



RADAR UNIT, modified by Sandia for long distance tracking, is located at this site at Battery MacKenzie from which Judi-Dart chaff rockets are launched weekly for upper air meteorology studies. This World War I coast artillery defense station is near the Atlantic entrance to the Panama Canal.

Upper Air Winds Over Panama Studied in Blast Prediction Project

If a number of nuclear explosives were fired simultaneously to excavate a new sea-level Isthmian canal, would the resulting air blast break windows and crack plaster 300 miles away? Would strong jet stream winds cause blast and sound waves to be funneled toward earth in a presumed "safe" area? How could a row of nuclear explosives be modified to limit any damaging effects which might be found to be probable?

Studies of blast waves have been the concern of meteorologist Jack W. Reed (5232) since 1951, first in connection with nuclear tests in the Pacific and at Nevada Test Site, and since 1959 in connection with a blast safety prediction program for possible nuclear canal excavation.

The long-considered use of nuclear explosives for canal building became pertinent in 1964 when Congress authorized a feasibility study of a new sea-level Isthmian canal.

President Johnson appointed a five-man Atlantic-Pacific Interoceanic Canal Study Commission to direct studies of engineering matters by the U.S. Army Corps of Engineers, and study of safety matters by the U.S. Atomic Energy Commission.

The Canal Study Commission established a number of working groups. Jack Reed is chairman of one of these groups—The Acoustic Wave Working Group. Among the other groups are three chaired by personnel of Lawrence Radiation Laboratory studying radioactivity, ground shock, and cratering characteristics.

Group chairmen are also members of the Canal Studies Coordinating Committee.

Mr. Reed's Acoustic Wave Working Group is involved in a feasibility study of

long-range damage which could be expected from a nuclear explosion as the blast wave expands in the atmosphere. The study is divided into three parts: propagation mechanisms (mainly a study of upper atmospheric temperatures and winds); source strength (an assessment of the air pressure wave created from cratering explosions); and structural responses (a study of building construction materials and methods, and possible modifications).

"We are interested in the direction and speed of winds in the 100,000-200,000-foot range. The data we obtain would apply to any of the canal locations which have been proposed," Jack Reed explained.

"We will have to study data gathered over a period of at least two years to be able to predict high altitude wind fields with any assurance," Mr. Reed said. "At these high altitudes in equatorial regions, there may be both annual and quasi-biennial (26 month) wind waves which would cause long-range blast propagation patterns to be quite variable and hard to predict."

Upper air meteorology studies began March 9 at Battery MacKenzie, a World War I coast artillery defense station near the Atlantic entrance to the Panama Canal. The Atomic Energy Commission is providing 180 Judi-Dart chaff rockets for weekly wind observations which will be fired over a two-year period. (Chaff consists of small bits of foil which, when released, becomes a wind-blown cloud that can be tracked by radar.) A radar unit, modified at Sandia Corporation, is being used for long distance tracking and is equipped with an automatic plotting board.

(Continued on Page Two)

Furthering Technical Vitality and Proficiency

Educational Aids Program Marks Tenth Anniversary

Ten years ago Sandia embarked on an Educational Aids Program. Through the ensuing decade, nearly 3000 employees have completed credit courses under EAP.

Initially the program was limited to graduate students, but in January 1957 EAP was expanded to include undergraduates as well. In both instances Sandia support includes payment of half of the employees' tuition. Limited time off the job to attend classes is granted under certain conditions to those with junior status or above.

There were several reasons for starting the program: increasing the potential contribution of on-roll employees by encouraging further education; attracting well-qualified candidates interested in furthering their education; and lowering the number of employees terminating to return to school.

"Educational Aids Program has turned out to be the major means by which members of our staff have been able to maintain technical vitality in an advancing and enlarging technology," says Howard R. Shelton, supervisor of University Relations Division 3134.

Significantly, "getting a degree" has never been a stated goal, although 135 degrees have been earned under the program. Instead, participation has largely been on an individual course basis and has been of significant value to employees in obtaining specialized knowledge which can



THESE UNIVERSITY OF NEW MEXICO catalogs represent the years Dennis Hayes (5623) was enrolled in courses under Sandia's Educational Aids Program while studying for his BS degree in physics. Dorothy Mohart (3134) assists with enrollment in this 10-year-old program.

be applied to their jobs.

"The number of enrollments under the program has stayed fairly constant in recent years—about 600 a year. About 76 percent of the courses taken have been

in science and engineering. We have very few withdrawals and the failure rate is very low," Mr. Shelton notes.

Unless an employee already has had considerable college work, getting a degree under the plan is a long pull and requires a great sacrifice in leisure time. But even that factor doesn't stop those who recognize the importance of education.

Dennis B. Hayes, Advanced Systems Development Department 5620, is one of several Sandians who finished virtually all of the course work for a Bachelor's degree under Educational Aids Program.

Dennis had only completed one college course when he started Fall semester 1958 at the University of New Mexico under the Company-sponsored program. Fourteen semesters later, in June 1965, he received his BS in physics. The first few years he was able to carry a maximum of 12 hours each semester because he worked a night-shift in the Print Shop (Section 3462-3) and could attend classes during the day. By the time he transferred to the day shift, Dennis had junior status at the university and was allowed limited time off the job to attend class.

"I had been at Sandia more than a year before I began a regular course of study," Dennis says. "During that time I saw what others were doing and decided what I would like to do. I knew I'd need additional schooling to reach that goal." Technical courses were no problem, but

Dennis admits that German was his most difficult course.

"I think management support of the program is a big factor in its success," Dennis says, "and most of all, I appreciate the encouragement that everyone gave me."

Dennis' name is still carried on the "EAP Participant" roll. He's already completed 12 hours toward his Master's degree.

Although 95 percent of the enrollments are at the University of New Mexico, employees also attend the University of Albuquerque, and at Livermore the University of California, and other schools nearby. Correspondence courses for university credit are available to employees at remote sites.

Assistance and counselling is given EAP participants at Sandia Laboratory by members of Division 3134. At Livermore Laboratory, this function is handled by W. L. Miller of Division 8212.

"The strength of a company like ours lies in the technological excellence of its employees," Mr. Shelton says. "Industry's chief responsibility in this regard is to provide a climate which encourages individual growth, learning, and updating. Sandia has tried to provide this climate through the Educational Aids Program, Technical Development Program, Out-of-Hours Courses, and Unified Science and Engineering (USE) course."

SANDIA LAB NEWS



Vol. 18, No. 23, November 18, 1966

SANDIA LABORATORIES

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA

OPERATED BY SANDIA CORPORATION FOR
THE U. S. ATOMIC ENERGY COMMISSION

Testing proves performance

Tiny Booms Play an Important Role In The Operation of Sandia Systems

Small explosive components perform a number of important functions in Sandia-designed systems. These range from electrical internal switching to power cutting knives which sever parachute lines. The explosive devices, as with all components developed at Sandia, undergo complete environmental testing.

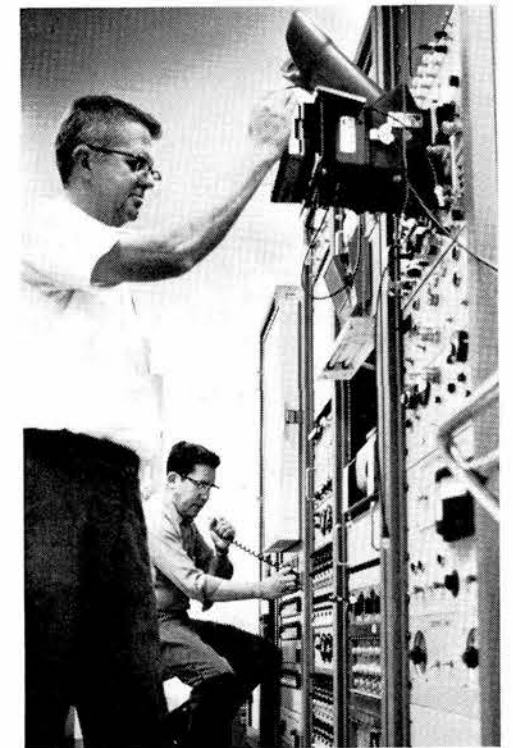
Thorough testing has long been part of Sandia's development philosophy. By designing and building components and systems which meet the toughest performance tests, Sandia insures work-the-first-time reliability. No one in the weapons business will settle for less.

Few industrial products face a tougher gauntlet of testing—temperatures ranging from -100°F to +1250°F., accelerations up to 300 times the force of gravity, heavy mechanical shock, extreme vibration, humidity saturation, plus combinations of these.

Explosive devices, because of their inherent hazards, demand special considerations for environmental testing. Needed are knowledgeable personnel experienced in handling explosives and skilled in the specialties of environmental testing. Special machines are also required to perform the necessary shaking, shocking, climatic conditioning, and firing in an area safe for operating personnel.

