

LAB NEWS

VOL. 22, NO. 1

JANUARY 2, 1970

SANDIA LABORATORIES - ALBUQUERQUE NEW MEXICO & LIVERMORE CALIFORNIA



President Hornbeck discusses Sandia with LAB NEWS Editor John Shunny (left) and Max Linn (3400).

An Interview With John Hornbeck

"Sandia Laboratories - - A Healthy Corporate Body"

Continuing a practice begun last year, President Hornbeck discussed the state of Sandia with LAB NEWS.

Last year at this time you stated "Sandia is in good shape." What is your assessment of our present health?

I'd say we're still in good shape and, in fact, have improved. We've made real progress in areas such as the control of programs and costs and, even more important, the quality of our technical judgment is better. Our technical competence in selected areas — for example electron tubes — continues to grow, and it's worthy of note that we do have significantly more Phase 3's than we had last year at this time. By any measure, Sandia Labs is a healthy corporate body.

Everyone is aware of the tight money situation. What effect will this have on Sandia's programs? On personnel ceilings? Are we going to have to reduce the number of people on roll?

Like every federally funded agency in the country, we are feeling the effects of the tight money situation. However, there is certainly no indication that AEC wishes or plans for Sandia to be a less viable weapons laboratory.

We want to keep people who perform well and in the best interests of Sandia. Of course, if there should be a major change in funding by AEC or the Congress, we might then have a different situation. But in terms of what we can reasonably foresee, I do not expect any significant changes in our numbers of people.

Sandia Laboratories Livermore has changed somewhat over the past year or so, particularly in the area of applied research. What is the significance of the change?

We need more technical depth and capability at Livermore to solve our everyday problems. This greater technical competence means that program work is better and more quickly performed.

The number of PhDs at Sandia is increasing steadily. Why? Does this mean less opportunity here for technical people below the doctorate level?

There are really two reasons for this. First, more PhDs are available. But perhaps more to the point is the circumstance that the technological problems we face are more complex and demanding. I want to emphasize, however, that this does not mean that the non-PhD at Sandia has less opportunity. Work as broad as that we do here requires a variety of educational backgrounds. But PhD or not, it is vital that our people keep up to date in their areas of technical competence. This is one reason Sandia has such extensive educational programs — to help the employee help himself through course enrollment. His is the primary responsibility to avoid technical obsolescence, but the Laboratories will continue to support him in his effort.

Non-weapons work — does it appear that we will have more or less of it in the coming year? How about Plowshare?

I see no change here in our present level of effort (about 15 percent of total). The same applies to Plowshare since I don't foresee a significant change in the level of the national Plowshare program.

Space programs seem to present technical problems in which Sandia is particularly well suited to make important contributions. Do you see greater involvement in such activity?

We'll continue to be involved pretty much to the extent that we now are. From time to time we may come up with a good idea — like the recent one relating to the NASA Mars landing program in 1973 — which we'll submit and hope will be accepted. (Ed. Note: Sandia has proposed that a terradynamics penetration vehicle containing a geophysical instrumentation package be implanted beneath the surface of Mars). Our aerospace safety program is already an ongoing program, and I expect this to continue.

Many Sandians have sons and daughters now entering the job market and many of them would like to work here. How do you feel about this?

We welcome qualified young people and would certainly make no distinction in the selection process, one way or the other, simply because an applicant's father or mother is on the payroll.

Do you see any major changes in employee benefits in the next few years?

This is a subject that's under continual study and review. We compare our benefits with those of others throughout the country and our aim is to reflect industry-wide standards. We will change in the future at about the same rate we have changed in the past.

Any significant changes planned in Sandia's physical plant?

Probably not this year because of the tight budget. However, we shouldn't overlook the very real growth in computing capacity we've had in both Livermore and Albuquerque during the past year, and more growth in this capacity is anticipated in 1970. Also, don't overlook such new facilities as the new firing site in Coyote Canyon and Hermes II — fine additions to our technical capability. And our radar tracking facility at TTR is scheduled for significant improvement in 1970.

How does Albuquerque's economic future look to you? Are we influencing it significantly?

It looks good to me. We, of course, continue to be a significant influence in the city's economy, but this diminishes as other industry moves in — which is the way it should be.

Any general observations?

People remain the one constant that determines the caliber of a laboratory, and I feel that here at Sandia we have good people who are well motivated to turn in a superior job — and that's what counts.

Micro-Miniature Device Invented to Record Nanosecond Pulses

A micro-miniature means for recording the amplitude of very short electrical pulses has been invented by three Sandians. Pulses of such brief duration — as little as 10 billionths of a second (nanoseconds) — previously had to be displayed on a specialized oscilloscope, then photographed for a permanent record of their waveform.

By contrast, the new invention may be no larger than a one cent piece and therefore is believed to be particularly useful in satellites and high-altitude rockets where weight and space are critical factors.

A patent for the invention was recently awarded to the AEC in the names of Bob Matthews (9231), Gus Simmons (100) and Fred Wymer (9214).

When the device is recording, the electrical input pulse is used to reverse the magnetization of a magnetic thin film — the greater the amplitude of the pulse, the greater the extent of the reversal.

The device is "read" at any time following the event by applying an interrogating pulse to the element and measuring the time interval until a signal is reflected by the end of the magnetized material. This interval is proportional to the length of material which has experienced magnetic reversal, and therefore proportional to the amplitude of the original input pulse.

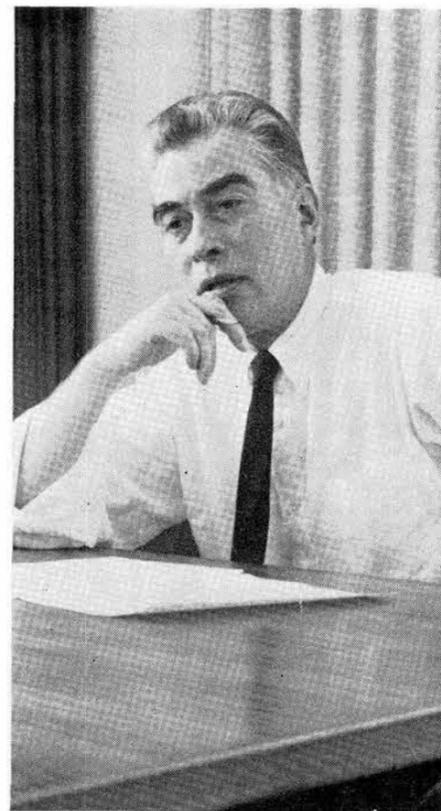
Complete waveforms may be recorded by addressing an array of magnetic elements sequentially by a series of delays which break up the original signal into a "mosaic" of chronologically-spaced component signals. Each of the magnetic elements may then be interrogated individually to plot the complete waveform.

