

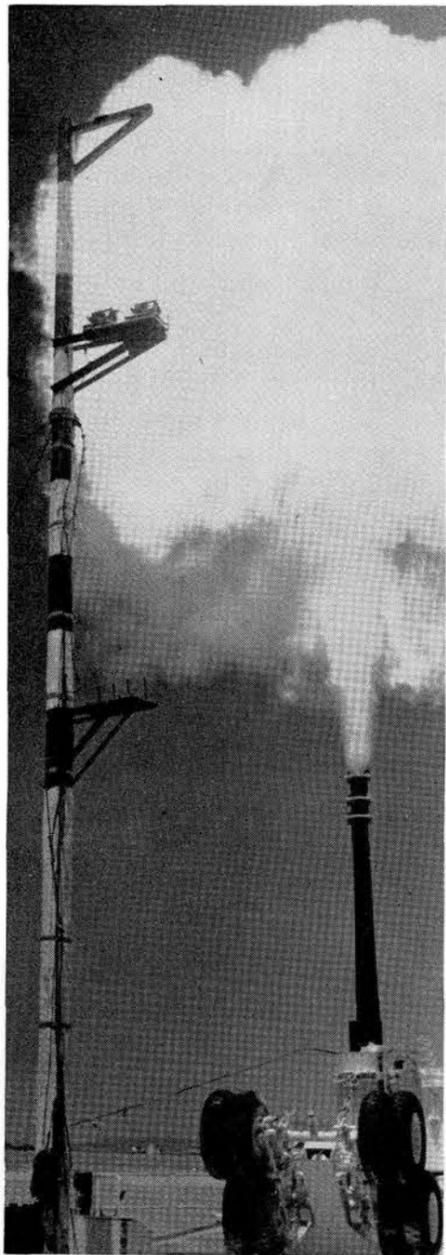
LAB NEWS

AUGUST 14, 1970

VOL. 22, NO. 17

SANDIA LABORATORIES · ALBUQUERQUE NEW MEXICO & LIVERMORE CALIFORNIA

Big Gun at Tonopah Range Creates Shocking Conditions



KA-PLOOIE or something like that occurs when 155 mm cannon at Tonopah Test Range fires instrumented projectile at 85° launch angle for acceleration and shock testing. New telemetering techniques have been developed by Division 7282. Tower at left supports camera stations.



CAROL TRASK (7340) is the latest Sandian to attain the rating of Certified Professional Secretary. She took UNM Community College courses to bone up for the stringent six-part test.

Sandia engineers in Instrument Applications Division 7282 have developed new techniques for the use of cannon-launched projectiles in shock and acceleration testing. Major improvements include better control of the environmental conditions encountered and innovations for in-barrel telemetry.

Specially-designed 155 mm cannon shells are used to subject test components to accelerations of up to about 16,500 times the force of gravity (16,500g). While similar acceleration levels may be achieved with laboratory gas guns, the acceleration by cannon is maintained over a longer time period—about 15 milliseconds as compared with about 2 milliseconds for a gas gun. Additionally, the cannon imparts angular acceleration (spin) to the system.

Similar tests are conducted with 81 mm mortars, which produce, a setback acceleration of about 7000g for 7.5 msec.

(This is not the first time that cannon have been used for purposes other than weapons. In 1865 Jules Verne described the launch of a manned spaceship to the moon via gigantic cannon in "From the Earth to the Moon." In 1962 a Sandia engineer suggested launching large rockets from tubes anchored under water. And since 1963 the U.S. Army has been launching atmospheric research vehicles to altitudes as high as 90 miles with specially-designed guns up to 119 feet in length.)

One of the early drawbacks in Sandia's use of cannon was encountered when the shell containing test components was brought to a stop for recovery. The shell was first shot into a static, boxcar-sized "berm box" filled with sawdust; however, the stop was so abrupt that deceleration forces rendered some test results ambiguous—it was difficult to determine whether they were caused by terminal deceleration or by the initial acceleration, or both.

Near-ideal results were achieved when the berm box was mounted on a rocket sled and launched simultaneously with the shell. Moving at only slightly lower speed than the shell, the berm box absorbed the impact shock gradually, thus protecting the test components from undesired shock con-

(Continued on Page Two)

'Houdini' Approach Transmits Energy in Sealed Container



A patent on a "Piezoelectric Feed-through Device" has been issued to the AEC in the name of Otmar Stuetzer, manager of Exploratory Test Measurements Department 7210.

The device provides a way to charge a battery inside a closed metallic container, or to transmit electrical information inside to activate a switch or insert a code.

Normally the problem is solved by drilling a hole through the container shell and inserting an insulated wire, but there are instances when this is not possible (for example when the case will be submerged) or not desirable (when there might be outside interference to electrical signals or information).

Mr. Stuetzer's invention includes a disc of piezoelectric material which is glued to the inside of the container. A metal electrode is connected from this disc to the using device (such as a battery). A similar disc is pressed on the outside wall to transmit the information (this disc can be removed after use or be permanently affixed). The electrical impulse passes through the wall between the discs as acoustic energy and is reconverted to electrical energy inside.

Mr. Stuetzer has some 35 U.S. and German patents.



SANDIANS and their families are invited to visit the Sandia Laboratories Exhibit Center (formerly Sphere of Science) during the noon hour. A guide (in this case Bob Gall, 3433) will conduct a tour of the new exhibits.

Wheeler-Blanca Study

Plant Variations At Altitude Offer Insight Into Environmental Effects

It's hard to believe that a college student could ski and hike his way to a doctoral dissertation, but it's even harder to believe that there is a relationship between the plant species on two major mountain peaks and Sandia work in carbon technology.

Hal Mackay (5314) is the person who makes both things believable. For his biological research, he compared the plants found on New Mexico's Wheeler Peak (conveniently near his favorite ski area) and on Colorado's Blanca Peak (conveniently near his ranch). The mountains are only 70 miles apart, but Mac discovered five species of plants on Mount Wheeler that had been previously unreported in the state.

As to the work-related aspect, the methods he used for comparison of the floras could be adapted to any problem involving changes in the environment. Sampling, data reduction and statistical studies employ techniques that remain the same for flowers or for quality control on thermal batteries.

Hal's PhD is in biology, but he took all available courses in organic chemistry offered by the University of New Mexico. This is the area of study that is most helpful in his Sandia research into carbon composites. His main concern is with cellulose (a plant product) and resins (also of plant origin). These materials in their various forms may be combined and converted by heat in an inert atmosphere into carbon composites.

