

LAB NEWS

VOL. 22, NO. 14

JULY 2, 1970

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO & LIVERMORE CALIFORNIA



A TOTAL of \$530,000 in cost improvement is credited to Russ Maxwell (2318), right, and Chuck Prohaska (3414) for their efforts in declassifying the production of a ceramic element, part of a Sandia component. "It was a matter," Chuck says, "of presenting and arguing our case with enough supporting evidence so that the AEC classification people became convinced beyond any doubt that the nation's security would not be jeopardized." Savings in production costs will accrue over the next two years and derive from both simplified physical handling and broader competitive basis in various procurement actions.

Acoustic Wave Forms

Art by Computer Theme of City Museum Show

A digital computer that can hear and speak is still some way off, but in the field of art the computer has already arrived—albeit with the assistance of man.

The summer-long exhibit, "Art Systems in Evolution," at the Museum of Albuquerque gives a hint of the precise and intricate designs which can be achieved through the computer medium. The designs curve and soar but in reality are all segments of straight lines reoriented only slightly with each stroke of the plotter's stylus. In instances where the printout drawings are made up of typewriter characters, changes in density are achieved by overprinting.

Included in the exhibit is a series of

40-Year Anniversary For Bert Eich

Bert Eich (5529) observed his 40th anniversary with Bell Telephone Laboratories on June 20. He was presented with an engraved wrist watch.

Bert joined BTL's technical staff in New York in 1930 and his first assignments were in circuits, telephone apparatus, and relays. During World War II he worked on sonar equipment.

In 1949 he transferred to Murray Hill, N. J., where he worked on printed wiring and plastic encasements. Much of his work at Sandia for the past 17 years has been of similar nature. Bert is currently on special assignment to the Director of Materials and Processes.

As for his personal plans for marking this occasion, Bert has jumped the gun: this spring he took a 49-day trip by ship around the entire South American coast.



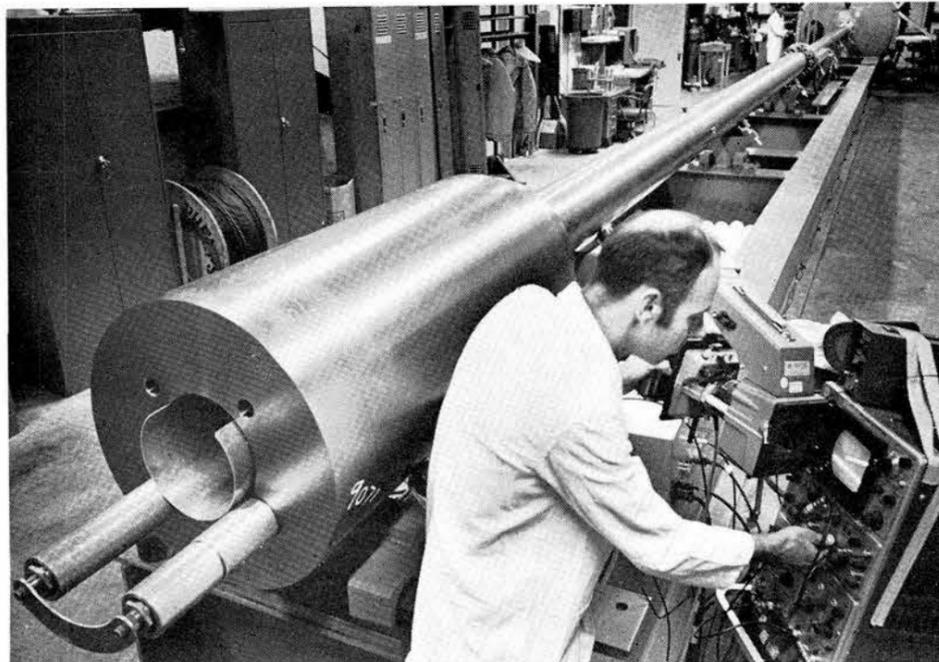
Variable Annuity Unit Value

July, 1970	1.264
June, 1970	1.378
Average 1969	1.697

acoustic wave forms plotted for computer by Don Robbins (9424). These were originally done in collaboration between Don and Dean J. Donald Robb, professor emeritus of the University of New Mexico. Don has used a digital to analog converter to modify the computer dots into varying voltages which, rendered on magnetic tape, produce electronic sounds on a tape recorder.

"In addition to being a form of electronic music, these acoustic wave forms are being studied by Cliff Fisk (9424) in the hope that voice identification by computer would be possible," Don explains.

Another of Don's contributions to the exhibit is a long narrow strip of paper



BIG GUN — Bob May, foreground, and Bob Hardy (both 5163), near impact chamber, adjust instrumentation for Sandia's new high-velocity gun facility. The gun is 87 feet long with a 3.5-inch bore. It can fire a two-pound projectile and achieve impact velocities of 8000 fps in materials research programs.

Fastest Gun In the West?

Precise Impact Control Aim of New High-Velocity Gun Facility

An "equation of state" is a mathematical statement relating variables — such as temperature, pressure and volume — which define the physical condition of a substance. The information conveyed by the equation is invaluable to the designer, particularly the designer of Sandia hardware that is expected to survive extreme shock.

Within the materials research program at Sandia, new emphasis is being placed on composite materials — for instance, thin filaments of metal imbedded in a ceramic and coated with another metal. With composites, high strength and light weight can be achieved in combination with other desirable characteristics (LAB NEWS, April 24, 1970). But very little equation of state and stress wave propagation information exists for composites.

Previously, basic data for equation of state tables for materials were gathered through use of a number of small compressed gas guns or explosive facilities which subjected sample materials to shock.

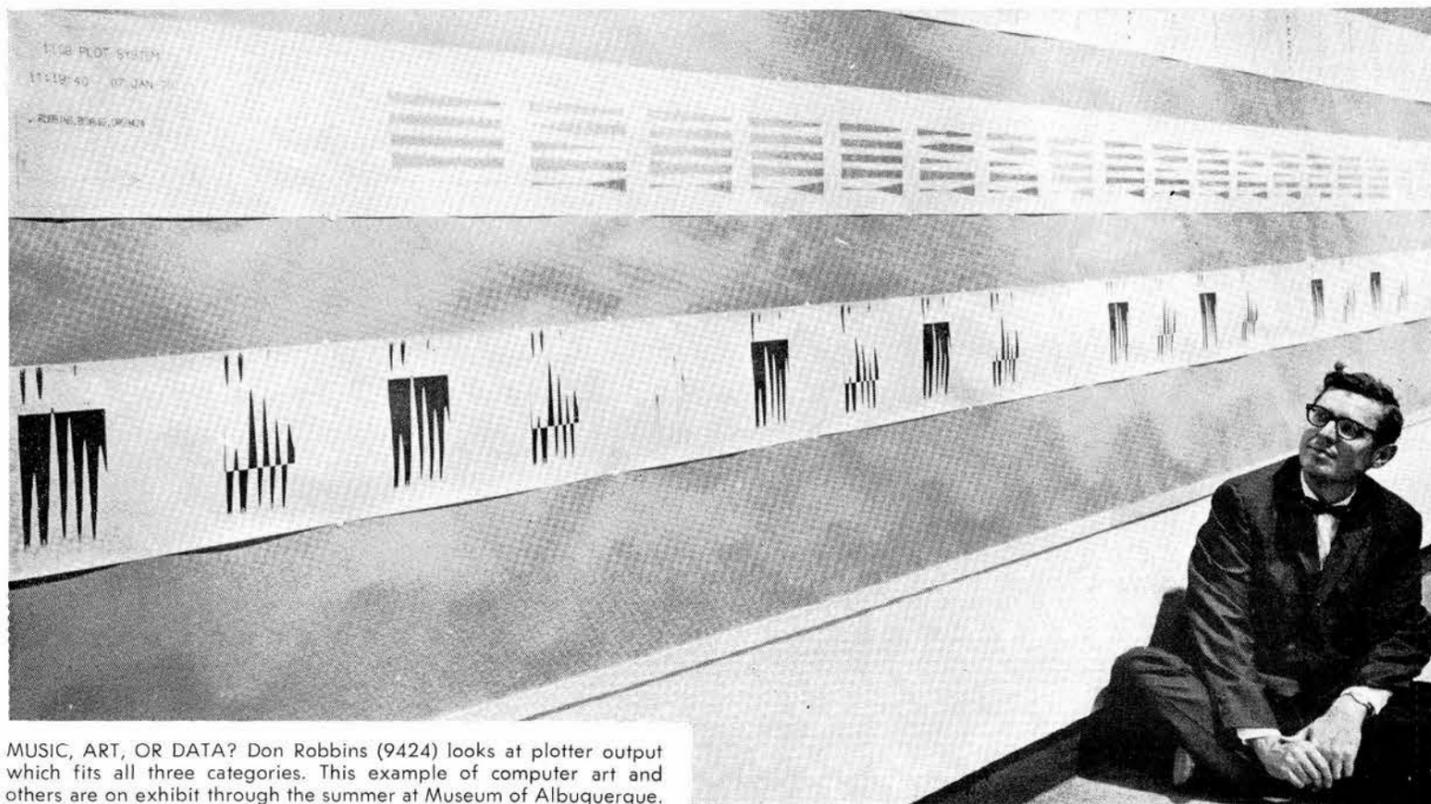
Since last December, a new high-velocity gun facility has been operating in Sandia's Area Y adjacent to Area III. The gun (which uses conventional artillery powder) can fire a two-pound projectile up to 8000 feet per second (fps). The velocity range of the new facility fills a gap between compressed gas guns and explosives and, in fact, extends well into the range formerly accessible only to explosives. Because impact conditions with respect to the test material can be precisely controlled, data derived are reliable and accurate.