SNAP 27 on Moon Continues to Operate

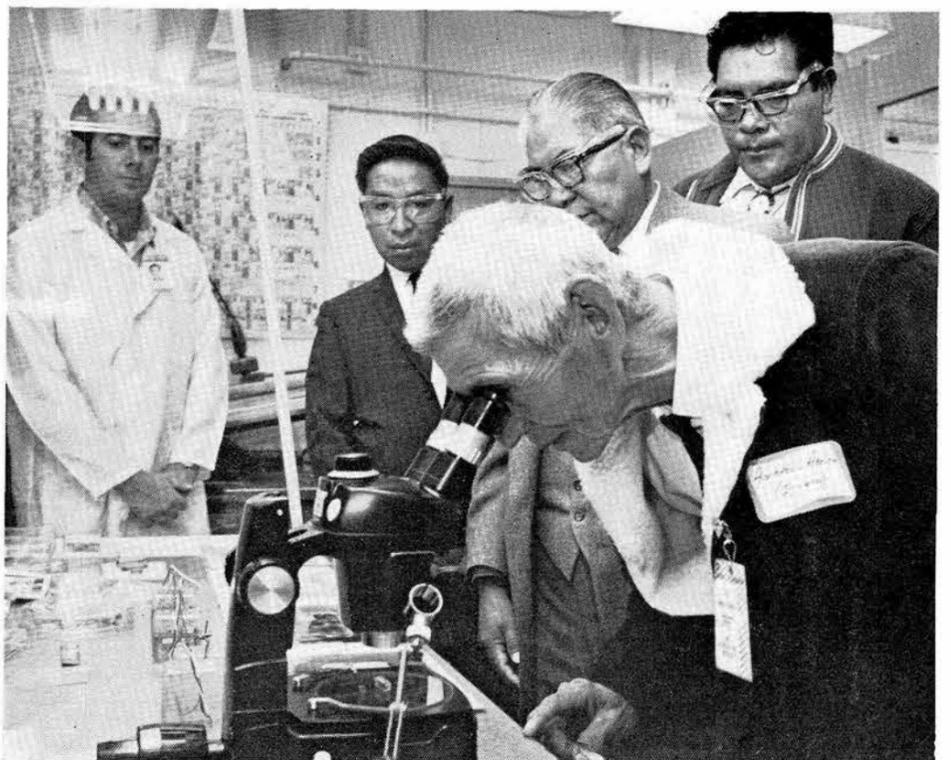
The SNAP-27 nuclear generator placed on the moon last month by the Apollo 12 astronauts continues to operate after enduring the extreme temperatures of a complete lunar cycle. The generator is producing in excess of 70 watts of electricity to power the instrumentation of the five scientific experiments deployed by the astronauts on Nov. 19.

During the first 28-day lunar day-and-night cycle just ended on Dec. 17, the nuclear generator operated in temperatures ranging from 291 degrees below 0°F to 283 degrees above 0°F.

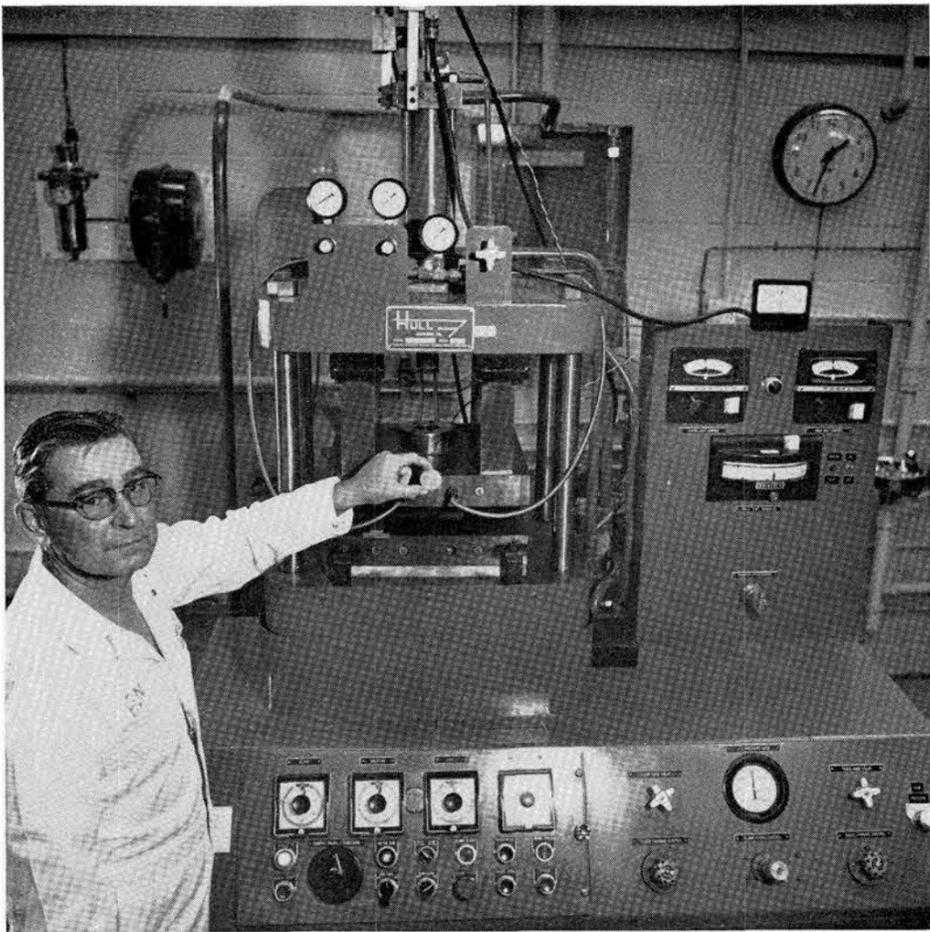
The nuclear generator was designed to produce a minimum of 63.5 watts of continuous power at the end of one year. Sandia provided technical direction for the SNAP project, including aerospace nuclear safety aspects, and a Sandia team loaded the SNAP-27 fuel capsule on board the lunar module.



"Here at Sandia we have good people who are well motivated to turn in a superior job."



TINY ROLAMITE components are viewed under a microscope by Ambrosio Abeita of the Isleta Pueblo, one of 30 New Mexico Indian officials who recently toured Sandia. After solemnly declaring themselves to be native-born Americans, the Indians toured the General Machine Shop, the Numerically Controlled Machines section, the Electronic Apprentice Shop, and the Rolamite Laboratory. The group was welcomed by Ray Powell (3000) and briefed on Sandia's mission by President John Hornbeck. Tom Cleveland (4222), left, explained principles of rolamite to the group.



BEN LONGFELLOW (4222) displays pellet of epoxy material which is inserted into the transfer molding machine to encapsulate electronic components or to form small structural shapes. New machine enlarges capabilities of Sandia's Plastics Laboratory.

New Encapsulating Machine Installed in Plastics Laboratory

A new machine in the Plastics Laboratory of Division 4222 offers several new options to designers of electronic packages. The machine — a semiautomatic transfer and compression molding and encapsulating machine — can quickly mold a great variety of products using conventional thermosetting plastic compounds. Curing is a matter of minutes as contrasted the hours required in conventional liquid epoxy methods.

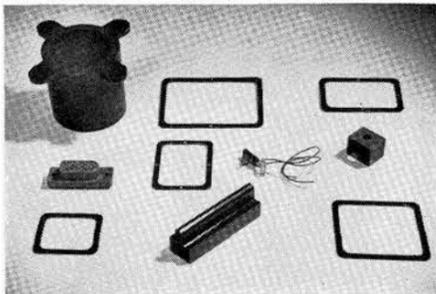
The machine can encapsulate individual components (diodes, capacitors, etc.), complete circuits, switches with contacts molded in place or make timers, computer memory packages, etc., into uniform modules. It can also make small precision housings and structural shapes such as rolamite cases, etc. Tolerance range is .0005 to .001".

The machine offers a particular advantage in molding soft flow thermosetting materials around delicate pressure-sensitive inserts. Molds can be made for the machine which permit precision positioning of extremely small components and circuitry. Almost any shape may be molded around them.

