



LAB NEWS

VOL. 33, NO. 5
MARCH 6, 1981

Livermore — 25th Anniversary



Supervisory Appointments

GIL CHAVEZ to Section Supervisor/ Security Lieutenant 3432, effective Jan. 1.

Gil was a part-time security inspector at the Labs for six months before becoming a full-time employee in June 1978. Before Sandia, he was employed as a security police technician for the NM Air National Guard. Gil had earlier been a military member of the Guard for 20 years, working in military intelligence, education and training, and air operations. He attended the Air University in Alabama and is a graduate of the Police Academy of San Antonio, Texas.

Gil and his wife Mercy have five children and live on a farm in Pueblitos, south of Belen. In addition to his farm work, Gil enjoys hunting and fishing.

* * *

RON COONEN to Section Supervisor/ Security Lieutenant 3422, effective Jan. 1.

After a year and a half as a part-time security inspector, Ron became a full-time employee in 1976. Before joining the Labs, he had run a family business in Wisconsin — "Like so many others," Ron says, "I came south to beat the snow."

Ron earned his BS in criminology from the U of A and is working on a second undergraduate degree in business administration. He enjoys biking, jogging and photography. Ron lives in SE Albuquerque.

* * *

RON WARD to supervisor of Composites and Abrasives Machining Section 1481-3, effective Feb. 16.

Joining the Labs in 1969 as an apprentice machinist, Ron completed the program in 1973. He earned a mechanical TI Certificate (five-year program) in 1979.

Ron was in the U.S. Army for three years, serving one year in Vietnam in the First Cavalry Division as a helicopter crew chief. His leisure-time activities include camping, motorcycling and waterskiing. Ron and his wife Carmen (3141) live in the NE heights.

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LAB NEWS

Published every other Friday

SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
Editorial offices in Albuquerque, N.M.
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FTS 844-1053
ZIP 87185
In Livermore Area 415 422-2447
FTS 532-2447

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PROMOTED: (Back row l to r) Marlyn Sterk (5651) and Al Bustamonte (5652); (seated l to r) Ron Ward (1481-3) and Gino Carli (2420).

MARLYN STERK to supervisor of Advanced Systems Division I 5651, effective Feb. 1.

Marlyn joined Sandia in 1965 as an environmental test engineer. Since 1969 his assignments have been with various project groups as design engineer and, most recently, as project leader for advanced ballistic re-entry systems. In his new position, Marlyn will continue work with ABRES.

Marlyn earned his BS and MS in ME from the State University of Iowa. In addition to work with a religious organization, he enjoys camping, tennis, hunting and fishing. Marlyn and his wife Shirley have three children and live in NE Albuquerque.

* * *

AL BUSTAMONTE to supervisor of Advanced Systems Division II 5652, effective Feb. 1.

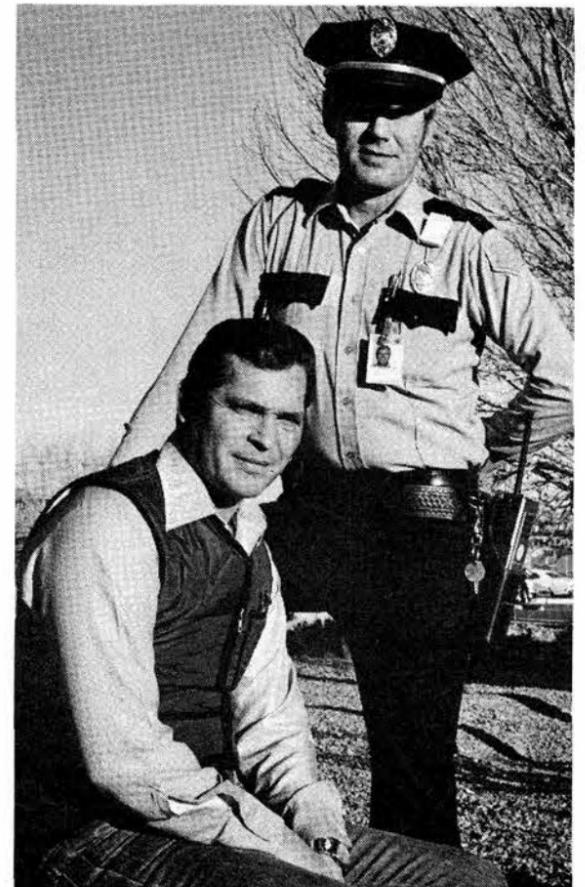
Al joined the Labs in May 1959 in the aerodynamics research department, working primarily in flight testing. Later, with the aerospace nuclear safety organization, his work has included both design and testing; and, with the exploratory systems organization, he has been concerned with the development and testing of re-entry vehicles. In his new position, Al will continue work with re-entry vehicles.

Al received his BS in aeronautical engineering from the University of Notre Dame and an MS in ME from NMSU; he has also done graduate work at UCLA. He is a member of AIAA. Al's off-the-job activities include ranching at his place on the Pecos, horseback riding, hunting and basketball. He lives in NE Albuquerque.

* * *

GINO CARLI to manager of Computer Aids and Product Data Department 2420, effective Feb. 1.

Gino joined Sandia in March 1951 as a staff member in a test equipment development organization. He became supervisor of a division in that group and, later,



SECURITY LIEUTENANTS: Gil Chavez, seated, and Ron Coonen (both 3432).

supervised a component and circuit evaluation division. Most recently he has headed Computer & Systems Development Division 2424.

He received his BS in EE from the University of Kentucky and has done graduate studies in EE and computer science at UNM. Gino belongs to numerous professional groups: IEEE and its computer society, ACM and its special interest group in graphics, and the National Computer Graphics Association. He's on the steering committee of Initial Graphics Exchange Specification (IGES), which is developing a national standard for graphics exchange. And he's vice chairman of DOE's computer-aided design and development group.

Gino enjoys skiing, jogging, racquetball and tennis. He and his wife Patricia have two boys and live in the NE heights.

Insulin Pump Offers New Way For Diabetics

An electronically controlled, programmable insulin delivery system developed by Sandia National Laboratories and the University of New Mexico School of Medicine has been temporarily implanted in a 41-year-old male diabetic.

Every other day the system's reservoir is filled with a two-day insulin supply, permitting the patient to receive all needed insulin from the implant.

The new implant functions are similar to those of a normal pancreas, except that insulin is delivered into the peritoneal cavity (abdomen) where it enters the portal vein, then flows into the liver to aid the body in regulating glucose.

The implant's delivery rate can be easily changed by patient or physician, a programmable feature not shared by other systems which simply deliver a steady drip of insulin under the skin. Insulin is absorbed faster in the abdomen than under the skin.

Because the Sandia/UNM system can deliver insulin very slowly—a fraction of a drop over a period of several minutes—the new implant can use standard concentration (U100) insulin. Other systems deliver only laboratory-prepared diluted insulin.

The system's pump, motor, electronic controls, and two lithium batteries are housed in a thin titanium case about the size of a deck of cards. This 300-gram (11 ounce) package, along with a four-cubic-centimeter silicone rubber reservoir and a 15-cm catheter that conveys insulin into the abdomen, was implanted below the patient's right rib cage between two layers of muscle.

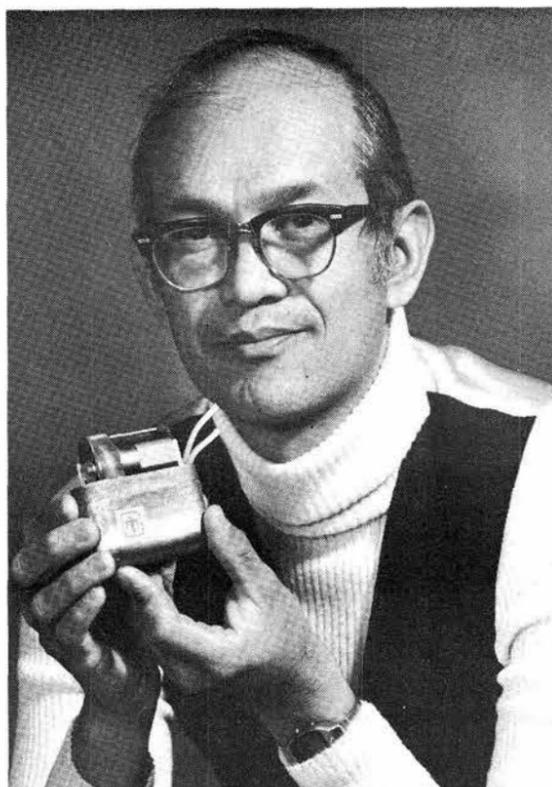
Similar systems have been implanted in a number of dogs. These implants were preceded by two years of testing various delivery system designs, externally in diabetic humans and internally in diabetic dogs.

Heart of the new system is a peristaltic pump driven by a rotary solenoid motor originally built at Sandia for a weapons control system and modified for this application.

Each back-and-forth movement, or click, of the motor rotates the pump head slightly forward, causing rollers on the head to advance a two-microliter droplet of insulin through a 1.5-mm-diameter rubber tube leading to the delivery catheter. The frequency of the clicks thus determines how often the droplets pass from the catheter into the abdomen.

When the patient is not eating, the pump operates very slowly, providing a maintenance dose like a normal pancreas. This rate can be varied from a droplet every four minutes to one every 16 minutes.

Before eating, the patient calculates a meal-time insulin dose by solving a simple formula based on expected calorie intake from the upcoming meal and present blood sugar level. The patient then uses a hand-held programmer, designed and built at Sandia, to instruct the implant to



RUBEN URENDA (2324), electromechanical designer for the Sandia/UNM insulin delivery system, holds a unit like the one implanted in a 41-year-old diabetic man. The top of the unit's titanium case is removed, displaying the pump and motor, Urenda's major design responsibilities.

deliver the calculated dose at a high rate (one droplet every eight seconds, for one minute to 16 minutes).

In addition to directing the implant to change its delivery rate, the programmer can obtain information from the implant about the amount of insulin delivered, the amount remaining to be delivered for an on-going meal-time dose (insurance against overdose), and battery strength, and can perform other system diagnostics.

The programmer, which has a 1024-byte program memory, uses complementary metal oxide semiconductor (CMOS) integrated circuits and analog and bipolar devices mounted on four-layer printed circuit boards.

The implant's package, designed by Sandia and built by RCA's Government Systems Division, uses standard digital device CMOS integrated circuits, analog bipolar discrete components, support circuitry, and a 32 kHz watch crystal. The components are mounted on a 1 1/4" x 2" ceramic thick film circuit.

Future versions of the implant system are expected to be about one-half the present size and will be powered by a battery which lasts up to five years, rather than the present 12 months. Capacity of the reservoir, filled through the skin with a syringe, will be increased to hold a 30-day supply of insulin, rather than the present seven-day supply.

At Sandia, the idea for such a device developed out of conversations between Bill Spencer (now 8100, then 2100) and Dr. Phil Eaton of UNM's Medical School. Gary Carlson, Jerry Love and John Gaona, all of Ray Bair's Command & Control Division 2335, and Ruben Urenda (2324) were principals on the project. Valuable contributions were made by the department 1480 Shops (pump and motor fabrication) and departments 5830 (laser welding), 2520 (battery development), 1220 (reliability analysis) and 2450 (design definition).

Cover Photo

Nearly 700 Livermore Sandians gathered on the lawn north of Bldg. 913 recently for a 25th anniversary group photo. Sandia photographer Mike Stefanski (8413-1) took the picture from the roof of Bldg. 913.

ASME to Host Synfuels Symposium

Synfuels are the topic of the 21st annual ASME Symposium to be held March 19 and 20 at the UNM Physics Lecture Hall. The symposium, jointly sponsored by the American Society of Mechanical Engineers and UNM's College of Engineering, annually provides a forum for timely topics in technology. This year is no exception.

The immense coal, shale and other resources of this country can provide much needed liquid and gaseous fuels as petroleum reserves are depleted. However, the facilities and technologies used to extract fuels from coal and shale are expensive and represent an investment that industry is not currently willing to assume. This symposium will outline synfuel options and their limitations.

Symposium chairman Dick Traeger (4740) and program chairman Herb Sutherland (4739) report that a number of invited experts from both government and industry will speak on current synfuel research. Topics include: coal gasification, coal liquefaction, oil shale retorting, crude oil production from tar sands, and methane recovery from coal beds, among others.

