



RADIATION PATTERN MEASUREMENT TEST of a four-turn helix antenna is checked by Ronald D. Bentz (1424) in an inflated nylon "balloon" section of Bldg. 9970. The antenna is mounted on a model pedestal which is remotely operated from a console in an adjoining room. The pyramid-shaped foam plastic (lower foreground) is used to eliminate reflection of radio waves.

Division 1424 Designs Special Antennas For a Myriad of Laboratory Applications

When Sandia launches a rocket that looks like a porcupine, the quill-like appearance is due to the efforts of Antenna and RF Problems Development Division 1424.

"As I recall, the highest number of antennas that we've had on a single rocket system was 22," says Jack Ames, supervisor of Division 1424.

One of the SNAP (Systems for Nuclear Auxiliary Power) re-entry flight demonstration test vehicles had eight antennas. It had a tail whip antenna and one internal ring antenna for the telemetry band, and six microwave slot antennas for radar beacon purposes.

The majority of the assignments in Division 1424 involve the design and development of antennas for specific Sandia field test and aerospace projects. To date, some 275 different model designs have been developed and about 30 different new designs are currently being worked on. These will be designed for radio wave lengths ranging from kilometers to millimeters.

Most antennas must be custom designed to provide the important communications link between the space vehicle and ground stations. Antennas for both ends of the link are designed by the division.

Basic considerations in designing the antennas include the desired direction of the telemetry signals; system sensitivity and range of signals; both internal and external environments to which the vehicle will be subjected; weight, drag, and other aerodynamic characteristics of the antennas; size and shape of the vehicle; and selection of materials.

Materials used in making the antennas include steel, brass, tungsten, molybdenum, various alloys, plastics, and ceramics. For example, plastic materials are used to provide a protective ablative cooling shield which prevents the metal antenna from being burned up by the high temperatures encountered during the vehicle's flight through the earth's atmosphere.

Sometimes a bias voltage is applied to the antenna to prevent ionization and breakdown of the thin air at high altitudes which would "short out" the antenna.

The various types of antennas used by Sandia include nose probe, slot, fin-mounted dipole, whips (angled and straight), bi-conical horns, discons, split-missile, helix, parabolic reflectors, spirals, blades, and arrays which combine most of these types.

To check the various designs, prototype antennas are mounted on a metal mockup which duplicates the necessary features of the airborne system. The impedance characteristics are then tested in an instrumented "dark room." Interior walls and ceiling of the room, located on the fourth floor of Bldg. 802, are covered with radio frequency wave absorbing foam plastic to eliminate reflection of the radio waves.

Directional characteristics of the antenna systems are checked by mounting a full or fractional scale model of the object with the antenna system in place high on a rotating tower and automatically recording the signal strength received from a nearby source as the model



VARIOUS ANTENNA SHAPES are displayed by Robert A. Leighninger (1424) on the roof of Bldg. 802. Bob is shown holding a nose probe and a selection of both angled and straight whip antennas. Helix antennas are on the left with three plastic covered antennas in the lower left foreground. A fin-mounted dipole is in the lower right foreground.

turns. "Pattern measurement" facilities are on the roof of Bldg. 802 and in Bldg. 9970 in Area Y.

An inflated nylon "balloon" section of Bldg. 9970 serves as the testing area. The semi-transparent "walls and roof" of the balloon don't interfere with the radio waves.

Whether it is a variety of "quills for a porcupine" or a single whip, Sandia's antenna group enjoys the challenge of designing antennas for ground and space use.

Sandia Tech Papers At IEEE Annual Meet

Four technical papers, authored by Sandians, were presented at the annual conference of the Institute of Electrical and Electronics Engineers, held July 18-22 in Palo Alto, Calif.

In addition, A. R. Sattler (5211) spoke on "Partitioning of Energy Losses in Semiconductor Materials" during a round table panel on Fundamental Mechanisms in Semiconductor Materials and Devices.

The technical papers given were: "Photoconductivity Processes in Low-Mobility Organic Materials Using Pulsed X-ray Excitation" by F. N. Coppage (1413) and R. G. Kepler (5213);

"Anomalous Photocurrent Generation in Transistor Structures" by D. H. Habing (5214) and J. L. Wirth (5212);

"Electron and Neutron Damage of n-Type and p-Type Silicon," by H. J. Stein (5211);

"Transient Annealing in Semiconductor Devices Following Pulsed Neutron Irradiation" by H. H. Sander and B. L. Gregory (both 5212).

SANDIA CORPORATION

LAB NEWS

PRIME CONTRACTOR TO THE ATOMIC ENERGY COMMISSION / ALBUQUERQUE, NEW MEXICO / LIVERMORE, CALIFORNIA



VOL. 18, NO. 15, JULY 29, 1966

Second Nuclear Shot Set in Tatum Salt Dome Cavity in Mississippi

Sandians will be participating in Project Sterling, an underground nuclear detonation test tentatively scheduled in Mississippi late this year.

The AEC plans to conduct the experiment for the Advanced Research Projects Agency (ARPA) of the Department of Defense at the site near Hattiesburg.

The experiment, called Project Sterling, calls for firing a nuclear device with a planned yield of 350 tons in the underground cavity formed in the Tatum Salt Dome by the detonation of the five-kiloton Salmon device.

Salmon was conducted by the AEC for ARPA on Oct. 22, 1964, as part of ARPA's Vela Uniform Program to develop means of detecting, locating, and identifying underground nuclear detonations.

For the Salmon event, Sandia Laboratory participation included arming the Salmon nuclear device, recording free-field particle motion underground and on the surface, and providing a specially-designed television camera to inspect the drilled holes before and after detonation. The camera and an optical measuring device were used extensively after the detonation for mapping and inspection of the cavity.

Ken B. Kimball of Blast and Earth Motion Division 7242 is project leader for Sandia's participation in Sterling. He and Dean B. List (7242), Sandia project oper-

ations officer for Sterling, inspected the site last week and checked Sandia instruments used for Salmon.

After three years in the ground, 90 percent of the Sandia instruments used to measure the acceleration and velocity of the earth during the Salmon detonation are still usable. Performance checks verified that much of the instrumentation will be reusable for Sterling.

New instruments will be installed, however, in two new bore holes at the site.

W. R. Perret of Underground Physics Division will be Project Scientist for the Sterling event.

Project Sterling will result in much less ground shock than did Salmon because Sterling's explosive yield is less than one-fourth that of Salmon, and because firing in the center of the large Salmon cavity should result in less explosive energy being transmitted through the surrounding salt mass. The Salmon shot, detonated in a tightly confined space, formed a spherical cavity some 110 feet in diameter at a depth of about 2720 feet.

The AEC is now seeking bids from experienced contractors to perform the necessary construction work for Project Sterling. The work includes opening the original Salmon emplacement hole, drilling a new hole in which chemical high explosives will be detonated for comparison purposes, and cleaning out several existing holes for instrument placement.

Cost Improvement Action

New Computer Program Prepared by Leigh Hendricks Saves \$9400

Time is money.

In the case of Sandia's IBM 7090 computer, time is worth \$200 per hour.

A new program written by Leigh Hendricks is saving Sandia an average of nearly four computer hours per month.

Leigh, a programmer in Applications Oriented Systems Division 9424, converted an older program for Sandia's Cost Budget Report to Fortran II language which makes effective use of advanced techniques in data processing. She has been credited with a \$9400 cost improvement action by Sandia's Cost Improvement Committee.



PROGRAMMER Leigh Hendricks (9424) is credited with a \$9400 cost improvement action for her work on a program which saves about four hours of computer time each month.

The Cost Budget Report is prepared monthly and shows the charges made to each Sandia Corporation organization against budget allocations. With the old program, a typical month's report might require as much as nine hours of computer time. The same report prepared with Leigh's new program required only 88 minutes.

The Cost Budget Report was originally programmed in the Auto Coder language for use on the IBM 705. It was programmed in the 9PAC language during conversion to the IBM 7090. With the 9PAC program, it was necessary for the computer operator to change tapes and mount new tapes a number of times during the run of the program. This required as much as 25 percent of the total time.

With the new Fortran program, this non-productive time has been considerably reduced. Tape changing takes only 10 percent of the total time, thus the computer capacity is more efficiently used.

Leigh's assignment to reprogram the Cost Budget Report was part of a general study of advanced computer techniques by Division 9424. The methods and techniques Leigh developed in the Cost Budget Report program will be circulated among all Sandia programmers for use in other programs which deal with volumes of input and output.

The program is flexible and easily adapted to computers other than the 7090. The program has been in use for the past three months and will be a continuing responsibility of W. H. Jackson of Administrative Programs Division 9423.

Leigh has been at Sandia since November 1949 with a couple of years out to teach mathematics in the Albuquerque Public Schools. She headed a data analysis section in the Research organization prior to becoming a programmer in advanced studies.

Editorial Comment

"Anything classified?"

This is the matter-of-fact greeting we get from the guard as we leave a Tech Area.

