



PRESIDENT HORNBECK reports to the Sandia Savings Bond Committee information he received at a meeting of the nation's top industrial leaders in Washington, D.C., recently. Inflation and increasing national debt add urgency to the national need for more savings bond purchases.

Urgent Need For Savings Bonds Related to Sandia Committee

The national urgency for more purchases of U.S. savings bonds was related to members of the 1968 Sandia Savings Bond committee by President John Hornbeck at the group's first meeting last week.

President Hornbeck attended a meeting of the nation's top industrial leaders in Washington, D.C., recently where administration officials, including Secretary of State Dean Rusk, told of the inflationary trend in the nation's economy and the rising national debt.

"The U.S. business community responded enthusiastically," President Hornbeck said, "convinced that savings bonds can be of significant help in curbing inflation and providing needed government funds. In addition, savings bonds remain one of the best methods the private citizen has for accumulating permanent savings. Still, another reason for buying bonds is patriotism. You invest in your own country's future."

Chairman of the Sandia Savings Bond Committee, Robert Lynes (9413), reviewed the history of Sandia bond drives and reported that 82 percent of our employees now participate in the payroll deduction plan. Some 6678 employees currently purchase \$102,141.25 in savings bonds each month.

The committee will be formulating plans for this year's bond drive during the coming weeks. The drive will be held in May.

Committee members include Mr. Lynes, Ralph Fisher (1124), Mary Pasko (2112), Marty Martegane (3242), W. W. Smith (3412), J. P. Cavanaugh (4131), Byron L. Stewart (4234), A. N. Chaves (4615), Homer McIlroy (4622), S. D. Spray

(5621), R. W. Swanson (6021) and R. M. Workhoven (7322). J. L. Wilson (8112) is the Livermore Laboratory representative on the committee.

G. A. Fowler President Of Kit Carson Council



G. A. Fowler (9000) is the new president of the Kit Carson Council of the Boy Scouts of America. He was elected Jan. 27 at the Council's annual meeting.

Long active in scouting, Mr. Fowler has served both as Council commissioner and vice president and for a number of years has been a Deputy Camp Chief on the World Gilwell Training Team. He is responsible for conducting Wood Badge Training (sometimes called the PhD of scouting) in this area. The program calls for concentrated training of adult leaders during an eight-day encampment.

On Feb. 10 Mr. Fowler will attend the annual Silver Beaver-Eagle Scout dinner sponsored by the Council in Santa Fe. Part of National Boy Scout Week, the dinner will feature a report to the Governor on the Council's activities in the state. Boy Scout Week will be observed Feb. 7 through Feb. 13.

Scout membership in the Council, which includes the upper half of New Mexico and the Navajo Reservation in Arizona, numbers 20,000 in 605 scouting units. The Council has an operating budget of \$220,000 for 1968.

SANDIA LAB NEWS



VOL. 20, NO. 3, FEBRUARY 9, 1968

SANDIA LABORATORIES

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA

OPERATED BY SANDIA CORPORATION FOR
THE U. S. ATOMIC ENERGY COMMISSION



FLIGHT LINE BOUND are (l to r) Maj. K. A. Sarason, Maj. H. A. Mullin, Jr., Maj. D. L. Quinlan, Capt. R. E. Cuthrell and Maj. R. A. Bertrand. The five jet fighter pilots were among the 30 Sandia employees who were called to active duty with the New Mexico Air National Guard 150th Tactical Fighter Group. Story on the callup and additional pictures of other Sandia employees who were granted a military leave of absence from the Laboratory appear on page four.

Short Notice Given

Weapons Safety Group Responds to Emergencies

The ringing of the telephone didn't interrupt the tranquility of a quiet Sunday afternoon at the Roy P. Lambert (1544) home in the north valley two weeks ago this weekend, but the message did.

"Roy, this is Parker. We have . . . (code words) in Thule, Greenland. Be at Kirtland about 7:30 tonight with arctic gear. Check with the military as to whether or not you need a passport. I'll see you at Kirtland."

The 4:30 p.m. call was from Roy's supervisor, Parker Jones. The instructions allowed Roy about three hours to prepare for a trip to the northland for an indefinite stay.

A little less than three hours earlier, an Air Force B-52 bomber had crashed on the ice on North Star Bay, some seven miles west of the Thule runway. A Department of Defense release reported that the aircraft, which was carrying nuclear weapons, was attempting an emergency landing when it crashed.

Because the weapons were unarmed, there was no danger of a nuclear explosion. However, whenever nuclear weapons are involved in an accident or incident, an "action response safety team" of nuclear weapons experts is called to the scene.

The team is usually made up of one specialist each from Atomic Energy Commission's Albuquerque Operations Office and, depending upon the particular weapon system involved, either Los Alamos Scientific Laboratory and Sandia Laboratory, or Lawrence Radiation Laboratory and Sandia

Livermore Laboratory. The three team members responding to the accident were from AEC/ALOO, LASL and Sandia Lab.

The Lab representative may be any one of the weapons specialists in Weapon Safety Division 1544.

This case was perhaps typical of the way the safety group operates. Parker received a call for a Sandia weapon specialist from the Joint Nuclear Accident Coordinating Center (FC/DASA & AEC) at Sandia Base. Parker called Roy, an expert on the particular weapon system involved in the accident.

Roy came directly to the Laboratory where he reviewed the weapon design features and any recent modifications. He then assembled and packed equipment, such as hand tools, flashlight and batteries; camera and film; special protective clothing in the event of any radiation hazard; and arctic clothing.

In the meantime, Parker went directly to Kirtland where he obtained additional details on the accident from the Directorate of Nuclear Safety. He gave this information to Roy when they met before the briefing.

Various types of military safety and ordnance disposal teams were also assembling at other locations in preparation for departure to the accident scene.

The AEC action team arrived at Thule aboard a military aircraft the following morning. The harsh environment at Thule has hampered operations. Even on storm-free days, the various teams must travel the seven miles from the airbase to the

site on dog sleds in 15° to 30° below-zero weather. The area is enveloped in darkness except for four hours of twilight from about 10 a.m. (EST) to 2 p.m. daily when there is a span of sub-twilight. Occasionally a blizzard halts all operations.

Department of Defense releases have stated that there was some detectable low-level alpha radiation, but it was well below levels considered hazardous.

As information is relayed from the site to the Laboratory, other groups are consulted to provide backup guidance and suggestions on operating procedures. For example, Division 1544 personnel have been meeting with personnel from Weapons Effects Research Department 5230, Advanced Systems Development Department I 5610, Environmental Health Department 3310 and other organizations.

The day-to-day, non-emergency responsibilities of Division 1544 personnel include serving on AEC and military operational safety study groups, assisting in safety studies of underground nuclear tests in Nevada and serving as technical advisors on the preparation of technical manuals on weapons.

But when they are called to respond to an accident or incident involving nuclear weapons, Division 1544 personnel are prepared to depart for most any location in the world on short notice. Two years ago, they and a number of other Sandia organizations participated in recovery operations following the accident involving nuclear weapons off the coast of Palomares, Spain.



CHECKING OUT ARCTIC CLOTHING and other equipment for a trip to Thule, Greenland, is Jack W. Hickman (l). P. F. Jones (both 1544) reviews an equipment list. Jack replaced Roy P. Lambert as a member of an action response safety team in Thule this week.



HOLDING THE BAG that houses the new recovery system on rocket flights, Don Johnson (9324) explains packing procedures. The ram-air bag is shown suspended in the center of the picture with the eight-foot parachute draped on the table below. The seam between the two conceals the hole through which the air passes to inflate the bag. The dark colored, looped strap around the bag is a recovery line.

New System Aids Recovery of Rocket Payloads Landing in Water

A new "bubble-top" recovery system for Sandia rocket test vehicles impacting on water has been developed by Donald W. Johnson (9324).

Heart of the new recovery system is a spherical ram-air bag that is stitched around a hole cut in the center of an eight-foot-diameter parachute canopy. As the parachute is pulled earthward by the weight of the payload, air caught under the chute's canopy is forced through the hole to inflate the neoprene coated, balloon-like bag.

After impact on the water, the weight of the collapsed, water-soaked chute serves to keep the 30-inch-diameter bag upright — thus sealing the hole between the bag and the chute so the bag remains afloat.

Another smaller bag, which is contained within the ram-air bag, provides additional assurance that the double "bobbers" will remain afloat. This interior bag is automatically inflated with carbon dioxide from a small pressure vessel after the chute is deployed.

Mounted atop the bright yellow outer bag is an antenna for transmitting signals that aid in locating the payload attached to the chute. Aircraft, usually used in over-water recovery operations, home-in on the transmitted signal. Once sighted, a helicopter is dispatched to make the pickup. As the helicopter hovers over the floating bag, a crew member uses a long hooked pole to snag a recovery line that is securely attached around the bag's equator. The bag, chute and payload are then towed to the operations base.

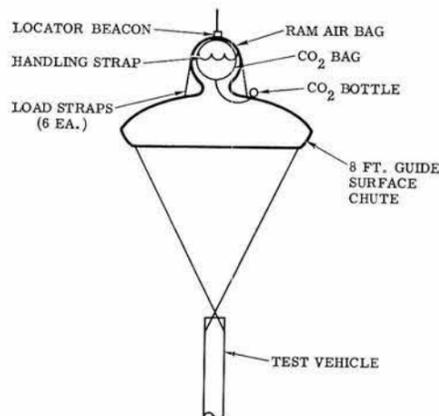
Major advantage of the new water recovery system is that it keeps the beacon antenna above water when used with both floating and sinkable payloads. The previously used sausage-shaped flotation gear stretched out lengthwise on the water when used with payloads that floated. This resulted in a loss of beacon signals, because the antenna on one end of the sausage was under water.

The recovery system can be used with 9- to 13-inch-diameter payloads weighing from 100 to 250 pounds.

Sympathy

To M. E. Grant (2423-2) for the death of his father in Laurel, Nebr., Jan. 22.

To M. M. McKinley (2541) for the death of his father Jan. 31.



ARTIST'S SKETCH of the new recovery system.

Robertson Presents Paper On Coronal Measurements at Eclipse Symposium in Brazil

M. M. Robertson (1122) will present an invited paper on "Airborne Coronal Measurements During the Nov. 12, 1966, Eclipse" this week at the Eclipse Symposium at Sao Jose dos Campos, San Paulo, Brazil.

Mr. Robertson was scientific commander of the Sandia expedition that conducted coronal studies from a NC-135A jet aircraft flying over the South Atlantic off the Brazilian coast during the eclipse. His paper will describe Sandia coronal studies in the visible and infra-red spectrums.

About 150 papers are expected to be presented during the Feb. 5-11 meeting. Invitations for papers from Mr. Robertson, another experimenter at Lawrence Radiation Laboratory and three experimenters at Los Alamos Scientific Laboratory were received by the Atomic Energy Commission headquarters.