Explosive Mechanical Devices Division 7336 under James R. Harrison provides both—skilled, experienced men and the facilities for testing explosive devices and conventional high explosive charges up to two pounds.

The work is performed in Bldg. 904 in Area II and at the Small Explosive Facility in Area III. The division's "customers" include design and development engineers, manufacturing development groups, quality assurance organizations, field test groups, research scientists, and materials development researchers. The testing ranges from five-year programs to, literally, one-shot tests.



OPERATING SMALL EXPLOSIVE FACILITY in Area III are Chuck Grassham and Felix Almaraz. The facility is currently conducting a series of parachute deployment tests which use explosive devices.

In addition to personnel and facilities for conducting tests and recording data, Division 7336 provides test planning support. Perhaps the most valuable part of this support is the experience of the staff—the nine men in the explosives portion of the division have an average length of service at Sandia of 12 years. This, for the most part, has been spent in explosives testing or in

(Continued on Page Four)

Editorial Comment . . .

Now It's Over

Most of us voted last week. And now most of us will sit back and relax for a couple of years. Then we'll go to the polls again to cast our ballots again for county, state, and national candidates.

But now, and during these next two years, is the time that we should be active.

Now is the time to contribute—be it time, effort, or money. Let's not wait until election eve in 1968 to decide that we should have participated, should have "done something about it."

Government, politics should not be a sometime thing. As citizens it is our responsibility to take an active role in our political system.

Do it now. You'll find it interesting, enlightening, and worthwhile.

Continued from Page One . . .

Panama Winds Studied for Plowshare

The rocket station at Battery MacKenzie is staffed and operated by U.S. Army meteorological technicians from White Sands Missile Range.

C. A. Coonce (9327), gave aerodynamic assistance to the project; J. M. Baca (7223) helped with field installation of the radar unit; K. R. Fortman and W. D. Love (7222) prepared the radar unit; and L. B. Smith (5241) was a meteorological rocket consultant.

The U. S. Air Force Air Weather Service in sending aloft Arcas rockets, which will indicate temperature ranges at high altitudes and will supplement wind direction and speed data obtained from studying chaff released by the Judi-Dart rockets. Eventually daily observations may be made.

The other main problem in predicting air blast damage or safety is to determine in advance the strength of the air pressure wave. This is dependent upon yield of the device, depth of its burial, the type of material being excavated and its moisture content, and the number of explosive devices to be detonated at one time. Plans

for economical excavation of a ditch (or canal) by nuclear means have been based upon explosive charges arranged specific distances apart in a row and detonated nearly simultaneously; however, experiments show that overpressures, similar to reflected shock waves, from this type of detonation may exceed the force of the pressure waves created if the charges had been combined in one device.

Scaling based upon high explosive tests at Sandia indicated that a row of 10 one-megaton charges would give five times the overpressures expected from a single one-megaton crater burst and twice as much blast as from a single 10-megaton cratering shot.

"In the current design concepts for nuclear canal excavation," Mr. Reed said, "every row-charge detonation would give 4 to 10 times the overpressures of a single one megaton burst." Perhaps short delays between individual charge detonations is the answer. At any rate, further study of this condition is being carried out under general Project Plowshare excavation research activities.

At Johnston Atoll, Gather Your Seashells Close to the Seashore

Johnston Atoll—Special to the LAB NEWS—There is a moral to this story: when you're at Johnston Atoll, heed the warnings and don't swim in unprotected areas.

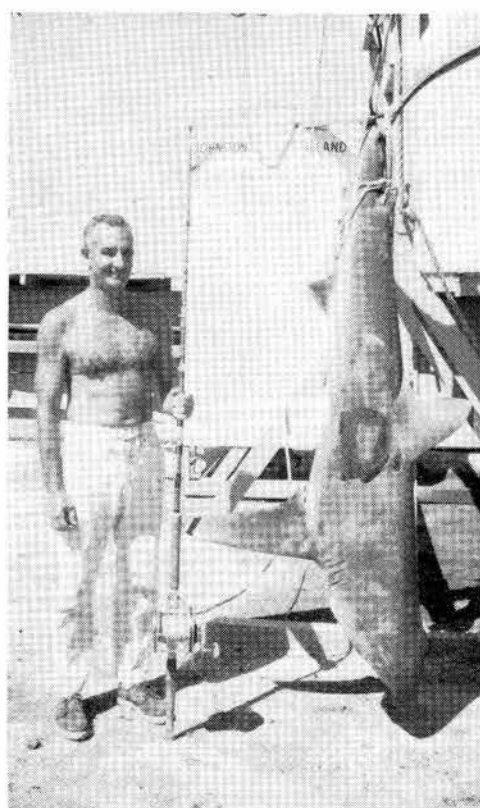
Last month C. E. (Chad) Miller (7214), Ed Newfield (2555), and Joe Jasiorkowski, an electronics engineer, were fishing for tuna about three miles out from Johnston Atoll. They were in a 17-foot Air Force boat with twin 40 hp motors, one of which was acting up and had given them some concern when going out through the breakers.

The men had been trolling about five minutes when Joe got a strike, but his 130-pound test line snapped in two when he set his brake. A minute later Chad's reel "sang" and he had his hands full trying to reel in a good-sized tuna. He had worked it almost to the boat when the fish suddenly "sounded" and took out about 50 yards of line, stopped, and then—wham!—the line went screaming out to sea.

Forty minutes later Chad had worked his catch to within 10 feet of the boat. There was a shark which looked about 12 feet long, and just above its jaws, but still on the line, was the head of the tuna.

About this time the shark took off again under the boat and Chad had another 20-minute match on his hands. Because of the angle, he had to take the pole out of the seat socket and cradle it in his arms. Finally, Chad maneuvered the shark to the boat's side.

Since a shark has about 150 sharp teeth, the fisherman didn't want the still-alive fish inside the boat. Finally, the skipper, Airman J. Murphy, worked the fish close enough with a 10-foot gaff for Joe to secure a half-inch rope on the shark's tail. They then prepared to tow it behind the boat through a narrow channel in the reef. Chad was poised with a Bowie knife



FISHERMAN EXTRAORDINARY Chad Miller (7214) landed this record-breaking shark three miles off Johnston Atoll.

to cut the towing line in the event the drag of the shark, coupled with the lack of full power, carried the craft onto the reef. They made it through the breakers okay.

The shark proved to be the largest fish ever caught off Johnston Atoll—215 pounds, 8 feet, 3 inches long.

Ed Newfield's catch? No luck, he just got seasick.



R. D. BLAND (1123) observes the ion bombardment cleaning of a SPR fuel ring. All radioactive materials are contained within the glass bell jar. Sandia has coated the uranium fuel of SPR with a thin film of aluminum, a unique achievement.

Ion Plating Achievement

Sandia Pulse Reactor Operation Improved with Aluminum-plated Fuel

More than a year ago the uranium fuel assembly of the Sandia Pulse Reactor (SPR) was plated with a thin film of aluminum. The plating was a unique achievement—uranium fuel elements have never before been plated with aluminum.

With the aluminum coating, radioactive contamination has been virtually eliminated within the building that houses the reactor. It is no longer necessary to wear protective clothing inside the building.

The pulse reactor is stored in a lead-shielded, underground pit. For radiation "bursts," it is raised on its elevator, pulsed, lowered back down, and covered with a shield.

Sandia's pulse reactor is one of the hardest-working reactors in the country, having performed more than 5300 bursts since installation in June 1961. It produces short bursts of neutrons and gamma rays, and is specifically designed for studies of radiation effects in materials.

Nickel was formerly used to coat the uranium fuel. During a burst of the reactor, the fuel's temperature increases from about 65°F to 250°F in some 40 microseconds. With continuous use, this thermal cycling caused the nickel plating to fracture, flake off, and expose the uranium to oxidation.

Corrosion products flaking from the fuel elements produced contamination inside the building. Personnel had to wear protective clothing. And, periodically, tests would be suspended while the facility was scrubbed to remove the contamination.

Even with the aluminum coating bonded to the uranium, the high thermal shock of the fuel fractures the aluminum. But the protection remains.

Investigation has shown that the ion plating process forms a molecular layer of an aluminum-uranium intermetallic compound—UAl₃—on the surface of the uranium. This molecular layer works. It is sufficient to protect the uranium from corrosion.

Personnel of Reactor Development Division 5223 are enthusiastic about the ion

plating of reactor fuel. They have specified its use for the fuel of the new Sandia pulse reactor now under development.

Ion plating, a process developed by Don Mattox, supervisor of Inorganic Materials Science Division 1123, has made possible the aluminum to uranium deposition. This is the first time that such a deposition was successful, and the process is now being studied by the AEC's Rocky Flats and Oak Ridge facilities for use in the manufacture of nuclear fuel parts.