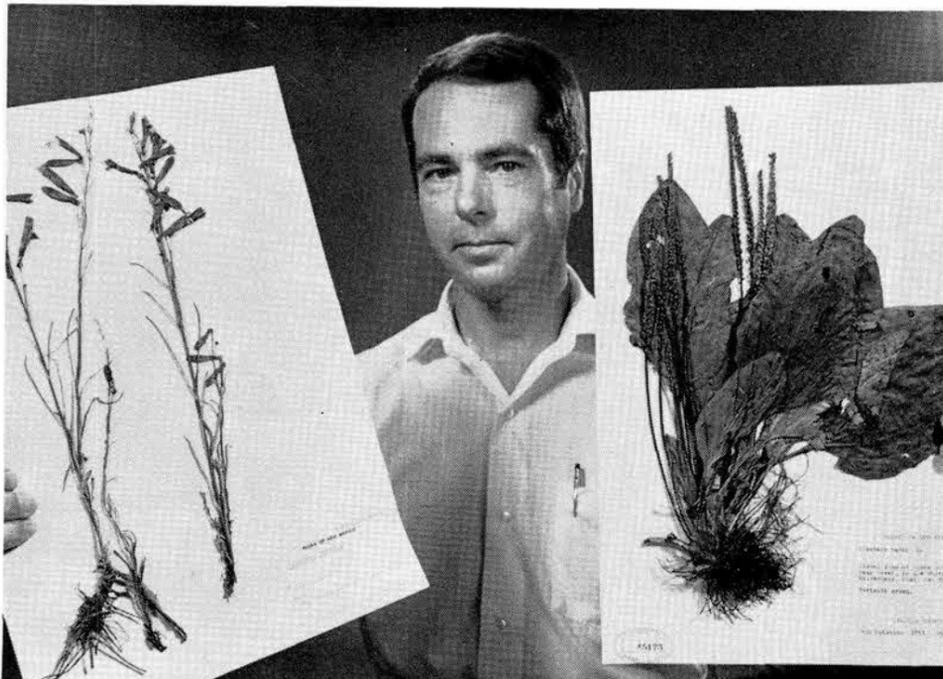
The first year of his doctoral study, Hal gathered samples of flowers every two weeks from May through August and once a month in April, September and October at different altitudes on both peaks. At the same time

he assigned the species to vegetational zones. The second year he scanned the same areas to see what he had missed.

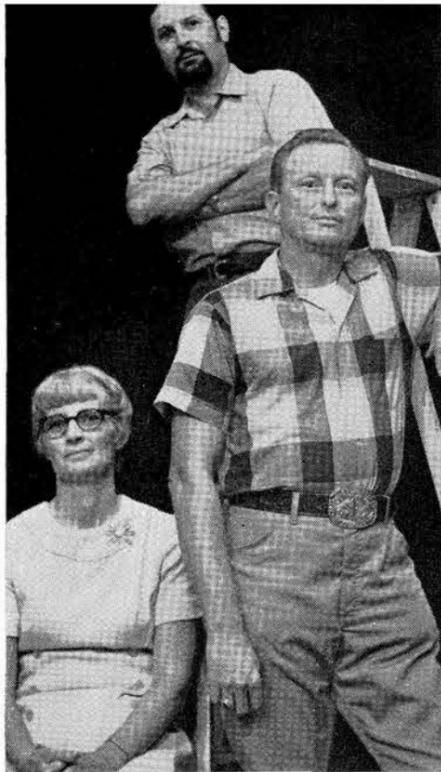
In order to make meaningful comparisons, specimens were gathered representing five species from the Alpine tundra of Wheeler and Blanca Peaks. Back in Albuquerque, working with samples of each species, Hal then made 10 different measurements of each (size of flowers, leaves, stem, reproductive parts, etc.), and analyzed the chemistry of the plants. Later statistical reduction of this data revealed certain interpopulation differences.

"I found some extremely different examples of the same species, notwithstanding the fact that Mount Wheeler and Blanca Peak have the same geological origins, were glaciated at the same time, have the same exposure, and have about the same environmental conditions. On both peaks above the 12,000-foot level, the severe conditions create almost a matt-type vegetation with very low growing forms, and the strong ultraviolet radiation probably causes many color variations," Hal explains. "In many ways, the Alpine tundra plants resemble those found on the desert: they have thick skins, few leaves, grow close to the ground, have viscous cell sap, and have adapted to a short growing season."

As to the five species new to New Mexico, which Hal discovered, three are found on Wheeler above the 12,000-foot level while the other two are found below 11,000 feet. "One of the plants is native to Newfoundland. How the seeds traveled 2000 miles to New Mexico is anyone's guess—perhaps years ago in a Canadian trapper's pack?" Hal speculates.



FLORA OF NEW MEXICO are cataloged this way at the University of New Mexico's herbarium. Harold Mackay (5314) discovered five species previously unreported in the state during recent research on Wheeler Peak.



"THE DEPUTY" by Rolf Hochhuth, one of the most controversial plays of the 60's, opened last night at Old Town Studio. The cast features three Sandians—from top, George Cosden (4332), Don Schubeck (4113), and Oletha Cox (9415). Oletha and George have dual roles. The powerful drama deals with Hitler's anti-Semitic policies in WWII and how Pope Pius XII reacted to these policies. The play will be presented tonight, Saturday and Sunday and again Aug. 20-23. Curtain time is 8:30 p.m. Call 242-4602 for reservations.

Take Note

Ever been close enough to a bighorn sheep in the wild to reach over and touch his nose? Will Ouellette (5225) has done so, then he shot the animal—with a camera from a distance of three feet.

It all happened during a hike in the Pecos Wilderness this summer. "The sheep wanted to get from one place to another, and I happened to be on their route," Will explains.

The State Game and Fish Department was so impressed with Will's photos that they featured them on their regular Wednesday evening TV show "New Mexico Outdoors" on July 25 and Aug. 5. In color, match!

Clarence Mehl, manager of Weapons Effects Research Department 5230, was recently named chairman of the subcommittee on blast and thermal effects of the National Academy of Science Committee on Civil Defense. He has been a member of the committee for the past three years and succeeds Luke Vortman (9111) who was chairman last year.

Jerry Smith (7263) earned the low gross championship title in the Sandia Golf Association's Fred Given tournament played July 25 at UNM south course. Low net went to John Hart (4316). First flight winner was Chet Fornero (4337); second flight, John Hart (4316); third flight, W. C. Scrivner (9400); and fourth flight, Jim Davis (9227).

George Dennis Named Information Director For AEC/ALO

H. C. Donnelly, manager of AEC's Albuquerque Operations Office, has announced the appointment of George Dennis as Director of Information, succeeding Richard Elliott who retired last month.

Mr. Dennis joined AEC in 1957 and has been Deputy Director of Information. A native of El Paso and a graduate of the University of Texas at Austin, he is a former newspaperman and naval officer. He was city editor of the EL PASO TIMES when he entered the Navy in 1942.

He is a member of the Public Relations Society of America and is a board member of several Albuquerque organizations, including the Easter Seal Society and the Bridge House Foundation of New Mexico, which assists in the rehabilitation of alcoholics.



42 State Areas

Wilderness Devotees Plan for Federal Hearings on N.M. Areas

The Sandia population includes a large number of hunters, fishermen, backpackers, bird-watchers (different from girl-watchers), and people who just like the outdoors. Put them all together and you have the nucleus of a group interested in wilderness areas.

Although not limited to Albuquerqueans, the newly-formed New Mexico Wilderness Study Committee has several Sandians in official positions. Corry McDonald (3416) is vice chairman, and Phil Thacher (5153) is on the advisory board. Milo Conrad (9115) was responsible for the idea and for bringing the interested persons together to form the committee.

Out-of-Hours Courses Starting September 14

Catalogs listing courses available in Sandia's out-of-hours education program next semester are being distributed to all employees today. Classes will start Sept. 14.

Enrollment, scheduled Aug. 17-28, is expected to reach 2500, according to Gene Bates (3132), coordinator of the program.

A new computer technology program is being offered for the first time this year, Gene reports. Designed for Sandia's staff, the program offers a series of eight courses that will provide the skills and knowledge necessary to use the computer as a tool in present or future work assignments. The program emphasizes computer language skills, methodology and applications of computers. A certificate will be awarded for successful completion of the program.