Representatives of the Brazilian government, National Aeronautics and Space Administration and National Science Foundation will participate in the symposium.

Local Engineers' Week Observance To Highlight Engineering Profession

Special awards and an annual luncheon will highlight National Engineers' Week (Feb. 18-24) activities in Albuquerque.

L. M. Doren, president of the National Society of Professional Engineers, will be the featured speaker at the noon luncheon on Feb. 23 at Sheraton Western Skies.

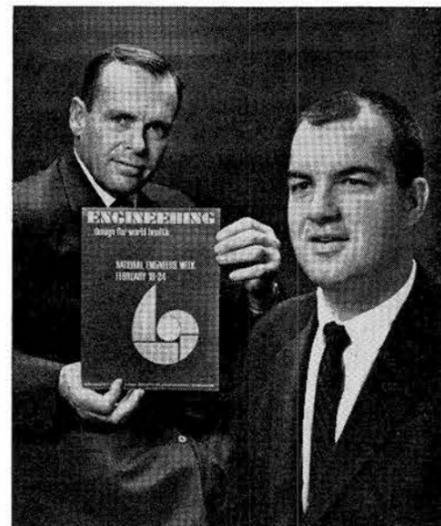
Awards will be presented to Albuquerque's outstanding engineer of the year and to the outstanding foreign engineering student at the University of New Mexico during the noontime program.

Over 400 persons are expected to attend the luncheon, including members of the JETS—high school students interested in engineering careers.

Special displays of engineering subjects will be featured throughout the city during the special week. Sandia will have an exhibit at the mall in Winrock Shopping Center.

A speakers bureau has also been organized to provide schools, service clubs and other organizations with speakers on engineering subjects.

Albuquerque Engineers' Week activities are supported by local chapters of the National Society of Professional Engineers, Institute of Electrical and Electronics Engineers, American Institute of Industrial Engineers, American Society of Civil Engineers and American Society of Mechanical Engineers.



ENGINEERS' WEEK COMMITTEEMEN J. H. Lovelace (l) and C. F. Huff display one of the posters that will be displayed throughout the city.

Charles F. Huff (9328), Floyd L. McFarling (9331) and John H. Lovelace (7252) are members of the local Engineers' Week committee.

Developing Nuclear Excavation Technology

Project Cabriolet

Project Cabriolet—an experiment in developing nuclear excavation technology—was conducted Jan. 26 at the Nevada Test Site with a number of Sandians participating. The low-yield nuclear device (equivalent to about 2500 tons of TNT) created an oval crater about 350 feet across and 125 feet deep.

The device was detonated 170 feet underground in a shaft drilled into hard, dry rock. The determination of cratering effects in hard rock is important because it is expected to be the most frequently encountered material in future excavation projects.

Project Cabriolet was under the technical direction of Lawrence Radiation Laboratory.

The AEC in its Plowshare program is studying and developing a technology for using nuclear explosives for peaceful purposes. With a tremendous amount of energy in a relatively small package, nuclear explosives may make feasible projects which otherwise would be uneconomic or technically impractical—such as a new canal across the isthmus of Central America.

Participating in the Cabriolet experiments as scientific advisor for close-in air blast measurements was L. J. Vortman of Underground Physics Division 7111. Luke has been involved in Plowshare work for more than 10 years. He wrote the first comprehensive scientific report of the possibility of creating a trans-isthmus canal with nuclear technology.

Jack Read (also 7111) was scientific advisor for installation and operation of nine microbarograph stations for Project Cabriolet.

Both Luke and Jack are associated with the Inter-Oceanic Canal Study Commission. Jack is chairman of the Acoustic Wave Group and Luke is a member of the Cratering Characteristics Group.

Cabriolet will supply data with which to plan the future nuclear cratering development program and will support the current feasibility studies of the Inter-Oceanic Canal Study Commission.

Since the Plowshare program was established in 1957, the AEC has conducted 20 nuclear field experiments and extensive laboratory research development, and has derived data from numerous nuclear tests conducted for other purposes. From this work, an understanding of the basic phenomena of underground nuclear explosions is evolving. Goal of the program is to develop a safe and economic excavation technology using nuclear explosives.

A&F Support Division 7132 under R. K. Petersen provided arming and firing systems support for Cabriolet. Participating from the Division were W. C. Wilson, R. G. Mosteller, J. H. Fuqua, R. J. Burton and P. W. Blaylock. The Division was also responsible for operation of the nine microbarograph stations. Personnel involved were D. A. McFadden (7132), Ray Jones (2543), B. P. Neumon (2561), J. E. Clark (7322), Carmel Mares (2554), Harvey Morris (1524), A. G. Bauer (8332), K. C. Bauhs (7335) and Tobias Montoya (Eberline Instruments).

Instrumentation Fielding Division I 7123 under B. C. Benjamin was responsible for air blast measurement instrumentation. Participating from the Division were H. G. Laursen and B. C. Holt.

Events Calendar

- Feb. 9-11—"One Flew Over the Cuckoo's Nest," Old Town Studio, 1208 Rio Grande NW. For reservations, tel. 242-4602.
- Feb. 10—Basketball, UNM vs. UTEP, University Arena.
- Feb. 10—Easy hike to the volcanic plugs on the western horizon. N. M. Mountain Club, leader Ethyl Ringer, tel. 256-2038.
- Feb. 14—Albuquerque Symphony Orchestra presents world premiere of James Galloway's latest work. UNM Concert Hall.
- Feb. 18—Trip to ghost town of Albermarle in the Jemez. N. M. Mountain Club, leader Ray Nethers, tel. 255-2056.
- Feb. 19—Community Concert series presents Robert Merrill, baritone. Civic Auditorium.
- Feb. 22—Basketball, UNM vs. Arizona, University Arena.

SANDIA LAB NEWS



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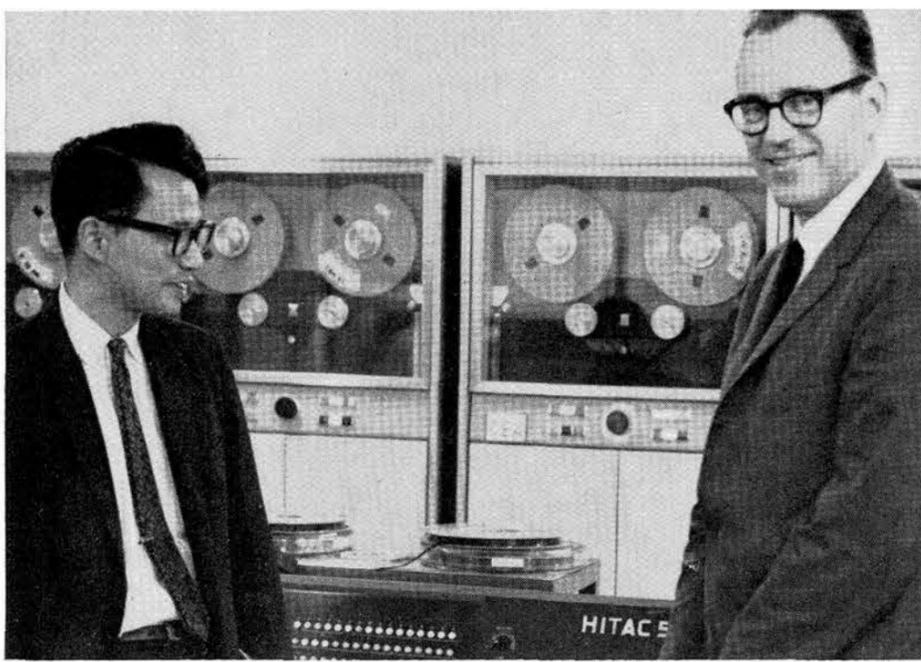
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TOURS OF INDUSTRY during Arlyn Blackwell's (8110) trip to Japan included the National Aerospace Laboratory in Tokyo. Ito Hiraki, left, Head of First Aerodynamics Division, explains the operation of the Laboratory's computer center, a modern, spacious facility which houses a Hitachi computer.

Tours Tokyo Area

Sandian Impressed by Advancing Japanese Industrial Technology

"Industrious," is the enthusiastic way Arlyn Blackwell describes Japan.

The manager of Engineering Analysis Department 8110 recently toured five plants and laboratories near Tokyo. The tours, arranged to observe Japan's technology in practice, were part of his attending the Semi-International Symposium of the Japan Society of Mechanical Engineers held on the Society's 70th anniversary. Arlyn presented a paper, "Temperature Distribution in the Tool-Chip Contact Area," at the symposium.

"I was able to get a good appreciation of Japan's industry in action," Arlyn says, "and I'm very impressed with the Japanese people and their accomplishments since World War II."

Highlight of the industrial tours was his visit to the National Aerospace Laboratory (NAL) which is responsible to the Science and Technology Branch of the Prime Minister's Office for aerodynamic research and development. Touring their testing facilities, which included a good complement of wind tunnels, Arlyn noted, "Several of the tunnels looked like close parallels to Sandia's hypersonic tunnel. Although they were obviously operating on a modest budget, and some of the facilities did not have the most modern conveniences, the tunnels were all functional and busy. I watched a transonic test of a finned missile shape.

"The data collection and processing system was most efficient," he commented. "Their computing center is very modern, a spaciouly arranged facility housing a Hitachi computer. Interestingly, the machine, which is rented, is maintained during only four hours on each weekend, and they enjoy essentially 100 percent up-time."

Wind Tunnel Testing

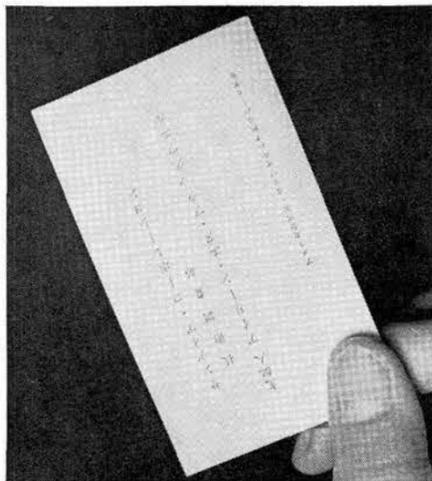
At the time of Arlyn's visit, NAL was having a problem with condensation in the settling chamber of their hypersonic tunnel. "They had a consultant in from Kobe and, over a cup of tea, were concluding that the cause was water formed in the combustion of propane in the pebble-bed heater," he said. "Since this problem arose in Sandia's facility several years ago, Department 9320 has assisted by sending an explanation of Sandia's solution—repeated evacuation of the pebble-bed after heating—along with a description of our facilities."

