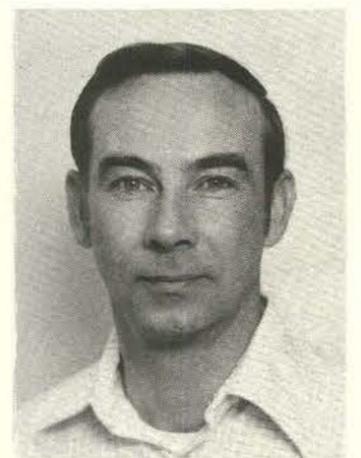
Ralph Hendrix - 3423

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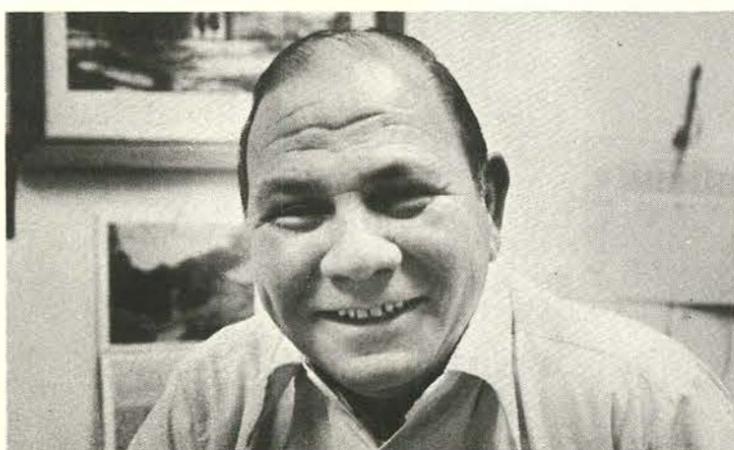
Bruno Navalesi - 3241

