

IN REPLY REFER TO:

S. P. Schwartz
President
Sandia Corporation
Sandia Base
Albuquerque, New Mexico

Dear Monk:

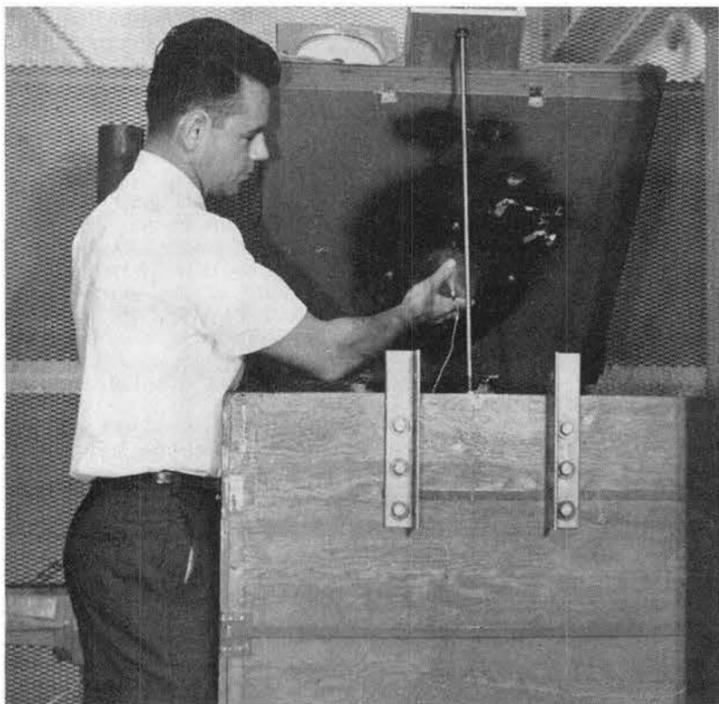
General Betts has made a specific point to note that our weapons production system did a most remarkable job in the fiscal year just ended. This job was accomplished in the face of what often seemed to be insurmountable difficulties in relation to our time scales.

I wish to express my sincere appreciation for the excellent support and cooperation that you and your organization have rendered in making it possible for the excellent record we have achieved in weapon production during Fiscal Year 1963. The performance of Sandia Corporation was indeed outstanding throughout the year in their support of weapon production. This performance certainly reflects the aggressive attitude of all the people involved to "get the job done."

Please extend my sincere thanks and that of the AEO Headquarters Staff for the excellent cooperation and support given them by your organization.

Sincerely,


K. F. Hertford
Manager



MAGNETIC SHOCK FACILITY is readied for test at Livermore Laboratory by Tom Meagher (8121-2), co-designer of the unique device. Tom places projectile against electromagnetic coil which will propel projectile into sawdust at bottom of box. Accelerometer mounted on projectile will monitor and measure acceleration produced during the tests.

Magnetic Shock Test Facility Yields Forces to 100,000-G

With the development of a revolutionary new shock testing facility at Livermore Laboratory, engineers may soon be able to "dial" the force they need to test a component, and attain results within an accuracy of five per cent.

The new shock testing machine, developed by Tom Meagher (8121-2) and Ken Marx (8121-4) at the suggestion of R. S. Jacobson (8121-4) and E. H. Daus (8158-1), makes use of magnetic "pressure" to propel test components with the force of a cannon.

Still in the prototype stage, the facility can transform electromagnetic energy into a mechanical force sufficient to apply more than 50,000 pounds of force and 30,000 g's on a two-pound specimen. In some tests, an acceleration as high as 100,000 g's has been produced.

Since the amount of electrical energy introduced into the facility is directly proportional to the mechanical force produced, results can be predicted with high reliability. In fact, according to Tom, test results indicate a higher degree of reliability, predictability, and repeatability than those obtained with more conventional shock testing machines.

The magnetic shock facility is currently being used to test accelerometers, and to gain a better understanding of the principles

of magnetic shock propulsion. A larger model is being investigated to subject weapons components to high shock and impact conditions. This model would handle test specimens weighing several hundred pounds.

This is the way it works: A projectile or test component made of conductive material, is held by a vacuum against the core of an electromagnetic coil. When sufficient current flows through the coil, the vacuum is broken and the magnetic field produced by the coil repels the projectile.

The energy source for the facility is a 24-Kilojoule capacitor bank which can be charged to as much as 17,000 volts. This energy is normally released in 125 microseconds. The voltage can be varied accurately to produce the desired acceleration pulse. Accelerometers attached to the test specimens monitor the acceleration produced. Because of its low noise characteristics, the facility eliminates the need for filtering data, resulting in even greater accuracy in test results.

Additional details on the development of the shock testing facility were reported by Tom in Sandia Corporation Development Report 369-62. The report was also presented by Tom at the Instrument Society of America meeting this month in Chicago.



SAFETY GLASSES SAVE EYES. This fact was proven out on Aug. 26 in the foundry of Bldg. 840, when three 4221-4 employees were burned by molten aluminum. Ramon Armijo, Dominicio Sandoval, and Donald Quayle (above) were pouring the metal into a crucible. There

was a loud report, and molten metal spewed from the container. Probable cause of the accident was moisture in the receiving crucible. All three men were burned. Mr. Quayle's safety glasses kept the metal from his eyes, although he was burned on neck and shoulders.

Top Scientists to Meet Here on Aerospace Nuclear Safety

A National Topical meeting of the American Nuclear Society with the theme, "Aerospace Nuclear Safety," will be held in Albuquerque Oct. 1-4. Participating in the program will be three members of Sandia Corporation's Aerospace Nuclear Safety Department 7410 while other Sandians will be active in the local arrangements committees.

V. E. Blake, Jr., manager of Aerospace Nuclear Safety Department 7410, will be chairman of the Re-entry and Postmission Disposal session of the conference. J. L. Colp, supervisor of Section 7412-1, will present a technical paper entitled "Aerospace Nuclear Safety Ground Test Program." A. J. Clark, Jr., supervisor of Aerospace Nuclear Safety Division II, 7412, will present "Aerospace Nuclear Safety Re-entry Flight Test Program."

Keynote speaker for the meeting will be Senator Clinton P. Anderson, chairman, Committee on

Aeronautical and Space Sciences. Norris E. Bradbury, Director of Los Alamos Scientific Laboratory, will be a luncheon speaker. K. F. Hertford, manager, Albuquerque Operations Office, AEC, will be session chairman for "Safety Programs and Philosophy."

Other speakers will be top officials and scientists of AEC, NASA, Air Force, Los Alamos, and aerospace industries. The *Lab News* will present additional program information next issue.

The Trinity Section of the American Nuclear Society, headed by D. M. Ellett (1541), is handling local arrangements. Mr. Ellett is also serving as publications chairman. R. E. Dunlap (3423) is technical editor of the *Proceedings*.

P. O. O'Brien, supervisor of SPRF Operations, Facilities, and Equipment Division 5332, is finance chairman for the meeting.

Art Hasenkamp (5331) is assisting with arrangements.

Mr. Colp is tour chairman for Sandia Corporation. Delegates to the conference will visit Sandia Laboratory reactors and environmental test facilities Thursday, Oct. 3.

Glen Whan, University of New Mexico Associate Professor of Nuclear Engineering and Sandia summer employee in Department 5330, is chairman of the special arrangements committee.

Co-sponsors of the meeting are Sandia Corporation; Air Force Special Weapons Center; Air Force Weapons Laboratory; Albuquerque Operations Office, AEC; Directorate of Nuclear Safety, USAF; Los Alamos Scientific Laboratory; and the University of New Mexico.

Technical sessions will be held in the New Mexico Union, UNM campus.

Prison Inmate Requests Wolowicz Article on Drafting Technology

Chet Wolowicz (8114-2) has received numerous inquiries from manufacturers and individuals, ever since his "Axioms of Drafting Technology" series first began in *American Machinist Magazine*. But the strangest request of all arrived last week — a letter from a man serving a long term for robbery in the Ohio Penitentiary.

"I am currently working in the institution's machine shop as a combination draftsman and machinist, and I am also, at present, actively undertaking a self-study program revolving around Tool Engineering and Mechanical Drafting in general," the prisoner explained.

He noted in his letter that he had acquired the first two articles in the series, and wondered where he could obtain the remainder of the series. "Due to the small amount of state earnings (approx. \$4 a month) that I make, I wouldn't be able to send more than the above amount in one month if the price of the above material runs more than that but, I would be quite willing to send each month the above amount until the material is paid for," he wrote.

Chet planned to give him an extra set of the series free "so he'll have some money left for cigarettes and such," Chet said.

Sphere of Science Open to Employees And Their Families

The Sphere of Science, Sandia Corporation's technical exhibit area, will be open to employees and their families Saturday, Sept. 28. Visitors will be able to view the exhibits from 9 a.m. to noon. "The Sandia Story" will be shown at 9:30, 10:15, and 11 a.m.



Editorial Comment

Fatality Statistics and People

Occasionally, plans for news stories to be printed in the **Lab News** are changed as investigation reveals more facts. Never has this so dramatically developed as in the preparation of this article on "licensed driver fatality rates" in New Mexico and California.

We had intended to show that licensed drivers in New Mexico are more apt, statistically, to become fatalities than licensed drivers in California. These two states were selected for comparison because the bulk of Sandia's employees live in the Albuquerque area of New Mexico and the Bay Area of California.

Proceeding with our article we put down the following statistics:

	California	New Mexico
Licensed drivers	8,790,000	613,000
1963 fatalities to the end of July	2,279	196
1962 fatalities	4,121	437

Startling figures? Yes. So we continued the search and found that, considering the number of vehicles on the road, the safety record was improving. There were more cars, but fatalities were not up at the same rate.

We had uncovered two statistical bits on accidents. Interesting. So the next step was to illustrate the article. A bar chart of the New Mexico-California fatality ratio was prepared. Then the decision was made to superimpose this chart on the photograph of the results of an auto accident. The photograph was to come from the files of the New Mexico State Police.

As we looked at the photographs our interest in numbers and percentages crumbled.

