

## Tonopah Employees Move to Las Vegas; Range Tests Continue

Within the next six months, Sandia Laboratories employees working at Tonopah Test Range in Nevada will be living in Las Vegas, rather than Tonopah. Principal reason for the move is to provide greater flexibility in use of Sandia's technical employees.

The move will involve some 40 employees (members of Department 7230) and their families.

Sandia officials emphasize that no reduction in activity at Tonopah Test Range is involved. A full test schedule will be carried out during the next several months, and there are no indications that the program will slacken in the foreseeable future.

Lee Hollingsworth, Sandia's Director of Field Testing, says, "We have extensive operations at Nevada Test Site as well as at Tonopah, and having our people located in Las Vegas will enable us to assign them where they are needed most at any given time."

Initial movement of Sandia employees to Las Vegas will be between school terms. A housing office is being set up in Las Vegas to assist employees in finding living quarters there. Improved air transportation between Las Vegas and the Tonopah range will be established. Commuting time will be approximately the same as the time it now takes to reach the range from the AEC housing area by bus. When Sandians are in Tonopah for several days at a time, they will utilize commercial hotel accommodations there rather than return to Las Vegas each night.

A building will be leased in Las Vegas for laboratory facilities in which some engineering design, and maintenance of portable equipment such as cameras, oscilloscopes, receivers, etc., can be carried out.

Living in Las Vegas will allow employees the choice of renting or owning their homes as well as giving access to adequate medical and dental facilities. As Sandia employees vacate the AEC housing units, some will be occupied by employees of the AEC, Reynolds Electric Company, Wackenhut Guard Service, and other AEC contractors.

Since Sandia began operations at Tonopah in February 1957, the test range has undergone many changes to become a complex, fully instrumented field testing laboratory. The 625 square miles of dry lake beds and rolling desert in central Nevada have been used for a wide variety of gun and rocket tests, underground explosive effects tests, high-performance aircraft tracking, atmospheric sampling, and system development experiments.



# SANDIA LAB NEWS

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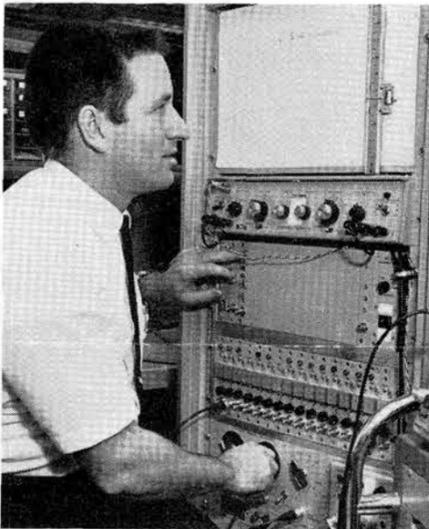
### Uses High Speed Disk

## Recorder Developed by Division 7335 Improves Data Gathering in Area III

An innovation in data recording instrumentation by Duane Arlowe of Area III Instrumentation Division 7335 offers greatly improved capabilities for gathering environmental test data from shock and impact test facilities in Area III.

Duane has developed an instrumentation recorder that uses a metallic magnetic disk instead of plastic magnetic tape. The recording system is built around a commercially available disk transport which is similar to disk memories used in computers and to instant replay systems used by television networks.

The basic recording is made on concentric (not spiral) tracks near the edge of the disk. The disk turns like a phonograph record but at 3600 revolutions per minute.



DUANE ARLOWE (7335) demonstrates playback feature of a new Sandia-developed disk recording system. The unit offers a number of advantages in recording shock and impact data over the currently-used tape systems.

Since the track "grooves" are not spiral, the recording time is limited to about 16 thousandths of a second. However, for the majority of Sandia's shock and impact testing this is more than enough time.

The disk recorder has a number of advantages over a tape recorder. Because the speed is much faster, the disk recorder can record signals which exceed by 5 to 10 times the frequency response of present tape recorders; and because the recording surface is very smooth, the system has very little "noise." By use of a rigid disk instead of plastic tape, the timing error between channels is reduced to about 20 nanoseconds, compared to several microseconds for a tape recorder.

The system has two operational modes. In the first mode, the system can simultaneously record 16 channels of analog data using normal FM recording technique. In the second, the system is capable of recording 252 channels of event signals with a resolution of 300 nanoseconds.

The analog data mode utilizes Sandia-designed modulators and demodulators. Data bandwidth is DC to two megahertz and the signal-to-noise ratio is about 100 to one.

The playback feature of the new recorder is also one of its prime advantages over existing equipment. Each time the disk revolves, at 60 cycles per second, data on the disk is repeated and can be viewed on an oscilloscope. In addition, a sampling unit can be used to plot X-Y axes data. Furthermore, the data does not suffer the degradation that occurs when magnetic recording tape is slowed down for playback.

The new recorder has been used to gather high speed impact data from a rocket sled test on Sandia's 5000-foot track and it will be used shortly for recording explosive tests.

Duane is responsible for the overall concept and design of the system while Dick McAvoy (7335) and Dennis Breuner (7222) developed the 63-channel event marker adapters.

## \$291,397 Total Pledged in Current ECP Campaign

Final tabulation of the results of the recent Employee Contribution Plan campaign shows a total of \$291,397.58 pledged by Sandians to support the Albuquerque United Community Fund and seven health agencies in 1969.

Average gift of the 5705 employees who contributed is \$51.

There are 2845 employees who contribute a "fair share"—one hour's pay per month. Some 118 Sandians contributed one percent or more of their annual salary.

In analyzing the campaign results, ECP committee chairman Hank Willis (3130) said "The ECP continues to show the maturity that it had attained last year. Sandia employees are generous and concerned citizens. The increase in the average gift to more than \$50 is solid evidence of the Sandian's feeling of responsibility. In a way you could say that we have a committee of 5700. When there is this kind of backing, it's hard to go wrong."

"The goal of ECP is still to have every employee contribute his fair share, but the number of contributors is declining. Next year we hope to increase the number of 'committee' members to 6900. Then we will have really done something."

Hank expressed thanks to all the ECP participants, members of the committee and others who helped in the campaign.

Members of the ECP committee are Mr. Willis, L. M. Berry (5430), deputy chairman; L. L. Stevens (1650), past chairman; J. P. Cavanaugh (4131), treasurer; Mrs. Marion Jacot (3252), new hire coordinator; H. R. Welch (4514), Metal Trades Council representative; M. A. Martegane (3242), Guards Union representative; A. N. Chaves (4615), Office Employees representative; R. P. Gall (3433), acting executive secretary; W. C. Riggan (2614), D. M. Fuller (9423), E. R. Servis (5434), R. L. Wilde (1213), and Lorella Salazar (3433).

## Complex Scientific Programs Great For New CDC 6600 Computer

Acceptance testing is underway on a Control Data Corporation (CDC) 6600 which will further extend the capacity of Sandia's computer center.

Sandia Laboratories Albuquerque already has two IBM 7090s, a Univac 1108, and a CDC 3600. The newest computer is especially suitable for lengthy and complex scientific programs involving partial non-linear differential equations. The CDC 6600 has a storage capacity of 131,072 60-bit words and as many as seven programs can be run simultaneously, completely independent of each other.

Its high speed capacity will take an operating load off the CDC 3600 which is backlogged despite 'round-the-clock' operation. Initially the CDC 6600 will be operated two shifts, but a 24-hour saturation point is expected to be reached in about six months.

The computer was purchased under a \$5½-million contract and is located in the computer annex of Bldg. 880. Only a moderate amount of remodeling was required to accommodate the equipment—mainly additional power and water (each bay of the machine is self-cooled by a refrigerator-type heat exchange system).

The "central processor" is surrounded by 10 peripheral processors for system functions. Each of these units operates independently with regard to programming and each of the peripheral processors has a memory of 4096 words of 12-bits each.

Other features of the CDC 6600:

—Twelve CDC 607 tape drives operating

at 150 inches per second and capable of transferring 120,000 characters per second.

—A disk file with a capacity of 171,000,000 characters.

—Two card readers with a capacity of 1200 cards per minute.

—Two card punches with a capacity of 250 cards per minute.

All of these features increase the flexibility of the facility and help insure more efficient use of computer time.

Paul A. Lemke and Joseph R. Ashcraft (both 9421) have been responsible for modifications to the "executive" system to meet unique Sandia requirements. The executive system allocates the machine's resources, keeps the programs separated, determines who gets the machine next, etc.

Roger M. Campbell (9411-1) is in charge of operation of the CDC 6600. Two operators have already taken two weeks training at Kirtland AFB on a similar computer and others will receive on-the-job training.

Scientific programs being run on the computer vary a great deal in purpose.

Members of Solid Dynamics Research Department 5160 use the computer to solve partial differential equations nicknamed "hydro-codes," since initially they referred to the flow of fluids.

Walter Herrmann, 5160 department manager, explains that his group's interest is in developing numerical techniques to describe the response of solid materials to stresses induced by dynamic loading, e.g., explosives or impact. Some of these seem-

(Continued on Page Two)



CDC 6600 CENTRAL PROCESSOR, with Bonnie P. Chavez at the console, is surrounded by 10 peripheral processors, each with a memory of 4096 words of 12-bit size. Changing tape in the background is Frank C. Padilla. In foreground at card sorter is Bobby Jaramillo (all 9411-2.)