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Earl Morris - 9524

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Tom Zudick - 3171

25



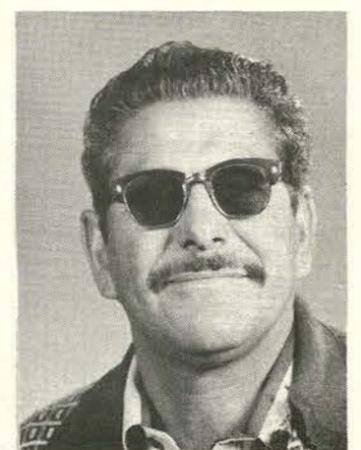
Lorena Schneider - 8212

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Mary Fischer - 3172

25



Nabor Rael - 9573

25

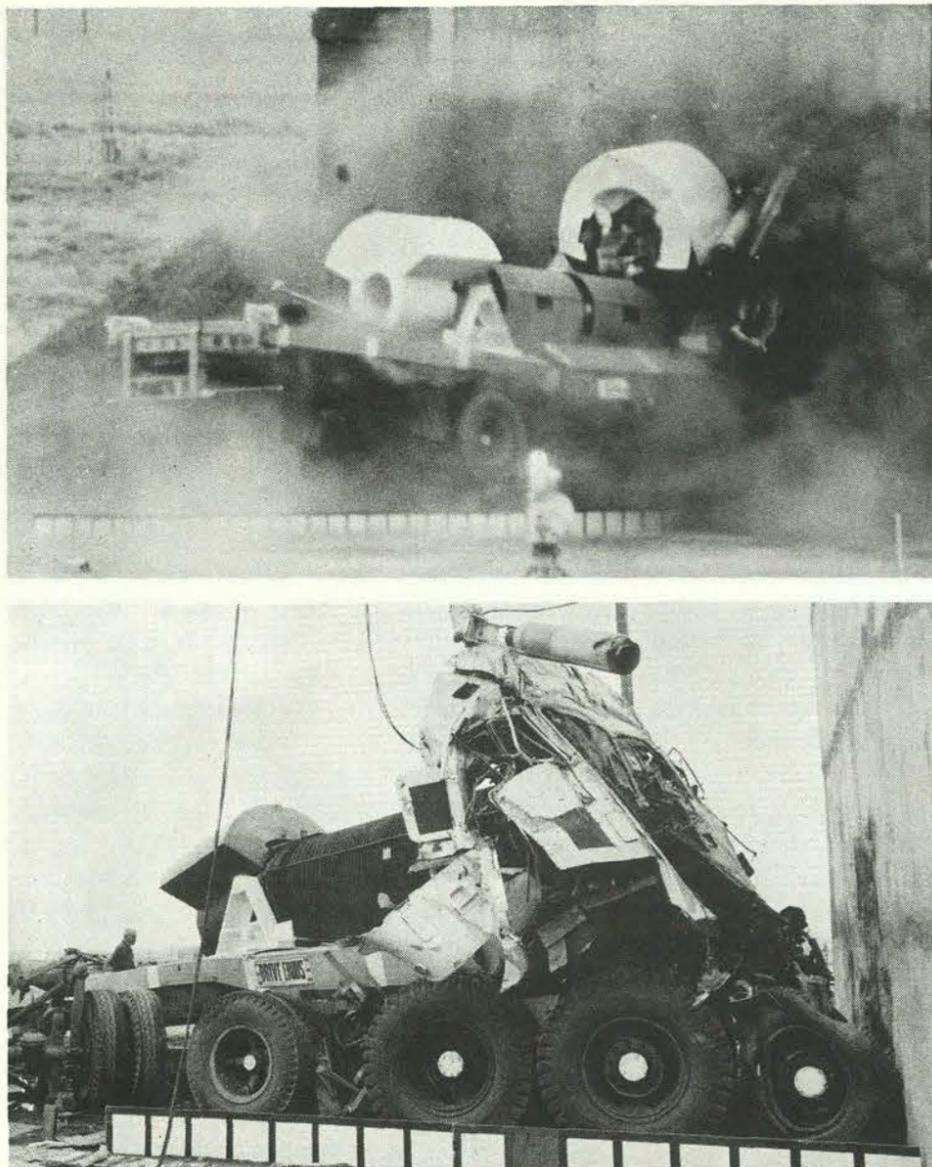
Events Calendar

- Mar. 25 - Apr. 17 — "Star Spangled Girl," Ole Henry's Dinner Theatre, 293-5060.
- Mar. 25 — Music of Bach, Mozart and Sibelius by the Chamber Orchestra of Albuquerque.
- Mar. 27 — N.M. Mt. Club, 5-mile Trigo Canyon hike in Manzanos, 255-2640.
- Mar. 27 - May 30 — Crafts VII, a juried exhibition of contemporary New Mexico crafts, Museum of Albuquerque.
- April 1-4 — Eugene O'Neill's "Emperor Jones," U. of A. Stage 1, 8 p.m.
- April 1-3 — "Jesus Christ Superstar," Civic Light Opera, Popejoy, 8:15 on 1st and 2nd, 2:15 on 3rd.
- April 1-30 — "Divorce Me, Darling," Barn Dinner Theatre, 281-3338.
- April 4 — UNM Varsity Band Recital, Rodey, 8:15 p.m.
- April 5 — UNM Jazz Band Recital, Popejoy, 8:15 p.m.
- April 12 — UNM Symphony Orchestra, Rodey, 8:15 p.m.

Congratulations

Mr. and Mrs. Charles Greenholt (5831), a daughter, Alissa Beth, March 8.

DURING & AFTER — If you choose to run a truck at 84 mph into a concrete wall, things happen. In the second test of the impact resistance of a nuclear fuel cask, the score is cask: 2, truck: 0. Next, a railroad locomotive will take on cask. Tests are being run in Area III.



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.

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

- REAR TRUCK BUMPER removed from '72 Chevy ¾ ton, painted, with tag light, \$30. Morris, 298-8664.
- WURLITZER SPINET PIANO, \$495; Scott's hand mower, \$7.50; 2 pair metal bed rails, \$7 pair. Scales, 296-9295.
- CAMPER SHELL, insulated, low profile, fits Datsun or Toyota pickup, \$200 or best offer. Latta, 256-1259.
- BASKETWEAVE LEATHER HOLSTER, for K-frame Smith Wesson, 6" barrel, \$12. Smith, 296-8519.
- CARDTABLE and four chairs, \$22; camper portable ice chest, \$3; two patio lounge chairs, \$2 ea., Smith, 881-1001.
- SHREDDER BAGGER, Sears, 3½ HP gasoline engine, \$75. Coleman, 299-2377.
- AM AUTO RADIO, mfg. surplus (73 Chrysler) w/external speaker, push button, 4 transistors, 1 I/C, \$20. Smith, 242-9576.
- TAPPAN ELECTRIC RANGE, 30" x 24", separate filter hood, with 2 lamps, 2 yrs. old, \$115. Lujan, 294-4215.
- CRIB MATTRESS, \$17; Ford tot-guard child's car seat, \$15. Caskey, 294-3218.
- WATER SKIS, Cypress Gardens, \$25.; CB antenna, center loaded, \$12.; weights, 110 lbs., vinyl clad, \$10. Denton, 298-0566.
- TV, 23" B&W, modular chassis; portable stereo phonograph; 19" B&W picture tube in unopened box. Rebarchik, 299-1385.
- HIDE-A-BED, double size, newly upholstered, \$160.; basketball goal w/backboard, \$10; small frame girl's 10 speed bike, \$60. Horton, 298-4449.
- DOUBLE BED, w/mattress and box spring, Canty, 255-9388.
- TIRES, 5J60-15 mounted on 5-hole