In addition to tests of composite materials, samples of porous materials, mixtures and polymers have been tested at the new facility to date. Basic information about the way solid material compresses under extreme shock has been gained. The information makes possible reliable extrapolations of equation of state data over a wide range of conditions in various combinations of materials.

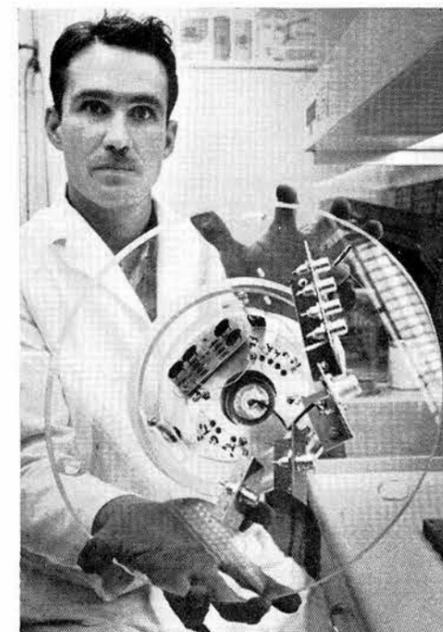
Work in this area is under the supervision of Darrel Munson, Shock Wave Phenomena Division 5163. He is also responsible for the high-velocity gun facility. Darrel and others in Department 5160 are concerned with analytical and numerical techniques for calculating stress wave propagation in materials and resulting dynamic fracture (spallation) and with shock-induced melting and vaporization. In addition, other organizations are in the process of performing ballistic penetration and scaling studies using the gun.

Bob May of Division 5163 is project leader for operation of the high-velocity gun facility.

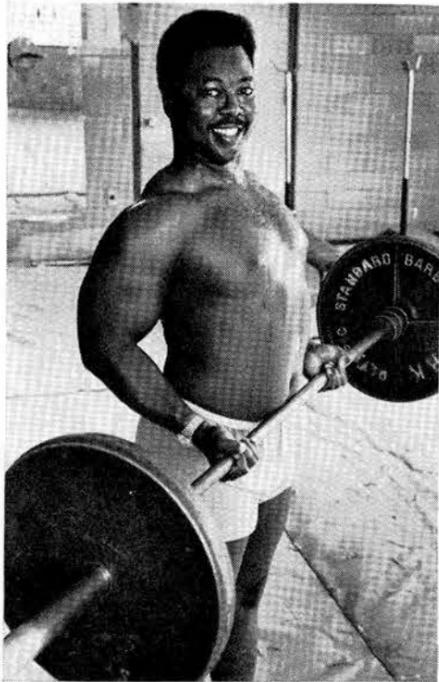
The 87-foot-long gun has a 3.5-inch bore. (Continued on Page Four)



MUSIC, ART, OR DATA? Don Robbins (9424) looks at plotter output which fits all three categories. This example of computer art and others are on exhibit through the summer at Museum of Albuquerque.



INSTRUMENTED TARGET for impact testing is displayed by Bob Hardy. Material to be tested (with flat surface facing projectile) is mounted on the other side of the quartz gage located in the center of the target mounting.



BIG-D—Dallas Allen, that is, of 9217, is shown with the tools and results of his hobby. In three years of weight lifting, he's gained about 60 pounds—mostly muscle we'd say.

Dallas Allen:

'Muscles Not Inherited'

Nobody kicked sand in his face. Dallas Allen (9217) weighed 160 lbs., was happily married, and felt pretty good about it three and a half years ago when a friend tried to interest him in weightlifting. "I didn't think weightlifting could change your muscular set or the appearance of the body much," Dallas says. "I thought that the size and shape of people were inherited characteristics."

Dallas is his own proof of how wrong he was. Now at a muscular 225 lbs., Dallas looks "considerably different" from what

he did then. He can lift 400 lbs. of dead weight and regularly curls 175 lbs. during his workouts.

He used to smoke but that changed too. Dallas says there's a right way and a wrong way to lift weights. He had a little help from his friend in the beginning but has learned the proper methods through reading and watching others work out in the Sandia Base Gym during noon hours.

Diet is important, Dallas says, because a weightlifter must maintain his weight. He eats a balanced diet of about 3000 calories per day which includes at least 200 grams of protein.

Before joining Sandia Dallas attended Central Technical Institute in Kansas City and worked in construction. He strained his back one time lifting two bags of cement, one in each hand. His back bothered him intermittently through the years but he doesn't have that problem anymore. "Proper lifting can strengthen every part of your body," Dallas says. "You don't get musclebound unless you strain a muscle and scar tissue forms on the inside."

Dallas says that now that he's into a training routine, he plans to continue. He would like to compete in a weightlifting contest, and will probably enter some events this year.

He works out during the lunch period four days each week and then two more hours in the evenings at home.

"Sure, I get tired," he says, "but I find that I actually have more energy and enthusiasm for other activities."

Toastmasters 765 Elect Rudy Baca

Sandia Toastmasters Club 765 installed new officers at a banquet last week. Rudy Baca (4541) is the new president of the organization. Joe Deveney (9513) is executive vice president; Leonard Flesner (7422), educational vice president; Dennis Cordova (7513), treasurer; and Rees Bevan (Honeywell), sergeant-at-arms.

Jerry Long (9111), immediate past president of the organization, reflected on the value of the organization: "Contrary to what many people think," he said "a Toastmaster is not just a comedian who makes people laugh at a dinner meeting or someone who just loves to talk (although he may be both of these). More likely, he is a man who is terrified at the thought of even standing in front of a large audience but is determined to conquer his own fears."

Toastmasters provides a working laboratory for public speaking, Jerry says, in addition to providing valuable training in committee organization, conducting business meetings and project responsibilities. It is valuable training for anyone with ambition to grow in community service or in a profession.

Jerry invites anyone interested in joining Sandia Toastmasters Club 765 to contact him.

Vacation Problem

Empty House Makes Easy Pickins

It's sad but true that most Sandians have either been burglarized in the last few years or know someone who has been a victim. So what do you do when you and the family are heading out for a few weeks vacation—just hope for the best? Well, one precaution is to engage someone to live in your house while you're gone. Occupied houses

look occupied, and burglars aren't anxious for company. A friend's older son or daughter might be willing and, for a consideration, might also take care of pets and the green things.

If you can't swing this, then here's a checklist you can follow that will help. Sorry, it's not guaranteed.

- Stop delivery of newspapers, milk, laundry, dry-cleaning, soft-water service, etc.
- Have postmaster suspend mail deliveries or arrange for neighbor to bring mail into house.
- Notify police of absence.
- Ask neighbor to keep an eye on house and leave vacation itinerary with him.
- Engage small person to do watering, cut lawn.
- Disconnect appliances and extension cords.
- Make certain kitchen range switches and valves are in off position. Lower thermostat on furnace.
- Check faucets to be sure they are tightly closed.
- Lock all windows, doors, and screen doors.
- Connect lighting fixture in bathroom to photoelectric switch which turns light on at dark, off when sun rises. (These cost less than \$5.)
- Place low volume-high expense goodies such as jewelry and cameras in safe place. And have a good one!

Authors

H. E. Guttman (1644) and B. H. Finley (3112), "Accuracy of Visual Spatial Interpellation," Vol. 13, No. 2, ERGONOMICS.

A. G. Beattie (5151) and J. E. Schirber (5150), "Experimental Determination of the Low-Temperature Gruneisen Parameter of Silicon from Pressure Derivatives of Elastic Constants," Feb. 15 issue, PHYSICAL REVIEW B.

N. S. Gillis (5151), "Self-Consistent Phonons and the Coupled Electron-Phonon System," Feb. 15 issue, PHYSICAL REVIEW B.

R. L. Fox (9341), "Effect of Inelastic Collisions on Electron Transport Coefficients," Vol. 13, No. 6, PHYSICS OF FLUIDS.

J. M. Worrell (1721), "Upper Semicontinuous Decompositions of Spaces Having Bases of Countable Order," Vol. 26, pages 493-504, PORTUGALIAE MATHEMATICA.