# Albuquerque Surtax Vote Dec. 16 To Meet School Emergency Needs

Albuquerque voters will go to the polls Dec. 16 to decide on a state income surtax to help meet financial needs of Albuquerque public schools for the second semester.

Voter approval will be sought on the one-time-only emergency tax of 43 percent (of individual's 1968 state income tax) to raise \$3,085,706 to meet critical needs in the educational system.

This emergency arose principally from an earlier miscalculation in computing the revenue accumulating from this year's ad valorem taxes. As a result, the current budget was based on more money than was actually received. The nature of the emergency is heightened by the fact that the 1968-69 budget was considered to be a "standstill" budget even before the miscalculation was discovered. However, there is no intention to continue the surtax past the present emergency (the tax measure is self-canceling); a permanent solution lies with public school funding by the State Legislature.

At the present time (1968-69 figures), Albuquerque receives from the state \$463 per student, compared to the national average of \$619 per student.

Proposed use of the surtax monies includes \$330,000 for addition of 100 teachers for the second semester of the 1968-69 school year. This, in effect, would reinstate 80 teaching positions previously cut from the budget and would add 20 new positions to alleviate seriously crowded classrooms caused by addition of more than 1200 students to the system this year.

The same problem exists with regard to student instructional supplies and materials. A proposed \$740,000 would restore to last year's level the amount set aside for library, audio-visual, and other instructional supplies, including supplies for the 1200 additional students. The proposed amount would also include an increase of

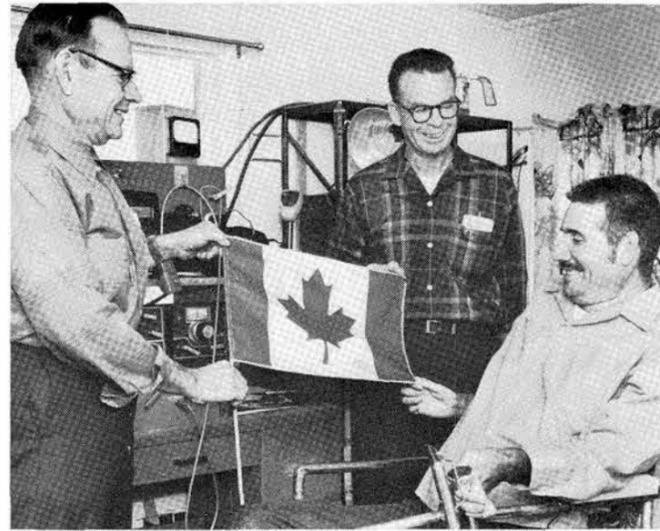
\$3 per pupil for student instructional supplies and supplementary textbook materials.

The largest item, \$1,527,920, will provide a five percent cost-of-living salary increase for Albuquerque public school employees (with exception of school lunch program employees — a self-supporting function). No change would be made in the base rate of teacher salaries (the same as 1967-68), even though 83 of the 89 school districts in New Mexico have base rates higher than Albuquerque's \$5400. The cost-of-living increase is for the balance of this school year only.

The surtax would make available \$479,355 for maintenance of school buildings; lack of maintenance has created a critical situation in some instances. Many Albuquerque schools were constructed during a period of heavy enrollment growth in the 1950's and have been without any major maintenance since that time. This budget item includes cost of building repairs (roofing, plumbing, heating, etc.), additional maintenance workers, and maintenance equipment and supplies.

Several Sandians have been active in explaining the need for the surtax election. R. B. Powell (3000) is chairman of the Greater Albuquerque Chamber of Commerce education committee, and H. M. Willis (3130) and J. M. Zanetti (3415) are members of a working committee to publicize and support the surtax proposal. The Chamber of Commerce has taken the stand that education is one of the city's major industries and that the education of children benefits our economy not only today but permanently.

Mr. Zanetti is also coordinator of a speaker's bureau set up to explain the surtax and how the money will be used. Any group interested in having a speaker on this topic is asked to contact him or call the Chamber of Commerce.



AS A gesture of appreciation a Canadian flag was recently presented to Hank Rutherford (right) for his help in keeping communications between Sandians serving in Alberta, Canada, and their families. A "ham" radio operator, Hank also relays messages from Johnston Island. Presenting the flag, from left, are Don McFadden (9132), and Eugene Hansen (7223).

## Ham Radio Operator's Helping Hand Reaches Out Thousands of Miles

There lives in Albuquerque a man who, although unable to leave his wheelchair throughout his adult life, frequently reaches out thousands of miles to extend a helping hand to Sandia employees.

He is Hank Rutherford, a "ham" amateur radio operator and, in the words of Sandian Eugene Hansen (7223), "an exceptional individual." Paralyzed as a result of a boyhood accident, Hank has served as a communication link between Sandians working in remote areas of the world and their families.

When a group of Sandians, including Gene, was cut off from communication with their families because of a postal strike while working on the "Prairie Flat" project in Alberta, Canada, Hank put in several hours every night relaying messages to their wives and children. In recent weeks, Hank has also relayed messages for the men working on Johnston Island in the Pacific.

"We can't express enough our appreciation for Hank's reliable and willing help," Gene says. Gene became acquainted with Hank several years ago when he helped Hank set up his radio gear. Among equipment modifications he has made for Hank, who has only partial use of his arms, is a mercury switch in the microphone so that it can be turned on or off merely by tilting.



TWO WHITE STARS for the Laboratories' "Minute Man" flag were presented to President John Hornbeck during the recent visit of Mrs. U. S. Savings Bonds. Mrs. Joy Berlemann of University Park, N. M., noted that the award recognizes Sandia's sustained superior performance in Savings Bonds drives and employee participation — 85 percent purchase bonds through the payroll savings plan.

## Book Review

**A Handbook for the Scientific and Technical Secretary by George Freedman, Barnes & Noble, Inc., New York, 1967 \$3.95**

Going on the premise that a secretary does a better job when she understands what she's doing, this book approaches matters such as chemical equations from a very feminine viewpoint.

For example:  $3Eg + M + Su + F1 \rightarrow C$ , when translated, denotes what goes into a cake. By use of this approach the author gets the message across. He believes that the secretary should not be overwhelmed by complex details involving unfamiliar subject matter, yet on the other hand, "It is not difficult to explain about a math or chemical equation to one who has the level of intelligence required to be a good secretary."

The discussions span the fields of chem-

istry, mathematics, physics, and electricity and electronics. In each case there is a basic vocabulary of words common to the particular science, a listing of often-used prefixes and suffixes, and a warning about "sound alike" words that could cause problems in transcribing from dictation.

Graphics relating to the different fields are discussed (typing chemical compounds, mathematical equations, etc.) and there is a brief description of more common fundamental concepts. For example, the chapter on physics deals briefly with mechanics, hydraulics, acoustics, optics, heat and thermodynamics, and crystallography and crystal physics — all areas in which Sandia has interests. In the hydraulics section, "capillary action" is described in terms of a drinking straw, "viscous" is related to density of molasses, and "surface tension" is called the force that holds together a soap bubble. In the crystallography section, a unit cell is described in terms of a one carat-diamond, which contains 200-million-billion groups of five atoms arranged in an identical pattern.

There is a brief explanation of how to draw tables, graphs, and simple sketches. Plotting a graph from tabulated information somehow becomes the same procedure as finding your way in New York City with a map of the regular network of streets.

Of real value are the glossaries which include technical and scientific abbreviations, names of scientists and engineers (many of which have become scientific words, such as "Poisson ratio"), Greek letters and their scientific uses, Hebrew and Russian alphabets, and a 78-page glossary of scientific and engineering terms, including the correct word division, part of speech, and simple definition — not the kind that requires a dictionary to decode the definition.

Probably the best word of advice in the book: "Accustom yourself to the method preferred by your employer . . . different symbols are used by different men."

C.L.B. 3432

### Welcome . . . Newcomers

Nov. 11-29	
<b>Albuquerque</b>	
Hazel L. Darnell	9412
Betty L. Jackson	3126
Felice C. Lovato	4574
Richard P. MacGibbon	3415
Salomon Moya	4574
Kirby H. Oehmke	4233
Roger J. Rizkalla	3415
Kerry L. Sturgeon	7651
<b>California</b>	
*Frank C. Peterson, San Diego	9113
<b>Tennessee</b>	
Albert E. Hodapp, Jr., Tullahoma	9341
*Retired	

Continued from Page One

## New CDC 6600 Computer

ingly solid materials are fluid-like when subjected to large stresses. In the computer the response can be simulated using as many as 250,000 mesh points (volume elements) to describe the material. The condition at each mesh point can be calculated at successive time intervals — resulting in millions of calculations — an

operation that would be virtually impossible before the advent of computers.

The department's computer work includes one- and two-dimensional programs applicable to material flow; a shock wave analysis program; and another program concerned with structures, such as how much explosive is needed to buckle a thin shell.

Aerothermodynamic Projects Department 9320 has a two-dimensional program which is concerned with ablation and heat conduction. P. A. Kaestner (9323) explains that the program is of sufficient complexity to require five to six hours of on-line computer time even with the 6600's capacity.