In the ion plating process, the part to be coated is made the cathode of a high voltage circuit and is cleaned by ion bombardment from an inert gas discharge. When the surface has been cleaned by the ion bombardment, the film material to be deposited is then thermally evaporated from a filament which is the anode to the high voltage circuit. A portion of the evaporated film atoms is ionized in the gas discharge, then accelerated, at 5000 electron volts, across the cathode dark space, where with a high velocity it strikes the surface of the part being coated.

The metal ions penetrate several lattice parameters into the substrate surface. This permits formation of pseudo-diffusion type interfaces even when there is no solubility between materials, thus improving adherence between previously incompatible substrate-coating combinations.

The process used to coat the SPRF parts with aluminum is described in a Sandia Development Report, SC-DR-65-530, written by Mr. Mattox and R. D. Bland (1123), available through the Sandia Technical Library.

Sympathy

To William K. Paulus (2421) for the death of his father in Grand Rapids, Mich., Nov. 6.

To Robert Y. Peters (6030) for the death of his father in Monroe, Mich., Nov. 13.

To Joyce (4152) and Howard Johnson (4513) for the death of his mother, Oct. 18, in Huntington Beach, Calif.

To Robert Findlay (4570) for the death of his wife, Oct. 22.

Sandians Pledge \$261,532 to ECP

Sandia Laboratory's Employees Contribution Plan committee compiled the final statistics on the current drive last week and has reported a new high of \$261,532 pledged by Sandians. The current total surpasses last year's record gift by \$18,262.

Of the 6977 employees at Sandia Laboratory during the drive, 6152 contributed. Of these, 5911 are members of the ECP which requires a minimum annual contribution of \$12. Percentage of employees participating in ECP is 88.3.

Fair Share givers, employees who contribute at least one hour's pay per month, number 2691. In addition, 148 employees are giving one percent of their income or more.

Average gift of the employees who contributed was \$42.41, up from \$39.61 last year.

The ECP funds are distributed to the United Community Fund and eight other health and welfare agencies.

SANDIA LAB NEWS



SANDIA LABORATORIES
ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA

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Employee Injured In Staircase Accident

On Monday, Oct. 24, an employee tripped (or turned an ankle) and fell down approximately six stairs in Bldg. 912. Parcels were being carried in both hands which made it impossible to use the handrail.

The employee suffered pains in the right leg, a lower back strain, and painful bruises. For several days after the accident, the employee continued to work but later found it necessary to remain at home for a few days. The employee returned to work Nov. 7.

Until this accident, Livermore Laboratory had worked 21 days or 111,201 man-hours without a disabling injury.

Sandian's Lola T-70 Sports Car Wins Concours d'Elegance

Jim Muir's (8166) sports car — Lola T-70 powered by a Traco Chevrolet engine — won first place in a recent "contest of elegance" exhibit sponsored by the Prancing Horse sports car club of San Lorenzo, Calif.

Jim's Lola T-70 looks just like the real thing, except in this case the owner carries the car, instead of the car carrying the owner.

The model is a 1/32 scale of the English-made, American-powered sports car. It is equipped with an electric motor and rolling wheels which make it suitable for slot-car racing.

Preparing a car for a concours involves more than the ability to follow the instructions provided in a 79-cent kit. Most of the parts contained in the basic kit are discarded, and new, more detailed ones are either purchased or fabricated. All new parts must be authentic (like the real car) and properly scaled. In addition, judges rate attention-to-detail in the workmanship.

To achieve accuracy in authenticity and scale, Jim studied detailed drawings published in sports car magazines. Materials for new parts, however, require a little more ingenuity. For example, the model's engine was assembled from more than 50 pieces of brass tubing, plastic, and wire. The rear view mirror and seat belt buckle are tinfoil; seat belts and padded seats are adhesive tape; the screen for the motor's air intake came from the filter used in kitchen faucet aerators. Eight coats of paint gave the body a bright blue metallic sheen.

Asked when he would enter his Lola T-70 in a slot-car race and thus expose it to accident, Jim turned pale and silent. Later he replied, "As soon as I can forget the 150 hours it took to assemble it."



UNUSED ENGINE, supplied with a 79-cent Lola T-70 sports car kit, is removed from an assembly "tree" by Jim Muir (8166). Replacement engine (behind car's driver) was built by Jim from over 50 separate parts. Model car pictured won recent Concours d'Elegance.

R. H. Johnsen Elected To LRL Credit Union Board

R. H. Johnsen (8143) has been elected a director of LRL's credit union (Livermore Site). He will serve with eight LRL board members who, as policy makers, manage the affairs of the credit union. Bob is the first person from Sandia Corporation to serve on the credit union's board.

Bob notes that Sandia's Livermore Laboratory employees have been eligible for some time to become members of LRL's credit union. Membership information can be obtained by contacting the offices of the Radiation Lab Livermore Credit Union, 2582 First St., Livermore, tel. 447-5001.

Livermore Notes

Marv Beckett (8161) was guest speaker at the luncheon meeting of the Livermore Rotary Club on Nov. 2. His speech and slide presentation was entitled "Planning for the Small Business Man" or "PERT Without a Computer."

LRL won the fourth annual Sandia-LRL Golf Tournament, retaining the permanent golf trophy for another year. The handicap tourney was played at Spring Valley Golf Course at Milpitas, Oct. 22.

Sixty players competed in the tournament. Each man could score a maximum of three points. Scoring was determined by allowing one point match play for the front nine holes, one point match play for the back nine holes, and one point medal play for the 18 holes.

A special award went to Gene Aas (8161) for coming closest to the pin at the seventh hole.

Three More Sandians Are Registered as Professional Metallurgical Engineers

Three Livermore Laboratory employees—H. R. Johnson (8133), M. W. Mote and R. K. Woodbury (both 8134)—have been notified of their registration as professional metallurgical engineers in the State of California. J. W. Dini (8133) and L. F. Graves (8134) were notified of their registration in July.

These registrations were approved by the State's Department of Professional and Vocational Standards under provisions of the Civil and Professional Engineer's Act. The act was amended recently to establish a new branch designated "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.

LIVERMORE NEWS



HAPPINESS IS A PAIR OF SAFETY GLASSES—Roger Busbee (8121-3) receives a pin and certificate as he is welcomed into the Wise Owl Club by C. H. DeSelm, director of Staff Services at Livermore 8200 (right), and H. A. Zenger, Safety Engineering Division 8255.

Busbee New Member Of Wise Owl Club

Roger Busbee (8121-3) is Livermore Laboratory's newest member in the exclusive Wise Owl Club, an organization sponsored by the National Society for Prevention of Blindness.

He was presented with a membership certificate and Wise Owl pin this month by C. H. DeSelm, director of Staff Services at Livermore.

Roger, a mechanical technician in the test assembly group, normally wears non-prescription safety glasses at work. He often wears them at home, and fortunately had them on when working on his car. While using a hand drill with grinding stone attachment to smooth down a weld, the grinding stone suddenly broke and one of the pieces struck Roger's safety glasses, shattering one of the lens. There was no injury to his eye.

Membership in the Wise Owl Club is made up exclusively of employees and students who have prevented blindness through the use of safety glasses.

Two other SCLL employees are members of the club, Fred Hohmann and Lloyd Rothaker (both 8222-2). They were awarded membership in May 1962.

Welcome Newcomers

Oct. 20 - Nov. 7

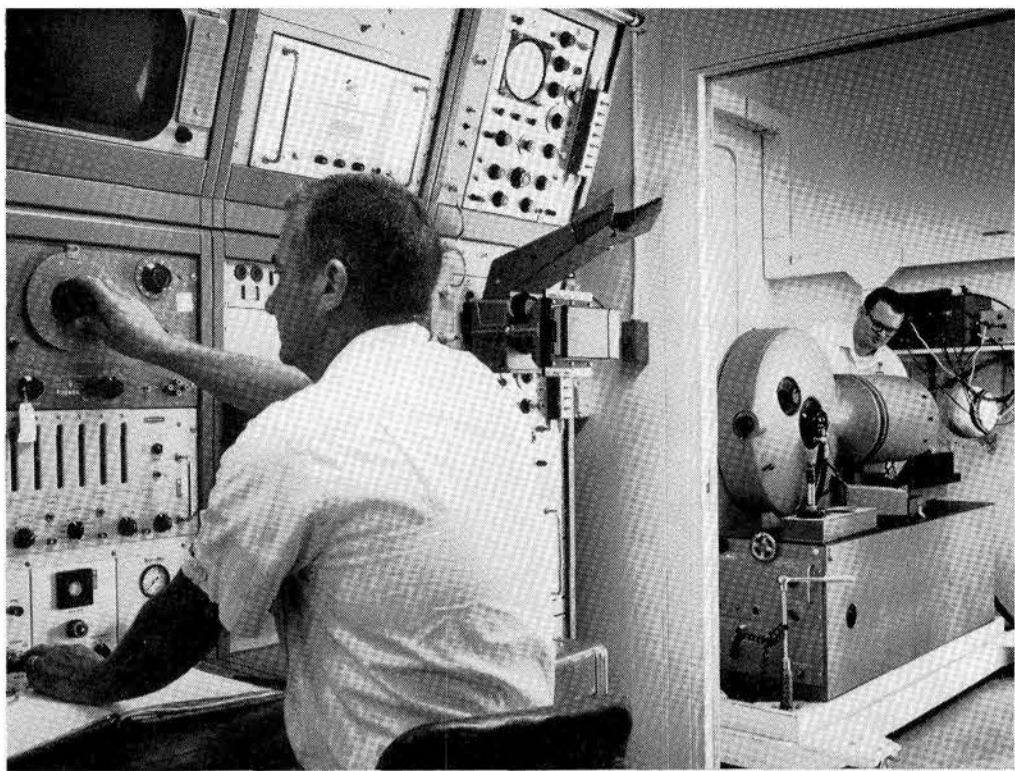
California	
*Gregory C. Drummond, Livermore	8235
Raymond M. French, Dublin	8222
Gerald M. Priebat, Fountain Valley	8163
Mississippi	
*Sidney C. Bowie, Poplarville	8135
Texas	
Dorothy A. Schroeffer, Amarillo	8252
Returned from Leave	
Gerald E. Strandin	8131
Transfers from Albuquerque	
William W. Chapin	8168
Andrew H. Stark	8132
*Denotes rehire	