No. 1 Shipbuilder

During Arlyn's visit to the Yokohama shipyard of the Ishikawajima-Harima Heavy Industries (IHI), a 175,000 dead-weight ton tanker was under construction. IHI is Japan's leading shipbuilder with nine percent of the world's production—more than any other nation. IHI attributes this lead to its time-saving production techniques. Construction time is reduced by building in sections. "The procedure reminds me of unitized construction of automobiles in this country," Arlyn commented. "Another significant factor contributing to Japan's position of leadership in the field of shipbuilding is that their universities graduate about 200 naval architects every year."

Visits Sony Corporation

At Sony Corporation, a familiar name in consumer electronics in the U.S.A., Arlyn found what appeared to be very progressive management. Sony manufactures most of the components for its products and offers profit incentive systems to reward employees. Arlyn found



BUSINESS CALLING CARD used by Arlyn during various tours of Japanese industry reads (from left) "America, U.S., California State, Livermore City; Mr. Arlyn N. Blackwell; Department Manager; Sandia Corporation." The reverse side is printed in English.

Sony employee statistics most interesting. The average age is 23.5 years, 20.5 years for women and 26.5 for men—they referred to their employees as "boys" and "girls." Most of Sony's employees join the company at the end of their compulsory education (age 16) and are housed in corporate dormitories and trained by the company. "They pointed with pride to their invention of a tunnel diode by Esaki, who has since gone to Bell Labs," Arlyn said.

Arlyn's visit to Fujitsu Limited, the only independent computer manufacturer in Japan, was aimed at learning about Japan's status in numerical control of machine tools. Fujitsu produced more than 90 percent of the 500 tools in operation in Japan. They are very proud of an electrohydraulic pulse motor design which is the servomechanism at the heart of their numerically controlled hardware. Fujitsu is a member of the U. S. APT numerical control group and has developed a simplified two-dimensional control system for small computers, called FAPT (Fujitsu-APT).

Toured Nikon Camera

Since Arlyn is an avid camera "bug," his tour of Nikon, Inc., was of personal as well as professional interest. Nikon has earned the reputation for producing some of the finest consumer and industrial optics and optical equipment in the world; however, cameras now comprise about two-thirds of their business. "Their factory is better described as an established, functional variety, rather than a glittering, modern type," he said. "They make their own glass at this factory—sand goes in one end, lenses out the other. The tour included the glass processes—melting, molding, heat treating, grinding, polishing and coating—followed by the machine shop and the Nikon F assembly line. Their assembly line, as well as the lens processing sequences, included numerous quality control steps virtually at each assembly or processing stage where 100 percent inspections are made."

The Japan Society of Mechanical Engineers symposium in which Arlyn participated was attended by about 500 representatives from some 14 countries. It was the first international symposium spon-

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SANDIA LAB NEWS

FEBRUARY 9, 1968

Take Note

Arnold D. Andrade of Model Shop, Manufacturing, and Shop Liaison Division 8223 has been named a member of the Acceptable and Repairability Committee of the Institute of Printed Circuits. IPC is a national trade association established for the exchange of technical information and the development of standards in the field of printed circuitry. He will represent both Sandia Laboratories.

Arnold has been involved in the development of printed circuit processes and equipment for the past five years, during which time he assisted in the development of the printed circuit laboratory at SCLL. His experience has led to writing on printed circuitry processing for various publications.

Loren B. Converse of Instrumentation System Development Division 8112 was the author of an article published in the January 1968 issue of THE ELECTRONIC ENGINEER. Title of the article was "Ratio Measurements: Improving Resolutions in the Microvolt Range."

Paul Dominguez (8161) won a camper as first prize in the drawing at the 1968 San Francisco National Sports and Boat Show held at the Cow Palace last month. Paul says that he already has a cab-over camper but plans to keep his new one to use just for hunting and fishing.

Arnold D. Andrade (8223) is author of an article appearing in the January 1968 issue of ELECTRONIC PACKAGING AND PRODUCTION magazine. Title is "A Fabrication Process for Close Tolerance, Multilayer, Printed Wiring Boards."

Jim Muir (8166) recently received acknowledgment in the SAN QUENTIN NEWS for the time he spent helping their slot-car modelers with a Christmas project. Jim—representing a local model car racing

sored by the JSME and was extremely well organized. About 150 papers in three categories — experimental mechanics, heat transfer, and gearing — were presented in five concurrent sessions. English was the official language, at no little inconvenience to the Japanese.

"I found the Japanese people to be very polite and friendly. They were most gracious and treated me royally," Arlyn said. "I also found them to be very industrious. It seemed as if everybody works in Japan—the teen-agers have jobs in department stores, the older people are doing manual labor on the farms and in the cities. Even the women are serving in construction gangs doing, for example, street construction. And they travel a lot—even the children. I saw groups of school children many places on conducted tours. Touring their country is a part of their education."

He also found that the Japanese are "mad" about taking pictures. "Even the children have complex cameras—instead of Instamatics as many have here, they have Pentaxes and Nikons."

100 Million Population

"Although the country is the size of California, the population is almost 100 million. However, the population growth is very low, less than the U.S.A., and the life expectancy is the third highest in the world, greater than the U.S.A.," he said.

According to Arlyn, the Japanese people are proud of their country and its very impressive position in world industry. "They point to positions such as first in shipbuilding, radio receivers, and motorcycles, and second in synthetic fibers, cameras, and watches," he said.

"The cost of living is high—and wages are modest, the average being about one-fourth of wages here; but the gross national product is one of the fastest growing in the world, and the standard of living is rising rapidly," Arlyn said. "The Japanese acknowledge much help from the U.S. after World War II, and still about 30 percent of imports and exports are with us. They have few intra-city highways and, therefore, use mostly public transportation. However, the public transportation is perhaps the best in the world — especially their very good trains which includes the 125-mph New Tokaido Line connecting major cities on the Pacific coast of Japan."

club—donated several model car kits to the project and aided in putting the finishing touches on the completed models.

At a recent meeting, Leo Gutierrez (8100) was elected chairman of the board of directors of the Guarantee Savings and Loan Association of Livermore. He has served as a member of the board for the past three years.

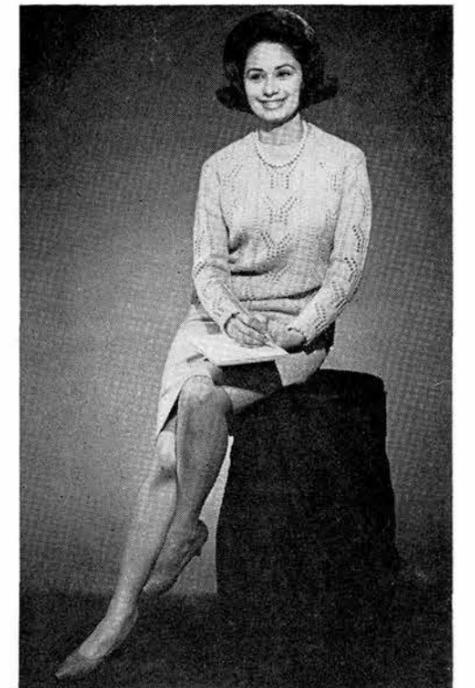
Mt. Diablo Subsection of ASME will meet Feb. 20 at Hap's Restaurant in Pleasanton. Guest speaker at the meeting will be Frank Kelliher of Spectra Physics, Mountain View, Calif. He will discuss "Lasers," and his presentation will include demonstrating three holograms.

Social hour will begin at 6 p.m., followed by dinner at 7. For reservations or further information, contact Marv Beckett (8161), ext. 2451.

Paula Cooper (8114) shot a net low score of 71 to win the first place trophy in the Sandia Employee Golf Club tournament Jan. 27 at Silver Pines Golf and Country Club in Newark. Paula tied with Mike Lettrich (8245) who lost the trophy on a hole-by-hole comparison of scores.

The tourney was played on a straight handicap basis with participants divided into two flights. Mike was the top winner of the first flight (handicap of 23 or less) and Bob Badger (8254) won the second flight (handicap 24-42) with a net score of 72.

A special award was won by E. A. (Scotty) Romine (8255) for coming closest to the pin at the No. 5 hole.



Nancy McCorkle (8235)

Take a Memo, Please

Driver courtesy and respect for the pedestrian are necessary for parking lot safety.

Welcome . . . Newcomers

Jan. 17 - Jan. 24

California
Stephen M. Halleck, Hayward 8242
R. Phillip Hebert, Los Angeles 5510
W. Dan Ross, Hayward 8242
Martha A. Taylor, Livermore 8243

Sympathy

To Bill Ryan (8212) for the death of his mother-in-law in Castro Valley, Jan. 16.

To Gerry Strandin (8131) for the death of his mother-in-law in Livermore, Jan. 17.

To Tonni Nunley (8154) for the death of her father-in-law in Tracy, Jan. 23.

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SANDIA LAB NEWS



LT. COL. D. E. HENRY
—conducting briefing for pilots—



MAJ. R. L. BROWN
—departing for communications meeting—



SGT. D. J. SANCHEZ & MAJ. R. N. ROSE
—processing personnel—



AIRMAN ORLANDO VIGIL
—checking supplies—



AIRMEN A. U. CHAVEZ & G. D. JONES
—discussing ground communications—

30 Sandia Lab Employees

Now on Active Duty at Kirtland AFB

Thirty officers and men in the New Mexico Air National Guard 150th Tactical Fighter Group were Sandia employees until the group was called to active duty two weeks ago.

Members of the unit, who were granted military leaves of absence, are J. E. Arnold (2212), A. A. Apodaca (7216), J. P. B. Armijo (7216), A. Anaya, Jr. (4574), R. A. Benham (7342), R. A. Bertrand (5000), R. L. Brown (1313), A. U. Chavez (7333), R. E. Cuthrell (1133), T. E. Demaree (7341), L. J. Connally (1326), D. E. Henry (5613), I. T. Holt (9324), G. D. Jones (4233-2), and R. A. Klein (5141).

J. A. Lackey (7216), J. R. Mahboub (3242), J. H. Martin, Jr. (2231), H. A. Mullin, Jr. (5542), L. H. Pitts (3114), D. L. Quinlan (9211), R. E. Rogers (4151-3), R. N. Rose (5000), R. R. Rozelle (2213), D. J. Sanchez (2211), K. A. Sarason

(1544), A. A. Sena, Jr. (3415), O. Vigil (4615-3), R. L. White (5151) and G. I. Williams (9413).

At the Laboratory, one was a security inspector, another a mail clerk, two were division supervisors, two were draftsmen, two were math analysts, two more were lab assistants, another was a janitor. Others included a systems analyst, apprentice electronics technician and technical and administrative staff members.

Now they are pilots, technicians, administrative officers, clerks and maintenance men at the Air Guard headquarters at Kirtland Air Force Base. Members of the 150th Tactical Fighter Group, who will be on active duty for two years or until released, may be transferred to another base anytime. For the present, however, they are able to spend their off-duty time with their families.



Sandia Medical Director Reviews Cholesterol Facts

By S. P. Bliss, M.D.
Sandia Medical Director

Recent publicity from the American Medical Association regarding cholesterol has once more raised questions about the subject; so it might be worth reviewing what's new about it.

