

A PREVIEW PEEK at the Livermore Laboratory exhibit now at the Alameda County Fair was enjoyed by Claudia Cozzo (8212-3). Here Claudia listens to a tape-recorded narration explaining the operation of a telemetry system. Above her is a large color transparency showing an artist's concept of a moon landing. The science display will be on view at the Home Arts Building at the fairgrounds through July 14.

Livermore Laboratory Fair Display Tells of Communication in Space

Livermore Laboratory's science exhibit, now on display at the Alameda County Fair in Pleasanton, Calif., is attracting thousands of visitors daily.

The exhibit, describing the operation and use of telemetry in space communication, has been shown since the fair's opening, June 30. The fair closes July 14.

Key feature of the exhibit is a display of a telemetry system, coupled with a tape-recorded narration describing it. The visitor picks up a phone to hear the narration, which takes the listener on a simulated flight through space. Actual recordings of telemetry signals plus missile noises from a Polaris flight are included in the taped narration.

The display includes an ac-

tual telemetry package, a lucite model simulating a missile reentry vehicle, flashing lights representing radio signals, and meters showing vibration, acceleration, and temperature experienced by missiles in flight.

Another feature of the exhibit is an audience-operated telemetry system powered by solar batteries. A color reproduction of a mural used as the theme for the 1963 National Science Fair in Albuquerque is displayed. The exhibit background is a large color transparency of a painting showing a space probe about to land on the moon.

Completing the display is a Sandia Laboratory rocket nose section, designed to detect radiation at high altitudes.

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Professionals Can Serve Community, Heilman Says

Luther J. Heilman, Sandia's Director of Programming 2600 and a member of the Albuquerque City Commission, was guest speaker at the annual meeting of the Albu-

querque Area Chapter, International Systems and Procedures Association at the Sandia Base Officers' Club, June 10

He discussed the functions of many volunteer boards and committees who are providing professional services to the city, and outlined areas in which the SPA chapter could help improve paperwork and information processing systems.

Several Sandians hold offices in the local chapter of the SPA. Perry V. Davis (4431-1) is president, E. E. Brass (3451-1) is vice president, and S. O. Woodall (3456) is secretary-treasurer. J. W. Hook (4110) is international director for the local chapter. Committee chairmen include T. L. Beckley (4112-2), membership; J. O. Palmer (4431-1), publications; Dan Clement (4111-1), program; and J. P. Logan (3451-1), education planning.

Objectives of the SPA are to promote and foster improvement of systems and procedures through study, education, research, and the exchange of ideas, and to promote a broader understanding of the value of systems and procedures as a component of effective management.

George Steck Leading Two River Outings For Vacation Fun

George Steck (5425) should have some adventures on his vacation—at least he's out looking for excitement.

George planned to be in Idaho working as a boatman on two Sierra Club outings down the middle fork of the Salmon River. The two trips took place in late June and early July.

"Each trip lasts five days and I hear that the last day and a half is through a series of rapids aptly named Impassable Canyon," he reported before leaving.

George was likewise vague about where the trip started. "It was explained to me," he said, "as near Deadwood Lodge, which is 50 miles from Cascade, which is 75 miles north of Boise." We hope he found it.

If these two trips turn out well, George hopes to lead a group of Albuquerque river boating enthusiasts down the same route next summer.

Sandia Albuquerque Payroll for Past Year \$62.4 Million

Sandia Corporation's payroll in Albuquerque for the fiscal year 1963 amounted to approximately \$62.4 million based on actual figures for 11 months and estimated figures for June. This compares to the fiscal year 1962 payroll of \$59.5 million.

During fiscal year 1963, the number of employees on roll at Sandia in Albuquerque averaged 7,000. The average for FY 1962 was 6,900.

Assets of Sandia Corporation totaled approximately \$124.6 million for the year based on actual figures for 11 months and estimates for June. At the end of June last year, total plant assets in the Albuquerque area amounted to \$106.7 million. These figures represent undepreciated values of buildings and facilities at Sandia Laboratory and Tonopah Test Range in Nevada, but exclude Sandia's Livermore (Calif.) Laboratory.

All of the plant assets are the property of the Atomic Energy Commission, but are used and operated by Sandia Corporation in research and development work for the AEC, principally in the ordnance phases of the nuclear weapons program.

Sandia President Reports on Contribution Plan

"Sandia Corporation is interested in your agencies and your work," S. P. Schwartz, Sandia Corporation President, told representatives of nine health and welfare agencies meeting at Sandia Laboratory last week. "You are part of our community and part of our responsibility."

Representatives of the Albuquerque Association for Retarded Children, American Cancer Society, National Multiple Sclerosis Society, Bernalillo County Heart

Association, Muscular Dystrophy Association of America, Arthritis and Rheumatism Foundation, Albuquerque Association for Mental Health, New Mexico Society for Crippled Children and Adults, and Cerebral Palsy Association of Bernalillo County were invited to visit Sandia for an unclassified briefing on Sandia's mission and a discussion of the Employees' Contribution Plan.

They heard talks by Mr. Schwartz and R. H. Schultz

(7320), chairman of the ECP committee. The representatives also viewed the "Sandia Story" and toured the Sphere of Science.

"Sandia is interested in the Albuquerque community and in doing our part as citizens to support the United Community Fund and the agencies represented here," Mr. Schwartz said. "The ECP is our answer to the community's need and to the responsibilities

imposed on all of us as residents of this city."

Fair Share

"We have always been proud of our employees' willingness to respond to the city's needs," Mr. Schwartz continued. "We recognize that the requirements for your agencies grow as Albuquerque grows and we know that our obligation is an ever-increasing one. The employees of Sandia, I am sure, will respond with the same willingness as in the past to carry their fair share."

Mr. Schwartz reminded the agency representatives that many Sandia employees give more than money. They serve in many capacities with the agencies. He said that Sandia takes great pride in the willingness of its people to serve the community.

Mr. Schultz, in discussing the history of the Employees' Contribution Plan, stressed that it was founded by the employees of Sandia Laboratory in 1957 to foster united giving. He urged the agencies to respect the ECP sticker when displayed on the door of members' homes.

"The ECP is administered by a committee of employees representative of all Laboratory employees. The committee is responsible for the funds pledged," Mr. Schultz said. "The committee plans and conducts the annual drive, maintains liaison between the ECP members and the agencies participating in the plan, and determines the allocations assigned to each agency."

Distributing Funds

In telling of the method of allocation used by the committee, Mr. Schultz said, "At the inception of the plan, Sandia employees believed that their money should go to the 34 participating agencies in the same ratio as it would if

the employees gave at home instead of through ECP. To do this, the ECP committee annually determines the aggregate amount of funds raised by the 34 agencies in Bernalillo County. The committee determines the percentage of the total that each agency has raised through its fund drives. The agency then receives an allocation of Sandia's ECP funds based on this percentage relationship."

Mr. Schultz pointed out that Sandia employees have contributed more than \$750,000 through the ECP since the plan's beginning. "Because Sandia Corporation assumes the entire cost of administration and solicitation, 100 cents of each dollar contributed by our employees reach the intended recipient," he said.

The agency representatives were given new audit forms developed by the ECP committee and designed to show the income and expense of agencies participating in ECP. "It is the committee's responsibility to see that each agency is treated fairly in the allocation of money pledged," Mr. Schultz said. "We are also interested in knowing that each agency is spending its funds in the pursuit of objectives for which it was founded." He explained that the new audit form would aid the committee in fulfilling its obligations to ECP members.

In closing the meeting, Mr. Schultz stated, "Last year 90 percent of all Sandia Laboratory employees contributed to the plan. Average contribution was \$27.71. We know this year that our members will recognize the greater need and will respond."



EMPLOYEES' CONTRIBUTION PLAN and Sandia Corporation's mission were discussed by S. P. Schwartz, Sandia Corporation President, with representatives of

nine health and welfare agencies at Sandia last week. The visitors learned how the ECP campaign is conducted and how the agency fund allocations are made.

(Editorial Comment)

THE CASE OF THE PENNY CANDY PILFERERS



There once was a lollipop manufacturer who turned out the finest lollipops in all the United States. All the moppets asked for his brand whenever they pressed their noses against the candy showcase. He'd cornered the market!

Suddenly he called a meeting in the plant and told the employees he was in financial trouble. Losing money? A man who was selling so many lollipops? Yes. He'd been buying increasing amounts of raw material to turn out the same number of lollipops. Either they were wasting materials or somebody was stealing them.

After the first shock wore off, one of the more vocal members of the lollipop plant spoke up. "I have it! We'll set up a committee to police the plant and spot the waste or stealing."

Everybody agreed that was a good idea—provided no Gestapo methods were used. So they started their vigil. And they caught the culprits.

To their surprise, the culprits were—everybody, including the owner's wife. For example, there was the wooden handle maker. He was building a table for his grandson's sport car game and needed a few dowels to use as telephone poles to line the streets. There was the girl who was hungry mid-day and found two lollipops helped fill the hole in her stomach. And the cellophane wrapper. Her kid brother needed a few sheets to dress up his junior high science project. And the shipper who needed some empty cartons to mail clothing and medicine to his brother behind the Iron Curtain. And the aforementioned owner's wife. She'd call the office and ask

for a case of lollipops—assorted flavors and shapes—for nieces, nephews and the children of friends.

The funny thing about it, you could leave your wallet with any of them and never have a single cent taken from it. Well, then, why were they pilfering and how had their pilfering put the company in such a touch and go situation? The first part of the question was a little hard to answer since the "pilferers" had always considered themselves "honest," "loyal," "God-fearing" people. They had just never applied "Thou shalt not steal" to a few dowels, a few sheets of cellophane and a few lollipops. "Stealing" was robbing the safe, hijacking the truck. But was it? The committee—and the employees—after a great deal of personal soul searching concluded it was stealing! And the pilfering stopped.