There was a crushed body of a curly headed tyke. Was it ours? In another photo were the remains of a strapping man. Our neighbor? Six persons were burned to death sitting upright in their car. A family of six lives across the street. A popular 1962 model automobile was crushed like an accordion. Parts of bodies extended from the wreckage. A friend has the same 1962 model car.

Half sick, we selected the photo used here. Never again will highway fatality statistics be mere figures. They will be people.

Mary Webster to Retire from Sandia At End of Month

Mary A. Webster will retire from Sandia Corporation at the end of September. During her nine years at Sandia, she's been secretary to J. J. Michnovicz, supervisor of Industrial Photographics Division 3465.

Mary expects to remain in Albuquerque after her retirement. "I have a number of relatives and friends here," she said, "and I'll probably spend a good deal of time visiting with them."

Gardening and flowers are the two hobbies Mary favors most, and she also plans to devote much of her spare time to them.

Sympathy

To C. H. Stockley, Jr. (7432) for the death of his father-in-law, in Bellingham, Wash., Aug. 19.

To R. M. Betz (6010) for the death of his mother in Columbia, Mo.

To W. A. Otero (4624) for the death of his father in Albuquerque, Sept. 4.

To D. L. Hurt (2313) for the death of his brother in Urbana, Ill.

To Jose A. Armijo (4514-1) for the death of his father in Albuquerque, Aug. 27.

To George R. Norris, Jr. (7214-2) for the death of his father in Ardmore, Okla., Aug. 28.

To R. L. Torres (3311) for the death of his father in New York.

Welcome Newcomers

Aug. 23-Sept. 5

Albuquerque	
Patricia P. Apodaca	3126
*Marjorie J. Cole	4333
Clifford C. Condit, Jr.	4233
A. Wade Cunkleman	4254
*Duane L. Dewerff	4254
Richard L. Foster	3428
Wendell H. Grimsley	4233
Joseph S. Honest	4233
Billie W. Huffman	4233
Joe E. Lucero	4254
Andrew W. Myers	4254
Herbert A. Pluemer	4254
Yvonne S. Riley	3126
*Bobby A. Reane	4233
Rosella V. Saavedra	4333
Eva R. Silva	3126
Ervin L. Smith	4233
Helen L. Temperly	4152
James C. Warmkessel	4254
Joseph G. Woodley	3427
Connecticut	
Thomas A. Green, Middletown ..	5152
Indiana	
Hubert C. Fox, Terra Haute	4335
David A. Edelman, West Lafayette...	1443
Kansas	
David K. Brice, Lawrence	5310
Kentucky	
Adelbert L. Roark, Lexington ..	5426
Mississippi	
James O. Harris, Jr., Tupelo	1313
Nebraska	
Donald G. Schueler, Lincoln	1433
Wisconsin	
Bernhard W. Weinberg, Whitewater	1425
Returned from Leave	
Alice N. Boothe	3421
Arthur M. Breipohl	9130
Paul J. Cruz	4153

* Denotes Rehired



SUMMIT of Antero Peak in southern Colorado offers wide vistas to Milo Conrad. He and a companion climbed nine such peaks this summer.

Milo Conrad Has To Be In Top Shape To Enjoy His Vacation

Milo Conrad (7251) took a vacation in the mountains this summer. With a difference.

A long-time mountaineer, Milo, along with John DeBuck, a mathematics teacher at Ernie Pyle Junior High School, spent a week among the 14,000-ft. peaks in Colorado's Sewatch Range. They climbed nine of them in seven days.

"We started with Shevano Peak (14,229 ft.) and Tabeguiche (14,155 ft.) the first day," he explained. "The peaks of the Sewatch are clustered fairly close together, and the whole area is above timberline, for the most part."

On the second day, Milo and John climbed Antero Peak (14,269 ft.); on the third day, Princeton (14,197 ft.); and on the fourth day, Yale Peak (14,194 ft.)

On the fifth day, they set up camp near the tiny mining town of Rockdale, Colo., and then packed in to Cloyes Lake. From the lake, they climbed Huron Peak (14,005 ft.) and Missouri Mountain (14,067 ft.). Then, they returned to the lake and packed back to Rockdale—all in the same day.

"It rained the next day," Milo continued, "so we spent it looking around Aspen, Colo." The following day—the last of the trip—they climbed Belford (14,197 ft.) and Oxford (14,153 ft.), and drove

home to Albuquerque.

Registers on the summits indicated that numerous people are spending time climbing mountains. "From 150 to 200 people are visiting some of the peaks yearly," he continued.

Thunderstorms were a persistent hazard. "Since a climber, exposed on a high peak, is an excellent target for lightning," Milo explained, "we timed our ascents so that we'd reach the summits in the morning, before the afternoon thunderheads built up."

Milo studied climbing at Olympia College in Bremerton, Wash. He had his first climbing experiences in the Olympic Range. He's a member of the New Mexico Mountain Club and the Los Alamos Mountaineers, and an affiliate of the Albuquerque Mountain Rescue Council. "The New Mexico Mountain Club offers an excellent opportunity for experience for anyone interested in the mountains," he concluded.



Mary Ann Craig, 1523

Take a Memo, Please

Acquire good safety habits, they'll last you through a lifetime.

Charles J. Skaloud Retired from Sandia At End of August

Charles J. Skaloud, an electronics technician and calibrator in Instruments and Electrical Standards Section 4231-3, retired from Sandia Aug. 30. He had been with the Company since 1952.

Before coming to Sandia, Mr. Skaloud served in the Merchant Marine as chief radio officer. He served on oil tankers during World War II. Prior to that time, he was a radio mechanic in the U. S. Army Air Corps.

Mr. Skaloud's two daughters and son live in southern California, and he plans to move there. "I plan to take it easy, do some hunting and fishing, and spend part of my time rock-hounding," he says.



VISITING SANDIA LABORATORY recently as part of a community-wide orientation program for new teachers of the Albuquerque Public Schools, was this group of science and math teachers. From left are Steve L. Wirtz, Linda Wright, Joe Williams, and Mary Noble. Twenty-eight educators toured Sandia's Sphere of Science, 7090 computer facilities, and the Wind Tunnel building as part of Albuquerque's annual Business-Education Day.

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Sandia Engineers Have Served ASME Well During Local Section's History

The New Mexico Council of Scientific and Technical Societies serves the technical community of New Mexico. Following is the story of the American Society of Mechanical Engineers, a member organization.

The American Society of Mechanical Engineers was founded in 1880 and has grown to more than 50,000 members nationally. There are now almost 100 Sections engaged in active programs in major industrial centers in the United States, Canada, and Mexico.

The active Albuquerque group of ASME members first organized in 1950 as a subsection of the Rocky Mountain Section. It became the nucleus of the New Mexico Section in 1953 under the chairmanship of R. A. Bice, now Vice President Engineering for Manufacture 2000. Numerous Sandians have served as chairman of the Section, including R. W. Henderson, Vice President, Weapon Programs.

Membership in the New Mexico Section of ASME now totals more than 400 with 250 from the Albuquerque area, which includes about 150 Sandia Laboratory employees. The organization promotes the exchange of information through meetings, a monthly magazine, five technical journals, and discussions to help members become aware of significant developments in the profession.

Nationally, there are 26 professional Divisions of ASME which are concerned with various specialized fields within the profession such as applied mechanics, air pollution, fuels, heat transfer, nuclear engineering power, solar energy, and underwater technology. These Divisions conduct national meetings and programs and maintain their own chairmen, ad-

ministrative officers, and research committees.

ASME is divided into eleven geographic Regions, encompassing all 50 states, each headed by a Vice President of the organization. E. H. Draper, Vice President, Development 1000, heads Region VIII, which includes New Mexico, Colorado, Idaho, Montana, and Utah. J. W. McKiernan (7419) is Region VIII secretary.

E. H. Copeland (7331) is chairman of the New Mexico Section for the coming year. "Activities will resume after the summer recess Sept. 26 with a buffet dinner and speaker scheduled," Mr. Copeland says. "Regular meetings are held September through May and feature a varied program of social and technical activities under the direction of our vice chairman and program chairman, J. P. Myers (1521)."

Major project of the local ASME group is an annual Fall Symposium. In the past, the symposiums have featured national authorities discussing aspects of such subjects as "Designing with Non-Metals," "Honeycomb Structures," and "Advanced Technology." The annual symposium will be held this year Nov. 1-2 in cooperation with the University of New Mexico. G. C. McDonald (1550) is chairman of the event. Subject areas will include the hydrocarbon fuel cell, engineering problems in air traffic control, recent developments in plastics and metals as engineering materials, and problems of engineering education obsolescence.

Other Sandians who are officers of the New Mexico Section include C. L. Carpenter (1513), treasurer; and C. E. Runyan (4220), secretary. Don Williams (7311) is a former chairman of the organization and is currently a director and an ASME representative to the Tech Council. J. R. Harrison (7521) also is serving as a director.

"ASME is a firm believer in a united technical community," Mr. Copeland says, "and promotes united activities of the Council. We sponsor a student chapter of ASME at UNM and New Mexico State University. We have a special committee for engineering education."

Membership chairman is A. J. Clark, Jr. (7412), who invites anyone interested in joining ASME to contact him, ext. 20240.



CLEANUP CAMPAIGN Oct. 7-25 at Sandia Laboratory, fire hazards, improve safety. Jessie Waddles (4624) will clear work areas of unused equipment, reduce gets rid of some trash collected from Bldg. 894.

Clean-up Time's Coming Again

Sandia Laboratory's annual Cleanup Campaign has been scheduled for Oct. 7 through 25. The Campaign, sponsored by the 4500 and 4600 organizations, will clear work areas of unwanted or unused equipment, reduce fire hazards, and improve the safety of working conditions.

Material may be sent to reclamation without paperwork. Call ext. 38241, Material Handling Section 4614-2, to make arrangements for pickup of unwanted material.

If accounting credit is desired for items sent to reclamation, attach a tag with the individual's name, organization number, and telephone extension. Organization 4622 will prepare the DTR form and arrange credit. Refer questions concerning this to W. E.

Hall, ext. 20262.

During the campaign, employees are encouraged to clean out desks, storage cabinets, and work areas. Small trash should be put into dumpsters; large bulky trash should be placed near a dumpster for pickup. Cardboard cartons are available from Division 4624, ext. 44144.