R. T. Hurlburt (9323) describes one of his division's programs as a point mass trajectory program which previously has been run on the 3600, and the other as a balance calibration program for the wind tunnel facility.

Theoretical Division 5231, Weapons Effects Research Department, has two programs being run on the CDC 6600, and Analytical Development Division 1541 is using the new facility for three programs.



CARD READER with capacity of handling 1200 cards per minute is a feature of new CDC 6600 computer. Shown here is Paul A. Lemke (left), one of those in Division 9421 responsible for modifications to the "executive" system, and Roger M. Campbell (9411-1), in charge of operation.

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SANDIA LAB NEWS

DECEMBER 6, 1968

## SANDIA LAB NEWS



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# LIVERMORE NEWS

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RESISTOR AND CONDUCTOR mask of hybrid integrated circuit is examined by (left) Ike Davis and Bob Noble (both 8182) in SLL's new microelectronic lab. The lab will help to keep engineers up-to-date on advances in microminiature hybrid integrated circuits.

## Integrated Circuit Technology

### Microelectronic Lab New Research And Development Tool

Maintaining an awareness of the latest technology in integrated circuits is a challenge for the most ambitious engineer. A near revolution—comparable to the transistor's effect on the electronics industry—is occurring in the field.

To keep the engineer up-to-date on the "state-of-the-art," Sandia Laboratories Livermore has equipped a laboratory for his use in designing hybrid integrated circuits.

An integrated circuit consists of a thin-film circuit pattern of resistors and electrical conductors on a very small ceramic insulating board. It becomes a hybrid integrated circuit when discrete microcomponents (transistors, diodes, capacitors) are secured to the film pattern and electrically connected to the circuit. Near microscopic in size, the advantages of hybrid integrated circuits include increased electronic operating speed and improved reliability, highly desirable characteristics in telemetry and data acquisition systems.

Discussing the new lab, Bob Noble (8182) says, "We will be able to take the engineer's newly designed circuits and convert them into a thin-film hybrid circuit assembly in a few days. Several circuit design changes can then follow and be evaluated in a short period of time until the final design is established.

"By use of thin-film hybrids," continues Bob, "a telemetry package one-fourth its conventional size is conceivable. Of great significance also would be the increased reliability we would gain by eliminating 448 soldered or welded interconnections. Interconnections cause most failures in electronic systems."

The lab's capability can be described best by telling how a circuit is fabricated.

Working from the designer's drawing of his circuit, the technician first sketches the thin-film hybrid 10 times its final size. Using this sketch, he then places opaque tape on a transparent ester film or glass plate to form the desired pattern of film resistors and conductors.

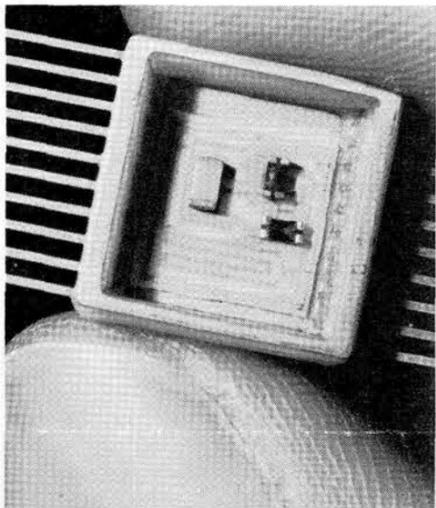
A reduction camera is then used to project a one-tenth-size image of the pattern onto photographic film. From the resulting negative the final-size positive mask is contact printed. This mask will be used to transfer the circuit pattern onto the photosensitized surface of the thin-film ceramic substrate.

The substrate itself is an alumina ceramic thinly coated with chromium—the resistor material. The chromium film is coated with a thin nickel film which, in turn, is coated with a gold film. The nickel and gold films act as conductor material.

When a liquid photoresist material is applied over the gold surface and allowed to dry, it forms a photosensitive film surface.

The substrate with the photo mask is then exposed to a mercury vapor light source which illuminates all areas of the substrate except those covered by the mask. Photographic developer then removes the exposed photoresist and an acid bath is used to remove the gold/nickel film underneath. A gold pattern remains under the mask to form the thin-film electrical conductors.

Photoresist is again applied to the entire substrate and the pattern-forming process is repeated. This time a resistor mask is used instead of a conductor mask, and the unwanted chromium film is chemically re-



FINGERNAIL SIZE, microminiature hybrid integrated circuit contains a transistor and two capacitors (darker components) interconnected to thin-film resistor and conductor pattern.

moved, leaving the resistor pattern. The conductor pattern is unaffected.

Microcomponents are then secured to the network and connected to the circuit.

After inspecting the thin-film network with a microprobe tester, the network is hermetically sealed and returned to the designer.

"The microelectronic lab," says Frank Murar, supervisor of Telemetry Development Division 8182, "will give our engineers a tool they need to keep up with advances in microelectronics. They can apply that technology to telemetry development and to other areas as well. The laboratory also has potential as a research tool in the technology of thin-film vapor deposition and metal sputtering, and plans are underway to enhance this capability. Most of the equipment for this work is installed and will be made operational as we are able to contribute to this rapidly advancing technology."

## Death



Ted J. Saselli, a retired Sandia employee, died Nov. 14 in Martinez, Calif. He was 65 and had been ill for some time.

Mr. Saselli worked as transportation dispatcher in Plant Maintenance Division at Sandia Laboratories Livermore for seven and a half years. He retired in February 1964.

He is survived by his widow, one son, four daughters, 12 grandchildren, and three great grandchildren.

## Livermore Sandians Again Help Needy at Christmas

As in previous years, many individuals and organizations at Sandia Laboratories Livermore are pooling money to assist the needy at Christmas time instead of exchanging greeting cards.

Division secretaries and others throughout the Laboratories are acting as collection points for contributions. Collection boxes have been gaily decorated so they may be easily spotted.

Jim Henderson of Employee Benefits, Division 8214, reports that the deadline for contributions is Dec. 20.

Donations will be turned over to the Livermore-Amador Valley Emergency Fund Center, and money will be used to purchase groceries, clothing, and shoes for needy families.

Those who wish to "adopt" a particular family at Christmas time can obtain information about the family from the Emergency Fund Center office by calling 447-4186.

Names of needy families will not be released. However, should individuals or organizations wish to make contributions directly to a family, the name will be provided on a confidential basis to the person making the delivery.

## Supervisory Appointment



JOSEPH A. PORTOLESE to supervisor of Second Shift Computer Operations Section 8322-2, effective Nov. 1.

Joe joined Sandia Laboratories Livermore in April 1959 and worked as a clerk in various organizations including drawing reproduction, reclamation, and plant property control. In 1962 he terminated from the Laboratories to return to school.

He received his AA degree from San Joaquin Delta College in 1964 in business administration with a major in personnel management. After working a year for Sunset Market in Tracy, Joe returned to Sandia and was assigned to the microfilm bank. Shortly after his return, he was promoted to staff assistant in forms control and in May 1967 transferred to Management Information Division 8223 where he has been a programmer.

From 1955-58, Joe served with the U.S. Army in Germany.



"MAY I CUT IN, SANTA?" asks Marge Mederios (8333) as Livermore Laboratory's Santa Claus Jim Henderson (8214) and Sherry Bowen (8153) practice a few steps for the annual Employee Christmas Dance set for Dec. 20 at Castlewood Country Club in Pleasanton.

## Reserve Dec. 20 for Annual Christmas Dance

Tickets are on sale for the 1968 Christmas Dance slated for Friday evening, Dec. 20. The annual holiday party will be held at Castlewood Country Club in Pleasanton and is open to Sandia and LRL employees and their guests.

Ernie Alford (8245), chairman of this year's Employee Dance Committee, says both the Florentine and Cellini Rooms at Castlewood have been reserved, and dancing will continue from 9 p.m. to 1 a.m. to the music of Maury Wolohan's orchestra. At 12:30 a.m. breakfast will be served. Several valuable door prizes will also be given during the evening to lucky ticket holders.

Tickets are \$5 per person and can be obtained from Pat Harmon, Bldg. 911, Rm. 223; Nancy Martin, Bldg. 912 upstairs, Rm. 242; Mona Krehwisch, Bldg. 912 downstairs, Rm. 144B; Marge Mederios, Bldg. 913, Rm. 100; Pat Tarp, Bldg. 914, Rm. 116; Karen Yung, Bldg. 916, Rm. 114; Ginger Common, Bldg. 973, Area 8; and Barbara Carter, Mobile Office 3.

## Sympathy

To Liz Bodie (8232) for the death of her mother in Duluth, Minn., Nov. 12.

To Doris Brown (8161) for the death of her mother in Richmond, Calif., Nov. 1.

To Andy Anderson (8222-1) for the death of his father in Bakersfield, Calif.

To Eddie Berry (8243-1) for the death of her father in Morganton, N. C.