Other courses offered for the first time include a Modern Methods of Materials Characterization course which will be instructed by 17 Sandia specialists. Other new courses are Simulation Techniques, Numerical Methods, Microwave Semiconductor Devices and Applications, Digital Integrated Circuits Utilization, History of Mathematics, and Anisotropic Elasticity.

Enrollment cards are included in the catalogs. Questions concerning the out-of-hours program should be directed to Ruth Brooks (3132), tel. 264-6538.

As Milo explains, "Our committee is made up of individuals who are actively concerned about the proper interpretation of the Wilderness Act, and will be devoted to obtaining enactment of favorable wilderness legislation for the state of New Mexico and its citizens."

The Wilderness Act of 1964 requires that all National Forest Primitive Areas, and roadless areas within National Parks, Monuments, and Wildlife Refuges be reviewed by 1974 for possible inclusion within the National Wilderness Preservation System. At least 42 areas in New Mexico have already been designated for consideration.

The purpose of the new committee is to make recommendations on each area before the public hearing. (A public hearing was held last December on the Blue Range Primitive Area and a hearing is scheduled in November on the Black Range Primitive Area in southwestern New Mexico.) These recommendations will be based upon explorations of the areas and upon examination of plans offered by the U.S. Forest Service and the Bureau of Land Management, and Sport Fisheries and Wildlife.

If you are particularly well acquainted with any of these areas and could contribute information, or if you would like to be a member of a task group, please contact Corry McDonald, 620 Sierra Dr. S.E.

The Wilderness Act states that it is "a policy of Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." In this sense, the wilderness is also your heritage.

Credit Union Statements

As part of its normal audit procedure, the Supervisory Committee of the Sandia Laboratory Credit Union recently mailed statements to members with account numbers from 11,000 to 11,999. If your account number is in this series and you have not received your statement, please notify Karl Waibel (4117), Committee Chairman.

Phil Thacher Works for Zero Population Growth

Phil Thacher, a research physicist in Solid State Electronics Division 5153, is the father of a four-year-old daughter and a son, age two. That's all the children that he and his wife Aija are going to have.

Phil is treasurer of the recently organized Albuquerque Chapter of Zero Population Growth, a national organization which aims at equating the birth rate to the death rate.

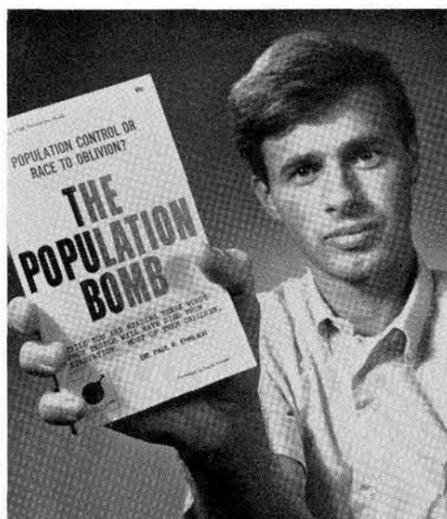
"The evidence is overwhelming," Phil says, "there are too many people in the world. Overpopulation is the basic cause of our social problems and our environmental problems. Crime, social chaos, crowding, noise, pollution and depletion of resources are the results of too many people."

"The world's food supply is critical — half of the world's three billion people are now literally starving or malnourished. Within 30 years — by the year 2000 — if current birth rates continue, the world's population will double and that's a disaster of the highest order. Between today and that time Americans, who are the most generous people in the world, will themselves have a serious food shortage and we will simply have to watch helplessly while millions of people starve to death."

Phil wants to head off the day of reckoning. He says that Americans should put their own house in order by equalizing births with deaths and then exert pressure for world population control.

The Zero Population group advocates that no responsible family should have more than two children. Any family wanting more than two children should then adopt children. Adopting children does not increase the population.

ZPG advocates that all methods of birth control, including legal abortion, be freely available. They actively lobby for revisions in the tax structure to encourage small families and they conduct programs to ob-



WORLD STATISTICS on population are frightening says Phil Thacher (5153). For the whole story he recommends a number of publications including this one.

tain more government support for birth control.

The group provides speakers and seeks audiences. Personal letter writing campaigns to influence friends, relatives and acquaintances are conducted.

And they distribute literature. "The Population Bomb" by Paul Ehrlich, founder of ZPG, is one of a number of publications which discusses the population problem in detail.

"Read the book," Phil says. "It is documented and convincing. The message is clear. There are too many people. If we don't do something, our kids will grow up in a dirty, littered, polluted world and our grandchildren will probably not have enough to eat."

Death



Nancy Wallace, secretary to Project Management Division II, 1514, died Aug. 1. She was 40.

She had worked at Sandia Laboratories since February 1959.

Survivors include two daughters and a son.

Continued from Page One

Big Gun at Tonopah

ditions. Acceleration data was computed from velocity of the shell, rather than from a direct telemetered reading from accelerometers in the instrument package.

Use of the rocket sled technique, however, proved costly, and Sandia subsequently developed a parachute recovery system which combines economy with the advantage of minimal interference from spurious shock environments.

The projectile is launched from the can-

non at an elevation angle of 85 degrees at a velocity determined by selection of the powder charge. Typical muzzle velocity is 2750 feet per second (fps), with a shell spin of about 240 revolutions per second.

At an altitude of about 21,000 feet, the projectile is acquired by radar tracking stations and reaches an apogee of 10 miles approximately 45 seconds after launch. Next, explosive charges detach the ogive nose cone and the parachute is deployed for a 7½-minute base-first descent at about 80 fps. These conditions assure that test items will experience only minor side-effects for unprogrammed shock environments. Telemetry signals are transmitted until parachute deployment.

The assembled projectile is 32 inches long and weighs 73 pounds, and consists of a standard 155mm M118 illuminating round base section, an electronic package and the fiberglass ogive containing the telemetry antenna and parachute. The electronics package—excluding its two liquid ammonia batteries—and the modular housing for test components are reusable.

The on-board telemetry system contains six data channels multiplexed into a four-watt phase-modulated crystal-controlled transmitter. While up to 15 channels may be employed with the same multiplexing system, only six are presently required to monitor the system's two accelerometers and two channel batteries.

Need for testing at higher g-levels arises from expanding interest in high velocity payload carriers.

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BACK TO THE BOOKS, under Sandia's One-Year-On-Campus plan, go Anthony Reid (8324) and Jean Kwan, he to Stanford and she to Purdue. Randall German (8312) has also been selected.

Livermore Names Three To One-Year-On-Campus Program

Named this year for Livermore's OYOC program are these recent graduates: Randall German (8312), a materials science graduate from San Jose State College who will be continuing his studies at Ohio State University; Anthony Reid (8234), a graduate of Rensselaer Polytechnic Institute who will continue his studies in electrical engineering at Stanford University; and Jean Kwan (8321), a mathematics major from Michigan State University who will do graduate work in computer science at Purdue University. The three will study full time toward completion of MS requirements.

Two other Sandians returned last week after earning Master of Science degrees under OYOC.

Hugh Coleman of Aerothermodynamics Division 8351 was awarded an MS degree in mechanical engineering from Stanford University. He joined Sandia Laboratories Livermore in June 1969 following graduation from Mississippi State. And David Fielder of Materials Division 8311 earned his MS degree in chemistry from the University of California at Berkeley. He joined Sandia Laboratories Livermore in September 1968 after graduating from the University of Washington.

Congratulations

Linda Beckman (8133) and Wayne Will (8124) married in Tracy, July 11.