Employees are urged to have only one day's supply of flammable liquids in buildings, and to discard partially used cans of paint, lacquer, or thinner. Acetone, alcohol, or other flammable liquids should be stored in approved safety cans. Used rags should be placed in approved containers.

During the campaign, fire inspectors will check each building, and fire hazards will be reported to supervisors for correction.

Idle equipment to be used in the future should be placed in storage. Employees are requested to call ext. 54208 to arrange for transportation to storage. Material going to storage will require a completed form SC 6370-F.

W. H. Kingsley Named Member of Albuquerque Health Advisory Board

William H. Kingsley, manager of Environmental Health Department 3310, has been appointed to the City Health Advisory Board by City Manager Edmund L. Engel. He's also serving on the District and County Health Boards.

As a member of the Advisory Board, he'll participate in programs and activities including food and beverage sanitation, air pollution, and general environmental health conditions. The latter function covers programs dealing with ordinances governing swimming pools, nursing homes, trailer courts, animal control, food and beverage regulations, and general programs of health protection.

Two Sandia Fathers Get Big League Workout in Babe Ruth World Series

This is another in a series of articles telling of the community activities of Sandia Laboratory employees.

For most people, the World Series is just around the corner. For Bill Johnson (7331-1) and T. W. McKinney (4431-3), the best World Series of all was completed recently in Farmington. This was an international event for the Babe Ruth League, an organization which provides summer baseball competition for some 144,000 boys, age 13 to 15.

Bill Johnson is State Director for Babe Ruth League in New Mexico and W. T. McKinney is the New Mexico District One Commissioner. Both men devote many hours throughout the year organizing, promoting, coordinating and arranging league activities.

As State Director, Bill is responsible for the operation of the Babe Ruth League in New Mexico. He works constantly to recruit more adult leaders, to establish new teams, to raise funds, and to conduct tournaments.

Bill was instrumental in bringing the Babe Ruth World Series to New Mexico. He was a member of the planning committee for the tournament and served on the Regional Board of Directors. He became interested in Babe Ruth League when his oldest son started playing at Carlsbad. He became president of the city league.

Bill came to Albuquerque in 1957 and helped establish the city's Mile High Babe Ruth League which has been active for the past four years.

"We had 52,000 people attend the Babe Ruth World Series in Farmington," Bill says. "This was the largest total attendance ever achieved at a Babe Ruth World Series. It was an outstanding tournament."

As District One Commissioner or New Mexico, "T. W." coordinates League activities between Albuquerque, Los Alamos, Santa Fe, Espanola, and Raton. He serves as a consultant on rules of the game, advisor on activities, and general promoter for the League. He has been active for two years.

In Albuquerque, he arranges for playing facilities for League teams. "This is one of our headaches," he says. "We hope soon to establish a permanent diamond and stadium in Albuquerque for Babe Ruth League. We are looking for about 10 acres for this project."

There is always a need for additional adults to manage or coach teams. The League hopes to establish teams in both the North and South Valley areas next year.

"Working with the individual boys is the greatest satisfaction of all," T. W. says. "Baseball is a great sport and the boys who play the game in Babe Ruth League develop character and sportsmanship. None of the boys who participate in Babe Ruth League in Albuquerque has ever been in trouble."

Both Sandians are looking forward to many more years in the organization. Each has four sons.



GREAT SPORT — T. W. McKinney (4431), left, and Bill Johnson (7331), remember the recent Babe Ruth World Series in Farmington as the "best of all possible"

World Series. T. W. is District One Commissioner of New Mexico and Bill is State Director for Babe Ruth League. Sandians spend many hours on the projects.

The Privilege of Service

'I Shall Remain . . . Whatever Comes to Hand,' Clara Barton

By her actions she spelled out the meaning of mercy. By her words she impressed her cause and her personality upon her country and upon the world. She was Clara Barton, the "Angel of the Battlefield" and founder of the American Red Cross.

Clara Barton was pursuing an active life in Washington, D.C., as one of the first women employees of the government when the civil war started. She had abandoned a career of teaching and considered herself a spinster at 40.

But she had an infinite concern for humanity and the welfare of individuals. As the war neared Washington, she took sheets, towels, and blankets from her home to make into bandages for the wounded. From small beginnings her work spread in all directions. She collected a warehouse of medical supplies.

She burned with indignation at the lack of nurses at the front. Through her Washington acquaintances, she finally secured permission to be allowed to take her supplies to the Battle of Cedar Mountain. And she became a nurse, telling about it this way:

"I shall remain here while anyone remains, and do whatever comes to my hand. I may be compelled to face danger, but never fear it, and while our soldiers can stand and fight, I can stand and feed and nurse them."

After the Battle of Cedar Mountain, she secured more relief supplies, received Army support and served throughout the war as the "Angel of the Battlefield." When the war was over, Miss Barton devoted her energies to lecture tours, raising funds for families of the dead, promoting national war cemeteries and a monument to "the unknown soldier."

In 1869, she began her campaign to have the United States participate in the Geneva Treaty and the International Red Cross. She was in Europe during the Franco-Prussian War and helped the fledgling Red Cross distribute re-



Clara Barton
—angel of the battlefield—

lief supplies and organized work-rooms where civilians, destitute from the war, could help themselves with the manufacture of clothing and goods.

In 1881, Miss Barton and a group of supporters formed the American Association of the Red Cross as a District of Columbia corporation. America ratified the Geneva Treaty in 1882 and the American Red Cross was chartered by congress in 1900.

The organization, headed by Miss Barton, devoted itself to disaster relief on a national scale for the next 20 years. Miss Barton took Red Cross supplies and services to Cuba during the Spanish American War, and once again was giving front-line care to the wounded.

When she was 84, she wrote: "What armies and how much war I have seen, what thousands of marching troops, what fields of slain, what prisons, what hospitals, what ruins, what cities in ashes, what hunger and nakedness, what orphanages, what widowhood, what wrongs, and what vengeance. And yet one lives and laughs as if nothing had happened and thanks good fortune that it is as well as it is."

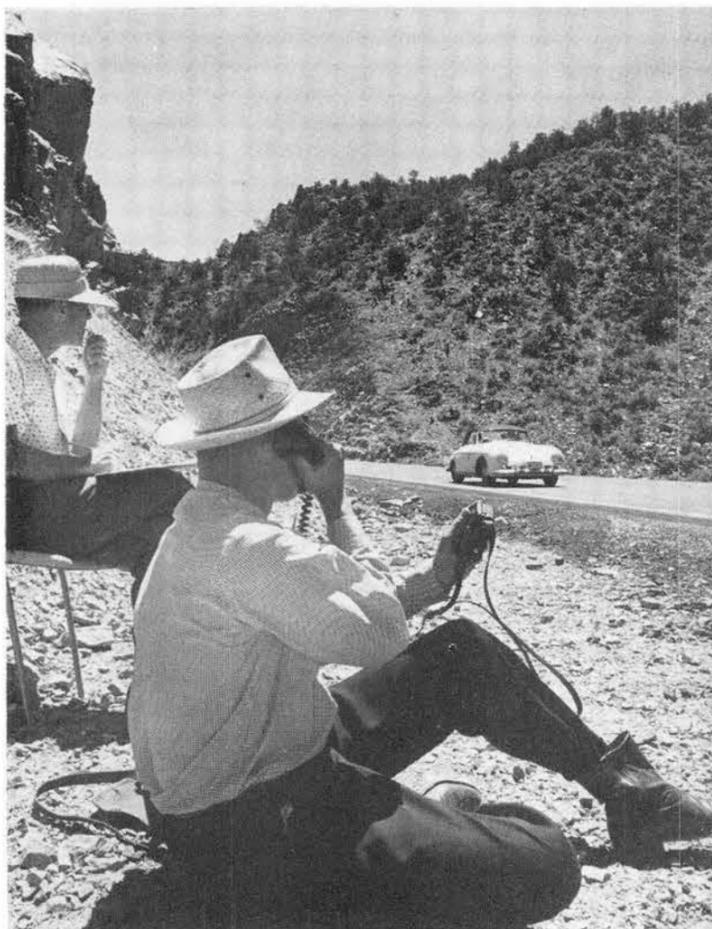
Through personal service, sacrifice, and dedication to an ideal, Clara Barton created a great humanitarian service, The American Red Cross. Her life illustrates this truism: The fortunate must care for the needy. Your opportunity for caring is the Employees' Contribution Plan or the United Bay Crusade. You are among the fortunate. Give generously.



CERTIFICATE of completion of rescue training is presented to a member of Sandia Laboratory's Rescue Squad, A. B. Whitmore (4623), right, by Larry Walsh, Senior Chief of the Sandia Base Fire Department. At far left are D. S. Tarbox, Director of Security and Industrial Relations, and Col. S. W. Gooch, Commanding Officer of Sandia Base. Presentation of certificates of completion was made at Sandia Aug. 20.



THESE ARE MEMBERS of Sandia Laboratory's Emergency Force. They provide a number of special skills and training for use in emergencies arising at Sandia Laboratory or Sandia Base. Rescue Team numbers 18.



PARTICIPATING in a National Sports Car Rally recently were Jack Marceau (2421), left, and Jack Shoup (1430), who clocked cars past a check point near Penasco. Sponsored by the Aztec Sports Car Club and the Rio Grande Region of the Sports Car Club of America, the rally drew 43 cars from across the country. Two-day rally covered about 500 miles.