Now, how does the lollipop company's problem apply to Sandia's business? Fortunately, we aren't desperate because of a sudden wave of employee pilfering. Still, once in a while, we may be guilty of appropriating a few "lollipops and dowels"—inexpensive and expendable items—for our own use.

What's in the "lollipop and dowel" category in our business? Many things. For example, ball point pens, pen refills, rolls of cellophane tape, boxes of paper clips, pencils, rubber bands, wire, transistors, tape, small tools, and dozens of other types of items the company buys in a year. These "lollipops and dowels" cost thousands of dollars yearly. Remember those dollars. They add up rapidly.

Long-Time Rock Hound Has Unique Find in Nevada Desert

A. J. Petersen (7252) has been a rock hound and collector of Indian artifacts for some 25 years, but his recent finds in Nevada are his prizes.

In the area between Frenchman Flat and Mercury at the Nevada Test Site, Bill Perret (5412) told him where to look for rock containing fossilized fish. Pete found the small area and quarried the rock from the steep hillside. He used a geologist's hammer and a cold chisel to split the rock, and there in a very thin layer were the remains of the "killifishes."

Pete sent the specimens to the University of Nevada in Reno. A member of the Biology Department

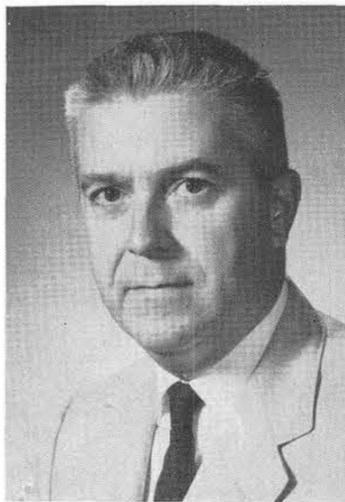
expressed great interest in the specimens as heretofore there had been no fish remains reported south of Tonopah. The specimen was estimated to be approximately 21 million years old.

However, the specimen was later sent to the Smithsonian Institution. Authorities there estimated the age at 15-18 million years. The acting curator noted that this family of fish (Cyprinodontidae) is found in tropical and warm temperature, fresh and brackish water from geological to recent times.

Pete also found a Shoshone knife of petrified wood on the Tonopah Test Range. "I thought it was just another piece of petrified wood until I saw that it had been worked," he said. The knife is about five inches long and measures a little over two inches at its widest point.

J. F. Reed Returns From NATO Meeting In St. Genese, Belgium

James F. Reed (7422) recently attended the AGARD Specialists' Meeting on Noise in the Turbulent Boundary Layer, presented in the Training Center for Experimental Aerodynamics at Rhode-St. Genese, Belgium. This meeting was attended by approximately 50 members of the North Atlantic Treaty Organization.



H. H. Mabie

Second Edition Text Published By Sandia Man

H. H. Mabie (1332-4) is co-author of a book, "Mechanisms and Dynamics of Machinery," which has just appeared in its revised second edition.

The book includes analytical cam design, gear analysis, computing mechanisms, and velocity, acceleration, and force analysis by vector methods using complex numbers. The first edition, which appeared in 1957, has been used as a textbook by 65 schools.

The revisions were made and other work in connection with the new edition was done by Mr. Mabie during leisure time over a period of two years.

The co-author is Fred W. Ocvirk, professor of mechanical engineering at Cornell University. He holds a BS degree from Wayne University and an MS from the University of Illinois, and has been on the Cornell staff since 1940. Mr. Ocvirk is currently on sabbatical leave and is a visiting lecturer at the University of New South Wales in Sydney, Australia.

Mr. Mabie has been at Sandia since 1960 and previously worked here from 1958-59 while on his sabbatical leave from Cornell. He formerly taught mechanisms, kinematics, dynamics of machinery, and machine design for 19 years at Cornell.

Earns BS Degree

John P. Hoice (1423) is still another Sandia Laboratory employee who received a degree at the recent University of New Mexico commencement exercises. His degree was a BS in electrical engineering. The study was completed under Sandia's Educational Aids Plan.

D. A. McCoy Died June 25

Donald A. McCoy, a Sandia employee for more than 10 years, died suddenly at his home June 25. He was 57.

Mr. McCoy was a design engineer in Vibration Division 7324.

He came to Albuquerque 15 years ago after retirement from the Navy with 21 years' service.

Survivors include his widow, two sons residing in South Norwalk, Conn., and Vandenberg AFB, Calif., and seven grandchildren.

Guy W. Jones Died June 21

Guy W. Jones, a Sandia employee for more than 11 years, died June 21 after a short illness. He was 52.

Mr. Jones was a dispatcher in Motor Pool Division 4573.

Funeral services were held locally June 22 with burial in Jackson, Miss.

Survivors include his widow, a married daughter, a granddaughter, his mother, a sister, and four brothers, all residing in Albuquerque.



EARLY-DAY ELI WHITNEY-produced musket was presented by L. E. Snodgrass (2561), left, to the American Society for Quality Control as an example of pioneering in quality control. (L to R) Mr. Snodgrass, C. W. LeSage, Assistant Superintendent, Inspection and Quality Control Engineering, Teletype Corporation; I. W. Schoeninger, ASQC executive secretary, and T. P. Conlon (2561-3). Ceremony was at Skokie, Ill.

Presented to ASQC

1822 Musket Used to Show Methods of Quality Control

The American Society for Quality Control, in a ceremony on June 19, was presented with a rifle, owned by L. E. Snodgrass (2561), which exemplified methods and principles which laid the foundation for quality control in American industry.

The musket was an Officer's presentation model, produced by Eli Whitney under the U.S. government contract of 1822.

The ceremony took place at the annual Western Electric Company Inter-Works Quality Control Planning Committee meeting, held at Teletype Corporation in Skokie, Ill.

Mr. Snodgrass has done considerable research on the subject since obtaining the rifle. "Small arms manufacture," he said, "has played a very important part in the development and refinement of modern production methods. The idea of making the parts of early weapons interchangeable with those of others at point of manufacture, at the armory repair bench, and, to a large extent, in the field, was to spread to the tools and machines for making weapons as well as other products."

Under his earlier government contract of 1798, Eli Whitney agreed to produce muskets on a mass-produced basis, with the interchangeable part feature. During the forthcoming years, Mr. Whitney worked out the beginnings of many of the modern day industrial quality control procedures such as in-process aging, testing and inspection, defect prevention, in-process control, vendor quality control, inspection standards, quality and workmanship standards, and concepts for sampling.

"It is his total system concept that stands as his greatest contribution to American industry," according to Mr. Snodgrass.

After proof that it was possible to mass-produce weapons, handcraft methods gradually gave way to the newer techniques.

"We in quality control are especially indebted to him (Whitney)," Mr. Snodgrass said. "It seems fitting and proper that our society should possess one of the products of his works as a reminder of his contribution to our American heritage in arms—and of our continuing role as a professional group in this heritage."



Barbara Whitlow (8212-3)

Take a Memo, Please

No adjustment of any kind should be performed on any power tool while it is in motion. This is only inviting injury.

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Congratulations

Mr. and Mrs. Howard Jones (1512) a daughter, Megan Caiplin, on June 11.

Mr. and Mrs. Paul R. Kintzinger (5412) a daughter, Sarah Jane, on June 18.

Mr. and Mrs. Don J. Rigali (7421-2) a son, Mark Joseph, on May 29.

Sympathy

To Joy C. Lewing (4511-2) for the death of his mother in Texas on June 13.

To W. V. Sawyer (4514-3) for the death of his father in Ohio on June 17.

Booklet Gives Better Understanding Of Canada - Our Unknown Neighbor

Canadians are not as much like Americans as most of us believe. They differ from us noticeably in customs, temperament, and origin. A new booklet, which appears in the racks next week, draws a strong, clear picture of our friendly neighbor and, in so doing, shows a Canadian national character quite distinct from that of the U.S.

The booklet is called "Canada: Unknown Neighbor." In it we find that the two major nationalities in Canada—French and English—and other smaller groups did not mix to become the "melting pot" that the U.S. is today. As a result, ancestral characteristics are still very much in evidence.

Canada today is considerably more than moose, Eskimo, hockey and virgin forest. The booklet makes that apparent as it examines the economy, geography and natural resources of the huge nation—second largest country in the world after the U.S.S.R.

Sandia Corporation people planning to visit Canada should find the booklet a good starting point. A two-page map shows highways

and other major points of interest. The booklet also discloses that Montreal is already preparing for its 1967 World's Fair, which will offer a fine opportunity for many Americans to learn more about our friendly neighbors to the north.

Sandia Librarian Named Member of Scholastic Honorary

Mary Ellen Du Vall, a newcomer to Sandia's technical library (3421-1), has been named a member of Beta Phi Mu, international scholastic society for library science.

Mary Ellen came to Sandia in February directly from the University of Michigan where she received her MA degree in library science. She also holds a BS degree in mechanical engineering from the same school.

The honorary was founded in 1948 to encourage scholastic interest among library school students and to recognize distinguished service in library education.



USS CAPITAINE is one of the submarines on which Larry E. Horner has served. Larry is one of the 165 military reservists from Sandia who spend two weeks each summer on active duty. The Company provides up to two weeks for the men to participate and pays the difference between military pay and their regular salaries.

Military Reserve Summer Camp Is All Business--And Tough

Gilbert Padilla (4254-2) polished his jump boots last week. Like 165 other Sandians, he will spend two weeks this summer on active duty in the Armed Forces. The two-week "summer camp" climaxes a year-around training program for the military reserve personnel.

Sandia Corporation provides up to 10 days for the men to participate in the reserve programs, and pays the difference between their military pay and their regular Sandia salary. Last fiscal year, this amounted to a total of 1650 days for the reservists and a pay differential of almost \$27,000.