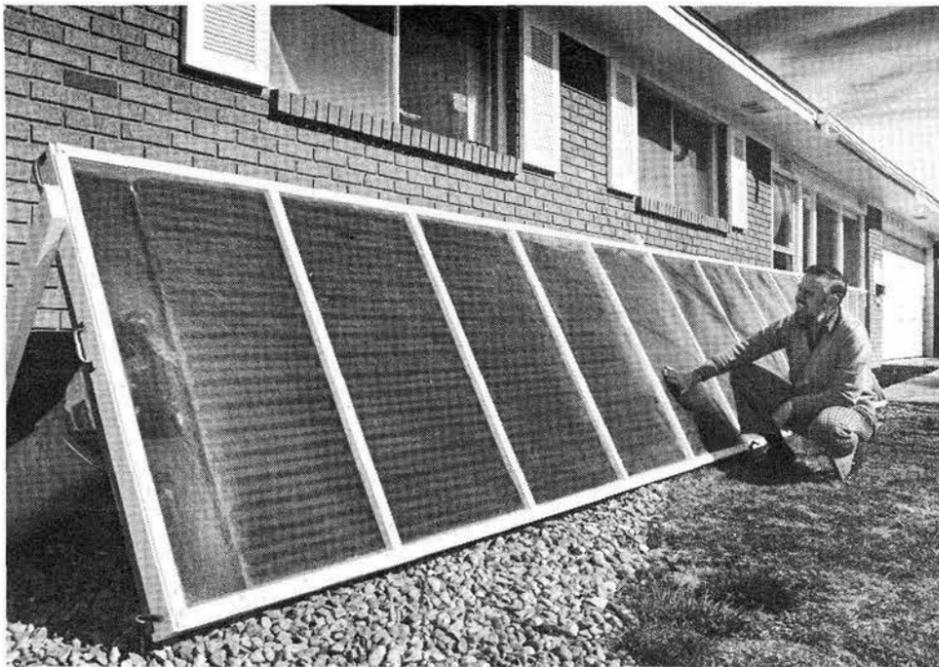
Other Sandians serving as committee chairmen are: Rod May (5522), Jim McClure (4551), Randy Mayes (5522), Harold Maciolek (4325), Al Dennis (4442), Alfonso Ortega (5512), and Kathleen McCaughey (2325). Contact any of these Sandians for information.

Take Note

While classes and clinics are effective, the fact is that most smokers who quit pretty much do it on their own. This is the basis of a two-manual package, "Freedom From Smoking," available from the American Lung Assn. of New Mexico, at 216 Truman NE. A \$5 donation is asked for the first manual, "Freedom From Smoking in 20 Days." The second manual is furnished when the smoker successfully reaches the 16th day of the program.

* * *

Pianist Andre Watts is the next big gun to play with the New Mexico Symphony, March 13 and 14 at Popejoy. He'll be playing some Brahms and Haydn. The release notes that at age 26 Watts was the youngest person to receive an honorary doctorate from Yale in more than 200 years. Well, we certainly can't hold that against him. You can reserve tickets by phoning the symphony office, 842-8565, and using your charge card.



ROSS YINGST checks out his solar collectors. Note duct at lower left through which cool air is blown into the collectors, heated, and circulated back into the house through the greenhouse.



ANOTHER VIEW of Ross's solar system showing his porch-turned-greenhouse.

Energy Do-It-Yourself

Solar System Works, Cost Is Modest

Like the rest of us, Ross Yingst (4343) has been uncomfortably aware of the steadily rising cost of heating a home. But Ross, like an increasing number of people, did something about it. He built an active solar system for his 17-year-old, 1920-sq.-ft. house and kept the cost of the system within reasonable bounds.

"I converted the entrance to my house into a solar greenhouse and placed a collector array along the front of the house," says Ross. "The collectors are at ground level next to the bedrooms—a squirrel-cage fan pumps in air from the house's interior through the collectors, into the greenhouse, and then on into the house. A thermostat within the collector

activates the fan when the temperature hits 90 degrees. The collectors are detachable so I can store them in the backyard during the summer.

"I painted a hot-water tank black and placed it inside the greenhouse to preheat our hot water. The collectors and the greenhouse keep the front of the house pretty comfortable. I also vented the clothes dryer into the greenhouse and I had previously installed a woodburning stove in the den's fireplace at the back of the house."

Ross's solar system has been in operation since early December. His gas bills so far have been averaging \$40 to \$50 less than his neighbors', and he figures that the

collector and greenhouse account for 25-35% of the reduced gas consumption.

"I used some salvage material," Ross explains. "Corrugated metal for the collectors, second-hand water tank and fan. The double-paned glass and plastic covering for the collectors was new, as was the copper plumbing to extend water lines to the hot water tank."

"The system cost a little over \$1200 and I estimate it came to \$5 to \$6 a square foot, including the duct work. With my son helping me, the job took about a year of spare time work to complete. The system will pay for itself in four years, and an immediate benefit is that some of my construction costs are rebatable on both federal and state income taxes."

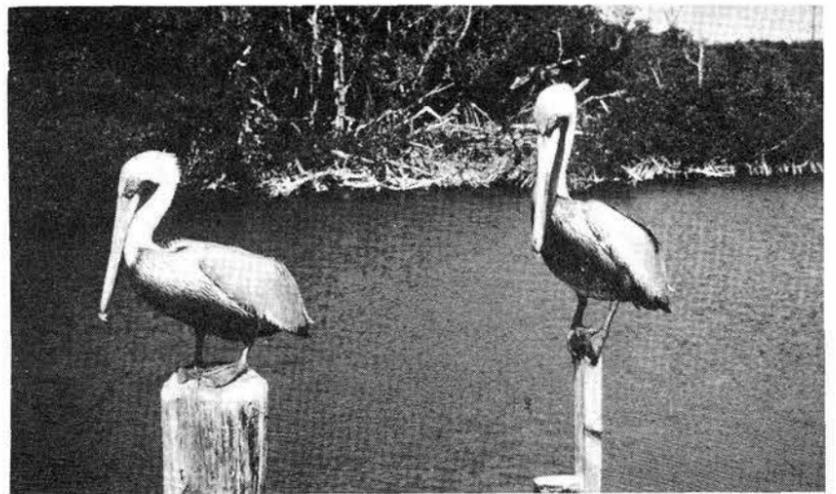
Retiree News

Gene Newlin Golfs, Fishes In Florida

Gene Newlin, who retired in January 1980 after heading Sandia's patent activities for 26 years, writes to the LAB NEWS from Florida:

"My wife and I have spent the first year of my retirement in Homosassa, Florida—a small fishing village about 70 miles north of St. Petersburg. The Homosassa River, which flows into the Gulf of Mexico, runs in front of our home and is a water sportsman's paradise—fishing, boating, water skiing.

"Much of the time Jeanne and I take our small boat and 'lazy' down the river simply to absorb the magnificent tropical beauty of the area. All around us pelicans dive-bomb for their food, sea gulls hover overhead, and great white herons stand guard along the river banks looking like graceful, alabaster statues. Every so often a manatee swims by. Manatees weigh between 300 and 400 pounds and can give



RETIREE Gene Newlin displays a string of fish caught from Florida's Homosassa River which runs in front of his home. Gene enjoys nature photography, took photo of two sea birds.

you a real jolt if you don't know they're gentle, harmless creatures just swimming along minding their own business. They're on the endangered species list—only around a thousand in existence, we understand.

"You can imagine that this is a photographer's paradise, too.

"The golf course fairways are lush and green, but look like they've been bulldozed through a sub-tropic jungle. We're never quite sure what creepy-crawlies are lurking in the jungle roughs—coral snakes, rattlesnakes and/or alligators—so we don't walk

very far off the fairways looking for lost balls.

"If all this sounds a little too utopian, let me tell you that 100-degree temperatures, with 100 percent humidity, is the summertime norm. And when they talk about the 'rainy season,' that means it rains every day for about a month and a half! It's like living in a sauna bath.

"So we're looking forward to coming home around the middle of May. There's still no place like our beloved Albuquerque."

Sandia Experiment Points Way To Geothermal Drilling Savings

In an experiment conducted last November at a geothermal drilling site in the Valle Grande, the vast volcanic caldera between Jemez Springs and Los Alamos, Sandia laid the groundwork for significantly reducing the cost of geothermal drilling.

Charged by DOE, under its Geothermal Drilling and Completion Technology Development program, to demonstrate cost reductions in geothermal drilling by 25 percent by 1983, Sandia is examining all phases of geothermal drilling.

One of the major factors in the high cost of geothermal drilling, up to five times higher compared to oil or gas drilling, is the extreme corrosion rate of drill pipe.

An oil or gas well uses a drilling fluid, called "mud," which is a mixture tailored to the particular well. The mud functions as a lubricant for the drill stem (the long string of 30-ft. lengths of steel pipe going down into the well), as a coolant for the drill bit and as a medium to carry the drilling debris to the surface. Standard mud formulas may be used only in the shallower portions of geothermal wells.

In geothermal wells, the deeper formations are usually porous or fractured and temperatures may reach 350°C. The formations may be "underpressurized"—a type of pressure anomaly—when compared to other geologic formations at depths around 4500 ft. Conventional "heavy" drilling mud is lost into the formation under these conditions, which is not only costly, but clogs the formation, reducing steam production. To overcome the problem, geothermal drillers use high-pressure air and water to form a "light" drilling fluid of vapor mist. The high flow rates and temperatures of this vapor combine to oxidize the drill pipe at an alarming rate. Addition of various chemicals to the vapor slows the corrosion but not enough—the cost of these chemicals plus replacing corroded and weakened drill pipe at the Valle Grande geothermal well was running close to \$4000 a day at the time of the Sandia experiment.

Sandia substituted a non-corroding gas—nitrogen—for the compressed air of the

drilling fluid and cut the corrosion rate by a factor of 10. Billy Caskey of Geo Energy Systems Analysis Division 4756 explains:

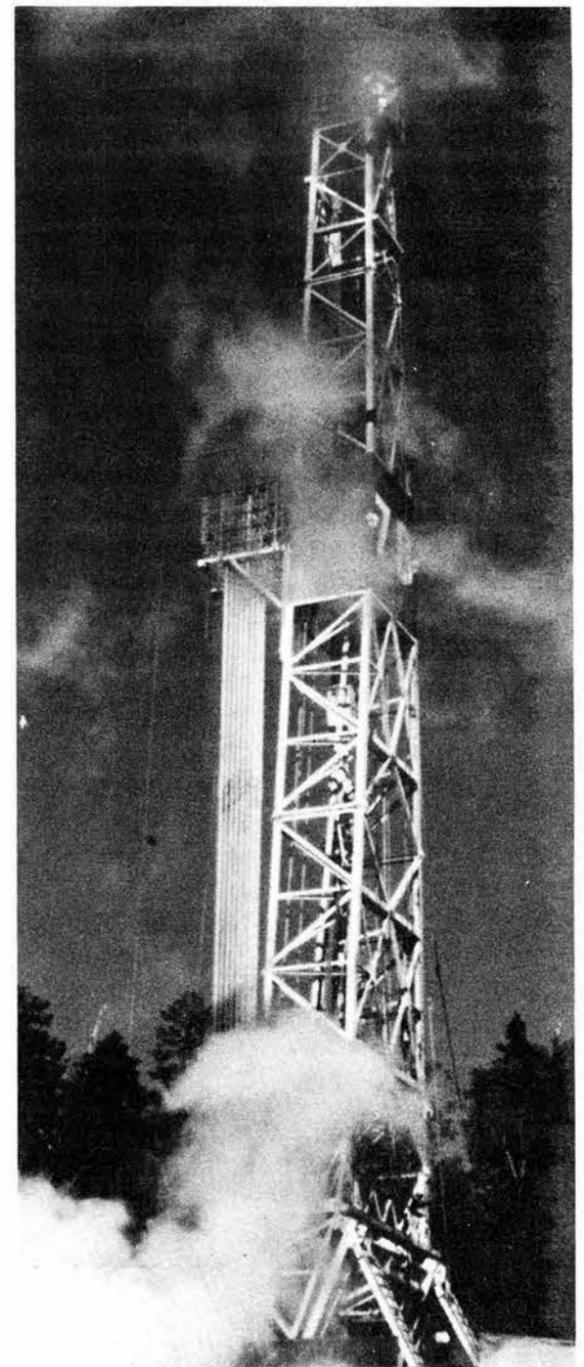
"Our lab tests and analyses convinced us that nitrogen was the answer to the corrosion problem. But we had to have an actual field experiment to prove it. In a field situation, there are many unknown and uncontrollable factors where air is introduced into the drilling operations—when the drill stem is removed, for example, to add additional lengths of pipe or to replace a bit. Our experiment, although costly since we trucked liquid nitrogen to the drill site, did prove conclusively that nitrogen significantly slows corrosion under actual drilling conditions.

"Here's the next step. We are working with industry to develop a catalytic converter that can take exhaust gas from the huge diesel engines which drive the drill rig, generators and air compressors and remove the remaining oxygen, leaving mostly nitrogen. Such a device is feasible—the diesel engines provide more than enough exhaust material—and a small prototype unit has been built. Sandia is now assisting industry through development contracts to produce commercial units of the size needed. Our computer models tell us that a system producing nitrogen at the drill site and using it as the drilling fluid could reduce corrosion costs by half, or by \$2000 a day in the Valle Grande.

* * *

The geothermal well used by Sandia for the experiment is part of a project involving DOE, the Public Service Company of New Mexico and Union Geothermal Company of New Mexico to build a geothermal demonstration power plant producing 50 megawatts. A network of 17 wells will supply steam for the turbine generators. All geothermal waters will be returned to the underlying formation via injection wells.

The area of the Valle Grande where the plant will be located is west of Redondo Peak and not visible from State Highway 4



A CLOUD of nitrogen and water vapor rises from a geothermal drill rig as Sandia conducts an experiment aimed at reducing drilling costs. Use of nitrogen instead of air as drilling medium cut corrosion rate of the drill stem pipe by a factor of 10. Next step is the development of an on-site nitrogen generator which converts diesel exhaust gases to nitrogen for use in drilling.

which skirts the Valle Grande caldera. Currently, the area is farmed and grazed by the Baca Land and Cattle Company.