Most of us accept this challenge as a matter of course. A few may chafe, interpreting this question as a challenge to integrity or loyalty. Occasionally the challenge brings us up short — we realize that we are carrying a document with us that we meant to put in a safe or deliver to someone before leaving the Tech Area.

And that, of course, is the purpose of the "Anything classified?" challenge by the guards. Not to question our loyalty, not to accuse us of trying to make off with something classified, but simply to remind us that we may inadvertently be carrying a classified item outside of a security area.

It's easy to become engrossed with projects and problem-solving, and being engrossed, forget what we have in hand. The reminder of the guards jogs our awareness and should be welcomed, not resented.

Year 'Round Relaxation

Walt Westman's Houseboat Serves as Center for Aquatic Life

In a protected cove, about a mile across the lake from the North Dock at Conchas Reservoir, Walt Westman (2224) built a houseboat and a way of life. The houseboat serves as a comfortable headquarters for his family's weekend activities—water-skiing, boating, swimming, and fishing.

Since the houseboat was completed on Labor Day last year, Walt has made it to the lake almost every weekend. Even in mid-winter, the houseboat is comfortable and a fine place to relax.

Basic foundation, or float platform, for the houseboat is 42 feet long, 16 feet wide. Bouyancy is provided by two 40-foot lengths of styrofoam about three feet square at the cross section which are mounted underneath the deck. The styrofoam is permanent. It will not rot, rust, or become waterlogged. It will support 25,000 pounds.

Walt assembled the styrofoam floats and the deck skeleton near the North Dock and towed it across the lake to the cove. There is no road to the anchorage in the cove. All of the material for the houseboat was cut to size in Walt's workshop in Albuquerque, hauled to Conchas, and ferried across the lake in Walt's 16-foot runabout.

He started the project in May and finished in about 10 weekends.

Living quarters on the boat are divided into kitchen-sleeping quarters and a screened lounge area. Appliances, including lights, operate from butane. Built-in cabinets and storage areas are covered with prefinished blond mahogany paneling. Walt achieved an attractive appearance which requires minimum maintenance.

Frame construction of the living quarters is heavily insulated and covered with aluminum siding on the outside. Walt may build a sun deck on the roof. Inside, he plans to add a free-standing metal fireplace and barbecue grill.

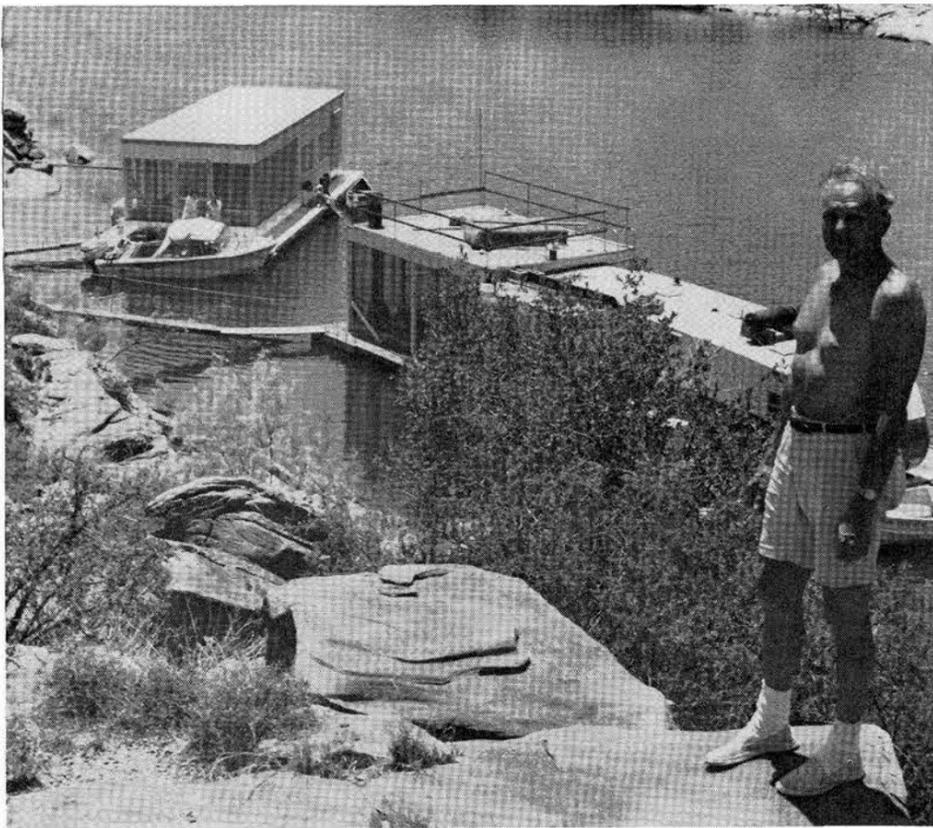
Walt's "neighbor" at the cove is a houseboat owned by Wanda Cupp (4333) and her husband, Royce. They used the same styrofoam float construction for their 50-by-16-foot deck, and then rolled a 32-foot house trailer onto the deck. After some difficulty (the deck almost cracked), the trailer's chassis was removed and the trailer became the houseboat's living quarters. Later, the Cupps added a screened area with a sundeck on the roof.

The cove is a popular gathering place for the many Sandians who regularly visit Conchas. Members of the "Sandia Navy" at Conchas include Jim Meikle (2520), John Erni (1425), S. O. (Woody) Woodall (4114), Bob Lassiter (4382), Darrel McNabb (2521), Jim Harrison (7336), Margaret Reese (3321), and Len Mahuron (9410).

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LAB NEWS

JULY 29, 1966



PROTECTED COVE at Conchas Lake serves as anchorage site for Walt Westman's houseboat (left), which he built last summer, and the floating trailer (right) belonging to Wanda Cupp. The cove is a popular gathering place for the "Sandia Navy" which uses Conchas for summer recreation.



SANDIA PRESIDENT S. P. Schwartz addressed 30 local school principals and counselors attending the three-week Vocational Guidance Institute at the University of New Mexico. The Institute, sponsored by the Plans for Progress organization, will give participants up-to-date information on job opportunities and educational needs in an effort to improve vocational counseling for junior and senior high school students. Other speakers at the opening session on July 18 were Governor Jack Campbell, UNM President Tom Popejoy, Earl Louhan, vice president, Mountain States Telephone, and W. J. Jackel, vice president and general manager, ACF Industries, Albuquerque Division.

Sandians Participate In Current JTF-2 Tests in California

A number of Sandians are participating in tests being conducted at Hunter-Liggett Military Reservation in California by Joint Task Force—Two and the U.S. Army Combat Developments Command Experimentation Command.

These tests are in addition to the current series being conducted in Arkansas.

The California test is a two-fold project designed to investigate the vulnerability of low-flying combat aircraft to simulated ground fire and the tracking effectiveness of air defense guns against fast, low-flying targets. Test aircraft fly over five instrumented courses at Hunter-Liggett running a low level gauntlet past a variety of ground weapons.

The aircraft will carry the same Sandia-designed pods used in the JTF-2 flights at Tonopah Test Range last year. The instrumentation pods have been modified for the new tests.

All testing will be confined to the restricted air space surrounding the Hunter-Liggett range. No live firing or aerial drops will be made. Four types of aircraft will be used—the Navy A-4 Skyhawk, the Air Force F-4C Phantom jet, F-100 Super Sabre, and B-52.

C. S. Sonnier of Test Planning and Evaluation Division 9213 heads Sandia's test project group. Field instrumentation pod operations are under C. E. Ingersoll of Test Operations and Facilities Division 9214. Other Sandians participating in the project group include W. R. Cramond (9213), C. T. Avant (9213), and M. N. Cravens (5520), assisting in the test planning; L. D. Jones (9211), responsible for instrumentation pod design; C. E. Abraham (5263), mathematical prediction models; R. R. Prairie (2153), data analysis; C. T. Schafer (9212), data processing; and A. D. Swain (2152), human factors.

Sandian Appointed To ASEE Committee



Wash.

The purpose of the division is to promote and develop technical institute education. The seven-man committee is composed of university faculty members and two representatives of industry.

Mr. Elliott is also a member of the Division's executive committee. His term of office is two years.

Guy Accettura Elected to Sandia Board of Directors



Guy Accettura, vice president and general manager of Bell Telephone Laboratories, has been elected a member of the Sandia Corporation Board of Directors. He fills the vacancy created by the retirement of Howard K. Onstott on July 1.

Mr. Accettura had been vice president of Western Electric Company in charge of the customer planning division for a year when he was named to replace Mr. Onstott as BTL's vice president and general manager the first of this month.

In September 1936, Mr. Accettura entered the Bell System as a bench hand in WE's Hawthorne Works and later held assignments in the accounting organization.

Following his military service from 1942 to 1946, he returned to the Hawthorne Works as a business methods investigator. After holding various supervisory positions in accounting, he was transferred to New York headquarters to participate in the Company's management training program. He returned to Hawthorne Works in May 1953 where he held a number of supervisory positions. He was named comptroller in July 1962. In February 1963 he was promoted to manager of the Columbus Works (administrative officer).