Linda Knowles (8342) and Ted Hoeger (LRL) married in Reno, Nev., July 14.

Sympathy

To Dick Jacobson (8122) for the death of his mother in Middleton, Wis., July 27.

Take Note

Joe McManus, supervisor of Technical Art Section 8231-2, has designed an identification emblem and letter masthead for Interfaith Housing, an organization which offers low cost housing for the elderly in Livermore.

Bob Johnsen, supervisor of Product Control Division 8161, was guest speaker at a recent luncheon meeting of the Livermore Lion's Club International. He discussed Sandia and the AEC production complex. His presentation included a showing of the film "Here at Sandia."

Three Sandians won awards at the Alameda County Fair recently for their hand knit sweaters. Mary Sites (8232) took two blue ribbons, one for a multicolor ski sweater, the other for a plain sweater with pattern stitch; Carol Jacobs (8231) won a first award for the classic cardigan; and Karen Poor (8320) gained a white ribbon for a striped shell and a green ribbon for her classic cardigan. Carol and Karen are former members of a noon hour knitting class Mary has been instructing over the past few months.

Al Derby (8264) shot a low net score of 67 to win the first place trophy in the Sandia Employees Golf Club tournament played at the Silver Pines Golf Course in Newark on July 25. Tied for second place with scores of 68 were Bill Ormond (8217) and Don Skinrood (8136). Mike Stephenson (8172) was closest to the pin in the hole-in-one contest.

Don't Rock the Boat, Coast Guard Bill Morehouse Advises

Bill Morehouse (8168) is a man who feels strongly about boat safety. "Many people think you can operate a boat as casually as a car," he says "but you can walk away from a disabled car and you might have a little trouble doing this if your boat breaks down." Bill talks knowledgeably about boat safety as a member of the Coast Guard Auxiliary.

Original purpose of the Auxiliary back in 1939 was to indoctrinate small craft operators in safety and to enlist their support of Coast Guard jobs. The Auxiliary soon found though that most of the assist calls were the result of poor seamanship and ignorance of the law, and modified its mission accordingly.

Bill's outfit, Flotilla #25, was formed about five years ago and encompasses the Livermore-Pleasanton area. Bill gives boating instruction, with emphasis on safety in seamanship.

"Auxiliary members also inspect boats and do safety patrols," says Bill. "And they take part in search and rescue missions and help out in regattas."

"Some boat insurance companies give discounts to Auxiliary members," Bill adds. "To become a member, you must be over 17, a citizen, and own not less than a 25 percent interest in a boat, aircraft, or amateur radio station, or have special qualifications."

Bill will be teaching a boating course this fall, starting Sept. 16, at East Avenue School in Livermore. Equipment and gov-

ernment regulations, boat handling, fire prevention, safety afloat, lines and anchoring, piloting, and electronics will be covered. There is no charge for the course, only for the textbook. Boat insurance rates normally are less if the owner has completed this course.

Boat owners may also request an examination of their boat by the Auxiliary. No charge is made for the examination, and if the boat fails to pass the inspection no report is issued. But if the boat passes, a decal to this effect is issued and the boat will not be boarded by the Coast Guard unless there is a violation of the law.

Bill urges boat owners departing on a trip to leave a float plan with someone, either at home or at the marina. Accidents can happen and breakdowns can occur even on a cruise of a few hours duration.

The following information should be included: boat name, registry number, length, manufacture, type (inboard, outboard, or sail), color, radio frequency and call sign, time of departure, originating port, destination, date, route, and estimated time of return. Notification should be made in the event of delays or changes in route.

Forms for float plan information are available at no charge at local marinas or from the office of the Coast Guard Auxiliary, 630 Sansome Street, San Francisco 94126.

For search and rescue emergencies, call 415-986-5500.



GETTING A TICKET? No, just a boat inspection by Bill Morehouse (8168), left, of the craft of Elwood Ingledue (8272). Bill is in Coast Guard Auxiliary, gives courses in boating.

Sandia's Contribution to Hard-Core Unemployed Program Cited

Recognition has been given Sandia Laboratories Livermore for its contribution to the National Alliance for Businessmen, a program devoted to meeting the problem of the hard core unemployed.

Sandia was one of several Alameda and Contra Costa County companies included in an Honor Roll publicly released recently by the NAB for the Metropolitan Oakland Area. These companies have supplied loaned executives to serve as NAB job developers since the start of the program.

The NAB received its charter in the President's Manpower Message to Congress on January 23, 1968. In his message, the President pointed out that "The question for our day is this: in an economy capable of sustaining high employment, how can we assure every American who is willing to work the right to earn a living?" He called on American business to apply its

talents to the critical national problem of finding jobs for the hard-core unemployed.

The Alliance program is called "JOBS—Job Opportunities in the Business Sector." Its goal is to find jobs in private industry for men and women and to place needy youth in productive summer employment.

Sandia has been represented in the program by loaned executives Ed Baldwin and Bob Norvill who each assisted in the East Bay area effort for an approximate six-month period.

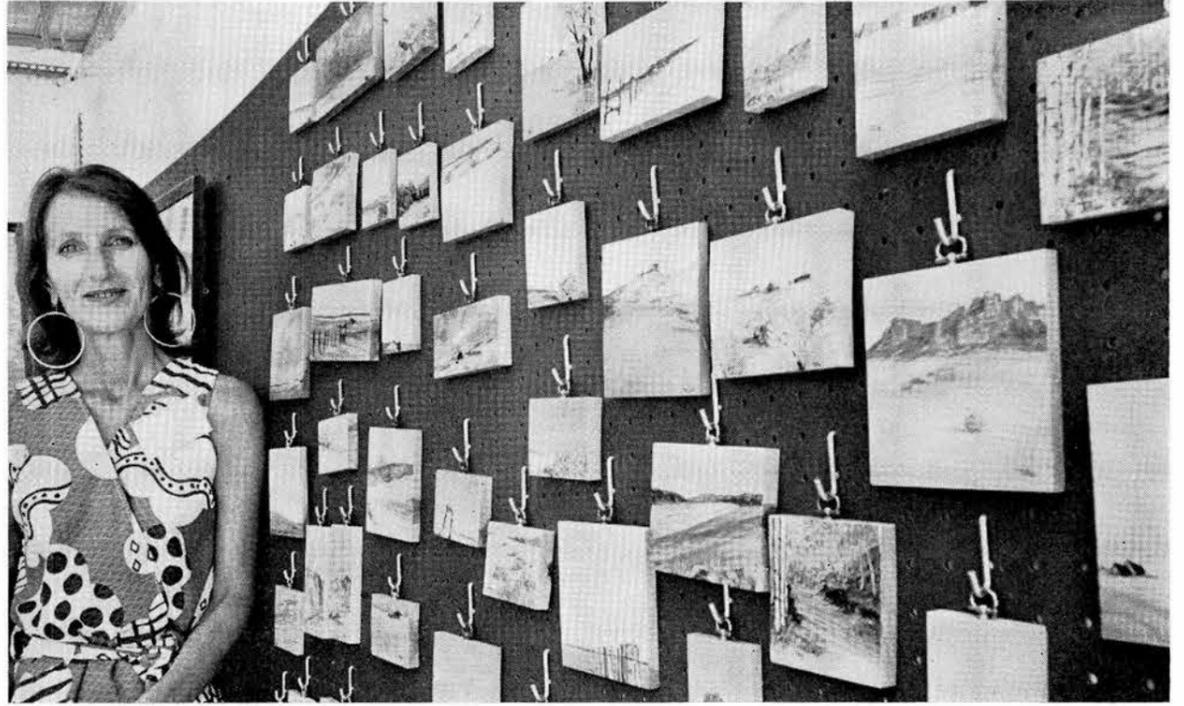


WEAPONS SUBCOMMITTEE of General Advisory Committee to AEC met here recently for briefings on Livermore programs. Lady member is Jane Hall, Los Alamos scientist who is also chairman of this subcommittee. Howard Vesper, seated far right, is chairman of GAC. Tom Cook (8000), standing left, was host to the visitors.