It's only been in the past 10-15 years that doctors realized the importance of blood cholesterol as one of the predictive, causative factors in coronary heart disease. Like a high blood sugar and like high blood pressure, a high cholesterol has proven to be a "bad thing to have" because it's one of the most significant factors in accelerating arteriosclerosis (hardening of the arteries) which, in turn, is the factor behind most "coronaries."

Granted that a high blood fat content is bad, what do you do to control it? Cholesterol blood fat is influenced by the fat in your diet—specifically by the type of fat in your diet. Thus, corn oil, safflower oil, even olive oil do not raise your cholesterol. Corn oil and safflower oil are the polyunsaturated type of fats you hear so much about. The "bad" fats are the saturated fats such as animal fats. Foods themselves high in cholesterol such as egg yolks, should be limited in cholesterol-control attempts.

Now, the body does make its own cholesterol but eating the "right" fats can "trick" the metabolism into keeping the cholesterol under control. For specifics you should consult your own doctor; but here are some of the classical food ideas in following a cholesterol-control diet:

—Avoid all visible meat fats and well fat-marbled cuts of meats—especially bad are bacon, sausages, spareribs, frankfurters, cold cuts and average hamburger.

—When eating poultry—generally a good thing to have—avoid poultry skin, duck, goose.

—Most fish is good, including shellfish. To be used sparingly are such fishes as salmon, herring, mackerel, trout and sardines.

—In the dairy area, not more than four whole eggs a week should be eaten. Avoid all cream, whole milk and whole milk cheeses.

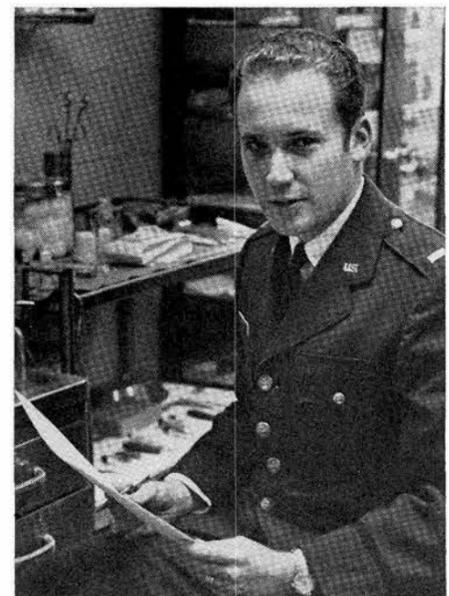
—In the area of fats, avoid butter, meat drippings, suet, lard and ordinary saturated fat margarines.

—Most commercial baked goods such as cakes and pies are to be avoided unless one knows they were prepared with the right fat.

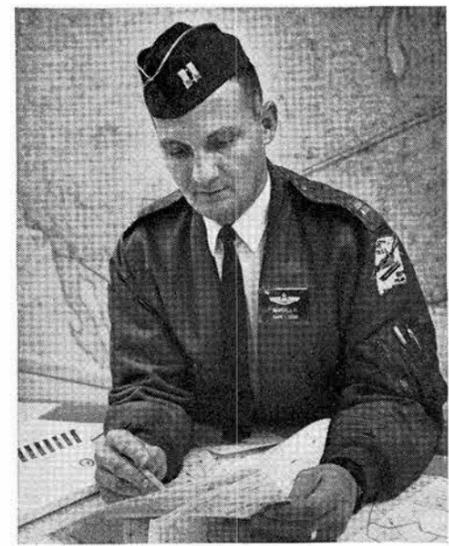
—Avoid cream soups and all chocolates, fudge, ice cream, milk shakes and fancy desserts.

That list may seem discouragingly long; but if I were to list all the things you could eat on a cholesterol-controlling diet, the list would run on for pages.

The whole problem of blood fats is much more complex than outlined here—but it's a serious one that American medicine is taking seriously—as should all Americans.



LT. L. H. PITTS
—checking medical records—



CAPT. J. H. MARTIN, JR.
—checking flight routes—



MAJ. IRA HOLT
—in F-100C cockpit—



LT. R. E. ROGERS
—conducting personnel briefing—



AIRMAN R. A. KLEIN & LT. R. A. BENHAM
—chatting about new responsibilities—

Take Note

The University of Nebraska Alumni Club of New Mexico will hold the Annual Founders Day Dinner in Albuquerque Friday, Feb. 16. H. D. Sivinski (2570) will discuss "Man and the Space Environment." All persons who have attended the University of Nebraska are urged to attend. Reservations may be made by calling Bob McCallum (2412), tel. 268-1158.

* * *

William B. Pepper, Jr. (9324), is serving as chairman of the Aerodynamic Deceleration System Conference scheduled Sept. 23-25 at El Centro, Calif., by the American Institute of Aeronautics and Astronautics. A. Y. Pope (9300) will present a paper at the conference entitled "Processing, Use and Recovery of Isotopic Fuels."

* * *

New Mexico vehicle registration stickers and license plates will be available at the military gatehouse at the Sandia Base West Gate (Gibson Blvd. at Louisiana Blvd.) Feb. 19-23 and Feb. 26-28. The office will be open from 9:30 a.m. to 3:30 p.m. Deadline for registration of New Mexico licensed vehicles is midnight Saturday, March 2.

* * *

Kansas State University alumni will meet for dinner Tuesday, Feb. 13, at 7 p.m. at La Hacienda, Old Town Plaza. Dean Hess, alumni director, will present a slide show and discussion of recent campus developments. Reservations may be made by calling local alumni club president Walt Adams (1546), tel. 256-7265, by Feb. 10. All alumni, former students, parents and friends are urged to attend.

Retiring



John E. Marquis, supervisor of Design Definition Section B IV 2212-4, will retire Feb. 29. He joined Sandia as a draftsman in February 1952 and was promoted to his present position in 1956. Before coming to the Laboratory,

John had been chief draftsman for a trucking company in Wisconsin.

Mr. and Mrs. Marquis will continue to live in Alameda at 265 Diers Rd. NW. Their home is situated on an acre of ground, and John has built a greenhouse and a woodworking shop to meet the needs of his two main interests—gardening and woodworking.

"This early retirement plan of Sandia's is real nice," John says. "For me the difference financially between early and regular retirement is so small that it's hardly worth talking about, and most important of all, it's giving me that extra time to do the things I want to do."

* * *



Ina R. Hackman, a stock record clerk in R&M Administrative Services Section 4622-2, is retiring Feb. 29. She came to Sandia in October 1955 and has worked the entire time in the Reclamation organization.

"I live in a trailer court and I love it," Ina says. "We have a big swimming pool and I don't have to worry about the tumbleweeds in the yard." Ina has so many retirement plans that she's quite sure she will have to abandon some of them. She has recently purchased a 16-foot travel trailer for short trips and fishing jaunts.

"First thing on my agenda is a trip to Oklahoma to visit my parents and my son and his family," Ina says. "When I return, I want to enroll in some courses at the University. I'm going to resume knitting and studying music—it's been a long time since I've had piano lessons. I want to take an advanced course in sewing to be able to make my own suits and coats."

"I enjoy painting and rock hunting and currently I'm studying with a metaphysical group which I find very exciting and spiritually rewarding. I also plan to play some bridge. I think I'll have to schedule my time and probably get up at 4 a.m. to have time for everything."

D. W. Ballard, supervisor of Manufacturing Research Division 2564, and C. F. Schroeder, Jr., of Energy Components Division 2134, are members of the faculty of a two-day seminar on nondestructive testing scheduled Feb. 9-10 at the University of New Mexico.

Intended to familiarize management, business, production and design engineering personnel with the role of nondestructive testing in modern industry, the seminar is sponsored by the State Technical Services for New Mexico, the Albuquerque and Los Alamos Sections of the American Society for Nondestructive Testing and UNM.

* * *

Jim Marsh, supervisor of Classification Division 3414, was elected chairman of the newly organized New Mexico Chapter of the National Classification Management Society. John Shunny, supervisor of Technical Information Division I 3411, is serving on the steering committee. The new group aims at improving communications and information exchange among professionals in the classification field and to join in national society activities. Some 25 persons attended the organizational meeting Jan. 31.

* * *

President John Hornbeck was elected secretary of the United Community Fund at the group's recent annual meeting. L. P. Gise, manager of Albuquerque Operations, Atomic Energy Commission, was elected first vice president and W. H. Chandler (4111) was re-elected to the board of directors. President Hornbeck is serving his second year as a member of the board. This is Mr. Chandler's third two-year term as a director. Before that, he was chairman of the budget committee.

At the same meeting, UCF silver awards were presented to 24 Sandia organizations. At least 90 percent of the Sandia employees in the organizations honored contributed to the Employees Contribution Plan with at least 75 percent of them pledging a "fair share" of their salaries.

* * *

Annual membership drive of the Albuquerque Community Concert Association will be held Feb. 12-17. The Association has brought the best in serious music to the community for 38 years.

Next week will be the only opportunity to purchase tickets for such outstanding attractions as the Royale Winnipeg Ballet, Chamber Symphony of Philadelphia, violinist Itzhak Perlman and others. Membership must be renewed or purchased during the membership drive as no tickets will be available after this time.

To obtain tickets or additional information, contact the Association at its headquarters in the Alvarado Hotel or Cherry Lou Burns (3432), home tel. 242-2407.

* * *

D. W. Ballard (2564) is the newly elected president of the Sandia Laboratory Federal Credit Union. Other officers are W. E. Prekker (4121), vice president, and J. S. Miller (4122), secretary. Credit Union manager Dale Bellamy holds the treasurer position.