Mr. Accettura became director of organization planning in May 1964. In February 1965 he was named vice president of staff and became vice president of the staff and customer planning division a month later.

SANDIA CORPORATION LAB NEWS



ALBUQUERQUE, NEW MEXICO • LIVERMORE, CALIFORNIA

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Home away from home . . .

Livermore Test Group Works on NTS Project

"A full-power, full-frequency dry run is scheduled for 1800 hours (6 p.m.) in Area 2," comes the radio announcement from control point.

Reacting almost instinctively after four months on this project, the Livermore Laboratory test operations crew immediately starts making final adjustments to the data collecting and recording equipment for another important dry run which will pave the way for a full-scale underground nuclear test.

The place is a remote test area located deep in the interior of the Nevada Test Site (NTS)—the AEC's continental proving ground located 65 miles northwest of Las Vegas. It's late afternoon on a windy spring day. The scene is a complex of instrumentation trailers parked in a semi-

circle. From the trailers, hundreds of cables in insulated troughs converge at the junction building near ground zero. The whole array looks like half of a huge wagon wheel lying on the desert floor. Behind the trailers are diesel-driven generators running full-blast day and night to provide electrical power.

The aluminum instrumentation trailers have been outfitted with the most sophisticated data collection equipment available. The equipment configuration was designed and programmed for this particular test by Sandia engineers and technicians.

Inside the trailers, members of the test crew continue preparing for the dry run.

"It's hard to get a good picture of everything we've done on this job," Dick

Houser (8121) explains. "At this stage of the game, everything is in place and buttoned-up for the test. We started this project last August by outfitting our trailers at SCLL with new equipment. At the same time, the cables were being installed at the site by Reynolds Electrical and Engineering Company (REECO), a prime contractor to the AEC at NTS.

"In December, we had the trailers moved to the test site," Dick Houser continues. "When we arrived in January, we checked the cable lay-out to see if it conformed to the test plan. Then we installed our test instruments and made hundreds of connections to junction boxes at ground zero and in the trailers. After all the connections were made, we began having dry runs to calibrate and verify our instruments. All in all, it's been a long, drawn-out, and complex job—but an interesting one."

During the week, the crew lives at the Mercury campsite. Facilities at Mercury, a community operated by REECO for the AEC, are modest by any standard. There are trailers and barracks provided for those who stay overnight; a new dining hall is available as well as a steak house which is open in the evenings. A movie theater, bowling alley, swimming pool, and recreation hall offer evening diversions.

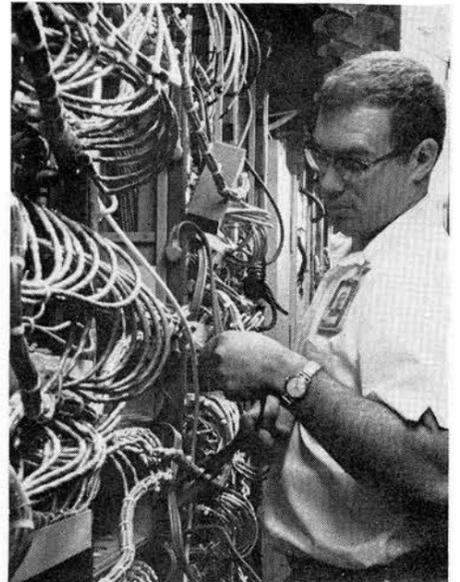
There are several thousand people working at NTS during the day, but very few stay on the site after 4:30 p.m. For one thing there are no accommodations for families. Only single people and transient test crews live in Mercury. "Being away from the family for five days out of the week can be rough for the men, especially over a long period of time," says Cliff Potthoff, supervisor of Test Operations Division 8121.

"The trouble is getting time to relax and enjoy the recreation facilities provided by the AEC," says Tom Takahashi (formerly of 8121, now of 7261), a Sandia veteran who has been on many test projects. "Our day goes something like this. We get up at 6 a.m., shower, shave, and eat breakfast. By 7 a.m. we are on our way to the site, which is 40 miles into the forward area. The ride isn't too bad in the spring. The desert is green and dotted with wild flowers, but during the summer-heat or winter-cold, the ride can be long and lonely.

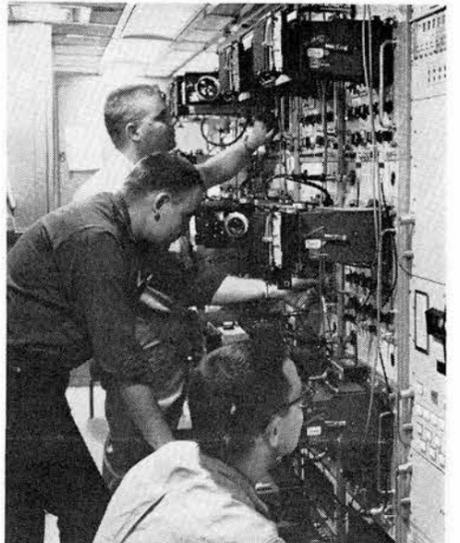
"Once on the job, we go like fury either preparing for a dry run or evaluating a run that occurred the evening before. Necessary adjustments, based on previous evaluations, are made to equipment and preparations are made for more dry runs until the Test Director is satisfied. On many occasions, we have to work late into the evening. Tonight is no exception," he notes.

"Minus 30 minutes, Area 2," squawks the radio.

Within 30 minutes, several months of painstaking work and planning will be tested to see if the data collection system will function properly. Len Dighton (8121), project leader for the SCLL group, has gone to the control point to monitor the



DOUBLE-CHECKING A CONNECTION behind an instrument panel in one of SCLL's diagnostic instrumentation trailers is Jerry Uhlig (8121).



PREPARING FOR THE DRY RUN, (l to r) Dick Roy (8121), Gordon Bennett (8233), and Dick Houser (8121) set their recording instruments and oscilloscope cameras.

SCUM (Sandia Control Unit & Monitor) system, a remote monitoring unit which was designed by Sandia Laboratory engineers. Gil Esquibel (8121) is stationed at the "monastery," a permanent Sandia Corporation ground station located on a hill overlooking NTS.

At zero hour, instruments will begin collecting and recording the many hundreds of channels of data. If the dry run is successful, the live test will take place soon, completing this particular project. On the other hand, if it fails, the test crew can count on another long night

Continued on Page Four

LIVERMORE NEWS

Two Sandians Become Registered Professional Metallurgical Engineers

Two Livermore Laboratory employees, J. W. Dini (8133) and L. F. Graves (8134), have been notified of their registration as professional metallurgical engineers in the State of California.

The registration was approved by the State's Department of Professional and Vocational Standards under provisions of the Civil and Professional Engineer's Act. This act was amended recently to establish a new branch of "metallurgical engineering" in California's professional engineering registry.

To qualify for registration, applicants must have met the requirements of the Business and Professional Code and presented evidence of nine years or more of acceptable metallurgical engineering experience.



Pat Mauer (8123)

Take A Memo, Please

Taking chances can result in serious mishaps both at home or on the job. Of the 14 lost time injuries at SCLL since 1958, 12 were due to individuals taking unnecessary risks.

California Historical Landmark Publication

A revised edition of "California Historical Landmarks" has been published by the California Division of Beaches and Parks. With summer vacation time here, Sandians will find the 114-page booklet especially useful as a ready reference on trips.

The booklet is a directory of the 802 places designated by the state as historical landmarks. The landmarks fill in the outlines of California history from the days of discovery through the gold rush era to more recent events.

Some of the landmarks are structures still visible, while others identify the ground where historical events took place. Included are the emigrant trails; stations of pony express, stage, and railroad; offices of telegraph and express companies; homes, ranches, hotels, and theaters; blacksmith shops, sawmills, grist mills, and country stores; churches, and graveyards.

The revised edition adds 17 recently designated sites. Of these, 12 are in the northern part of the state and five in the southern.

Copies are available for \$1 (including tax) from Division of Beaches and Parks, Box 2390, Sacramento.

Congratulations

Mr. and Mrs. Glenn Smith (8252), a son, Glenn Wayne, July 7.