Sandia Volunteers Get Special Rescue Technique Instruction

Eighteen of the 50 members of Sandia Laboratory's Emergency Force have received instruction in special rescue techniques. The men volunteered for the special training, which they received from

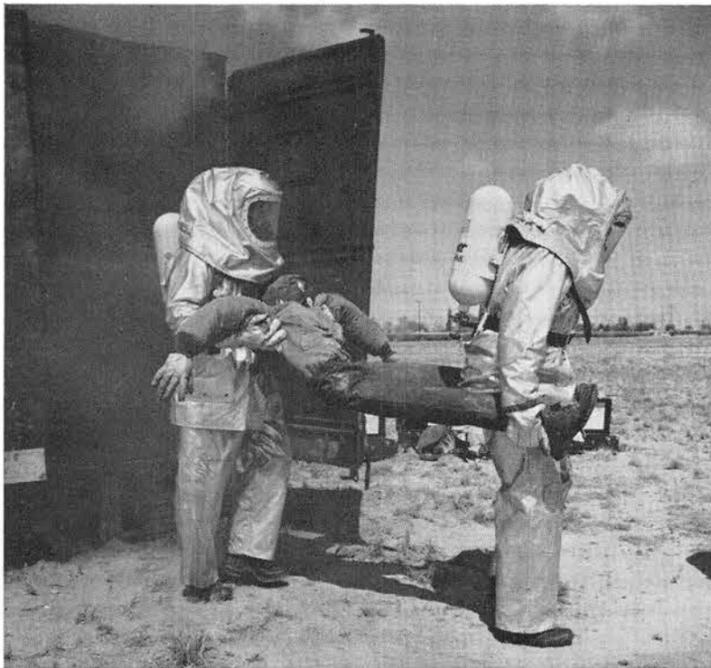
members of the Sandia Base Fire Department.

They were presented certificates of completion of the training by Larry Walsh, Senior Chief of the Sandia Base Fire Department, Aug. 20.

Sandians who completed the training include Joe Apodaca (4623), Tomas Apodaca (4612), T. J. Dawkins, Jr. (4212), Tony Garcia (4623), H. W. Gentry (4612), Reynaldo Gonzales (4612), W. A. Grace (4631), L. J. Johnson (4612), W. A. Johnson, Jr. (4623), A. F. Lamoria (4623), G. A. Lucero (4631), R. H. Marmon (4631), E. E. Martinez (4623), R. D. Mitchell (4251), J. F. Salazar, Jr. (4212), M. Sanchez (4623), V. D. Schaeffer (4254), and A. B. Whitmore (4623).

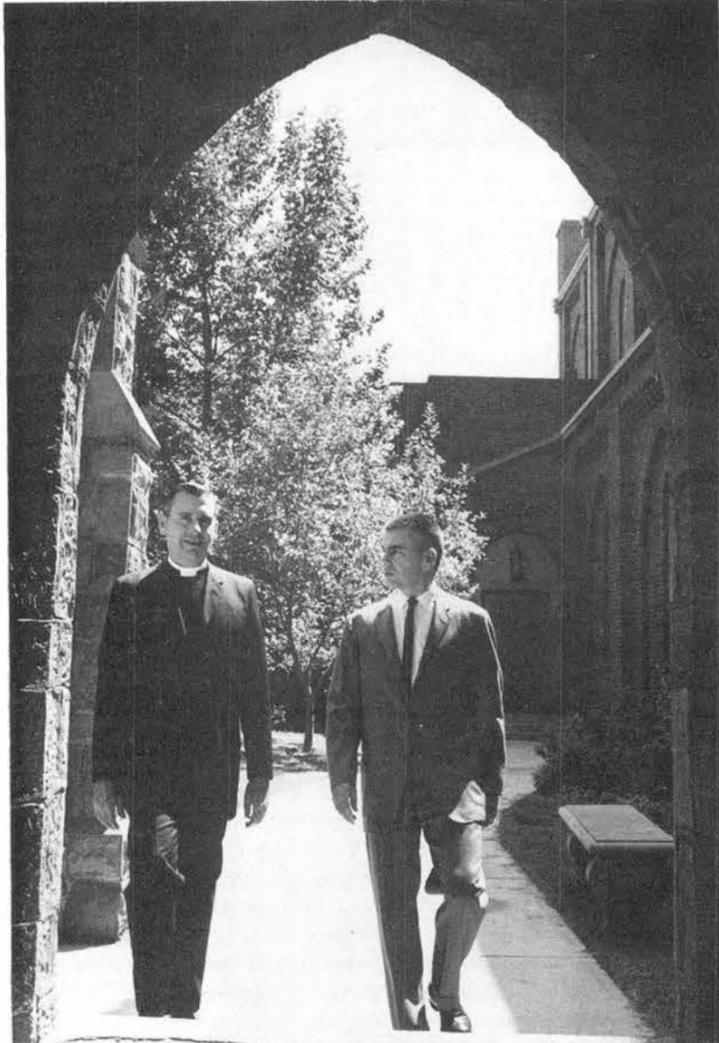
While not trained as firemen, the rescue team is specifically trained to help firemen in rescue operations during emergencies at Sandia Base.

The emergency force—of which the rescue team is a part—was organized three years ago, and consists of personnel with special skills or knowledge which would be valuable in emergency situations. The rescue team will not be called out to function separately from the emergency force, but will serve within it during emergencies.



RESCUE of dummy "victim" from smoke-filled chamber is part of training received recently by members of 18-man rescue team of Sandia Emergency Force. They completed training at Base Fire Department.

Lab Manager Leaves Business To Enter Training for Ministry



DISCUSSING his plans to enter Seabury-Western Theological Seminary, F. H. Grubbs, manager of Electronic Data Processing Department 3450, visits Rev. Albert W. Tarbell at St. John's Episcopal Church in Albuquerque. Mr. Grubbs will leave Sandia in September to enter ministry.

Frank H. Grubbs, manager of Electronic Data Processing Department 3450, will leave Sandia Corporation in late September. He'll journey to Evanston, Ill., where his wife and family are waiting for him. Then, he'll enter Seabury - Western Theological Seminary to study for the ministry.

"I've been a lay reader in St. John's Episcopal Church for the past five years," he says, "and presently, I'm serving as a vestryman and taking part in training of acolytes at the church. My decision to study for the ministry is the logical outgrowth of a continuing concern with the Episcopal faith."

Mr. Grubbs came to Sandia in May 1950 and spent several years in the Accounting Methods Division before becoming manager of Payroll and Vouchering Department. Then, he became manager of the Data Processing Department.

A graduate of Albuquerque High School and the Western School for Private Secretaries, Mr. Grubbs worked for the War Department several years before he enlisted in the Army. Commissioned in 1942, he served in the Signal Corps in France and Belgium during World War II. On his return to the United States, he served a tour of duty in the Pentagon.

He received a BA degree in Business Administration from UNM in 1950, and an MA degree in the same field in 1958. He has served on the executive committee of the board of directors of the UNM Alumni Association. A Lieutenant Colonel in the Army National Guard, he served on the Staff of the Adjutant General from 1946-1962, and is presently in the Reserve Selective Service Unit.

Mr. Grubbs will attend Seabury-Western for three years, and will spend his summers during that time in pastoral institutional training. At the end of three years he'll take canonical examinations leading to ordination as a deacon. Then, after a week as a deacon, he'll take more canonical examinations, to be followed by ordination as an Episcopal priest.



SMASHED AUTO reflects tremendous impact suffered recently by C. J. McGarr (4600). The accident could have been fatal had it not been for the seat belt Mr. McGarr was wearing. Accident occurred Sept. 6.

C. J. McGarr Glad He Is Believer In and User of Auto Seat Belts

C. J. McGarr, Director of Service Operations 4600, is alive today, he believes, because he uses seat belts in his automobile. Last Friday, on the way to work, his car was struck on the right side by another car traveling about 50 mph.

Mr. McGarr had stopped for a red light at the intersection of Coal and Broadway and was proceeding through the intersection after the light changed. The other driver was cited for running a stop light.

When the cars collided, Mr. McGarr was thrown against the left door of his car, bounced back to the right all the way down in the seat, and was then thrown forward

toward the windshield. The seat belt he was wearing kept him inside the car.

The left door was thrown open and then slammed shut with enough force to spring the hinges. Both vehicles received extensive damage.

"I'm convinced," Mr. McGarr said, "that if it hadn't been for the seat belt I was wearing, I would have been thrown out that door and under the wheels of both cars. I used to sit on my seat belt," he said, "but luckily I finally developed the habit of buckling it on. I don't remember buckling the belt that morning. The habit saved my life."

ECP Kickoff Date Is Nearer; Drive Will Last Three Days

Captains heading solicitation for this year's Employees' Contribution Plan drive were announced this week by the ECP Committee. The Drive will start Sept. 30 and continue through Oct. 2. Only those employees who are not ECP members will be personally solicited.

The ECP is the only in-plant health and welfare drive at Sandia Laboratory. Originated in 1957 as a "Give Once and For All" campaign, ECP has made it possible for Sandia Laboratory employees to give a total of \$827,000 during its seven-year history. Thirty-six agencies, including those of the Albuquerque United Community Fund, receive the ECP funds.

Members of the plan give a minimum of \$1 per month to ECP either in cash at the beginning of the drive or by payroll deduction throughout the year. Last year, the average Sandia Laboratory contribution by members of the plan was \$27.74. Goal of the drive has always been a "fair share" dona-

tion or one hour's pay each month. The captains and the organizations to be solicited are as follows:

- C. H. Mauldin (1314) — 1100, 1300, 1500
- P. J. Komen (1422) — 1400
- J. R. Meikle (2632)—2600, 2300
- P. W. Callies (2444)—2400, 2500
- K. E. Sutton (3151)—3100
- W. W. Ives (3463) and J. G. Marsh (3422)—3400
- H. M. Willis (3240)—3200, 3300
- L. R. Neibel (4330)—4300, 6000, 9100.
- H. G. Pierce (4136)—4100
- E. M. Hodges (7534)—7500
- C. E. Runyan (4220), A. C. Taylor (4254), and D. A. Watt (4233)—4200
- D. J. Yarbrough (4420)—4400
- Glen Seay (5133)—5100, 5300, 5400
- L. R. Wilson (4574), S. L. Johnson (4542), and J. H. Simmons (4513)—4500
- Andy Blain (4614), and W. A. Otero (4624)—4600
- E. L. Harley (7418)—7400
- H. S. North (7241)—7200
- W. H. Cross (7332)—7300

15 Year Service Awards



W. M. Folks
8121
Sept. 7, 1948



Robert J. Kraus
2624
Sept. 20, 1948



Bessie L. Passmore
4433
Sept. 20, 1948



Glenn C. Ryan
7312
Sept. 20, 1948



John C. Robinson, Jr.
7532
Sept. 20, 1948



Jessie H. Burns
8124
Sept. 20, 1948



John R. Halliday
1414
Sept. 21, 1948



B. E. Van Sickle
2413
Sept. 24, 1948



Nicholas S. Perea
2643
Sept. 24, 1948



James M. Winter
4512
Sept. 24, 1948



Wayne E. Brookshire
1113
Sept. 27, 1948



Dale L. Fastle
7244
Sept. 27, 1948



Alfred L. Romero
2641
Sept. 28, 1948



John K. Merillat
3151
Sept. 28, 1948



Leslie E. Cox
4274
Sept. 28, 1948



Robert G. Piper
4543
Sept. 28, 1948



Teddy Chavez
4221
Sept. 29, 1948



Herman Chaves
4512
Sept. 29, 1948



Frank Castillo, Jr.
4631
Sept. 29, 1948

Clerical Applicants At Sandia Process Through State Service

For a number of months, the New Mexico Employment Service has been providing and administering a battery of screening tests to female candidates for clerical employment at Sandia Laboratory. All new applicants are required to complete tests before they come to Sandia's employment office for interviews and other tests.