Sharon Ham (8213)

Take A Memo, Please

We consider that our homes are safe. However, last year 4,300,000 Americans suffered disabling injuries and another 28,500 lost their lives in their homes.



STREAK CAMERA, aimed at mirror through concrete wall, right, photographs nanosecond events happening inside explosion of a test device. The camera is protected by thick glass plate in tube. Ken Edwards operates the control console while Robert A. Lederer is in charge of camera.

Continued from Page One

Role of Small Explosives

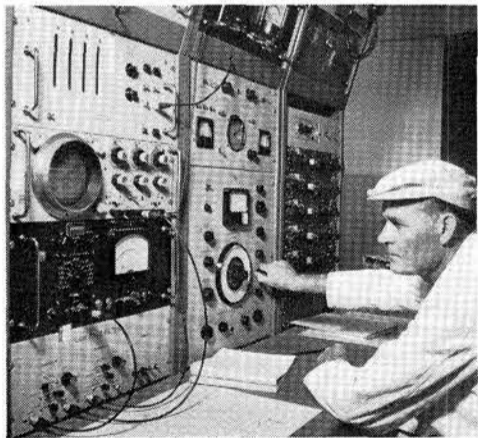
related environmental test activities.

For climatic tests, the explosive devices are scheduled through one or a series of 18 temperature chambers in Bldg. 904. Some storage tests in the chambers are programmed for as long as five years. The explosives are stored in a chamber and may be subjected to severe temperature changes during this time. The chambers can be programmed to automatically provide any time-temperature combination within the limits of the chamber. The chambers can also create salt fog, humidity, and atmospheric pressure environments.

An explosive device can be subjected to a heat or freezing temperature for a specified length of time and then taken immediately outside to a firing site and detonated. Or, by using a portable temperature conditioning machine and styrofoam shroud, an explosive component can be heated or frozen while in place for firing.

Two mechanical shock machines in Bldg. 904 provide shock pulses from 15G (15 milliseconds duration) to 10,000G (0.2 millisecond duration). By varying the shape and kind of cushioning material used with the shock machines, different shapes of shock pulses can be created and controlled.

Sinusoidal and random vibration requirements are met by using a large "shaker." The vibration system provides a frequency cycling range of from five cycles per second to 10,000 cycles per second and a sine wave force output up to 5000 pounds. A portable temperature conditioning machine again provides heat or cold environments for units undergoing vibration testing.



JOHN BUDLONG operates the vibration machine in Bldg. 904. He controls the vibration program and frequency rate of the shaker from the safety of the remote room.

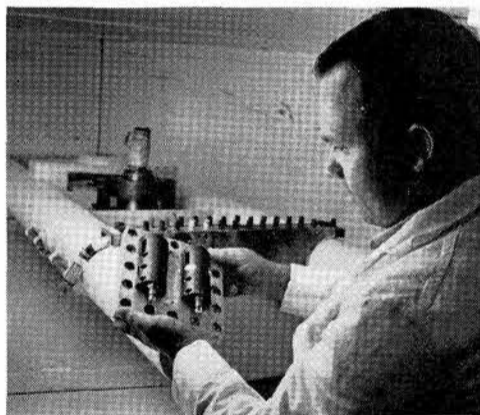
Acceleration tests ranging from five to 300G calling for a dynamic load capacity up to 15,000 G-pounds are conducted on a small (in comparison with the giant centrifuges in Area III) three-foot centrifuge. Test units weighing up to 150 pounds may be tested using this machine and small explosive squibs may be fired while spinning.

Another important facility in Bldg. 904 is the streak camera. This turbine driven camera "looks" inside an explosion and records on film the burning rate of the explosive and the shape of the resulting pressure wave. A rotating mirror "projects" or "writes" the image on film. The effect is to stretch out time—test engineers are given a look at events which happen in nanoseconds. (A nanosecond is the amount of time it takes light to travel one foot.) At

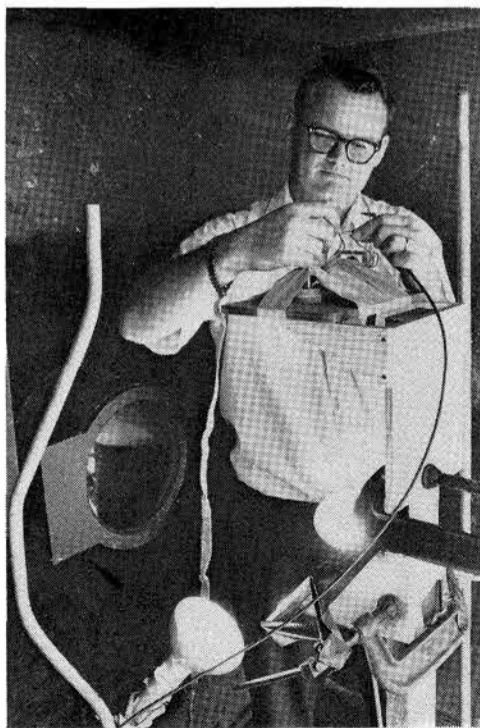
the rate this camera exposes film, about six miles of film (more than 31,000 feet) would be exposed in a single second if it operated for that length of time.

In Area III, the Small Explosives Facility fires explosive charges weighing up to two pounds. The facility is manned by Felix Almaraz and Chuck Grassham. They prepare the charges or devices for testing, install the firing circuitry and sensory instrumentation, and operate the recording equipment. The facility is designed for flexibility and a wide range of devices and charges have been tested.

"Our test activities are diversified," Jim Harrison says. "The explosive element is the unifying factor. We operate a complete environmental test laboratory inside Sandia's larger Environmental Test Laboratory. We can expose explosives and explosive devices to any kind of mechanical or climatic environment, fire under these conditions or following exposure, and provide the necessary data including explosive burning rate, pressures, and velocities."



BILL CHILDERS removes a fired explosive parachute shroud line cutter from the three-foot centrifuge in Bldg. 904. The machine provides acceleration forces up to 300G.



BOB LEDERER completes a test setup inside an explosive firing chamber. Tube at left gives visual access for streak camera. It is focused on mirror and protected by thin glass in tube.

Sandia Speakers

Marvin Moss (5154), "Dispersion Hardening in an Alloy System," Third X-ray Analysis Workshop, Oct. 28, Salt Lake City.

G. A. Samara (5132), "Physics and Chemistry at High Pressure," New Mexico Chapter of the American Chemical Society, Oct. 21, Santa Fe.

B. W. Lindsay (5256), "SID—Sandia's Image Digitizer," Fall SWAP meeting (organization of users of small and medium-size CDC computers), Oct. 17-19, Cleveland.

W. C. Lyons (1116), "The Dynamic Response of a Cylindrical Shell Subjected to Instantaneous Heating and Impulse," 72nd Meeting of the Acoustical Society of America, Nov. 2-5, Los Angeles.

E. P. Eer Nisse (5142), "Variational Method for Electro-Elastic Vibration Analysis," 72nd Meeting of the Acoustical Society of America, Nov. 2-5, Los Angeles.

D. K. Robbins (9424), "FLOGO: A Dynamic Flow Chart Program," UAIDE annual meeting, Oct. 31-Nov. 3, San Diego.

M. Leigh Hendricks (9424), "Color Development for the SC-4020," UAIDE annual meeting, Oct. 31-Nov. 3, San Diego.

W. R. Barton (9324), "The Missing Bomb," winter meeting of the American Nuclear Society, Oct. 31-Nov. 4, Pittsburgh, and Air Force Association meeting, Nov. 29, Albuquerque.