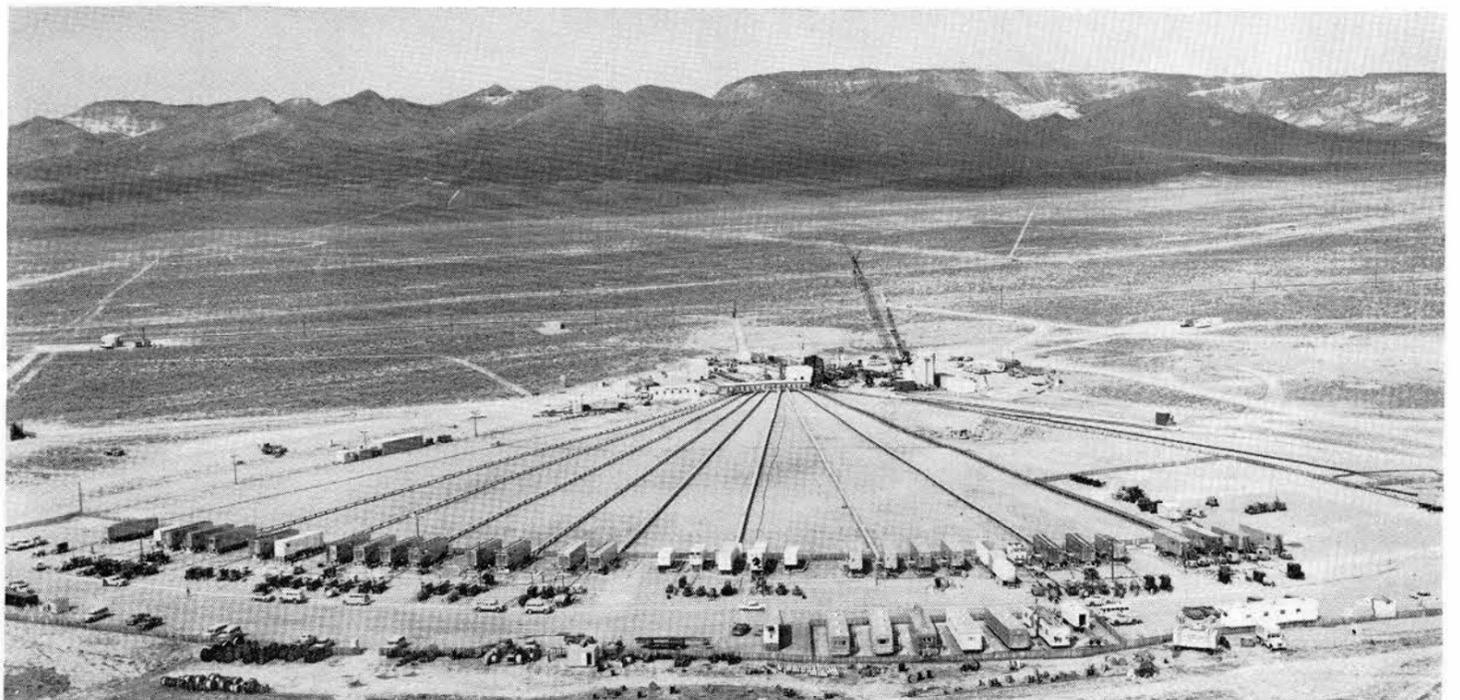
Mr. and Mrs. Bob Bailey (8252), a son, Brett Allen, July 8.

Mr. and Mrs. Bob Miller (8121), a daughter, Susan Marie, July 5.

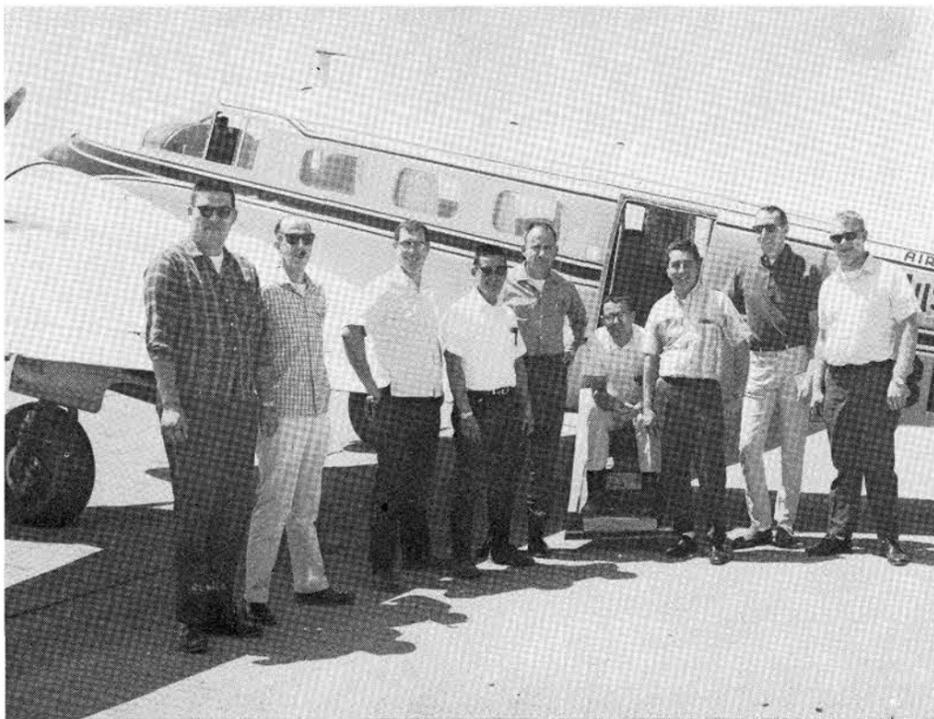
Mr. and Mrs. Max Schell (8168), a son, Kevin Ray, July 7.

Sympathy

To Lurl Ostrander (8231) for the death of his brother-in-law in San Jose, July 15.



THE TEST LOCATION, deep in the forward area of the AEC's continental proving ground in Nevada, resembled a huge wagon wheel lying on the desert floor. Covered cable troughs run from trailers to underground instrumentation.



READY TO BOARD this chartered airplane for a trip to the Nevada Test Site are SCLL's test operations crew (l to r) Vern Hudgins, Bob Miller, and Jerry Uhlig (all 8121); Tom Takahashi (7261, formerly in Division 8121); Gordon Bennett (8233), Dick Houser, Gil Esquibel, Len Dighton, and Dick Roy (all 8121). Not shown is Chet Tarne (8121), Field Engineer Liaison.

Continued from Page Three

Livermore at Nevada Test Site

checking out equipment for another dry run until the simulated test is performed perfectly.

Each of the crew members studies his instruments and waits patiently for the dry run to take place. All the work they have put into this project since January is wrapped up in this dry run. "A full-power, full-frequency dry run is like a dress rehearsal," says Dick Roy (8121). "If everything goes well we're ready for 'opening night.'"

"Minus 15 minutes, Area 2," the radio interrupts again.

The operators again check their instruments.

The trailers are beginning to rock from the buffeting winds whipping up out of the desert. It is like being below deck in a ship. "The wind is really bad out here at times," Len says. "Men and equipment both take a beating from the severe weather in the desert."

Again the radio breaks in—"Minus 10 minutes, Area 2."

An SCLL photographer assigned to the test crew dims the trailer lights and adjusts the oscilloscope cameras. "We use very fast film in these cameras," says Gordon Bennett (8233). He explains that the cameras will try to capture on film a peak signal which will be recorded on oscilloscope for a split microsecond. A picture of this fleeting signal when analyzed in the laboratory can provide valuable information concerning conditions during the test.

Once the instruments are checked, the crew sits back and waits for the next announcement from the control point. "One of the toughest things we do on this job is wait," says Bob Miller (8121). "A dry run may be postponed at the last minute or even several times before it actually comes off."

"Minus one minute, Area 2," announces the control point operator.

The men are now over their instru-

ments, tensely waiting the final count down.

"Minus 10 seconds . . . 5, 4, 3, 2, 1, 0." The full-power, full-frequency dry run is underway. Tape-drivers in the trailers turn rapidly, camera shutters click open—then close, lights flash in the instrument panels indicating that switches are operating according to plan. In a few short moments, the dry run is over.

The next announcement indicates that the dry run has been successful—"an almost perfect run," the control operator comments. Cheers are heard over the radio and in the trailers.

In the two hours following the dry run, the crew busily prepares the performance data collected during the test for an evaluation meeting scheduled for the next morning. By the time this task is complete, it is 8:15.

Wearily, the men leave the trailers and climb into their vehicles for the long drive back to Mercury. The wind is blowing harder now, and the dust makes it difficult to see.

At 9 p.m., the crew is in the dining hall having dinner. They are tired, but satisfied and happy that the day's activities have gone well.

Members of Livermore Laboratory's test crew are not the only employees who have or will have to spend countless hours away from their families on location conducting tests in the desert under conditions which are less than perfect. But, they are typical of the many dedicated scientists, engineers, technicians, and support personnel who fulfill the essential function of testing at Sandia.

Events Calendar

- July 29—Santa Fe Opera, "The Rake's Progress"; July 30—"Don Giovanni"; Aug. 3 and 5—"Capriccio"; Aug. 6 and 10—"Rigoletto."
- July 30-31—Puye Cliffs ceremonial at Santa Clara Pueblo.
- July 30-31—Family backpack to Frijoles Canyon. N. M. Mountain Club, leader George Steck, tel. 299-2313.
- Aug. 1—Lectures Under the Stars, David Newhall on "Interpretation of Democracy," UNM Administration Bldg., 8 p.m.
- Aug. 4—Feast Day and corn dance at Santo Domingo Pueblo.
- Aug. 8—Lectures Under the Stars, Don Bolt on "Latin America, the Powerful Unknown."
- Aug. 11-14—Inter-Tribal Indian Ceremonial at Gallup.
- Aug. 11-14—"Hatful of Rain," Old Town Studio, 1208 Rio Grande NW. For reservations, tel. 242-4602.