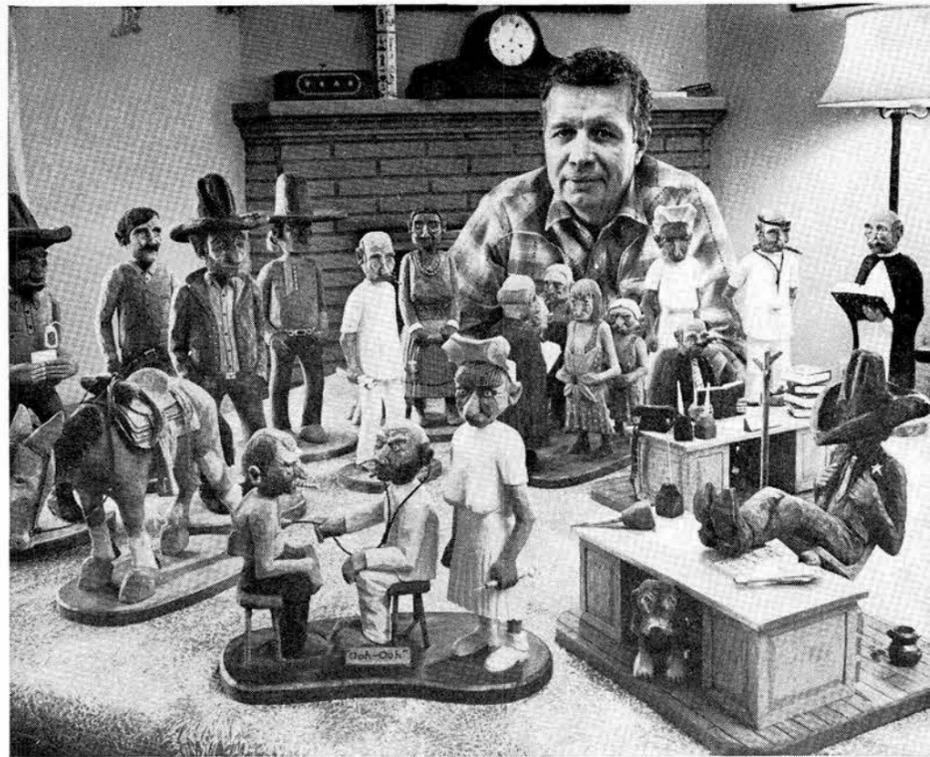
Members of the board of directors are A. Y. Pope (9300), William Olheiser, Jr. (4516), J. A. Maldonado (4614), C. E. Sandy (1432), and J. E. Westbrook (9411).

Chairman of the credit committee is Karoline (Lilly) Redic of the Credit Union staff. Members are R. A. Quelle (3122) and Molly Raisen (Credit Union).

* * *



LASER COMMUNICATIONS EXHIBIT at Sandia's Sphere of Science draws the attention of physics club members from Central State College, Edmonds, Okla. The group recently visited Sandia as part of a tour of New Mexico scientific installations.



COLLECTION OF CARICATURES carved by Tom Mickey is displayed in his home. Figures on the left and in the right background are 12 to 15 inches in height.

Whittles Away Free Time Carving Caricatures of Western Figures

Tom Mickey's hobby of whittling western characters out of wood has resulted in a widespread demand for his creations within a two-year period.

However, Tom plans to continue whittling as an avocation in spite of offers from salesmen to purchase his carvings for resale.

"My greatest enjoyment is derived from giving wood carving demonstrations to youth groups such as 4-H Clubs and Boy Scouts," Tom comments. "I also appreciate

is ready for staining, which takes another two hours.

Tom prepares his own stains by mixing paint thinner with artist oil colors. The special stains make the figures' clothing appear dull and worn. Stains are also used to emphasize certain facial features.

His hobby started about two years ago when his wife purchased a book on H. S. (Andy) Anderson, an ex-cowboy who became famous for his carvings, for her father. After scanning the book, Tom decided to get himself a copy.

He has devoted about 10 hours a week to whittling since then. In all, he has made about 100 figures, most of them 12 to 15 inches in height.

Mrs. Mickey is also an active participant. She clips pictures of cowboys from magazines for model purposes and makes the paper patterns. However, Tom discourages their three daughters from whittling because of the potential danger in using sharp tools.

"Many people refer to me as a chiseler," Tom comments with a wry smile, "but I prefer to be called a whittler."



USING HIS FAVORITE homemade knife, Tom whittles a cowboy head.

the smiles and chuckles of people when they look at my caricatures of old-time western figures."

For his talks to youth groups, Tom has prepared a special slide presentation showing the various steps involved and some examples of his finished products.

As a wood pattern and model builder at Sandia (4221-4), he generally works with close tolerances and smooth finishes. He also uses a wide variety of wood working machinery and wood chisels and gouges on his job.

In contrast, Tom uses a minimum of tools—four homemade knives and a few small wood chisels and gouges—when whittling. Bold cuts, but fine detail, are distinctive features of his caricatures of cowboys, doctors, dentists, Indians, nurses and horses.

His favorite whittling tool is a long-bladed, double-edged knife which he made from scrap steel. Old straight razors can be used to make excellent whittling knives, he says. Some of his knives have curved blades. All are regularly stropped on a leather band to keep them very sharp.

Each carving is started with a paper pattern which is used to trace a rough outline of the figure on a block of basswood or white pine. A bandsaw is then used to cut the silhouette. After 10 to 12 hours of meticulous whittling, the figure

SEGA Golf Tournament Feb. 22 at Paradise Hills

Annual pre-season tournament of the Sandia Employees Golf Association (SEGA) will be played Feb. 22 at Paradise Hills golf course. The event will be a "best two-ball" tournament and is open to all potential 1968 SEGA members.

Golfers who have not been SEGA members in the past are especially invited to join in this event. For those without an established handicap, a special Calloway Flight will be formed.

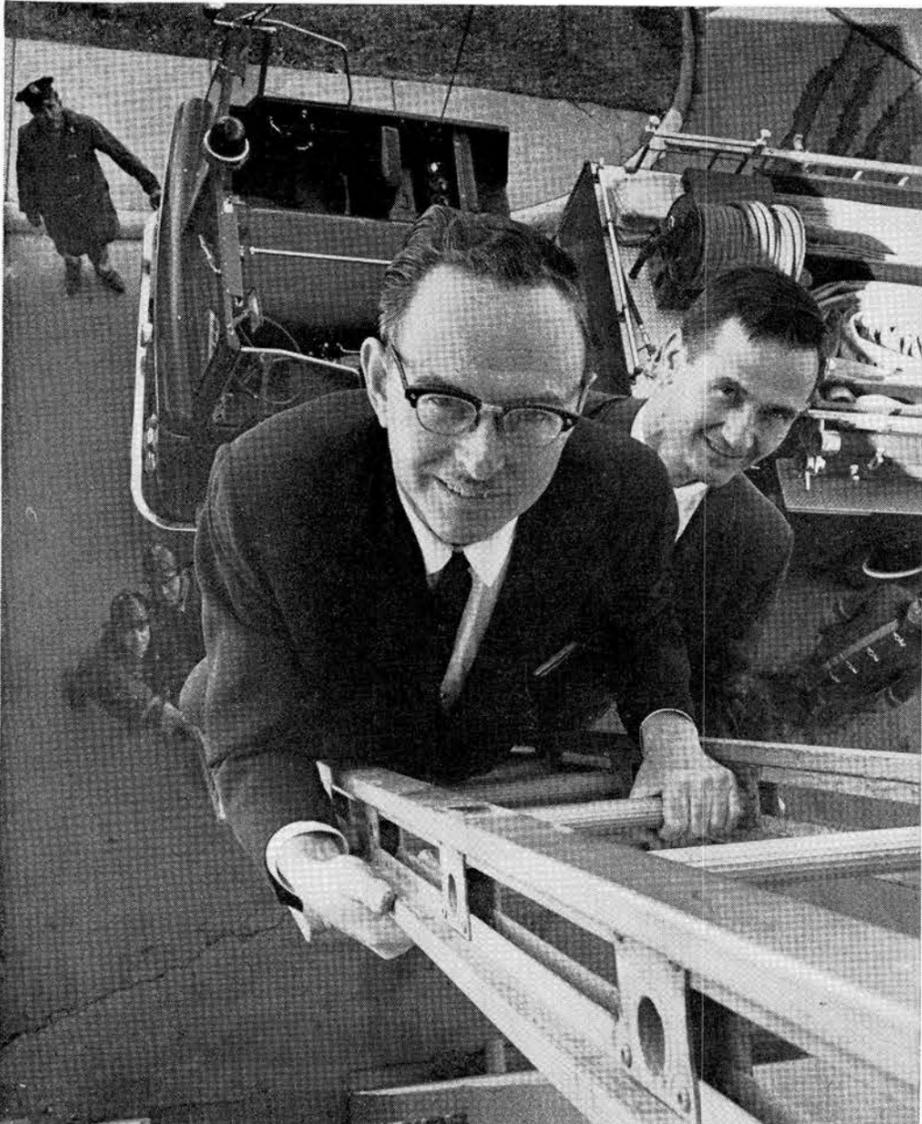
Two-man teams (your choice) may be entered. Flight designation will be based on team handicaps. Golfers entering as singles will be paired with another single by the tourney director. Teams may also make up their own foursomes.

Other SEGA tournaments are scheduled beginning in early April. Weekend and evening leagues will be formed for regular competition in match play.

SEGA membership is open to all Sandia and AEC employees. For more information about SEGA or the Feb. 22 tournament, contact O. J. Foster (3126), tel. 264-7775.

Promotions

Lester H. Pracek (1432) to Staff Associate Technical
James E. Simpson (1524) to Staff Associate Technical
Eloy V. Sedillo (4614) to Utility Operator
Joseph M. Seiler (4575) to Laborer
Ervin L. Smith (4512) to Technician
Timothy C. Roudsbush (8222) to Laborer
Della Reinhardt (3126) to Typist Clerk
Yvonne J. Sandoval (3126) to Typist Clerk
Guadalupe Dominguez (3126) to Secretarial Stenographer
Betty Jo Espinoza (3126) to Secretarial Stenographer
Verna C. Russell (3126) to Secretarial Stenographer
Nettie B. Schrock (3126) to Secretarial Stenographer
Keve L. Williams (3126) to Secretarial Stenographer
Theresa M. Griego (3126) to Secretarial Stenographer
Rosalie K. Sorrels (3126) to Secretarial Typist
Fredrick J. Schroeder (2526) to Teletypewriter Operator
Margaret E. Kennedy (4135) to Invoice Clerk
Richard H. Campiotti (8112) to Technician
Mary R. Gellinas (8142) to Secretarial Stenographer
Mary D. White (8241) to Assistant Editor
Sarah A. Rupp (8161) to Service Clerk
Victor C. Krause (8223) to Model and Instrument Maker



LADDER OF SUCCESS—Sandia's fire prevention program earned another top rung in the National Fire Protection Contest. Sandia placed third in the industrial division in 1967, first in 1966. Symbolizing the success of the Laboratory's effort are fire prevention engineers Ray Cohrs (foreground) and Vernon Duke (both 4544).

3rd Place in National Fire Prevention Contest Won by Sandia Laboratory

Third place in the 1967 National Fire Protection Association contest was earned by Sandia Laboratory. Sandia's fire prevention program, conducted by Field and Plant Operations Engineering Division 4544, was judged one of the best of the 132 U.S. and Canadian entries in the industrial division in the annual contest sponsored by the National Fire Protection Association.

The honor is a continuation of the record the Laboratory has earned through the years. Last year Sandia received the number one Grand Award ranking; in 1964 Sandia was fifth, and in 1965, thirteenth.

Judging was based on entry form data, supported by a scrapbook of fire prevention activities. Sandia's program included continuous inspection of all buildings and facilities, regular tests of all sprinkler systems and fire extinguishers, periodic training of the fire team in each building, fire drills and fire extinguisher demonstrations involving all employees, a continuing fire prevention education campaign and Fire Prevention Week activities.