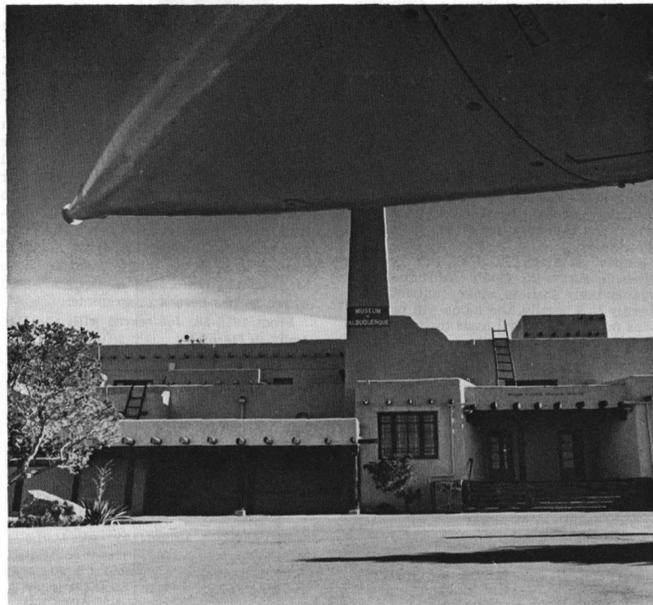


Cathy Imhoff (8243-1)

## Take a Memo, Please

Since gasoline vapor can explode like dynamite, keep gasoline in closed metal containers out of the reach of children and away from all accidental sources of ignition.

# Rockets In New Mexico



THE MUSEUM OF ALBUQUERQUE, located in the old airport terminal building, stands framed by the nose of a World War II German V-2 rocket on loan from White Sands Missile Range. Hours for the current exhibit are 10 a.m.-5 p.m., Tuesday through Saturday, 1-5 p.m. Sundays.



THE WONDER of the young for the new is evident in the faces of these children from Pajarito Elementary School as they toured the "Rockets in New Mexico" exhibit. The Albuquerque Municipal Museum opened its doors for the first time in September 1967. Free tours can be arranged for educational and civic groups.



THE STUFF of Space. Hardware and instrumentation on loan from Sandia Laboratories stand poised like sentinels.

Museums are a form of history: they reflect the past and suggest the future. At the new Museum of Albuquerque the current display on rockets bespeaks the achievements that have set the stage for the role which Sandia and other laboratories in New Mexico now fill.

The exhibit, entitled "Rockets In New Mexico," illustrates the advances in space technology that have taken place in New Mexico from the early pioneering of Goddard to today's sophisticated research and develop-

ment. Included are models, photos and hardware on loan from laboratories and test facilities that are synonymous with the nuclear age and the space age—Sandia, Los Alamos, White Sands and others.

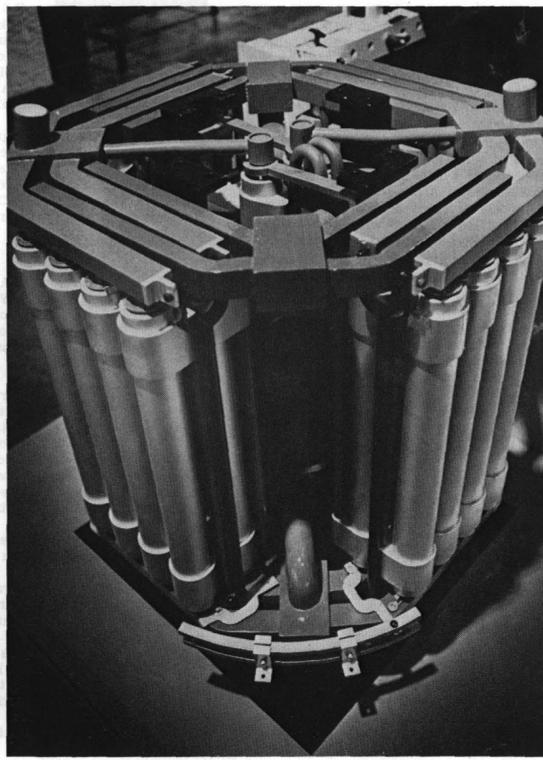
Sandia has long supported community efforts to establish the museum, which opened its doors for the first time in September 1967. Richard Bice, vice president 7000, was chairman of the Advisory Board appointed by the City Commission to facilitate the organization of the museum, and later was named Chair-

man of its Board of Trustees. Museum Director Frank Crabtree gives much of the credit for the success of the current exhibit to Alan Pope (9300), who served as advisor for the rocket display. Mr. Pope, who has been a member of the Board of Directors of the Museum, was recently named to the Board of Trustees. Additional assistance on the current display, which will end Jan. 26, came from Ken Sutton, supervisor of Community Relations Division 3433.

NITE HAWK 9 instrumentation payload captures the attention of these youngsters. For some, however, the marvels of the space age offer little competition to the camera.



IT GOES. Youngsters are silhouetted by a transparency of a Sandia reentry vehicle being tested on the rocket sled track. Above is an earlier Sandia REB that played an important role in earth penetration studies.



## Speakers

E. D. Jones (5114), "Observation of the  $Tm^{169}$  and  $Al^{27}$  NMR in Thulium Aluminum Garnet," 14th annual Conference on Magnetism and Magnetic Materials, Nov. 18-21, New York City.

J. E. Boers and D. Kelleher (both 9243), "Exact Solution for Space Charge Limited Flow in a Relativistic Planar Diode"; T. H. Martin (9143), "Determination of Bremsstrahlung Production Efficiencies from Experimental Data at 27 MeV," 1968 Fall Meeting in the East of the American Physical Society, Nov. 25-27, Miami Beach, Fla.

L. D. Tyler (9341), "Shock Diffraction in Channel Intersections"; with W. D. Sundberg (9341), "High Speed Impact of a Liquid Drop," Division of Fluid Dynamics, American Physical Society, Nov. 25-27, Seattle.

R. T. Meyer (5271), "Reactions of Excited Iodine Atoms in the Flash Photodecomposition of Methyl Iodide," Symposium on Fundamental Processes in Gas Kinetics, Southwest regional meeting of the American Chemical Society, Dec. 5, Austin, Tex.

E. L. Burgess (5272), "The Thermionic Emission from Rhenium and Chemically Vapor Deposited Rhenium in Cesium Vapor," Thermionic Conversion Specialists Conference, Oct. 21-23, Framingham, Mass.

N. J. DeLollis (5433), "Adhesion," Los Angeles Chapter, Society of Aerospace Material and Process Engineers, Nov. 18, Hawthorne, Calif.

J. H. Spitzer (9426), "Reducing Directory Storage Requirements in Third Generation Data Processing Applications," Northern New Mexico Chapter of the Data Processing Management Association, Nov. 14, Santa Fe.

R. G. Luckey (4100), "Educational Needs for the Expanding Scope of the Accounting Profession," Beta Alpha Psi honorary accounting fraternity, Nov. 20, Oklahoma State University.

J. M. Hueter (3134), "Creativity—Choice or Chance?" St. Vincent Academy Parents Council, Nov. 12, Albuquerque; "Value Engineering—A Key to Creativity," American Institute of Industrial Engineers Conference on Creativity and Communication in Management, Nov. 15, Omaha.

R. A. Matthews (3454), "The Roll of Volunteers in Welfare Agencies," New Mexico Conference of Social Welfare, Oct. 31; "A Suicide Prevention Center for Albuquerque," Conference of District 1 Nurses, Oct. 15; Hillel Counselorship-Temple Albert, Oct. 22; Second Presbyterian Womens Group, Nov. 4; and Life Insurance Auxiliary, Nov. 20, all in Albuquerque.

L. D. Bevis (2613), "Sub-atmospheric Pressure Measuring Techniques," New Mexico Section American Vacuum Society, Dec. 10, Albuquerque.

F. L. English and M. K. Parsons (5153), "Electron Mirror Microscope Observations of Resistivity Inhomogeneities and Potential Barriers in Semiconductors," Joint Chemistry and Physics Colloquium, University of Kentucky, Oct. 28, Lexington.

## Authors

I. J. Hall (1643) and Akio Kudo (Kyushu University, Japan), "On Slippage Tests—(I) A Generalization of Neyman Pearson's Lemma," October issue, ANNALS OF MATHEMATICAL STATISTICS.

A. R. Champion (5131), "Electrical Response of Anodized Aluminum to Shock Waves," Oct. 12 issue, NATURE.

R. T. Johnson, Jr. (5132) and D. M. Darsey (7334), "Resistive Properties of Indium and Indium-Gallium Contacts to CdS," November issue, SOLID-STATE ELECTRONICS.

W. E. Alzheimer (1541), M. J. Forrestal (1222), and W. B. Murfin (1541), "Transient Response of Cylindrical, Shell-Core Systems," October issue, AIAA JOURNAL.

D. R. Morrison (1713), "PATRICIA—Practical Algorithm to Retrieve Information Coded in Alphanumeric," October issue, JOURNAL OF THE ASSOCIATION FOR COMPUTING MACHINERY; with R. E. Woolsey (former Sandian), "Arithmetic in Galois Fields of Characteristic 2," November issue, MATHEMATICAL ALGORITHMS.

L. V. Feltz (9323) and D. J. Rigali (9328), "High-Speed Monorail Rocket Sleds for Aerodynamic Testing at High Reynolds Numbers," November issue, AIAA JOURNAL OF SPACECRAFT AND ROCKETS.