P. J. Roache (9343) and T. J. Mueller (University of Notre Dame), "Numerical Solutions of Laminar Separated Flows," March issue, AIAA JOURNAL.

R. K. Quinn and Patricia Neiswander (both 5154), "The Growth of Rhenium (VI) Oxide Single Crystals by a Vapor Transport Mechanism," Vol. 5, No. 5, MATERIALS RESEARCH BULLETIN.

F. G. Blottner (9341), "Finite Difference Methods of Solution of the Boundary-Layer Equations," February issue, AIAA JOURNAL.

D. W. Braudaway (7452), "Optimal Control of the Radioactive Voltage Standard," Vol. 8, No. 3, ISA TRANSACTIONS.

R. R. Eaton (9341), "Three-Dimensional Numerical and Experimental Flowfield Comparisons for Sphere-Cones," Vol. 7, No. 2, JOURNAL OF SPACECRAFT AND ROCKETS.

Bruno Morosin (5152), "Exchange Striction Effects in MnO and MnS," Vol. 1, No. 1, PHYSICAL REVIEW B.

N. J. DeLollis (5333), "Theory of Adhesion Mechanism of Bond Failure, and Mechanism for Bond Improvement," Vol. 43, No. 2, RUBBER CHEMISTRY AND TECHNOLOGY.

J. E. Boers (5254), "Digital Computer Simulation of Crossed-Field Electron Guns," Vol. ED-17, No. 4, IEEE TRANSACTIONS ON ELECTRON DEVICES.

P. J. Chen (1721), "On the Growth of Longitudinal Waves in Anisotropic Elastic Materials," Vol. 36, No. 5, ARCHIVE FOR RATIONAL MECHANICS AND ANALYSIS.

Credit Union Statements

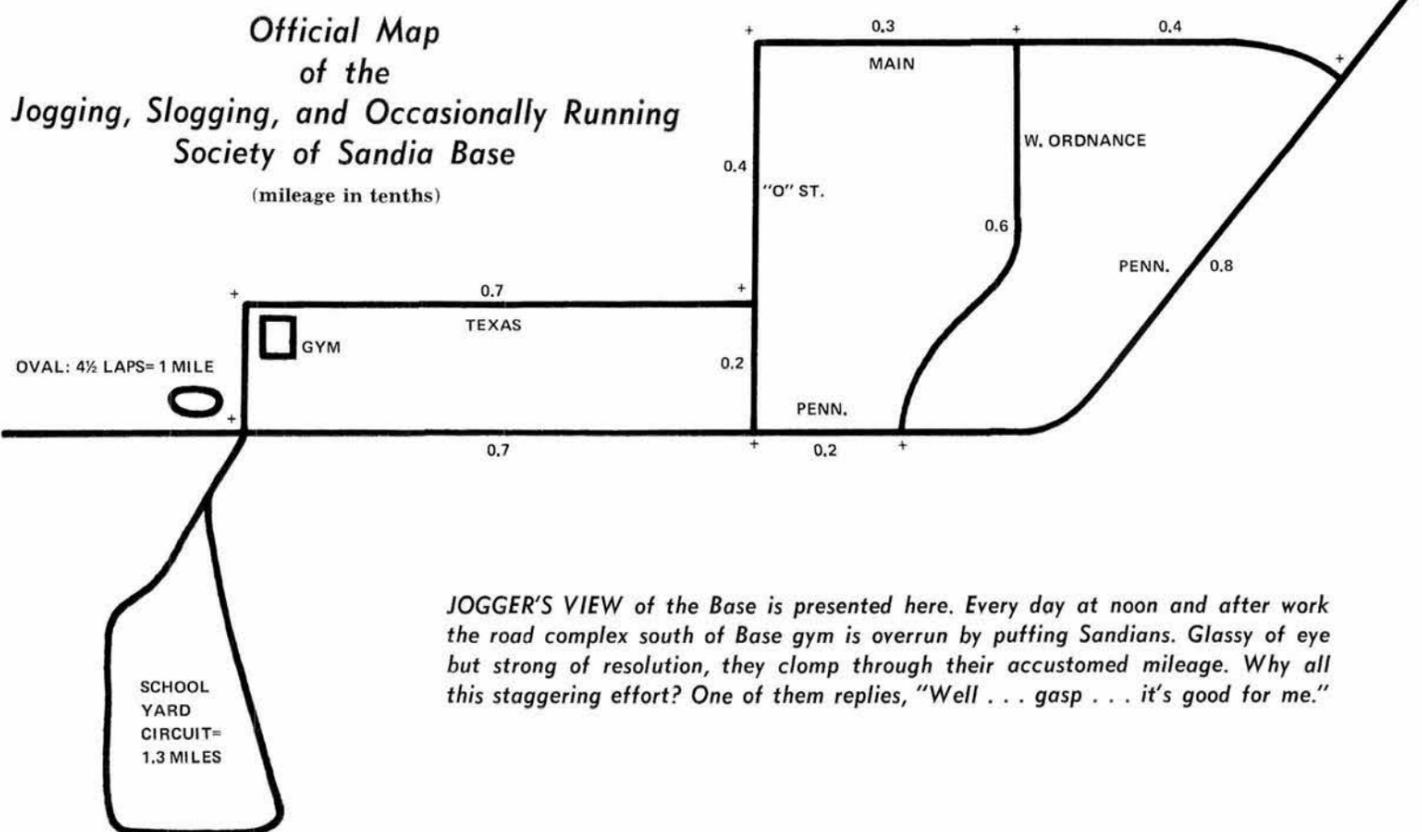
As part of its normal audit procedure, the Supervisory Committee of the Sandia Laboratory Credit Union recently mailed statements to members with account numbers from 7000 to 7999. If your account number is in this series and you have not received your statement, please notify Karl Waibel (4117), Committee Chairman.



Death

Tom Taylor, a camera operator in Photographic Services Division 3455, died June 26 following an automobile accident. He was 57.

He had worked at Sandia Laboratories 23 years, primarily in photometrics. Survivors include his widow and two daughters.



JOGGER'S VIEW of the Base is presented here. Every day at noon and after work the road complex south of Base gym is overrun by puffing Sandians. Glassy of eye but strong of resolution, they clomp through their accustomed mileage. Why all this staggering effort? One of them replies, "Well . . . gasp . . . it's good for me."



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LIVERMORE NEWS

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Supervisory Appointments



JAMES BARHAM to manager, Preliminary Design Department 8130, effective July 1.

After joining Sandia/Livermore in 1959, Jim worked for about five years in the test department on various projects in development and application of microwave, magnetic recording, and telemetry systems. In June 1965, he was promoted to supervisor of the Telemetry Development Division, and in May 1968 transferred as supervisor of the Preliminary Design Division.

Jim received a BS in electrical engineering from the University of California at Berkeley in 1959. Previously he attended Modesto Junior College, Modesto, Calif., following his discharge from the U.S. Air Force in 1955.

He is a member of the Institute of Electrical and Electronics Engineers.

Jim, his wife Valli, and their two children live at 622 Escondido Circle, Livermore.



ROBERT GAEDERT to manager, Personnel and Budgeting Department 8210, effective July 1. He also continues to serve as administrative assistant to the Vice President at Livermore (8000).

Bob has been an administrative assistant since he came to Sandia/Albuquerque nine years ago. He was first assigned to the Physical Sciences Research Department, then to the Nuclear

Burst Physics and Mathematical Research organization. In March 1965, he was promoted to supervisor of Administrative Assistant Division, assigned to the Vice President of Research (5000). In January 1969, he transferred to Sandia/Livermore.

Bob received his BS in business from Emporia State College in Kansas and his MS in business administration from Arizona State University. He is a member of the American Management Association and Pi Omega Pi, honorary business society.

He served four years in the Air Force, stationed half the time in England.

Bob resides at 1141 Concannon Blvd., Livermore.



ALVIN BAKER to supervisor, Physical Properties Acceptance and Evaluation Division 8137, effective July 1.

Al joined Sandia/Livermore in December 1965 in a project engineering division where he worked in vulnerability analysis and verification. In May 1969, he transferred to the preliminary design organization and has been involved in design concepts of advanced reentry vehicles.

Previously, he received a BS in aerodynamics, an MS in mechanical vibrations, and a PhD in dynamics from Oklahoma State University. As a graduate student, he held a research assistantship for three years.

He is a Fellow in the National Relay Association.

Al, his wife Nancy, and their twin daughters live at 2676 Kennedy Street, Livermore.



NEW SECURITY MONITOR REMINDERS — Sandy Howard (8310) displays the security monitor reminder to be used during the months of July and August. A series of these reminders has been developed by illustrator Ray Leri of Technical Art Section 8231-2. Bob Crow of Security Division 8261 coordinated the project.

Take Note

Jack Dini of Metallurgy Division 8312 served as technical chairman of the "Plating on Plastics" symposium held during the 1970 convention of the American Electroplaters' Society in Montreal, Canada, June 21-25. During the general session of the convention, Jack presented a technical paper, "Plating Gold on Stainless Steel," which he co-authored with John Helms (also 8312).