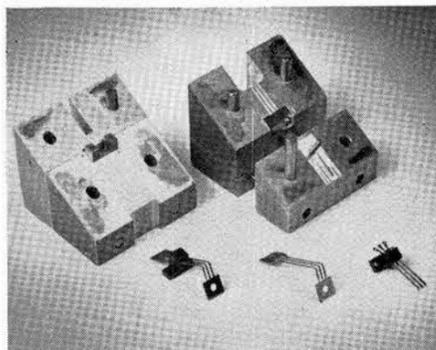
The automatic vacuum attachment, which provides for rapid evacuation of air and gaseous matter from the cavities of the molds and molding compounds, aids in the production of high quality, void-free parts. Uniformity of parts is assured.

Pressure sensitive components may be encapsulated by the machine with great control. The plunger head pressures may be regulated to any point within a range from 25 to 300 psi. Temperature range is from 250° to 350° F.

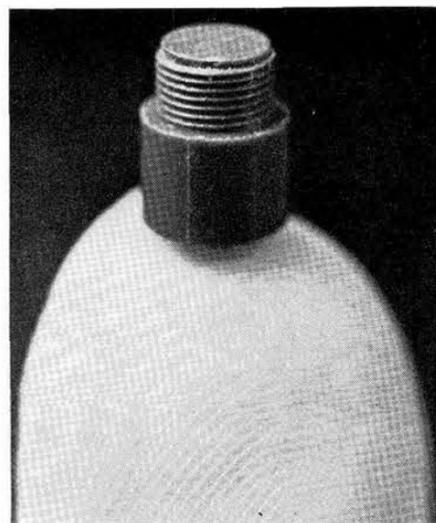
For additional information, contact Blythe Wemple, 264-3455.



VARIETY of structural parts produced by transfer molding is shown in this photo. At upper left is flexible neoprene rubber sleeve. Other shapes are made from fiber reinforced epoxy compounds, including miniature switch with contacts.



MOLD, fabricated in Sandia's Miniature Machine Shop, allows for precision positioning of electrical contacts for a tiny connector part. The electrical contacts were made in the Rolamite Laboratory.



TINY INSERT with 80NS-2A threads was molded from glass fiber reinforced epoxy compound.

Do Hippies Count?

Census-Taking in New Mexico Partly Job of Explaining Purpose

Taking the census every 10 years may be a snap in a large city, but the task is more difficult when you're in charge of the project for half of New Mexico and the ethnic groups include Spanish-Americans and three tribes of Indians.



Lee Amador, an electronics technician in Semiconductors and Radar Testing Division 7532, will take a year's leave of absence starting this month to serve as Census Director for 17 northern New Mexico counties.

His first action will be to attend a week-long training session for regional directors in Denver. Upon his return, Lee will set up an office at 1712 San Pedro NE and start the task of recruiting and interviewing census takers. Some 600 persons will be needed for northern New Mexico (including Albuquerque), and Lee adds, "This time the Department of Commerce especially requested that bi-lingual persons be used where needed. To be effective, interviewers must have rapport with the persons they are interviewing."

An important part of Lee's job will be to inform the general public about the

purpose of the census. He will address the Greater Albuquerque Chamber of Commerce upon his return from Denver and hopes to have the opportunity to speak before other groups to explain the reason for many of the questions in the census form.

The public's first contact with the census will be on March 28 when every residential household will receive a "short form." These forms are to be filled out and handed to the census taker when the home is visited. Every fifth household will be asked to complete the "long form."

New questions included in the 1970 census are generally pointed toward improving programs for manpower development, determining the extent of occupational mobility, measuring the effects of early marriage on housing and the birth rate, and deciding how best to allocate money for the assistance of disabled persons.

All information given in a census is strictly private and, by law, may be used only for statistical purposes. In addition to providing information necessary for reapportionment of the Congress and of state legislatures, census figures are also the basis for distribution of billions of dollars of federal and state funds each year. The statistics help to pinpoint America's progress in meeting major national goals (such as decent housing, high employment, and education), and they help both business and government plan for future needs.

"Use of the statistics benefits everyone in some way," Lee says. "As to my role as Census Director, it will be both a challenge and an education."

The Question Was Not Academic

Elizabeth White (4151) is glad she asked a few questions at a recent fire extinguisher demonstration given by Walt Smith (4551), Sandia fire prevention specialist.

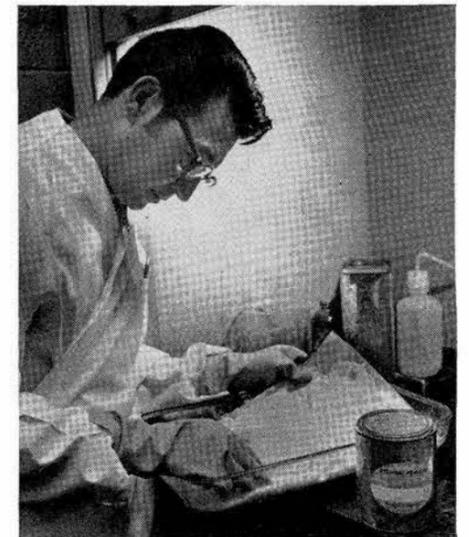
Walt was demonstrating the use of various kinds of extinguishers and explaining the kinds of fires to use them on. Elizabeth wanted to know what a housewife would do about a fire on her cooking range if she didn't have a fire extinguisher handy. She wanted to know what to do in case of a fire on top of the range or inside the oven.

Walt's answers were, first of all, that everyone should have a fire extinguisher in their home in a place of easy and quick access. If not, a surface fire on a cooking range, such as in a flaming pan of grease, could be put out by placing a lid on the pan or smothering the blaze with ordinary baking soda. The baking soda would work for an oven fire also.

A few days later Elizabeth came home and ran into such a situation. Her visiting mother-in-law had turned on the electric oven to warm it up for baking. A few days earlier, Elizabeth had set a foil pan of grease in the oven to cool. No one knew that the pan had a small leak and some of the grease had accumulated on the bottom of the oven.

Elizabeth smelled something burning. When she opened the oven door, the inside immediately burst into flame. Elizabeth grabbed a pot holder and removed the bottom heating element. Then she remembered the baking soda and doused the oven with that. The blaze was immediately put out.

"It was kind of messy," Elizabeth says, "but it was easily cleaned. There was no damage to the range or smoke smell left in the kitchen. Baking soda is very effective as a flame killer."



LARRY GARCIA (4221) uses protective equipment, including safety glasses, when working with caustic etching powder in the Printed Circuits Lab. The glasses recently saved his eyesight.

Larry Garcia Is New Member of Wise Owl Club

Larry Garcia, a technician in the Printed Circuits Laboratory of Division 4221, is the newest Sandia member of the Wise Owl Club of America.

The Wise Owl Club is an organization that you wouldn't join by choice. Its members are people who might have suffered accidental blindness but for safety glasses or other protective eye equipment.

Larry was cleaning a sheet of copper in the laboratory when he noticed that a can of etching powder, a caustic powder very similar to lye, had been left open on the work bench. Apparently, some water had gotten into the groove into which the lid fits, and when Larry tapped the lid shut the solution splattered his face. Safety glasses prevented serious eye injury, but he did suffer slight burns on his face and neck.