Ward Hunnicutt, Division 4544 supervisor, directs fire prevention activities at Sandia. Fire prevention engineers and inspectors include R. W. Cohrs, V. L. Duke, J. C. Snowden and W. L. Smith.

Plant Systems Division 4511 personnel who contribute to the fire prevention program include V. J. Domme, J. A. Woellhart, Tom Silva, A. L. Metzgar, J. J. Schenck and H. C. Sisneros. Security Inspectors of Patrol Division 3242 also assist in fire prevention activities by checking all buildings during non-operational hours.

R. W. Cohrs was responsible for preparing the contest entry forms and gathering the scrapbook material. It was prepared for presentation by Mrs. Delores Ganzerla of Technical Art Division 3463.

"Credit for Sandia's outstanding record in fire prevention rests with all employees who participated in the fire prevention program—from those directly involved to those who cooperated by maintaining their work areas in fire-safe order," Mr. Cohrs said.

Congratulations

Mr. and Mrs. J. A. Lackey (7216), a son, Samuel Dickson, Jan. 30.



TECH ARTIST Delores Ganzerla (3463) prepared Sandia's scrapbook of fire prevention activities which was part of the basis for judging in the National Fire Protection Contest. Sandia Laboratory placed third.

Death



John R. Piri, a mechanical inspector in Mechanical Measurements Section 4213-3, died suddenly Feb. 2. He was 46.

He had worked in the Inspection organization and the Development Shops at Sandia Laboratory since January 1952.

Survivors include his widow and two sons.

Sandia Speakers Bureau

Need a Speaker? Charles Johnson Has Long List of Special Subjects

Busiest speaker of the Sandia Laboratory Speakers Bureau is Charles S. Johnson (7252). For the past couple of years, he has averaged about two talks a month to groups ranging from high school classes through a variety of civic organizations to technical societies.

Prime reason for his demand as a speaker is the long list of subjects he's ready to talk about almost anytime and anyplace. Here's the list:

A Citizen's View of the State of the Union, The Challenge and Chance of a Career in Science and Engineering, The Scientific Quest for ESP, The Generation Gap, Logic and Alcohol—Do They Mix?, The Similarities of Science and Religion, Whispers Across Space—Telemetry, Where Has "Justice" Gone?, Did They Understand What You Said?, The Deceptive Use of "Genuine Imitation" Truth in Arguments, Society's Parasites, Fiction and Fact in Science and Superstition, The Amazing Mystery of the UFO, Guides for Mature Living, Technical Film Scripting and Directing, Can We Solve the Problems of Juvenile Delinquency?, and Where Society Is Missing the "Technological Boat".

Such a wide range of interests reflects Charlie's voracious reading habits. He is concerned about these subjects and maintains a current file of information on each.

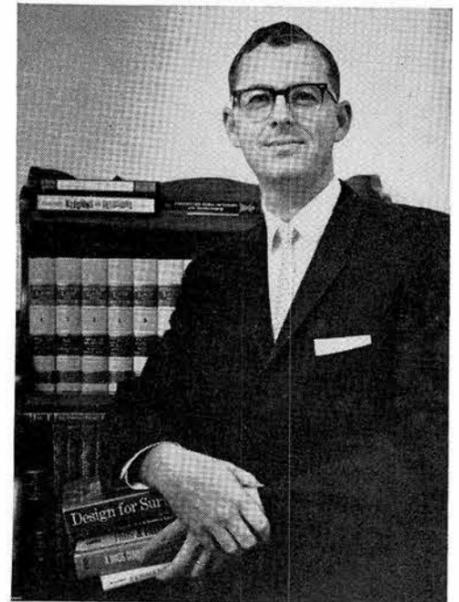
None of the titles has jelled into a "canned" speech. He tailors each talk for the specific audience and varies the time from 20 minutes to an hour. He also enjoys a question and answer session during each speaking engagement.

"This is one of the major personal benefits of a speaker," Charlie says. "I learn from the audience, meet stimulating people, and make new friends. Speaking to all these groups is a tremendous experience."

Charlie's interest in public speaking stems from his campus activities at Mississippi College. Although a mathematics major, he participated in college debate, drama activities and managed the college radio station.

He joined Sandia in 1956 after graduation and worked as a writer/director of technical training films and as an instructor in weaponry training in the Military Liaison organization. He is currently project leader in Diagnostic Instrumentation Division 7252.

The Sandia Speakers Bureau is coordin-



CHARLES S. JOHNSON
—busiest Sandia speaker—

ated by Public Information Division 3431. It consists of employees who have prepared talks and are available for speaking engagements at civic club meetings, educational institutions, youth groups, social clubs and technical organizations.

A list of speakers and subjects is available from the Division, tel. 264-4207.

But Charlie may not be available—he's booked for about one speech a week for the next couple of months.

Speakers

Leo Arellano (4153), "Valuation and Control of Fixed Assets in Research and Development Activities," Third Annual New Mexico Accounting Seminar, University of New Mexico, Jan. 26.

R. C. Wayne (5132) and F. A. Smith of Argonne National Laboratory, "A Pressure Induced AFM-FM Transition in Au₂Mn and the Pressure Dependence of the FM Critical Temperature," American Physical Society, Jan. 29-Feb. 1, Chicago.

J. E. Schirber and W. J. O'Sullivan (both 5151), "The Effect of Pressure on the Fermi Surface of Cu," and with J. R. Anderson of the University of Maryland, "Parameterized Pseudopotential Models for Lead," American Physical Society, Jan. 29-Feb. 1, Chicago.

D. C. Williams (5234), "91Y Levels Observed in the 89Y (t,p) Reaction," American Physical Society, Jan. 29-Feb. 1, Chicago.

R. L. Park (5123), "A Matrix Formalism for LEED Crystallography," American Crystallographical Association meeting, Feb. 4-7, Tucson.

Bruno Morosin (5131), "The Crystal Structures of Cu(NH₃)₄SO₄ · H₂O and Cu(NH₃)₂SeO₄," American Crystallographical Association meeting, Feb. 4-7, Tucson.

K. G. Overbury (7221), "TM Frequency Selection," Frequency Coordinator Working Group, Air Force Test Range Communication Committee, Jan. 16, Pt. Mugu, Calif.

H. O. Jeske (7211), "Receiving System Design Considerations to Minimize Intermodulation Interference," Frequency Coordinator Working Group, Air Force Test Range Communication Committee, Jan. 16, Pt. Mugu, Calif.

R. K. Traeger (1111), "Response of Rigid Polyurethane Foams to High Rate Compressive Loading," American Institute of Chemical Engineers, Feb. 18-21, St. Louis, Mo.

W. J. Whitfield (2572), "The Basic Function of a Clean Room," American Society of Tool and Manufacturing Engineers seminar, Feb. 6-7, Chicago.

R. F. Utter (3132), "Equal Employment Opportunity and Psychological Testing," New Mexico Apprenticeship Association, Jan. 15, Albuquerque.

W. C. Busby (4111), "Gaining Cooperation in Cost-Cutting," New Mexico Chapter of the American Association of Hospital Accountants, Jan. 26, Albuquerque.

C. S. Johnson (7252), "A Citizen's View of the State of the Union," Northeast Optimist Club, Jan. 30, and "Can We Solve the Problems of Juvenile Delinquency?" St. Mary's School Parents Group, Feb. 8, Albuquerque.

Civitan Club Offers Scrambled Eggs and Community Service

Every Tuesday morning at 6:30 a number of Sandians are having scrambled eggs and a lively discussion with other members of the Albuquerque Breakfast Civitan Club. Wielding the gavel and keeping the enthusiastic proceedings orderly is Glenn Miller (5235), president of the group.

The name Civitan is adapted from the Latin word "civitas" which means citizen, Glenn says. Aims of the group are knowledge ("Our programs feature expert speakers"), fellowship ("We have a great time"), and community service ("A major project is providing and maintaining a summer camp for crippled children").

The camp, located east of the Sandia mountains on Frost Road, has been in operation since 1964. Club members from the three Civitan organizations in Albuquerque leased the site, procured the buildings and moved them to the mountain location. The camp includes a general purpose hall, dining facilities, arts and crafts building, picnic pavilion area, and two sleeping facilities. It is equipped to meet the special needs of crippled children. Each spring and fall club members volunteer about 400 man-hours of labor to keep the camp in first class condition.

"Between sessions we scrounge for new equipment," Glenn says. "During the summer months we try to be useful at the camp, but the Society for Crippled Children is the responsible agency for camp operations."

Another project of the Club is sponsoring a Scout troop for mentally retarded boys. Bob Sallach (5234) is the scoutmaster.

"The Club is extremely proud of this troop," Glenn says. "Bob has done an outstanding job."

Gil Cano (5235) is treasurer of the group and Bob Jefferson (5224) is program chairman. Other Sandia members include R. F. Armstrong (5224), Stan Brooks (4537), and Earl Simonson (4122). Wayne Brown and Don Roberts of AEC/ALO are members.

Service Awards 20 Years



J. R. Dillard
4623

W. A. Otero
4624



F. G. Gabaldon
1546

D. L. Russell
2225

15 Years



J. T. Chavez
3242

W. J. Dalby
9312

R. M. Dayhoff
9312



H. J. Henry
8241

K. E. Lindell
1521

C. F. Magnuson
1546



D. M. Olson
1510

L. W. Platt
2441

R. W. Roberts
2454



Doris Rutledge
4517

Winnie Sandusky
6000

10 Years

Feb. 9-22

W. E. Schuetz 7226, R. D. Hoagland 1541, S. Jean Bischoff 4332, Janice E. Robertson 1520, R. D. Golding 1132, Dorothy M. Wiemken 8214.

Chimney Formed as Predicted

Early Project Gasbuggy Data Released

Preliminary technical data obtained from Project Gasbuggy was released last week by the AEC, El Paso Natural Gas Company and the U. S. Department of the Interior.

The Project Gasbuggy detonation occurred Dec. 10, 1967, near Farmington and was the first joint government-industry experiment in the AEC's Plowshare Program to develop peaceful uses of nuclear explosives. Limited analyses of seismic data examined to date indicate that the explosion released approximately 26 kilotons of energy.

Specific objective of Gasbuggy is to obtain data to help determine whether nuclear explosives can be used to stimulate the production and ultimate recovery of natural gas from formations where the gas is not presently economically recoverable by conventional means.

Re-entry drilling was completed Jan. 10 and indicates that a chimney of broken rock was formed as expected. The top of this chimney is 3907 feet below the surface of the ground which gives a chimney height of 333 feet. A pre-shot calculation had indicated that a layer of coal, located 334 feet above the explosion point, might stop the formation of the chimney at that height. The correlation between that calculation and the actual chimney height is considered to be remarkably good. The fact that the actual chimney height was so close to the calculated height gives increased confidence that pre-shot calculations such as the 78-foot chimney radius may be also approximately correct. Other measurements indicated that the chimney was formed by cavity collapse within a minute after the explosion.