## Congratulations

Mr. and Mrs. James K. Linn (9213), a son, Rodman Ray, Nov. 10.

Mr. and Mrs. H. Duane Arlowe (7335), a son, Steven Herbert, Nov. 23.

## Take Note

John W. McKiernan, supervisor of Space Power Systems Division 9521, was recently elected national vice president of the American Society of Mechanical Engineers, Section VIII.

He joined the organization more than 20 years ago while a student at the University of Missouri and has been active since at the sectional, regional, and national levels of ASME.

The National Safety Council's award of appreciation was recently presented to W. W. Allison of Sandia's Safety Engineering Division 3351 in recognition of his "outstanding services to industrial safety."

The award was presented by Dana Fraser, general chairman of the National Safety Congress.

Mr. Allison was also elected to the National Safety Council aerospace section executive committee and will be program chairman for next year's sessions.

Part of a library extension to be completed later this year at MacArthur Elementary School will be devoted to a permanent display of mementoes of the life and career of General Douglas MacArthur.

Mrs. Lois Dittmer, librarian at the school, has appealed to persons having any newspaper or magazine articles, books, correspondence or other objects related to the General to send them to her at the school, 1100 MacArthur NW.

John Hiller (2344), who placed second in the state in horseshoe pitching competition, has won first place in the Class A singles of the Sandia Labs Horseshoe Association.

First place in the Class A doubles went to Don L. Hurt (1613) and Joe Brooks (7333). Singles second place winner was Parker (Doc) Burns (recently retired), while John Hiller (2344) and Oren Worden (1613) took second in doubles.

The Class B title went to Leslie Cole (4233) for singles, and to Les and Louie Flores (7332) in the doubles. Oren Worden (1613) took second in singles, and Dan Padilla (7431) and F. G. Gabaldon (1546) won second in doubles.

In Class C competition, F. G. Gabaldon (1546) took first and Gary Carlson (5424) took second in the singles; in doubles, first went to Tony Garcia (4254) and Frank Speakman (4644), and second to J. L. Sheyka (7613) and Manny Archuleta (7613).

Updating of the State Motor Vehicle Code will be discussed during an open forum sponsored by the New Mexico Safety Commission Thursday, Dec. 12, from 9:30 a.m. to 3:30 p.m. at Sheraton Western Skies.

The nine-item agenda will include discussion of proposed restrictions on riding in trailers, speed laws regarding trailers, and safety aspects of trailers and campers. Further information may be obtained from J. C. Barnes (7333), home tel. 344-9855, who is president of the Thunderbird Travel Trailer Club.

## Promotions

B. Chavira (4574) to Janitor  
I. Gutierrez, Jr. (4574) to Laborer  
J. C. Griego (3426) to Reproduction Equipment Operator  
J. M. Garcia (4514) to Oiler  
J. R. Jewell (4221) to Technician  
F. E. Peoples (4221) to Technician  
F. E. Martinez (4222) to Electroplater  
D. W. Fenstermacher (3415) to Mail Clerk  
A. A. Max II (3415) to Mail Clerk  
D. D. Sandoval (3415) to Mail Clerk  
M. E. Garcia (3521) to Stenographer Clerk  
H. Kurovski (4533) to Record Clerk  
E. N. Giron (9415) to Messenger  
E. Smith (3415) to Mail Clerk  
E. Tapia (3415) to Mail Clerk  
M. M. Beck (3126) to Secretarial Stenographer  
C. E. Wille (3126) to Secretarial Stenographer  
M. E. Frenquez (4641) to Teletypewriter Operator  
A. R. Gibson (9411) to Data Processing Clerk  
G. Luna (9411) to Data Processing Clerk  
F. C. Padilla (9411) to Data Processing Clerk  
J. M. Romero (9411) to Data Processing Clerk  
S. Sena (9411) to Data Processing Clerk  
B. J. Brumfield (9411) to Data Processing Clerk  
M. L. Jones (9411) to Tabulating Equipment Operator  
E. E. Moss (9411) to Tabulating Equipment Operator  
E. L. Rodriguez (9411) to Tabulating Equipment Operator  
M. G. Arvin (9411) to Computer Facility Operator  
Patricia Sanchez (9411) to Computer Facility Operator  
H. C. Miller, II (8245) to Shipping and Receiving Clerk  
A. James (8242) to Messenger  
J. Mueller (8242) to Messenger  
C. C. Ross (8131) to Secretarial Typist  
P. A. Childers (8212) to Secretarial Typist  
S. K. Harris (8242) to Secretarial Typist  
M. A. Ballou (8243) to Teletypewriter Operator  
L. J. Short (8243) to Record Clerk  
R. G. Tremmal (8322) to Computer Operator  
V. W. Westbrook (8322) to Computer Operator  
A. M. Velasquez (3251) to Stenographer Clerk  
A. D. Michele (4500) to Secretary

## Death

William D. Price, a retired Sandia employee, died Nov. 4 in Jay, Okla. He worked as a plant inspector at Salton Sea Test Base from August 1953 until he retired in October 1963. Survivors include his widow and one son.

## Groups Visit Sandia

RECENT VISITOR to Sandia Laboratories Albuquerque was Frank Weitzel, assistant comptroller general of the United States. Shown here before luncheon conference and discussions are (l to r) Walter Sheley, regional manager, General Accounting Office, Dallas; Charles C. Campbell, assistant manager, AEC/ALO; President John A. Hornbeck; Mr. Weitzel; Charles W. Campbell, Vice President 4000.



WE HEALTH officials toured Sandia recently to study the Laboratories' industrial hygiene practices and facilities. Dr. S. P. Bliss, 3300 director, accompanied the group on their three-day tour of facilities at Albuquerque and at NTS. Shown above are, from left: Dr. James Dunn, staff medical director at WE-New York City; Dr. Bliss; Dr. Gerald Grawey, staff medical director at WE-Chicago; and Frank Worden, industrial hygiene coordinator at WE-NYC. The visiting health officials were specifically interested in environmental health work in the area of toxic chemicals and in the possible application of practices developed here to comparable problems at WE.

## Carl A. Ashby Marks 35 Years With Western Electric

Last week Carl A. Ashby, supervisor of Special Assignments Division 3252, marked his 35th anniversary with Western Electric Company.

Carl's first job with WE was as an expeditor at the Kearny Works in New Jersey. He worked in the production and purchasing organizations at Kearny until 1950 except during the war years when he was at various WE plants for short periods.

He joined Sandia in 1950 and has headed groups in purchasing and personnel.

In 1963 Carl published "Fantasia Americana," a book which advocated a national program of on-the-job training handled by employers instead of a massive Job Corps. The employer would receive tax benefits for each trainee.

Carl is looking forward to retirement next year. He is currently building a summer home in Southwestern Colorado, continuing work on another book, and is actively engaged in a number of political organizations.

## Exchange Greetings, Not Cards; Savings Help Needy Area Families

Continuing a tradition of many years standing, Sandia Laboratories employees will forego the exchange of Christmas cards again this year and use the money thus saved to sponsor a large number of charitable activities. By saying "Merry Christmas" in person or by telephone, instead of exchanging cards, employees have in past years been able to use the money saved to buy food, clothing, toys and even small household items for needy families.

Plans are already well along for some of the Christmas projects of long standing, such as the collection of gifts for underprivileged children of the Riverview School, sponsored by the Metal Trades Council members at Sandia, and the annual paperback book sale in the foyer of Bldg. 802, sponsored by Organization 3400 for the benefit of underprivileged families in the Manzano Mountains communities.

Organizations wishing to plan and carry out a group project are invited to contact

the Community Council, tel. 247-3671, for information about needy and deserving families. This is one means of making certain that (1) every needy family will receive some help, (2) there will not be duplication of assistance, and (3) the aid given will be appropriate to the need.

In general, the Community Council recommends the giving of non-perishable food, children's clothing, toys and other gift items of practical value. On occasion, gift certificates or credit may be appropriate, where sizes are not known or food needs may involve perishables. Cash funds may be used to purchase recommended items or, if this is not practicable, the funds may be sent to the Community Christmas Clearing Program at the Community Council office.

Further information about how to organize and carry out a Christmas project may be obtained from Community Relations Division 3433, tel. 264-2763.

## Share-the-Book Christmas Project Needs Donations

Would you like to share that juicy mystery story with someone else? Or how about that thin book of poetry already committed to memory? Here's an opportunity to pass along enjoyment to a co-worker at the same time you are helping a needy family.

For the past several years members of Organization 3400 have been re-selling paperbacks and hard-backed books and using the money to purchase food, clothing, toys, hardware, kitchenware, and other necessities for families living in small communities along South Highway 10. Last year the sale of donated books totaled some \$200.

A similar project is planned for this Christmas. So, join in the fun. Take the weight off your home bookshelves. Bring your books to the LAB NEWS office, Bldg. 800, Rm. 112. The 3400 Christmas-project bookstore will be open for business later this month in the lobby of Bldg. 802. Prices are always moderate.

## Supervisory Appointments



ROBERT H. ALTHERR to supervisor of Physical Electronics Section 4221-2, effective Nov. 16.