V. E. Blake (9310), "Aerospace Nuclear Safety," winter meeting of the American Nuclear Society, Oct. 31-Nov. 4, Pittsburgh.

R. I. Butler (7342) and Max McWhirter (7340), "Transducers for Shock and Vibration Measurements," annual meeting of the Instrument Society of America, Oct. 24-27,

New York City. Mr. Butler was chairman of a session on instrumentation for shock and vibration measurements.

W. J. Whitfield (2572), "Microbiological Studies of Laminar Flow Rooms," annual convention of the Parenteral Drug Association, Nov. 2, New York City.

T. B. Cook (5200), "A Discussion of Modern Nuclear Weapons Effects," Arnold Engineering Development Center, Nov. 4, Tullahoma, Tenn.

A. D. Swain (2152), "Human Factors Principles Related to Production Processes," Amarillo Subsection of the American Society for Quality Control, Oct. 27, and AEC, Mason-Hanger, Sandia personnel, Oct. 28, Amarillo; "A Method of Quantifying the Effects of Human Performance in Man-Machine Systems," U. S. Naval Aviation Safety Center, Oct. 19, Norfolk, Va.

G. H. Conrad, W. B. Estill, and M. M. Robertson (all 1122), "Identical Area and Particle Extraction Investigations," Applied Research Laboratories Micro-Probe Users Symposium, Oct. 25, Los Angeles.

J. R. Holland (9332), "Materials Problems in Space Isotope Generators," Stanford University Materials Science Colloquia, Nov. 7, Palo Alto, Calif.

J. E. Schirber (5151), "Pressure and the Fermi Surface," Iowa State University Physics Seminar, Oct. 31, Ames.

J. R. Sublett (2560), "The Role of Industrial Engineering in a Research and Development Organization," student chapter, AIIE, Texas Technological College, Oct. 27, Lubbock.

PAGE FOUR

NOVEMBER 18, 1966

SANDIA LAB NEWS

White House Fellows Program for 1967-68

One-year assignments as assistants to White House staff members, the Vice President, Cabinet officers, and other top government officials are being offered to college graduates between 23 and 35 years of age under the 1967-68 White House Fellows program.

The program is open to men and women from all occupations. Normally, Fellows will have completed their education and begun their careers. Each will have demonstrated exceptional ability, marked leadership qualities, unusual promise of future development, and high moral character.

Fellows receive travel costs and, based on age, up to \$15,000 during their term of service. White House Fellows are designated by the President of the United States. Final recommendations to the President are made by the President's Commission on White House Fellows after regional and national selection meetings.

Job assignments are designed to give Fellows a better understanding of the process of government and not necessarily work experience in their chosen field. Emphasis is on direct participation in the most important work of the executive branch. A continuing educational program helps prepare the Fellows for their work assignments and expand the learning process which takes place on the job.

A candidate may either apply or be nominated for the program by another individual or an organization, but an official application must be submitted in either case. Deadline for mailing applications is Jan. 6, 1967.

Additional information and application forms may be obtained by writing to the Director, Commission on White House Fellows, The White House, Washington, D.C., 20500.

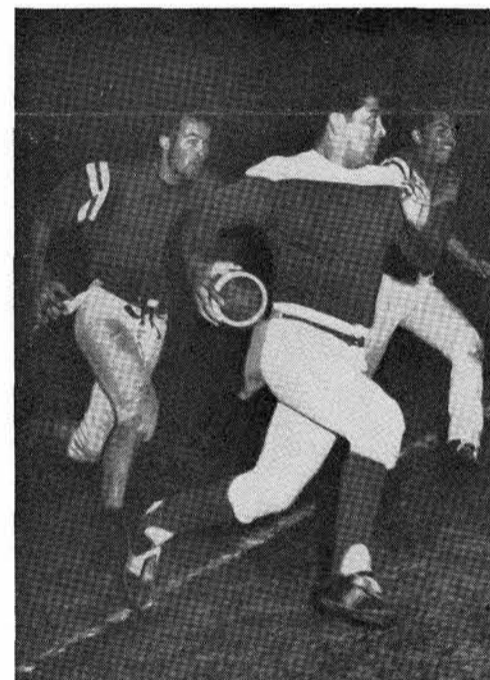
Death



James M. Miller, supervisor of Storage and Stocks Section A 4611-2, died Nov. 1 after a long illness. He was 60.

He had been at Sandia since September 1950.

Survivors include his widow and son, David (1333).



BUDDY SANCHEZ (9411), Sandia Lab All-Star quarterback, charges for a few yards during fast action of the recent Intra-Base tournament. Sandia took the tourney by defeating KAFB twice in final games.

Sandia Lab All-Stars Take Intra-Base Tournament

The Sandia Laboratory All-Star flag football team took the Intra-Base tournament recently after climbing out of the loser's bracket in the double elimination event.

Last two games were against Kirtland Air Force Base for the championship. The Laboratory took the first one 16-14 and the final game 20-16. Earlier, KAFB handed Sandia a 22-18 defeat to put the Laboratory in the loser's bracket.

Sandia downed Sandia Base 44-14 in the first game, 42-16 in the second to gain a second shot at KAFB.

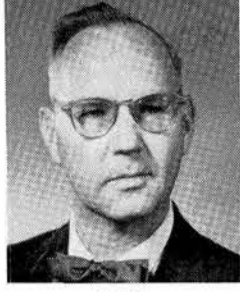
Cliff Kinabrew (7244) is the Sandia Lab coach. Members of the All-Star team include:

Gerald Williams (9231), James Parvin (9234), Robert Stearley (5632), Buddy Sanchez (9411), Art Hardeman (9426), Charley Salazar (4252), Phil Lopez (AEC), Bill Emrick (2442), Carl Wersonick (3465), Larry Ferree (3151), Ray Paxton (4574), Ron Martel (2223), John Otts (7324), Bob Henderson (7311), Tom Bratcher (1427), Preston Herrington (9226), Marlyn Sterk (7324), Bob Dosch (1121), and Joe Woodley (7324).

Service Awards

Promotions

20 Years



2432
D. K. McMillin

15 Years



J. G. Apodaca
4511



C. B. Baca
4613



C. R. Balistrere
2432



R. G. Bowers
4362



Joseph Catallo
4575



H. A. Colvin
8122



C. L. Cox
3242



V. S. Gabaldon
4631



D. C. Held
8213



E. B. Lopp
8252



J. S. Montoya
4611



R. K. Morrissey
2433



W. F. Nielsen
1423



Donald Peacock
4512



L. K. Porter
9233



L. C. Trujillo
2564



J. D. Wade
4211

Daniel Murphy (1524) to Staff Associate Technical
James L. Lovell (7262) to Staff Associate Technical
Michael L. O'Neal (1414) to Staff Assistant Technical
Edgar E. Boeck (2126) to Staff Assistant Technical
Richard E. Bohannon (7344) to Staff Assistant Technical
Polly A. Pine (3151) to Staff Assistant Administrative
Margalee Hertzler (2213) to Staff Assistant Drafting
Deluvino Gutierrez (3462) to Reproduction Equipment
Operator
Herman Kaneshiro (3462) to Bindery Operator
Terrance D. Wolfe (8222) to Utility Operator
Carla Lee Thornton (4333) to Record Clerk
Martin H. Gonzales (3415) to Mail Clerk
J. Dennis Rex (3415) to Mail Clerk
Gertrude J. Cleary (3126) to Secretary Typist
Gerald M. Hayhurst (2232) to Reproduction Service Clerk
Carol M. Somermeyer, (4622) to Service Clerk
Lillian L. Balfour (3421) to Library Assistant
Bobby R. Collins (9411) to Data Processing Clerk
Joanne Foeller (3421) to Library Assistant
Bruce Reich (9411) to Tabulating Equipment Operator
Hugh H. Howe (3421) to Library Assistant
Catherine Fifield (3421) to Librarian
Charles R. Freund (2554) to Order Analyst
Joe Ruiz (8245) to Shipping and Receiving Clerk
James W. Alviso (8235) to Messenger
Randall G. Gummis (8235) to Mail Clerk
George F. Rafal (8235) to Mail Clerk
Lawrence Kent (1115) to Staff Assistant Technical
Susana Derado (3126) to Assignment Clerk
Maxine Gatlin (3154) to Personnel Clerk
Andrew J. Landis (3433) to Staff Assistant Technical
Walter E. Myers (4211) to Staff Assistant Technical
Howard Christianson (4251) to Staff Assistant Technical
Ramon Lamberson (2521) to Staff Assistant Administrative
Walter J. Norris (2551) to Staff Assistant Administrative
John H. Formea (4545) to Staff Assistant Administrative
Donald J. Gallagher (8161) to Staff Assistant Administrative
Martin H. Gonzales (4224) to Helper
Rodger A. McClure (4615) to Stockkeeper
Ernesto P. Olquin (4611) to Stockkeeper
Oliver W. Davis (3415) to Mail Clerk
Ermenio Mata (3428) to File Clerk
Jose C. Ortiz (9411) to Messenger
A. Ann English (4312) to Steno Clerk
Jose C. Torrez (2433) to Record Clerk
Dennis M. Gutierrez (2232) to Reproduction Service Clerk
Joe E. Otero (3432) to Service Clerk
Carol R. Kaemper (3421) to Library Assistant
Alice Smith (3421) to Library Assistant
Frank Pena (2522) to Schedule Clerk
Roscoe Williams (4573) to Transportation Dispatcher
Marlin C. Klemm (4614) to Transportation Dispatcher
Charlie Chavez (2523) to Expeditor
Betty J. Russo (8127) to Secretary Typist
Bobbie Goodman (8135) to Secretary Typist
Zelma Creager (8245) to Record Clerk
Richard Campiotti (8112) to Laboratory Assistant
Ada Jane Akin (5500) to Secretary