Favorite Old Photo

A GLIMPSE of the old days on the Nebraska plains is provided us by Ken Payne (4323). "This picture was taken around 1912 on my grandfather's farm in Franklin County," says Ken. "That's my mother on the left with the dog—to the right are my grandparents and the others are some of her brothers. The cows and horses represent all my grandad's livestock—he also raised corn, wild hay, and some feed grains. The area today has a lot more trees, although my family doesn't own the property now."

feed back

Q. The mechanism for getting work done at the shop is very obscure. I have no idea where to start when I have new work which I need them to do for me. It would be very helpful to have a single point of contact in the shops for all incoming work.

A. There is indeed a single point of contact for new work orders to be done by the Organization 1400 Shops. As noted in SLI 6505, if a customer knows what section will be doing the work he can go directly to that section or, if he does not, he should go to Division 1485.

Since many people may not read SLIs, we have listed "Shop" in two places in the Sandia phone book. In the section "Albuquerque Services," you will find "Shop Fabrication Requests," and in the section titled "Organization Index" you will find "Shop Support Division." Both of these refer you to Division 1485. In the organizational section of the phone book under Shop Support Division 1485, you will find "Work Orders and Load Balancing (1400)." Joe Suknot or Pete Rospopo handle this function. Give one of them a call on phone number 4-8577 or visit them in Room 200S of Building 840. I am sure they can help you.

L. J. Heilman—1400

Q. The recent change in telephone equipment has been generally for the better. However, one change is decidedly not. Previously, in situations where I had to call someone long distance urgently, if FTS was continuously busy, I could dial direct. Now, however, we are physically prevented from use of DDD. So what am I supposed to do now for those few occasions when it is important to get through very quickly?

A. Your letter could be construed to mean that the new telephone system does not permit Direct Distance Dialing at all from Sandia. It should be pointed out that the new system only prevents DDD to those areas which have FTS automatic direct off-net dialing service. There are now 25 automatic off-net area codes (see the 12/18/80 Sandia Labs Weekly Bulletin) in which commercial numbers can be reached by FTS.

This restriction was required by DOE to insure that users who might be unaware of the availability of off-net service didn't inadvertently place a DDD call to these areas.

A new procedure has been established where, in emergency situations, the KAFB operator will place DDD calls for you when FTS service to the automatic off-net areas is not available. Simply dial 0, explain the problem to the operator, provide the DDD telephone number and the operator will dial it for you. If you have further questions covering the FTS use, call Jim Porter on 4-7640.

L. E. Hollingsworth—2600

Q. During Mr. Cook's laboratory briefing, he stated that improvements in the 912 office area would be made during the next 10 years with the MX group moving into the first refurbishing area.

The 883 office area appears currently to be the Livermore "stepchild." Sixteen project members of the B83 share 856 sq. ft. [53.5 sq. ft./person] and two of our staff are located in an already crowded laboratory.

It would appear that the MX group, which already enjoys large office areas, should defer to the B83 for new/enlarged office space.

A. The new Combustion Research Facility and the new temporary building, 922, have recently given us some badly needed space. The effect has been to provide space in previously existing buildings to improve housing for the solar activities and the Library, move more people out of 916 so more of it can be converted to labs, and to decrease the density of activities in 912. The latter has not been implemented yet, but is in progress. First the MX, W79/82, and W84 groups will all get more space. As those moves occur, the B83 and some support groups will inherit additional space as well.

On top of all these moves and rearrangements, Plant Engineering is very busy with design work on an addition to the computer facility, on seismic upgrading of our older buildings, and on a new lab building.

The seismic work will start in 912. The physical construction will cause disruption and relocation of activities in certain areas of the building. Therefore, prudence dictates careful planning in execution of this activity and delaying plans to spruce up areas which will be involved.

We still have many people in trailers. We are very anxious to acquire new quarters and get rid of trailers. This all takes time and money. We are working very hard to obtain funds for this purpose.

I think we have made excellent progress and remain hopeful we can continue the trend.

A. N. Blackwell—8200

Q. Re: Mandatory Seat Belt Use—I'm highly irritated with the latest rule. Could there be a Sandia parking area off Base that a person could walk or bicycle from? Is there any future plan to isolate Sandia Labs from KAFB?

A. Sandia Safety encourages the use of seat belts, a proven safety feature, and urges their use at all times. The Base Command has decreed their use on base and all tenants have been asked to cooperate.

As to your questions, SNLA has adequate parking and does not see the need to buy, lease or rent off-base parking space. Secondly, there is no plan within the foreseeable future to isolate SNLA from KAFB.

As tenants on KAFB, Sandia endeavors to cooperate with Base Command; and even though belt use on Base is dictated, it is in your interest to buckle up.

D. S. Tarbox—3400

Q. I went to the stockroom to get some forms and found out that while most forms are stocked, medical and dental forms come from Benefits, and budget forms come from Budgeting. Wouldn't it be more efficient to stock them all at the stockroom? Or is there a good reason for this?

A. Thanks for your suggestion. Arrangements are being made to stock the Budget Adjustment and Capital Equipment Budget Request forms in Central Stores, and the Dental Insurance Claim forms in both General Stores and the Self-Service Stockrooms. Medical Insurance and Physician's Certificate forms are already in the General Stores system.

J. C. Strassel—3700

Q. The mechanism for getting work done at drafting is very obscure. I have no idea where to start when I have new work which I need them to do for me. Perhaps the drafting areas in 836 and 892 could each have a contact point for all incoming work.

A. Some time ago a letter was written to each department manager in which we listed the drafting division(s) supporting that department.

If that information is not available, each drafting supervisor has a list showing each organization supported by each drafting division. Any drafting supervisor will be happy to put you in contact with your supporting drafting division.

C. F. Bild—2400

Q. Why has the petty cash voucher remained at a \$25 maximum for as long as I can remember, 25 years? Why not make it a \$50 limit?

A. The \$25 ceiling on petty cash vouchers is a Bell System requirement. Unless they change—we cannot. Under the SNL/DOE contract terms, we must follow Bell practices.

We have considered this point periodically, but see no reason to ask for a change. Petty cash is for emergency procurements, minor conference or meeting expenses, meals, etc. It is not a primary procurement system and should not be used as such. We have other procedures available for rapid procurement of services or small value items and, therefore, feel no increase in the present petty cash maximum is warranted.

C. R. Barcord—3200

Q. For some years I had looked forward to receiving the mantel clock as my 25-year service award. Now a cheaper, simulated walnut case, battery-operated job has been substituted, so I don't want it. I already have a watch and a calculator, and I don't want any Nambe ware. Let's go back to the original mantel clock.

A. I'm sorry that we are unable to continue giving the solid walnut Whitehall clock as an anniversary award—it was the most called for item among those offered for 25 and above years' service. Let me explain why we had to substitute a different clock.

The Internal Revenue tax code limits the amount that can be spent on a service award to \$100 without the entire amount spent being reported as income.

I hope that you will be able to make a selection from the awards available. Have you thought of selecting a watch for your wife? There are some very nice women's quartz watches (not shown in the brochure) from which to select.

D. S. Tarbox — 3400

Q. Company vehicles are hard to start when cold and barely run until they are thoroughly warmed up.

This encourages warming the engine by idling [and thus wasting fuel].

A new van in our division ran well when new but after "maintenance" it can only be started when cold by rapidly pumping the accelerator and then invariably dies when shifted into gear. Very irritating!

Why are these vehicles tuned this way?

A. When vehicles are brought into Motor Pool for preventive maintenance, the engine is usually warm and, unless any special problem is noted on the work order, the mechanic does only scheduled preventive maintenance work. We sometimes need to keep a vehicle overnight to find a cold starting problem. If this can be arranged, we will be glad to repair it. Due to the fluctuation in temperatures, choke settings change. Also, some chokes stick which causes hard starting when engine is cold.

Anyone having difficulty with a vehicle should bring it to Motor Pool and discuss the problem with Bill Rose.

D. S. Tarbox — 3400

Congratulations

To Jack (4719) and Pat Jackson, a son, Joseph Lee, Feb. 17.

To Mike Garner (2146) and his wife Carolyn, a son, Jonathan Michael, Feb. 18.

Sympathy

To Manuel Garcia (1473) on the death of his grandmother in Las Vegas, NM, Feb. 17.

To Nelson Sexson (1471) on the death of his father in Albuquerque, Feb. 8.

To Kyle Williams (1483) on the death of his father in North Carolina, Feb. 22.



Unusual Vacations

'Cancun Can't'—Tim Leonard

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

Tim Leonard (4712) and his attractive bride Judy, a graduate teaching assistant at UNM, should have had a great time on their honeymoon during the Christmas holiday in the Mexican resort city of Cancun, right? Wrong.

Tim came charging into the LAB NEWS office fit to be tied.

"You run unusual vacation stories, don't you?"

Yes.

"Well, mine may not have been all that unusual but it sure was lousy."

Tell us about it.

"Judy and I got married the day after Christmas. Our parents were here. Parties. Dinners. Arrangements. Moving. Finally, on Jan. 2, we took off for Cancun on our honeymoon. The travel agency said it was going to be great—beautiful beaches, clear water, tropical jungle, Indian ruins, luxury hotel. We paid in advance."

Then Tim laid a story on us which resembled something by Neil Simon about a couple who experienced extraordinary bad luck during a trip to New York. Although a part of it, bad luck wasn't the point of Tim's story.

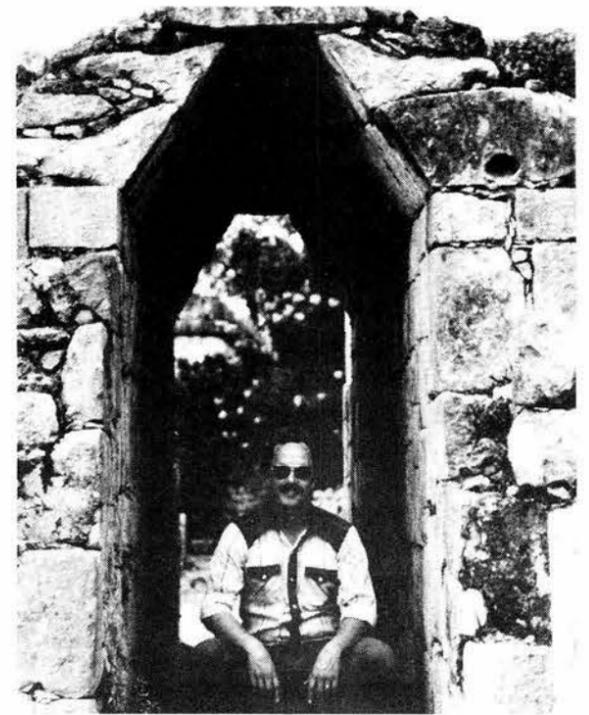
"Cancun is a ripoff," Tim says. "It exists solely as a place for tourists to go and spend their money. There is no other local industry. Prices are outrageous—\$1 for a six-ounce glass of ice with a splash of Coke, \$35 for a plate of fish and rice, \$2 for a beer, \$10 for a T-shirt with 'Cancun' printed on it, \$10 for a plastic souvenir—and the list goes on."

Tim and Judy signed up for a guided tour of the famous Mayan ruins of Chichen Itza.

"Another ripoff. The bus spent more time at rest stops at junk curio places than at the ruins. The 'guidance' consisted of parking under a tree."

Everyone experiences a surly waiter or bartender sometime. According to Tim, Cancun employs no other kind.

"They kept muttering in Spanish," Tim says, "which Judy understands. They were insulting. And it's infuriating. We had to sit there and make believe we didn't comprehend or we could make a scene."



MAN IN RUIN—Tim Leonard (4712) recently visited Cancun, a Mexican resort city on the Yucatan Peninsula near the famous Mayan ruins of Chichen Itza. In spite of "rotten luck" and other things, Tim and his wife Judy enjoyed visiting the ruins, the "high point of the trip."

"I did complain when the reservations were fouled up, when we got locked out of our room because the bill was not paid in full in advance as the travel agency contracted and about the paper-thin walls in our room above the cocktail lounge and the music going all night.

"Still, I didn't complain about the lousy food, the ridiculous prices, the extra 15 percent tacked onto the hotel bill for tips when I had very carefully tipped all those surly waiters, and things like that. Even the weather conspired against us. The skies were cloudy, the beaches and surf were cold."

So why didn't you leave?

"Tried to. Couldn't get seats on a plane before our scheduled departure."

What can the LAB NEWS do?

"Tell people to do a good job of planning their trips a long time in advance. Get receipts and contracts from travel agencies in writing. Double-check reservations. And go anyplace in the world except Cancun."

Anything else?

"Yes, Judy and I are planning another honeymoon."

Take Note

A public sale of 120 used sedans, pickups, station wagons, buses and other vehicles will be conducted on March 13 by the General Services Administration. The vehicles may be inspected at the GSA motor pool, 1800 12th St. NW, from 8:30 a.m. to 3:30 p.m. on March 11 and 12 from 8 a.m. to 9:15 a.m. on the day of the sale. The sale takes place at the Indian School auditorium, 1000 Menaul NW and begins at 9:30 a.m. Offers will be submitted by bidders in writing on cards—the card with the highest bid gets the vehicle.

* * *

The New Mexico Distinguished Public Service Awards banquet is scheduled for April 4 at the Classic Hotel. The awards program, now in its 12th year in New Mexico, has been established to recognize unusual contributions to public service and to the improvement of government by government employees and private citizens. Speaker at the banquet this year is William Carey, executive officer of the American Assn. for the Advancement of Science. John Cantwell (3163) is the Sandia contact for persons interested in attending the banquet. Tickets are \$15/person. (At the Labs, two prior recipients of the awards are Ray Powell, VP-3000, and former VP Dick Bice, now retired.)