Jackman type rims, used 3000 mi, \$200.; drop equalizer trailer hitch, \$75. Chaffin, 881-4633.

HAIR DRYER, Lady Sunbeam Flair, \$15.; pool table, regulation size, \$100.; above ground round pool, 18' x 4' w/accessories, \$200. Blechinger, 299-4890.

FORMICA, 4 sheets, green 48" x 66". Martinez, 299-1918.

WILSON GOLF CLUBS, 1, 3, 4, woods, 3-9 PW irons, \$50; Simmons International Pro-Line woods 1, 3, 4, 5, \$50. Kaiser, 296-5215.

WATER TANK for rec. vehicle, 20 gal. plastic, \$12. Schneider, 299-6243.

OUTBOARD MOTOR, 30 HP, Johnson manual start, recent overhaul, \$300. Bentz, 299-3448.

TENT TRAILER, Sears VII, spare tire and add-a-room, \$300. Harris, 299-6664.

GE ELECTRIC DRYER, automatic and timed cycles, \$50. Kessler, 242-9737.

LADY KENMORE WASHER, 3 speed, 9 cycle, white, overhauled in Feb., \$60.; Harmon Kardon AM-FM tuner, \$5. Anderson, 299-5727.

AUTO ROOF RACK, unopened package, oak bars, suction cups, \$10. Smith, 242-9576.

VACUUM CLEANER, Sears, w/powermate attachment. Gendreau, 268-3436.

BANJO, 5-strings w/case, \$85. Griego, 299-0627.

CAMERA, Miranda Sensorex 35mm w/case, telephoto and wide-angle lenses, \$200. Russell 268-9023 after 6.

CALVES, 300 to 700 lbs., 40 to 50 cents per lb. Morrison, 877-7425.

GOLDEN PRO DRIVER, graphite shaft, medium flex, \$25. Knox, 255-3145.

CAMPER, cab-over, 10 ft, GMC, refr. heater, A/C, flush toilet. Fisher 881-8072.

ORGAN, Baldwin 72L w/Panasonic tone and Leslie speakers, \$650. Schindwolf, 897-0470.

COUCH w/5 cushions, 8' long, needs upholstering, best offer; 2 matching white vinyl chairs, two for \$70. Yoder, 294-3875 after 5.

DOOR, 30" hollow core, w/3 hinges and knob, Stanley, \$12. Merritt, 299-1482.

CAROUSEL (KODAK) slide trays, 80's, \$2.25; 140's \$3.75. Woods, 296-4741.

VEAL, 3 mo. old milk/grain fed calves, whole or half, \$1.80 lb. freezer weight. Shank, 877-4497.

POKER TABLE, round, 8 places w/ folding legs, includes thermo table pads, \$35. Shoemaker, 255-8820.

FORD TIRES, four wide oval track w/rims, 2 chrome, 2 reg., sell or trade. Martinez, 831-0876.

WHIRLPOOL DRYER, LAI-5801, gas,

1½ yr old, white, 3 speeds, 5 temperatures, \$150. Benjamin, 293-5578.

SINK, wall hung, porcelain iron, w/faucets, \$13; screen door, exterior, wood w/hardware, \$5. Trump, 299-5162.

GRAY & WHITE HAMSTER, cage, water bottle, cedar shavings, 7 lbs. food, \$15. Elaine, 296-8460.

MAGNAVOX TV, 25", color, needs new picture tube (\$80), have full service manual, \$100. Mosteller, 256-3227.

VINYL UPHOLSTERED CHAIRS, two, armless, \$20 ea. Perryman, 294-6113.