Events Calendar

Nov. 18-19, 25-27—"Oliver," musical version of Dicken's OLIVER TWIST, Albuquerque Light Opera Company, Highland High School Auditorium. Matinee on Nov. 27.
Nov. 19—Broadway production of "The Odd Couple," benefit for the Santa Fe Opera. UNM Concert Hall.
Nov. 20—Renoir's film "Picnic on the Grass," 7:30 p.m. followed by discussion. Newman Center, 1815 Las Lomas NE. Tickets at door 50 cents.
Nov. 22—Broadway comedy, "Luv," UNM Concert Hall.
Nov. 25—Annual Christmas parade for children.
Dec. 1-10—"A Thousand Clowns," Albuquerque Little Theatre, 224 San Pasquale SW.

10 Years

Nov. 18 - Dec. 1
J. C. Taggart 1512, R. W. Eifert 2411, L. R. Fisher 4254, Q. A. Carrillo 4514, Anthony Parisi 7214, O. D. May 4251, M. D. Bennett 9321, J. K. Reid 9211, D. F. Hiller, Jr. 8113, Ruth C. Scates 2125, H. E. Thomas 3244, H. G. Pierce 4136, L. A. Hitchcock 7344, R. K. Vokes 9423, Lavonne J. Zipprich 1524.
D. W. Jones 2134, Cynthia L. Kelly 3113, V. C. Looney 4234, J. F. Smatana 1112, D. W. Davis 4254, G. W. Stohner 4151, and Cirico Herrera 4573.



AUTHENTIC ARABIC HEADDRESS complements the costumes George Cosden (4332) and his wife Rose wear to demonstrate folk dances of the Middle East.

Folk Dancing With Meaning Is the Aim of Enthusiasts

When it comes to ballroom dancing, George Cosden (4332) seemingly has "two left feet," but he's a whiz at folk dancing. A few months ago he didn't know a polka from a hora. Now, he and other Albuquerqueans have learned Israeli, Arabic, Greek, Italian, Russian, and American folk dances.

George is an organizer extraordinary. He started an adult education program for B'nai B'rith and ended up learning Hebrew so he could teach others. The folk dancing group was an outgrowth of his interest in cultural exchange. "Before we learn a dance, I study the ethnic origins of the people, and translate the words of the music so that the dances have more meaning," he says.

The folk dancing group is open to anyone and includes couples, single people, fathers and daughters, persons from 13 to 65 years of age.

"We have three 'official' teachers," George says, "but anyone can demonstrate their specialty and teach it to others." An engineering professor at the University of New Mexico teaches the Israeli and American dances; a local hairdresser demonstrates the Russian dances; and a serviceman from New York gives the instruction in Greek and Arabic dances—he also knows Eastern American Indian dances.

"We'll put on free shows as soon as we become more proficient," George explains. "We already have three future bookings."

The folk dancers meet every Monday evening. For location and further information call George at 256-0547.

Take Note

First joint Sandia Laboratory-AEC-ACF open team of four bridge tournament ended Oct. 25 in a tie for overall first place. Teams from Sandia captained by Ernie Bowman (1425) and from AEC/ALO captained by Mel Fegan shared the victory. In overall third and fourth places were Sandia teams captained by John Nakayama (1513) and C. O. Duimstra (9226).

Nine teams competed regularly in the monthly event which has been in progress at the Coronado Club since March. An all-women team captained by B. A. Hayes (2432) showed its ability by placing second for the final session. First and third places in this session were taken by teams captained by John Nakayama and Victor Pajunen (2432). The tournament was sponsored by the Sandia Laboratory Employees Bridge Association.

* * * *

Students in commercial classes at the Technical Vocational Institute have been receiving some additional on-the-job hints from two Sandia secretaries. It started when Virginia Hagan (3126/4382) offered to speak before two classes being taught by a friend. Virginia discussed "Pointers on Being a Secretary." Recently Mary Campbell, supervisor of Secretarial Section 3126-3, spoke before the same classes on "Responsibilities of Secretaries."

Welcome

Newcomers

Oct. 31 - Nov. 11

Albuquerque	
Johnny H. Biffle	1542
Emery L. Chavez	3153
Sandra E. Chrisman	3126
* Donna S. Eaton	9426
* Frances Fawcett	3126
Paul T. Gallegos	4574
Julianita L. Gonzales	3154
Kenneth B. Grant	3112
Patti M. Harvey	3126
* Thomas A. Howard	5612
Doris L. Jackson	3126
Linda E. Jennett	5214
Geraldine S. Jewell	4622
Carol N. Loving	3126
Charles A. Luff	9213
Alice M. Lynn	3133
June B. Lysengen	3152
Camille R. McRae	3133
Mary L. Mitchell	3154
Betty Jean Olsen	3126
Timothy M. Padilla	3415
Charles W. Reno	2213
Verna C. Russell	3154
Samuel Sena	4574
Consuelo T. Trujillo	3416
Sandra M. Ulibarri	3126
Phillip L. Watterberg	3415
California	
David J. McCloskey, Pasadena	5214
Florida	
Larry W. Ebinger, Tampa	7246
Illinois	
Gary S. Benson, Champaign	1134
Charles F. Joerg, Chicago	9333
John R. Seal, Chicago	7246
New York	
Richard P. Kromer, Auburn	5213
Floyd R. Tuler, Ithaca	1115
Texas	
* Ray P. Reed, Austin	1115
Washington	
Ralph D. Hermansen, Kent	2564

*Denotes rehires

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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

- Limit: 20 words
- One ad per issue per person
- Must be submitted in writing
- Use home telephone numbers
- For Sandia Corporation and AEC employees only
- No commercial ads, please
- Include name and organization
- Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

FOR SALE

SHOTGUN, Remington model 870, 16 gauge, modified choke, \$50. Wessell, 296-2526.
LADIES DRESSER w/40x40" mirror and padded bench, cost \$80, sell for \$27.50; lamps, Nichols, 247-2564.
WEIGHT lifting set, 110 lbs., \$15; '51 Kaiser 4-dr., needs work, \$50. Koletar, 255-4751.
VIOLIN AND CASE, no bow, about 40 yrs. old, \$15. Hill, 243-3493.
'65 DODGE CORONET 440, 2-dr. HT, big engine, 4-speed, Stoker, 299-7221 after 5.
WASHER AND DRYER, matching, Kelvinator, pink, both working, \$60 for both. Curtis, 344-8937.
WASHER, Kelvinator, in working condition, \$25; free kittens. Smith, 299-7950.
HI-FI amplifier, RCA, 7-tube, \$10. Merritt, 299-6630.
'53 PLYMOUTH, 2-dr., tires, engine, windows, \$150. Colgan, 243-4882.
KENMORE gas range; bowling ball w/case; Underwood standard typewriter; 4 plastic-covered chairs; 3 ceramic hanging lamps; toys; games; misc. Brown, 255-0566.
STARCK spinet piano, just tuned, \$495; Admiral TV, recently serviced, \$45; hookcase, \$4; new GE KD2 deluxe hair dryer, \$15. Costello, 256-9702.
'58 OLDS, PS, PB, air, \$245. Sumlin, 299-6137 after 5.
75-WATT novice amateur radio station. Halliday, 256-6685 after 5:30.