* * *

L'Ecole de l'Alliance Francaise d'Albuquerque is launching its first gourmet cooking class this spring. Classes will be held in March and April on Saturday mornings and will be conducted in French, with English translation. Instructors are a team from the Alliance Francaise and Cordon Bleu grad Jack Ward. Class consists of preparing something suitably gourmet, then eating it for lunch. Call Margery Storrs, 821-5788, if you're interested.

* * *

The New Mexico Friendship Force is getting set for its next trip. This one goes to Newcastle-Upon-Tyne in England on April 11 to 25. Previous trips have been made to Korea, Costa Rica and Italy. Persons in the Friendship Force stay with families in the country visited; ultimately the visited family becomes a visitor and stays with a host family in this country (not necessarily the home of their prior guests). The England trip by air charter is running \$830 and has several openings. In addition, the local Friendship Force people are seeking more host families here in the Albuquerque area. Workshops are held to prepare both visitor and visited for the event. If you're interested, call the Friendship Force on 243-6916. State director is Bert Lindsay of Org. 2143.

* * *

Purchasing's Jay Hughes reports that once again Sandia's nominee for Small Business Subcontractor of the Year—the Los Alamos Technical Associates—has been selected as winner in Region VI, which includes Louisiana, Arkansas,

Oklahoma, Texas and New Mexico. The winner will now compete with nine other regional winners for the national award. Incorporated in 1976, Los Alamos Technical Associates now has 85 employees and an international clientele. Last year, the company had several contracts with Sandia. In 1980, Sandia's nominee—CVI Laser—went on to win the national award.

* * *

"Sandia Medical: Your Health Is Our Concern" is the topic of Medical's next program in the Go For Health series. Dr. Larry Clevenger from Sandia Medical is the speaker, and he will focus on services available in Medical and new programs coming up in 1981. The program will run on Tuesday, March 17, in Bldg. 815 (outside) from 12 to 12:30 p.m.

A video repeat of Medical's four-part series on heart problems is set for showing in Bldg. 892, room 211, 12 to 12:30 p.m. as follows: Risk factors and symptoms, March 6; Diagnostics, March 13; Treatment, March 20; and Exercise & Rehabilitation, March 27.

* * *

If you're edgy about hotel fires, we've got a brochure from Ray Cohrs (3652) describing a small device that you can hang on the inside of your hotel door which is a combination smoke and intrusion alarm (with different alarms for each). WE has negotiated a \$19.50 price for the device, plus two bucks postage and, if you'd like order forms, call Ray or Vern Duke in Plant Engineering's Fire Protection office, 4-1958.

* * *

It's not quite your Sunday *Times*, but you may have noticed something different about this LAB NEWS . . . it's bigger. This issue runs to 20 pages, our biggest yet. That may not seem very much by newspaper standards but remember—newspapers are about two-thirds ad copy.

* * *

The KAFB Base Library is presenting Dan True, local author, on Monday, March 16, at 7 p.m. to give a talk on his book *Family of Eagles*. Sandians and their families are invited to attend.

* * *

The Dept. of Electrical and Computer Engineering at UNM has extended, to March 24, a call for papers for the 24th Midwest Symposium on Circuits and Systems. The Symposium takes place June 29 and 30 at the University. Professors Shlomo Karni and Peter Dorato are contacts at UNM; at Sandia, Don Schroeder (2648), 4-4921, has additional information (see the bulletin boards as well).

* * *

Two papers, co-authored and presented by Ron Iman (1223) and W. J. Conover (Texas Tech), were named outstanding presentations of the 1980 annual meeting of the American Statistical Association in Houston. The papers were among 102 presented in the section on physical and engineering sciences. "Small Sample Efficiency of Fisher's Randomization Test When Applied to Experimental Designs" was named the outstanding paper and "Multiple Comparisons Procedures Based on the Rank Transformation" was named runner-up.



LUCILLE CAFFERTY (2550) and VERA McCULLOUGH (4210), at right, explain to West Mesa High School students some of the new techniques used by Sandia secretaries. Other members of Sandia's Secretarial Committee making these presentations at city schools are Soila Brewer (1220), Bonnie Reilly (3510/3530), Carol Kaemper (5500) and Pam Wilkinson (former Sandian). Their message: with the shortage of secretaries, better salaries, specialized training programs and new equipment, the office of the future will not be dull!

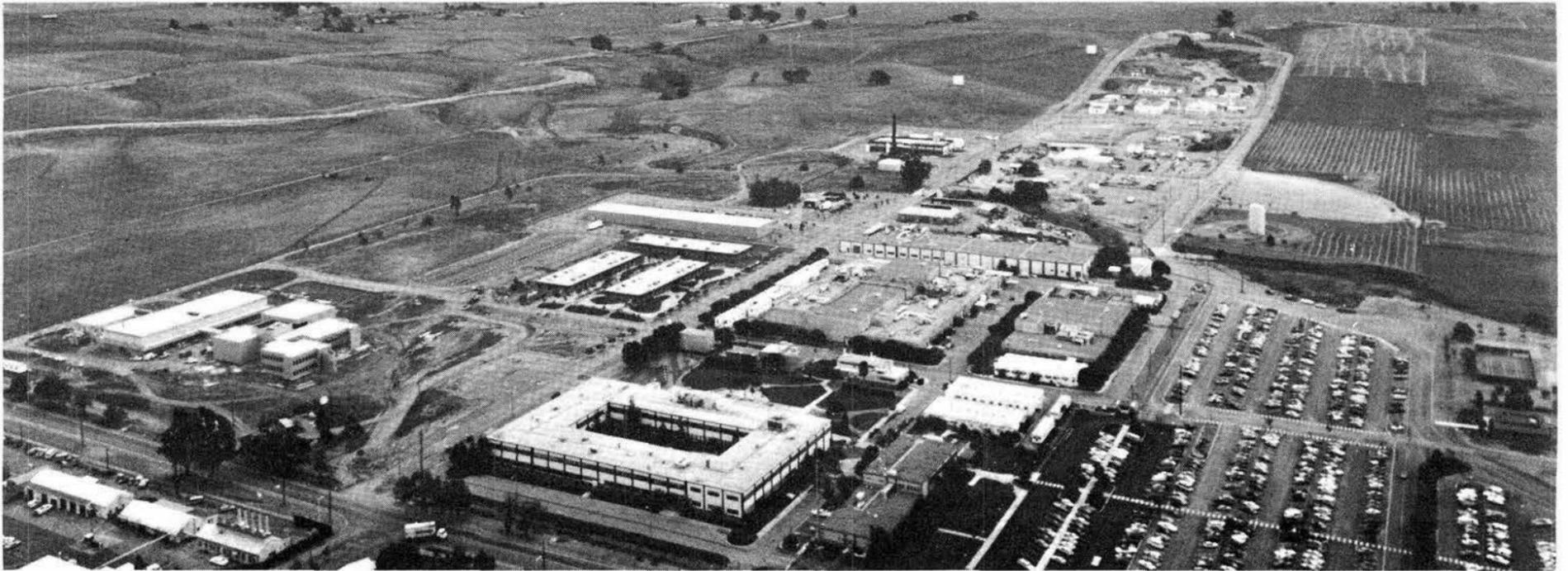


LIVERMORE NEWS

VOL. 33, NO. 5 LIVERMORE LABORATORIES MARCH 6, 1981



25th Anniversary Issue



SANDIA NATIONAL LABORATORIES LIVERMORE as it looks today from the air. The Labs holds an open house for Sandians' families and invited guests Saturday, March 7, from 9 to 5. Displays, activities and tours are scheduled.

Newest feature of SNLL is the Combustion Research Facility (on left in photo), to be formally dedicated today (March 6) at 2 p.m.

Now 1065

We Began With Fifteen People

Twenty-five years ago this weekend Sandia Laboratories established its Livermore facility. The new Lab would perform nuclear ordnance work upon the nuclear devices designed by UC's Radiation Laboratory with whom, at the time, the Lab shared quarters.

An advance team of 15 Sandians had been sent out in the summer of 1955 to set up shop in an old barracks. Then on March 8, 1956, the establishment of the new Lab became official with an announcement to that effect by the Atomic Energy Commission. As of that date, 28 employees were on site, and five of them remain on roll today: Gayle Cain (8412), Jim Henderson (8216), Bill Little (8270), Frank Murar (8322) and Harvey Pouliot (8441). Five have since returned to Albuquerque.

Present-day retirees who were part of the initial group include Wayne Grimshaw, Bob Siglock, Maurice Taylor, Mary VanBrocklin and Orval Wallen. The remainder, no longer at the Labs, include Nora Belle Byrd, Bob Dewhurst, Cliff Erickson, Vernon Field, Ben Fisher, Art Grover, Charles Gump, Ray Huston, George McCarthy, James McMinn, Bill Marsh, Joe Sladky, and Frank Thomas.

At the outset, only one department, Engineering (1250) headed by Jack Howard (2), was operating. He became Director of Systems Development in November 1956 and, in 1957, Bob Poole became the Labs' first VP.

In those early days, Sandia Livermore did engineering design and test work on

nuclear ordnance, as well as on assembly of weapon test devices. That work continues today with nuclear weapon systems, their concept, design and development. And our mission has expanded to include energy research, particularly in solar and combustion.

By the end of 1956, 109 employees were working here. In 1957, Bldg. 911 was completed and about a year later, Bldg. 912 was ready for occupancy. By 1961, after five years, Sandia had grown to 950 employees in 12 buildings, with an annual payroll of \$7 million. The city grew, too—from 11,000 to 16,000.

This year, our number of people is at 1065; our payroll reached \$23.8 million by the end of FY '80. The Labs site now contains more than 30 buildings.

And the community's growth in the '60s and early '70s reached a high plateau, with 48,107 population, according to the 1980 census figures.

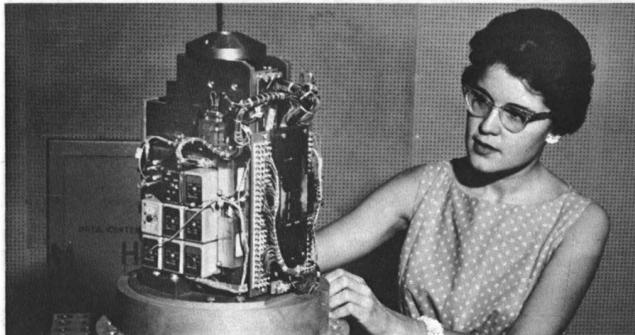
Sandia at Livermore observes its silver anniversary this weekend with Family Day on Saturday, March 7. Preceding this is the dedication of the new \$10 million Combustion Research Facility this afternoon (March 6).



BLDG. 911 was the first structure on the present site, completed in the fall of 1957. Even the Thunderbird emblem looked different then!



SANDIA LIVERMORE'S FIRST VP, Bob Poole, is shown with Jim McRae (right), president of Sandia when the Livermore facility was founded in 1956. Both men are now deceased.



SANDIA LIVERMORE'S FIRST woman engineer, Betty Carrell, is shown in 1961 in the Environmental Testing Lab examining a telemetry package.



MUCH PROGRESS has been seen since SNLL's microelectronics lab first opened in 1968. Working in the new facility were Ike Davis (8262) and Bob Noble (8424) at right.



ENJOYING the 1969 Sandia Christmas Dance are, from left, Hilt DeSelm, Burnie Biggs, Lorena Schneider (8215) and Matt Connors (8214).



AEC CHAIRMAN Dixy Lee Ray posed with Sandia president Morgan Sparks, left, and Tom Cook (8000) during a November 1973 visit to Livermore.



THUNDERBIRD THEATRE—Sandia provided an impressive display for the Alameda County Fair in 1959, including this Theatre for showing "The Sandia Story." In front at desk is former Sandian Bob Dewhurst.



CHANGING OF THE GUARD—As he retired in 1968, Livermore's vice president Burnie Biggs offered his chair to successor Tom Cook, Livermore's present head. Looking on was Sandia president John Hornbeck.



SANDIANS GAVE Linda Hoeger, their entry in a charity bike race, a grand sendoff in the fall of 1971 when this photo was taken.



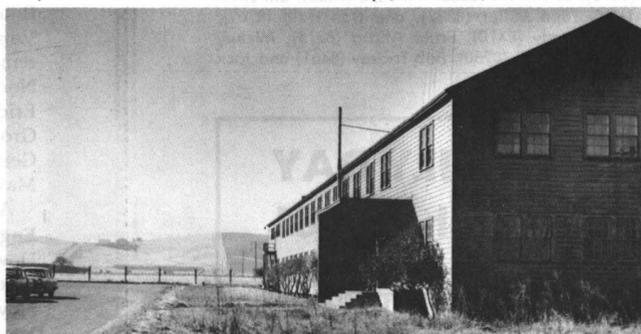
TWILIGHT GOLF League winners in a November 1966 tourney were, clockwise beginning at bottom, John Liebenberg (8112), Frank Kay, Al Baker (8452) Bob Reese (now 4551), Charles Duffy, and Don Yearout.



TAKING TO SKIS in Livermore's Tech Area after the surprise snowfall of March 1975 was Marnie Cody (8423).



MACHINING and other work on this scale model of a weapon under development in 1975 took over 1500 hours. Those involved include (from left) design draftsman Bob Graham (8272) and machinists George Dawson (8423), Andy Cardiel, Dell Houser, and Bill Lavinsky (all of 8423).