Bob joined Sandia Laboratories in 1960. For the past two years he has worked in Process Application Division 5433. Before that he was with Quality Control Division 2560.

Before coming to Sandia, Bob was with the Delco Radio Division of General Motors at Kokomo, Ind.

Bob holds a BS degree in chemical engineering from Purdue University and is completing studies for an MS degree in metallurgy at the New Mexico Institute of Mining and Technology at Socorro. He is a member of the New Mexico Chapter of the American Ceramics Society.

A World War II veteran, Bob was a pilot in the Army Air Corps from 1942 to 1945.

## Hello Mr. Chips

## Word Gets Around—'Ask Mr. Baca' About Self-Development Courses

When any of the men in the janitor service want information about educational courses, they know the person to ask is Florencio Baca.

Florencio is supervisor of Janitor Service Section 4574-4 but he serves as unofficial "education consultant" for many more men than those in his own group. Besides his catalogs for Sandia's Out-of-Hours Courses and the Albuquerque Technical-Vocational Institute, he is informed about other courses such as those offered by the city's high schools, the University of New Mexico, or by correspondence. He counsels interested persons and helps them with the sometimes involved paper work.

"I don't tell them that taking educational courses is an automatic stepping stone to promotion, but it has helped some of them to get better jobs," he says.

Florencio has been instrumental in helping several of the lower graded employees (who had not finished high school) to prepare for and receive a General Equivalency Diploma, a certificate which is recognized as the equivalent of a high school diploma. Two of his proteges filled the gaps in their education and qualified for Sandia's Apprenticeship Programs.

At one time it was difficult for night-shift janitors to enroll in Sandia's Out-of-Hours Courses because they were offered during the noon hour or after 5 p.m., when the men were just starting work. Florencio discussed the problem with the staff of Employee Training and Education Division 3132 and some of the classes were rescheduled for 3:30 or 4 p.m. He asked for—and received—a special bulletin board near his desk so he'd have a place to post the latest education information.

It's not just a matter of having the information available and talking about the



"THIS WOULD BE a good course for you to take," says Florencio Baca (4574-4) as he counsels John Packer and Laudente Gallegos about self-improvement courses.

courses; Florencio can give a first hand opinion about many of the courses because he has taken them himself. Right now he's attending a refresher course in algebra.

"The word must have spread that I'll help a man get started because as soon as some of the men are hired, they come around to see me. In fact, some say they heard about my efforts before they came to work," Florencio says.

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SANDIA LAB NEWS

DECEMBER 6, 1968

## Unions Sponsor Party For Duranes Children

Boxes will be placed throughout Sandia next week for collection of gifts for children attending Duranes elementary school. This Christmas project is sponsored by the United Unions (International Brotherhood of Electrical Workers — Local 1988, and International Association of Machinists — Local Lodge 1689).

Co-chairmen Hilario Garcia (4221-1) and Granville Dourte (4231) say the collection boxes will be located in Bldgs. 840, 892, 894, and at Areas 3 and 5. The names of the 494 children at the North Valley school will be matched with gifts so that each youngster is assured of a gift.

The collection boxes will be picked up Dec. 17; presents will be handed out on Dec. 20 at a Christmas party at the Albuquerque Boys' Club.

All Sandia employees are invited to contribute gifts for this project or money for a Christmas party for children at the Casa Linda home for the mentally retarded.

## Events Calendar

Dec. 6-8, 13-15—Jean Anouilh's drama "Becket," University Theatre. Box office tel. 277-4402.

Dec. 7—Peralta Canyon (Tent Rocks area). N. M. Mountain Club, leader Norm Bullard, tel. 268-1812.

Dec. 12—Albuquerque Symphony Orchestra, Jose Iturbi conducting. UNM Popejoy Hall.

Dec. 12—Matachines dances at Jemez Pueblo.

Dec. 12-15, 19-22—Charles Dickens "A Christmas Carol." Old Town Studio, reservations tel. 242-4602.

Dec. 14—Indian ruins in the Jemez area. N. M. Mountain Club, leader Ray Nethers, tel. 255-2056.



RONALD A. HILL to supervisor of Experimental Aerophysics Division 9342, effective Dec. 1.

Ron came to Sandia Laboratories in June 1963, and has done research in plasma physics as a member of Plasma Research Division 5243 since that time.

Ron holds BS and MS degrees in physics from Michigan State University, and received his PhD degree, also in physics, from Michigan State in 1963.

He is a member of the Optical Society of America, and the American Physical Society.



MARSHALL M. SLUYTER to supervisor of the newly-created Applied Mechanics Division 9343, effective Dec. 1.

Formerly on the faculty at Illinois Institute of Technology, Marshall joined Sandia in September 1964. He comes to his new position from Aerodynamics Research Division 9341 where he has been a project leader.

Marshall holds a BS degree in aeronautical engineering from the Newark College of Engineering, an MS degree in aeronautical engineering from New York University, and his PhD in applied mechanics from Illinois Institute of Technology.

A member of the Sigma Xi Honorary Research Society, Marshall is also a member of the National Committee on Education of the American Institute of Aeronautics and Astronautics. He is also a member of the Accreditation Board of that group.

# Service Awards

20 Years



E. J. Allen  
4252



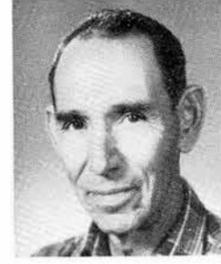
A. E. Astorga  
7323



H. E. Bolser  
4516



R. R. Boyd  
4512



Carlos Candelaria  
4573



G. A. Chandler  
4221



Samuel DeHaan  
4645



B. W. Duggin  
7342



Robert Findlay  
4570



J. N. Garcia  
4231



R. C. Hansen  
4222



J. C. Lewing  
4511



L. E. Mahuron  
9410



R. A. Matthews  
3454



G. W. Rodgers  
2620



W. M. O'Neill  
5420

## 15 Years



C. N. Eden  
3415



N. L. Hensinger  
4517



Hugh Howe  
3421



A. Margaret Smith  
1643



A. W. Snyder  
9140



W. M. Sodja  
7336

## 10 Years

Nov. 29 - Dec. 12

H. C. Malmquist 8222, A. J. Chabai 1224, D. S. Corder 8243, D. A. Greenwell 7222, H. F. Lewis 2324, J. P. Young 2352, B. J. Starcevic 4135, C. N. Visbeck 8331, Coralyn K. McGregor 8231, and J. A. B. Hay 8245.



USED EYEGLASSES and jewelry donated by Sandia employees filled several boxes during recent "New Eyes for the Needy" drive. Andy Landis (left) of Community Relations Division 3433 helped Drive Chairman Bert Eich (5439) with arrangements.

### Only Dragons Should Smoke

Women do not start smoking as early, do not inhale as deeply, and have not smoked as long as men, the American Heart Association points out. But the closer women's smoking habits approach those of men, the closer do their disease and death rates reach the levels recorded for men.

Autopsy studies of the coronary arteries of 645 men showed atherosclerosis to be twice as extensive in heavy smokers as in nonsmokers, the American Heart Association reports. Atherosclerosis is the form of "hardening of the arteries" which sets the stage for most heart attacks and strokes.

Of more than 60,000 doctors polled recently by **Modern Medicine**, only 22.5 percent said they continue to smoke cigarettes, and most of these against their better judgment, the Heart Association reports. More than half (52 percent) do not smoke at all; the remainder have switched to pipes or cigars.

Each year, at least 60,000 American men die prematurely of coronary heart disease that has been accelerated by cigarette smoking, the American Heart Association reports. This is about equal to the yearly number of deaths due to smoking-related diseases.

### SHOPPING CENTER

#### CLASSIFIED ADVERTISING

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

#### RULES

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

#### FOR SALE

##### MISCELLANEOUS

REVERBERATOR, for car radio, 2 mos. old, \$7. Gallo, 298-1089.  
USED cinder blocks, 10c ea.; used bathroom fixtures; muskrat stole. Cervantes, 255-5670.  
S&W .38 special revolver w/6" barrel, micro rear sight & target grip, \$65. James, 255-8429.  
4' X 8' BIRCH PLYWOOD, 1 sheet, \$12. Bowen, 255-8195.  
SSB, USB/LSB selection, CW, AM 15 tube receiver Heathkit Mohawk RX-1, \$135; 2 meter-AM transmitter receiver rack mounted, \$35. Bassett, 898-1840.  
9" DEWALT saw, \$125. Williams, 298-4602.  
CAR TOP CARRIER, \$5; electric coffee pot, \$3; electric sterilizer w/bottles, \$5; misc. baby items. Tassia, 299-6096.  
HO GAUGE train layout, 3 1/2 x 7' table, folding legs, freight, 2 engines, cars, buildings, 45' track, switches, transformer, \$60. Hawn, 299-7835.  
FOR CAMPER dbl. hammock bed w/brackets, \$9; S&W 357 mag., 6" barrel w/extra 4" barrel, adjustable sights, \$88. Archuleta, 255-6781.  
HOTPOINT refrigerator, working, \$35. Mills, 299-2130.  
TWO 15" Fenton Hawk mag wheels, \$35. Houghton, 299-3386.  
3/4 VIOLIN, \$40. Schreiner, 298-4501.  
1925 HARLEY DAVIDSON 125cc, not running but can be restored, \$25. Shock, 877-3728.  
PARAKEETS w/cage, \$2.50 ea. or both w/cage for \$6, retail value about \$15. Lemmon, 255-2028.