Jeff Sheline (8256-2), a trainee under Sandia's Work Experience Education Program for high school students, was awarded a trophy at the annual awards night ceremonies of the Atomic Soccer Club held recently at the Livermore Recreation Center. Jeff was honored for his contribution to the soccer program in the 16-18 year-old category.

Mary Benapfl (8264-1), also a trainee under Sandia's Work Experience Education Program, was one of six recipients to receive \$200 scholarships awarded recently by the Livermore Valley Charter Chapter of the American Business Women's Association. Mary plans to attend Chabot College in the fall.

Dick Wilhite of Plant Engineering Planning Division 8251 has been elected secretary of the Livermore Chapter of the California Society of Professional Engineers for 1970-71. Last year he served as chairman of the professional relations committee and the previous year as a board member.

Charles Mauck of Project Engineering Division 8162 has been elected president of the San Francisco Chapter of the Society of Aeronautical Weight Engineers for 1970-71. This past year he served as secretary of the chapter.

Bill Jamieson, supervisor of Public Relations and Services Division 8235, was recently elected vice chairman of the Valley Council for Mental Health. The Council has been responsible for establishing the Valley Health Clinic and funded the Inter-Church Counseling Service drug abuse program.

Mike Ferrario (8273) captured the men's singles championship in the Novice Tennis Tournament sponsored recently by the Livermore Tennis Club. The club plans to feature the novice tournament as an annual event.

Jim Shelby (8331) presented a technical paper at the American Ceramics Society meeting held in Philadelphia May 4-6. Titled "Internal Friction of Sodium Germanate Glasses," the paper was co-authored with Dr. D. E. Day of the University of Missouri.

Building Contract Awarded For Additional Facilities At Livermore Laboratories

An addition to the south end of Administration Building 911 and a new explosive assembly building (Bldg. 983) in Area 8 are underway at Sandia Laboratories Livermore. N. H. Sjoberg & Son Construction Company of Oakland will construct the facilities.

The addition to Bldg. 911 will contain 2400 square feet of space. A single story concrete structure, the addition will blend with the existing building in architectural treatment. It has been designed as a new main entrance to the Laboratory and to provide improved visitor control and employee convenience.

Building 983 is a single story, reinforced concrete structure with a single story masonry service area. Containing 1700 square feet of space, the facility provides the means for assembly and disassembly of flight test units.

Work is scheduled for completion about the first of the year, and includes a small, earth-covered explosive storage magazine in Area 8.

Personnel of Plant Engineering Planning Division 8251 working on the project are Jim Harter, Jim Smith and Dick Wilhite.

Touring in California . . .

Flower shows are popular events in California. Even most of the county fairs feature floral exhibits and model gardens.

Here's a checklist of upcoming shows and fairs in and around the Bay Area:

- July 2-5—Marin Art and Garden Fair, Ross
- July 2-5—Napa County Fair, Calistoga
- July 13-25—Sonoma County Fair, Santa Rosa
- July 27-Aug. 8—San Mateo County Fair, San Mateo
- July 29-Aug. 2—Contra Costa County Fair, Antioch
- Aug. 6-9—Napa Town and County Fair, Napa
- Aug. 14-23—Santa Clara County Fair, San Jose
- Aug. 21-Sept. 9—California's State Exposition and Fair, Sacramento
- Aug. 27-30—San Francisco County Fair and Flower Show, Hall of Flowers, San Francisco

When visiting the Hall of Flowers, located at Ninth Avenue and Lincoln Way in San Francisco, don't forget the adjoining demonstration gardens which occupy six acres in the Strybing Arboretum and the year 'round show on another 41 acres open to the public. Check at the arboretum's information stand for plants currently in bloom.

A Little Different: Stained Glass, '70

"The art form of stained glass has intrigued me since art school days in Boston," recalls Joe McManus (8231). "I was influenced by frequent assignments in school to draw the nearby Corning stained glass works, and I've long wanted to design and build a stained glass window myself. By the time I got around to it, advances in plastics opened the way for newer approaches to window design."

Joe's first work is a one-by-six-foot window in the entryway of his home. Its light grey framework is complemented by the vibrant colors of the plastic—blue, green, orange, yellow and red. By daylight, the

white light of the sun is transformed into shades of orange, yellow and red. At night, houselights bring out the blues and greens.

Designing and making the window presented problems. First effort was concentrated on making small models to learn how plastic behaved during the coloring, pouring and forming phases. Various materials were tried to determine which was most suitable for the molds. Clay or rubber molds weren't quite right, but aluminum foil appeared to offer the best solution.

"It took several experiments before the foil could be used successfully," relates Joe. "The hardened plastic shapes wouldn't separate from the mold, and heat discolored the plastic shapes. Finally, I hit upon a combination of foil and spray lubricant that would do the job."

More pioneering followed and, in time, Joe settled on a method for making the window. The design was drawn on a sheet of plywood the size of the entryway window. Cardboard patterns were cut out for the colored shapes in the design. These patterns shaped the bottom of the aluminum foil mold.

Dye-colored plastic resin with a catalyst added for hardening was then poured into the mold and allowed to set. When removed, the one-and-one-half inch thick shapes were filed and sanded. A thin coat of clear plastic was applied to eliminate imperfections.

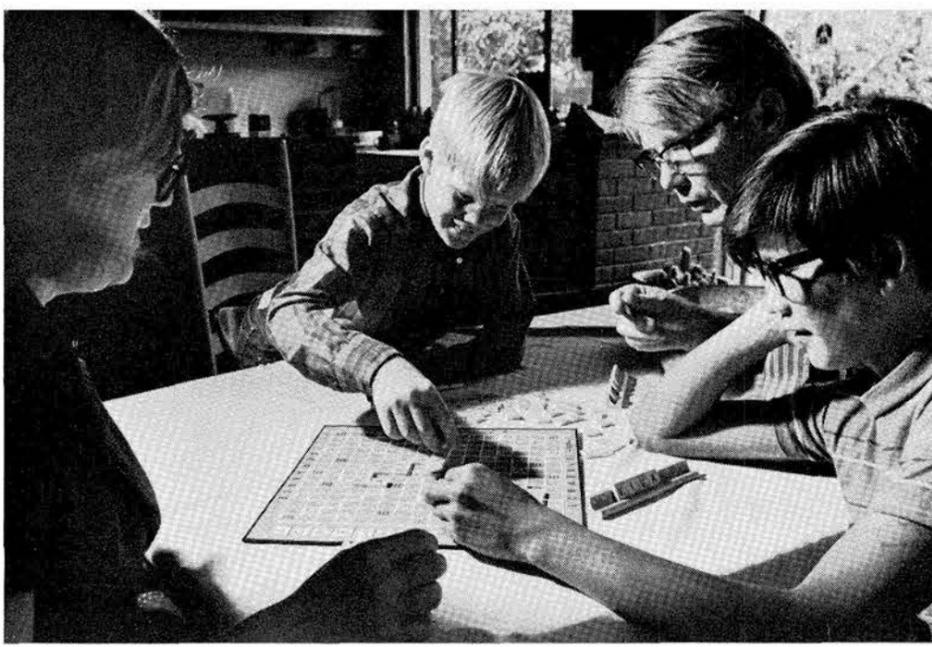
Working on a ping-pong table, Joe clamped a grooved redwood frame to a mylar-covered, one-by-six-foot piece of plywood (the mylar let the design show through but prevented wood-grain impressions on the plastic). A one-eighth inch layer of clear plastic was poured into the frame and allowed to harden.

A second one-eighth layer of clear plastic was poured over the first. Before the plastic set, the design shapes were positioned according to the pattern and their edges sealed (to keep other colors from running underneath them). A final one-quarter inch layer of grey plastic mixed with washed aquarium sand was then poured between shapes.

"From start to finish," recalls Joe, "the project took a month and cost \$36. But that's insignificant—being creative and doing it myself is the name of the game."



WE NEED COLOR to do justice to stained glass window done by artist Joe McManus (8231). He's holding earlier try. Joe used entirely new home-grown technique in making window.



FAMILY FUN at the McHarneys includes frequent games of scrabble (left to right, Caryl, Andrew, Mac, and Eddie Begaye), as well as woodworking in the garage, creative art in Caryl's studio, or merely feeding a menagerie of ducks, chicks, and rabbits. Eddie, a Navajo, has been a member of the family for four years.

The McHarney Program

Person-to-Person Work With Navajos Rewarding To Both Sides

Rupert McHarney (3417) and his wife Caryl have their own brand of Peace Corps. In the past few years, through their church, they have worked closely with Navajos from the Huerfano area, about 20 miles southeast of Farmington. It all started when the Navajo mission church was "adopted" by St. Mark's on the Mesa (in Albuquerque) and Mac and his wife—both former school teachers—were asked to conduct a summer Bible school there. Caryl had studied archaeology and anthropology and was already somewhat familiar with the Indian way of life.