THIS WAVE BARRACKS occupied the site where Sandia's Bldg. 911 was later constructed in 1957.



SURVEYING PLANS for construction of the south wing of Bldg. 912 in August 1963 is Jim Harter (8254).



SANDIA RECEIVED the Navy certificate of merit for its work on the Polaris missile warhead in March 1961. At the ceremonies (from left) are Rear Adm. Joseph Black, Sandia Livermore VP Bob Poole, VP Burnie Biggs of SNLA, Sandia president S. P. Schwartz, LLNL director John Foster, and Harold Brown of LLNL (until recently, head of DoD).

Tom Cook: Looking Ahead 25



Sandia Livermore's vice president Tom Cook (8000) was asked by LAB NEWS to look into his crystal ball and to tell us what he sees 25 years hence—for the year 2006. Here is what he forecasts.

"Although futurists have achieved some respectability, for example Herman Kahn and Carl Sagan, I believe their track record is about as good as that of the average witch doctor. I say this as a cautionary preface to my 25-year forecast.

"To my knowledge, we had the good judgment 25 years ago not to make a forecast of what we would be like in 1981. (Or if anyone did make such a forecast, he or she had the good judgment not to tell anyone.) But having been asked to forecast the next 25 years, and considering the possible smile my forecast may bring in the year 2006, here goes:

- Sandia Livermore will still be here.
- Our numbers clearly will not increase percentage-wise as much as they have in the last 25 years, when we went from 28 employees to the present 1065. However, I do see an increase by about the same in absolute numbers for an on-roll number of 2000 employees.

- The Labs will be internationally recognized as a leader in certain fields of science and technology. How things burn or 'combust' is one such field. How to design complex, safe systems to handle hydrogen, deuterium, and tritium—important fuels in our future—is another.

- Our weapons R&D will reflect increased emphasis on fighting wars in space. A major challenge will be to make these weapons safe for people on earth but effective in space. Thus safety, reliability and effectiveness will continue to have a major role in R&D.

- There will be a prohibition on the building of nuclear weapons, that is, nuclear weapons as we know them today. This restriction will be possible because of recognition that such weapons cannot be effectively used.

- The B83 strategic bomb, the W82 and W79 artillery shells, and the W84 ground-launched cruise missile—all in design today at SNLL—will be in the stockpile. However, international arms reduction agreements will be reducing their numbers rapidly.

- Energy supply will be well matched to the nation's need. This will result from the use of fission, fusion and coal energy sources augmented by solar, the latter particularly in the southwestern United States. Energy R&D will thus not be as major a concern as it is today.

"In closing, I would predict with greater confidence that science and technology in 2006 will have great recognition and acceptance by society. And I'd predict further that Sandia at Livermore will continue to apply its know-how in 2006 to important national and world problems."

The Good Old Days: Rain, Cold, Heat, Snow...

It was an opportunity to reminisce when 22 Sandians who arrived during 1956 got together for a LAB NEWS photo session: the hottest summer, the wettest winter, how they adjusted to this little western town, how close-knit the group became, how they worked in make-shift facilities.

Roger Baroody (8410) recalls, "What I remember is the day Mary and I and our three children arrived. It was raining hard and steady. We had no rain gear, so spent the first hours at Penney's trying to get outfitted. But they had already sold out their rain gear to the other Sandians, so we ordered what we couldn't get that day. By the time it arrived, it had quit raining and hasn't rained quite that hard in 25 years since . . ."

Frank Murar (8322), also remembers the wet weather: "I think it rained just about every day the first month I was here; the fields were soggy and the countryside covered with pools of water. The whole Dublin area was an open field and mostly flooded at the time. The facilities were something to remember. When we moved into a larger barracks, we'd huddle around the space heaters on those winter mornings trying to get warm. The central heating system didn't get installed until summertime. Then it was so hot—with 110° temperatures—that we all got sent home."

Harvey Pouliot (8441) commuted back to Albuquerque on weekends until his house was sold. When his family did move out, "It was springtime—very nice, lush and green, most pleasant. The atmosphere was a lot more informal."

Bob Hauff (8271) came here from another company in Seattle. "I came down three months before my family and had been writing to them how nice it was. Then, lo and behold, on the day they arrived there was snow on all the hills surrounding the valley . . ."

Marv Glaze (8260) transferred out as our financial agent. He leased two duplexes at 240 and 242 North K St., plus another house on Marilyn Avenue, which were the only rentals available for Sandians to use until they found permanent housing. Marv recalls: "What I thought was my first California earthquake came in the barracks one day when a truck backed into our loading dock and the whole place shook."

Gordon Miller (8332) came here from Sandia's outpost at the Fairfield (Calif.) Air Force station. "The eastern boundary of the city was Hillcrest Avenue. We got fresh eggs from Mr. Barber who had a farm at the end of Hillcrest."

Bob Tockey (8461) recalls the rapport among Livermore Sandians. "We were a happy family in an excellent and fertile work environment. We pulled together on high-priority national projects. We had close social ties partly because of our common interests and partly because of some local coolness toward the 'upstart' scientists. But our community spirit quickly developed."



ORIGINAL TRANSFEREES to Livermore are shown in this 1956 photo. From left to right against wall are Charles Barncord (3200), Charles Gump, Clifford Erickson, Gayle Cain (8412), Charlie Winter (400), Frank Thomas, James McMinn, and William Marsh. In front are Benjamin Fisher, Jr., Robert Siglock, Vernon Field, Wayne Grimshaw, Orval Wallen, Mary "Aggie" VanBrocklin and Nora Belle Byrd. Other Livermore pioneers include Frank Murar (8322), Bill Little (8270), Harvey Pouliot (8441), Ray Brin, Jack Howard (2), George Martin, Maurice Taylor, Ray Huston and George McCarthy.



TWENTY-TWO SANDIANS on roll during the first year (1956) of operation at Livermore pose today for this Silver Anniversary photo. From left, standing, are Gayle Cain (8412), Bob Hauff (8271), Bob Hofford (8272), Frank Murar (8322), Pat Gildea (8443), Jim Henderson (8216), Bob Crow (8335), Al Ford (8423), Bill Little (8270), Lorena Schneider (8215), Harvey Pouliot (8441), Gordon Miller (8332), and Don Held (8262). Kneeling in front from left are Dick Cook (8272), Roger Baroody (8410), Ernie Alford (8275), Mickey Rindone (8444), Walt Dzugan (8214), Leo Gutierrez (8400), Marv Glaze (8260), Bob Tockey (8461) and Jack Bolen (8445).

Lorena Schneider (8215) remembers the town. "In '56 Livermore had about 11,000 people, and you could see everything in a 10-minute drive. The town reminded me a little of the old West, right down to the movie theater in the original opera house with its short velvet drapes on brass hangings and creaky, wooden floor . . . Several merchants thought we were a Danish furniture company, Sandria, that was supposedly locating here."

FAMILY DAY
March 7, 1981

**SANDIA NATIONAL
LABORATORIES LIVERMORE**

Molten Salt Receiver Looking Good

An advanced molten-salt solar receiver designed to produce five million watts of thermal energy has successfully undergone more than 400 hours of testing since last August at Sandia's Central Receiver Test Facility.

Designed by Martin Marietta Corporation for DOE, the receiver uses a molten salt mixture, 60 percent sodium nitrate and 40 percent potassium nitrate, as a high-temperature, heat-transport field.

For test purposes, the receiver is mounted atop the 200-foot-high power tower where sunlight from the field of 222 computer-controlled heliostats is focused on its 11x18-foot panel of black tubing. Molten salt flowing through the tubing at 550°F is heated to 1050°F by the concentrated sunlight. In an electric generating plant, the hot salt would be used to generate steam to produce electricity. The CRTF is not equipped with a generator.

For the CRTF, which is used to test and characterize solar energy components for central receivers, the molten-salt receiver is the third solar receiver to be tested.

The first receiver, tested in 1978 under the sponsorship of DOE and the Electric Power Research Institute, was a one-megawatt, gas-cooled prototype built by Boeing. The second was a three-megawatt (thermal) water-to-steam receiver developed for DOE by McDonnell Douglas and Rocketdyne.

CRTF's heliostat field, 88,800 sq. ft. of mirror surface, can concentrate the equivalent of more than 2000 suns upon a test receiver to produce up to five megawatts of solar thermal energy. Depending on design, any of several heat-transfer media—water, air, or molten salt—may be circulated through the receiver and heated by the concentrated sunlight.

The molten-salt receiver is one advanced concept that offers potential advantages over conventional water-to-steam technology, including significantly higher system efficiency, lower working pressures, lower pumping costs, and higher overall heat-transfer rates. In addition, the receivers are light and simple to control.

Because of these advantages and its potential cost effectiveness, the molten-salt receiver is a prime candidate for solar repowering projects in which a solar power tower would be sited next to an existing fossil-fuel generating plant or next to an industrial plant where it could provide heat for production purposes.

Bill Marshall heads the Central Receiver Test Facility. It is part of DOE's Large Power Systems Project managed by Sandia National Laboratories.



From an advice column on pet care:
Dear Dr.: I have heard that if you put a little bit of wine in a guinea pig's water every day he will not get a cold. Is there any truth to this?—J.W.

Dear J.W.: I really can't substantiate that wine would prevent a guinea pig from getting a cold, but I do know that you'll have a very happy guinea pig.



SANDIA MEMBERS of the Network for Women in Science and Engineering met with Ray Powell (VP-3000) to discuss plans for an upcoming conference, "Expanding Your Horizons," designed to interest young women in technical careers. Pictured are (sitting, from left) Mary Ann Sweeney (4247), Julia Fu (2144), Suzanne Weissman (5821), Nancy Hall (5814), Betty Brake (5513), Judith Mead (4363). Standing, Barbara Epstein (4247), Gerda Krefft (5112), Jennie Tischhauser (3532), Mr. Powell, Ruth Whan (5820), Sharon Kurtz (3141) and Liz Scott (3153). Other participants not pictured are Patricia Allen (4719), Zelma Beisinger (5521), Ellen Edge (4453), Karen Haskell (2646), Kathleen McCaughey (2325), Michi Wada (2113) and Annie Webb (1121).

Expanding Your Horizons

Technical Careers For Women Promoted

A number of Sandia women are involved in the planning of the Albuquerque "Expanding Your Horizons" conference, sponsored by the New Mexico Network for Women in Science and Engineering. The purpose of these conferences—five are being held throughout the state—is to introduce high school girls to science and engineering careers. The Albuquerque conference takes place at UNM on Saturday, March 28, from 8:15 a.m. to 4 p.m.

The women from the Labs will participate in activity workshops and career panels. The activity workshops give the students an opportunity to get acquainted with a field through "hands on" experience, for example, operating computers, growing crystals, making a camera,

reading topographical maps, etc. The career panels feature groups of women in a technical field discussing typical workdays and how to combine a career and family. The old belief that girls don't do math and science persists; through these workshops, the students can see that "yes we do" is more appropriate.

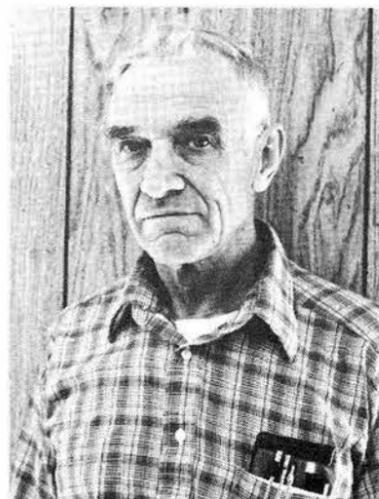
Sandia has helped sponsor the statewide conferences for the second year with administrative support, publicity, and conference materials.

The Network urges parents at Sandia to encourage their teenage girls to look into a career in science and engineering. Attending "Expanding Your Horizons" is a good first step. For more information, contact Gerda Krefft, 4-2679, Kathleen McCaughey, 4-1573, Jennie Tischhauser, 4-7165, or Suzanne Weissman, 4-6450.