TOY POODLES, silver, white, 2 1/2 mos. old, AKC reg., very small, will hold for Christmas. Shipley, 298-2433.  
2 SNOW TIRES, 8:50x14 sws; plus 1 14" wheel, \$25. Pewe, 255-3518.  
WOODWORKING machinery & sheet metal tools, planer, jointer, lathe, jigsaw, brake rolls, shears punch, etc. Waldorf, 344-1017.  
WEAVER K4 scope, dot reticle nzw w/mounts, \$30; Winchester carbine 357 mag., \$100; want old Winchester rifles. Zaluja, 344-1564.  
AUTUMN HAZE mink stole, initials of your choice included, \$240. Jordan, 299-4004.  
CHAIN HOIST, 1/2-ton; genuine contour chair; Lane cedar chest, blond; blond desk-sewing cabinet. Aaron, 295-6822 evenings.  
GUITAR, classical, Pimentel model 002-1957 w/case, \$150. Mata, 898-3377.  
NORGE electric dryer; maple breakfast table/chairs; early American maple coffee table; dbl. beds; dresser; chairs; lamps; Wonder horse. Chandler, 296-3323.  
AMPLIFIER, Gibson-Lancer, 1-12 plus 1-15-inch speakers, reverb, tremelo, \$150; Epiphone guitar, 2 pickup, tremelo bar, case, other items, \$100. Milesosky, 255-8904.  
FREE Collie cross pups ready for Christmas. Melick, 867-2860.  
CITATION I preamplifier; Citation II, power amplifier 120 watts; Citation III (mono) wired price \$690, sell for \$300. Zudick, 255-2113 after 5.  
HAMILTON BEACH 10-spd. mixer & bowls, \$20; Kenmore electric can opener & knife sharpener, \$7.50. Smith, 299-6873.  
16" RED 2-wheel bike w/training wheels, \$15 cash. Cunkelman, 255-3244.  
FULL SET golf clubs, bag & cart, \$60, used 2 seasons. Apodaca, 298-1288.  
TIRES, Pirelli, for Volvo, \$60; dining room suite w/buffet, \$100 or make offer; GE FM 2-way, \$50. Banks, 255-2544.  
MINIATURE SCHNAUZER female puppy, fine pet, easily trained, no odor or shedding, ready for Christmas giving. KcKinley, 296-7015.  
'66 YAMAHA 100cc twin jet oil injection motor bike. Houghton, 299-6230.  
HI FI in a blond wood end table, monaural, includes changer & 15-watt amplifier. Goodman, 299-3652.  
TWO SETS fiberglass drapes, 144"x90" long, \$20 ea. or both for \$35; 6-drawer dbl. dresser w/plate mirror, blond w/plastic coated top, \$45. Montoya, 344-6222.  
BABY CRIBS, 2, \$8 ea. Monson, 298-7969.

KENMORE auto. washer, \$20. Reinman, 256-9737.  
EPIPHONE guitar, orig. \$240, sell for \$89. Tholburn, 842-9694.  
AIR TRAVELERS ASSOCIATED, seeking members & shareholders for flight training & flying in Cessna 150 & 172. Fox, 256-2606.  
THREE portable electric baseboard space heaters, nzw price \$25 ea., sell for \$10 ea. guaranteed performance. Weinreich, 344-9167.  
TV, Admiral 17", slimline w/stand, new pix. tube, \$47.50; boat, 10' Jon w/extra high sides, aluminum w/steering wheel, \$45. Kutzley, 255-3572.  
'66 BSA motorcycle, 441 cc single cylinder. Tapia, 268-0691 after 5:30.  
CLARINET, B-flat, case & stand, \$45. Newman, 299-2729 after 5:30.  
COCK-A-POO cross puppies, \$5, will hold for Christmas. Connally, 244 Erbbe NE, 299-1887 after 7:30.  
BICYCLE, AMF English racer, 5-spd., \$40. Binder, 299-2937.  
'67 SUZUKI 50cc motorcycle, \$150. Rufsvold, 268-5970.  
ROTARY LAWN MOWER, 18", 2 1/2 hp Sear's engine, chassis never used, \$7.50; power tool stand, heavy ga. steel, h/ight adjustable, w/mounting clamps, \$15. Brown, 299-6384.  
HIDEABED, turquoise, \$85. Westman, 255-6048.  
SKI BOOTS, lace, double boot, size 12, La Dolomite, \$20. Linn, 282-3986.  
BICYCLE, Hercules 3-spd., 26", \$15; 2 bicycles, girl's, 24", \$5 ea. Gabaldon, 268-8679.  
UNICYCLE, \$16. Durant, 298-4952.

#### REAL ESTATE

PROPERTY at 811 Rio Grande Blvd. NW, near Freeway, Old Town Plaza. Jones, 247-9158.  
LOT in Glenwood Hills, 80 x 140, \$3250, terms. Fox, 299-9031.  
2 LG. LOTS w/views, in foothills of Sandias, all utilities, paved street. Duimstra, 299-9278.  
SALE OR LEASE: 2-bdr. home, hw/f, new carpeting, fp, formal DR, landscaped, Rex, 256-3048.  
MOUNTAIN CABIN, 24 x 26 feet downstairs, 10 x 24 sleeping area upstairs, on Forest Service leased land, five miles east of Tres Ritos. Stuart, 299-9190.  
3-BDR. adobe house, chain link fence, in Bernalillo. Gonzales, 867-2834.  
4-BDR. HOME, carpet, cfa, finished 2-car garage, 3 blocks east of Juan Tabo on Brentwood Hills, \$18,600. Gallegos, 1922 Jenu Ct. NE, 299-7270.

3-BDR. w/master suite, den, bar, fp, 1 3/4 baths, carpet, AC, cfa, \$2500 under appraisal, 6% loan. Entwisle 296-3379.  
TWO adjacent lots, 60' x 110' each, in Brentwood Hills Addition, near Candelaria & Chelwood Park Blvd. NE. Hock, 256-0276.  
MOSSMAN 3-bdr., den, 1 3/4 baths, 2-car garage, sprinklers, lg. patio, Cleveland, Del Norte schools, near Coronado, 4 1/2% loan available. LeRoy, 255-3784.  
3-BDR., 2 1/2 baths, 2450 sq. ft., LR w/fp, recreation rm. w/fp, in Paradise Hills. Sutton, 296-1157.  
1334 MARRON CIR. NE. 2-bdr. house, den, walled yard, landscaped, \$11,500 total, \$800 down plus closing, approx. \$93/mo. FHA. Stark, 299-5953.  
HOLIDAY PARK, 3-bdr., 1 3/4 baths, den w/fp, carpeting, drapes, landscaped, view, many extras, \$24,500. Levy, 299-4225.  
4-BDR. & Dcn, 1900 sq. ft. Excellent location. Terms to reliable buyer. DeMattos 298-7320.

#### CARS & TRUCKS

'63 GRAND PRIX, factory air, overall power and '62 Ford Country sedan wagon, factory air, 390 engine. Burns, 255-3677 after 5:30.  
'62 CADILLAC: '57 Dodge 6-cyl. pickup. West, 299-5521 after 6.  
'60 VOLKSWAGEN, rebuilt engine, \$300. Nelson, 298-5761.  
'49 CADILLAC, 39,000 miles. Braasch, 268-8416.  
'60 CORVAIR, white 2-dr., red bucket seats, AT, R&H, new battery, \$250. Lynes 268-0144.  
'65 MUSTANG 2-dr. HT R&H, AC, PS, below book. Carli, 256-2781.  
DUMP TRUCK, '63 CHEV., model C-60, 4 yd. bed, 2-spd., R-axel, hydraulic lift, new engine. Johnston, 344-6684 after 5.  
'64 CORVAIR Monza convertible, 4-spd., R&H, new tires. Rex, 298-1055 after 5:30.  
'66 FORD Cortina GT, 31,000 miles, one owner, R&H, \$1175. Stark, 296-4971.  
JEEP, 4-wd, '51 pickup, \$350. Albright, 268-8534.  
'66 VOLKSWAGEN, blue w/white interior, \$1250. Deaton, 256-1418 after 5.  
'64 CHEVROLET wagon, 8-cyl., AC, new brake lining & shocks, \$795. Coughenour, 296-4146.  
'66 VOLKSWAGEN sedan, AM-FM, air, opening rear windows, tinted windshield, radial tires. Campbell, 804 Tulane NE, 268-8445.  
'67 CHEVROLET Biscayne, white 2-dr. sedan, 6-cyl., R&H, std. trans. Hawley, 255-0332 after 5:30.

'63 CHEV. Monza Spyder, \$600. Sellers, 255-2533 after 5.  
'55 OLDSMOBILE, 4-dr. sedan, original owner, hydromatic, PB, PS, R&H. Mills, 299-2130.