Events Calendar

- Jan. 4—Beginners' ski tour up the Sandia Tree Springs Trail and across the Crest Trail to the Sandia Peak ski area. N.M. Mountain Club, leader Jack Hickman, tel. 298-3804.
- Jan. 5-6—Broadway hit musical comedy "Mame." UNM Popejoy Hall.
- Jan. 6—King's Day Indian dances at Cochiti, Jemez, San Ildefonso, Taos, Tesuque, Sandia, San Juan, and Zia Pueblos.
- Jan. 8—UNM Orchestra concert. UNM Popejoy Hall.
- Jan. 10—N.M. Wildlife Conservation Association presents Wally Taber's safari show — "Coho Fever" and "Safari Northwest U.S.A." UNM Popejoy Hall.
- Jan. 12—American Ballet Theatre presents "Giselle" and "Gaité Parisienne." UNM Popejoy Hall.
- Jan. 16—Community Concert presents pianist Lili Kraus. UNM Popejoy Hall.

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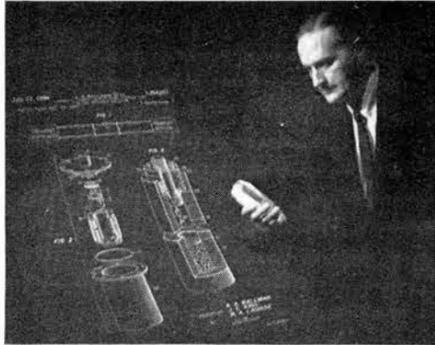
1969 Highlights at Livermore

With the closing of another year, LAB NEWS reviews some of the significant happenings which occurred at Sandia Laboratories Livermore in 1969.

January

Two engineers at Livermore designed a remote control system which reduced electrical shock hazards when operating the control panel of a capacitor bank (electrical energy storage unit). The control panel is equipped with air-actuated, remote-controlled switches and is encased in non-conductive plastic.

A three-year contract between Sandia and the Sheet Metal Workers International Association, Local 216, was signed at Livermore. New contract expires midnight Dec. 4, 1971.



Patent for Crystal Growing Process

Jim King, Director of Applied Research at Livermore, was co-inventor of a new process for producing synthetic quartz crystals with a high-growth rate and acoustic properties similar to natural quartz. The patent was assigned to Bell Telephone Laboratories in the names of Messrs. King, Albert A. Ballman, and Robert A. Laudise, associates at BTL, Murray Hill.

February

The first employee from either Livermore or Albuquerque to complete his graduate work under the One-Year-on-Campus (OYOC) Plan of Sandia's Graduate Education Program returned to Sandia Laboratories Livermore. Through the OYOC Plan, he received a Master of Science degree in electrical engineering by attending classes on a full-time basis while in residence at the University of California at Berkeley.

A new three-coordinate measuring machine, which speeds the mechanical inspection process, became operational. Equipped with a digital computer and a Teletypewriter, the machine is accurate to $\pm .0005$ of an inch and prints inspection reports automatically.

March

Construction began for a Radiation Test Facility in Livermore's Area 8. The contract included electrical improvements between the main laboratory area and Area 8.

April

A Mass Properties Facility was completed in Livermore's Area 8. Equipment installed in the facility gives engineers more accurate information on how to correct unbalanced conditions in test vehicles and thus aid in the predictions of their aerodynamic behavior.

May

Over 2000 employees and members of their immediate families visited Sandia Laboratories Livermore during a second Family Day on May 10. (The first was held in February 1965.) Special exhibits and demonstrations were presented.



Family Day at Sandia Laboratories Livermore

June

Sandia engineers at Livermore developed a telemetry assembly to monitor about 50 functions during flight test to determine how well a system operated. The assembly is used in AEC/DOD programs of post development testing.

The blood bank program at Sandia Laboratories Livermore marked its 10th anniversary. In that 10-year period, Sandians donated nearly 1100 pints of blood for the use of Sandia families at reduced cost.

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July

An employee in Livermore's Safety Engineering Division designed a fixture for testing overhead emergency showers. One man can now conduct tests without risking water damage to surrounding areas and laboratory equipment.

As part of the continuing security program at Sandia Laboratories Livermore, a new booklet and a series of posters and coasters were developed for use throughout the Laboratories.



Youth Opportunity Campaign Trainees

August

Vice President at Livermore, Tom Cook, reviewed the events of the past year with employees. The most significant trend was toward the expansion of Livermore's capabilities in applied research.

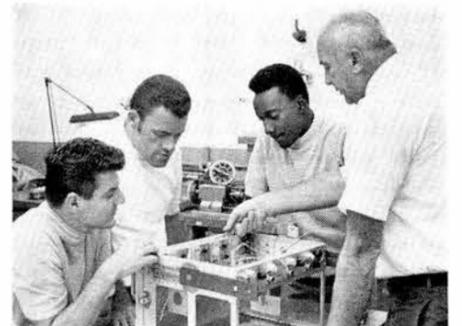
Livermore's electronic technician apprenticeship program was officially certified by the State of California and three employees were selected for the first class. The four-year program consists of on-the-job training and out-of-hours classroom instruction at Chabot College.

For the fifth summer, Sandia Laboratories Livermore participated in the national Youth Opportunity Campaign to provide temporary summer work and training experiences for students returning to school in the fall. This year 22 YOC trainees were on roll at Livermore.

September

Details of a new contribution program LEAP (Livermore Employees Assistance Plan) were announced. Under the Plan,

employees have the opportunity to contribute to eight local and national health and welfare agencies in addition to the United Bay Area Crusade (UBAC) agencies.



Electronic Technician Apprentices Program

The first employee graduated from the machinist apprenticeship program established at Sandia Laboratories Livermore in 1966.

A Livermore employee while on leave helped scientists and engineers from the Brazilian government and University of California at Berkeley launch two astrophysical research rockets. Prior to joining Sandia, he had designed the rockets' x-ray counter payloads, used to obtain data on 30 x-ray emitting stars.

October

Livermore employees contributed \$30,065 to the LEAP fund drive, a 15 percent increase over the amount given during the previous year's contribution campaign.

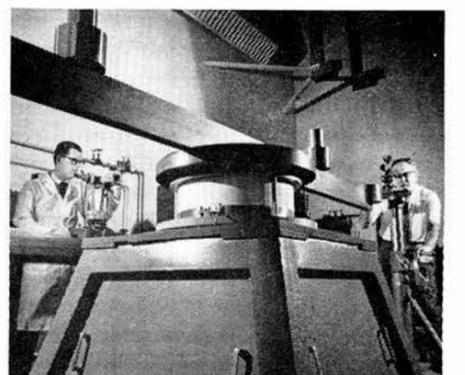
November

Irradiating material with a pulsed electron beam and photographing the reaction as it occurs was described as an effective technique used at Sandia Laboratories Livermore to analyze how very rapid heating affects the material. Data obtained from photos includes the velocity of the expelled metal, visible characteristics of the blow-off plume, and the bending of the test sample as a function of time.



Remote CDC 6600 Computer Console

A remote console of the Laboratories' CDC 6600 computer was operational. The console allows an engineer to display a complete system defined by differential equations and to monitor or change the computer program for optimum parameter selection.



Livermore's Mass Properties Facility



EMPLOYEE-OF-THE-YEAR—Dale Irving (8223) didn't give much thought to the employee number—1969—he was assigned when he came on roll at Sandia Laboratories Albuquerque back in February 1952. Now, 17 years later and working at Sandia Laboratories Livermore, he finds he's the "Employee-of-the-Year."

Take Note

Hal Brumfield (8312) and Wes Estill (8311) were coauthors of an article appearing in the July/August 1969 issue of the JOURNAL OF CELLULAR PLASTICS. Title of their paper was "Characterization of Foam Structure by Use of the Scanning Electron Microscope."