Sympathy

To T. O. Meyer (2545) for the death of his father-in-law in New York, July 16.

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LAB NEWS

JULY 29, 1966



A TAPE RECORDER IS ADJUSTED by Bob Miller (8121) before the full-power full-frequency dry run takes place.

Cold Dakota Winters Are Past For Solberg Brother Engineers

Ask for Mr. Solberg, and Sandians working on Joint Task Force-Two projects will ask right back, "Which one?" That's because the two Solberg brothers are assigned to the same department.

The similarities continue beyond job assignment. Both completed Sandia's Technical Development Program, both received their MS degrees from the University of New Mexico in June, and both are electrical engineers. There's only a year's difference in their ages, and there is a noticeable family resemblance.

James E. Solberg has been assigned to Test Planning and Evaluation Division 9213 for more than a year. His duties are in test designing, mathematical modeling, and systems studies of weapons (especially missiles) in which JTF-2 test groups are interested.

Robert D. Solberg has been in Instrumentation Systems Division 9211 since last March. Most of the work for the current test series was already completed when he joined the organization, but new activities will be starting soon. One of the main efforts of the division is a distance measuring system to be used on flights of aircraft.

Both joined Sandia Laboratory after receiving their Bachelor's degrees at the University of North Dakota.

The Solberg brothers come from Willow City, a village of 500 persons next to the Canadian border. Their father manages a grain elevator, and their mother admittedly wishes that one of her two sons had gone into business in their hometown.

Jim, who is the older, displayed a talent for mathematics while in high school, so he chose to major in engineering at college "because it's mostly math and the opportunities seemed there." However, he explains, "I was an indecisive engineer. I started in industrial engineering, switched to mechanical, and finally settled on electrical. As the result of changing my major so many times, I had to take courses during one summer session."

When Bob began college, he admits he was influenced by his older brother. (A year later, their sister also started college and is now a teacher in San Francisco.)

While in college both boys had relatively well-paying summer jobs. Bob worked as a surveyor for two summers for the Bureau of Land Management, one summer for Shell Oil Company in Corpus Christi, Tex., and a few months for a power company in North Dakota. Jim also had one stint with the same power company, and worked two other summers for the U.S. Forest Service at Yellowstone National Park. Even during high school days, they worked summers on farms and for their dad.

Their interest in Sandia followed a natural path: three engineers in the class ahead of Jim had been hired here and were enthusiastic about the company; and, while Jim was a senior, a team of BTL-Sandia Corporation recruiters visited the campus. A year later, Bob followed Jim to Sandia, and a college friend, Ed Kist, followed Bob another 12 months later. Both

Solbergs were initially assigned to divisions in 1940, and then completed rotational assignments in other organizations, as is customary among TDP participants.

In addition to the educational advantages offered by the Technical Development Program, the brothers appreciated the opportunity to meet young engineers with whom they had many similar interests. Several close friendships have resulted. For recreation, they enjoy swimming and playing tennis with other TDPs. Both played high school baseball and basketball, but they explained, "When you're taking engineering at college, you're out of it as far as participating in sports."

Their wives are also from North Dakota. Bob's wife is a registered nurse and Jim's is a teacher in a local elementary school (she was working on her Bachelor's degree while he was studying for his Master's).

The Solbergs agree they aren't interested in going on for their PhD degree—at least "not right now." They're happy at Sandia; they find their assignments interesting; the people they work with are capable; the benefits are good; and Bob adds, "We're away from those cold North Dakota winters."

Welcome Newcomers

July 11-22

Albuquerque	
*Jay D. Anderson	2212
Dewey M. J. Berry	2213
Susan Colp	3126
Gerald P. Conley	9311
Kenneth M. Glibert	5242
Dwight S. Hill	7244
*Fred V. James, Jr.	9226
Larry G. McConahy	9421
Richard A. McHugh	9421
Dorothy B. Milliken	3126
*Bernard R. Reicks	2212
Catherine Y. Ruhl	3421
Thomas A. Sandlin	3415
**R. Vencil Skarda, Jr.	5253
Willbur D. Smartnick	4122
Lawrence J. Smith	2212
Nebraska	
James L. Jorgensen, Lincoln	1425
New Jersey	
Anthony J. Barber, Vineland	5221
New York	
Frederick W. Reinhardt, Buffalo	1323
Oklahoma	
Jerry R. Osborn, Midwest City	2212
Oregon	
Ronald J. Bohlman, Lake Oswego	9212
Pennsylvania	
William B. Bopp, Williamstown	2213
Larry K. Grube, McKeansburg	2211
Donald E. Keener, Bernville	2213
Conrad O. Keich, New Ringgold	2211
David J. Renninger, Boyertown	2213

*Denotes rehire.
**Denotes summer hire.

Death



M. L. Shoemaker, a retired Sandia employee, died July 17 after a short illness. He was 62. He had been a staff assistant in systems development organizations since February 1948. He retired in December 1965.

Survivors include a daughter, two brothers, and a sister.



FLIGHT PLAN for current JTF-2 series of tests is discussed by Bob (left) and Jim Solberg, who are brothers assigned to Systems Evaluation Department 9210.

Service Awards

20 Years



P. G. Rospopo
4254

15 Years



Joy R. Cannedy
4131



Pierre Chevalier
7214



R. K. Crawford
4232



D. E. Grebe
7215



Elizabeth Heisler
1100



B. R. Higgins
4221



H. E. Houts
7252



L. K. Hungate
2111



F. O. Lane, Jr.
5141



H. G. Laursen
7242



C. H. Maak
1131



T. W. McKinney
2225



B. M. Montano
4573



W. T. Price, Jr.
2541



S. S. Quintana
4513



Simona Quintana
2234



M. A. Romero
4575

10 Years

July 29 - Aug. 11

R. R. Aguilar 3242, Richard Chavez 4233, H. E. Kinney 5622, F. T. Stixrud 7311, L. J. Allen 1422, L. F. Stravanski 1512, J. B. O'Meara 2433, J. E. Moore 3111, F. E. Ramirez, Jr. 4212.
Fidel Gonzales 4575, H. C. Marquez 4614, J. S. Llamas 7224, M. D. Campbell 7310, I. H. Gillett 7531, F. P. Norcott 1523, H. S. Garcia 3415, J. L. Hay 4252, G. J. Saviteer 3312.
R. J. Mickey 3463, S. H. Neff 4214, W. H. Carter 2126, M. E. Bauder 9425, Norman Rosenberg 1323, Ernest Carey 4252, Eleanor R. Dadian 8213, and Sylvia J. Martinez 3126.



W. G. Self
4221



R. A. Silva
4573

Bill Moffat Becomes Source of Information on N. M. and Australia

It seems that one thing New Mexicans and Australians have in common is a curiosity about each other's land. When Bill Moffat (7220) was in Melbourne, strangers asked for information about Albuquerque, and now that he's home, he receives calls from strangers inquiring about Melbourne.

Bill and his wife Jane recently made a combined sea-air trip to the "Down-Under" country to visit son Pat, who has been working near Melbourne for the past year. They found a pioneer country "bustin' to go" and people (both natives and "new Australians," as the immigrants are called) impatient to see the country grow.

"It's a lousy place," Bill explains, "a little like the United States was 40 years ago. Homes are quite modern although hard goods, such as refrigerators and TVs, are very expensive since Australia doesn't yet have a manufacturing capability for these products. Automobiles, in particular, are very expensive. Pat had to pay \$4000 Australian dollars for a Valiant demonstrator with 4000 miles on it."

Australia recently revised its monetary system from the pound to the dollar. The Australian dollar is worth \$1.12 in American money, and Bill notes, "The currency is all so new, it looks like 'funny' money."

The Moffats spent most of their time near Melbourne on a 1600-acre sheep ranch which is owned by the parents of a girl who spent a year with the John Piper (5622) family as an exchange student.

"When I walked down the streets of Sundbury, a village of 3000 near the ranch, people stopped to ask who I was and if I planned to move there," Bill says. "It was like a frontier town; everyone was friendly. The people have a leisurely attitude and are interested in having fun."

Although the cost of living is low, wages are correspondingly low. The average salary is \$35 a week, and the government has a ceiling of \$25 a week for workers under 21. "Still it's an experience to walk into a meat market and see T-bone steaks selling for 21 cents a pound."

The Moffats found many Australians who had traveled in the United States and some who planned to visit here. Especially among young people, there is a great desire to travel and many take year-long world tours with very little cash, planning

to work as needed where they are able to find employment.

With a population of only 11 million, Australia is as large in area as the U.S., but only a small percentage of the land is productive. Offshore drilling for oil is just starting, and there are tremendous deposits of minerals in the mountains awaiting economical production methods or transportation. "There are things to be built and things to be done. The people recognize the potential and want to be part of it. If I were a young man," Bill says, "I wouldn't wait five minutes to join them!"