#### FOR RENT

LG. MODERN 3-bdr., den, fp, dbl. garage, 1 yr. lease, 1014 Indiana NE, \$200. C DeBaca, 344-3369 after 5:30.  
FURNISHED sleeping room w/full house privileges, gentleman. Welch, 296-2332.  
FURNISHED 2-bdr. mtn. home, 2 1/2 acres, east of Tijeras on 66, owner out of town until June '69. Brooks, 282-3239.  
3-BDR., 1 3/4 baths, garage, electronic heating, water & softener paid, lg. walled yard, range, near bases. Johnson, 247-8634.

#### WANTED

JOIN CAR POOL vicinity of Bridge Blvd. & Sunset Rd. to Bldg. 802. Baldonado, 264-7469.  
RADIAL ARM SAW & movable storage shed. Tiefs, 299-2763.  
POWER steering assembly for late model Ford, '67 up. Reif, 296-2179.  
USED mini-bike, running condition. Folkins, 867-2825.  
SET OF MATCHED DRUMS. Dickason, 299-8125.  
SMALL acreage w/home in Los Lunas area. Tucker, 877-9405.  
PING PONG table, fold-up type; canopy twin beds; 8mm film editor. Chandler, 296-3323.  
'57 through '60 Chev. 1/2-ton pickup. Hindi, 299-8996.  
CHILD CARE in my home, near base. Leonard, 255-4686.  
BABY SITTING jobs for reliable teenager, NE Heights. Downs, 299-1537.  
ROLLING TOOL CHEST; 4 & 8-track auto stereo. Flowers, 282-3458.

#### LOST AND FOUND

LOST—Black dangling earring, RX sunglasses w/ brown frames, oval-shaped brooch w/rhinestones & pearls, amber clip-on sunglasses w/gold frames, Merham lined pipe, Apple shale pipe, 2 silver rings, ladies black wool jacket, brown tobacco pouch, royal blue V-neck golf cardigan sweater, man's yellow gold engraved wedding band. LOST & FOUND, tel. 264-2757, Bldg. 610.  
FOUND—key, RX glasses in blue case, pearl handled pocket knife. LOST & FOUND, tel. 264-2757, Bldg. 610.

# Formal Sanado Dance Tomorrow

"A Christmas Dream" is the theme of the Sanado Women's Club formal Presentation Ball scheduled tomorrow evening at the Coronado Club.

A baker's dozen of debutantes will be presented during the festivities by H. C. Donnelly, manager of the AEC's Albuquerque Operations Office.

The evening starts with a social hour at 6 p.m. and dinner at 7:30 following the presentations, after which there will be dancing to the music of Sol Chavez and the mighty Duke City brass.

Mrs. O. B. Tjeltweed, decorations chairman, reports that the Club will be resplendent in traditional red and green with golden accents. Dinner will be served by



HOLIDAY FASHIONS will be presented during the noon hour at the Club on Friday, Dec. 13. Models will include Lisa and Jamie Noonan, foreground, Betty Sanchez (Coronado Club staff), left, and Hazlet Edmonds (3421). Norma Manson of Sears will be moderator.

candlelight and the glow from hurricane lamps.

Sanado's president and her husband, Mr. and Mrs. S. D. Brooks, and the first vice president and her husband, Mr. and Mrs. S. T. Landrith, will welcome guests at the entrance.

The presentation has been planned and directed by Mrs. George Dennis and her committee.

Tickets are available at the Club office. Reservations should be made today.

## Christmas Parties

From now until the annual New Year's Eve party, the Club calendar is dominated by organizational Christmas parties. Friday night social hours will be held in the main lounge from 5 until 8 p.m.

## Kids' Christmas Party

Santa Claus will visit the Coronado Club on Saturday, Dec. 21, from 10 a.m. until noon to host a giant party for children of members. Free candy and goodies, special entertainment and a few surprises are in store for 12-year-olds and under. It's free.

## Luncheon Special

A double-barreled holiday menu is offered for luncheon patrons of the Club on Thursday, Dec. 19. The 99-cent special includes your choice of turkey and dressing, giblet gravy and all the trimmings, or Virginia baked ham with mandarin sauce, French cut green beans, candied yams and other goodies such as fruit cake for dessert. The special will be served at the Club, the Area III cafeteria and the Bldg. 839 cafeteria.

## Stock Market Forum

A four-week course in stock market investing will be offered by the Club beginning Tuesday, Jan. 14. The forum will meet each Tuesday from 7:30 to 9:30 p.m. The course is free to employees of Sandia and AEC. Personnel of Goodbody & Co. will conduct the course.

## Holiday Fashion Show

Holiday fashions for ladies and children will be modeled at the Club during the noon hour on Friday, Dec. 13. Norma Manson of Sears will be moderator. Models will include the children of Coronado Club manager Jim Noonan, Hazlet Edmonds (3421), Soila Candelaria (4364) and Betty Sanchez (Coronado Club staff).



SPLENDID CHRISTMAS decorations for the holiday season will be provided for the Coronado Club by members of Sanado Club. Mrs. M. M. Newsom, left, and Mrs. N. E. Corlis, members of the committee, display one of the many original decorations planned. Mrs. O. B. Tjeltweed is chairman of the committee.

## Retiring

Joseph A. Ozmina, an electronics technician in Electronic Component and Evaluation Section 7352-1, will retire the end of this month. He was employed by Sandia in May 1952 and is currently assigned to Connectors & Cables Division 2634, doing environmental testing on connectors. Before coming to Sandia, Mr. Ozmina had worked with a local firm and with the Western Electric Hawthorne plant in Chicago.



Mr. and Mrs. Ozmina have three children and six grandchildren. One son, with the Forest Service in Alaska, will be home for Christmas. Later, they will visit with their son in West Virginia and their daughter in Indianapolis.

Joe has many interests to keep him busy following retirement. He will work with radio, TV and Hi-Fi electronics, and woodworking. "My wife raises African Violets — she has over 150 varieties — so I help her by building floral carts and backgrounds for her arrangements. I also play tennis, but I play with my grandchildren so I won't have any competition."

Joe also likes to watch track and field events. His interest in these sports goes way back. In 1929 he spent three months in Germany where, as a member of a Chicago track club, he competed in an international track and gymnastics meet.

## Our Busiest Retiree? Jay Paulhamus Uses Sandia-Acquired Knowledge



SANTA'S HELPER, Soila Candelaria (4364), reminds you of all the swinging party packages scheduled at the Coronado Club through December. While organizational Christmas parties dominate the Club calendar, Friday night social hours will continue in the main lounge and lobby from 5 until 8 p.m.



THIS ALBUM, shown by Gaye Romesberg (3413), features a 12-man group — the Supreme Court. The record discusses the Court in detail and is available from Divisions 3126 or 8242 for \$1.40.

## 'Supreme Court' Album Makes Outstanding Christmas Present

"The Supreme Court," an LP album prepared by the public affairs organization of Western Electric Company, is still available to employees at cost. Personnel of Employee and Secretarial Services Division 3126 recommend the album as an ideal Christmas gift for a bright youngster or inquiring adult.

The album describes in detail the evolution, the impact and the significance of the Supreme Court in American democracy.

The albums are available at Sandia from Division 3126 in Rm. 3 of Bldg. 610. Cost is \$1.40.

At Livermore, the records may be obtained from Public Information Division 8242, Bldg. 912, Rm. 138.

Jay Paulhamus is claiming the title of "Sandia's busiest retiree."

He retired in mid-1966 after almost 14 years with the Laboratories, where he was active in development of clean room standards which were accepted by the General Services Administration.

"The real key to the following series of happy events is the extraordinary opportunity which was given me by Sandia . . . The fundamental knowledge that I acquired during the performance of some of my assignments equipped me with the basis for a post-retirement career as a consultant in the field of airborne contaminant management," he writes.

During his two retirement years, Mr. Paulhamus has worked on the technical document which later appeared as a NASA Contamination Control Handbook; became a staff consultant for a national corporation having a clean room division and for a Los Angeles-based filter service company; and developed and conducted a training program for clean room workers for a prominent electronics manufacturer and for a governmental installation.

"The high point in slightly more than two years as a consultant," Mr. Paulhamus says, "was an invitation to visit Europe as the guest of Philips Industries of Eindhoven, Holland."

During a three-week period he toured clean room facilities at the various Philips installations in Holland, France, England, and West Germany, and lectured on clean room problems and their solutions for managerial and technical personnel. "A part of my assigned task was to offer suggestions, irrespective of the affect they might have on the installation management, for the betterment of the facilities," Mr. Paulhamus says.

Mr. and Mrs. Paulhamus are now settled in Florida, but Mr. Paulhamus adds, "I am not stopping completely, but am now very 'selective' in the commissions I accept — especially if it means traveling to some place that is cold and snowbound!"

## Sandia Safety Signals

Think safety belts are confining?

Not half as confining as wheelchairs.

What's your excuse?

## For Flameproof Trees and Greens

The National Safety Council says this formula will not change the color or texture of the tree or greens while making them flameproof.

Mix nine ounces of borax, four ounces of boric acid and one gallon of water. Wet tree or greens completely. Let dry, then decorate.

To aid penetrating qualities of the solution, add ¼ tablespoon of low sudsing detergent (such as Dash or All) to mixture.