At the time of the explosion, instruments indicated that fractures in the rock around the chimney extended out to about 440 feet. The pre-shot prediction of the extent of such fracturing was about 390 feet.

The chimney formation and the extent of fracturing are important since the rate at which natural gas flows into a well is determined by the permeability of the rock and the pressure of the gas within the rock. Thus, the size of the chimney of broken rock and the extent of fractures extending outward from it determine the increase in recoverable gas.

Measurements of gas pressure in the Gasbuggy reservoir prior to the detonation revealed a reservoir pressure of about 1050 pounds per square inch. The gas pressure, measured after the explosion, currently is 833 pounds per square inch at the surface which indicates pressure in the chimney now to be about 950 pounds per square inch. The lower pressure results from the fact that the explosion created about two million cubic feet of void space between the broken rock in the chimney into which gas can flow. As gas enters the chimney,

the pressure within the chimney increases and is expected to approach the original levels within a few months. One of the objectives of the Gasbuggy experiment is to determine the rate at which gas re-enters the chimney, and this can be measured, in part, by the rate of pressure increase. These data further will be refined by removing gas collected in the chimney and again measuring the rate at which gas re-enters the chimney. Such determinations will be part of the continuing post-shot program.

Predictions made before the Gasbuggy explosion indicated that several radio-nuclides would be present in the gas after the explosion — including krypton-85, iodine-131, xenon-133 and tritium. Measurements to determine the amount of tritium are important in assessing the public health and safety aspects of this experiment. Rough measurements of samples of gas collected to date at the Gasbuggy site have demonstrated the presence of xenon-133. The short radioactive half-life of xenon-133, about five days, means that it would not be of significance in future applications.

The on-site instruments used for these radioactivity measurements are designed primarily to assure the health and safety of workers at the site. They are not de-

signed to perform detailed analyses to identify very small quantities of krypton or tritium. Samples of natural gas have been flown to Lawrence Radiation Laboratory at Livermore, Calif., which has technical direction of the project, for detailed analyses.

The most important information to be obtained from the Gasbuggy experiment—on radioactivity, gas flow increases related to fracturing, gas pressure and gas production testing—will be gathered and analyzed over the next year or more, after which it will be possible to draw firm conclusions about the results of the experiment.

Arming and firing systems support for Project Gasbuggy was provided by A&F Field Support Division 7132 under R. K. Petersen. Instrumentation Fielding Division I 7123 under B. C. Benjamin provided instrumentation for blast measurement and earth motion studies.

A group of Sandians from Livermore Laboratory, headed by R. A. Baroody (8160), supported an LRL project in connection with the experiment. Others participating in this program included Frank Murar (8135), V. G. Black (8168), H. N. Pouliot (8137), R. E. Martinell (8135), J. S. Farnbach (8112), T. F. Jones (8131) and M. G. Gregory (8128).



VISITING SANDIA LABORATORY last week was Chester R. Raftery (center), president of the National Association of Purchasing Agents. He talked with C. R. Pritchett (4300), left, and C. W. Campbell (4000) at Sandia, and later presented an address at a meeting of the Purchasing Agents Association of New Mexico.

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

CARS & TRUCKS

- '57 2-dr. PONTIAC V8, AT, new lifetime battery, plugs, wiring, etc., \$200. Thompson, 299-0020, after 5:30.
- '57 KARMANN-GHIA, new red paint, \$550. Sarason, 299-2443.
- '64 CHEVROLET Impala 2-dr. HT, AT, red w/cream top, new brakes & tires, R&H. Hochrein, 268-7905 after 6.
- '64 CHEVROLET Impala V8 station wagon, PB, PS, AC, \$100 under NADA, \$1550. Everett, 298-3994.
- '65 FORD LTD, low mileage, \$1970. Gallo, 298-1089.
- '66 PORSCHE 911, 16,000 miles, AM/FM/SW, AC, all the extras, \$7200 new, sell for \$5500 or best offer. Kjeldgaard, 296-2212.
- '61 PONTIAC HT deluxe coupe, Hydramatic, tinted glass, AC, PB, PS, Grand Prix wheels, low mileage, \$595. Cronk, 299-6401 after 6:15.
- '63 PONTIAC Bonneville, one owner, mileage—45,700, air, all power, 6 new tires, extras, \$1375. Ermi, 299-9128.
- '57 PLYMOUTH station wagon V8, running condition, will sell or will trade for guns, camping, hunting equipment, etc. Pace, 298-1112.
- '66 RAMBLER American, 4-dr., AC, R&H, std. shift. Scheerer, 298-2550 after 6.
- '59 ENGLISH FORD, 2 new tires, 34,000 miles, \$250. Flowers, 282-3458.

'66 PLYMOUTH Satellite, 383 cu. in., 4-spd. trans., 21,000 miles, under warranty, \$1850. Spickler, 298-8367.

'59 GMC 1/2-ton pickup w/camper shell, 337 cu. in. V8, 4-spd., widebase, 6 1/2' long, R&H, trailer hitch, \$495. Bassett, 898-1840.

'62 VOLKSWAGEN, sedan, deluxe, R&H, wsw, new tires & brakes, 33,000 miles, one owner, always kept in garage, \$795. Duimstra, 299-6106.

MISCELLANEOUS

AM-SW table radio; GE automatic toaster; Remington shaver. Church, 299-2175.

3-YR.-OLD GELDING, part Arabian, spirited, \$125. Oravec, 282-3667.

'66 HARLEY Sprint Scrambler, tuned pipe, fiberglass seat, \$450. Shaffer, 242-6507.

NEW SUNBEAM electric can opener, \$7. Newman, 256-3295.

HONDA "50," 2200 miles, \$110. Rush, 296-1244.

AIRWAY 100-BTU furnace w/plenums, etc., new (never installed). Kraft, 299-1278 after 5:30.

HONDA Trail 90, '65, \$200; Bell TX500 helmets, 6 7/8, 7 1/2; Mooney mite airplane, 75 hp, Continental, \$2600. King, 298-2991.

PORTABLE TV, 19" Magnavox, B&W, slim line, 1 yr. old, \$60, includes stand. Mellone, 298-6449.

GARAGE DOOR for single car garage, metal roll-up type w/lock, never used. Grass, 298-4627.

SLR PRESENT LENSES: 35mm f3.5, 135mm f3.5, 200 mm f4.5, 2X converter for canon, mounts for Pentax and Canon. Gundersen, 298-2133.

OXY-ACETYLENE torch w/3 welding tips, cutting head, 2 stage regulators, 12' hose. Dugan, 296-4440 after 5:30.

EPHPHONE electric guitar, dbl. pick up, hand vibrator w/case, 1 yr. old, cost \$420, sell for \$275. Heath, 255-5418.

CITIZENS BAND radios, Raytel TWR-2, TWR-7, 2 Ganset G-11, 3 antennas, handie talkie, all for \$170. Foster, 282-3975.

LADIES red coat w/fox collar, size 12, worn only a couple times, originally \$135, sell for \$50. Spencer, 298-5061 after 5:30.

ORGAN, Baldwin Orgasonic, maple finish. Buchanan, 242-5066.

BASSET PUP, tri-color male, 11 wks. old, champion line, AKC. Meyer, 299-5683.

DINING TABLE, 4 chairs, 2 leaves; couch, reclining chair; floor polisher; couch & chair need upholstered. Eaves, 299-7728.

MALE Hamster w/cage, food and all, \$4. Sejka, 299-2441.

STEEL 8" I-beam, 17.5 feet long, \$25 each; 9" channel iron, 17.5 feet long, 5c per pound. Houghton, 299-3386.

BOY'S ski pants, stretch, black, size 16, \$5. Smith, 299-6873.

HI-STANDARD .22 Magnum Derringer, never fired, \$25. Hof, 255-5915.

AKC reg. Basset hound puppies, sired by N.M.'s only champion stud, Ch. Del-Maree Buffe. Klinebake, 298-9520 or 268-8227.

CLASSICAL GUITAR, Pimentel, \$99; plywood box for auto race track, \$18. Winblad, 344-3109.

2-METER transceiver, Knight TR108; unit has internal 110 VAC and 12VDC power supply, w/mike, antenna, cables. Lindsey, 298-0818.

RUNABOUT SKI BOAT, 30hp Mercury outboard motor, homemade trailer, \$600 or best offer. Cox, 256-1977, 510 Espanola St. NE.

ENLARGER, Durst 2 1/4 w/2 lenses; Savage rifle, model 99F, lever action. Pennington, 298-6356.

'67 YAMAHA 100 cc Trailmaster, all chrome, 3 sprockets, \$300; '67 Yamaha 100 cc street & trail, 2 sprockets, \$275. Romine, 299-4758 after 5:15.

BABY FURNITURE: Storkline crib, Cosco playpen, stroller, jump seat, bathinette, car seat. Stephenson, 298-5902.

BIANCHI motorscooter, "65," needs small repair; washing machine, used, \$25. Carter, 296-2019.

50 FT. of concrete reinforcing mesh; tenor banjo; front half of '51 Ford pickup frame & running gear, good for making utility trailer. Schulze, 298-9528.

FOREIGN CAR GUIDE, featuring VW, first '56 issue through '61, 4 bound volumes, make offer; child-size maple combination chest-of-drawers; clothes closet, \$15. Morgan, 299-2850.

GUITAR, electric, amplifier, less than 1 yr. old. \$50. Thayer, 299-3127.

BEAGLE PUPPIES, AKC, champion sired, \$40, 6 wks. old, on Valentine's day. Buckner, 296-1251.

KITCHEN DINETTE set, \$25 or trade for what have you. Witherspoon, 265-4806.

WARD'S tent type camp trailer w/spare tire & new tent, used 1 time, sleeps 4, \$200. Frasier, 299-6933.

3 AND 5-year-old reg. Tenn. walking horse, mares and hinney, father is Shetland and mother is burro. Crosby, 898-0705.

KIRBY vacuum, \$25. Bliss, 255-7980.

DARK centered keystone mag wheels, fits 14" Ford car, Huensfeld, 256-1477.

14 CU FT. freezer, chest-type, Montgomery Ward, \$75. Cazier, 299-0340 after 5:30.

56 BY 32 1" solid cherry combination tilt top table & seat, 29" high. Baker, 296-2190.

WORLD BOOK encyclopedia, complete set w/dictionary & supplements for '62-67, \$50; dishes, Baur California pottery, service for 8 w/extra dishes, \$20. Hesselbarth, 256-1720.

.38 S&W revolver, heavy frame, 4" barrel, holster, 2 boxes ammo, \$75; Pacific Spartan press w/ram, \$15. Gubbels, 299-8089.

ATLAS auto. portable sewing machine, \$40; GE washer, \$75; dishwasher, portable, \$45; baby buggy & bathinette, \$8 ea. Browne, 344-6343.