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TILLIE PIERCE (3417)

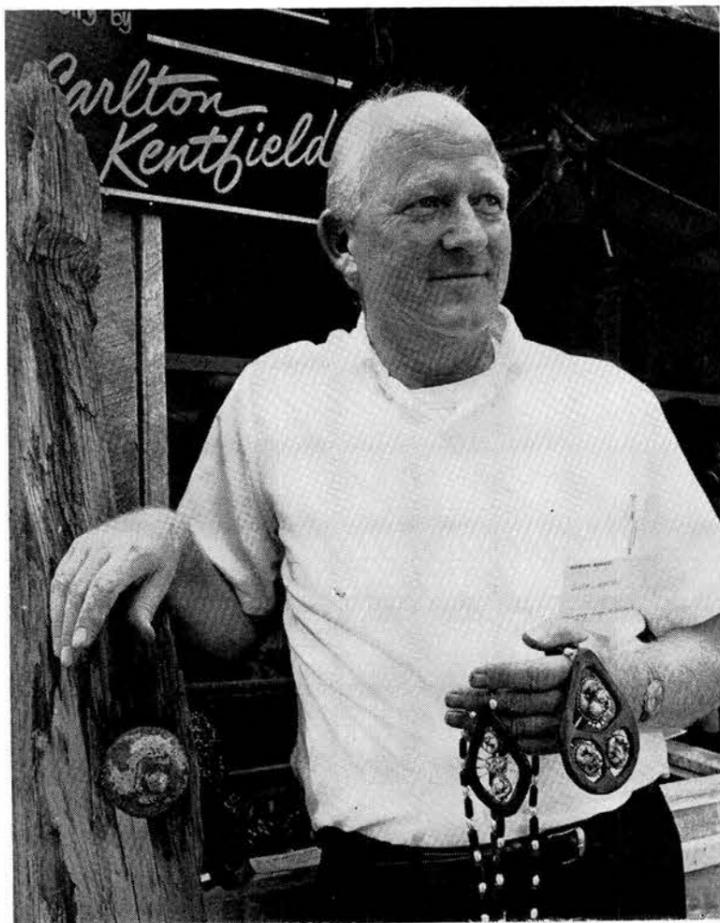


(Above)
DICK STROME (3417)

(Left)
VORIS HOPE (3417)



JIM WALSTON (3417)



CARLTON KENTFIELD (7612)
(Left)

Service Awards

20 Years



Pat Anderson
7291



Benjamin Armijo
4514



Oscar Fligner
1525



Elizabeth Frost
1643



Verne Honeyfield
3520



John Logan
9412



James Murray
4612



Pedro Ortiz
4518



Robert Stewart
3520



Harry U'Ren
4622

15 Years



Joseph Asturias
9241



Richard Berg
2535



Edgar Downing
4542



Dolores Guist
4221



Val Hruska
1220

10 Years

Bruce Van Domelen 2345, Carolyn Viel 8120, Daniel Scomor 9512, Armen Meyers 8125, Marvin Reichenbach 2452, Mary Ward 7651, Stan Serpa 8256, Gerry Nerton 8322, and Doris Spohr 3256.

Promotions

Frank Arellano (4221) to Technician
Jacob Barreras (7531) to Technician
Gary Benson (7423) to Member of Technical Staff
P. R. Candelaria (4337) to Procurement Specialist
Charlie Chavez (4337) to Procurement Specialist
Dennis Chavez (4338) to Procurement Specialist
Donald Cook (4222) to Specialties Technician
Herman Du Bois (8256) to Utility Operator
D. W. Fenstermacher (4222) to Specialties Technician
Celedon Gabaldon (9415) to Messenger
Roque Gallegos (7345) to Lab Assistant
Gabriel Garcia (7653) to Draftsman
Diego Gonzales (4518) to Laborer
Isaias Gutierrez (4514) to Auto Serviceman
Miriam Hall (8263) to Staff Assistant-Laboratory
Robert Hewes (4338) to Procurement Specialist
Richard MacGibbon (7326) to Lab Assistant
Alex Maestas (3428) to Mail Clerk
Craig Mueller (8322) to Computer Operator
Rosalia Perea (3256) to Secretary
Dianna Perry (3232) to Personnel Clerk
Joseph Smith (4222) to Specialties Technician
Barbara Torres (3256) to Steno Clerk
Robert Treharn (4514) to Laborer
Daniel Vallejos (4514) to Truck Driver
Celso Vazquez (8263) to Technical Assistant
Carol Verity (8231) to Staff Assistant-Laboratory
Juan Garcia (3452) to Reproduction Equipment Operator
Ermelindo Marquez (4212) to Toolkeeper
Kenneth Peters (7531) to Technician
Rodney King (4135) to File Clerk
Richard Padilla (9411) to Computer Facility Operator
Ronald Allen (8256) to Utility Operator

Nuclear, Space Effect Papers at IEEE Meet

Eight Sandia technical papers were presented at the 1970 IEEE Annual Conference on Nuclear and Space Radiation Effects, held July 21-23 in San Diego.

The authors and their reports were: D. H. Habing (2654), "Combined EMP and Ionization Effects"; C. W. Gwyn (2653), G. G. Summers (2653), and W. T. Corbett (2652), "An Analysis of the Saturation Characteristics of High Voltage Transistors with Application to Device Modeling"; B. L. Gregory and G. W. Gwyn (both 2653), "Application of Neutron Damage Models to Semiconductor Device Studies."

J. V. Walker (5223), "Electron Beam and Flash X-Ray Diagnostics"; E. P. EerNisse and R. J. Chaffin (both 5112), "Design of Neutron Radiation Tolerant High Efficiency Microwave Avalanche Diode Sources (TRAPATT Oscillators)"; C. E. Barnes (5112), "Neutron Damages in Epitaxial GaAs Laser Diode"; L. A. Harrah (5514), "Pulsed Electron Beam Energy Deposition Profiles Using Solid Radiation Sensitive Plastics"; J. A. Cooper (2652), "Effects of Ionizing Radiation on Monolithic MOS Inverters"; and J. M. McKenzie (2653), "Noise from Neutron Induced Defects in Junction Field Effects Transistors."

Minitouring with CB

Annual Indian Market Source for the Unusual

Like to do your Christmas shopping in August? If so, check out the Indian Market at the Santa Fe Plaza next weekend (Aug. 22-23). It's one of the less publicized events (even the Santa Fe Chamber of Commerce professed ignorance of the date), but the Indians know about it.

Pueblo Indians have been making pottery since way back when, but in the last 30 or 40 years several especially talented potters have emerged, and in many instances an entire pueblo has emulated the particular style of a gifted potter. For example, you might find 30 women making black-on-black pottery at San Ildefonso, but there's only one Maria Martinez, a potter of international acclaim. So, if your heart is set on a black San Ildefonso pot, check the Indian Market for examples by those other 30 potters.