Retiring



Roy Rainhart (1472)

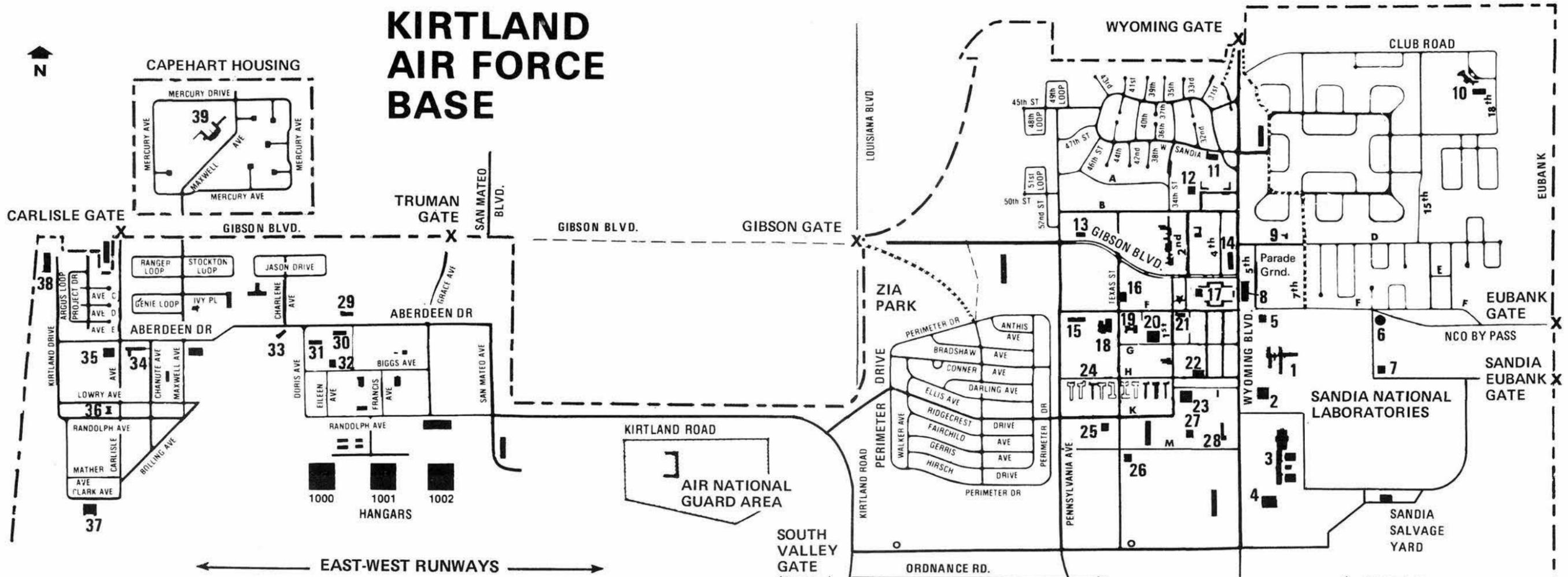


Ray McVeety (4721)



George Davies (3432)

KIRTLAND AIR FORCE BASE



NOT TO SCALE

LEGEND

- | | | | |
|-------------------------------------|-------|-------------------------------|-------|
| 1. Sandia National Labs | BLDG. | 21. Post Office (East) | BLDG. |
| 2. Sandia Credit Union | 609 | 22. Bank of New Mexico (East) | 20320 |
| 3. Nuclear Weapons School | 20602 | 23. Thrift Shop | |
| 4. AF Contract Management Division | 20604 | 24. DOE | 383 |
| 5. Lab News | MO125 | 25. Auto Hobby Shop | 375 |
| 6. Sandia Exhibit Center | 852 | 26. Wood Hobby Shop | 440 |
| 7. Sandia Cafeteria | 861 | 27. Rec. Equipment Rental | 2414 |
| 8. Air Force HQ. | 20200 | 28. Atomic Museum | 20358 |
| 9. Base Nursery (East) | 21851 | 29. Gymnasium (West) | 585 |
| 10. Officers Club (East) | 22000 | 30. Bowling Lanes (West) | 953 |
| 11. Coronado Club | | 31. Mecca Swimming Pool | 950 |
| 12. Que Pasa Rec. Center | 20155 | 32. Arts & Crafts Center | 954 |
| 13. BX Main Store (East) | 20170 | 33. Theater (West) | 485 |
| 14. AF Test & Evaluation Center | 20130 | 34. AF Weapons Lab HQ. | 497 |
| 15. Olympic Pool | 20227 | 35. Weapons Lab R&D Complex | 412 |
| 16. Security Police Desk | 20220 | 36. Base Nursery (West) | 404 |
| 17. Library | 20204 | 37. Aero Club | 333 |
| 18. Gymnasium (East), bowling lanes | 20228 | 38. NCO Club | 201 |
| 19. All Ranks Club | 20226 | 39. Officers Club (West) | 1900 |
| 20. Theater (East) | 20225 | | |

--- FENCE LINE - - - - BIKEWAY

New Use for Radar: Underground Mapping

The traditional method of finding out what's underneath the ground is to dig or drill a hole. However, if you don't know the exact location of your objective—whether it's as small as a buried canister or as large as a room—you might dig up quite a bit of dirt or drill lots of holes before you find what you want.

A group in Experiments Division 1116 has come up with an underground radar system that can locate many subterranean objects. "We use an impulse radar which generates very short bursts of energy," says Wayne Cook, the group's head. "We send an electromagnetic pulse into the ground to look for reflections which indicate changes in the medium. These changes can be holes, brine pockets, even a waste canister.

"Underground radar was originally acquired for WIPP—to locate quickly where waste canisters are buried and to find gas pockets during mining. But the technique has wider applications—for example, in the Strategic Petroleum Reserve and shale programs. In the SPR program especially, underground radar has good potential because salt is an ideal medium to look through since it's a very good dielectric. Salt water, on the other hand, isn't. Radar penetration of seawater is measured in inches, while penetration in salt or granite is in hundreds of feet."

Wayne reports that underground radar is potentially useful for mapping salt domes—the underground cavities in which petroleum reserves are stored. In shale programs he expects that radar can measure the rubblization, that is, the extent to which the shale is cracked. "We've been running tests at Avery Island, Louisiana, as well as at a test bed we built in Area Y—just east of Tech Area III,"



WAYNE COOK (right), Rod Shear (middle) and Cliff Kinabrew set up their underground radar gear at Mississippi Chemical Mine, about 20 miles from Carlsbad.

Wayne says. "Southwestern topsoil contains just enough clay to prevent radar penetration, so we dug a pit, placed various test objects in it, then filled it with sand. In one test at Avery Island we placed crushed glass in a glass container 1.3 meters below the mine floor, and the radar located it to within 2 centimeters.

"We use commercially available equipment, although some of it has been adapted to our specifications for under-

ground work, like a transducer totally shielded on five sides to eliminate reflections from a drift—that's miner's talk for a tunnel. The radar can be used on the surface, too. We pull it along on a cart taking readings. Or we use a borehole probe which sends out concentric signals into the surrounding medium."

Ed Ames, Cliff Kinabrew, and Rod Shear (all 1116) are the other members of the subterranean radar group.

Big Money Saved at Sandia In Cost-Cutting Program

A substantial saving in money is the bottom line of a recent program in Depts. 2150 and 2160. Called the Simplified Definition System, SDS has already realized six-digit savings at production facilities.

"It started with a letter from ERDA back in '77 to all the labs—Sandia, Los Alamos, Oak Ridge, and so on," reports Tom Workman, head of Power Conditioning Subsystem Department 2160. "The letter instructed all of us to cut costs wherever possible. In response, we've developed and carried out a number of cost-cutting procedures in production at Bendix Kansas City.

"In the magnetic components and cable area, we decided that the technology was mature enough for us to phase ourselves out of inspection and testing steps that we took at the beginning. In the case of components that Bendix makes for its own use, we can minimize our involvement since many component subassemblies are thoroughly checked out during fabrication and testing at the next assembly level.

What all this really means is that it's up to Bendix to make certain that their components function as they should and still meet shipping schedules and keep costs down. In testing, if a completed component has a failure rate of, say, 1 in 10,000, it may be more economical to test the completed assembly rather than all the subassemblies on a piece-meal basis. We leave it up to Bendix to determine the cost effectiveness of in-process testing."

Dave Weingarten, head of Passive Components Division 2153, says that Bendix has projected a savings of \$390,000 for FY 81 in its magnetics and cable department—"And this will increase as production increases," he told us.

"Before, if the serial number of a transformer was missing the dash called for in the specs, the part would be rejected. Then our design engineer would have to examine the component and do a lot of paperwork. Since the transformer is readily identifiable even with a missing dash, we've relaxed this and other similar requirements. As a result, we've been able

to take on additional assignments without increasing the staff."

George Donaldson, head of Interconnections Division 2154, reports that in the past Sandia set complete specifications. "But now we only set the limits and give the contractor leeway in choosing alternate manufacturing processes. We just give them the maximum allowable tolerances that will still enable us to meet requirements of reliability and safety.

"We'll still help them in problem-solving, but we just won't be looking over their shoulders as much. As a result of these streamlined procedures, Bendix didn't need additional employees and was able to transfer two people out of the transformer inspection and marking area. And I won't have to increase my staff even though we expect more weapons work."

Tom Workman says the SDS has been implemented only at Bendix Kansas City: "But we'll be looking at wider applications within Bendix and at Monsanto's Mound Research Facility in Dayton, Ohio."