HONEYWELL AUTO STROBONAR, 880 with battery pack and AC converter, \$75 or best offer. Kramer, 898-7149.

CYLINDER HEAD for 1930-1940 Plymouth or Dodge, \$10; manual mystery inverse oiler, \$5. Stuart, 299-9190

'76 COLEMAN Valley Forge Camper, sleeps 6, Porta-Pottie, heater, 2 double sleeping bags, spare tire and bumper. Hensinger, 821-4675.

PATIO COVER 10' x 20', 40# rated, wrought iron columns, in carton, \$225; 3 passenger bench seat w/arm-rests for '77 van, \$100. Allen, 293-3043

ROLL-A-WAY BED, full size, seldom used, \$50. Bland, 255-7026.

WATER-PIK, green, 4 picks, \$10. Hawkinson, 281-5239.

WATER COOLER down draft, never used, no motor or pump, \$80. Wilkinson, 299-8327.

AKC GREAT DANE PUPS, males, \$125, females \$115, will be in Albuquerque April 2 & 3. Singleton, 299-1613.

2 FREE CATS, 3 yr old spayed female, 2 yr old male, Weber, 266-9100.

GAS DRYER, harvest gold, General Electric, \$100. Jeffery, 298-1231.

BED, with box spring and top mattress, 39" wide, with head and footboard, \$25. Roberts, 294-3648.

TRANSPORTATION

BICYCLES, Girls' Schwinn 26", \$25. ea. Scales, 296-9295.

'73 FIAT, AM-FM 8 track, 4 speed, 39,000, luggage rack, new tires, new top, below book. Ladig, 299-3308.

'74 FIAT 128SL, 25,000 mi., 25 mpg city, 30 hwy, \$2350. Hart, 293-6396.

'57 CHEVROLET, 283 rebuilt engine, dual exhausts w/headers, new seat covers, good tires. Boeck, 298-6495.

'70 MAVERICK, 3 speed, 2 door, 6 cyl. 170 cu in. vinyl roof, \$925. Peabody, 296-6239.

'75 SUZUKI 380, less than 17,000 mi.,

Martinez, 344-7850.

'70 JEEP PICK-UP, 4 wheel drive (J2500), 40,000 mi, 350 V-8, AM-FM 8 track stereo, hubs, 2 speed transfer case, 3 speed AT, new camper shell. Whelan, 255-6873.

ALUMINUM BOAT, 14', and trailer, \$350. Madsen, 344-9970.

'73 MAVERICK (Grabber), 2 dr, 302 V-8, AT, PS, AC, white vinyl, radial tires, 33,000 mi, \$1950 (\$500 below book). Harker, 265-7328.

'63 4WD FORD PICKUP, V8, stepside, rebuilt engine. Padilla, 877-8584 or 843-0667 after 5.

'76 CHEVY P/U 4x4 PS, PB, AC, AT, fully loaded w/many extras, below book, Lackey, 345-5474.

10 SPEED men's bicycle, centerpull brakes, Shimano derailleurs, rattrap pedals, stem shifters, aluminum fenders, \$50. Joseph, 299-6989.

'74 PINTO STN. WGN, 2300 eng, 4 spd, radial tires, low mileage. Staley, 299-9364.

BICYCLE, girls single speed, \$15. Moss, 298-2643.

'67 FORD, R, AC, PB, PS, one owner, \$450. Klamers, 299-5235.

'73 YAMAHA, 125 flat tracker, can be street legal, '77 lic, many extras, \$200. Holmes, 293-6851.

'73 PLYMOUTH FURY III, 400 CID, PS, PB, AC, Brougham pkg, best offer. Sandoval, 293-6261.

'72 VW 2-DR SEDAN, AT, \$1400. Detorie, 299-1868.

'72 NOVA SS, 350 PS, PB, 4 speed, 35,000 mi, white, black vinyl top, \$2,200. Roberts, 255-9527.

'71 DATSUN, 510 Sedan, orig. owner, \$1400. Latta, 256-1259.

COLUMBIA WOMEN'S BICYCLE, 5 speed, \$15. Binder, 299-2937.

'76 OLDS DELTA 88, 4-dr, air, PS, PB, tilt steering, AM-FM radio, less than 12,000 mi, \$4975. Morris, 298-8664.

'68 DATSUN 510, 1600cc, radio, AT, 4 dr, \$850 or best offer. Swier, 298-8435.