Stories have it that the Navajos got their start as silversmiths when the tribe was confined at Bosque Redondo in 1864. Coils of brass and copper wire were issued to the Indians by their military guards and the Navajos hammered the metal into bracelets. After return to their traditional lands in northwestern New Mexico, the Navajos converted the white man's silver coins into buttons, necklaces, and concho belts and thereby combined self-decoration with ready cash. In the early 1900's they began to inset turquoise into the simple heavy silver bracelets.

From this start silversmithing among the Navajo and Zuni tribes, in particular, has progressed to a high degree of art. The fine detail of the Zuni channel work, needle-point, and inlays contrasts with the boldness of the Navajo use of turquoise and the strong design of the sandcast pieces.

The Pueblo Indians are coming up with items to replace their old standbys—necklaces of colored beads or corn. Rapidly gaining popularity (and higher asking prices) are necklaces of hand-rolled silver tubing (about 1/16-inch in diameter).



Strings of especially fine tubing are made by one of the Santo Domingo men and last year his necklaces sold for \$200-\$300. These silver beads are frequently combined with coral, turquoise, or polished shells. Also new is the increased use of polished abalone shell for beads and the strings of finely polished mother of pearl "wampum."

The Indian Market is fun and the prices are fair. But make sure the Indian item fits your home and your way of life. A large blonde woman wearing a denim suit and a high-crown Navajo man's hat drew only puzzled glances in Santa Fe. In her native Switzerland she and her getup will probably stop traffic.

— Cherry Burns

Semiconductor Effect Papers Scheduled

A number of Sandia scientists will be presenting papers at the International Conference on Radiation Effects in Semiconductors to be held Aug. 24-26 in Albany, N.Y. The conference is a follow-up of a previous meeting held in Santa Fe in 1967 which was sponsored by Sandia Laboratories.

Most of the local papers will be based upon research in ion-implantation, which has received heavy emphasis the past year and a half.

Fred Vook (5111) was a member of the international committee which organized the conference. He will present the opening address and also chair a session on ion-implantation. Herman Stein (5111) will review work in silicon.

Other Sandia papers are: Sam Picraux, and Fred Vook (both 5111), "Low Temperature Channeling Measurements of Ion Implantation Lattice Disorder in GaAs"; George Arnold (5111), Ruth Whan (5522), John Maurin (5522), and James Borders (5111), "Luminescence from Implanted Zn Ions in GaAs"; Keith Brower (5111), "Electron Paramagnetic Resonance of a New Defect in Silicon: The Si-Si Center"; and Charles Barnes (5112), "Absorption Measurements in Neutron Irradiated Silicones."

Speakers

C. E. Robertson (7514), "The Photographic Response of Certain Films to Q-Switched Ruby Laser Energy"; D. L. Fastle (7514), "High Intensity Flash Illumination Exposure Prediction for Ultra High Speed Photographic Instrumentation" and "Line Resolved Spectroscopy as a Practical Instrumentation Tool," Ninth International Congress on High Speed Photography, Aug. 2-7, Denver.

J. E. Schirber (5150), "The Effect of Uniform Compression on the Fermi Surfaces of Metals," Gordon Conference on High Pressure, June 15-19, Plymouth, N.H.

A. Goodman (1224), "Some Things That the Future May Bring," Manzano Sunrise Kiwanis, July 20, Albuquerque.

Lorella Salazar (3433), "Unity Among Mexican-Americans, the Second Largest Minority in the U.S.," Auxiliary of the U.S. National G. I. Forum, July 31, Flint, Mich.

SHOPPING CENTER

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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 Laboratories 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

MISCELLANEOUS

SAILBOAT, '69 Venture 21, many extras. Lewis, 255-3483.
NMMI UNIFORMS, call after Aug. 16. Nogle, 299-3863.
M1 CARBINE, NRA excellent, reloading dies & components, ammo, magazines, \$90. Dungan, 298-2906.
'67 HONDA S-90, \$175. Sperl, 268-5506.
TWO corner speaker enclosures w/12" drivers, Klipsch-horn design, walnut finish, both for \$120. Stibis, 299-5363.
MW SEWING MACHINE HEAD, attachments, \$15; breakfast suite, \$15; Groves hunting bow, \$22; \$25; cable reel, \$5. Herrmann, 296-8260.
DIAMOND RINGS, size 6 1/2, white gold diamond wedding band, lg. diamond engagement ring, \$110; yellow gold plain band, lg. diamond engagement ring, \$85. Duvall, 299-8744 after 6.
FREE: black kittens, 8 wks. old, trained. Berman, 296-6655.
EIGHT-TRACK auto stereo, \$29; FM stereo auto radio, \$49; auto race track on board, \$19. Winblad, 344-3109.

MANDOLIN, made by Martin, w/case, \$75. Miller, 298-3570.
SLANTING BOARD, \$15; Rolleiflex accessories: close-up lenses, sunshade, filters & case; cable release; kitten basket. Frauenglass, 265-7372.
SAFETY SERVER baby feeding table, \$10; play pen, nylon net, \$10. Allen, 268-3654.
1/3 HP ELECTRIC MOTORS, single speed, \$10; dual speed, \$15; for shop use or air conditioners. Rehbeck, 268-7646.
PASSENGER SEAT for '70 Ford van w/3 seat belts, \$65. Lewin, 898-2303.
BOWLING BALL & bag, \$10; used 1 yr. Rex, 255-2871.
.41 MAG. BLACKHAWK w/holster, dies, ammo, \$100; coffee table, \$30; power mower, \$15; tow hitch, Ford, \$8. Husa, 298-3335.
SET antique Knowles china, \$15; three old Navajo rugs; Colt .25 cal. auto., \$55. Smitha, 299-1096.
GUITAR, 6-string classical w/case, \$75; Briggs & Stratton 2 hp gas motor, \$20. Krebs, 296-2710.
TWO WHEELS, 4-hole w/6.50x13 tires, o.k. to recap, \$7.50. Geck, 299-5095.
TOY POODLES, black, males, 6 mos.; misc. electronic parts, make offer. Johnson, 298-7356.
WHITE wrought iron dinette set w/glass top, 4 chairs, \$50. Cox, 299-0480.
GE B&W 23" TV, pecan console, \$130; Hotpoint refri. freezer, self-defrosting, deep door storage, 15 cu. ft., \$125. Hook, 296-6285.
DNCE FIRED 20 ga. plastic shotshell cases from skeet loads, 2 cents ea. Erickson, 299-6824.
SEARS Craftsman sander, \$18; Sears drill press stand for 1/2" drill, \$15; or trade for electric motor. Nelson, 264-1674.
GARAGE SALE: leaving town, furniture, tools, sporting & camping gear, much more, 3542 Colorado NE, just south of Comanche, Kohl, 268-3754.
ELECTRIC GOLF CART, carries 2 adults; Dual King bedspread; Gerrard turntable, mar's bowling ball & bag; barbecue. Chandler, 296-3323.
WHITE EPIPHONE electric guitar & amplifier, \$600. Potts, 255-7194.