Michael Soderstrand (8151) presented a paper at the IEEE International Symposium on Circuit Theory held recently in San Francisco. The paper was entitled "Very Low Sensitivity Canonic Active RC Filters." He has also published an article, "Extremely Low Sensitivity Active RC Filters," in the IEEE December Proceedings.

Half-price discount tickets are available from Employee Benefits for opening night of the San Francisco Sports and Boat Show to be held at the Cow Palace Jan. 9-18.

Verne McNabney (8262) has been elected to serve a two-year term as secretary of the Standards Review Committee of the Industrial Fire Protection Section of the National Fire Protection Association (NFPA). It is the responsibility of the committee to recommend changes in all industrial fire protection standards. Their recommendations to the NFPA Executive Committee receive wide acceptance for incorporation into federal, state and county fire protection legislation. Verne also serves the NFPA as a member of the Nuclear Industries Committee. This committee establishes fire protection standards for industries handling nuclear materials.

1969 Sandia Highlights -- A Year in Review

A custom for LAB NEWS at year's end is to present a compilation of significant happenings at the Laboratories. This was 1969 at Sandia:

January

Western Electric Company's contract with the AEC for operation of Sandia Laboratories and supporting facilities was renewed for the fourth time virtually unchanged. The no-fee contract will extend through December 1974.

Year-end payroll figures totaled \$91.6 million, including \$11.6 at Livermore Laboratories. There were 8125 employees on-roll including 1040 at Livermore. AEC assets at the Laboratories were worth \$235.6 million. Sandians pledged \$291,000 during the United Community Fund campaign, an average gift of \$51 per employee.

Figures for 1968 indicated 43 percent of the technical staff and 27 percent of all employees enrolled in the 113 out-of-hours courses offered. All 97 instructors are Sandia employees.

"Terradynamics," a 22-minute color film, won a bronze medal in the scientific research category at the International Film and TV Festival of New York. Some 2500 industry-produced films were entered in the various categories.

February

Two laminar flow "cleanroom-type" rooms are being used in the fight against leukemia at the University of Texas M. D. Anderson Hospital and Tumor Institute in Houston.

A new high-velocity gun facility was installed at Coyote Test Area to gather scientific data on behavior of materials under extreme impact conditions.

Also in operation was a new high intensity, ultra short pulse laser, designed to study laboratory-produced high temperature plasmas.

March

Radio-controlled model planes were substituted for full-scale aircraft for preliminary drop tests in the development of an experimental terradynamic shape and a miniaturized telemetering system.

A six-month crash program was completed for analysis and safety testing of a tiny radioactive heater for use in Project Apollo. The area of special concern was whether the heaters would survive atmospheric reentry and earth impact if the mission had to be aborted.

April

A NASA-sponsored handbook on contamination control was written by Sandians.

The advanced Nimbus weather satellite in twice-daily trans-polar orbit was using power from two Sandia-developed SNAP 19 generators. They produce about 50 watts of power and supplement solar cells as power sources.

Twelve Sandians were selected for participation in the Laboratories Doctoral Study Program.

May

A series of upper altitude research rockets were launched from Sandia's Barking Sands facility on Kauai in the Hawaiian Islands. Areas of interest were upper atmosphere constituents and densities, and outer space phenomena in the 300,000 to 1,000,000 foot altitude.

June

Thirty Sandians who were called to active duty in the New Mexico Air National Guard returned from tours of duty in Vietnam and Korea.

The annual influx of temporary summer hires was underway. This year 132 students were employed under the Youth Opportunity Campaign.

July

A novel "third-generation" telemetering buoy system was built and successfully tested at a range off Santa Cruz Island in the Pacific. The instrumented buoy transmits signals from hydrophones suspended below. As many as five buoys can be remotely controlled from a land or sea-based command center.

Two radioisotopic heaters — which were earlier tested at Sandia Laboratories — were left on the moon by astronauts of Apollo 11. The heaters were designed to keep seismic instruments operational during the extreme cold of the two-week lunar nights.

August

The Cost Improvement Program credited 72 employees with saving \$4,688,055 during FY '69. The submitted ideas either saved money outright or offered ways to avoid spending money without impairing efficiency or jeopardizing Sandia's mission.

September

A data acquisition and display system went into operation to serve experimenters using various radiation sources in Area V. Portable consoles make it possible to collect raw data directly from the experiment as it is underway. This data can be processed immediately.

Sandia scientists developed a new method of spacecraft sterilization which involves simultaneous application of heat and radiation. The combined effect is very effective in killing bacteria.

October

Project Rulison, a 40-kiloton underground nuclear blast, was successfully detonated in western Colorado. Intent of this Plowshare shot was to free gas from sandstone.

Far away on Amchitka Island in the Aleutians, a one-megaton nuclear device was detonated. Sandia Laboratories provided scientists and instrumentation for earth and underwater measurements of the shock wave created by the blast.

November

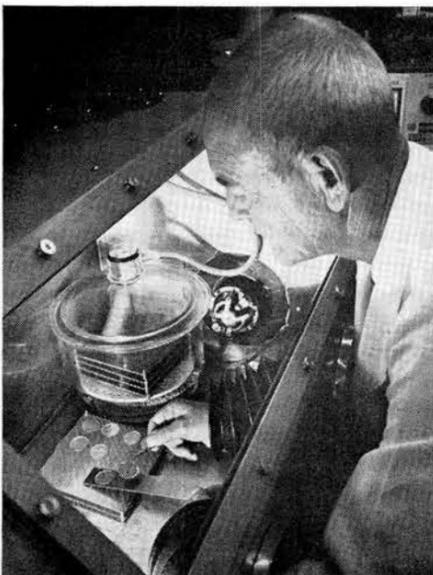
Sandia Laboratories marked the 20th anniversary of Western Electric taking over operation of the company for the AEC.

Four Sandians were in Hawaii to help the Army Corps of Engineers conduct a series of safety calibration tests prior to digging a harbor with conventional high explosives.

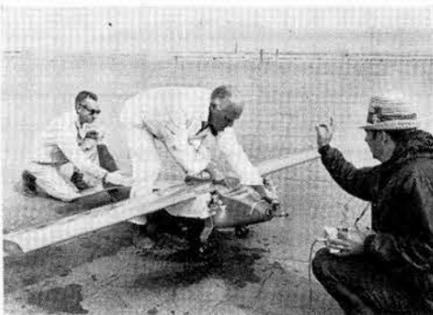
A new electron accelerator (REBA) underwent operational testing in Area V. It complements existing facilities in Sandia's radiation effects program and provides an additional tool for materials properties studies and for research in electron beam propagation.

Sandians pledged \$298,618 through ECP to support the Albuquerque Community Fund and nine national health and welfare agencies.

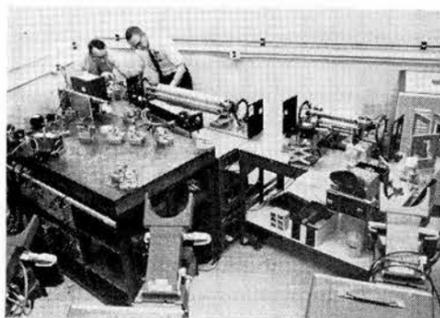
Sandia engineers loaded a SNAP 27 plutonium 238 fuel capsule on the Lunar Module of Apollo 12. The SNAP unit powers an array of scientific instruments which the astronauts left on the moon.