Their initial meeting with the Navajos (primarily women) was through an interpreter and there were long periods of silence—a characteristic of these discussions. The Navajos were asked, "Would you like to have someone come out this summer? What would you like to have them do?" The Indians decided they would like to think about the idea a week. The McHarneys made the 320-mile round trip a second time and were accepted.

Since Mac and his wife are both artists, their program for the two-week vacation school was primarily visual, which helped to reduce the language barrier and cultural differences.

"After only two weeks," Mac says, "we realized that these Indians were sitting on the fence between Navajo traditions and 20th century life. So we thought we could give them some help in dealing with problems of transition—when and where they wanted to be helped."

One activity involved young Indians. The first year they took four teenagers home with them for the Fourth of July holiday. The Navajo boys joined the four McHarney children in a typical observance—picnic, swimming, fireworks. "We soon discovered that we had to act a little like a Navajo—just sit and observe. If we asked too many questions, the boys felt we were prying," Mac recalls. From this initial experience evolved a more ambitious program, and five teenagers from the Huerfano area now are staying with Albuquerque families. It is hoped that the young people selected for this program will benefit from the relationship and will be better prepared as potential leaders in their Navajo community.

The McHarneys provided a creative environment for John Tsosie, a young adult who had training in welding and became artistic in his application of this skill (his delicate flowers of copper and brass were popular items in the New Mexico Arts and Crafts Fair in 1968). John is now back on the reservation, training home improvement teams who work under Navajo tribal programs. "He comes and goes as any Navajo does," Mac says, "and he belongs where he wishes to belong. John learned something of how to cope with off-reservation life and moves easily in both societies."

Another member of the McHarney family for the past four years has been Eddie Begaye, now a student at Highland High School. He wants to become a school teacher on the reservation.

"When we visit Eddie's family on the reservation, we no longer wait outside until we are invited into the home. Now we're treated like relatives. When we drive up, the children swarm around us; before

they would scatter out of sight," Mac says.

The McHarneys continue to teach in the summer church school and, through study at the University of New Mexico, Caryl is becoming fairly fluent in Navajo.

Their work with the Indians also has economic overtones. Several times the McHarneys have borrowed Navajo rugs from UNM's Maxwell Museum of Anthropology to show the women examples of fine quality weaving. Weaving in the Huerfano area has improved and some rugs are being sold through the mission.

Last summer five Navajos and a number of their children traveled to Albuquerque (many for the first time) where they made and sold Indian fry bread at the Arts and Crafts Fair. They profited in a feeling of self-achievement as well as money. Mac and Caryl helped them with the original idea and with merchandising tips.

For the McHarneys their involvement with the Indians has been a lot of work but a source of great satisfaction. "Sure we help them—but the experience is adding another dimension to our lives," Mac notes.

Supervisory Apointment



ALLEN CHURCH to supervisor, A&F Systems Division 9132, effective May 16.

Since joining Sandia in April 1955 as a staff member, Allen has worked on power supplies development, transverter development and later, when assigned to the Sherwood Project Group, helped design the 12-mega-joule capacitor bank. He was promoted to section supervisor of a semiconductor group in 1958. In January 1964 he transferred to his present organization where he has been working on component development and systems projects.

Before his employment with Sandia, Allen attended Stanford University and received a BS degree in electrical engineering. He is a member of the Institute of Electrical and Electronics Engineers. He served with the U.S. Army for two years.

Allen, his wife Carolyn and their two daughters live at 3018 Hyder SE.

Promotions

Mary Ellen Bopp (3256) to Secretarial Steno
 Cathleen Casper (3256) to Secretarial Steno
 Helene Chavez (3256) to Secretarial Steno
 Ida Chavez (3256) to Secretarial Steno
 Anna Maria Farina (3256) to Secretarial Steno
 Erlinda Garcia (3256) to Secretarial Steno
 Edward Haut (1526) to Lab Staff Associate
 Antoinette Haws (8212) to Secretarial Steno
 Margaret Kirchner (3256) to Secretarial Steno
 Helen Payne (3256) to Secretarial Steno
 Rowan Shipman (3256) to Secretarial Steno
 Florence Ann Urist (3256) to Secretarial Steno
 Magdalena Vigil (3256) to Secretarial Steno
 Karleen Walters (3256) to Secretarial Steno
 Harold Widdows (9324) to Tech Staff Associate
 Sharon Heckler (8310) to Secretarial Typist
 Sandra Howard (8310) to Secretarial Typist
 Carol Vurity (8231) to Editorial Assistant

U. of Chicago Electron Microscope Shows Atoms Within Molecular Chain

Scientists can now "see" a single atom within a molecular structure through use of a new technique developed at the University of Chicago.

Using a scanning electron microscope designed and built by Professor Albert V. Crewe under a contract with AEC, the University scientists saw and photographed single uranium and thorium atoms set in molecular chains and magnified a million times. Crewe's electron microscope provides both high contrast and high resolution. The work is described in detail in a forthcoming article entitled "The Visibility of Atoms," in SCIENCE magazine.

Crewe said the ability to see individual atoms within molecules should greatly enhance research in many fields, especially medicine, biochemistry and genetics. He said the technique would be particularly valuable in analyzing chromosomes and cancer cells.

Commenting further on the technique, Crewe said: "The ability to see the atom, even of high atomic numbers, will certainly enlarge the scope of biochemistry and molecular biology . . . (and) may make it possible to determine shapes of molecules and their relationships. In addition, the chemistry of this technique could be examined more closely if the atoms could be seen, and the precision of atomic locations and the degree of reaction could be studied."

Woof, Warp Types

The Parkers Work at Weaving Trade

Don Parker (3311) and his wife Janet have achieved a happy balance in their hobbies — she weaves and he builds weaving looms.

"I don't have a feel for textures," Don says, "so I leave the aesthetic matters to Jan and stick to the mechanics of the weaving process." Don has made carved furniture and cabinets for a number of years in his garage workshop. When his wife began weaving five years ago, it was only natural for him to look at commercially-available looms and come up with what he felt was the best combination of features.

The result is a loom with a jack-type shed, which means that each foot treadle operates any combination (or number) of harnesses, and a wide space is provided for working the shuttle. Another feature is that the cords which tie-up the harnesses are located on the side of the loom, a more convenient location than underneath the working surface.

Janet's interest in fabrics led to her learning to weave. As she became more proficient, she tried spinning her own wool; of course this was on a spinning wheel that Don whipped up in his spare time. "Raw

Because atoms are smaller than the wavelength of visible light it is not possible to reveal them with an optical microscope, no matter how powerful it may be. Although individual atoms have been imaged by the field ion microscope, until now there has been no way to view single atoms within a molecular structure.

Continued from Page One

FASTEST GUN

bore. The barrel is evacuated with a vacuum pump before each shot. Weight of the powder plus weight and geometry of the projectile are factors which control impact velocity. Powder charges up to 20 pounds may be used.

Advanced instrumentation to measure and record test data includes quartz gages, slanted resistors, velocity interferometers and x-rays.

"As we gain more experience with the gun we are achieving more control," Bob May says. "We believe that eventually we will be able to achieve velocities up to 10,000 fps under precise control with the present setup."

The gun can be modified relatively easily into a light gas gun using helium as the driving fluid, which should allow velocities well above 30,000 fps to be achieved.

wool is available locally and I have experimented with vegetable dyes," she explains. "Mainly I've used marigolds, chamisa, mistletoe, canaigre (a mesa weed with large amounts of tannin in its roots), juniper branches, and prickly pear. With prickly pear, you get a pink dye by using the fermented juice."

The 36- and 45-inch looms do have some limitations, so Janet turns to a circular loom for creation of wall hangings. She now uses old barrel hoops and works the yarn by hand directly onto the frame.

The Parker's weaving and woodworking hobbies have their practical aspects. Janet weaves the material and tailors her own coats, suits, dresses, and ponchos, and has instructed two classes in weaving; Don repairs antique spinning wheels when he has time; their 12-year-old son is weaving and selling "Inca" belts to finance a new bicycle; their 10-year-old daughter also enjoys using a small loom.

The Parkers will have a booth at the New Mexico Arts and Crafts show in Albuquerque this summer, and Janet currently has a piece of her weaving on display at the New Mexico Craftsmen Biennial Exhibit at the Museum of International Folk Art in Santa Fe.



LOOM BUILDER Don Parker (3111) watches while his wife Janet weaves fabric for a nubby wool poncho. This 45-inch loom is of Philippine mahogany. A 36-inch prototype, also made by Don, is of pine.

Speakers

W. E. Alzheimer (1544), "Flyer Plate Loading of Circular Rings," and J. C. Crawford (5153), "A Piezoelectric Field Effect Strain Gauge," Society for Experimental Stress Analysis 1970 Spring Meeting, May 19-22, Huntsville, Ala.