In recognition of the importance of the military reserve program, the Lab News talked with three Sandians who participate. Here's their story:

GILBERT PADILLA is a lance corporal in the U. S. Marines. Five days a week he's an apprentice machinist in the Development Shops. One weekend each month and for two weeks during the summer, he's part of the combat-ready 5th Force Reconnaissance Company.

"The unit's job is to patrol, to scout," Gil says. "We are trained to penetrate hostile territory, locate bridges, do demolition jobs, pick air strips and helicopter sites. We spend one weekend each month, usually in the mountains, on simulated missions. During the winter, this can get rough."

Gil will report next week at Camp Pendleton, Calif., for more jump training. "We've had six jumps already," Gil says, "and after the whole unit is qualified in this area, we will move on to underwater training—SCUBA diving."

Gil volunteered for the Marines almost four years ago. He spent eight months on active duty and will continue in the reserve program for eight years. He's been to two summer encampments and is looking forward to the next one. "I like the Marines," Gil said, "and the reserves are important. We are trained to be ready to go at any time. Ours is a rugged, rough outfit. You have to study and work hard, but it's a challenge. And you stay physically fit."

JOHN M. HART (4321) is a Buyer in Purchasing. As a reservist, he commands the NAV SEC GRU 8-17 unit in Albuquerque,



L/Cpl. G. Padilla



Lt. J. N. Hart



Cmdr. L. E. Horner

engaged in communications training. The unit meets once a week at the Naval Reserve Armory.

John has been in the Naval Reserve 13 years. During World War II, he spent three years active duty aboard the USS Gear in the Pacific. He was assigned as a radioman on the salvage repair ship.

He was discharged in 1946, and after graduating from the University of New Mexico, he applied for a commission in the Naval Reserve. After 13 years of reserve training, John remains enthusiastic about the Navy.

"The Navy provides a good training program," John says. "Each summer means another interesting experience at a Naval facility. I've been to a number of schools—Ordnance Orientation, Damage Control, and Naval Security Group schools."

John just returned from Naval Security Group School at Bainbridge, Md. "The Navy makes summer assignments individually, not by groups," John says, "and you get a choice in the schools you attend. Naval security is my area of interest, and usually I attend some school in this field."

John feels that the reserve program is important in the nation's defense, and enjoys being part of the effort.

LARRY H. HORNER (1522) is a flight test engineer at Sandia Laboratory. Two weeks ago, he was a Naval Commander aboard a Polaris submarine operating out of New London, Conn.

"The Polaris submariners are the most dedicated and the most competent of our first line defenses," Larry said. "In my opinion, they're the varsity of the Armed Forces. Obviously, it's a pleasure for me to be a small part of it."

Larry has a total of 19 years in the Navy. He attended the Naval Academy in 1941 and spent World War II aboard the submarine Piranha on war patrol in the Pacific. He served in the Navy un-

til 1954 as an officer on cruisers, destroyers, amphibians, and submarines.

He came to Sandia in 1954 and the following year reapplied for a commission in the Naval Reserve. His summer duty has been spent at Pearl Harbor, San Diego, San Francisco, and once with the Army at Ft. McClellan, Ala. "I attended Atomic Biological and Chemical Warfare School," he said.

One of the toughest jobs in the recent active duty was requalifying in the submarine tower. "You blow and go," Larry said. "You go down in an air lock to a depth of 50 ft. You step inside the tank, exhale, and float to the surface. It's a long way up."

During the year, Larry spends one evening each week as an instructor in the Naval Reserve Officers School in Albuquerque. He has taught naval courses in nuclear power, guided missiles, navigation, and atomic warfare.

"Although it takes time and preparation," Larry says, "it's still a lot of fun."

Sandia Authors

Current or forthcoming articles by Sandia authors in technical journals include the following:

E. C. Hirt (4432-3) and J. H. Hockett (4112), "An Eight-Hour Unified Microfilm System," March issue, *Graphic Science* magazine.

B. T. Kenna and F. J. Conrad (both 1122), "Separation of Titanium by Cation Exchange and its Spectrophotometric Determination with Disodium-1, 2-Dihydroxybenzene-3, 5-Disulfonate," August issue, *Analytical Chemistry*.

D. M. Mattox and J. E. McDonald (both 1124), "Interface Formation During Thin Film Deposition," August issue, *Journal of Applied Physics Supplement*.

Service Awards

15 Years



Wilson M. Hicks
4213
June 14, 1948



William E. Reed
7536
June 23, 1948



T. A. F. Eagar
7535
June 28, 1948



George H. Roth
7520
June 28, 1948



Horace G. Pickard
7536
July 1, 1948



Guy C. Willis
8126
July 1, 1948



Merrill C. Jones
2411
July 6, 1948



John R. Doyle
4613
July 6, 1948



Joseph D. Duran
7224
July 6, 1948



Donald A. Skinrood
8123
July 6, 1948



Willis E. Johnston
2442
July 12, 1948



John R. Piper
1543
July 12, 1948



C. A. Lowry, Jr.
7535
July 12, 1948



Robert N. Schowers
2441
July 13, 1948



Tomie D. Hill
4614
July 13, 1948



Warren E. Pierce
2625
July 15, 1948



Arthur W. Porter
3341
July 15, 1948



Tom Silva, Jr.
4511
July 15, 1948



Rafael Montoya
4614
July 15, 1948



Roger C. Williams
3462
July 19, 1948



Eugene Dirnberger
7225
July 19, 1948



Mildred D. Whitten
8212
July 19, 1948

10 Year Pins

July 6-19

James C. Drake 2412, William H. Blair 2413, Glenn S. Mills 2441, Paul D. Bishop 2624, Robert A. Jeffrey 7215, Gaynor E. Atkinson 7331, Robert L. Ault 7324.

George L. Adkins, Jr. 7423, Gordon E. Boettcher 1431, Ellen R. Jones 3446, Buford A. Coleman 4613, Adam Trujillo, Jr. 2643, Gloria J. Maginnis 3121, C. Herman Mauney 1533, C. B. Stillwell 1533, and William F. Jemison 3455.

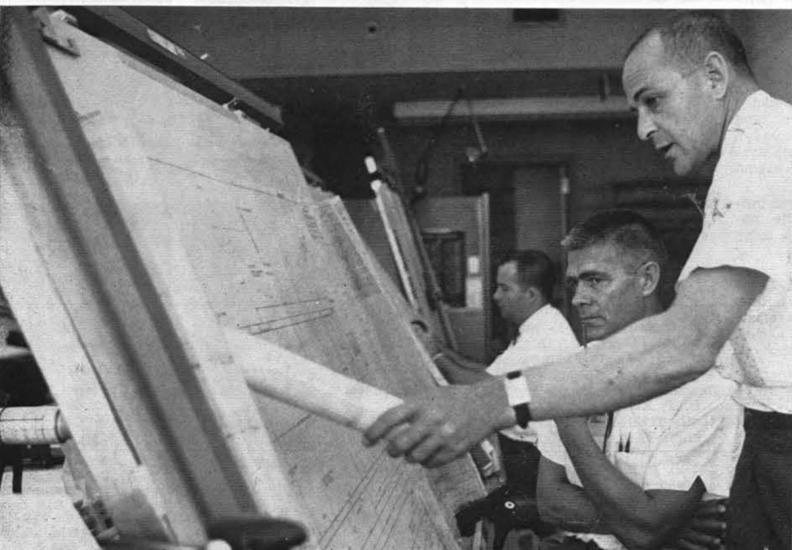
Sandia Laboratory Design Information Center Has New Look



REORGANIZATION of Sandia's Design Information Center is discussed here by T. T. Robertson, 4400 Director, (right) with two of his department managers, F. F. Eichert (4410), seated, and R. E. Hepplewhite (4430).



ENGINEER DON BUTEL (1542) is one of the many users of the Film Bank in Bldg. 836. B. Mary Schwarz (4432-4) assists the "customer" while Frank Pena (also 4432-4) makes another print of the microfilmed drawing.



PROJECT DESIGNER Woody Hunt (4412-5) started working with engineer R. J. Hart (1513-4), right, about six months ago. Their work association, which includes frequent meetings, is likely to last a couple of years until this particular project is completed. In the background is John Grau (4412-5) busy on a drawing.

When Organization 4400 was reorganized May 1, the change brought under one Director, T. T. Robertson, all functions associated with a Design Information Center. The make-up of the directorship can be simply defined: Design Definition Department 4410, headed by F. F. Eichert, does the drafting; Design Specifications and Standards Department 4420, headed by D. J. Yarbrough, prepares engineering standards and specifications; Design Information Processing Department 4430, headed by R. E. Hepplewhite, collects and documents product definition data and release and change information, and processes all drawings, specifications, standards and engineering releases.

The change from Design Services to Design Information Center was proposed by Sandia's Paperware Task Group. Design Information Processing Department 4430 was created to handle all functions pertaining to design information flow, including microfilming, reproduction, distribution, and film banks, previously administered as a responsibility of Department 3440.

"The organization was set up to employ the concept of all design information, defining, and processing within one organization; to try to confine this work strictly to that organization; to split out any other operation not strictly concerned with product information," Mr. Robertson said.

The set-up is a sharp departure from the previous Sandia Corporation "functional" concept in which, for example, all microfilming would be handled by one group regardless of its ultimate use or requestor. In the new concept, full authority and responsibility for the work and the personnel in a "system" are assigned to one person — the Director of 4400. The change is expected to speed up the processing of Engineering Information beyond improvements already accomplished.

Unique Division The reorganization has also resulted in establishment of a division which is perhaps unique in industry. Operations Planning and Quality Control Division 4441, Lee Toliver, supervisor, is concerned with quality audits, legibility of drafting prints, time checks for performing functions, etc. "We believe this is one of the first times such quality control functions have been applied to paper," Mr. Robertson explained. The division reports directly to him.