Take Note

Albuquerque Amateur Radio Club will conduct a course in radio theory at the Coronado Club starting Aug. 2 to help prepare radio amateurs for the technical sections of the Federal Communications Commission examination. Classes, which are open to the public free of charge, will be conducted every Tuesday from 7:30 to 9:30 p.m. for 11 consecutive weeks. Registrants will be required to purchase two textbooks which cost about \$2 for both. Several Sandians will serve as instructors. For additional information contact R. A. Wilson (1422), vice president of the Club, at 299-1872.

E. C. Peterson (3220) was chairman of an orientation seminar sponsored by the American Management Association, July 13-15, in Chicago. The session was entitled "Practice Sessions in Preparing for Bargaining, Negotiating, and Writing the Union Contract."

The T.D.P. Wives Club is hosting a swimming and dancing party at the Coronado Club tonight from 6:30 to 11:30. This party takes the place of the regular monthly meeting.

PAGE FIVE

LAB NEWS

JULY 29, 1966

SHOPPING CENTER

CLASSIFIED ADVERTISING
Deadline: Friday noon prior to week of publication unless changed by holiday.
A maximum of 125 ads will be accepted for each issue.

RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Corporation and AEC employees only
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

FOR SALE

SELL OR LEASE: 3-bdr., brick, 1 1/4 bath, hw/floors, landscaped, 3 blocks to Fair Plaza. Payne, 268-3184.

5-BDR. HOUSE, den, garage, NE Heights. Lujan, 265-6551.

WESTERN SADDLE for child, \$30 or trade for man's bicycle. Wing, 898-0062.

24" ELECTRIC STOVE, \$45; Hollywood bed frames, 2 for \$15; china, service for 10, \$20. Calek, 282-3285.

TENT, 6-man, insulated, dbl. wall, pole and tent spikes, \$25. Peterson, 256-7514.

SOUSAPHONE, E-flat, base, 4-valve special Holton Gold Bell w/case, sell or trade for 120 base accordion. Johnson, 344-9369.

19" TELEVISION, portable, 1 1/2 yrs. old, \$75. Boyes, 255-4617.

'66 YAMAHA 80cc. oil injection, must sell, \$300 or best offer. Barton, 298-1240.

'65 TR4-A, independent rear suspension, convertible, white, red leather interior, wire wheels, never raced, one owner, below book. Bagg, 898-2539.

'58 CHEV. 1/2-ton pickup, Fleetside, R&H, 4-spd. shift, automatic. Berger, 202 San Pablo SE, 255-0265.

10 CU. FT. apt. size refrin., 6 yrs. old, \$80 or best offer. Liguori, 256-3613.

TRAILER, 2-wheel, 4'x8' w/extra wheel and tire, \$40. Sutton, 296-1157.

'54 CHEVROLET, 4-dr. Bel Air, R&H, AT, \$190. Dugan, 298-0120.

LAWN MOWER, 18" reel w/basket, gasoline powered. Craftsman, recently overhauled, \$20. Officer, 256-0337.

'64 CUSTOM FORD, 2-dr., std. shift, R&H, cream w/blue interior, \$1150. Freedman, 298-2177.

'54 WILLYS, \$100. Mathias, 255-0156.

CAR COOLER, 12v evaporative, \$15; portable room cooler, evaporative, \$8; 2-burner hot-plate, \$10; 20" portable 3-spd. fan, \$18. Sisson, 299-7133 evenings.

COLUMBIA UNIVERSITY speed reading course, 13 volumes, complete w/pacer, used only once. Brown, 255-0566.

GARRARD RC 121 MK II 4-spd. stereo turntable w/GE stereo cartridge and needle, \$15. Cashion, 242-3345.

CAR MAGS 7:50x14; 8:00x14. Baca 298-2219.

REFRIGERATOR, Kelvinator, 8 cu. ft., white, \$25. Power, 255-7466.

'50 INTERNATIONAL 3/4-ton 4-spd. pickup. Gomez, 256-1584.

PHILCO electric range, full size, automatic timer. Ricker, 296-2191.

GE ELECTRIC RANGE, deep-well, broiler, large oven, top push-button controls. Lane, 299-9329.

TWO 6:70x15 Goodyear tires, \$6 ea., both for \$10. 8406 Los Arboles Ave. NE. Meissen, 298-2822.

CAR TOP luggage carriers, expanded metal, 44x44, \$10; Sear's waterproof 42x60, \$20. Cundiff, 5905 Constitution, 256-0043.

17" PORTABLE TV, '62 Packard Bell w/brass cart, \$60. Stirbis, 299-5563.

BOY'S 26" Royle Union English racer bicycle, black and white, hand brakes back and front, puncture seal tires and tubes, chrome rims, \$25. Fletcher, 298-2142 after 4.

3-BDR., paneled den, fp, 2 baths, carpets, custom drapes, entry foyer, dbl. garage, sprinklers, covered patio, 11604 Morenci. Villanueva, 299-9219.

L-SHAPED kitchen counter top, 118"x26" w/46" long beige w/gold flake formica top, \$20; drapes, 2 pr., pleated, lined, green print, 80"x58", \$8. Trump, 299-5162.

GENUINE LEATHER SEATS, red, for Mercedes-Benz 220 or 190 sedan, fits 1960-66 models. Cully, 256-6308.

LOT 47 Ponderosa Pine subdivision in Bernalillo County, 2 acres, S. Hy. 10, \$1500 cash, or \$1750 w/\$500 down and \$25 per month. See Guest, Bldg. 866.

NEW 8:50x14 tubeless, Fedway's premium quality tire, 40-month guarantee against all road hazards, \$20. Stamm, 255-2640.

WURLITZER spinet organ w/bench, cost \$1200, sell for \$750, walnut cabinet. Frenkel, 299-3258.

WESTINGHOUSE 14" table model TV, \$23. Drake, 299-0743.

21" GE table model TV, \$50; 17" Motorola TV, \$30; new TV Stand, \$18. Mills, 299-2130.

COLT .38 auto., M1 carbine w/scope and manlicher stock; 400 mm f5 preset lens for Exacta; 135mm f2.8 preset lens for Minolta. Ivy, 268-8733.

'47 CHEVROLET coupe, \$50. Wemple, 298-0424 after 5.

TIRES, mud/snow, 5-90x15, \$8 each or 2 for \$15; wrenches, metric for German or other imported cars, 6 open-end, sizes from 8mm to 19mm, \$4. Coleman, 299-2377.

LARGE 2-bdr. house, best offer. 425 Truman NE. Laskowski, 256-2053.

26" BOY'S Schwinn bicycle, 3-speed, \$15. Hodyke, 268-5210.

'62 SACHS motorcycle, J-BE, 125cc, 3500 miles, \$175. Miller, 255-6838.

1 ACRE LOT on the Rio Blanco River near Pagosa Springs, Colo., \$1250, \$125 down. Dimberger, 298-5172.

STEEL SASH WINDOWS, two 36 1/2"x39", \$20 ea.; two 55"x39", \$25 ea., includes screens and hardware, new. Silva, 877-5140.

CARPET and padding, 60 sq. yds., \$50. \$15 per sq. yd. new. Kelly, 345-1214.

THREE QUARTER and full size violins, \$35 ea. Kishbaugh, 268-0670.

'57 FORD V8 convertible, new top, PS, good engine, body and front end rough, \$125. Jeys, 299-4197.

WINDOW, steel sash w/glass and screens, approx. 3 1/2'x4 1/2'. No. 3323, \$15; trailer hitch for '59 Ford, \$5. Cleveland, 298-0218.

9'x9' UMBRELLA TENT, heavy canvas, \$20; women's Spalding Tru-Fite golf clubs, w/bag, cart, \$30; car bed, \$7; child's pedal car, \$6; garden tools; misc. Lumbach, 298-4917.

SWING SET: TV (needs repair); six 10-gal. aquariums. Cummings, 296-4626.

2-BDR. near Carlisle and Indian School at 1822 Hermosa Dr., carpets, drapes, fp, new roof, cfa heat, AC, landscaped, \$12,500. Barnette, 265-4787.

AMATEUR RADIO SALE: HQ-140-X receiver, \$140; HC-10, \$70; complete Viking II transmitter, \$110; or whole station for \$260. Jones, 268-4954.

'60 FORD ANGLIA, 5-passenger, 28 mpg, \$200. Johnson, 298-8514.

BASSET PUPPIES, AKC registered; Tappan gas range; B-flat clarinet; blond dbl. dresser. Morris, 268-3349.

AKC registered poodles, 1 toy male, silver; 2 miniature females, black, 12 wks. old; 1 toy male, 6 mos. old, shots and house trained. Schafer, 299-4634 after 4:30.

MATCHED SET PGA professional golf clubs, 2 thru 9 irons plus wedge, 4 woods, fiberglass shafts, \$175. Goodwin, 256-2216.