R. K. Cover (1724), "SID—An Image Digitizer"; M. K. Weston (1724), "PREM—An Algorithm for Simplifying LOOPS—The Contours from CAP"; B. W. Lindsay (1724), "Some Details of CAP, the Software of SIDCAP"; D. R. Morrison (1720), "CAP—Connector Analyzer and Plotter, the Software Component of SIDCAP," Forum of Control Data Users, May 25-27, Minneapolis.

D. W. Braudaway (7452), "A Truly Transportable Standard Cell Air-Bath," Conference on Precision Electromagnetic

Measurement, June 2-5, Boulder, Colo.

J. W. Reed (9150), "Low Frequency Periodicities in Panama Rainfall Runoff," Symposium on Tropical Meteorology, June 2-11, Honolulu.

S. R. Booker (7452), "Development and Evaluation of Electro-Optical High-Voltage Pulse Measurement System," 1970 Conference on Precision Electromagnetic Measurements, June 4, Boulder, Colo.

Calla Ann Crepin (3424), "Processing of Technical Reports—With an Emphasis on Changes in Techniques," 61st Annual Conference, Special Library Association, June 6-12, Detroit.

G. H. Miller (5235), "Emission Cross Sections for the N_2 Second Positive (O,O) Transition for H^+ and H Impact," 1970 Summer Meeting of the American Physical

Society, June 22-24, Winnipeg, Canada.

S. B. Martin (2325), "Design, Manufacture and Test of a Fluidically Controlled Hydrazine Roll Rate Control System," AIAA Sixth Propulsion Joint Specialist Conference, June 22-26, San Diego.

D. J. Coleman (3313), "A Detector for Health Physics Monitoring of Pulsed Neutron Sources"; B. L. O'Neal and T. R. Crites (3312), "An Abbreviated Thermoluminescent Dosimeter Annealing Procedure," 1970 Annual Meeting of the Health Physics Society, June 28, Chicago.

J. R. Holland (5321), "Capsule Materials for Space Isotopic Heat Source: Compromises Between Capabilities and Requirements"; S. McAlees (9513), "Design Concepts for Intact Reentry of Radioisotope Heat Sources," 16th Annual Meeting of the American Nuclear Society, June 28-July 2, Los Angeles.

A. J. Clark (9510), "Sandia's Role in the Space Program," Civitan Club, June 18, Albuquerque.

H. D. Sivinski (1740), "Planetary Quarantine," Research Society of America, June 23, Albuquerque.

R. A. Matthews (3454), "Suicide Prevention and Crisis Center," Rio Grande Lions Club, June 26, Albuquerque.

R. T. Walsh (5162), "Optimum Difference Method"; M. R. Scott (5222), "Eigenfunctions Via Nonhomogeneous Equations," 1970 SIAM National Meeting, June 29-July 1, Denver.

O. L. George (9322), "An Analysis of Experimental Hypersonic Data from the Flowfield Around a Yawed Sharp Cone"; W. S. Saric (9341) and B. W. Marshall (9511), "An Experimental Investigation of the Stability of a Thin Liquid Layer Adjacent to a Supersonic Air Stream"; J. F. Muir (9341) and A. A. Trujillo (9322), "Experimental Investigation of the Effects of Nose Bluntness Free-Stream Unit Reynolds Number and Angle of Attack on Boundary Layer Transition at a Mach Number of 6," AIAA Third Fluid and Plasma Dynamics Conference, June 29-July 1, Los Angeles.

E. P. EerNisse (5112), "Properties of Avalanching $P^{+}N^{+}$ Junctions with Carrier Trapping," 1970 Device Research Conference, June 29-July 2, Seattle.

W. S. Saric (9341), "The Stability Circular Couette Flow of Binary Mixtures," Sixth National Congress of Applied Mechanics, June 15, Harvard University.

K. J. Touryan (9340), "Recent Developments in High-Temperature Technology at Sandia Laboratories," 16th Annual Technical Meeting of the Institute for Environmental Studies, April 15.

P. J. Roache (9343), "Some Fundamental Relations for the Flight Mechanics of Maneuvering Reentry Vehicles," AIAA Atmospheric Flight Mechanics Conference, May 13, Tullahoma, Tenn.

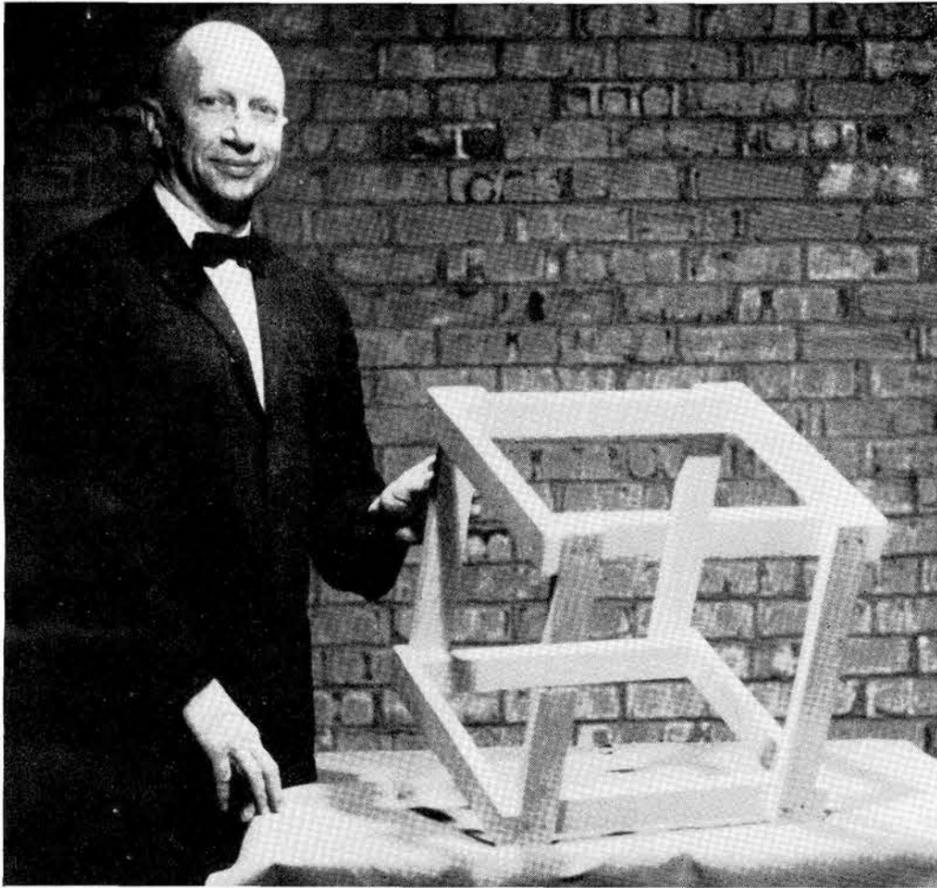
J. M. Worrell (1721), "Some Remarks Concerning the Nagata-Smirnov Theorem," International Conference on General Topology and Its Application, June 8, Pittsburgh.

G. A. Samara (5132), "Pressure Dependence of the Dielectric Properties of Ferroelectric Crystals"; R. A. Graham (5132) and C. L. Julian (7342), "Effects of Elastic Shock Compression on Conductivity of Germanium"; and L. C. Bartel (5132), "Effects of Pressure on the Properties of Itinerant Ferromagnets," Gordon Research Conference, June 15-19, Plymouth, N.H.

O. E. Jones (5130), "Energy Transfer, Hydrodynamics and Shock Phenomena," UNM Short Course on Industrial Applications of Nuclear Explosives, June 1-3, Albuquerque.

J. A. Brammer (5165), "Elevated Temperature Elastic Moduli of 2024 Aluminum Obtained by a Laser-Pulse Technique," 1970 Society for Experimental Stress Analysis Spring Meeting, May 19-22, Huntsville, Ala.

O. E. Jones (5130), "Shock Waves and the Mechanical Properties of Solids," Third International Conference on High Pressure "Solids Under Pressure," May 11-15, Aviemore, Scotland.



"MAN, BRICK WALL, & CRATE" is title of this serene photographic composition. Note subtle expression of subject, Norm Richardson (5224)—almost Mona Lisaesque. Picture deserves some sort of award.

Service Awards

20 Years



Lester Baumann
3520

Robert Blount
100

Melvin Merritt
9150

15 Years



Frances Aaron
4213

Ben Bader
9328

Carmel Mares
4612



Gladys Olguin
9415

Genese Shieler
7511

Victor Sirwinski
2444

10 Years

Paul Stokes 1516, John Keizur 1911, Doyle Morgan 2314, Ronald Oelsner 2451, Donald Anderson 7371, Richard Ashbaugh 9125, Benjamin Sewell 9217, David Nokes 2452, Richard Thompson 7624, Joseph Rodzewich 7651, Paul Dubois 4574, and Gordon Snidow 3417.