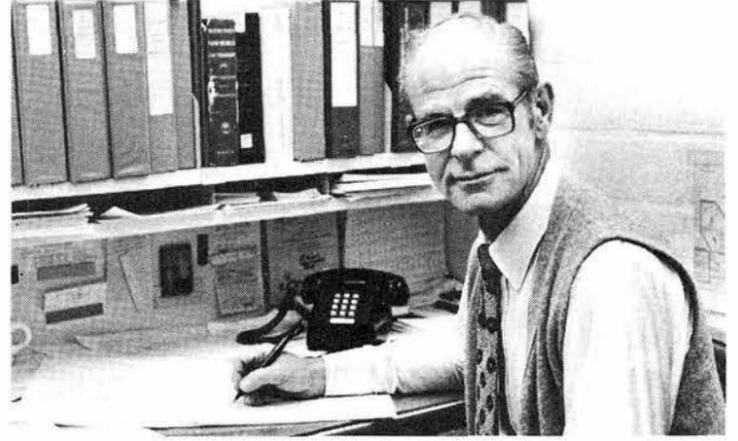
MILEPOSTS

LAB NEWS

MARCH 1981



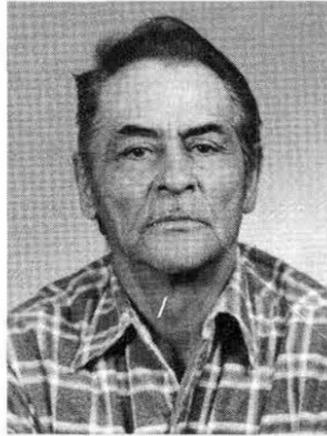
Larry O'Connor - 2342 15



Paul Kirby - 2653 30



Cecil Lang - 1173 20



Eufemiano Garza - 1442 30



Jim Arnold - 1766 25



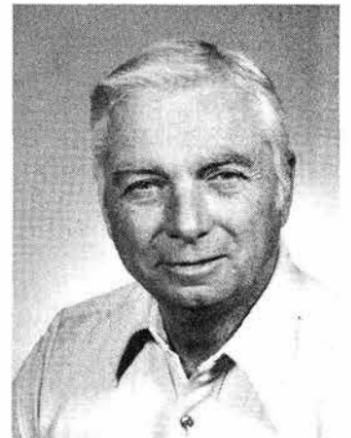
James McIlmoyle - 1125 20



Ed Clark - 5634 15



Bill Asher - 3615 25



Bob Clay - 4738 25



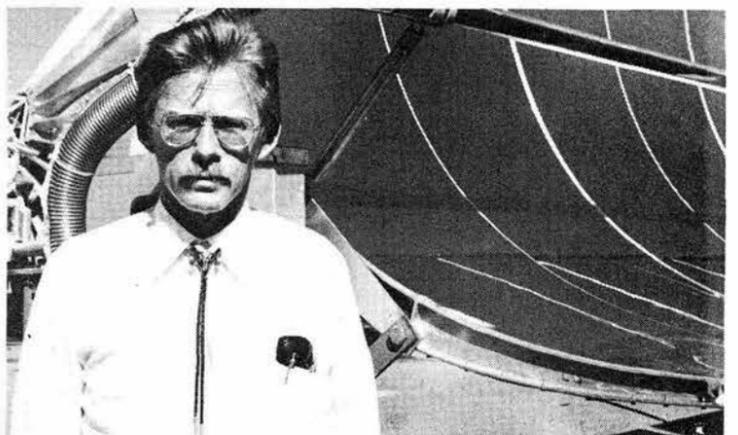
Jim Phillips - 4314 30



Bob Gaeddert - 3410 20



Richard Wahlberg - 1715 25



Dick Brasch - 4715 20



Art Hassig - 2452 20



Jim Coleman - 3255 30



Alma VanDeVelde - 2426 30



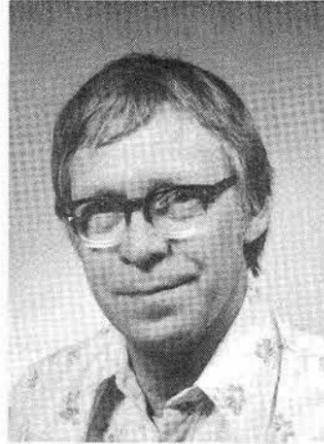
Roque Gallegos - 4221 15



Orville Howard - 1716 30



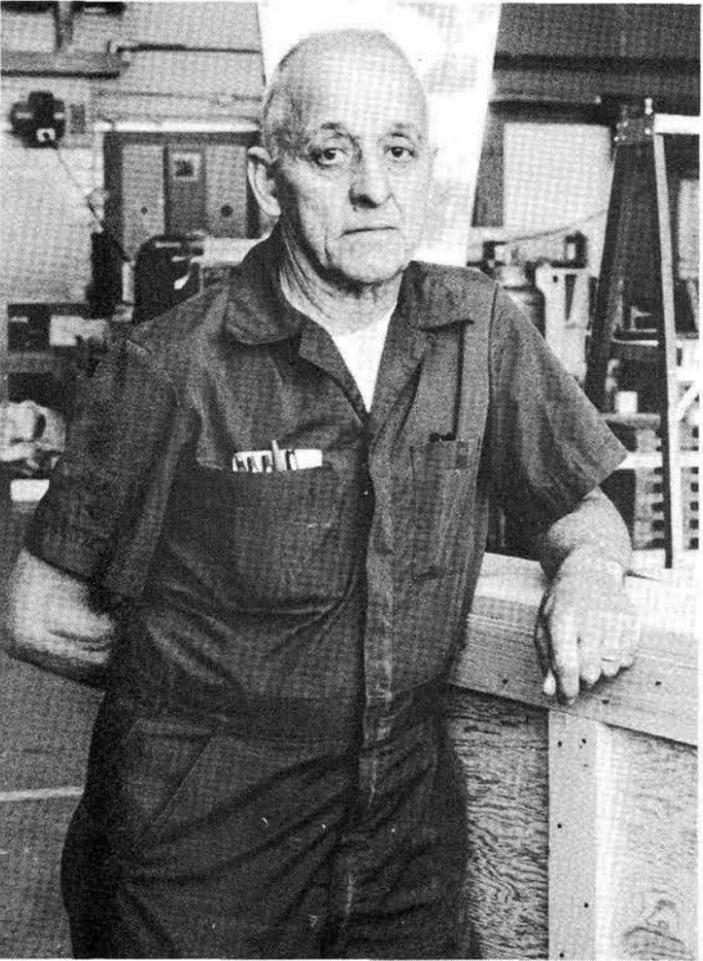
Archie Stannish - 3744 15



Billie Palmer - 1473 25



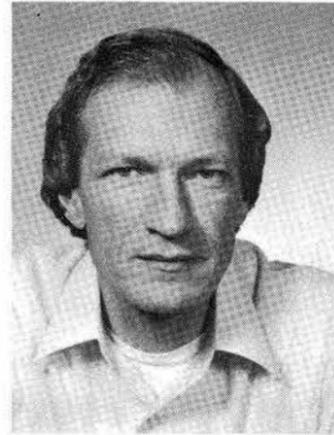
Betty Straba - 2614 15



Andy Landis - 3163 25



Ramon Armijo - 1473 30



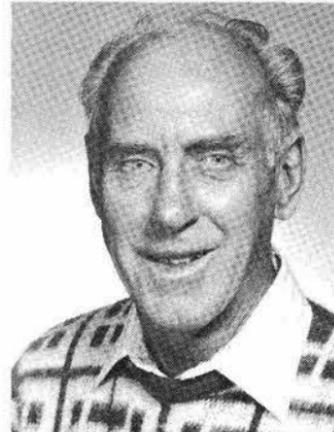
Frederick Gustke - 1521 20



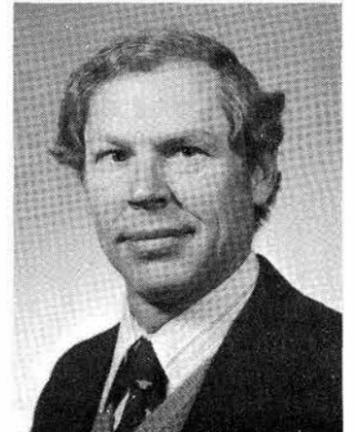
Herbert Loemaker - 1264 25



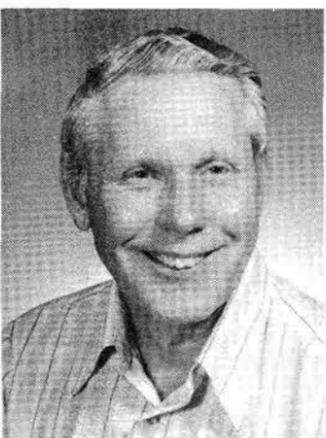
Bob Gardner - 3153 20



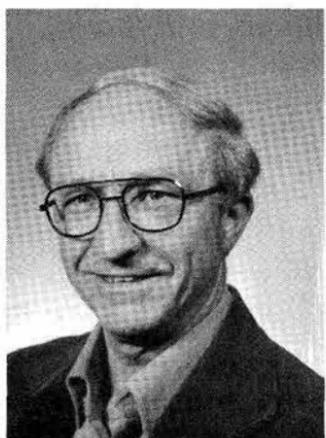
Walt Suiter - 1525 25



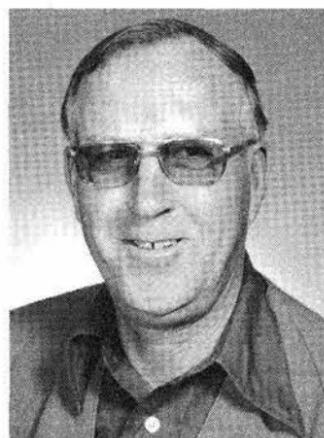
Ed Kjeldgaard - 2551 15



John Schamaun - 4734 20



Bob Scharrer - 1584 30



Dale Pipher - 4423 30



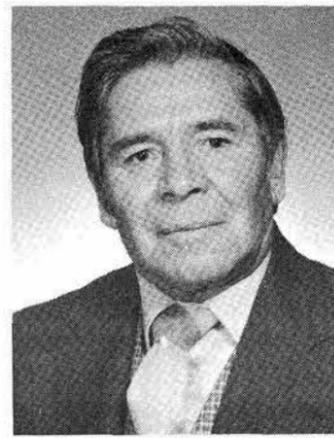
Gene Romero - 3432 30



Roscoe Williams - 3426 15



Roland Cleveland - 2456 25



Fred Gonzales - 1471 30



Lemmie Shew - 1414 25



My Favorite Old Photo

[Have you an old photo that tells a story? Tell us about it—4-1053.]

MAYBE the snows of yesteryear seemed deeper because snow removal was mostly a matter of moving snow by hand to form head-high drifts between sidewalk and street. In 1878, Grandad—T. C. Jones—was living in Sycamore, Illinois (where I was born), and managing Rogers' store. That was the year of the big snow, and Grandad (with shovel at left) and everyone else turned out to shovel snow . . . and to have the event photographed. These buildings still stand. (Jim Gravin—3441)

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

DELTA MARK 10 ignition, \$15; rubber covered 12-3 motor cable, 20 cents/ft. Bennett, 298-1142.
 ROOF-TOP Carrier, 3'x5', \$25; 14" Ford rims, free. Hine, 299-2260.
 COPYMATE, dry copier Model 400 by 3-M Co., \$20. Shaffer, 836-1610.
 UNIVOX TAPE echo unit, \$50; Mitchell 2-way PA cabinet, passive crossover, electro-voice HF driver, needs LF speaker, \$200. Whelchel, 293-8775.
 CAMPER SHELL for lwb pickup, smoked bubble type windows, \$275. Nelson, 881-0148.
 KENMORE washer, \$135. Troy, 294-5314.
 FULL SIZE bed, new mattress & box springs, \$65. Jarrell, 293-9671.
 MANDOLIN, new "EKO" brand, Italian made, \$90. Lewin, 898-2303.
 METAL SUNSHADES for 17' porch & 5' window; Singer straight stitch sewing machine, buttonhole attachment included, \$50. Norwood, 262-0073.
 7MM MAGNUM, special performance, high accuracy, special stock, case, 3x8 Bushnell, consider black powder guns in trade. Arana, 299-1214.
 ORGAN, Hammond C-3 console, separate speaker & Univox rhythm unit. Strance, 298-0258 after 5.
 16 CU. FT. refrigerator w/ice maker, compressor shorted, make offer. Horton, 883-7504.
 EARLY AMERICAN style loveseat; cherry wood dining table; packing boxes. Domingues, 821-9061.
 KING SIZE box springs, firm inner-spring mattress & HD frame, \$230 complete. Spellman/Cone, 265-2705.
 THRESHOLD 400A amplifier, Infinity tonearm, Sonus blue cartridge; gray suede safety shoes. Booth, 296-3955.
 CORVETTE original 283 alum. valve covers, \$100; 600 cfm Holley carburetor, almost new, \$80. Larsen, 281-2611.
 RANGE, elec., dbl. oven, coppertone, O'Keefe-Merrit, \$150. Rainhart, 821-3690.
 SKI RACK for Jeep CJ5 or 7, rear-wheel-mounted, \$25. Cox, 293-5518.
 SWING SET w/2 swings, glider, trapeze & lawn swing; wheelbar-

row, Linnerooth, 884-8615.
 AKC reg. miniature dachshunds w/pedigree, avail. about 3/25; make selection now, deposit will hold. Carter, 296-8709 after 5.
 BELL STAR 120 helmet, size 7, sun visor w/clear flip-up face shield, \$60. Arroyo, 821-1692 after 6.
 NORELCO 12-cup Dial-A-Brew coffee maker, used 3 times, \$25; Kodak Colorburst 50 instant picture camera, \$15. Simons, 821-9343.
 SOFA, Simmons hide-a-bed, 6' white Hessian cotton upholstery, \$300. Hartwigsen, 865-7836.
 PIANO, Baldwin studio, walnut finish, matching bench, \$1600. Bonn, 299-6258.
 SOFA, 3-pc. sectional, pit group furniture, brown fabric, 1 yr. old, \$195. Paul, 299-6387.
 PIPE DIES, 1/4", 3/8" 2 ea., 1/2", 3/4", 1" 2 ea.; handle, \$45; rigid pipe dies: 1/8", 1/4", 3/8", 1/2", 3/4", ratchet, \$65. Stuart, 299-9190.
 SIBERIAN HUSKY PUPS, red & white, 8 wks., all shots, (champion, group placing & specialty winning sire), \$175 & up. Akins, 867-2492.
 BEDSPREAD, new king size w/pillow shams, paid \$300, sell for \$150. Green, 294-3607.
 TYPEWRITERS: Olivetti port. manual w/case; Smith-Corona elec., \$35 ea. Almquist, 294-4723.
 COLT ARMY .38 special, 4" barrel, \$145; Colt 380 auto., \$95. Kraft, 821-6417.
 SWING SET, includes 2 swings, 1 trapeze, 1 glider, slide, \$20. Snyder, 296-5771.
 HIDE-AWAY-Bed, queen size. Trujillo, 865-5438.
 KITCHEN CABINETS, prefinished walnut design, 12 L.F. upper units, 9.5 L.F. base units w/counter top. Hendrick, 296-2163.
 ENGINE & transaxle for Volkswagen Type III, \$299. Wray, 344-5363.
 REFRIG. AC, never used (\$300 value), \$125; Hotpoint washer, new agitator, \$110; blonde buffet w/drawers, \$50; movie screen, 72x48, \$20. Burns, 873-1144.
 PATIO DOORS: 2 prehung, single-glazed w/screens, hardware, 6068 (\$35), 8068 (\$45). vanBerkel, 897-2541.
 BOY'S 20" Huffy bike w/banana seat & new tires, \$30; ladies 3-spd., \$25. Anthes, 884-3644.
 METAL DETECTORS: one Rainbow, Mach 1, TR; one Garrett coin hunter, BFO, your choice, \$125. Fifer, 299-3501.
 CALCULATOR, Radio Shack EC-495 w/nicads & charger, scientific slide rule type, 46 functions, \$10. Henry, 266-6467.
 LUGGAGE, burgundy vinyl, 26" pullman on wheels w/Presto combination lock, lg. carry-on tote to match. Easton, 256-7717.
 KONI adjustable shocks, fit 70-81 Firebird, Camaro, \$80/4; BellStar 7-3/8, \$35. Webster, 298-8102.
 KITCHEN TABLE & 4 chairs, \$25. Shortencarrier, 292-3575.
 PUPPIES, pug-cross, \$20 or best offer. Biefeld, 292-1671.
 TI-59 Calculator w/cards, manuals & all accessories, plus E.E. module, \$225 or best offer. Larson, 299-2384.
 CLASSIC books, Hugo, Emerson, Ibsen, many others to fall asleep by, 75 cents. S. Hwy 14 Project. LAB NEWS, trailer next to Bldg. 814.

GARAGE SALE March 7-8, 9-5:00, 4104 Lara Dr. NE: furniture, garden supplies, weaving materials, clothing, kitchen items, misc. Hartwig, 298-5048.
 PA SYSTEM: Column speakers, amp, reverb., mixer, mic., mic. stand. Nichols, 296-8259.
 WILSON golf clubs w/bag & North-western golf set for beginners; summer tonneau cover for MG Midget. Barnard, 831-4114, evenings.
 20 SQ. YDS. of gold shag carpet w/pad, \$40 or best offer. Schroeder, 344-1011.
 AM, FM, short wave console w/turntable; rocker w/footstool; recliner; coffee table. Bonahoom, 296-4450.
 ANTIQUE bedroom set, includes small chest of drawers, wardrobe, bed (no mattress), end tables (attached to headboard), \$300. Chavez, 831-9591.
 ANTIQUE barber's chair, Koken & Co., \$350. Day, 262-0923 after 5.
 NEW GOODYEAR Custom Tread radial HR78-15 whitewall. Leonard, 298-1531.
 MULTI-FAMILY GARAGE SALE: 9-5 3/7 & noon to 4 3/8, 7564 Bear Canyon Rd. NE. Anastasio, 821-4245.
 LOWERY ORGAN, 2 keyboards, Leslie speaker, fruitwood, \$650; '70 Datsun 1200, orig. owner, \$1200. Pike, 292-5080.
 2 15" GM WHEELS, \$5 ea.; 200 watt garage light fixture, \$5. McBride, 299-4347.
 JOHN DEERE Mod. 68 riding lawn mower, 34" cutting deck, \$600. McFarland, 292-8136.