'63 CAPRI, English Ford fastback, owner on TDY must sell, retail \$830, sell \$600. Grace, 255-4009.

KIMBALL grand piano, \$575; Coldspot 19 cu. ft. freezer, \$95; white iron table w/seats, \$30; boy's bicycle, \$10; Thor ironer, \$5. McCord, 247-2774 after 5.

17" ZENITH TV; 2 Jerry cans; camping trailer spare tire; new ironing board; man's bowling ball; movie camera; screen; projector. McGarvie, 298-3364 after 6.

'65 RAMBLER station wagon, Classic 660, V8, OD, PS, radio, 21,000 miles, will consider older car as trade. Prew, 296-3815.

'65 YAMAHA 250cc, 12 mos. old, \$675 new, oil injection, \$495. Yuhas, 268-6269.

CAR TOP CARRIER, zipper closure, Ward's make, used once, \$22.50. Morgan, 299-2850.

4-BDR. BRICK, 2 yrs. old, all extras, cash to large 5 1/4% GI loan, \$26,000, 1709 Bellehaven Ct. NE. Hopper, 298-7309.

POWER MOWER, 18" 6-blade reel type, just re-sharpened, \$35. Tichenor, 298-0192.

BASSET PUPPIES, 2 quality litters, terms available. Klinetobe, 268-8227 after 5.

'65 FORD CUSTOM 500 4-dr., V8, \$1575. Bischoff, 298-1994 after 5.

REGISTERED half-Arabian yearling colt, \$250, terms; trade Swinner Polaroid for 6.70x15 tires. Gentzler, 282-3425.

'64 FORD Fairlane 4-dr., 27,000 miles, still under warranty, 4 new tires, \$1750. England, 296-1367.

26" BOY'S and 24" girl's bicycle, as is, \$7.50 ea. Matlock, 255-0109.

BUFF BRICK, 3-bdr., DR, LR, den, 1 1/4 bath on 1 or 9 acres, Los Lunas area, sale or trade. George, 865-7969.

'62 CHEVY II 100, 4-dr. Dunn, 255-9213.

UNFINISHED house and five acres, Los Lunas area Rameriz, 865-7467.

14' WOOD extension ladder, \$5. Hauer, 298-3624.

MOSSMAN 3-bdr., hw/fp, carpet, drapes, patio, lawns, \$450 down FHA or assume 4 1/2%, \$14,550, 2812 Madeira NE. Hunter, 256-7610.

LARGE MODERN MOUNTAIN HOUSE w/2 or 7 acres, kennel building, suitable for horses, highway N. 10 at Cedar Crest. Barth, 282-3451.

3/4 REGISTERED Arabian gelding, \$350; '49 Dodge pickup, \$195; 4-bdr., study, 1 1/2 baths on 3 acres. Jarrell, 636-2834.

NEW El Camino 4-spd., large motor, R&H, snow tires, white cover, extras. Marine owner in Service, \$2200. Browne, 344-9675.

CORRALES, 1 acre, apple trees, restricted. Lochner, 265-4037.

MO-PED MOTOR BIKE, deluxe, new motor, half price. Howard, 255-7846.

CRIB, lg. size w/mattress, 5-dwr. chest, both blond wood, both for \$15. Alvino, 255-6339.

'63 VW SEDAN, 1 owner, AC, radio, vsw, \$1195. Casper, 268-4464.

STEREO, Silvertone portable, '65 model, 5-yr. warranty still in effect, \$70. Gum, 298-8866.

'60 TR2 coupe, R&H, new tires, \$450 firm. Ray, 265-1146.

18" SUNBEAM electric twin blade rotary mower w/100 ft. cord, \$40. Smith, 4615 Palo Alto Ave. SE, 255-7389.

COLOR SLIDE OUTFIT, 35mm Kodak Pony camera, leather case, blower cooled Tower projector, spare lamp, all for \$39.95. Stark, 299-5953.

AUTOMATIC WASHER, \$25. Breitenbach, 344-7584.

'62 CHEVROLET V8 4-dr. Impala station wagon, AT, PB, PS, \$950. Williams, 298-4602.

ADDBE HOUSE, 48 acres near water skiing, fishing, San Luis, Colo.; 3 1/2 acres and city lot. Taos, N. M. Chavez, 255-6155.

YAMAHA 80cc, '66 model, used 6 mos. adult driver, 1600 miles, \$299; Chev., '59, AC, standard, \$495. Sorrels, 298-1702 after noon during week.

'64 CORVAIR Monza club coupe, big engine, four on floor, low mileage, original owner, \$1225. Gregory, 268-2022.

'57 CHEV. station wagon, 6 cyl., straight stick, R&H, \$280. Stuckey, 255-2442.

TERRAZZO TILE, 112 sq. ft., \$45; wire fence welded 2"x4" openings, 5' high, 100' long, \$20. Romero, 344-0302.

3-BDR. ROBERSON, 1 1/4 ceramic baths, hw/f, pitched roof, AC, landscaped, w/sprinklers, \$17,200 or assume for less. Murphy, 256-1130.

TRANSMITTER, DSB 100, five bands 100 watt PEP, VOX and XX VFO, \$75; TA-33-JR antenna, CDR rotator, steel tower, \$60. Bauer, 255-7774.

TYPEWRITER, Everest deluxe portable, \$75, originally \$135; dark brown wig, \$25. Campbell, 296-2437.

'63 PLYMOUTH Belvedere 4-dr. V8, AC, PS, \$1300. Cleveland, 298-3647.

DE VILLE 15' house trailer, \$800, see at 1915 Inez Dr. NE. Irving, 299-1969.

'59 FORD Galaxie 4-dr., PS, AC, engine recently overhauled, \$475. Denney, 268-0004.

AIR COMPRESSOR w/motor and stand. Wilson, 282-3225.

RED FLAGSTONE, 144 sq. ft., \$16; 15" rim for '56 or older GM cars, \$3. Hoke, 298-2384.

WORLD BOOK encyclopedia Cyclo teacher w/sub-ject and test discs, \$25. McKelvey, 256-9787.

SHOPSMITH w/jig saw, sander, shaper, jointer, 10 cutters, \$150. Gustafson, 243-3690.

CHEVY walk-in van, completely insulated, recently rebuilt engine, trade or sell. Riley, 256-9722 after 5.

'62 STUDEBAKER 1/2-ton pickup, R&H, new tires, OH valve 6, tachometer, battery meter, vacuum meter, temp., amp., oil gauges, PB. Gross, 3203 Solano Dr. NE, 344-4155.

WANTED

TENT, 10x12, or bigger, in good condition. Newman, 298-2323.

RIDE or will join car pool from Cedar Crest to Bldg. 800. Gauthier, 282-3791.

TRADE: 5'x5'x4" dog house for much smaller dog house. Smith, 299-5478.

YOUR 20 or 22 ft. self-contained travel trailer when you go to larger size, all metal preferred. Muzey, 268-0914.

SMALL APPLE CIDER PRESS, must be in working condition. Neese, 282-3442, after 5:30.

SLEEPING BAG, down filled, reasonably priced. Egbert, 247-0311, ext. 2918 8 a.m. to 4 p.m.

STANDARD 8 mm movie film editor, splicer, and light bar. Matsko, 299-2145.

SKI BOOTS, size 10 narrow; cement mixer. Shunmy, 265-1620.

PUMP AND CARTRIDGE TYPE pool filter for 36"x12" pool. Roberts, 256-3901.

5-MAN BOWLING TEAMS for coming winter leagues, max. team avg. 825; bowl at 6:30 p.m. Friday, Holiday Bowl, Sandia T-Bird Handicap League. Tichenor, 298-0192.

10 SPEED Bike. Baxter, 344-7601.

PING-PONG table in good condition, tubular steel legs, folding, casters, prefer 1/2" top. Hunter, 256-7610.

2-WHEEL utility trailer or motorcycle trailer. Lathrop, 255-1901.

FOR RENT

PLACITAS, large recently remodeled old adobe house, all utilities available, spring water, electric pump, trees, fruit, garage, corral. Illing, 299-7378.

UNFURNISHED 2-bdr. apts., AC, stove, refrigerator, washer rough-in, near Sandia Base, \$75/mo., 821 Louisiana NE. Cornelson, 299-5105.

UNFURNISHED and furnished 2-bdr. triplex, AC, built-in stove and refrig., utilities included, \$85/\$100/mo., 439 Texas NE. McCrory, 298-7673.

LOST & FOUND

LOST—3 strand cultured pearls, key ring w/9 keys and screwdriver, book, "He Walked the Americas", raincoat, LOST AND FOUND, tel. 264-2757, Bldg. 610.

FOUND—Key ring w/keys and tag—"No. 8 C.E. Director & C.E. Office." Sears' white knit shirt, silver ring w/turquoise sets, dangling tube earring—white w/pink and green. LOST AND FOUND, tel. 264-2757, Bldg. 610.