SHOPPING CENTER ● SHOPPING CENTER ● SHOPPING CENTER ● SHOPPING CENTER

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

RULES

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

FOR SALE

MISCELLANEOUS

- NEW PAIR heavy duty camper jacks. Newton, 255-2074.
- '67 KAWASAKI motorcycle, 175cc, trail model, new rear tire & battery, \$200. Shurtleff, 255-6635.
- RADIO CONTROL: F&M 5-channel proportional; 1 xmtr., 2 receivers, 8 servos, nicad regg. batteries & chargers for xmtr. & receiver, \$165 takes all. Lenz, 298-3872.
- 25-GAL. AQUARIUM w/reflector, stand, pump, gravel, filter, etc., value new over \$115; sell for \$50. Krumm, 299-2279.
- SHOP MANUAL, '60 Corvair, \$2. Roberts, 255-9527.
- METAL car top carrier; hand mower; ice chest; 10' swimming pool; ice skates; 9x12' tent; drawing table. Matsko, 299-2145.
- REMINGTON MODEL 742 semi-auto. rifle, .30-06, used one time, \$125 (\$35 below retail). Martin, 299-6768.
- THORENS TD-135 turntable w/integrated tonearm, 5-sp., w/Shure ND-21 cartridge, \$65. Kjeldgaard, 296-2212.
- CAMPER SHELL for pickup w/short wide box. Goens, 282-3492.
- WASHING MACHINE, portable, Hoover, auto. spin-dry, used 6 mos., cost \$159.95, first \$115 takes it. Burns, 255-3737.
- LABRADOR RETRIEVER puppies, AKC litter reg., males, \$50, females, \$35. Morrison, 855-6244.
- ELECTRIC HEDGE TRIMMER, 15" double-edged blade, \$10. Robertson, 296-4613.

FRIGIDAIRE range & convert. dishmobile; new, white, bubble lighting fixture; Danish modern coffee & end tables; utility cart. Durkee, 298-9278.

CLARINET, w/case, \$50. Smaier, 299-8413.

YOUTH BED w/springs & mattress. Womack, 256-0642.

15 WATT Lafayette monaural amplifier & old Heath FM tuner w/manuals, both \$10. Woods, 296-4741.

2-PIECE sectional couch, each opens into twin bed, complete w/mattresses, \$100; blonde cocktail & end tables, \$25. Grimes, 299-2548.

GENERATOR for Opel or small car, 12 volts, 25 amps, w/regulator, \$10. Henry, 1828 Florida NE, 256-2467.

PUSH lawn mower, make offer. Riley, Bosque Farms, 1-636-2119.

DAVENPORT, Early American style, makes into bed, old but useable, \$30. Payne, 8009 Sierra Azul NE, 299-5966.

9 HP gasoline motor w/gear reducer, \$125. Eaves, 299-7728.

AIR DUCTS, 8 x 16 x 36 & 8 x 16 x 72, \$5 & \$10; ornamental iron post, \$5; Jacobson 2-cycle gasoline mower, \$12. Sutton, 298-0001.

LARGE DOG HOUSE, \$25. Berman, 296-5640.

4 6:95x14 tires w/rims, \$10 ea.; bowling ball & carrying bag, \$6; body of '58 Chev., no motor, \$20 or best offer. Sanchez, 242-3625.

SHOP vacuum cleaner, Sears' 30-gal. w/attachments, \$25. Allen, 299-9075.

RUGGED, simple to use Dwell Meter for any type engine, \$5. Stuart, 265-7315.

SHEEP. Montano, 877-2509.

BICYCLE, boy's 24", thornproof tubes, \$25. Booker, 299-3554.

PACK MULE trail minibike, \$75; pinball machine, \$75; unicycle, \$10; Kawasaki & Riverside gas tanks, \$5 ea. Weber, 298-1564.

2 HI-FI speakers, enclosures are blond & each 35" h, 25" w, 16" d, 8 ohm impedance, rated at 100 watts each, both for \$75. Snelling, 268-5895.

BEAGLE PUPS. Hart, 282-5220.

CARS & TRUCKS

'56 190 SL MERCEDES BENZ. Riley, Bosque Farms, 1-636-2119.

'64 PLYMOUTH 4-dr., PS, AC, other extras. Helm, 877-1835.

'63 FORD 1/2-ton pickup, lwb, 4-sp., 6-cyl., limited slip, \$750. Randle, 867-2668.

'64 OLDS sport coupe, PS, PB, AC, R&H, fiberglass tires. Osborn, 7910 Robin NE, 298-6158.

'64 VOLKSWAGEN with '65 engine, white, \$895. Tafaya, 299-5035 after 5:30.

'68 MUSTANG convert. GT, 4-on-the-floor, \$1850 or best offer. Minor, 1114 Field NE, 299-6302.

'58 CHEVY, big 348 cu. in. motor, electric fuel pump, PS, PB, dual speaker radio, transmission needs work, \$100. Graham, 255-6585.

'63 FORD Galaxy 500, \$375, see at 520 Dallas NE. Trujillo, 255-5053.

REAL ESTATE

3-BDR., den w/fp, 1 3/4 baths, built-in range, AC, landscaped, assume 4 1/2% w/second for part equity. Eckart, 299-3888.

5 ACRES Mtn. on Hwy., elec.; 5 acres Placitas near development, water, elec. Crosby, 255-4737.

MOUNTAIN CABIN on 1.95 acres, wooded, 45 min. from Abq., west of Chilili, 12x27' cabin needs some finish work on inside. Robertson, 299-3934.

UNIQUE 3-level rock & redwood home w/view on 1 acre in Mts., 7 miles east of town. Wahlberg, 345-0890.

WANTED

INTERESTED in renting 2 16' travel trailers for 3 wks. beginning July 10. Banos, 265-2558.

3-BDR. HOUSE for 1-yr. lease, drapes, carpeting & appliances included, NE area, starting Aug. 15. Gottlieb, 298-9859.

WELDING OUTFIT: electric, 220V single phase or gas engine driven, reasonable price. Butler, 299-1316.

'64-'68 JEEP Wagoneer, 4-wd, auto. or manual trans., V8 or 6-cyl., reasonable mileage, good condition. Stuart, 265-7315.

ONE ACRE West end Tijeras Canyon, outside city limits. Norris, 255-0118.

HOME for Great Dane, needs lots of room to run, gentle, obedient & handsome. Chandler, 296-8149.

MAN'S & woman's 26" lightweight bicycles, good condition. Sektnan, 296-5396.

HIGH SCHOOL junior or senior will babysit in your home full or part time, experienced & have own transportation. Roherty, 296-2618.

LOST AND FOUND

LOST—Drop carrying w/turquoise stone in cage, blue zippered Corp. briefcase, Rx safety glasses w/brown frames & black case, Rx sunglasses w/black frames & case, G1 issue Rx safety sunglasses w/grey frames. LOST AND FOUND, tel. 4-2757, Bldg. 832.

FOUND—Rx glasses w/dark tortoise shell frames (Suffolk), pocket knife, brass case w/2 blades. LOST AND FOUND, tel. 4-2757, Bldg. 832.

Alternative to Dust: Stick to Paved Roads

What can you do to alleviate Albuquerque's air pollution problem? Art Arenholz (9428), after seeing recent articles in the LAB NEWS on the subject, came up with this concrete suggestion: "There are a few employees who drive on the dusty roads south of Central and east of Eubank. They save a few minutes of time, but they produce clouds of dust that drift over the surrounding area. Stick to the paved roads. It will cut down on the amount of dust added to the air and, incidentally, be easier on cars."

The Albuquerque Environmental Health Department blames 28 percent of the city's overall pollution problem on dirt roads. If you have to drive on an unpaved road, drive a little slower to prevent stirring up so much dust.

INDEPENDENCE DAY CELEBRATION

BAND CONCERT FUN & GAMES SPECIAL PRICES

MARY ELLEN FRESQUEZ (46751)

CORONADO CLUB PATIO & TWIN POOLS

Coronado Club Activities

Special Social Hour Tonight, Fourth Of July Picnic; Birthday Party Set

RAY McKINLEY and the Glen Miller orchestra will play for the Coronado Club's 20th Anniversary party Saturday, July 18. It will be a great party—a free mai tai for everyone, a super buffet featuring barbecued baron of beef, lobster newburg, seafood cocktail, plus assorted salads and a gigantic birthday cake.



Ray McKinley

There are those of us who, believe it or not, were young during the era of big bands—late 30's and early 40's. We remember Ray McKinley had one of the finest big bands. He's a classic drummer with a beat like a metronome: solid, swinging. He also worked with the Dorsey brothers and with Miller during the group's great years. After Miller died in WW II, McKinley continued the tradition of big band swing and kept it modern and fresh.

Tickets for the 20th Anniversary party (\$6.50 for members, \$7 for guests) should be picked up by Monday, July 13.