Employment Division 3151 suggests that when the occasion permits, employees advise individuals seeking clerical employment at Sandia to visit the Employment Service and complete the tests before contacting Sandia's employment offices.



HIGH SCORE TEAM award was presented to shooters from Sandia's Patrol Division 3242. H. M. Willis, Manager of Security Standards and Operations Department 3240 (center left), presented the trophy to Robert

Crompton, while other members of the team (l to r) Lester Baumann, Thomas Carbin, Raymond Arnold, John Ivey, Thomas Tangney, and Jesus Baca look on. All of the members are in Patrol Division 3242.

Supervisory Appointments



SERVING as members of the Advisory Council on Creation of a Vocational-Technical Institute for the Albuquerque Public Schools are, from left, Charles W. Allen (2313), G. L. Krieger (1413), and M. A. McCutchan

(3132). The Council was appointed to study the need for a vocational-technical institute, to determine whether present facilities are meeting the need, and whether the Public Schools should establish such an institute.

E. E. BUSS to supervisor, Services Section II, 4211-2, effective Sept. 1.

Earl started his Sandia career in September 1956 with the field inspection organization. Oct. 15, 1962, he transferred to Development Shops Organization 4200, and has been with Division 4211 since that time.

Before coming to Sandia, he was head of the quality control department of Greenleaf Manufacturing Co. of St. Louis, and of the quality control department of Magnavox. He also worked in procurement for the U.S. Air Force.



TOMMY A. SELLERS to supervisor of Systems Engineering Section 7435-2 (newly created), effective Sept. 1.

Tommy has been in systems engineering since he came to Sandia in February 1958. In May 1958, he entered a six-month period of training in the U.S. Army's Nike Anti-Missile School at Ft. Bliss, Tex.

Before coming to Sandia, he attended the University of Oklahoma, where he received a Bachelor of Science degree in Electrical Engineering. He is a member of Tau Beta Pi (engineering honorary) and Eta Kappa Nu (electrical engineering honorary).



BILLY D. PONTSLER to supervisor of Specifications and Standards Section 8116-2, Product Evaluation Division, Livermore Laboratory.

Bill joined Sandia at Albuquerque in 1953 as a production planning engineer in Manufacturing Development 2530. After a year at Sandia, he was called for two years' service in the Armed Forces, where he worked as a research and development engineer with the Army Ordnance Corps at Picatinny Arsenal.

Following his Army discharge, he returned to Sandia as a design engineer, transferring to Livermore Laboratory in November 1956. In October 1957 he was assigned to work in the newly-formed Preliminary Design organization, where he remained until he transferred to a project group in 1959. Since March of this year he has been in field test operations.

Before coming to Sandia, Bill worked for six months as a civil engineer for the Bureau of Reclamation on the Grand Coulee Dam in Washington. Previously, he had worked for the Bureau part time over a four and a half year period while attending school.

He graduated from Washington State University in February 1953 with a BS degree in mechanical engineering.



Sandia Speakers

D. R. Morrison (5426), "Applications of Abstract Algebra to Real Problems," at University of Oklahoma, July 22.

L. J. Paddison (2400), "The Problem of Reliable Data," Reliability and Statistical Methods in Industry Course, Department of Engineering, UCLA, July 29-Aug. 23, and also at the New York Section of the IEEE on Oct. 1.

J. R. Holland (5135), "Quantitative Determinations and Descriptions of Preferred Orientation," Proceedings of the 12th Annual Conference on Applications of X-Ray Analysis, Aug. 7-9 in Denver, Colo.

R. B. Foster (2411), "Complete Immersion Testing of Liquid-in-Glass Thermometers," ISA Conference on "Environments for Standards Laboratories," Sept. 10, Chicago, Ill.

M. T. Abegg (1311), "Low Detonation Pressure Explosives," (H. J. Fisher, H. C. Lawton, and W. T. Weatherhill, Aerojet-General Corp. are co-authors); and "Explosive Evaluation of Coordination Compounds" (W. J. Meikle, 1311; J. W. Fronabarger, C. W. Hoppesch, and C. T. Rittenhouse, Universal Match Corp. are co-authors) at American Chemical Society meetings in New York City in September.

W. R. Perret (5412), "Free-Field Ground Motion Produced by Explosives," Symposium on Shelter Construction sponsored by Swiss Office of Civil Defense, Zurich, Switzerland, in July.

H. V. Fisher (7222), "The History and Control System Theory of Sandia Tracking Camera Mounts," Technical Symposium of the Society of Photographic Instrumentation Engineers, Los Angeles, Calif., Aug. 7.

Group Studies Vocational Education Needs for Students Missing College

Three Sandians are serving as members of the Advisory Council on Creation of a Vocational-Technical Institute for the Albuquerque Public Schools. Appointed last June by Charles R. Spain, superintendent, the Advisory Council is surveying present educational facilities and making a study of the need for vocational training.

Charles W. Allen, supervisor of Technical Training Section I, 2313-1, is vice chairman of the Advisory Council. M. A. McCutchan, supervisor of Technical and Trades Training Division 3132, is chairman of the Council's sub-committee for surveying current vocational and technical training in Bernalillo County. G. L. Krieger of Physics and Advanced Development Section 1413-2, serves as a Council member.

Responsibilities of the Council include assessing the community needs for additional vocational

training, evaluating present resources in light of projected needs, recommending pro or con on the creation of a technical-vocational institute and, if positive, recommending specific methods for establishing the institute.

"Our studies seem to indicate a definite need," Mr. McCutchan says, "for additional training beyond high school in both physical and mental skills. Forty-two per cent (2202) of high school students in Albuquerque are currently not completing the 12th grade.

Extrapolating this rate, by 1970, there will be some 26,000 students in Albuquerque leaving high school before graduation. Added to this number will be 18,000 students who graduate from high school but do not attend college. All of these young people—an estimated 44,000 by 1970 in Bernalillo County—will need additional training to meet the rising standards of modern employment."

Death

P. R. Hooten

Perry R. Hooten, a retired Sandia employee, died June 11 in Truth or Consequences, N. Mex. He was 74.

Mr. Hooten was formerly employed as a janitor at Sandia Laboratory.

He is survived by his wife Ethel who is also a retired employee of Sandia Laboratory, a son, Ross; and a daughter, Mrs. Margaret Whitlock.

Wedding

Lucy R. Metzgar (4135-1) became the bride of Ross B. Lopez on Aug. 3 at Holy Rosary Church.

During their honeymoon they visited Niagara Falls, Canada, New York City, and Washington, D. C., and are now at home at 416 59th St. SW. Lucy has been employed at Sandia Laboratory since December 1956.

Hikers Vacation at 10,000 Feet in Calif.

Annual outing of the New Mexico Mountain Club took a group of Sandians into the High Sierra country of California for two weeks recently. The Club hiked about 70 miles at an average altitude of 10,000 ft. in the Sierra Nevada Range and climbed three peaks.

Sandians making the trip included Hank Tendall (1513), Dick Martindell (2532), Irv Auerbach (5153), Betty Tanner (3421), and Carl A. Anderson (5331). Club members left Albuquerque Aug. 2 and returned Aug. 18.

They assembled in the Rock Creek Lakes area near Bishop, Calif., and then backpacked into the mountains. They carried enough supplies for six days. After making a loop northward, the group returned to the assembly area, picked up new provisions and hiked south for another week.

"Scenery was spectacular," Irv Auerbach says, "and it was a great trip. After the first day, you become acclimated to the altitude and the climbing.

The group climbed Mt. Hilgard, Red Slate Mountain, and Mt. Gabb, the tallest peak at 13,700 ft.

During the year, the Mountain Club schedules climbs about every weekend. President of the organization is Duane Arlowe (7312). Anyone interested in joining is invited to contact Duane, tel. 265-0727.



HIGH SIERRA COUNTRY — Members of a recent Mountain Club expedition into the Sierra Nevada mountain range in California pause by a small lake above 10,000

ft. Hank Tendall (1513), right, was group leader. Club members backpacked more than 70 miles in the mountains and climbed three peaks during the outing.

Employee Fund Distribution Brings Year Total to \$116,140

Sandia Laboratory employees who are members of the Employees' Contribution Plan have given a total of \$116,140 to the 25 agencies of the United Community Fund and nine other health and welfare agencies to date this year.

As the July checks — totaling \$13,304 — were mailed recently, the following distribution had been made:

	July	Year to Date
United Community Fund	\$10,377	\$89,838
American Cancer Society	665	5,894
Bernalillo County Heart Association	545	4,791
Arthritis and Rheumatism Foundation	212	1,862
Albuquerque Association for Mental Health	133	1,153
N. Mex. Society for Crippled Children and Adults	532	4,592
National Multiple Sclerosis Society	93	834
Albuquerque Association for Retarded Children	199	1,784
Cerebral Palsy Association of Bernalillo County	279	2,425
Muscular Dystrophy Association of America	133	1,148
Reserve Fund	133	1,148

Sandia Amateur Radio Operators Are Eligible for Western Electric Contest

Sandia Corporation employees are eligible to compete in the Fourth Annual CQ-WE Contest for licensed amateur radio operators. The contest will be held during the month of January 1964. Host is the Omaha Works with Fred E. Kujawa, KOETA, as coordinator.