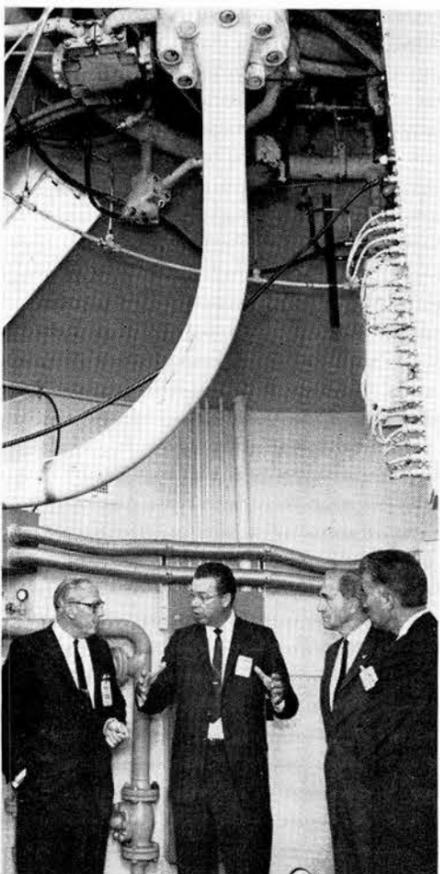
New method of spacecraft sterilization



Drop tests from model planes



High intensity, ultra short pulse laser



AEC visitor to underground centrifuge



SNAP loading team for Apollo 12

Authors

E. L. Clark (9322) and L. L. Trimmer (AEDC-VKF), "Stagnation Point Velocity Gradients for Spherical Segments in Hypersonic Flow," October issue, AIAA JOURNAL.

M. D. Bennett (9325) and A. A. Trujillo (9322), "Reentry Vehicle Roll Control Utilizing Recirculating Base Flow," October issue, AIAA JOURNAL OF SPACECRAFT AND ROCKETS.

K. H. Zimmermann (7434), "Hyperbolic Functions" and "The Catenary Curve," WIRE AND WIRE PRODUCTS HANDBOOK.

R. A. Hill (9342), "Plasma Diagnostics, A Book Review," November issue, APPLIED OPTICS.

D. B. Longcope (1222), M. J. Forrestal (1223), and W. E. Warren (1721), "Thermal Stresses in a Transversely Isotropic, Hollow, Circular Cylinder," November issue, AIAA JOURNAL.

J. E. Schirber (5150) and W. J. O'Sullivan (5151), "Effect of Pressure on the Fermi Surface of Be," Vol. 184, No. 3, PHYSICAL REVIEW.

P. J. Chen (1721), "On the Growth and

Decay of One-Dimensional Temperature Rate Waves," Vol. 35, No. 1, ARCHIVE OF RATIONAL MECHANICS AND ANALYSIS.

A. G. Beattie (5151), "Magnetoacoustic Quantum Oscillations in Aluminum and Copper," Vol. 184, No. 3, PHYSICAL REVIEW.

D. E. Bennett (2346) and C. F. Curtiss (University of Wisconsin), "Density Effects on the Transport Coefficients of Gaseous Mixtures," Vol. 51, No. 7, JOURNAL OF CHEMICAL PHYSICS.

R. J. Chaffin (5112), E. P. EerNisse (5112), and J. A. Hood (2650), "The Effect of Neutron Irradiation on the TRAPATT Diode," November issue, PROCEEDINGS OF THE IEEE.

Take Note

Frank Halasz (3414) was elected president of the Rocky Mountain Chapter, National Classification Management Society, during the group's annual election Dec. 17.

Other new officers are M. B. Gordon, Dikewood Corp., vice president; Mrs. Phyllis Nagel, Ken O'Brien Associates, secretary; and Fred Winstead, FC/DASA, treasurer. All will be installed in February to serve one-year terms.

Beta Aloosters Toastmasters' Club elected new officers last month. Wes Holley (9150) is the in-coming president, Clyde Northrup (9511) will be educational vice president, and Chad Looney (9226) will be secretary of the group.

J. F. Cuderman (5235), "Potassium Ion Source," Vol. 40, No. 11, REVIEW OF SCIENTIFIC INSTRUMENTS.

Congratulations

Mr. and Mrs. Al Switendick (5151), a daughter, Suzanne Eileen, Dec. 1.
Mr. and Mrs. Timothy Ristine (7624) a son, Sean, Nov. 26.

Promotions

Ernest Aguilar (9411) to Computer Facilities Clerk
Ada Jane Akin (5000) to Executive Secretary
Sandra Barber (3256) to Secretarial Steno
Dale Birch (8120) to Secretarial Typist
Kathleen Ann Brady (3256) to Secretarial Steno
Karmel Chavez (9411) to Computer Facilities Operator
Leo Chavez (4222) to Painter
John Cronin (4222) to Painter
Ann Dunsworth (3417) to Record Clerk
Ernest Duran (3428) to Mail Clerk
James Duran (9411) to Computer Facilities Operator
Celedon Gabaldon (3428) to Mail Clerk
Manuel Gonzales (3428) to Mail Clerk
David Hendren (3428) to Mail Clerk
Alex Maestas (3428) to Mail Clerk
Roy Palmer (9411) to Computer Facilities Operator
Evelyn Ratcliff (2300) to Secretary
Janice Robertson (1600) to Secretary
Beatrice Sanchez (3256) to Secretarial Steno
Delfinia Sanchez (3256) to Secretarial Steno
Robert Silva (7533) to Technician
Delia Stites (4338) to Purchasing Analyst
Donald Stuart (7533) to Technician
Clara Taylor (4100) to Secretary
James Trentham (7293) to Staff Assistant Technical
Mary Witek (8325) to Secretarial Steno
Margaret York (8310) to Secretary
Lyle Wetherholt (9230) to Staff Assistant Technical

Service Awards

25 Years



R. A. Bice
7000



George Andrews
4221



John Cavanaugh
4131



Joseph Connell
7425



John England
7630



Ronald George
4513



John Miller
8243



Ralph Wilson
4220



Roy Winter
7451

15 Years



Frank Alden
2331



Helen Anderson
7631



Alexander Beck
7654



William Bray
9342



Earlene Brinegar
9512



Don Bush
2345



Charles Champe
4542



John Coleman
7615



George Hawley
7414



M. L. Heister
7523



Loyd Keller
9512



Fred Magee
9413



John Morgan
7522



Myron Pilat
2491



Kitty Weston
1724



Elizabeth White
4151



Roy Wilcox
8252

10 Years

Richard Prairie 1643, Dwight Allensworth 5133, Deyde Sutton 3411, David Rice 5225, Robert Strout 8181, Charles Mills 4543, Fred Wymer 9214, William Swiss 3411, Howard Lehman 1514, Ronald League 8129, and Valla Cowan 8212.



Frenchie Sonnier with 5000 gallon tanker rig.

Tanker Service to Remote Sites

Frenchie Sonnier Likes Warm Weather

During cold weather Sandians in Area III, Area V, Coyote Test Field and other remote sites owe their comfort to Donadieu (Frenchie) Sonnier (4575). Frenchie makes a daily run to the remote sites carrying 5000 gallons of fuel oil and 500 gallons of kerosene to fuel the furnaces of the test facilities.

In addition, Frenchie uses his big tanker

to provide water for various test purposes and to dampen soil or sawdust for explosive tests.

Before moving to the Transportation organization nine years ago, Frenchie worked in Field Testing operating site preparation equipment and handling explosives.