Mr. Robertson has seen changes and improvements of many kinds take place since he arrived at Sandia in February 1950 as a consultant from Bell Telephone Laboratories with the job of establishing drafting specifications and standards. The assignment was supposed to last six months. At the end of that period he was asked to stay. The Company then had 1700-1800 employees, one permanent building, and engineers who largely did their own drafting. Two drafting groups, comprised of approximately 27 employees, worked entirely with development engineers and product engineers.

"We had to hire all of our draftsmen from out of state, as there was no talent available in Albuquerque, not even for the most unskilled drawing," Mr. Robertson said. To remedy this situation, Sandia started its own drafting school, which included three months of training for high school graduates who previously had received very limited architectural drawing instruction. The first class had 24 students. "Some members of that original class are still here and are turning out excellent work," Mr. Robertson noted, "and we are proud of them."

Drafting School The drafting school was continued until five years ago when graduates trained in drafting became available from accredited technical institutes. Their employment has proved quite successful. Specific drafting courses, tech-institute-oriented, are still offered through Sandia's out-of-hours educational program.

Mr. Eichert and Mr. Yarbrough, two of the 4400 department man-

agers, also have been assigned to this organization since its beginning.

Mr. Eichert's Design Definition Department has the job of providing design services support for engineering groups. This includes information in the form of design layouts, product drawings, associated lists, and charts and graphs. Department 4410 is also responsible, along with product specifications, for the official definition of products designed here at Sandia — drawings or specifications that can provide the legal basis for contracts with suppliers and manufacturing information to the AEC production integrated contractors.

Division 4411, headed by G. W. DeSato, supports the 2400 organization primarily; Division 4412, headed by P. A. Nicovich, supports the 1500 and 7300 organizations primarily; Division 4413, headed by D. B. Kennedy, supports the 1300, 1400, and 7200 organizations primarily. Each section may service one engineering division, or may work for one or two general organizations, depending upon the demand for drawings. Each of these sections is comprised of about 20 employees who have the experience, talent, and ability to carry through with design details, layout, and final checks.

Mr. Eichert pointed out, "The objective of this arrangement is to look upon drafting services as part of an engineering organization. Such an arrangement tends to establish the efficient teamwork of a small company while drawing upon the advantages of a large coordinated company. Communications are fast. The section supervisor operates freely within his authority in conjunction with the engineering supervisor, and may, but only when necessary, alter standard practices to facilitate a particular job."

Usual Procedure The usual procedure is first to produce a design layout, which defines the configuration and the controlling function design requirements (data, critical dimensions and tolerances, materials, etc.). When this is approved, a set of detail drawings is prepared for each part and assembly.

During the past couple of years, the Technical Information Exchange (TIE) system has been in process of development to combine the design, manufacturing, and acceptance drawings into one master drawing, which can be used by AEC production agencies.

The system requires preliminary design conferences in the early stages of the drawing with AEC production contractors (such as ACF or Bendix). When the weapon has advanced to the point where raw materials can be ordered and manufacturers can start tooling operations, the drawing is transferred to the integrated contractor, where it is maintained up to date as changes or improvements occur. After production is completed, and the item is stockpiled, the drawing is returned to Sandia Corporation for reference.

"Other new developments," Mr. Eichert said, "are automating much of the listing information, such as materials and parts; and designing parts for numerically controlled machines, which require more mathematically and geometrically precise drawings."

In line with technological progress, Sandia Corporation has been active in the development of a new dimensioning and tolerancing system, which would provide universally-recognized drawing standards.

A step in this direction has been the writing of a book, "Concepts of True Position Dimensioning," which presents a forthright method of expressing design intent through the use of symbols. The book was prepared for Sandia training purposes, and for distribution to supplier personnel and other AEC integrated contractors.

Printed Circuit Masters One section that is unique within Department 4410 is Design Definition Section A5, 4411-5, headed by L. P. Baudoin, which makes printed circuit masters and optical comparator charts for weapons, test vehicles, and acceptance groups alike. Information is received orally from engineers, or layout boards are sent in from other drafting sections. The section also makes changes in existing circuit masters and does some development work to find new and improved ways to create circuit masters. Under the old system, the masters were drawn by hand in India ink; later, metallic tape was used (and continues in use); then came cut and strip material; and now, members of the section are researching in the area of circuit masters in shapes other than flat (three dimensional).

Design Specifications and Standards Department 4420, managed by D. J. Yarbrough, is responsible for all engineering standards, such as process, materials, finishes, and designs. This information is closely coordinated with materials and process development in Organization 1100.

"In using and developing a standards program," Mr. Yarbrough said, "we take advantage of existing government standards programs when feasible. These number some 25,000 and can often be adjusted as required. If we generated, from scratch, our own basic standards, it would take 10 times as many people as we now have on the job. We develop our own standards when we are extending the limit of technology or when the technology is sufficiently different and there are no applicable standards."

The Standards Division, headed by P. E. Jockle, Jr., puts out a standard parts manual which combines studies, tests, and surveys from Department of Defense reports for known applications. Here again, there is the constant pressure of new methods and new means which must be incorporated

ed in information for designers. The division also has been making two special studies on its own. One deals with the structural uses of beryllium, the other with torque-tension relationships for threaded fasteners.

7-Digit Specifications Considerable effort during the past two years has been directed toward developing "7-digit specifications" standards information drawings developed between AEC integrated contractors and Sandia Corporation. (These uniform standards support the TIE system but are not dependent upon it.) "We hope the 7-digit specification program will eventually be adopted by the AEC," Mr. Yarbrough said.

The Standards Division is also responsible for preparing five other manuals, design, materials, process, structures, and drafting, to support all programs, and such things as SC requirements for inspection of standard hardware, and a standard repair manual for modification centers.

"A standard is always a specification, but a specification is not always a standard," Mr. Yarbrough stated. "A specification becomes a standard through repetitive use, otherwise there is no basis or foundation for comparison." At Sandia, product specifications are written by members of Division 4422, under E. A. Turner, Jr. The staff represents a total of 80 years' experience in this field or the closely-related field of engineering.

"It's impractical to make a drawing that says everything pictorially," Mr. Turner said. "It's necessary to put some things in words that can be understood by anyone yet not be misleading."

In dealing with this problem in semantics, Mr. Turner's people work with design engineers in 1300, 1400, and 1500, and manufacturing development engineers regarding any changes. In any activity where outside advice is desirable, they work with members of 1100 and 7300.

The 4422 member reviews the notes on drawings on the various projects to make sure that these words convey the appropriate meaning. "In dealing with engineering subjects, you must be clear and concise to avoid confusion," Mr. Turner said.

Government Specifications Government specifications are referenced when possible as their requirements are already nationally known and recognized.

In a few words, Division 4422 handles the written requirements for all product design specifications of war reserve type material. These support words, together with engineering drawings and basic standards, make up the product definition for all weapon materials.

"The specification engineers give assistance to design engineers in putting together a package which, contractually and administratively, gives the best control

over what is manufacturable and possible," Mr. Yarbrough explained.

In creation of Design Information Processing Department 4430, Mr. Hepplewhite explained that three separate functions were brought together: integration, release, and reproduction and distribution.

In recent years, there has been a tremendous increase in the amount of engineering data which must be handled in weapons development, production, and storage activities. The four sections of Integrating Division 4431, headed by E. C. Domme, combine the diverse production definition information that is initiated by the many engineering groups.

Nomenclature Section 4431-1 controls the assignment, standardization, and publication of the system of code names to identify all materials and parts used in weapon programs. Its various manuals defining nomenclature assignments, description data, and procedural policies are used throughout the AEC development and production complex.

Parts List Data Control Section 4431-2, established less than a year ago, prepares parts lists for selected programs and components which form the basis of the product acceptance definition and provide the user with an index of the design, manufacturing, and acceptance definition of the product. Eventually, these lists will be a part of a total product definition record system file maintained on electronic data processing equipment.

Engineering Information Recently created in the reorganization was Engineering Release Analysis and Change Section 4431-3, comprised of engineering information analysts charged with insuring that each engineering change or release document meets the intent of the engineering information system rules. The section was designed to relieve design engineers of much of the paperwork in connection with design changes and other information changes. Just as the draftsman collects engineering information from an engineer and creates a drawing to express that information, so the engineering analyst will collect engineering information from the engineers and create the proper release and change paper to express that information.

Clerical, typing, and administrative support for all of the drafting and specifications organizations is provided by Drawing Definition Data and Service Section 4431-4. This section processes drawings and engineering release and change paper, and maintains the file of all original tracings prepared for weapon development programs.

As soon as a drawing is taken off the drafting board it enters the drawing release process. In

moving through Reproduction and Distribution Division 4432, headed by N. W. Ollman, the engineering action paper is edited, typed, reproduced, and distributed.

Million Cards The drawing and related information are processed onto microfilm aperture cards (they now number close to a million), which are filed in a Sandia Film Bank or meet other contractor requirements. Film banks are maintained locally in Bldgs. 802, 836, 880, and 892 and have identical copies of current issues. At any one of these locations the drawings can be studied on a reader printer, or prints can be quickly made. The master file in Bldg. 802 reproduces production quantities of prints for use of outside suppliers and also has on hand superseded issues. These are kept until the drawings are sent to archives when the item is no longer in stockpile.

The whole Film Bank system (in lieu of blueprints) saves time, space, and money. The average time from when a drawing or specification enters the release system to when it is available in the Film Bank in the form of an aperture card averages eight hours, but some have been moved through as fast as three hours.

The other records and the Numerical Indexes are maintained on punched cards but are also based on drawings.