Contest scoring will be on the basis of two points for each confirmed contact, times the sum of all the different U.S. Call Districts and Foreign Prefixes. The same station cannot be counted more than once per weekend. Logs will

show GMT time, the call of the station worked, his name, location, and WE unit to which he belongs.

Four operating periods of one hour each during the weekend of Jan. 11-12 and four one hour periods during the weekend of Jan. 18-19 are scheduled. In addition there will be a four hour session on Jan. 26.

Complete contest information is available from the Albuquerque Area Coordinator, E. G. Stewart (4511-4), tel. AL 6-9290. His call letters are K5UJQ.

Seafood Buffet to Follow Social Hour At Club Tonight

The Coronado Club will feature a Seafood Buffet this evening, with a social hour and music provided by the Bud Fisher Band. Prices for the buffet are \$1.25 for adults; \$1 for children.

The buffet on Friday evening, Sept. 20, will feature spaghetti and meat balls, and a fish dinner. George Davis will provide music. Prices: \$1.25 for adults; \$1 for children.

The Los Alamos-Sandia Golf Tournament Banquet will be held at the Club the evening of Sept. 21.

Western Electric Ham Roundtable Invites Amateurs

All Sandia radio amateur operators are invited to participate in the Western Electric Roundtable Discussion, a program started last month for all persons connected with units of Western Electric Company.

The Roundtable is on the air every first and third Saturday of each month at 0200 GMT, 40 meters at 7.235 mc.

D. B. Owen's Review Of Two Publications Published in Magazine

A review written by D. B. Owen, supervisor of Statistical Research Division 5425, of two compilations of mathematical tables, has been published in the May issue of *Technometrics*.

The books are *An Index of Mathematical Tables* by A. Fletcher, J. C. P. Miller, L. Rosenhead, and L. J. Comrie; and *Guide to Tables in Mathematical Statistics* by J. Arthur Greenwood and H. O. Hartley.



SLOW PITCH ALL-STARS recently downed the Sandia Base 901st Co. 22-13. In the first row, from left, are Mike O'Bryant (4411), Norbert F. Siska (2453), Floyd Salas (3427), Milt R. Madsen (7324), Bill S. Saric (7311), and Jim F. McDowell (2564). Standing are Ted R. Garcia (3421), John R. Rosborough (2452), Louis G. Nogales (4432), George T. Kolesar (4411), Win E. Bergsten (2564), Leo J. Klamerus (2564), Joe J. Bradshaw (7324), and H. E. Long (2641). Not shown are Lee Stevens (AEC), Bob Jaramillo (3427), Joe LaGrone (AEC), Bill Emrick (2442), and Don Deatherage (2541). Mike O'Bryant is team manager.



SLOW PITCH CHAMPIONS — In the front row, from left, are John H. Weinlein (2423), Norbert F. Siska (2453), George Kamboureis (1531), John Marcon, Jr. (2453), John R. Rosborough (2452), and Mike O'Bryant (4411), manager. Standing are Gerald D. Phaklides (2421), Keith Treece (2453), George T. Kolsar (4411), Archie M. Sorley (2413), and Raymond V. Fisher (7412). Not shown are Don Deatherage (2451), James C. Mason (2452), John V. Willems (7162), Andrew C. Wilken (2421), Bill Emrick (2442), and Gene A. Daniels (4411).

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

- WATER HEATER, 40-gal. glass lined, natural gas, 17 months remaining on guarantee, \$5. Hill, CH 3-3493.
- BOY'S 24" BIKE, baby buggy; bathinette. Matsko, 299-2145.
- '59 RENAULT DAUPHINE, 300 miles on major overhaul, R&H, \$495. Dobbins, 299-5562.
- POODLE PUP, male, miniature, pedigree, 5 months old, white w/tinge of apricot, fresh trimmed, all shots, 75. Johnstone, DI 4-6388.
- '15" FORD WHEEL, tire and tube; Hotpoint TV, 17", \$32.50 or best offer. Asturias, 299-4173.
- '55 PONTIAC 2-dr. HT, R&H, w/w, \$350; two 15" wheels for Chevrolet; two 8.20x15 used w/w, \$2/ea. Wilson, AX 8-0049.
- DINETTE SET w/6 chairs, \$25; room divider desk w/light, planter, \$7; single headboard, metal/gold, \$5; Drapes (Chinese), White Priscilla, \$1.50/pr. Baca, 299-8190.
- '49 CLASSIC SUNBEAM-TALBOT 4-dr. sunroof sedan, \$250 firm. MacCallum, DI 4-4656.
- SAW, ARBOR, tilt table without motor, Craftsman, \$45. Pitti, AL 6-1629.
- '58 LINCOLN 2-dr., air, \$895; '58 Jeep wagon, \$595. Nielsen, AL 5-2045.
- '55 DODGE 4-dr. station wagon, AT, R&H, \$275. Chose, 299-4982.
- MOUNTAIN CABIN, A-Frame, Manzano Springs, electricity, water available, Community Club House privileges, deer hunting, \$2500, will finance. Anderson, AX 9-4518.
- FIVE 7.50x16 tires and wheels, \$100 with '49 International 3/4 ton pickup in running condition thrown in as a bonus. Teisher, AX 9-6987.
- MOUNTAIN CABIN on 1 acre lot, timber, Manzano Mountains, 1 mile from Highway 217 in Holiday Hills. Moore, 256-2748.
- WURLITZER SPINET PIANO, blond, \$342. Fesler, 8902 Phoenix Ave. NE, AX 9-1020.
- 3-BDR HOME, 1 1/2 bath, walled, a/c, carpet, 85x120' lot, \$11,250, \$78/mo.; 6-yr. crib, \$7. Smith, AX 8-0767.
- '60 CUSHMAN EAGLE, \$175. Homan, AL 5-5021.
- REFRIGERATOR, Coldspot, 13 cu. ft., \$25. Himes, AX 9-7828.
- 3-BDR., den w/fireplace, 1 1/4 baths, pitched roof, double garage, a/c, near schools. Martin, 1809 Gretta NE, AX 8-4356.

- 2-BDR. HOME, carpet, drapes, a/c, f/a heat, 720 California SE. Magruder, AL 5-2078 after 5 p.m.
- DRAKE 2-B receiver, \$215; Viking Ranger transmitter, \$130. Halliday, AL 6-6685.
- HO GAUGE, wall hung, complete scenic train and motor car combination layout, 2 trains, transformers, motorcars, \$50. Devor, 256-6541.
- COUCH, 9-ft., rose, \$75. Smith, 4615 Palo Alto SE, AL 5-7389.
- OAK KITCHEN TABLE w/4 chairs. Niper, 299-6290.
- MICRO-BUS, Deluxe, 1962, red and white, radio, \$2100; '55 Chevrolet 1 1/2-ton truck w/1000 gal. water tank, \$900. Norton, BU 2-3165.
- '58 FORD PICKUP 1/2-ton, 3 speed, 8 cylinder, 6 new tires, heater, \$895. Carnahan, 299-3816 after 4 p.m.
- HOTPOINT ELECTRIC DELUXE RANGE, \$40. Steele, 1632 Moon NE, after 5 p.m. or weekends.
- POWER LAWN MOWER, 3 HP, Briggs-Stratton rotary, \$20; pair T-Bird cast alum. valve covers. Kite, 255-8208.
- SORREL MARE, flaxen mane, tail, 3-yr.-old, AQHA appdx., gentle, pleasure riding trained, ready for performance training, \$450. Bushmire, AL 6-7321.
- TWO CLARINETTS. Smeltzer, AL 6-3908 after 5 p.m.
- '61 VOLKSWAGEN MICROBUS, 40 HP, Syncro, all forward gears, 24,000 miles, \$1500 firm, no trades; trailer hitch for 1957 Pontiac. Class, 255-4952.
- ALL WOOL MATERNITY SUIT, 2 pieces, charcoal, size 14, \$10. Nix, 2813 Virginia NE, 298-4282.
- CAR COOLER, Wright, 12V, evaporative, new cost \$60, sell for \$15. Hurley, 256-0746.
- MOVING, want to sell misc. items, including Harvard Classics, China, fur stole, Ency. Britannica, freezer, etc. Cervantes, AL 5-5670.
- SOLID OAK BOOKCASE HEADBOARD, double bed w/innerspring mattress and box springs, \$45. Hiller, 299-7573.
- 3-BDR ROBERSON w/family room, 1 1/4 bath, a/c, sprinklers, disposal, new carpet. Gay, AX 9-6567.
- '53 PLYMOUTH CRANBROOK, \$195. Coomer, 243-6591.
- REMINGTON TYPEWRITER, portable (Quiet Riter) w/case. Pitti, AL 6-1629 after 5 p.m.
- WINCHESTER SHOTGUN, model 12, 12 ga., modified choke, \$69; Colt Frontier Scout single-action revolver, .22 LR cal., and carrying case, \$39, terms available. Kubiak, 256-1513.
- HOFFMAN BRICK, 2-bdr., 1 1/4 bath, low down payment, 2523 Gen. Bradley, NE. Gilpin, AX 9-1100.
- SEARS 24" self-propelled rotary mower, new paint; Admiral 17" table model TV; Wonderland and Knowledge set. Lowe, 11404 Bellamah, NE.
- BABY CRIB w/mattress, \$15; small wood spring horse, \$4. Bryant, AX 9-8315.
- BULLETIN-TYPE typewriter; '61 Thorobred Mustang motorcycle, 2100 actual miles. Montoya, AM 8-5675.
- '62 TR-3 ROADSTER, less than 10,000 miles, heater, whitewalls, Tonneau cover, sell or trade for new Micro-Bus. Rowley, 265-4622.