TRANSPORTATION

'79 MUSTANG GHIA, V8, 4-spd., AC, PS, CC, radials, rear window defroster, 17-19 mpg. Guillen, 836-2115 after 5.
 '79 HONDA 750 four-K, 3000 miles, \$2300. Gallegos, 255-5264.
 '72 FORD 3/4-ton pickup, twin tanks, \$2100; camper shell, \$225; 15' travel trailer w/Reese hitch, \$1675. Smith, 299-1981.
 '76 HONDA XL350, 2700 miles, adult ridden, \$675; '77 Mercury Grand Marquis, 2-dr., loaded, equipped for trailer pulling, 4-wheel disk brakes, more, \$4700. Larsen, 281-2611.
 '73 JEEP pickup, 3/4 ton, 4-wd., PS, PB, AT, \$2850. Marder, 268-9643.
 '76 SUBARU stn. wgn., auto, 4-cyl., 47,000 miles, \$2000. Cover, 881-3860.
 BOAT, cartopper type & Sears motor, complete pkg. only, oars, motor stand, etc., \$900. Singleton, 299-1613.
 '79 CHEVY LUV, 4x4, 4-spd., 28,000 miles, bucket seats, rear slide window, 22 mpg city, \$6500. Montoya, 265-2559 after 6.
 '79 HONDA CB650, less than 2200 miles, extras, best offer. Roginski, 296-6535.
 BICYCLE, Centurion Pro Tour, double-butted frame 24 1/2", Suntour Cyclone derailleur, Sugino crankset, w/all alloy components, \$400 or 7 Davis, 293-0410.
 '74 CORVETTE T-top L-82, AC, black interior, burnt orange exterior, T/A radials, luggage rack, antenna

lead-in for CB, AM-FM radio. Perryman, 294-6113.
 VW VAN, '69 body, '77 rebuilt engine, double bed in back, \$1800. Gerlach, 298-2916.
 '66 MERCURY stn. wgn., AT, AC, PB, PS, fur seats, \$750. Kramm, 281-5379.
 '80 KAWASAKI KZ 440, 1600 miles, \$1400. Foster, 265-0069 after 5.
 '56 T-BIRD w/continental kit, convertible HT, V8 auto. Sandoval, 293-6261.
 '76 PONTIAC Astre, 4-cyl., 5-spd., 2-dr. coupe, 18,000 miles, AC, AM radio, radial tuned suspension, 20 mpg city, 31 hwy, \$2350 w/o CB. Stang, 256-7793 after 5.
 '73 FORD Mustang, 2-dr., V8, AT, PS, PB, vinyl roof, 8-track, chrome rims, \$1100. Esterly, 881-1973.
 '76 FIAT 131, 5-spd., 4-dr., AM-FM radio, 44,000 miles, new brakes & rear shocks, \$2200. Lackey, 898-6638.
 '73 VOLKSWAGEN BUS. Zanner, 281-1789.
 '67 VOLVO, rebuilt engine, \$2000. Anthes, 884-3644.
 '72 BUICK LeSabre, AT, AC, PS, PB, CC, \$700. White, 293-2219.
 DAYSAILER, 11' sloop rigged Wild Flower, 2-pc. mast, can car top, \$700. McLaughlin, 6212 Aztec NE, 881-0875.
 HONDA CR125 Elsinore, shocks, air forks, \$475; Bell Star 7-3/8, \$35. Webster, 298-8102.
 '80 SUBARU Std. hatchback, 4-wd, 4000 miles, \$5900. Overmier, 268-4992.
 '75 DODGE Dart 4-dr. sedan, AC, PS, AT, \$1850. Hinds, 869-2191.
 '67 MALIBU, 6-cyl., new brakes-battery-tuneup-tires, \$500 firm. Work, 883-1853.
 '79 YAMAHA XS 750F, fairing plus box on back, 12,000 miles, \$2400. Mogford, 898-1416 or 898-2882.
 '71 MONTE CARLO V8, PS, PB, AT, AC, bucket seats, FM radio, vinyl roof, \$999. Zurawski, 268-9511 after 6.
 '76 CUTLASS salon 4-dr., AC, AT, PS, PB, tilt Buckets, cruise, low mileage, \$2750. Chapek, 298-8383.
 '78 RABBIT, green 2-dr., 31,000 miles, new Michelins, battery, fuel injected, book \$4000, asking \$3500. Hesch, 881-9874.
 '80 DATSUN B210HB, AM-FM cassette, \$5100; '79 Cougar XR7, low mileage, moon-roof, loaded, 18 mpg. Benton, 1-864-4241 or 293-1007.
 '63 JEEP Wagoneer, 4x4, 6-cyl., manual trans., seats recently upholstered. Robertson, 881-2544.
 '71 FORD LTD Brougham, 4-dr., reg. gas, extras, new tires, \$750. Meyer, 296-9066.
 '80 BUICK Regal Limited, AT, AC, AM/FM stereo, cruise, 5700 miles, tilt steering wheel. French, 821-6144.

REAL ESTATE

ASSUME 8% loan w/moderate down, \$49,500, 3-bdr., 1 1/2 bath, single car garage, Westgate Heights new addition. McClure, 294-3095.
 4-BDR., 3 bath, FR w/tp, 2050 sq. ft., pueblo style, NE hqts., \$72,500. Weinmaster, 298-1620.
 ONE ACRE LOT adjacent Nat'l Forest, Forest Park near Cedar Crest, 14

miles to Sandia, central water system. Eagan, 281-5696.
 WINROCK VILLAS CABANA, \$32,500, \$5000 down, balance at 11%, second floor, north side. Calek, 242-5466.
 MOBILE HOME, 14x70', 1972 Ranchette, 2-bdr., 2 bath. Humberstone, 281-1120.
 3-BDR., 2-bath home, overlooking Sandias, dbl. garage, lg. deck, barn, corrals, 8 1/2% VA assumption available. Christensen, 281-5451.
 NEAR BASE, pueblo-style 3-bdr., 2 1/2 bath, FR, study, private courtyard, wet bar, corner lot, 2300 sq. ft., \$95,000. Ribard, 265-3164, 266-4289.
 4-BDR. CONDO, NE hqts., 1200 sq. ft., 1 1/2 baths, storage rm., carport, 2 swimming pools, clubhouse, 7 1/2% mortgage on \$38,400, appraised \$57,000. Mane, 298-0948.
 3-BDR., 2112 sq. ft. house, 1 yr. old, 2 1/2 baths, fp, 2-car garage, 4-Hills addition near KAFB. Norma, 881-9263 after March 8.
 IDLE HOME, 3-bdr., den, 1 1/2 bath, assumable loan or refinance, within 3 1/2 miles of Sandia. Corradini, 266-4307.
 1971 TOWN & COUNTRY, 14x70, 3-bdr., 2 bath, partially furnished, Terrace Park, Zuni & Wyoming, adults only. Walcko, 292-3193.

WANTED

ONE 25-year Sandia service lapel pin, original type jewelry. Botner, 298-6007.
 10" RADIAL ARM SAW. Anderson, 265-0403.
 INFANT CARE, your house or ours, mature person caring for no children (except possibly own), 8 a.m.-6 p.m., Mon-Fri; position open about June, references required. Sweeney, 247-4866 after 6.
 VIDEOTAPE OF "Centennial," part 7, broadcast of Oct. 11, 1980; can copy VHS or Beta or trade blank tape. Lambert, 293-8825.
 200-300 GALLON propane tank, used. Burt, 296-6704.
 RIDE to or from round trip Tulsa OK any weekend. Souder, 281-3121.
 BELT SANDER, 4" w/dust pickup. Strip, 255-7230.
 RETIREE w/mobile home. Preferably couple w/no children who like to garden; park your home rent-free. Carter, 877-1485.
 TRIM PARTS, 1966 Dodge Dart GT. Sylvester, 298-5196.
 BIG doghouse for St. Bernard, will transport. Bell, 821-7148.
 FACTORY repair manual for BMW R90/6 motorcycle; 1974-76 Honda XL250 or XL350, complete or just engine. Barnard, 831-4114.

WORK WANTED

PAINTING, int./ext. by experienced UNM students, estimates given. Peter Shunny, 265-1620.

SHARE-A-RIDE

RIDE TO AREA I, live on Robin NE between Moon, Eubank, Indian School Rd. & Constitution. Smith, 299-7151.

Coronado Club Activities

**All Elements
Come Together
For Great TGIF**

TONIGHT is a good night for TGIF at the Club. All the elements come together. The wild man — Bob Banks and the Trio — returns to the bandstand playing tunes like "Dinner Music for a Pack of Hungry Cannibals" from eight to midnight. The dual guitars of Jay and Jeff Jolly entertain in the main lounge. Dinner—a sit-down, table-service special—is your choice of a giant T-bone steak or shrimp between 5:30 and 8 with super hors d'oeuvres available for an extra two bucks. Happy Hour prices (always reasonable) are in effect all evening.

TOMORROW is Variety Night which means a super supper is available about 6 p.m. followed by one of Walt Disney's film classics—*101 Dalmatians* in animation. Admission is free for members and families.

FRIDAY the 13th is just another Friday the 13th at the Club. This is your standard Happy Hour with special prices, prime rib topping the buffet menu, Gene Corbin entertaining in the lounge and Jeanne Rich and Friends on the bandstand. Senior citizens get a break on the buffet price—\$5.50.

THE BIGGIE this month is a '50s-'60s nostalgia night scheduled Saturday, March 21. Flashback, billed as an authentic "'50s band," plays for dancing from 8 to midnight. Dinner is a choice of Steak Diane or lobster tail for \$8. Tickets must be picked up by March 14.

CORONADO SKI CLUB ends its season Tuesday, March 17, with a party featuring two-bit beer, door prizes, ski movies and election of new officers. It starts at 7 p.m.



SHEILA (4715) & KEN (5524) model clothing now available at the LAB NEWS office (in the trailer next to Bldg. 814). The T-shirts are \$6, caps \$5 and wind-breakers \$15. All use Sandia blue in the color scheme. Proceeds help support the South Highway 14 Village Project, a charity venture helping poor families in villages on the east side of the Manzano Mountains.

A *PRE-TRIP MEETING* for the Disneyland-Catalina Island group is set for Thursday, March 19, at 7:30 p.m. Anyone interested is invited.

Other Club-sponsored travel packages scheduled in upcoming months are Chaco Canyon, April 25, \$20; Puerto Vallarta, May 5-12, \$399; Las Vegas, May 24-27, \$132, and Mazatlan, June 1-8, \$354.

Travel Director Frank Biggs (4231) reports that motorized raft floats down the Grand Canyon are being allowed this year and that he is trying to organize a trip. He needs names of those who might be interested. Cost of the five-day trip will be about \$675 per person. If interested, leave your name and number at the Club office.

See Frank in the lobby tonight for more info.

SANADO WOMEN meet Tuesday, March 10, for lunch at 12:30 at the C-Club. Derek Swinson, "The Singing Leprechaun," entertains. Also, the annual

Sanado art show will be on exhibit at the Club from 4 p.m. Monday, March 9, until noon Tuesday. Luncheon reservations from Maurine Romme, 299-8765.

Minicomputer Meet March 10-11

The Labs is hosting the third meeting of the DOE Nuclear Weapons Complex Facilities' mini/microcomputer users. The Mini/Microcomputer Information Interchange Group will meet in Bldg. 815 (inside Area I) on March 10 and 11. Tom Pace (1120) is chairman. Papers being presented on Tuesday, March 10, include "Safety and Security" at 10:50 a.m. and "Networks" at 2 p.m. On Wednesday, March 11, "Control Systems" is scheduled for 8:15 a.m., "Word Processing" at 11 a.m., and "Software" at 2 p.m. Mini/microcomputer users are welcome to attend on a space-available basis. For more information, call the meeting coordinator, Bob Vokes (2611), 4-4271.

Events Calendar

March 7—Navajo Rug Auction sponsored by the Center for Anthropological Studies; rug preview 6 to 7:30 p.m., auction 7:30, Hilton Inn, Mediterranean Room.

March 8—Eldorado High School Symphony Benefit Concert, 3 p.m. and 8 p.m., Popejoy.

March 8—Fine Arts Music Series: Robert Grayson, tenor; 1st United Methodist Church, 4th & Lead, 4 p.m.

March 10—Cultural Entertainment Series: "The Gin Game," 8:15 p.m., Popejoy.

March 11—Audubon Wildlife Film Series: "Wilderness Trails," 7:30 p.m., Popejoy.

March 13-14—NM Symphony Orchestra, 8:15 p.m., Popejoy, 842-8565.

March 13-29—Albuquerque Little Theater, "Roman Conquest," Tues.-Fri., 8 p.m.; Sat., 6 p.m.; Sun., 8 p.m., 242-4750.

March 14—Operatic favorites, fundraiser for Albuquerque Opera Theater, 8 p.m., 1st United Methodist Church.

March 14-18—NM Glass Show, stained and hand-blown art glass, Albuquerque Main Library.

March 15—Film lecture by Dan True, "A Family of Eagles," 7:30 p.m., Popejoy, free admission.

March 19—Chamber Orchestra of Albuquerque, annual concert of American music, 8:15 p.m., Keller Hall, UNM.

March 20-22—Gilbert & Sullivan Operetta, 20th-21st, 6:30 p.m., 22nd, 4 p.m., 1st United Methodist Church, 243-5646.

Metropolitan Opera Radio Broadcasts, KHFM 96.3 FM; KZIA 1580 AM, 12 noon:

March 7—Strauss' "Salome"

March 14—Donizetti's "Elixir of Love"