Coronado Club Activities

Six Directors to be Elected; Patio Barbecue, August Moon Ball Set

Annual meeting of Coronado Club members will be held Monday, Aug. 1, at 8 p.m. Six new members of the Board of Directors will be elected. Nominated for the positions are J. C. Carter (ACF), J. H. Kelly (3112), C. R. Andes (4137), J. W. Carroll (4315), O. B. Tjeltweed (5632), and T. A. Sellers (9211).

Additional nominations will be accepted from the floor at the meeting.

"Carryover" directors on the Board include Pearson Crosby (AEC), D. M. Olson (1510), J. H. Shelby (4252), and E. D. Herrity (4312). C. W. Dickinson, Jr. (3120), and D. P. Dickason (AEC/SAO) are the Corporation and AEC appointed representatives to the Board.

Refreshments will be served.

For tomorrow evening, the Club has scheduled a patio barbecue and swimming party. Swim from 7 to 9; dine on barbecued pork spareribs, barbecued chicken, Boston baked beans, etc., from 8 to 9; then dance to the music of the Estancia Valley Boys from 9 to 1. Admission for members is \$2.50, \$3 for guests. Tickets must be picked up by 9 p.m. tonight.

On Saturday, Aug. 6, the Club will stage a spectacular August Moon Ball and Wine Taste, a Club tradition. The evening starts with various types of wine for sampling at 6 p.m. A prime rib dinner will be served from 7:30 to 8:30. Dancing starts at 9 p.m. with the Phil Graham group playing. Cost to members is \$3, guests \$3.50. Tickets must be picked up by 9 p.m. Aug. 5.

Monthly teenage go-go will feature the Deacons, Aug. 11. The bash starts at 7:30 and the action lasts until 10:30. Admission is 25 cents each.

Social Hours

Tonight, Elton Travis will play for social hour swinging. The chuckwagon roast beef and shrimp buffet will be served. The buffet is \$1.75 for adults, \$1.50 for children.

Next Friday, Aug. 5, the seafood buffet will be featured and Bud Fisher will provide the happy music.

On Aug. 12, the chuckwagon roast beef and shrimp buffet repeats with Tommy Kelly on the bandstand.

Bridge

ACF Bridge group meets Wednesday, Aug. 3 at 7 p.m.

Social hour at 6:30 precedes the duplicate bridge tourney set Monday, Aug. 8. Women pairs will battle men pairs.

Bowling

Bill Weinbecker (4252) is the newly-elected president of Coronado bowling. Vice president is Joe Woodley (4632), secretary is Lorraine Eriksen (ACF), and Ken Carmichael (4135) is treasurer.

Sanado Club's Membership Drive Party Set for Aug. 9

Annual membership drive party of the Sanado Women's Club is scheduled Tuesday, Aug. 9, at 2 p.m. in the Coronado Club ballroom. All women who are Coronado Club members are invited to attend this free punch party.

Sanado Club offers 11 interest groups which provide individual activities. A member may participate in any or all interest groups to share common hobbies or to learn new ones. These groups are bridge, gardening, golf, arte de cocina, charm, art, choral, skiing, tennis, horseback riding, and bowling.

General monthly meetings are held on the second Tuesday of each month and feature programs such as style shows, musical entertainment, speakers, dinner dances, and formal balls.

Theme for this year's membership party will be "Sanado Hol-i-daze." Each interest group will have a booth appropriately decorated for a selected holiday. Members will be present at each booth to answer questions. A drawing will be held for prizes.

Ladies interested in joining may contact Mrs. G. D. Horne, tel. 268-9646.



AUGUST MOON BALL at the Coronado Club Saturday, Aug. 6, will feature a prime rib dinner and dancing with the Phil Graham group. Walt (3465) and Laverne Scott limber up for the event. A wine taste precedes the dinner and dance.

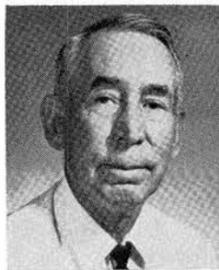
Retiring . . .



"The first thing I'm going to do is make a trip to California to see my new baby granddaughter, and this time I won't have to hurry back to the job," says Glenn E. Anderson.

Glenn retires from Sandia Laboratory today. He is a model instrument maker doing precision machining in Project Section 4253-1. He joined the Company as a machinist in October 1948.

Glenn has three sons—one living here and two in California. In addition to the new grandchild, he has six other grandchildren. He resides at 1696 Del Sur Dr. SW.



Juan J. Gallegos of Janitor Service Section 4575-1 retires today. He joined the Company in March 1957. Before that time he worked as a lumber millwright and did carpenter work.

Juan plans to "take it easy" for awhile after retirement, but in order to get a little exercise and keep fit he intends to open a shop at his home where he will work part time as a carpenter and cabinet maker.

Mr. and Mrs. Gallegos live at 1413 Severo Rd., SW. They have two sons and a six-year-old grandson living at home. Juan says raising his grandson is keeping him young. They have four married daughters living in Albuquerque and one son in Oregon.

Congratulations

Mr. and Mrs. Johnny Sisneros (4151), a son, Paul Gerard, July 8.

Mr. and Mrs. Dean A. Buckner (5154), a daughter, Margot Hildegard, July 14.

Mr. and Mrs. James Haines (4254), a son, James Douglas, June 22.

Mr. and Mrs. J. A. Lipham (1415), a son, Thomas Alan, July 14.



SWITCHING TELEVISION COVERAGE from an alarm board in one of 10 buildings in Technical Area I to another on the central control monitoring system is William W. Peters (4511-2). In the background, R. E. Moery (4511-2) checks the boiler control panel.

Central Control Console Polices Equipment in Ten Lab Buildings

Air conditioning and heating equipment for 10 buildings and some environmental testing chambers in Technical Area I are monitored around the clock by a central control console located in the steam plant (Bldg. 605).

An operator sitting at the console can monitor more than 2000 points in the buildings through a variety of visual and audio techniques. Visual checks are made by monitoring an alarm board of red lights in the various buildings over a closed circuit television system, by direct readout of the different points in the console's instrument panel, or by readout values automatically printed on a tape machine.

The console also includes an inter-communication system which enables the operator to dial a number to listen to the sound of a particular piece of machinery. The operator can also converse with the heating and refrigeration mechanics in the different buildings by using a walkie-talkie radio channel.

Purpose of the system is to remotely monitor plant equipment and control points of plant equipment, such as refrigeration and air conditioning, readings of transformer loads, condensation readings on steam lines, and temperatures in the various buildings and environmental test chambers.

The station is manned 24 hours a day, every day of the year. Those directly concerned with the system are a boiler fireman, who also operates the console, and a plant maintenance mechanic in the field.

The system currently covers heating and air conditioning equipment in Bldgs. 800, 801, 802, 805, 806, 840, 860, 880, 892, and 894. It also polices the temperatures in such critical areas as the standards laboratory and environmental test chambers in Bldg. 860 and 880.

An alarm board with a capacity for 100 alarm points and 100 digital readings is installed in each of the 10 buildings and connected into the building systems. All 10 of the alarm boards are in turn connected with the central alarm board.

When an alarm is activated, a red light designating one particular building flashes on the central board. The console operator depresses a button to switch the closed circuit television coverage to the building's alarm panel. The illuminated red light on the building's alarm panel is

numbered to designate the particular piece of equipment monitored. By referring to a manual, the operator can tell the operating criteria for the piece of equipment.

He can get a direct readout of the equipment's temperature on the console by dialing a three-digit number listed in the manual. If he chooses, he can have all available information at the alarm point, such as oil pressure, oil temperature, hot gas temperature and bearing temperature in a turbine, transmitted automatically over a tape machine on the console. This information can then be checked against the manual for analysis. He can also flick some switches to listen to the equipment in operation.

The operator then contacts the plant maintenance supervisor, who dispatches a mechanic to the building affected to correct the problem.

The system thus makes it possible to remotely diagnose the trouble and shut down some of the equipment if it appears that continued operation will result in damage.

W. C. Elskes, supervisor of Plant Systems Division 4511, estimates that the monitoring system has made it possible to increase the maintenance efficiency of air conditioning and heating equipment by 80 percent. It has relieved plant maintenance personnel of continuously inspecting equipment thus allowing them to devote more time to other duties.

Sandia's Safety Scoreboard

Sandia Laboratory:

56 DAYS
1,960,000 MAN HOURS
WITHOUT A
DISABLING INJURY

Livermore Laboratory:

43 DAYS
205,970 MAN HOURS
WITHOUT A
DISABLING INJURY

Sandia Pistol Team Wins Regional First

Sandia Laboratory's pistol team placed first for the region and eighth in national competition during the recent National Rifle Association and National Industrial Recreation Association sponsored contest.

R. G. Mosteller (7262) was the high scoring individual shooter with 183 out of a possible 200. He was ranked 12th among 385 competitors.

The Sandia rifle team placed 46th in a field of 62 teams competing. The team scored 669 out of a possible 800. Top individual score was shot by R. R. Anderson (1111) with 183 out of 200.

The Sandia shoot was held on the Base and scores mailed to the contest director.