NEXT DEADLINE FOR SHOPPING CENTER ADS Friday Noon, Sept. 20

- '57 OLDS Deluxe car, radio; will sell or rent 3 1/2 HP 4-blade roto tiller. Bortniak, 298-5093.
- FREE KITTENS, long and short hair, black grey, or tiger plus combinations, weaned and housebroken, must give away. Swain, 265-0098.
- '55 FORD SIX, OD, \$200. Farmer, 898-2340.
- DRAPES, full-length custom-made, lined, brown w/pattern; also aqua net fiberglass, used together, will sell separately. Cowan, CH 2-1052.
- TARGET PISTOL, Colt Woodsman, \$60. Stephenson, AX 9-3904.
- ALUMINUM AWNING, white, 44" wide, \$10. Leyba, AL 6-6804.
- 21" TV w/stand, \$25; hand lawn mower, \$8; Wilson clubs, 3 woods, 6 irons, bag, cart, \$50. Copeland, AL 5-4688.
- WESTINGHOUSE TV, 24", \$65; Westinghouse electric sewing machine in cabinet, \$30; car cooler, \$15. Gluvna, 299-8027.
- SERVEL refrigerator-freezer, 13 cu. ft., automatic defrost, guarantee, original price \$448, sell for \$95. Zipprich, AX 9-2173.
- NEW HOUSE, 3-bdr., 1 1/4 baths, attached garage, near schools, Sandia Base, low down payment, no qualifying. Roberts, 299-7129.
- FREEZER, 20 cu. ft. chest-type, double door model; 4' cross-cut saw, one or two man model, used one season. Crass, 299-1418.
- '63 PARILLA TRAIL and road cycle, 12 hp, 4-speed; new Ruger Blackhawk .44 Magnum pistol, \$80. Etherton, 298-5155.
- '62 VOLKSWAGEN CAMPER, 16,000 miles, fully equipped, \$2250. Miller, 298-1994.
- BOY'S jackets and flannel shirts, sizes 12-16; blue suit, 14 Husky. Hicks, AM 8-8640.
- '55 VOLKSWAGEN, black, must sell. Krahe, 256-2234 after 5 p.m.
- '58 CHEVY 4-dr. sedan, all white, V8. automatic transmission, \$595 or reasonable offer. Pickel, AX 9-1291.
- ANTIQUE oak book case combination; old Kentucky rifle; civil war sword; baby swing; bathinette; want deer rifle, old coins. Zaluga, 344-1564.
- EICO MONO HI-FI HF 20 amplifier, HFT 90 FM tuner, EVSP12B speaker in corner enclosure, Garrard mono changer, total \$125. Letbetter, 299-4343.
- SIX-FOOT wing radio-controlled airplane complete with 5 channel receiver, wheels, 3 servos, ready to go. Ward, AL 6-9286.
- '60 AUSTIN HEALEY 3000 deluxe, wire wheels, Michelin "X" tires; Kenmore automatic wash, \$15. Milloy, 299-9112.
- DINETTE, 7-pieces, bronztone, large table. Martinez, DI 4-6994.
- POLAROID MODEL 850 Photo-electric automatic camera, w/Wink-Lite, flash, case, \$85; present retail price \$148.50. Deeter, AL 5-5789.

- '53 CHEVROLET 2-dr., new paint, \$250. Garcia, CH 3-3473.
- SNARE DRUM, music stand, \$25; blond end table, \$5; Hotpoint garbage disposal, \$20. Ward, AL 6-9286.
- '49 GMC LWB 2-ton truck, 16' van bed, 2-speed axle, '52 engine, recent valve job, \$495. Netz, 299-7036.
- TWO SNOW TIRES, tubes, mounted on rims; 6.40x15 for Tempest, F-85, Buick Special, \$30. Stirbis, 299-5363.
- LARGE TRICYCLE; misc. drapery material; covered top carrier for compact car. Haagland, 299-7097.
- BABY BASSINETT, pad, skirt, \$7.50; sterilizer and formula kit, \$5.50; maternity clothes, size 10-12, all seasons, various prices. McKinley, AM 8-4779.
- '46 CHEVROLET 4-dr. sedan, runs. Holmes, AX 9-2674.
- MAPLE CHEST-OF-DRAWERS, night stand, fireplace bench; brass headboard; Englander box springs for double bed; sell or trade for single bed box springs. Lindsay, AL 6-0089.
- EXTENSION MIRRORS for pulling trailer; propane gas regulator valve; 2 heat tapes; overload springs; BBQ grill; 2 sets of bed rails. Perusich, 298-4870.
- DINING TABLE w/6 chairs, blond oak, 2 extra leaves, sturdy, \$50; studio couch, brown upholstery, wrought iron legs, \$35. Fortman, 256-2105.
- '54 CHEVROLET 4-dr., R&H, 53,000 miles, \$300; boy's 26" bicycle, completely reconditioned, HD tires, thorn-proof tubes. Christy, 2932 Hermosa Dr. NE, 265-0247.
- BABY HIGH CHAIR, \$5. Ray, 11017 Phoenix NE, AX 8-0408.
- TWO END TABLES, 1 coffee table, blond step top, all for \$10. Frasier, AX 9-6933.
- GIRL'S bicycle, 24", best offer takes. Wheeler, AL 6-6230.
- RCA 21" table model TV, \$25. Evans, 8012 Fruit Ave., N.E., AM 8-7039.
- RCA gas stove, 4 burners, griddle, \$50 or best offer. Clark, AX 9-4819.
- 7 MM REM. rolling block carbine, \$18; .22 Ruger pistol, \$25; Sako peep sight, \$4. Klett, DI 4-9021.
- '61 OLDS CUTLASS, leather bucket seats, PS, automatic, tires, 1 owner; bedspread, King-size, white chintz, used 1 month, \$10. Ferree, 299-3854.
- '55 FORD 1/2-ton pickup, R&H, \$400; '61 FORD 4-dr. HT, many extras, \$1750. Cannon, AX 9-4592.
- '56 CHEVROLET 2-dr., HT, PB, Power Glide, V-8, \$400. Pohl, DI 4-8503.
- '60 GOLD-STAR 500 single BSA, includes bags and helmet, \$600. Hayes, AX 9-2357.
- 14' REFRIG., \$85; professional clarinet, Italian wood, new silver and paddings, new \$450, sell for \$175; 3 speakers, \$10 each. Scott, 298-1554.
- HOUSE TRAILER, 3 rooms, electric brakes, metal outside. Temple, CH 2-9092.
- FRIGIDAIRE refrigerator, 70 lb. freezer capacity, \$40. Beckes, 256-3967.
- GE TV console, blond oak, \$60. Zachmann, 2804 Tennessee, NE, AX 9-6871.
- 21" ADMIRAL TV, blond console model, \$25. Fite, AL 5-6943.

TWIN MAPLE BEDSTEDS; Stauffer reducing couch; electric Hawaiian guitar w/amp, make offer. Metz, AX 8-7989.

WANTED

- FISH AQUARIUM of any size from 5 to 20 gal. McIlroy, AX 9-4977.
- GOOD HOMES for kittens, 6 weeks old. Smeltzer, AL 6-3908 after 5 p.m.
- WIDOW would like single lady to share valley home, 909 Lead Ave., SW, kitchen privileges, garage if desired; room \$35/per month, kitchen, \$5, garage, \$5. Bowland, CH 3-5238.
- RIDE from vicinity Eubank and Comanche to bldg. 802 or 806. Trump, 299-5162.
- PIANO, used spinet or console, Abrams, DI 4-8252.
- USED boy's bike, 26" minimum, rideable, but inexpensive; homes for kittens. Colgan, CH 3-4882.
- HOMES for Calico Cate's grand kittens, housebroken. Johnson, AL 5-8851.
- RIDE from vicinity of San Mateo NE and Candelaria to bldg. 800. Heckathorn, 268-3093.
- USED SET OF WORLD BOOK encyclopedias of recent vintage, last 10 years. Schreiner, AM 8-4159.
- METRONOME in operating condition. Sundberg, AX 9-2177.
- BACHELOR to share two bedroom house, 604 Princeton SE. Matthews, 242-6285.
- TO TRADE 12 gauge Stevens single shotgun, will trade for 410 gauge single shot. Forkner, 298-0284.
- RIDE from Aloha Village Mobile Home court, vicinity Yale and Gibson, to bldg. 880. Hunt, 243-0162.
- CHILD CARE in home in Inez area, east of Winrock. Gibbons, AX 9-2863 after 5 p.m.
- RIDE vicinity Marquette and Washington NE, to vicinity bldg. 805. Riley, 256-9722 after 5 p.m.

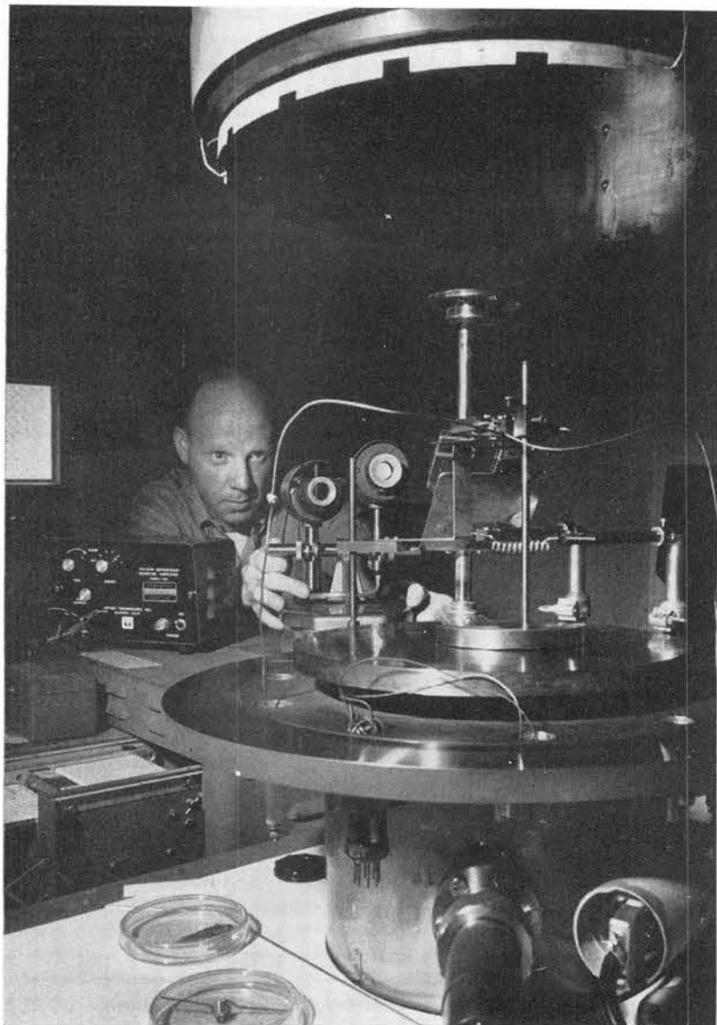
FOR RENT

- MOUNTAIN HOME with two 12x17' bedrooms, 8x10' children's bedroom, 24x18' living room, library, 8' stone fireplace, \$130 monthly. Harrington, BU 2-3188.
- 3-BDR. adobe house w/1/2 acre land, front yard walled, 1 bath, SW valley, \$70/mo. plus utilities. Gallegos, CH 2-7664 after 6 p.m.
- 1 BDR. furnished house, carport, available Sept. 15, \$75 per mo., water and garbage paid. Pinkerton, AX 5-2505.
- 2-BDR. furnished house, attached garage, plus washer, available Oct. 1, 3015 Edith NE, \$85. Browne, DI 4-6831.