'69 JEEP SUPER WAGONEER, 4 wheel drive, bucket seats, loaded, under retail. Duliere, 296-4785.

'75 MONZA, 2 dr sport coupe, less than 10,000 mi, less than blue book. Vaughn, 842-8313.

'66 PLYMOUTH FURY, 383 engine, PB, PS, AM/FM, AT, 76,000 mi, \$500. Powell, 292-2806.

'67 DODGE CORONET, 318 engine, PS, \$500. Conrad, 299-5316.

REAL ESTATE

3 C-1 LOTS, 1100 block of Louisiana SE, west side, \$28,575 or best offer, 29%

down, balance 5 yrs at 8%, Barrett, 9725 E 27 St., Independence, MO 64052.

HOME, 3 bdr, 1½ bath, oversized landscaped lot, 3406 Sierra Dr. NE, \$33,500. Falacy, 881-1802.

ADOBE STYLE, 3 bdr, 1½ baths, carpet, drapes, appliances, close to Sandia Labs and schools, \$35,600. Brainard, 296-6314.

HOUSE, 3 bdr., 1½ bath, 224 Gen. Stillwell NE, \$31,500. Molina, 299-5704.

WANTED

SUNFISH SAILBOAT. Souder, 281-3121.

16' CANOE with square stern for motor mounting. Grahek, 293-7810 after 5.

BANDSAW, 12". Grant, 255-6105.

UTILITY TRAILER, 2-wheel, strong, light, looks unimportant; black 15" rim, 6 hole, for Chevy Suburban. Hawkinson, 281-5239.

ELECTRIC MOTOR, ½ or ¾ HP, 3450 rpm. Bentz, 299-3448.

BOAT TRAILER for 14 ft boat. Bouton, 898-3562.

WATER TANK, 200-300 gal for hauling drinking water. Schuch, 298-9924.

BUMPER CARRIER for motorcycle. Laskar, 299-1024.

H.O. MODEL TRAINS and other sizes. Roth, 864-4080.

BICYCLE, 16 inch. Berg, 296-2695.

FOR RENT

HOUSE, 3 bdr, brick, yard and patio, washer/dryer, near Coronado Center, \$300 plus utilities except water. Williams, 296-0138.

HOUSE, 3 bdr, 2 bath, carpeted, draped, FP, fenced yd, dbl garage, 1112 La Charles NE, lease, \$350. Moody, 292-2975.

LOST AND FOUND

LOST — White knitted scarf with tassels; gold screw-type earring w/3 vari-colored prongs; ladies' black all-leather gloves, size 8 "Grandoe"; brown gloves; 4 keys on ring; gold charm bracelet, chain only; 3 keys on Credit Union holder; silver Timex watch w/electric calendar with broken black leather band; 4-leaf silver ring with flower in middle.

FOUND — Papermate silver automatic pencil; Sandia Labs (award) gold screw-type earring. LOST & FOUND, Bldg. 832, 4-1657.

FRIDAY	SATURDAY
25 — HAPPY HOUR ROAST BEEF BUFFET Adults \$3.25 Under 12 1.92 SOL CHAVEZ	26 — SOUL SESSION 9-1 TOGETHER Members Free Guests \$1
1 — HAPPY HOUR BBQ RIBS BUFFET Adults \$3.50 Under 12 1.92 MELLOTONES Singles Night — 4:30	2 — VARIETY NIGHT Mark Doyle & Seymore ISLAND AT THE TOP OF THE WORLD Color Cartoons Food 6 Show 7 Free to Members

PROMOTIONS — of travel packages like the ones now going aren't hard: the Club offers low prices and high quality. Take, for example, the trip to Tokyo — which is a pretty good idea in itself. A fantastic hotel, the Otani, will be your home from July 26 to August 9. You'll be right in the center of Tokyo with opportunities for the finest food, entertainment, shopping, and sightseeing anywhere. The package — air fare, hotel, a welcome sake party (try not to mutter "Sake's Alive" when they serve you), and a city sightseeing tour — is \$779 from LA; optional tours to other cities are also available. And you can stop over in Hawaii on the way home with no increase in plane fare.

JUST — a few dollars more (\$879 from Albuquerque; \$150 single supplement) will put you in Hong Kong November 12 through 28. Spend 14 nights at the Hyatt Regency or the Hong Kong Hilton, enjoy welcoming parties and farewell parties, and see the crossroads of East and West, the world's most outstanding marketplace. Ride a rickshaw, take a tram ride to the top of Victoria Peak for a fantastic view of

the harbor, hunt for bargains (it's open season).