EICO MODEL 753 transceiver & Model 751 power supply, 20-40-80 bands, AM, CW, & SSB, \$150. Harstad, 298-6551.
FREE! KITTENS GALORE, weaned, 7 wks. old, short haired, house & box trained, personality plus. Borgink, 898-3086.
NEW MEXICO Military Institute uniform clothing, some never worn, for less than half price, size 36 chest, 31 waist. Dickason, 299-8125.
CLARINET, almost new, cost \$150, sell for \$100. Frasier, 299-6933.
YAMAHA CT1, 175cc Enduro, less than 1 yr. old, 1800 miles, \$475. Bland, 298-8459.
GOLF SHOES "Pro Shoe Brand" size (runs small) 11 1/2, new \$39.95, sell for \$12.95. DeHaan, 268-6120.
FIVE 5-gal. plastic water cans, \$1.50 ea.; one 5-gal. metal water can, \$2.50. Wright, 299-6458.
HOT POINT electric stove, \$50. Ortiz, 242-6404.
MOSRITE 12-string, solid-body guitar, case; 7' pool table; boy's bike; left-handed golf clubs; 3 golf carts. Swiss, 265-5346.
RABBITS: 50 cents to \$1 ea., 6 wks. old; '59 Buick service & chassis manuals, both for \$4. Bassett, 898-1840.
50-CUP percolator, \$5. Fergesen, 299-1501 after 5:30.
8 MM MOVIE CAMERAS, 1 good, 1 needs repairs; 2 swing sets. Rogers, 268-8682.
REGISTERED Morgan horses, gelding and mares, reasonable prices. Ault, 282-3280.
26" GIRL'S bicycle, Sears, \$12. Wilkinson, 299-8327.
FRIGIDAIRE refrigerator/freezer combination, large, white, \$60. Hansen, 636-2716.
SEARS Convert. stroller & carriage; red Spanish style desk, \$125; Admiral solid-state stereo w/AM-FM; FM stereo receiver, \$100. Campbell, 268-8445.
REMINGTON Enfield, model 1917, 30.06, not modified. Lohkamp, 298-6494.
SONY TC-500A stereo tape recorder, 4-track, sound-on-sound capability, 7" reel capacity, detachable speakers, \$75. McKnight, 282-3377.

ENGLISH baby buggy, stroller; 18" reel power mower, needs work; spooled crib; infant seat; car seat; baby clothes, maternity clothes, size 7. Aeschliman, 298-7846.
MOTORCYCLE, '69 HONDA, Model CT90, 1091 miles, \$280. Jewett, 298-2796.
WARN OVERDRIVE, fits Jeep Universal 4-wd model CJ2, CJ3, CJ5 & CJ6 w/4cyl. engine. Caudell, 299-0646.
CARS & TRUCKS
SELL OR TRADE: '67 Chevrolet pickup, 292 cu. in. six, 4-spd.; also want hunting bow. Patterson, 877-3158.
'63 MG Midget convertible w/tonneau cover & top, 2 new w/w tires, R&H, 36 mpg, \$450 cash. Martinez, 268-6297.
'55 IMPERIAL, make offer. McKeever, 299-2777.
'59 VOLKS, extra engine that runs, \$550. Brumley, 877-2667.
'69 MUSTANG, 250 6-cyl., PS, AC, AT, Elder, 898-3665 after 6.
'69 FORD 3/4-ton camper special, 360 cu. in. V8, AT, PS, 5 7/8x16 8-ply tires, limited slip diff., insulated Eagle shell. Kilmartin, 299-9237 after 5:30.
'70 MUSTANG Fastback, 3800 miles, fully equipped, \$500 down, assume balance of \$2257 or trade considered. Romero, 298-8586.
'51 MGTD, completely disassembled, all new parts, engine rebuilt by professional, custom snap-on hard-top, all books, manuals, restorer's dream, \$1000. Cooper, (1) 636-2198.
'67 CAMARO Rally Sport, 327 V8, AT, air, PS, disk brakes, \$1850. Garnicom, 282-3421.
'68 GMC, 3/4-ton camper liner & Royal Coachman 8 1/2' camper, \$3400. Mares, 2726 Dallas NE, 299-6958.
'53 JEEP station wagon, 2-wd, 3-spd. w/DD, \$150. Thorne, 298-9771.
'59 BONNEVILLE, AT, Piraino, 205 Adams NE, Apt. 3.
'67 DATSUN wagon, series RL411, R&H, AT, low mileage, below wholesale. Millsap, 296-5198.

'68 3/4-ton Ford pickup, set up for camper, AT, AC, 390 cu. in. engine. Ezell, 842-9136.
'67 FAIRLANE GT, 390 V8, disc brakes, Monroe shocks, radio, console, 47,000 miles, \$1395. Larsen, 268-9651.
'60 RAMBLER American station wagon, new battery, \$125; single horse trailer, \$95. Bernard, 296-1385.

REAL ESTATE

LOS LUNAS, newly carpeted 3-bdr., 2 bath, den, fr. dbl. narane, 1/2 acre, \$600 down, balance \$13,600. Skelley, Rt. 1, Box 1177, Los Lunas.
MT. RETREAT at Blue Water on 1/2 acre, Jim Walters home partially finished inside, utils. & appliances are in, \$2000 equity & assume payments. Dickinson, 247-2810.
3-BDR. MOSSMAN, paneled den, 1 1/2 baths, carpeting, drapes, AC, landscaped, \$21,000, \$6000 equity, assume 5 1/4% FHA. Lamb, 256-7343.
IMMEDIATE occupancy, all brick, 3-bdr., FR, 1 1/2 baths, hw floors, \$18,000, assume 5 1/4% loan, 1117 Kentucky SE. Lockwood, 298-9563.

WANTED

TRADE—typewriter for utility trailer, camping or hunting equipment. MacGibbon, 256-3107.
RIDE from 2nd & Griegos NW to vicinity 892/870 for 1 week, 8/17 - 8/21. Nelson, 345-0440.
WEEKLY babysitting in my home, infants most welcome, Bosque Farms. Long, 636-2655.
BICYCLE, Schwinn 10-speed, Holloway, 255-6938.
BICYCLES, man & lady's, prefer 3 or 5-speed; medium sized refrigerator; lady's golf shoes, size 9, Chandler, 296-3323.
RIDE from Paradise Hills, mornings only. Welkenback, 898-2981.
BOY'S white dress jacket, size 10. Wilson, 282-3225.
ARMY .45 cal. mod. 1911 A1, must be reasonable. Wilkinson, 299-8327.

FOR RENT

3-BDR. HOME, \$140/mo., 817 Hidalgo Cir. NW. Ortiz, 242-7989 after 6.



Coronado Club Activities

Beachcombers Ball Tomorrow Night; Water Carnival Scheduled Aug. 22

Tomorrow night is the night. Man, the Beachcombers Ball is a tradition at the Coronado Club which goes back into the early '50s when a lot of Sandians lived on Sandia Base and were courting their future wives—mothers now with teenage children. Back in those days mama was a swinger. And the Beachcombers Ball was the swingiest party ever.

It still is. (And so is mama.)

It starts tomorrow at 7 p.m. with a great buffet of seafood cocktail, baked salmon, fried clams, plus assorted fruit and salads. The Coronado Club's famous mai tai cocktail in coconuts will be available.

Herb Remington and the Beachcombers will play for dancing and present two floor shows featuring a couple of grass skirted triple-threat wahinies called Melani and Lia.

Lifeguards will be on duty all evening because somebody is sure to be tossed in the twin pools. Since you're going to get wet anyway, you might as well wear a beachcomber-type costume. Prizes will be awarded for the best ones.

You can still make it. Pick up your tickets (\$4 for members, \$4.50 for guests) tonight.

Water Carnival

Saturday, Aug. 22, is the date of the Club's annual Water Carnival with fun and games for the whole family. The twin pools will open at 11 a.m. for recreational swimming. The games will start around noon-thirty—water races, watermelon push, penny dives, etc. At intermission, the Coronado Aquatic Club will present an exhibition of swimming and diving skills plus synchronized swimming.