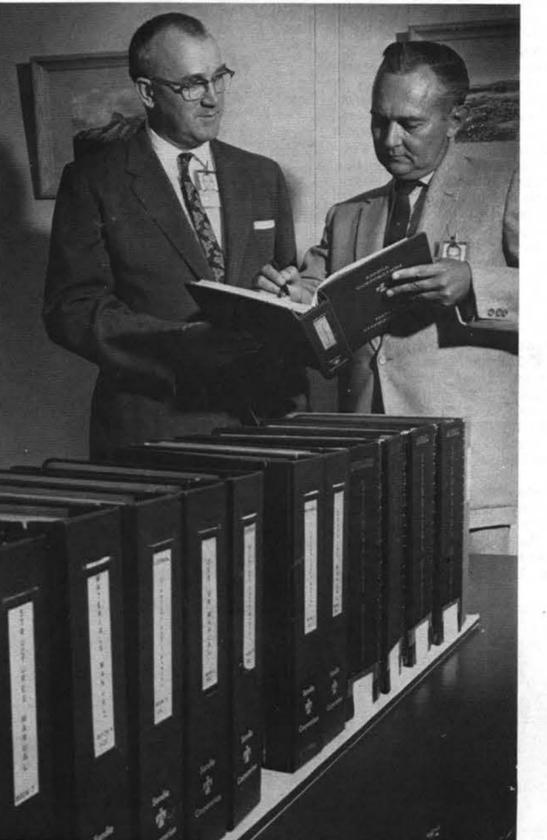
In conclusion Mr. Robertson said, "We do everything possible to convey in drawing or specification form knowledgeable engineering information so that the man in the machine shop in Maine or California can understand the thoughts of the engineer and know what he has to do to produce AEC hardware."

Finally, Release Division 4433, supervised by C. R. Pogue, is responsible for maintaining the drawing records and/or compiling and maintaining the numerical indexes. This operation has been carried on for the past nine years with only minor changes in the basic methods and procedures.

The Drawing Record File is a continuing historical record of each regular drawing originated at, or used by, Sandia Laboratory and released into the Sandia drawing system. It is manually maintained and records all drawing issues, the release date of each issue, drawing size and security classification, part numbers, complete drawing title, and any other pertinent information.

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In conclusion Mr. Robertson said, "We do everything possible to convey in drawing or specification form knowledgeable engineering information so that the man in the machine shop in Maine or California can understand the thoughts of the engineer and know what he has to do to produce AEC hardware."



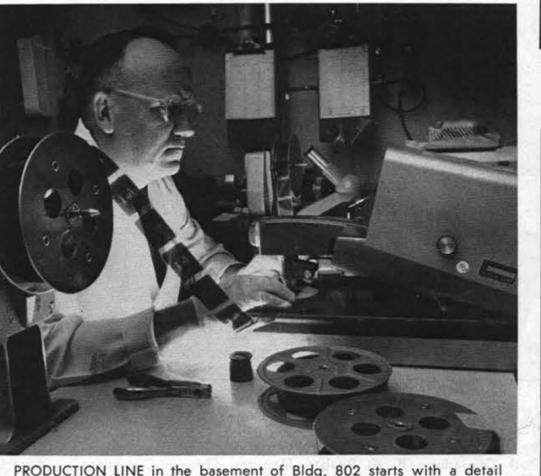
D. J. YARBROUGH, 4420 department manager, and (right) P. E. Jockle, Jr., supervisor of Standards Division 4421, display the many manuals prepared within the division that make up Sandia's standards program.



ORIGINAL TRACINGS of existing drawings are carefully filed and stored in Bldg. 880. Lela F. Martinez (4431-4) pulls out a tracing, while Antonio G. Torres (4431-4) files others in one of the many drawers.



KARL D. SVENSSON (4411-5) uses this Swiss-made plotter to create a printed circuit master. The machine's extreme accuracy and rotating table are important tools in his cutting and stripping work on masters.



PRODUCTION LINE in the basement of Bldg. 802 starts with a detail drawing and ends with copies of aperture cards containing microfilms of the drawing and accompanying information in key punch form. Floyd G. Shaw (4432-3) is operating instrument used to check density and resolutions of microfilm negative to assure the best print.

Master's Degrees to Twelve

Twelve additional Sandia Laboratory employees received Master's degrees during the recent University of New Mexico commencement exercises.

They are:

J. H. Barnette (1324), MS degree in mechanical engineering. His BS degree in mechanical engineering is from the University of Arkansas, and he has been with Sandia three years.

F. D. Betche (1442), MS degree in electrical engineering. He received his BS degree in EE from Washington University, and has been at Sandia since June 1960.

L. M. Bossart (7433), MS degree in electrical engineering. His Bachelor's degree in the same field was from Rensselaer Polytechnic Institute, and he has been at Sandia five years.

Richard O. Brooks (7325), MS degree in mechanical engineering. He holds a Degree of Mechanical Engineering from the University of Cincinnati, and has been at Sandia seven years.

Malcolm L. Cooper (2624), Master of Business Administration. He received his BBA at the University of Texas and has been with Sandia Laboratory since last September.

Vernon E. Kerr (4543), MS degree in civil engineering. His Bachelor's degree was also from the University of New Mexico. He has been with Sandia seven years.

John P. Logan (3451), Master of Industrial Administration. Previously he received a BS in civil engineering and Bachelor of Business Administration at the University of New Mexico. He has been with the company 13 years.

Dennis L. Mangan (1413), MS degree in electrical engineering. He received his BS in EE at the University of Notre Dame before coming to work at Sandia three years ago.

Lee J. Seligman (1113), MS degree in electrical engineering. His BS degree in EE was also conferred at the University of New Mexico. He has been at Sandia a little over three years.

William J. Steinmetz (2421), MS degree in electrical engineering. He has a BS degree in EE from Duke University and has been at Sandia since last September.

Theodore S. Trybul (1541), MS degree in mechanical engineering. He received his BS degree in ME from the University of Illinois, and has been at Sandia six years.

Glen H. Whiting (1532), MS



J. H. Barnette

F. D. Betche



L. M. Bossart

R. O. Brooks



M. L. Cooper

V. E. Kerr



J. P. Logan

D. L. Mangan



L. J. Seligman

W. J. Steinmetz



T. S. Trybul

G. H. Whiting

degree in mechanical engineering. He received his Bachelor's degree in mechanical engineering from Missouri School of Mines and Metallurgy and has been at Sandia three and a half years.

New Particles, New Elements New Uses for Atomic Power

Advances in nuclear science have included the discovery of numerous subatomic particles and of nine man-made elements. The following article tells of these developments and also briefly discusses the development of peaceful uses for nuclear explosives.

Advances in several areas of nuclear science and technology that do not stem directly from the achievement in 1942 of controlled nuclear chain reaction deserve to be summarized in any account of progress in these two eventful decades. Among these are the rapid discovery of numerous subatomic particles and of nine new man-made elements. Also noteworthy is the AEC's Plowshare program to develop peaceful uses for nuclear explosives.

In 1942, physicists knew that the neutron and proton did not adequately explain the behavior of the nucleus of the atom. Japan's famed Yukawa had predicted that there was some kind of nuclear "glue" present that overcame the electrical repulsion that otherwise would cause the protons in the same nucleus to fly apart. Production of mesons in 1948 in a particle accelerator confirmed Yukawa's theory.

Soon, it was found that there were several kinds of mesons and a host of other elementary particles in what has come to be called the "subatomic world." Other phenomena began to be identified so that today physicists are trying to formulate an orderly or "unified" theory that will explain the function of some 30 elementary particles and 45 other particle-like phenomena called "resonances" that have been identified.

Particle Physics

This new branch of science, known as high energy or particle physics, is one of the most exciting areas of investigation today, and major U.S. research in this field is financed by the AEC. The principal tools that have made possible these newest insights into the fundamental nature of all matter are the particle accelerator (atom smasher), the bubble chamber and the more recent spark chamber, and computers.

The two types of chambers enable scientists to demonstrate the existence and behavior of particles that live only billionths of a second by observing their interaction on photographic film.

The bigger U.S. accelerators are built by the AEC. The world's most powerful one is at Brookhaven

National Laboratory. It produces proton particles of 33 billion electron volts of energy (Bev). Construction has begun on a two-mile long linear electron accelerator at Stanford University that will cost more than \$100 million and is expected to reach an energy level of 10-20 Bev. USSR scientists are building a proton machine designed to go up to 70 Bev.

Physicists say even higher energies — 300 Bev and beyond — will be needed in the ceaseless quest for more knowledge about the smallest components of matter that make up the world in which we live.

Particle accelerators, reactors, and a nuclear detonation made possible the discovery of 11 new man-made elements of which neptunium, 93, was the first, discovered by E. M. McMillan and P. H. Abelson in 1940 at the University of California. Plutonium, 94, was the second. It was found in late 1940 by the group headed by G. T. Seaborg (now AEC Chairman), McMillan having been called away to other work.

New Elements

In 1944, Glenn Seaborg conceived the idea that a series of new elements would be similar chemically to actinium and the long-known rare earths. Thus, those elements beyond uranium took their place in the Periodic Table as the "actinide series."

Using the actinide concept, the Seaborg group, while still at the wartime Metallurgical Laboratory in Chicago, discovered americium (95) and curium (96) in 1944.

After the group moved back to the University of California, Seaborg and those who carried on when he left proceeded to isolate and identify seven additional elements. They are: berkelium (97), californium (98), einsteinium (99), fermium (100), mendelevium (101), element 102 tentatively called nobelium by investigators who thought they had identified a new element, and finally, lawrencium (103), discovered in the spring of 1961. These complete the "actinide" series.

Each of these new elements, us-

ually heavier in atomic weight than its immediate predecessor, has an increasingly shorter half life and the number of atoms available to confirm successive discoveries became fewer and fewer, reaching a low of 15. Ingenious methods had to be devised to carry the investigations to successful conclusions.

Found in 1952

The seventh and eighth transuranium elements, einsteinium and fermium, were found in the debris of a large thermonuclear bomb detonation that took place in the Pacific in 1952. This leads to the hope that more new elements may be discovered through the peaceful uses of nuclear explosives now being developed by the AEC.