In providing tanker service to the remote sites, Frenchie is always looking for ways to save time — it takes an hour to fill the big tanker and from 10 to 30 minutes to fill an underground storage tank at a site. Delivery schedules get tight in the winter time. As the temperature drops, fuel consumption goes up.

One example of the way Frenchie saves time involved the headquarters building for Coyote Test Field, located near Area III. When the Area III water system was installed, a large water storage tank at Bldg. 9925 was no longer needed. Frenchie suggested that the water tank be converted to fuel oil storage. Its larger capacity reduces the number of deliveries needed at the building.

Another example of his efforts was reported as a cost saving item amounting to \$754. Frenchie had a surplus 500-gallon tank mounted on the rear of his truck to carry kerosene. Formerly the kerosene was delivered in 55-gallon amounts from a tank mounted in a pickup truck. Now he can deliver the kerosene during a fuel oil run, saving time and equipment.

Frenchie is currently enjoying Albuquerque's mild winter weather. With fuel oil demand low, he's way ahead of his delivery schedules.

Death



Daniel Stringfellow, a transportation dispatcher in Material Handling Section 4614-2, died Dec. 16 after a brief illness. He was 52.

He had worked at Sandia Laboratories since August 1958.

Survivors include his widow, three daughters, two step daughters and five grandchildren.

Sympathy

To Charles Kaspar (4552) for the death of his mother in Albuquerque, Dec. 14.

Greasy Kid Stuff Look

King of Beagles Is Champ With Judge and Buckner Family

To the family he's known as "the king of the backyard," but on the dog show circuit he's Buckner's Gallant Beaumont.

The two-year-old beagle became a Champion at the Nov. 8 show in Roswell, much to the pleasure — and relief — of Dean Buckner (2317) and his wife Ellen, "Beau's" owners, trainers, and handlers.

Beau was judged strictly on conformation and needed 15 points (from wins in competition) plus top rating in two major shows to finish his championship rating. The Buckners understandably became a little discouraged when it took Beau five shows to get that final point.

"All in all," Dean says, "we showed him 24 or 25 times in New Mexico, Colorado, Texas and Arizona over a period of nine months. Fortunately the dog shows are often scheduled in nearby towns on successive days. In one five-day period, we entered Beau in shows in Albuquerque, Santa Fe, El Paso, and Las Cruces."

The Buckners always tried to combine the show schedule with family trips. When they vacationed in New York, they entered Beau in a show there, but had to withdraw him because there were no other entries in his particular category.

One advantage of showing a shorthaired dog is that grooming takes less time than for such shaggy species as poodles, Afghan hounds or Yorkshire terriers, but dogs don't always understand such advantages. A few hours before a show in Pueblo, Colo., Beau ran under a car and came out covered with grease. "We rubbed him and rubbed him with dog shampoo but he still had that 'greasy kid stuff' look," Dean recalls. "Nevertheless, the judges liked his looks and gave him a red ribbon. That night we used cornstarch to get rid of the rest of the grease. The next day Beau was clean and shiny, ready to compete with the same dogs but in a different town. He

didn't win a thing!"

The King of the Backyard won't be able to loll through the winter. The Buckner's next project is to enter Beau in obedience shows. They also have started another young beagle through conformation competition.



CHAMPION Buckner's Gallant Beaumont was shown by Ellen Buckner at a recent dog show in Roswell.

SHOPPING CENTER

SHOPPING CENTER

FOR SALE MISCELLANEOUS

SOLID MAPLE double drop leaf table and four chairs, \$60. Two large HEPA filters, \$5 ea. Twin squirrel cage blower, \$20. Johnson, 298-1011.

SEARS power furnace humidifier, used one season, \$40. Lochtefeld, 296-1326.

FIVE ASSORTED electric motors, \$5 ea. Jackson, 299-5107.

18" B&W TV, Zenith, with cart. Ham, 299-5294. TWO 1969 Honda CT 90 trail bikes, adult driven, \$275 ea. Kaiser, 296-5215.

FENDER GUITAR amplifier, two 10-inch Jensen speakers, \$80. Woman's ski boots, size 5D, \$5. Peterson, 298-1235.

ELECTRIC HAND saw, heavy duty battery charger, carpenter hand tools, Wards canister sweeper. Eaves, 299-7728.

POWER transformers, one UTC R-104 and one Freed 22915, \$1 ea. Henry, 256-2467.

COLT .25 cal. auto, \$55. Smith and Wesson .38 special stub nose revolver, not shootable, \$25. Smitha, 299-1096.

MOVIE CAMERAS, Brownie "Funsaver" \$15; Brownie "Starmite II" \$3. Ristine, 298-8383.

TRAILER HITCH for VW, fits 40 HP sedan, \$7. Souder, 282-3121.

BLACK MINIATURE poodle puppies, seven weeks old, AKC reg. litter. Tenbrink, 299-0679.

CHROME PLATE .41 Remington double derringers (2), \$45 and \$50; Nazi dress daggers (2), \$25 each; Model 1917 trench knife, \$17. Mattox, 296-4149.

DRUM SET, Ludwig snare w/case, bass, tom, hi-hat, and crash cymbals, sticks and brushes, \$175. Cotter 255-0653.

MEN'S ICE skates, size 9, ladies size 7. \$4 a pair; wooden skis, metal edges, 6'3" with bindings not mounted, \$5. Reed, 299-7425.

CARS AND TRUCKS

'60 FORD, std. trans., 4-dr., \$75. Johnson, 256-9218 after 5.

'59 FORD wagon, white, blue interior, OD trans., R&H, PS, tinted glass, one owner \$295. Stark, 8212 Pickard Ct. NE, 299-5953.

'55 CHRYSLER New Yorker, 2-dr. HT, Air, PB, PS, heater. Sweet, 255-0255.

REAL ESTATE

3-BDR. BRICK house, \$18,900. 2708 Alvarado Dr. NE. Villa, 298-0435.

WANTED

TELESCOPE, 6-inch or larger reflector, or 4-inch or larger refractor (Rich Field). Thomas, 256-7775.

SADDLES, western, full or 3/4 quarter horse tree, adult size, two needed; one bridle, curb type; also misc. tack. Eggert, 843-2994, 8-4 M-F.

LOST AND FOUND

LOST—Pr. Ladies RX glasses, granny-type; set of 3 keys on ring; pr. men's RX sunglasses, safety-type in black case; pr. ladies RX bi-focals, brown & silver frame; yellow gold ladies "Baylor" wrist watch. Tel. 264-2757, Bldg. 610.

FOUND—Pr. RX safety glasses (men's); 2 keys on chain w/metal tag w/"Tool Box" imprinted on it; pr. men's RX safety glasses. Tel. 264-2757, Bldg. 610.



Mary Ann
Bishop (1641)

Soul Session

CORONADO CLUB
SATURDAY, JANUARY 17
8-12 P.M. — SOCIAL HOUR PRICES

Coronado Club Activities

Soul Session Scheduled Jan. 17, Casino Night Set Jan. 24

Three swinging social hours, a Soul Session, Casino Night, a Teen Go Go and a garage sale pack the Coronado Club's January calendar.

Soul Session

Rod King and the Knights with their big modern rock sound will return to the Club's bandstand on Saturday, Jan. 17, for another "Soul Session." The event will be similar to the November bash when some 300 swingers crowded the Club's main ballroom from 8 to 12 p.m. It's free to members (guests 50 cents) and social hour prices will be in effect all evening.