LOST AND FOUND

- bone handle penknife, silver cross pen, 5 or 6 keys on leather Dodge holder, 5 or 6 keys on safety pin, brown Guild-Hall pipe. LOST AND FOUND, ext. 29157.
- FOUND—Bates nail file, silver pocket knife and file etc. w/Kahului Garage, Max Factor Cream puff compact. LOST AND FOUND, ext. 29157.

Thin Film Componentry Investigated by Advanced Development Section Staff



L. E. TERRY (1433) adjusts optical thickness monitoring equipment to prepare for vacuum evaporation of silicon monoxide insulating films. The Section is developing thin film devices to use with thin film circuitry.

J. C. Moody Takes Part in Program Of Production Engineering Conference

J. C. Moody, supervisor of Length and Mass Standards Section 2411-1, attended the International Conference on Production Engineering Research, Sept. 9-12, in Philadelphia. At the meeting, Mr. Moody discussed "Geometrical and Physical Limitation in Metrology."

A main purpose of this year's meeting was to bring out problems in various areas of production machining. The conference brought together experts in four major areas of production engineering research: chip-forming processes, plastic flow processes, machine tool considerations, and metrology. One day of conference time was devoted to discussion and exposition of each of these topics.

Mr. Moody's paper was one of 75 prepared by speakers at the conference and published before the conference sessions. The papers were then used for reference, and became the bases for discussions following the speakers' presentations. The papers themselves were not presented at the conference.

Meetings were held at the Car-



- J. C. Moody -

negie Institute of Technology. The conference was sponsored by the International College of Research for Production (CIRP) in Paris. The College sponsors meetings every other year in various countries. At the next meeting, to be held in London in 1965, discussions of possible solutions to problems aired at this year's meeting will be held.

Congratulations

Born to:

Mr. and Mrs. D. L. Smith (5135), a daughter, Barbara Lynn, Aug. 12.

Mr. and Mrs. L. W. Maschoff (7215), a son, Kurt Michael, Aug. 22.

Mr. and Mrs. W. B. Nelson (4411-1), a son, William Bruce, Aug. 22.

Mr. and Mrs. V. C. Garcia (4573), a son William Vincent, Aug. 10.

Mr. and Mrs. C. R. Wersonik (4432-3), a son, Mark Stephen, Aug. 10.

Mr. and Mrs. W. J. Hudson (3422), a daughter, Liza Jane, Aug. 25.

Mr. and Mrs. J. B. Duran (1121-3), a son, James Timothy, Aug. 27.

Mr. and Mrs. J. D. McClure (2313), a daughter, Beth Marie, Aug. 28.

Mr. and Mrs. J. P. Brane (4413-2), a son, Brian Keith, Aug. 28.

Mr. and Mrs. E. D. Sims (3242), a son, Scott Paul, Aug. 31.

Mr. and Mrs. O. E. Jones (5133), a son, Lawrence Anthony, Aug. 26.

Mr. and Mrs. A. Narath (5151), a daughter, Tanya, Sept. 1.

Mr. and Mrs. K. P. Conrad (2341-1), a daughter, Deborah, Aug. 28.

Mr. and Mrs. D. C. Brown (1533) a son, Edward Arthur, Sept. 1.

Advanced technology can already produce thin film circuitry, resistors, and capacitors—microscopic, intricate, and inherently reliable. The interest at Sandia Laboratory is to produce thin film active devices to substitute for transistors and conventional components. These would be compatible with thin film circuitry.

It is hoped that by this method thin film devices can be made smaller and more temperature-resistant than conventional devices.

"Thin Film" refers to the technique of depositing minute layers of one material onto another by the use of vacuum evaporation and other techniques. The layer of material may be as thin as two-tenths of one millionth of an inch. Numerous layers of different materials in various configurations can be built up on the base material. Connections are made to the thin film material by microscopic welding, soldering, or pressure bonding. The material may be scribed apart into many tiny components. In this way, a thin film "diode" has been produced by Advanced Development Section 1433-2 of Solid State and Thin Film Devices Division.

"Our job," supervisor Dan Hardin says, "is two-fold. We expect to become thoroughly familiar with solid-state and thin film fabrication and design technology. A great deal of experimentation and reading is necessary just to stay abreast of advances in these fields. From this knowledge, we will be able to suggest improved techniques, avoid poor processes, learn what can be built and what cannot. Eventually, our aim is to design and fabricate thin film and semiconductor devices for possible further development and applications such as logic systems for tiny special-purpose computers and satellite instrumentation.

In building the thin film diode, mentioned above, the following processes were performed:

Four millionths of an inch of titanium metal was deposited on glass substrates. A chemical solution was then applied to the film which formed a very thin layer of metallic oxide. Top electrodes of gold applied over the metal oxide completed the "sandwich" construction and produces diode action by what is called a graded junction.

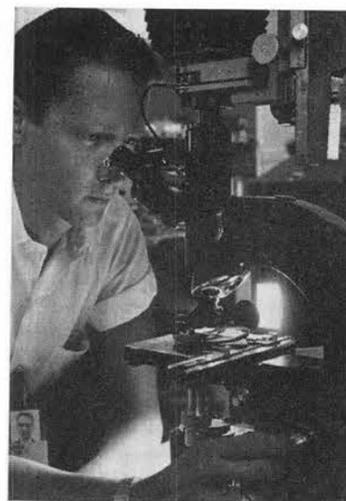
In addition to the thin film development program of the Section, theoretical work is being performed in the prediction of thin film conduction mechanisms and solid-state device performance.

The Section recently moved into remodeled Bldg. 828 and is in the process of installing and checking special-purpose equipment. Among the instruments used in the laboratory are diffusion furnaces, ultra high vacuum systems, micro-manipulators, microscopy equipment, an infrared spectrophotometer, electro-polisher, alloying furnace, chemical deposition furnace, interferometer, electron gun, and precision polishing and lapping equipment for surface preparation of semi-conductors.

Personnel engaged in the Section studies are L. H. Hogue, J. A. Hood, B. D. Shafer, L. E. Terry, C. I. Westmark, J. D. Williams, and D. G. Schueler. Assisting are G. P. Carter, W. T. Corbett, E. E. Komarek, and Judy Shaffer.

Sandia Speakers

D. B. Owen and G. P. Steck (both 5425) will present papers at a meeting of the American Statistical Association in Cleveland, O., Sept. 7. Mr. Owen will present "Control of Percentages in Both Tails of the Normal Distribution," and Mr. Steck will present "Approximations for the Bi-nomial and Hyper-Geometric Distributions."



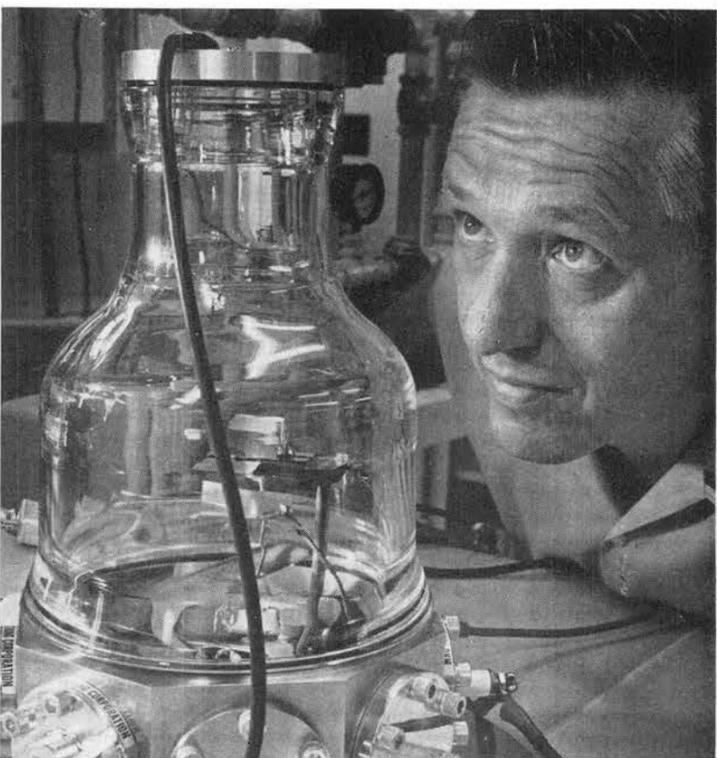
MULTIPLE BEAM INTERFEROMETRY TECHNIQUE is used by B. D. Shafer (1433-2) to measure thin film thickness. Thin film laboratory is located in Bldg. 828.



THIN FILM CIRCUITRY — Greatly enlarged photo shows a commercially-available integrated circuit approximately 1/16 in. on a side and .005-in. thick. This circuit contains six miniature conventional transistors and four resistors.



SANDIA SAMPLES — Displayed here are experimental thin film devices produced by Advanced Development Section 1433-2. Tiny speck at left contains three alloy diodes. Wafer contains field effect transistors.



ALUMINUM FILM is being oxidized by immersion in an oxygen glow plasma to form a thin film insulating barrier. Lee Komarek (1433-2) operates the high vacuum apparatus in the thin film lab in Bldg. 828.

Sandia's Safety Record

**Sandia
Laboratory**

HAS WORKED

525,000 MAN HOURS

OR 15 DAYS

WITHOUT A

DISABLING INJURY

**Livermore
Laboratory**

HAS WORKED

719,000 MAN HOURS

OR 138 DAYS

WITHOUT A

DISABLING INJURY