Theoretical work and two experimental underground detonations to date give promise of opening up important civilian applications of the mighty power contained in nuclear bombs. They would be used underground, thus controlling radiation. The first two detonations, Gnome (1961) and Sedan (1962), yielded much new scientific and engineering data.

The most immediate prospective application is moving huge amounts of earth and rock such as would be required in building a sea level transisthmian canal. Other potential uses of nuclear explosives appear to be in mining, water resource development, producing isotopes of heavy elements and scientific studies which depend upon availability of large quantities of neutrons, high temperatures and extreme pressures.

The next installment concludes this series of 13 articles on advances in the first 20 years of the atomic age. The vast array of accomplishments of the past two decades is a tribute to the work of thousands of nuclear scientists and engineers, and government, educational and industrial managers and administrators.

Two Appointed Members Fair Housing Board

Two Sandians were named by the Albuquerque City Commission to the Fair Housing Board, which was created to investigate complaints of discrimination in housing.

The naming of the seven-member board followed the Commission's action in passing, by unanimous approval, an ordinance which prohibits discrimination on the basis of race or religion in the sale or rental of housing or in making a loan for purchase of housing.

The new members include Kathryn Lawson, a scientist in Research Division II, 5152, and Walter Rosenberg, Assistant Purchasing Agent, Commercial Department 4360.

Mrs. Lawson has been at Sandia nearly five years. She holds a BA degree in chemistry from Dillard University, a Master's from Tuskegee Institute, and a doctorate in radio-chemistry and mathematics from the University of New Mexico.

Mr. Rosenberg has been at Sandia 17 years and has worked in manufacturing engineering, program control, and administration and co-ordinating. He has been a department manager since 1957. During World War II, he served four years in the Marines. Mr. Rosenberg has a BS degree from Panhandle A&M College.



AEC OFFICIALS from across the nation visited Sandia Laboratory last week for a technical briefing. In the front row, from left, are E. H. Draper, Sandia Corporation Vice President, Development; E. C. Shute, Manager, AEC San Francisco Operations; S. R. Sapirie, Manager, Oak Ridge Operations; H. S. Traynor, Assistant General Manager for Administration, AEC Headquarters; A. E. Jones, Grand Junction Office; and J. E. Travis, Man-

ager, Richland Operations. In the second row are J. C. Clarke, Manager, New York Operations; K. A. Dunbar, Manager, Chicago Operations; R. C. Blair, Manager, Savannah River Operations; L. D. Geiger, Pittsburgh Naval Reactors Office, AEC; E. L. Van Horn, Manager, Brookhaven Office; S. W. Nitzman, Manager, Schenectady Naval Reactors Office; and W. L. Ginkel, Deputy Manager, Idaho Operations Office.

C. A. Ashby Author of Newly Published 'Fantasia Americana'

Taking as his premise that the whole of life revolves around two basic dimensions—Need and Fear—C. A. Ashby, supervisor of Budget Division 4173, has written a book in which he develops a unique and challenging theory.

The book, titled *Fantasia Americana*, "The American Fantasy," represents an accumulation of many years of observations about the differences which Mr. Ashby sees as existing between our nationally proclaimed idealism and our practical way of doing things. It is published by Dorrance and Company.

"What I've tried to do," Mr. Ashby explained, "is to bring out, as forcefully as possible, a number of contrasts and contradictions between what we've set up as the American ideal and what we've done in attempting to realize it."

In his book, Mr. Ashby develops the theory of "Compequancy," a "do-it-yourself" word which he defines as "the measure of each citizen as an individual, as it is reflected in government, communities and slums, law enforcement, the age of plateaus of man, and in other areas."

"The axis of privilege is always ours," he said. "Choice is always ours, and responsibility is always ours. The Golden Mean, an outgrowth of the measurement of the attainment of our ideals, is real to the extent of our recognition of these things, and our personal acceptance of the liability, as well as the privilege, of being an individual."

Mr. Ashby has been working, in his leisure time, for about a year on the manuscript of *Fantasia Americana*. It is his first published work.

He has been employed by the Bell System for 30 years, and has been on loan to Sandia Corporation since 1950.



— C. A. Ashby —

Coronado Club's Annual Shipwreck Party to Be Launched Tomorrow

The Coronado Club will present a Shipwreck Ball tomorrow evening, with prizes for the best costumes and music for dancing by Tommy Kelly. The pool will open at 7:30 p.m. Social hour prices will be in effect from 7-8:30 p.m., and dancing will be held from 9 to 1 a.m. Admission prices are 50 cents for members and \$1.10 for guests. Reservations for the evening are requested.

On July 10, the Club will present a Bavarian Beer Festival for its members. The event will be held on the Club Patio from 5-7 p.m., with juke box music, and with a beer and cold cut dinner for \$1.

Forthcoming events include a teen dance on July 13, a family swim night on July 24 and a Hawaiian Luau on July 27.



TEAM 7300-II receives trophy for taking the championship of the Sandia Laboratory Thunderbird volleyball league. In front, John Otts (7324), team manager, accepts trophy from R. H. Schultz, manager of Environmental Research and Operations Department 7320. From left, in background, are R. L. Posey (7324), Bob Klingler (7324), Floyd Mathews (7325), Jim Randall (7325), and Tom Traver (7323). Team won 7, lost none.

Dick Brian Again Escorts Boy Scouts On Mexico Trek

Dick Brian (2633) is off on another of his trips leading a large group of Boy Scouts to Mexico.

This time the group numbers 106 Scouts and their goal is Monterrey, where they will camp in a pecan grove on the outskirts of town for six days.

Dick's wife Irene (3421-1) is also making the trip, but she's staying in Monterrey.

All will be back July 9.

Sandia's Clarksville Bowling Team Wins League Championship

The Sandia Corporation Bowling team, Division 7535, won the Late Show League championship at Clarksville, Tenn. In addition to the regular league awards, trophies were awarded to Jack Edde for individual high average and to Mike Zappach for individual high series. Other members of the team include P. R. Taylor, Jack Meacham, Tom Eagar, Gerald Gay, and C. S. Lewis (all 7535).

New Mexico MIT Club Invites All Alumni to Meeting

All alumni of Massachusetts Institute of Technology are invited to attend the annual meeting of the MIT Club of New Mexico at the Coronado Club at noon Thursday, July 11. New officers will be elected.

Newcomers are especially welcome. Advance reservations are not needed, but any additional information may be obtained from Tim Raftery (7243-1), ext. 32268.

SHOPPING CENTER

CLASSIFIED ADVERTISING
Deadline: Friday noon prior to week of publication unless changed by holiday.

RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Corporation and AEC employees only
6. No commercial ads, please
7. Include name and organization

FOR SALE

- DACHSHUND PUPPIES, AKC registered, 11 weeks old, championship bloodlines, some wire haired, for show, breeding, or pleasure. Caldes, BU 2-3272.
- MANKIN 3-bdr., a/c, 1 1/4 bath, carpeting, draperies, 6 months old, located in Foothill Estates, 12908 Turquoise NE. Thorp, 298-6030 after 5 p.m.
- 16" HAND MOWER. Sanchez, AX 9-9394.
- SORREL MARE, spirited, but very gentle, 3 yrs. old, quarter type, bred to Palomino stallion, \$250. Drannon, TR 7-9144.
- '60 COUPE DeVILLE, low miles, all power and air, at NADA average retail. Byrne, AL 6-2505.
- SPLIT-LEVEL 4-bdr., 3 bath, Bellehaven, den w/fireplace, electric kitchen, a/c, 2450 sq. ft., low down to 5 3/4% loan, \$29,950. Malone, AX 8-2380.
- HAWAIIAN STEEL GUITAR w/amplifier, \$60; 20 gauge automatic shotgun, \$70; '60 Triumph station wagon, \$500. Pritchard, 268-9618.
- FREE KITTENS, part Manx, part longhair; weaned, playful, cute, 8 weeks old, see at 2916 Avenida Nevada NE. Hughes, 299-6674.
- PORTABLE TYPEWRITER, Remington w/ case; Italian silk wedding gown etched with fabric cabbage roses. Ames, 265-0217.
- '53 KENMORE automatic washing machine, \$20; kitchen table, grey-white w/chrome, \$10. Bassett, 10320 Apache NE., 299-5685.
- AFGHAN HOUND PUPS, from outstanding bloodlines, for pets, show, and coursing. Crosby, 344-3098.
- SINGER SEWING MACHINE, portable, electric, \$35. Neitzel, 344-8685.
- 17' 1959 CENTURY "Resorter," 185 HP inboard w/skis and belts, surf board, and life preservers, \$2200. Zucuskie, 265-4772.
- '60 EL CAMINO and '59 English Ford. Mathews, DI 4-0593.