TONIGHT, a special social hour starts right after work and continues until 10 p.m. The Gerald Bordewick Show, booked direct from Lake Tahoe, will present two shows and play for dancing. The versatile group performs everything from the old standards through rock and country western and features a wild girl singer/dancer.

Club manager Jim Noonan has created a special Italian buffet for the evening but did not raise prices—still \$1.25 for adults and \$1 for kids. It's okay to take your dinner to the patio. Meet the family by the twin pools and have a ball.

CELEBRATE the Fourth of July with fun and games on the Coronado Club patio. The pools open for recreational swimming at 11 a.m. At noon the 35-piece Albuquerque Parks and Recreation Band will present a concert. Contests for kids and adults will fill the afternoon. Two hot dogs, baked beans and a soft drink will sell for 40 cents starting at noon. A happy hour bar will be in operation and the price of beer will be 10 cents from 11 a.m. until 6 p.m. Egad, a real old fashioned celebration with old fashioned prices! The pool and snack bar will be open until 9 p.m.

EXCEPT for the twin pools and the patio snack bar, the Club will be closed tomorrow for the holiday.

REGULAR Social Hours resume Friday, July 10, with Frank Chewiwie on the bandstand and seafood the buffet feature. On July 17, southern fried chicken will be

spread for the buffet while Bob Banks and the trio play for dancing. In the meantime, midweek social hours continue on Tuesdays from 5 to 8 p.m.

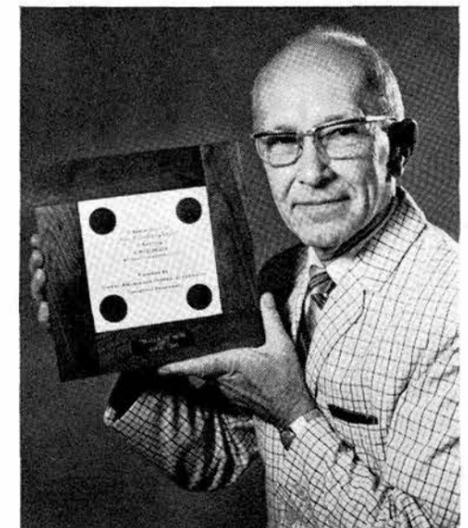
CHARLIE CHAPLIN will star in the Classic Comedy film Thursday, July 16, with Marie Dressler in a sidesplitter called "Charlie's Big Romance." The second episode of Flash Gordon will also be shown. A happy hour starts at 7 p.m., the movie at 8 p.m. It's free to members.

TEENAGERS will enjoy another dance session and pool party on Saturday, July 11. A group called "The Black and White" will be plugged into the bandstand from 7:30 until 10:30 p.m. Member parents should pick up tickets for their youngsters.

DUPLICATE BRIDGE group meets Tuesdays at 7 p.m. and is looking for new members. Call Virgil Bailey (2492), 299-5460, for additional information. The group is planning an open pairs tournament on Tuesday, July 28, with trophies and master points to be awarded winners.

Coronado Ladies Bridge meets Thursday, July 16 at 1 p.m.

Take Note



WILL SCRANTON (7614), president of Los Vagabundos Amigos, displays an award from the Albuquerque Chamber of Commerce for boosting the city as a convention center. Will was instrumental in arranging an excursion of the national Holiday Rambler Travel Trailer Club through "Indianlands of New Mexico." A group of 100 vacationers spent several days here headquartered at the State Fair Grounds.

Help! Plans for a reunion of former Pennsylvanians are underway. A member of the planning committee recalls that a Sandian had the complete list of attendees at the last reunion, but his identity is unknown. If you possess such a list, call Louise Lewis, 255-3316.

Richard M. White (9522) was one of the Sandian employee students to receive a Master's degree in math during recent commencement exercises at the University of New Mexico. He was a participant in the Laboratories' Computer Science Program.

Cowboy Artists of America elected Gordon Snidow (3417) president and former Sandian George Marks, secretary-treasurer, during the group's recent annual meeting in Oklahoma City.

The meeting was held in connection with the Fifth Annual Cowboy Artists of America Exhibit preview at the National Cowboy Hall of Fame. Both men also had paintings entered in the show.

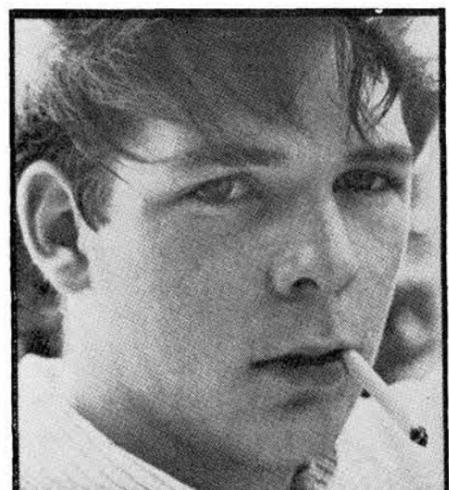
Bright Idea?

— Maybe

It sounds like a bright idea to solve your problem—no work, no expense. Just replace that grimy, blackened grill on your barbecue with a clean shelf from the old refrigerator. You wonder why you didn't think of it sooner.

Before you make that substitution, consider this: Silver solder, used to join parts of refrigerator shelves, contains about 20 percent cadmium, to inhibit rusting and for other protective uses. During heating, silver solder melts, releasing cadmium in gaseous form which may contaminate any food on the grill. At least three deaths are known to have occurred because of cadmium poisoning from this source. So stick with the grimy grill, or replace it with a grill designed for use over charcoal.

The Smoking Breed



WISE GUY

Likes to keep a cigarette in his mouth when he talks. Very hard to understand.

Cigarettes kill - why go up in smoke?

Events Calendar

July 3 and 11—"La Traviata" and July 4, 10, 17, "Le Rossignol" and "The Globolinks," Santa Fe Opera.

July 4—Wheeler Peak, New Mexico's highest point. N.M. Mountain Club, leader Harry Wyeth, tel. 299-1327.

July 5—Peralta Canyon near Tent Rocks. N.M. Mountain Club, leader Willard Converse, tel. 247-4568.

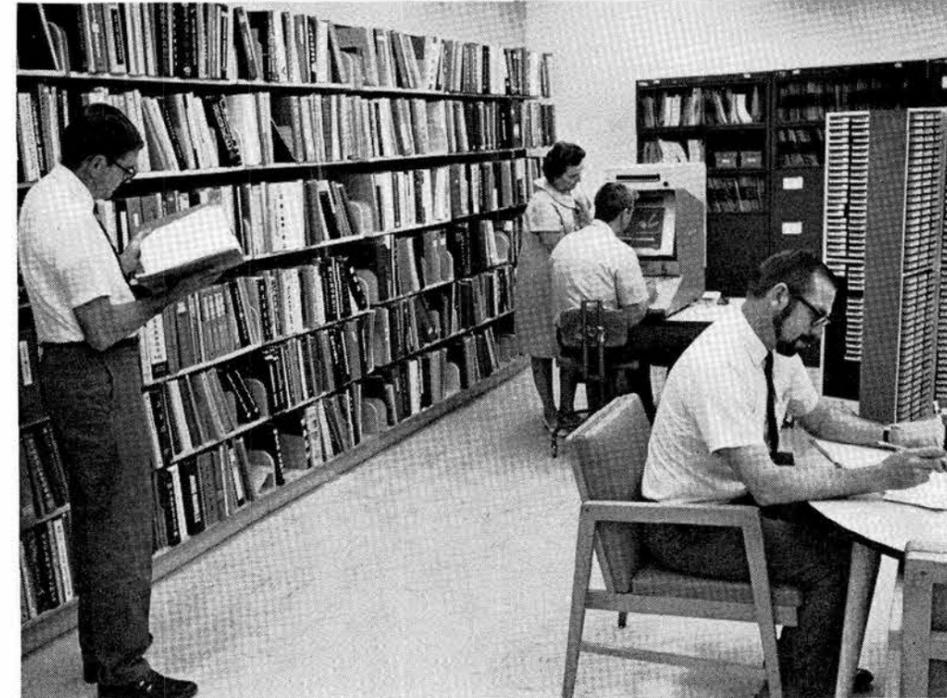
July 9-12—Rodeo de Santa Fe.

July 9-12, 16-19—"Futz," "Cockanear," and "Doing a Good One for the Red Man," three one-act plays, Old Town Studio, 1208 Rio Grande NW.

July 10-12—Onate Fiesta in Espanola.

July 10-12—YWCA charter bus trip to Grand Canyon. For information tel. 247-9372.

July 14—Feast Day corn dance, Cochiti Pueblo.



COMMERCIAL CATALOGS and the technical library's collection of government specifications are now located in rm. 203 of Bldg. 804. Suppliers' catalogs are on 16mm microfilm cartridges. Hugh Howe (3422), standing, is helping Garth Fahrback (2612) operate the microfilm reader. The collection was formerly in Bldg. 828.

LAB NEWS