SILVER MINIATURE POODLES, AKC registered, 10 wks. old, shots, \$45. Doyle, 299-7567.
'64 NORTON ATLAS motorcycle, 750 cc, \$800. Houston, 299-4118.
'64 VOLVO 122S 4-dr. sedan, Michelin X tires, \$1550 or best offer. Kjeldgaard, 296-2212.
REFRIGERATOR-FREEZER, 11 cu. ft. Norge, \$40. Quant, 256-9287 after 5.
SELL OR TRADE: '64 Impala 9-passenger wagon, full power and air, below book. Gallegos, 296-3535.
PIANO, blond, \$150. Hall, 298-3774.
'58 CHEVROLET Impala V8 sport coupe, 2-dr., 69,000 miles, Turboglide drive, silver blue, white top. Makal, 298-0912.
WALL HEATER; chair and ottoman; dividers for chest freezer; apt.-size refrigerator; maternity clothes; crib bedding; women's clothes; want 26" girl's bike. Naumann, 298-4240.
ROLL-AWAY BED; utility chair. Wymer, 299-0717.
3-BDR. HOME, 1000 sq. ft., tiled bath, carpeting, newly painted, AC, walled yard, large corner lot, garage workshop. Magerkurth, 299-0379.
'62 CHEVROLET S.S., 4-sp., bucket seats, chrome wheels. Lopez, 344-5508.
'60 JEEP station wagon, 4-wd., rebuilt engine and transmission. Spacer, 299-0211.
5-YEAR-OLD Hamilton automatic dryer w/vent pipe, \$50. Southard, 298-7740.
KENMORE WASHING machine, 8 yrs. old, modern fabrics cycle, infinite water level, filter, \$25. Bader, 299-9459.
STEREO portable, 4 speakers, used 8 mos., \$75; camper, canvas folding type w/frame for 1/2-ton pickup bed, new, \$65. Gum, 255-0452.
.22 SEMI-AUTOMATIC rifle, \$30 or trade for larger bore rifle; motor scooter, Ducati, 125cc, less than 5000 miles. Houghton, 299-3386.
DIVIDER BOOKCASE, 3 shelves, \$7. Marsh, 243-2767.
SILVER MINIATURE poodle, 7 wks. old, AKC reg., champion stock. Fosmo, 268-8563.
BICYCLE, boy's 26" Rolfast, \$15; child's swing set and jungle jim, both for \$15. Volk, 299-1702.
REGISTERED quarter mare, 4 yrs. old, trained for reining, western riding, and barrels, \$800. Bassett, 898-1840.
SEARS' dishwasher, \$25; guitar amplifier, sheet music, music stand, \$40; free 2-mo. old black female kitten. Hale, 298-1545.

GO-KART motor, MC-45 super modified, 9 ported w/race piston, alcohol carb., \$65. Lenz, 298-3872.
WOOL RUG, 9x13 1/2" w/pad, \$35; cotton carpet, approx. 10x12, \$25; TV console, 21". Dempsey, 255-9386.
GARAGE SALE, 10520 Princess Jeanne NE, bedroom set, occasional chairs, twin bed, girl's bicycle, misc., household items. Goodlive, 299-5596.
'56 FORD PU, stock rack; 2-wheel metal utility trailer; male Westie pup, AKC; 7 acres, Bosque Farms. Schooley, Los Lunas, 636-2970.
SIZE 46 wool topcoat, lined, brown, \$20; size 46, light weight sport coat, dark color, \$15. Kreitler, 299-8494.
POLAROID CAMERA, professional model 110A, w/exposure meter, \$100; Sony AM-FM portable and car 10 TR w/car bracket, \$50. Souther, 282-3841.
MINIATURE AKC registered black poodle puppies, 3 mos. old, \$50 or consider trade or terms. Workman, 298-8201.
'60 DODGE CARRYALL, 4x4, V-8 w/winch. Herther, 268-2732.
ARGUS 35mm slide projector, 150w, w/4 slide trays, \$22. Riggins, 299-7778.
21" PORTABLE GE TV, pink and white case. Heidrich, 344-7669 after 5.
GARAGE SALE: Sat. and Sun., 9x12 rug; reclining chair; drapes; venetian blinds; twin headboards; elec. can opener; misc. 1108 Dakota SE. DeHaan, 265-4511.
'66 VOLKSWAGEN, series 1300, 9000 miles. Whiting, 298-6598.
35MM glass slide mounts, new, .1 inch thick, Novo from Switzerland, six boxes, \$6/100. Kasparek, 344-7520.
'60 VALIANT, \$450. Cooke, 243-3696.
'60 BUICK Le Sabre, 4-dr., one owner, \$495. Corwin, 3206 Tennessee NE, 298-0113.
2-BDR. HOUSE, N. valley, \$6950, low down payment, \$60/mo. Chavez, 298-5091.
'53 CHRYSLER, ground grip tires on back, \$125. Dobias, 256-7476.
'55 OLDS 88 2-dr., R&H, AT, \$200. Schulze, 298-9328.
BERLINER AND SONS upright piano, \$150. Martinez, 268-6297.

8mm MOVIE camera w/3 turret lens, light meter, light bar w/4 bulbs and case, \$40; station wagon luggage carrier, \$14; 6-volt battery charger, \$6. Hart, 299-8832.
'66 MALIBU 2-dr. HT; '66 Belair 4-dr. V8, AC, PB, PS, AT, \$2200. Jarrell, 636-2834.
RCA 17" TV on portable stand, works, \$15; Safety Server baby chair/table, \$5. Stephenson, 299-3914.
8" CRAFTSMAN tilting arbor saw, 3/4 hp motor, \$30; 37-lb. Brahma recurve bow and access., \$30; boy's fibreglass bow, \$5. Suiter, 256-9662.
D/4 CAT, 7' hydraulic op. dozer 5 roller track, make offer. Bluet, 282-3660 a.m. or after 3 p.m.
'61 VOLKSWAGEN sedan, \$370; 39,000 miles. May, 299-2624.
SEARS' 13 cu. ft. refrigerator w/freezer; clock radio; car bed; diaper pail; sterilizer w/bottles. Richardson, 299-3673.
RACING CAMSHAFT KIT, Iskenderian for Chevrolet 283 V8, 55 thru 64, \$79. Fisher, 268-6633.
'53 CHEV. Pickup, 3/4-ton, overload springs, 4-sp. d. trans., \$225. Folkins, 867-2974.
'56 RAMBLER WAGON, 6-cyl., recent overhaul, rebuilt transmission, new seat covers, \$150. Matthews, 299-4200.
SCHOOLMASTER DESK, maple, sells for \$80, will sell for \$40. O'Meara, 299-1080.
'47 JEEP station wagon, 2-wd., \$75. Breedren, 877-9703.
AKC COLLIES, quality, show potential, \$65, terms to suit, or will trade for 2 twin beds or bunk beds. Stubben, 298-6116 after 5:30.
FORD BUMPER, \$15; Royal typewriter, \$35. Gurule, 898-1574.
ARCHERY OUTFIT, Groves 37-lb. Fiteline, six fibreglass arrows, six cedar arrows, quivers, arm guard, etc., \$50. Simpson, 299-7879.
'56 CESSNA 172, new paint, full panel, 290 hrs. on chrome major, 90 channel Nalco transmitter. Mark 2 Narco receiver, \$3650. Kreitler, 296-4262.
ACET OXY welding equipment, complete less bottles; dual type comb. wall and floor furnace w/valves and thermostat controls. Tolbert, 282-3438.

WANTED

ROTTEN HAY or straw for mulch; small cider press; 5.00x15 Renault tires. Maak, 282-3482.

TRADE: '66 Dodge Coronet 4-dr. V8, AT, R&H, for land in Albuquerque area. Regan, 256-0284.
JUNIOR GIRL SCOUT uniform, size 10. Gray, 265-1885.

FREEZER, upright preferred. Seligman, 298-1993. SERVICE MANUAL for '63 or '64 Rambler. Merritt, 299-6630.

CAR POOL needs 1 driver, 4 blocks either side of Eubank between Candelaria & Comanche, to vicinity Bldg. 892 - 836. Guist, 299-9060 after 5.

ADDBE ACRES car pool needs driver - riders, daily driver begins pickup 7:10 a.m. (flexible), need 3 more to drive once a week. Looby, 877-2742.
BABY CRIB. Long, 265-6360.

3 1/2 and **7 1/2** speed tape recorder for 7" reels; and food juicer. Gustin, 256-3807.
BOY'S bicycle, 24 or 26-inch, must be in good condition. Smith, 268-1228.

FOR RENT

2-BDR. UNFURNISHED house, 9221 Mesalero NE. Geisler, 299-4387 after 5.
NEAR VERMONT and Virginia NE, 1-bdr. house, completely furnished, all utilities paid. Frankel, 298-6265.

UNFURNISHED 3-bdr. home, tiled bath, carpeting, newly redecorated, washer-dryer rough-ins, AC, walled yard, corner lot, Princess Jeanne. Magerkurth, 299-0379.
339 TEXAS NE, 2-bdr. triplex, built-in stove and ref., gas and water paid, furnished and unfurnished, \$89 and \$79. Cornelison, 298-7673.

UNFURNISHED HOUSE, 3-bdr., 1 bath, NE Heights, available Dec. 6. Simpson, 344-5232.