Garage Sale

On Saturday morning, Jan. 17, the Club will offer for sale a number of items including drapes, carpet and patio furniture. Get there early (the sale starts at 10 a.m.) and make your selections. These are rare bargains.

Social Hours

Starting at 5 p.m. today, the Club is back on its regular Friday night social hour schedule with special prices until 9 p.m. Tonight's buffet, from 6 to 8 p.m., is the Club's famous chuckwagon roast beef with all the goodies. A group called The Changing Times will make happy music from 6 to 9 p.m. Then the TGIF crowd moves to the main lounge where Pat Reich and piano will entertain with a sing-along until midnight. Cost of the buffet is \$1.75 for adults, \$1.50 for kids.

On Friday, Jan. 9, a swinging 12-piece big band called the Top Hats will play for dancing while the southern fried chicken buffet is spread.

Mexican food will be the feature of the

Jan. 16 social hour. The Good Times will make the happy music.

The mid-week social hours continue on Tuesday evenings from 5 to 8 p.m.

* * *

Casino Night

The Club's annual Casino night with play money and real prizes is set for Saturday, Jan. 24. The tab will be \$1 for members, \$2 for guests. Elton Travis and the Westernaires will play for dancing from 9 to 1 a.m. Sandwich service will be available.

Dance Lessons

The Club is again offering dance classes for advanced and beginning students. Both classes will start Jan. 12 and will meet on Mondays for 10 weeks, the beginners at 7 p.m. and the advanced students at 8:30 p.m. Registration fee is \$20 which should be paid at the Club office prior to the first class meeting.

Bridge

The duplicate bridge group has moved its meeting day to Tuesdays at 7 p.m. Coronado ladies bridge will meet Thursday, Jan. 15, at 1 p.m. The group no longer requires reservations and urges anyone interested to join. Call 299-9168 or 299-1025 for more information.

* * *

Teen Go Go

A group called The Forthcomings rather than The Bounty Hunters as previously announced will be wired into the bandstand for the monthly Teen Go Go on Saturday, Jan. 10. Member parents should pick up tickets for their youngsters by Friday, Jan. 9, at 9 p.m.

Language Gap

Tech Article in Russian Is Writing the Hard Way

A new technical journal and a new attempt to solve the problem of international communication prompted Sandia's translator Marcel Weinreich (3421) to write an article in Russian.

The article was unusual for several reasons. Although born and raised in Russia, Marcel left there in 1920 and spent the ensuing years in Europe and the United States. Translations from Russian to English are part of his everyday job, but it has been a long time since Marcel has written an article in Russian. So long, in fact, that he was concerned about present day usage of certain words. He contacted the cultural attaché of the Soviet Embassy in Washington, D.C., who offered to have one of their editors check the article for obsolete words. "The Russians returned my article in about two weeks with only a few alterations," Marcel said.

Why write in Russian? The publication, LA MONDA LINGVO-PROBLEMO, printed in the Netherlands, is the only multi-

lingual European journal devoted to questions of international communication and linguistic situations as they pertain to sociological, economic, political, legal, psychological, ethnic, and scientific problems.

"Neither of the first two quarterly issues carried any articles in Russian," Marcel explained. "I felt it was a slight that defeated the purpose of the journal, and should be corrected." The Sandian's contribution was entitled "Bilingualism and Plurilinguism."

Although the articles appear in a variety of major languages, the abstracts (or summaries) are all printed in Esperanto. The quarterly is sponsored by the International Center for Research and Documentation of the World Language Problem.

Members of the journal's editorial board are scholars from universities throughout the world. Marcel is the publication's only contributor from the Southwestern United States and is also its book reviewer — in six languages.

Sandians Take Top Trophies In Table Tennis Tourney

Sandians earned all the trophies in a recent intra-base table tennis tournament. Jim Clark (7323) emerged singles champion of the meet. Dick Andres (4612) took second place.

In doubles competition, Gene Acton (9213) and Ray Jones (9213) took first place while second went to Jimmy Sanchez (7512) and Leo Cordova (4516).

In Class A singles, Jimmy Sanchez grabbed the top spot while Paul Longmire (1642) came in second.

Participants from Sandia Laboratories, Sandia Base, AEC, Kirtland AFB and Manzano Base competed in the tourney. Daril Gutscher (1213) was chairman.

Speakers

L. B. Smith (5233), "The Falling Sphere as an Atmospheric Measurement Technique," University of Illinois Aeronomy Laboratory, Dec. 9, Urbana.

R. A. Chaffin (5112), "Poor Man's TRAPATT Oscillator," IEEE Avalanche Diode Workshop, Dec. 10, New York City.

N. S. Gillis (5151), "Anharmonic Interactions in Aluminum"; R. W. Rohde (5133), "Comparison of Shock Compression and Hydrostatic Pressure Measurements of the bcc-fcc Transformation in an Iron-Nickel Alloy"; J. N. Johnson (5133) and O. E. Jones (5130), "Precursor Decay in Single Crystals"; R. A. Graham and G. E. Ingram (both 5132), "Piezoelectric Current from X-Cut Quartz Shock-Loaded from 25 to 70 Kbar"; L. M. Barker (5161), "Stress Wave Propagation in Plexiglas"; D. A. Freiwald (5242), "Shock Trajectories in Linear Shock Tubes with Solid High Explosive Drivers, and One-Dimensional Blast Wave Theory"; D. A. McArthur (5223), "Optical Mixing in CdTe Using the Pulsed Water Vapor Laser," 1969 Winter Meeting of the American Physical Society, Dec. 29-31, Los Angeles.

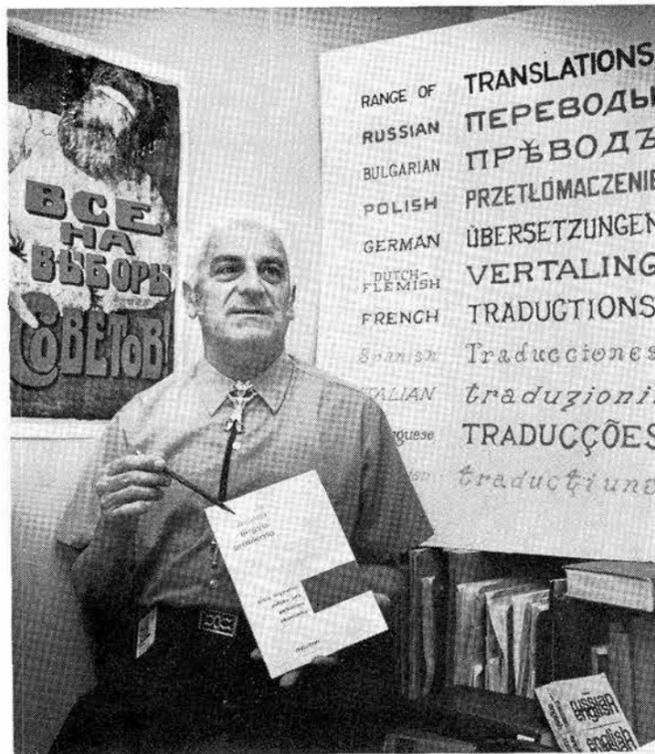
J. F. Muir (9341), "Transpiration Cooling," Society of Aerospace Materials and Process Engineers meeting, Nov. 17, Albuquerque.

Sandia Safety Signals

1970 A Year of Fewer Accidents



it's
up to you



TRANSLATIONS from 10 languages to English are part of Marcel Weinreich's regular job, but writing an article in Russian was a bit out of the ordinary.