- '55 PONTIAC 2-dr. HT, w/w, \$375; three 8.20x15 used w/w; two 15" wheels for Chevrolet. Wilson, AX 8-0049.
- '55 CHEVY SEDAN, 6-cyl., \$550. White, AL 6-3077.
- LONESTAR 14' Commander fishing boat w/American tilt trailer, \$375. Poor, 3200 Betts NE, 298-2509.
- 3-BDR. HOUSE, front patio and closed front yard, North Valley, \$7500. Gonzales, DI 4-7000.
- BUNK BED FRAME, maple, \$20. Geohagan, AX 9-7394.
- ROBERSON, 3-bdr., 1 1/4 bath, patio, other extras, GI 4 1/2% loan, \$83 per month, \$14,600. Johnson, 299-8894.
- CUSTOM DRAPES, 43" length, 100" width, light sand color, never used, \$20. Kinsey, 298-7034.
- BABY BED, \$10; maple bedroom furniture, \$75. Davis, 299-4784.
- COMPLETE 4-track stereo tape system, Sony 464-D plus case 2 ea. preamp-amplifiers; 2 ea. 12" speakers and Garrard record changer, \$220. Browning, AX 9-6384.
- UTILITY TRAILER, 4x8 wooden bed, 15" wheels. Knauss, AX 9-5364.
- 18" REEL TYPE lawn mower, Wards model TDZ-102A, Briggs and Stratton 4-cycle gasoline engine, \$25. Cashion, 2811 Monterey SE, 242-3345.
- '51 MERCURY 2-dr. sedan. Matlock, 6207 Aztec NE, AL 5-0109.
- ARGUS 515 automatic slide projector, 150 watt, \$20. Davenport, 268-7002.
- 4-BDR. BRICK HOME, double garage, 1 1/4 bath, corner lot. Haynes, 1100 Georgia SE, AL 6-3230.
- ZENITH 21" TV, console model, Hi-Fi sound, ebony decorator cabinet, double doors, \$65. Mitchell, 299-8647.
- STORKLINE BABY BED w/mattress, \$15; Detecto baby scales, \$5; playpen, \$7; Casco highchair, \$3; floor lamp, \$5; occasional chair, \$4. Smith, AX 8-2189.
- RADIO CONTROL EQUIPMENT manufactured by F&M Electronics; receivers and transmitter. Lenz, 7101 Edwina NE, AX 8-3872.
- REFRIG. AIR CONDITIONER for car or truck, \$75; 6x9 tread rug, \$5; 7:10x 15 snow tire, \$5. Post, AX 8-0481.
- ENGLANDER SOFA BED, brown w/inner-spring mattress; rocking chair, woodwork newly refinished, turq. plastic upholstery. Love, AX 9-0956.
- 3-BDR., brick veneer, built-ins, carpet, patio, forced-air heat, \$13,900 total, small equity. Chavez, AX 8-0674.
- 3-BDR., 1 1/4 bath, den, DR, hw/floors, pitched roof, a/c, walled, last appraisal \$17,900, sell under appraisal, near Grant-Los Altos school. McEwen, 299-5485 or 268-1598 after 5 p.m.
- AIR CONDITIONER, new, 4700 cfm, all porcelain, 2-speed w/pump, float, grille and switch, \$125. Gustafson, AX 9-3270.

NEXT DEADLINE FOR SHOPPING CENTER ADS Friday Noon, July 12

- 4-BDR. HOME, sell below appraisal, walled corner lot, landscaped, a/c, drapes, carpet, 15'x40' covered patio, \$16,400. Coughenour, 299-0914.
- '58 JEEP 6-cyl. wagon, OD, R&H, seat belts, \$200 below book. Nielsen, AL 5-2045.
- DISPOSING OF ALL MODEL AIRCRAFT engines, planes, etc., as son is now in Navy, make offer. Stickler, AL 5-3039.
- 18 MOUNTAIN ACRES with cabin; also 5-acre cabin site; both tracts on small stream in Chilili area. Leuhning, DI 4-2676.
- MILK GOATS, will consider trade for horse, shetland pony or beef cattle. Pierson, BU 2-3229.
- 3-BDR, den, double garage, 2 patios, terraced yard, just reduced \$2100. Hamilton, AX 9-6680 evenings.
- CHROME DINETTE SET w/4 chairs, \$20; camera Argus C-3 w/case and flash, \$25; swivel rocker, \$15; Cosco highchair, \$7. Gray, AL 6-1560.
- CAMERAS, \$100 each, Exacta (VX)—58mm Biotar Preset F2, Exacta (VX)—35mm Super Lethagong Preset F2.5. Olajos, AL 6-1649.
- STEEL SASH WINDOW, twelve panes glass, approximately 51" x 53", \$15. Graff, AM 8-5291.
- IRONER, Sears Roebuck, \$30. Moore, AL 5-7891.
- GREAT DANE PUPS, 10 weeks old, must sell, AKC reg. Holt, 299-5943.
- AUTO AIR CONDITIONER, 12-volt evaporative type, floor model, \$18, cost \$45 new. Matlack, AL 6-7371.
- 3-BDR MANKIN, pitched roof, hw/floors, built-in range and oven, located on dead-end court near school, shopping, Sandia. Patterson, AX 9-6590.
- MT. CABIN, 2 lots, elec., 1 hr. from city, in Manzanos. Call Ogden, CH 3-0649.
- '57 MERCURY Montclair, 4-dr., PB, PS, R&H, automatic trans., \$190 under average retail. Johnson, 299-7071.
- 26" BOY'S bicycle. Hutton, AL 5-7435.
- CEMENT MIXER custom built (homemade), approx. 2 cu. ft. capacity, w/1/3 HP motor, \$48. Marsh, AX 9-2098.
- GO-CART with a Power Products engine, live axle, must sell, \$100. Rothwell, 243-7532 after 6 p.m.
- '59 CHEV., 6-passenger station wagon Impala, V-8 Turboglide, PS, PB, loaded, except for air conditioning, 34,000 actual miles, \$1300. Haase, AL 5-9743.
- MALE COLLIE, 1 yr. old, has had all shots, \$10. Morrow, 298-1762.

- THIN PORTABLE TV, Montgomery Ward, 19" screen, '61 model, \$75. Walsh, AX 8-3173.
- HARDWICK GAS STOVE, 36", separate broiler, lighted oven. Asselin, AX 9-9270.
- FEDERAL COLD-LITE enlarger and other enlarging equipment. Alexander, 243-0141.
- 4-BDR. ROBERSON 2 years old, covered patio, double garage, drapes, \$17,000, less than appraisal, minimum down payment. Ahern, AX 8-0956.
- LARGE GALV. STEEL TUB, 42" long, 24" wide, 11" deep, excellent for child's pool or portable bath tub for summer camp, \$5. Hill, CH 3-3493.
- '54 FORD 6-cyl. 4-dr.; Turret 8 mm movie camera, projector, screen and editor. Calvery, 255-9545.
- ANTIQUE WHITE LEATHER SECTIONAL; desk; swing and slide; 15' x 9' air map of U. S. mounted; baby clothes; crib sheets and blankets, others. Kowalik, AX 9-8411.
- PIGEONS, various types. Dahl, 256-1067 after 1 p.m.
- 3-BDR MANKIN HOME, walled, landscaped, built-in electric kitchen, near schools, churches, shopping, 1506 Erbbe St. NE. Farnar, 299-6007.
- ROPE HOIST, 1500 lb. capacity, 6:1 mechanical advantage, 75' of 1/2" rope, \$10. Boling, 282-3256.
- 2 LIFE JACKETS, childrens size 6, \$1/ea.; Hotpoint elec. dryer, \$35; Nesco deep fat fryer, \$5. Elliott, AL 6-7909.
- DISHWASHER, GE portable Mobile Maid, used 15 months, top and bottom showers, retailed, \$259, sell \$125. Heaphy, AL 6-1094.
- BACK SEAT travel pen for auto, \$3; 10" oscillating electric fan, \$4. Anderson, 298-5285.
- '61 Rambler Metro, ST, R&H, 9000 miles; '53 Studebaker, R&H, ST, OD; calico cat and three kittens. Naumann, 298-6476.
- ROBERSON, GI, 1400 sq. ft., double garage, many extras, \$110/mo. Lettetter, 299-4343.
- '52 DODGE, 6-cyl., 4-dr., R&H, '63 plates, \$120. Allen, 298-2278.
- '56 MERCURY station wagon, 9 pass., R&H PB, Mercomatic and seat belts. Summers, AX 9-4674.
- '55 FORD six, OD, \$225. Farmer, 898-2340.
- TWO-TON CHAIN HOIST, \$60; 2-wheel utility metal trailer, \$50; trade either one for oxy welding equipment. Aaron, 282-3124.
- FOUR SOAP BOX DERBY WHEELS and axles, \$5; 3 HP Clinton gas engine, \$13. Stull, 298-2543.
- GALE OUTBOARD MOTOR, 25 HP, electric start, 2 propellers, controls, steering, 12-volt battery, low hours running time, one owner. May, AX 9-6782.

- REFINISHED OAK chest of drawers, possibly antique, needs strengthening, \$15; platform rocker, needs new upholstery, \$10. Hogue, 1435 Espejo St. NE, 299-1807.
 - TWO POLYFOAM twin size mattresses and upholstered mattress boxes, 4 pieces, \$20. Gillespie, AL 5-6421.
 - WESTINGHOUSE Carousel vacuum cleaner, new, canister type w/upholstered storage case, has never been used, Battaglia, 1210 Lead SE.
- WANTED**
- TO TRADE baby crib for a small youth bed. Matlack, AL 6-7371.
 - BABYSITTING IN HEIGHTS, full or part time by reliable girl age 17, transportation furnished if necessary. Erbert, 299-1164.
 - MOTOR AUTO REPAIR MANUAL covering the year 1955. Asselin, AX 9-9270.
 - BABYSITTING IN MY HOME for working mother. Breckenridge, AX 8-2573.
 - RETIRED MAN or man and wife, as resident manager of modern, luxury apartment house. Metzger, 298-5054.
 - FOUR or six string electric base guitar with or without amplifier, must be reasonably priced. Holstrom, DI 4-5216 after 5:30 p.m.
 - RIDERS from vicinity of Morris and Indian School Road to Bldg. 892 or 880. Whitlock, AX 9-3229 or Martell, 299-0833.
 - DRIVER to share expenses on trip to New York City. Leaving Aug. 22, returning Sept. 8. Gottlieb, 345-1009 after 6 p.m. or weekends.
 - '58 or '59 RAMBLER American, automatic transmission, excellent condition. Joseph, 299-6989.
 - HOME for 4 nice white rats with cage and water bottle. Watterberg, AX 9-8517.
 - "BERRY" GARAGE DOOR, no hardware or track. Ogden, CH 3-0649.
- FOR RENT**
- UNFURNISHED 2-bdr. duplex apt., stove and refrig., washer rough-in, near bases. K. T. Moriarty, 424 Alcazar SE, 268-5474.
 - 2-BDR. UNFURNISHED APT, range, refrig., washer, garbage and water furnished, available July 15. Elliott, 819 C Louisiana SE, AL 6-7909.
 - 2-BDR. APT., large rooms, a/c, carpeted, drapes, electric kitchen, large private yard, patio, 3514 Crest SE. Petrone, 255-3633.
 - 3-BDR. HOME, 1 1/4 bath, \$95/month, available mid-July. Ahr, 11412 San Jacinto NE, AM 5-0653.
 - FURNISHED APT., a/c, 2 rooms, bath, couple or single person only, no pets, \$50. Dalesandra, 2508 Candelaria NW, DI 4-3863.
 - 2-BDR. HOUSE w/stove and refrig., Country Club area near Old Town, 1/2 block to Sandia bus, \$95/mo., available July 20. Coombs, 2022 Alhambra SW, CH 2-9321.