LOST AND FOUND

LOST—in Bldg. 880, brown cardboard box, approx. 12x15", contents are personal files and textbooks. Browning, 87-122-3860; gold oval tie bar w/diamond in center, tan leather wallet, brown frame prescription glasses, charcoal gray glass case. LOST AND FOUND, tel. 264-2757. Bldg. 610
FOUND—Young, male German shepherd, black and fawn, call 256-9783 after 4; Japanese slide rule, keys, 2 keys in brown leather fold-pack, SEGA emblem. LOST AND FOUND, tel. 264-2757, Bldg. 610.

Supervisory Appointments



JAMES E. MITCHELL to supervisor of Public Information Division 3431, effective Nov. 1.

Jim joined the staff of the Public Information Division in November 1961. From 1957 to 1961, he was a news-writer in the public information office and a part-time instructor in journalism at Oklahoma State University. He was sports editor and general news reporter for the Southwest Daily Times in Liberal, Kan., from 1954 to 1957.

Jim received a BA degree in English from Panhandle A&M College in 1954 and an MS in journalism from Oklahoma State in 1960.

He also teaches English classes in the evening at the Community College, University of New Mexico.



MARLIN A. POUND to supervisor of Training, Benefits, and Records Division 8214, Administrative Services Department, effective Nov. 1.

Marlin joined Sandia at Livermore in July 1957 as a personnel representative and during this assignment handled the Laboratory's technical institute and college recruiting programs. In May 1963, he was promoted to section supervisor in employment and personnel development, and in January 1965 transferred to wage and salary administration where he has been a job analyst and involved with the Laboratory's labor relations activities.

He graduated from the University of New Mexico in 1955 with a Bachelor's degree in business administration. He is a member of the American Society for Engineering Education and its subsection, Relations with Industry.



PERRY K. LOVELL to supervisor of Environmental Health and Medical Services Division 8215, Administrative Services Department, effective Nov. 1.

Perry joined Sandia at Livermore in March 1963 and has worked as a health physicist in the health and safety organization the entire time.

Before coming to Sandia, he was employed for four years as radiation safety officer at Consolidated Electrodynamics Corporation, Pasadena, Calif., and for three years as a health physicist at Phillips Petroleum Company, Arco, Ida. Prior to that he taught high school biology and Spanish in Rexburg, Ida., for a year and a half.

Perry attended Brigham Young University for a year and received his BA degree in biological sciences from Ricks College, Rexburg, Ida., in 1951. He is a member of the Health Physics Society.



DELBERT L. RASMUSSEN to supervisor of Publications Division 8231, Technical Information Department, effective Nov. 1.

Del joined Sandia at Livermore in July 1964 as a technical writer in publications and most recently has been a project leader in the same organization.

Prior to coming with Sandia, he taught speech and English at Waldorf Junior College, Forest City, Iowa, for one year and high school in North Dakota for a year.

Del received BA degrees in speech and English from Concordia College, Moorhead, Minn., in 1956 and an MS degree in communications from Rensselaer Polytechnic Institute in 1964. He also completed some graduate work in speech at the University of Wisconsin.

He is a member of the Society of Technical Writers and Publishers.



SIX-TIME WINNER Jim Leonard (9331) accepts another top golfer award from J. A. Hornbeck, Sandia Corporation President. John Brane (2211) was awarded the President's Cup.

Awards Dinner Ends Sandia Golf Season

Presentation of trophies at a recent dinner wrapped up activities of the 1966 Sandia Employees Golf Association. New officers will be elected at a meeting Nov. 22 at 5:15 at the Coronado Club.

For the sixth time, Jim Leonard (9331) took the Laboratory golf championship. John Brane (2211) shared the honors by receiving the President's Cup. Larry Woodward (2211) was runnerup for the championship, Ken Flynn (1514) was runnerup for the President's Cup.

Top team in the SEGA league play was Dick Kidd (1513), Wendell Nelson (4137), and Larry Smith (5241). The trio emerged champions of 72 teams and 280 players participating in the league.

Gordon Prestby (2552) was awarded the "Most Improved Golfer" trophy.

J. A. Hornbeck, Sandia Corporation President, presented the awards.

Sandia Authors

J. G. Eberhart (1123), "The Estimation of the Surface Tension of Metal Oxides," September issue, TRANSACTIONS OF THE METALLURGICAL SOCIETY OF AIME.

E. D. Jones (5151), "Interpretation of Magnetic Susceptibility Data for CeP," Vol. 22, page 266, PHYSICS LETTERS; "Nuclear Magnetic Resonance in the Paramagnetic States of MnO, —MnS and —MnSe," Nov. 4 issue, PHYSICAL REVIEW.

W. W. Allison (3211), "High Potential Accident Analyses," October issue, SAFETY MAINTENANCE: "Electrical Safety," November issue, SAFETY MAINTENANCE.

R. W. Harris (5241) and Jeff McClintock (summer employee), "Plasma Conductivity and Temperature in a Theta Pinch," November issue, PHYSICS OF FLUIDS.

D. H. Anderson (5132), "Nuclear Magnetic Resonance of Fe²⁺ in Single Crystal alpha-Fe₂O₃," November issue, PHYSICAL REVIEW.

D. C. Wallace (5155), "Renormalization and Statistical Mechanics in Many Particles Systems I. Hamilton Perturbation Method; II. Statistical Perturbation Method," November issue, PHYSICAL REVIEW.

D. M. Mattox (1123), "Chromizing Molybdenum for Glass Sealing," November issue, REVIEW OF SCIENTIFIC INSTRUMENTS.

W. J. O'Sullivan and J. E. Schirber (both 5151), "Pressure Dependence of the Low Frequency de Haas-van Alphen Oscillations in Zn," November issue, PHYSICAL REVIEW.

R. G. Kepler (5213), "Generation of Electrons and Holes in Anthracene by Ruby Laser Light," November issue, MOLECULAR CRYSTALS: "Generation and Recombination of Holes and Electrons in Anthracene," November issue, PHYSICAL REVIEW.

'Evening in Scandinavia' Smorgasbord Set at Coronado Club Tomorrow

Tomorrow night at the Coronado Club marks the return of the Vikings. The event is "An Evening in Scandinavia" and the menu is a fitting tribute to the Norsemen. The smorgasbord will include kod boller, benelose fugle, fleskestag, banke kod, rodkaal, risengrod, stegte kartofler, and earter og guberoden among the unpronounceable but delicious goodies.

The smorgasbord starts at 7 p.m. Danc-



THE VIKINGS will be right at home tomorrow night at the Coronado Club's "Evening in Scandinavia" event. Paula Wilson (4333) is looking forward to the smorgasbord and dancing to the MBC Trio. The buffet starts at 7 p.m., dancing at 9.

ing with the MBC Trio is scheduled from 9 to 1. Cost to members is \$2.50, guests \$3. Tickets must be picked up by 9 p.m. tonight.

Holidays

The Holiday season is upon us and the Coronado Club is booked up with private parties and organizational celebrations through December. The annual New Year's Eve Party will close out the year's events on Dec. 31. The Club will be closed Thanksgiving and Christmas Day.

Social Hours

Tonight the seafood buffet will be served and Frank Chewiwie will provide the happy music. Cost to adults for the buffet is \$1.25, \$1 for children. For the remainder of the month and through December, there will be no regularly scheduled social hours, but special prices will be in effect at the main bar on Friday evenings from 5:30 until 7 p.m.

Bridge

Duplicate Bridge meets Monday, Nov. 21, at 7 p.m. The monthly master point duplicate bridge competition will be held Monday, Nov. 28, at 7 p.m. Ladies Bridge meets at 1:15 p.m. Thursday, Dec. 1.

Aquatic Club

Swimming in the winter? Right. The Coronado Aquatic Club will continue activities through the winter with workouts four nights a week at the Sandia Base Olympic pool. Membership is open to youngsters between the ages of 8 and 17 who are sons or daughters of Coronado Club members. Competition swimming is conducted between age groups. Call James Stoeber (7342), tel. 256-2439, for additional information.

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SANDIA LAB NEWS

Three Injuries Down Sandia Safety Record

Three employees were injured in recent weeks at Sandia Laboratory.

On Oct. 25, two employees suffered ruptured eardrums and facial cuts as a result of an explosion in a chemical laboratory. Both were taken by Company ambulance to a local hospital for treatment. One employee returned to work the same day, the other returned several days later.

On Nov. 3, an employee suffered a fracture of his big toe when a wheeled container weighing about 200 pounds toppled over on his right foot. He was treated at Medical and a local hospital. He recuperated at home for several days before returning to work. The three-wheeled container is being redesigned for four wheels to prevent similar occurrences in the future.

Sandia's Safety Scoreboard

Sandia Laboratory:
12 DAYS
420,000 MAN HOURS
WITHOUT A
DISABLING INJURY

Livermore Laboratory:
22 DAYS
118,940 MAN HOURS
WITHOUT A
DISABLING INJURY