GIRLS figure ice skates, 2 pr., sizes 2 & 4, \$3/pr.; Girl Scout uniform, size 12, plus extras, \$4. Jones, 344-4870.

ROLL-A-WAY BED w/mattress, \$15; accordion, \$50. Schelby, 344-5522.

7' SKIS, used, \$10; new men's golf clubs w/bag & accessories, \$50. Conrad, 299-5316.

MEMBERSHIP in Sigma Flying Club (Cessna Sky-line including hanger). Bickel, 268-3203.

BANTAM CHICKENS, hens, roosters, 75c ea.; '63 Jawa 350cc, \$300. Shock, 877-3728.

MAG. WHEELS, Hands aluminum 5 1/2 x 15, early Fords & Ford pickup, complete w/lugs, knock-offs & locks, \$110. Tarbell, 256-1322.

REAL ESTATE

CHAMA PROPERTY w/2 houses, \$11,000. Selph, 877-5737.

3-BDR. HOME, lg. patio, extras, sell or lease, trade equity for camper or terms. Mascone, 345-0955 after 5.

3-BDR. & den custom home in Bosque Farms, 1 acre plus all improvements, will consider trade for Albuquerque property. Everett, 636-2544.

4 1/4% LOAN, 3-bdr., 1 1/2 bath, new carpet, landscaped, fenced back yard, pitched roof, single garage. Love, 1336 Moon NE, 299-0956.

4-BDR, 1 1/2 bath, fp, dbl. garage, 1 acre, fenced w/corral, Bosque Park, \$23,500, \$158/mo. Downs, 296-4710 or 265-0217.

3-BDR., Brick, 2 baths, ww, drapes, AC, lg. patio, walls, sprinklers, near schools-churches-shops-w. gate, 1108 Florida SE, \$16,400. Eagar, 265-4320.

PARADISE HILLS, 3-bdr., 1 1/2 baths, FR, dbl. garage, landscaped, near school & shopping, \$13,500. Bauder, 299-7322.

BRICK 4-bdr., 2700 sq. ft., 2 1/2 baths, 2 fireplaces, landscaped, sprinklers, patio, dbl. garage, 3009 Vermont NE. Seay, 298-7227.

WANTED

TO TRADE 1 double bed (3 yrs. old) for twin beds. Roache, 268-4686.

TO TRADE air conditioner, 1-ton refrigeration type, for cement mixer. Key, 296-4039.

TAPE RECORDER. McCuckin, 298-8091.

TO RENT camptr, tent trailer or small travel trailer to sleep 4 for 3 weeks in May & June. Constant, 296-1431 after Feb. 12.

LATE MODEL Mercury 500 outboard motor, short drive. Harley, 299-7172.

SMALL cement mixer with or without motor. Morris, 877-3782 after 6.

GIRL SCOUT uniform, first year, for 11-yr.-old girl. Garcia, 898-3422.

BUICK, 1964-65 station wagon, AC, PS; Honda 305 scrambler. Schuch, 298-9924.

FOR RENT

HOUSE, NE, 3-bdr., 1 1/2 bath, LR, lg. den, 2-way fp, built-in kitchen, garage, walled yard, near schools, \$210 mo. Anderson, 299-9037.

AVAILABLE Feb. 15, Hoffmamtown brick, unfurnished, 3-bdr., 1 1/2 bath, carpeted, garage, 6 mos. lease at \$130 mo. Meyer, 298-1481.

LOST AND FOUND

LOST—Safety glasses, ring of keys, wallet, turquoise thunderbird, Chrysler keys, black leather glove, gold GMC key, brown leather glove, long gold pin, silver cuff link w/imprint of bomb, amethyst pendant attached to bow-knot pin.

LOST AND FOUND, tel. 264-2757, Bldg. 610.

FOUND—Pine, watch, earring, small pocketknife, shaving kit, silver w/turquoise earring. LOST AND FOUND, tel. 264-2757, Bldg. 610.



FASHION SHOW models for the Sanado Club luncheon Feb. 13 include, from left, Mrs. John A. Hornbeck, honorary board member; Mrs. C. R. Pritchett, Sanado president; and Mrs. O. B. Tjeltweed, a past president. Mrs. G. C. Hollowwa, seated right, will be fashion commentator for the show.

Marks 10th Anniversary

Sanado Club Plans Style Show Feb. 13

Sanado Woman's Club will celebrate its tenth anniversary with an elegant spring fashion show and a sherry luncheon Tuesday, Feb. 13, at the Coronado Club. Sherry service will begin at 1:15 p.m., the luncheon will be served at 1:30 and the fashion show will follow.

Models for the fashion show will be the past presidents of Sanado—Mmes. W. S. Sharp, R. S. Lemm, T. M. Cowles, George Dennis, O. B. Tjeltweed, R. W. Mottorn, J. N. Colquitt and the present office holder, Mrs. C. R. Pritchett. Sanado's honorary

board member, Mrs. J. A. Hornbeck, will also model. Commentator will be Mrs. G. C. Hollowwa. Fashions presented will be from Jordan's Winrock. Eckert's of Albuquerque will design and execute the stage setting.

Mrs. E. E. Ives, assisted by Mrs. K. D. Flynn and Mrs. G. S. Kinoshita, will use birthday cakes in their decorating plans.

Reservations may be made (deadline today) with Mrs. V. G. Nelson, 801 Van Buren Place SE.

Authors

D. C. Williams (5234), "Two-Neutron Configurations in the Even Calcium Isotopes As Observed in the (t,p) Reaction," Vol. 12, page 1192, BULLETIN OF THE AMERICAN PHYSICAL SOCIETY; with J. D. Knight and W. T. Leland (both Los Alamos Scientific Laboratory), "The Levels of ^{42}Ca and ^{46}Ca as Observed in the $^{40}\text{Ca}(t,p)$ and $^{44}\text{Ca}(t,p)$ Reactions," December issue, PHYSICAL REVIEW.

R. W. Harris (5235), "Direct Measurement of Mass Pickup in a Low Energy Theta Pinch," December issue, PHYSICS OF FLUIDS.

O. M. Stuetzer (1420), "Impulse Response Measurement Technique for Piezoelectric Transducer Arrangements," January issue, IEEE TRANSACTIONS ON SONICS AND ULTRASONICS.

G. A. Samara (5132), "Temperature and Pressure Dependence of the Dielectric Constants of the Thallous Halides," January issue, PHYSICAL REVIEW; "Pressure Dependence of the Ferroelectric Properties of KD_2PO_4 ," November issue, PHYSICS LETTERS; with L. C. Walters and D. A. Northrop (both 5154), "Polymorphism, Compressibility, and Thermal Expansion of Thallous Iodide," Vol. 28, page 1875, JOURNAL OF THE PHYSICS AND CHEMISTRY OF SOLIDS.

G. C. Smith (5213), "Triplet Exciton Phosphorescence in Crystalline Anthracene," February issue, PHYSICAL REVIEW.

G. W. McClure (5121), "Ionization and Electron Transfer in Collisions of Two H Atoms: 1.25-117 keV," February issue, PHYSICAL REVIEW.

K. J. Touryan (9326), G. E. Clark (1315), and D. J. Rigali (9326), "Pressure Distribution on Cone-Cylinder in Hypersonic Flow," March issue, AIAA JOURNAL.

Sandia Safety Signals

Seat Belt Negligence - Warning

In the 1967 Wisconsin Law Review 288, reporting on decisions in automobile accident cases, there was a concluding note: "Failure to use a seat belt may be held to be contributory negligence. However, factual causation problems must be overcome before such a holding can be made. More important, the social utility of the seat belt as a safety device must be accepted by the public."

Gun Accidents

The New Mexico Department of Game & Fish states all gun accidents can be prevented by putting into practice two basic principles of safe hunting. First, learn and practice good gunmanship rules and insist that your hunting partners do the same. Second, wear bright man-made colors, preferably blaze orange, so that you can be easily seen.

Big Jim Noonan New Club Manager; Announces Special Luncheon Policy

James W. Noonan, an executive supervisor with Szabo Food Service, Inc., is the new manager of the Coronado Club. No stranger to Albuquerque, Jim has visited the Coronado Club about once a month since Szabo took over the concessionaire contract at the Club.

"The Coronado Club is a fine facility," Jim says, "it's one of the best of the 450 units that Szabo operates throughout the country."

With one exception, Jim plans no changes in the restaurant's operation. "And the employees should be happy about this one," he says.

Starting Thursday, Feb. 15, Szabo will offer a 99-cent special luncheon menu once each month. The first one will be something extra special in honor of Jim's arrival—a top sirloin steak with French fries and all the trimmings. It will be available at the Club, in the Bldg. 839 cafeteria and Area III cafeteria.

Jim has 23 years experience in the food service business, both as a chef and as a food manager. He will personally supervise the kitchen operations and promises the best menus available. "I eat here myself," he says. Jim weighs in the neighborhood of 200 pounds.



JAMES W. NOONAN
—new Coronado Club manager—

Coronado Club Activities

Theatre Night Set Feb. 17

"Theatre Night" on Saturday, Feb. 17, highlights this month's calendar at the Coronado Club. An hour of variety entertainment will be presented by the Sandia Base Special Services Branch for the event.

The show's 30-man cast will present review sketches by Harold Pinter, popular and folk singers, an 18-piece stage band and a jazz quartet.

The evening starts with a social hour from 6 to 7 p.m., a prime rib dinner from 7 to 8 p.m., the show presentation, and then dancing from 9:30 to the music of Tommy Kelly.

Cost for members is \$3, guests \$3.50. Make your reservations and pick up your tickets by 9 p.m. Feb. 16 at the Club office.

Social Hours

Tonight the ever-popular Coronado Club chuckwagon roast beef will be the feature of the social hour buffet. Don Lesman

will play for dancing. The buffet costs \$1.75 for adults, \$1.50 for kids.

On Friday, Feb. 16, Max Madrid will make the happy music for the Mexican food buffet. The buffet costs \$1.25 for adults, \$1 for children.

The Rhythm Masters will be on the bandstand Friday, Feb. 23. The Coronado Club seafood buffet will be spread.

Every social hour this month will feature Pat Reich and piano entertainment in the main lounge.

Bridge

Open team-of-four bridge championship dinner will be held Monday, Feb. 12, at 6 p.m. Ladies bridge will meet Thursday, Feb. 15, at 1:15 p.m. Duplicate bridge will meet Monday, Feb. 19, at 7 p.m.

Holiday

The Club will be closed Thursday, Feb. 22, in observance of Washington's birthday.



PRETTY VALENTINE
Peggy Stevens (4364) helps promote the New Mexico Heart Association's observance of National Heart Month during February. The group will conduct door-to-door solicitation Feb. 25, designated Heart Sunday. Sandians who are members of the Employees Contribution Plan contributed \$9208 to the heart fund in 1967.