MEAN — daytime temperature in Lima in May is 67° with a 74° maximum and a 60° minimum. Beautiful weather, beautiful city. And a chance to tour a fascinating country — the hidden city of Machu Picchu; Cuzco, the capital city of the Incan Empire; Iquitos, the jungle city. Even if you never leave Lima, you'll have a great time. The Hotel Crillon is a 5-star; that means you may not want to leave it. The price? About \$500 from Denver (singles \$79 more). The dates? May 16-23. Get your reservation in *now*.

YOU — feel like a pile of roast beef tonight? (Maybe it's because you're sunburned.) The Club's buffet features generous portions of roast beef *au jus* along with baked potato and sour cream and lots of other good things. For dessert, *Sol Chavez* and company at 8:30.

TAKE — the opportunity to get *Together* tomorrow night. Well, don't get them, just allow them to give you a beat that will make tomorrow night's Soul Session hard to.

ORDERS — are what Mark Doyle gives Seymore, proving once more that it's better to give than to receive. Mark's a talented ventriloquist, Seymore a talented dummy (albeit one with a rather wooden smile). They're the live (more-or-less) half of Variety Night's entertainment on the 2nd. The other half isn't all that dead — it's a Disney adventure called *The Island at the Top of the World*. That's where the expedition finds the lost world of the ancient Vikings. They probably meet Eric the Green (he's a Norse of a different color).

FROM — past experience, the Club has learned that barbequed ribs buffets are

HOT FLASH — A where-to-eat, where-to-sleep, and how-to-get-around-in-London pre-trip meeting for those going (and for those interested) is March 30 at 7:30 at the Club.

messy but appreciated. So, after laying in an extra supply of tablecloths and napkins, they're ready for another next Friday. Baked beans and homefried potatoes too. At 8:30 it's the *Mellotones* beginning a four-hour stint on the stage.

MORE — fun as a fan next year if you're a Wolfpacker. And if you're a Wolfpacker, come on out for the Gala Annual Meeting and Wolf Roast. Elect four new board members, then listen to UNM Sports Info Director Dan McGuire discuss the seasons that were and the seasons that will be. It's at 7:30 on the 6th.

SNOBBISH — middle aged kids (say, 7 to 12) may look down their noses at juvenile carryings-on like Easter Egg Rolls, but their younger siblings (the six-and-under crowd) will enjoy it. So mark your calendar (10 a.m. on April 9), and bring the little ones.

PEOPLE — who are permanently or temporarily single get together again for Singles Night next Friday. *The date* is April 1, a date you don't need. Just show up, leave a half a dollar at the door, and dance, sip, chat, or establish meaningful relationships to the music of *Martha Kay*, the duo singles praised and danced to (sometimes simultaneously) in March.

MORE INFO — 265-6791

SOL • HONG KONG • SEYMORE • TOGETHER • MARTHA KAY •

Take Note

For the third year in a row, Sandia's nominee for Small Business Subcontractor of the Year has been declared the regional winner. Dikewood Industries will represent Region VI (Louisiana, Oklahoma, Arkansas, Texas and New Mexico) in the national competition with nine other regional winners. The award is given annually to firms which display unusual ingenuity and cost performance in handling complex contracts. Dikewood provides a number of computer-related services, including a computerized health care management information system.

Attention retirees: the annual retiree picnic at Albuquerque will be held Wednesday, June 1. Invitations will go out in late April.

People in Physical Standards Division 2551 are observing (celebrating?) the retirement of their boss, John Southwick,

with a dinner party-plus-entertainment at the C-Club on March 31. A cocktail session will start things off at 6 p.m. The roast sirloin menu runs \$7.50/person. John's friends are invited — call one of these for tickets and information: Frank Anderson, 4-7651; Leo Bressan, 4-7933; Bob Foster, 4-8992; or Bill McKinney, 4-7932.

Robert Rye (5114) will present "Reaction of Thermal Atomic Hydrogen with Carbonaceous Material" at the 5100 seminar April 5. The seminar meets at 3:15 p.m. in Bldg. 836, Rm. 201.

Sympathy

To Randy Maydew (1330) on the death of his father in Lebanon, Kans., March 5.
 To Floyd Philgreen (9572) on the death of his mother in Kansas City, Kans., March 8.
 To Jose Jojola (9582) on the death of his son recently.