MEMBERS of the Defense Orientation Conference Association, founded in 1952 to acquaint civilian leaders with national defense policies, met at Sandia Base June 3, and visited the Sphere of Science, where they were

briefed by Sandia Corporation's President, S. P. Schwartz, on Sandia's mission. The group, consisting of U.S. business leaders, was also briefed on the mission and responsibilities of the Defense Atomic Support Agency.

From professional drivers

Advice for Vacation-Bound Motorists

In 1962, traffic fatalities on the nation's highways exceeded 40,000 for the first time. In fact, the total rose from 38,000 to nearly 41,000 in 1962.

Most of the fatality increase came from summer month accidents. The National Safety Council has issued the warning that the death toll may be worse in 1963. The next few months will be critical.

The five professional chauffeurs of Taxi Dispatch Section 4573-1 have never had a serious accident—no injuries, no lost time. The men drive an average of 85 miles each, every day. This is a total of 110,000 miles driven annually by the Section. Most of the mileage is accumulated in city traffic during good weather and bad.

The Lab News asked the drivers to pool their knowledge of driving safety and pass on their suggestions for a safe summer.

"Most accidents usually occur pretty close to home," H. W. Clay, section supervisor, said. "What's more, the most common type of accident includes a straight road, a bright sunny

day, a vehicle that has passed inspection, and drivers who consider themselves to be better than average."

"For one thing," Clay continued, "bad weather, heavy traffic, or difficult roads keep us on our toes. People stay alert enough to keep out of trouble. Apparently, it's the easy driving that causes trouble. You can't allow your attention, while driving, to be divided by conversation, distraction, or daydreaming. You have to concentrate all the time."

Arthur H. Chacon started driving a Model T sedan as a taxi in Old Albuquerque during World War I. He was 17 and he's been carrying passengers ever since. He drove the first Yellow Cab in Albuquerque, operating out of a stand where the present Kimo Theater is located. He has never injured a passenger in all these years. He's been driving for Sandia since 1951.

Always observe traffic laws, obey signs and signals, and drive defensively. Art gives as his advice on how to avoid accidents.

Alfredo Fernandez has been in the Sandia taxi service since 1952.

During World War II, he was a motor sergeant in the South Pacific Area. He has been involved in only one minor accident—his cab was struck from behind while he waited at a traffic light.

Keep a sharp watch on the other driver, Al advises. Give him the benefit of the doubt and give up your right-of-way to prevent a collision.

Joe Chavez has driven a taxi at Sandia since 1948. He started with the AEC and transferred to Sandia when the Corporation was formed in November 1949. He has never been involved in a serious accident.

Keep within the posted speed limit, Joe suggests. When weather is bad and pavements are slick, slow down. Wheels lock easily on slick roads and cars skid out of control. Pump brakes to keep from locking the wheels.

Burl Alsop has been in personnel transportation since 1943. He drove for the Air Force at Kirtland for two years and for the Base Engineers for two years. He worked with the AEC and came to Sandia in 1950. He has driven for Sandia nine years.

Keep your distance, Burl cautions. Maintain a safe interval between your vehicle and the one ahead—at least one vehicle length for each ten miles per hour. On wet and slippery pavement, increase this interval to give you a proper margin of safety. Front-end collisions are number one on the traffic "hit parade." Few drivers realize how many feet it takes to stop their cars. On the average, before you can put your foot on the brake pedal you have traveled as many feet as you are going in miles per hour. Be safe; give yourself plenty of room to stop.

Hap Kindschi has been driving for Sandia for almost three years. During the war, he was a driver in troop transport overseas. He has never had a serious accident.

Install and use seat belts, Hap encourages. They won't prevent an accident, but they will reduce the possibility of injury if you should have one.

"The reason why many vacation drivers get into trouble has been analyzed by traffic experts," Clay said. "It's easy to see that the average driver who, all year long, stays pretty close to home, doesn't get into training for those long-distance, all-day driving marathons. Even an amateur athlete knows you've got to train for the big event—you don't go in cold."

Study maps and plan your route. Take a break about every 100 miles, and stop early in order to get plenty of rest for the next day's driving.

Check your car before you leave and have it completely serviced before you return.

There are many other rules of the road which will help. Learn them. Remember them. Have a good trip, and a safe one.



NINETY-THREE YEARS driving experience is shared by the five drivers of Sandia's Taxi Dispatch Section 4573-1. Each man averages 85 miles on the road each day—110,000 miles annually for the Section. They've never had a serious accident. From left are Joe Chavez, Alfredo Fernandez, Burl Alsop, Hap Kindschi, Arthur Chacon.

Unclassified Reports Placed on Open Shelves in Library

Reference copies of unclassified Sandia Corporation Technical Memorandum, Development Reports and some other reports are now located on open shelves in the Sandia Laboratory Technical Library.

The reports were previously located in the catalog room.

As new reports are published, one copy of each will be added to the existing collection.

These reference documents may be found on the end shelves above the carrels on the main floor of Bldg. 804.

Sandia Speakers

Alan Y. Pope (7420) spoke on "Experiences with Research Rockets" before the University of Colorado's Chapter of the American Institute of Aeronautics and Astronautics last month. The meeting was part of the annual Engineers' Day observance at the Boulder, Colo., campus.

Welcome Newcomers

June 17-28

Albuquerque	Louella G. Byrum	3455
	Mary Ann Craig	3126
	Dorothy P. Hall	4362
	Elsie L. Harper	4211
	Hermilio P. Molina	4574
	Tomas E. Rael	3427
	*Mary C. Rike	3452
	Linda K. Riner	3126
	Katherine E. Savage	3126
	Ann E. Starrett	3126
	Clara H. Wallace	4321
Alabama	Gerald D. Cain, Auburn	2413
Arizona	Douglas E. Robertson, Tempe	2642
Arkansas	Richard F. Phillips, Fayetteville	2563
California	William S. O'Sullivan, Pelos Verdes Estates	5151
Connecticut	Larry M. Parker, New Haven	1313
Illinois	R. Dennis Rowley, Oak Park	3451
	James J. Baremore, Chicago	2422
Indiana	Frank W. Bolek, South Bend	2451
	A. James Leineweber, South Bend	2421
	Michael Bumgardner, Terre Haute	1422
	Irwin Mordka, Crawfordsville	3131
Kansas	Junior K. Thiry, Kansas City	2541
	Thomas M. Keegan, Manhattan	3453
Kentucky	James E. Gover, Lexington	1314
Massachusetts	Samuel G. Varnado, Wesson	1314
Michigan	Ronald R. Reynolds, East Lansing	7331
	Robert C. Butler, Okemos	4123
	Ronald A. Hill, Lansing	5151
	John J. Forsyth, East Lansing	9130
Mississippi	Larry T. Nelms, Corinth	2444
	Orren T. Pickard, State College	2412
Missouri	Richard E. Fairley, Columbia	7333
Nebraska	L. Gary Holcomb, Lincoln	1314
New York	Thomas C. Looby, Ogdensburg	1113
	Leander G. Pickard, Rochester	1425
North Carolina	David T. Putnam, Raleigh	7214
North Dakota	James E. Solberg, Grand Forks	2542
Ohio	Herman Bolles, Jr., Cincinnati	1112
	Blynn D. Shafer, Columbus	1431
	Jerry N. Shinkle, Cincinnati	1322
Oklahoma	Jules B. Cohn, Norman	4113
	Carrol T. Madole, Norman	4413
	Gerald H. McCorkle, Oklahoma City	4412
Texas	Earnest W. Roberts, Fort Worth	4412
	Arthur F. Witte, Bryan	7323
	Jimie D. Guy, College Station	2441
Washington	Keith J. Craswell, Seattle	5425
Wisconsin	Raymond M. Uhler, Madison	1423
Returned from Leave	Glorianna Garcia	3153
Temporary Summer Hires	Theodore E. Batchman, Lawrence, Kan.	2420
	Michael Goodyear, Columbus, O.	1124
	Ralph L. Rosenbaum, Brookline, Mass.	5133
	*Dominick A. Ross, Columbus, O.	1112
	David A. Sealer, Columbus, O.	5310
	Robert A. Seftles, Columbus, O.	1433
	*Darrell L. Gentry, Albuquerque	2344
	James K. Brousil, North Royalton, O.	2421
	Theodore Hailperin, Bethlehem, Pa.	5426
	*Jerry T. Cole, Albuquerque	1111
	James P. Quint, Albuquerque	7225
	John Kushner, Binghamton, N. Y.	3132

* Denotes rehired

Sandia's Safety Record

Sandia Laboratory HAS WORKED 2,100,000 MAN HOURS OR 60 DAYS WITHOUT A DISABLING INJURY

Livermore Laboratory HAS WORKED 360,000 MAN HOURS OR 67 DAYS WITHOUT A DISABLING INJURY