Ten-cent beer will be on sale from 11 a.m. to 6 p.m. and a happy hour bar will be in operation. The snack bar will be open. Admission is by membership card.

Soul Session

The Coronado Club's own special kind of soul session is scheduled Saturday, Aug. 22, from 8:30 to 12:30 a.m. Rod King and the Soul Knights will play for dancing. Happy hour prices will be in effect all evening. Admission is free to members, 50 cents for guests.

Social Hours

Tonight Sol Chavez and the mighty Duke City Brass will make the happy music while the Club's kitchen staff wheels out the southern fried chicken buffets. Social hours start right after work on Friday evenings with special prices in effect until 9 p.m. The buffet is spread from 6 until 8 p.m. and the band plays for dancing from 6 to 9 p.m. Then the TGIF crowd moves to the main lounge where Yolanda Adent and piano entertain until midnight.

Next week, Aug. 21, Yolanda invites all the guitar players to the sing-along. If you're good, you might even do a solo. A couple of musicians brought their guitars last week and sounded fine.

Bob Banks will make the happy music for dancing that night and the Club's famous chuckwagon roast beef will be spread.

On Friday, Aug. 28, Gappy Maestas will be on the bandstand while seafood is the buffet feature.

Aquatic Club Wins Nat'l Tourney

First and second place in the national junior olympic water polo tournament played last week in St. Louis, Mo., was taken by the Coronado Aquatic Club. The boys team tied for first place and the girls team won second. To qualify for the nationals, the teams had already won state and regional contests.

Brian Duggin, Scott McGiveney and Rob Boyes were named to the boys all-tournament team. Marsha Hann and Terry Peterson were selected for the girls all-tournament honors.

Lawrence Goddard is coach.

Bowlers Needed

Bowlers are needed for the Coronado Club mixed bowling league. The action starts Sept. 2. Any interested member should contact Gabby Gabaldon (1513), tel. 264-7023.

Max Newsom Heads Coronado Club Board of Directors

Max Newsom (1213) is the newly-elected president of the Coronado Club board of directors. Chet Fornero (4337) is vice president and will continue to handle the Club's travel program. Bill Bickley (AEC) is secretary and Dick Coughenour (4143) is treasurer.

Other directors and their assignments include Don Hosterman (3134), capital improvements; Don Graham (3432), publicity; Pete Gallegos (2335), entertainment; George Kinoshita (1221), interest groups; Herb Filusch (9228), swimming; and Jake Gonzales (4253), membership.

Don Dickason (AEC) is the AEC representative to the board and Jack Merillat (3120) is the Sandia representative.

Coronary Classic

Glory Awaits On Crest—If You Win

If the sight of pure physical exhaustion turns you on, be at Sandia Crest Saturday morning, Aug. 22, and watch the finish of the sixth annual La Luz Trail Race.

If you feel the need for a little exercise, here are a few details about the race. It begins at 9 a.m. a quarter-mile down the road from the start of La Luz trail. All participants start at the same time, but it's not long before the runners (usually around 20) are strung out. The trail zig-zags seven and a half miles to the Crest, with an elevation gain of more than 5700 feet. In past years the best time has been one hour six minutes.

Milo Conrad (9115) is race chairman and other Sandians helping are Jack Shoup (2330), official timer, and Paul Thomson (4512), liaison with the Caravan Club.

The race is sanctioned by the AAU. If you are interested in entering or would like additional information, call Milo at 298-2989.

No Fireworks, But July 4 In Denmark Is Big Deal

The Fourth of July was a great celebration. The Hansens were there, and the Nielsens, and the Sorensens, and the Thomsens, and the King and the Queen. . . . Who? Well, it seems that the Danes also observe our Independence Day.

A. J. Petersen (9124) and his wife had heard about the celebration and timed their visit to Denmark accordingly. "There were close to 40,000 persons sitting on the ground in the rain in 45° temperatures. The program was great, but no fireworks," Pete explains.

The project originated in 1905 as a reunion of Americans of Danish descent with their relatives and friends in Denmark. Several years later 200 acres of land in Jutland was deeded to the Danish government to commemorate the Danish pioneers who became American leaders in the fields of agriculture, horticulture, science, education and handicrafts. The deed stipulated that

the land was to remain in its natural state and it has since become Rebild National Park.

One of the features of Rebild is a replica of Lincoln's log cabin containing relics from the early days of Danish immigration.

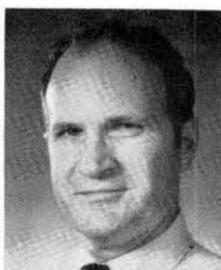
Pete reports that the July Fourth program this year included talks by George Romney and the former Danish Minister of Cultural Affairs; an exchange of greetings by the U.S. and Danish Ambassadors; and entertainment by a top Danish singer, the 800-voice Danish School Festival Choir, square dancers from Brigham Young University, the Chicago Children's Choir, the Pacific Lutheran University Choir, and the 686th U.S. Air Force Band (stationed in Germany).

"It was hard to tell the Danes from the Americans—they all looked equally cold and wet," Pete concludes.

Events Calendar

- Aug. 14-16, 20-23—Rolf Hochhuth's "The Deputy," Old Town Studio, 1208 Rio Grande NW.
- Aug. 14-16, 21-23, 28-30—"The Milk Train Doesn't Stop Here Anymore," Corrales Adobe Theater.
- Aug. 15 and 21—"Figaro"; Aug. 19 and 22, "La Traviata"; Aug. 20, "Anna Bolena," Santa Fe Opera.
- Aug. 15—Corn dance at Zia Pueblo and fiesta at Mesita for Laguna Pueblo.
- Aug. 21-23, 28-30—Albuquerque Civic Light Opera presents "Oliver," UNM Popejoy Hall. Sunday matinees.
- Aug. 22-23—Indian Market, Santa Fe Plaza.
- Aug. 22—Foot race up La Luz trail.

Supervisory Appointments



RUSSELL ASBURY to supervisor of Abrasive Finishing Section 4251-3, effective July 1.

Russell was employed by Sandia in March 1953 as a machine operator. He has worked as a layout operator in the milling section, a model and instrument maker, and in 1966 was promoted to staff assistant in the development shops. Most recently he worked as a programmer in computer aided numerical control machine section.

Before joining Sandia, Russell was machine shop supervisor for the Zia Company in Los Alamos. He served in the Navy from 1942-45.

Russell, his wife Marjorie and one of their three sons live at 1009 Dakota St. SE.



FRIEDA SALAZAR to supervisor, Engineering Services Section 7631-2, effective Aug. 1.

Since joining the Laboratories in December 1948 as a document clerk, Frieda has held a number of executive secretarial positions in the areas of engineering, manufacturing, research and development. She has served as secretary at most levels of supervision—department director, and vice president. In November 1966 she was promoted to staff assistant and has been an interviewer in the Employment Division until her present promotion.

Before coming to Sandia, Frieda worked for the U.S. Public Health Service, the Secret Service and the Office of Soil Conservation.

Frieda's husband works at Kirtland AFB. They have two sons and a daughter and live at 420 Graceland Dr. SE.

Congratulations

Mr. and Mrs. Charles Jenkins (2493), a daughter, July 26.



THINK SEAT BELTS UNCOMFORTABLE?

TRY A FACE FULL OF STITCHES.