SANDIA CORPORATION

LAB NEWS

PRIME CONTRACTOR TO THE ATOMIC ENERGY COMMISSION / ALBUQUERQUE, NEW MEXICO / LIVERMORE, CALIFORNIA

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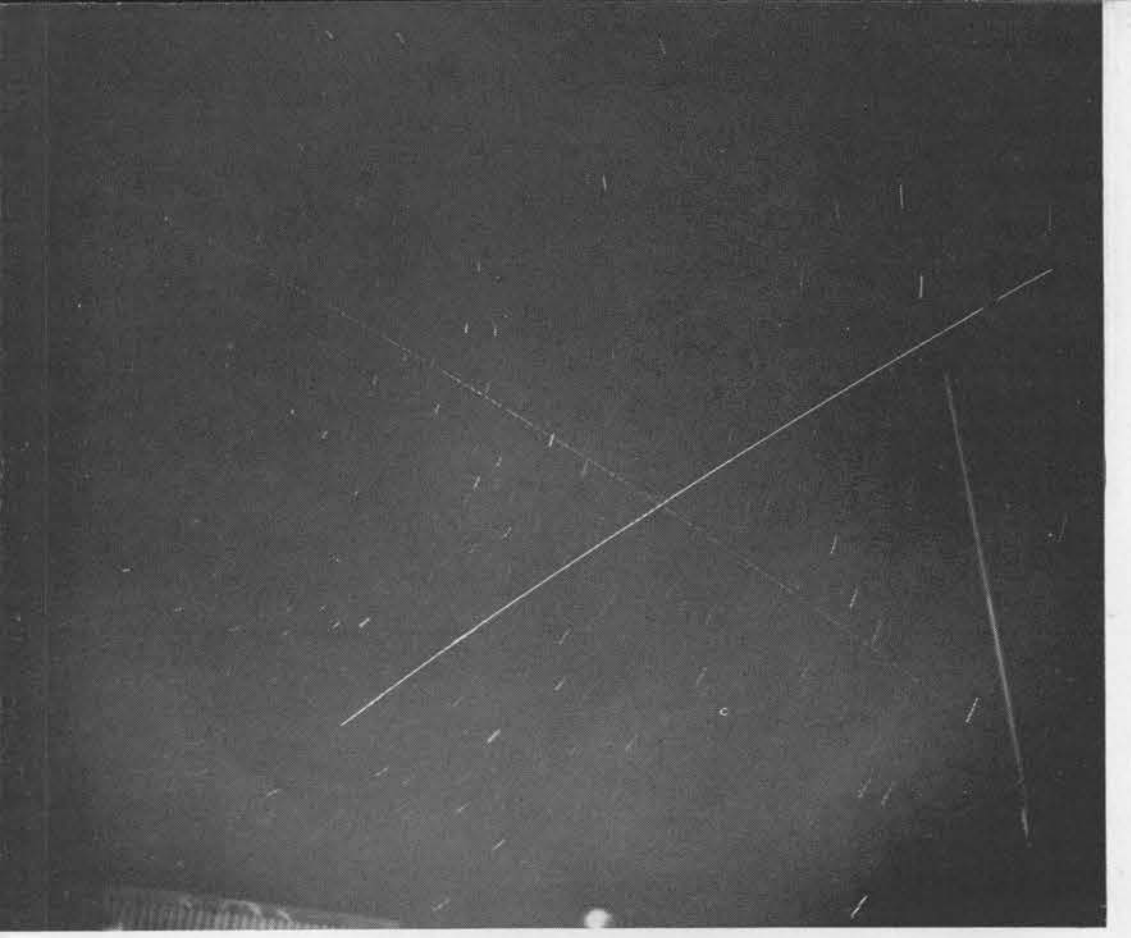


UNUSUAL PHOTOGRAPH shows Echo 1 and 2 satellites crossing orbits. It was made by a team of four Sandians Friday, Jan. 31, at 4:30 a.m. The event, extremely rare, could only happen in the space age.

Echo 1 and 2 Satellites Perform on Schedule For Optics Experts

Some sort of a "first" was recorded by a team of four Sandians from Range Optics Division 7224 on Friday, Jan. 31. They photographed Echo 1 and 2 balloon satellites crossing paths.

The event occurred shortly after 4:30 a.m. The Sandians—Grover Hughes, Jose Llamas, Leo Scully, and Robert Hughes—were waiting with three Sandia-designed plate cameras loaded with black and white and color plates.

Grover Hughes had been observing both satellites for several mornings prior to the event and had predicted the occurrence in advance. He calculated the crossing point azimuth, elevation, and time. The cameras were placed in position on Thursday evening and the team assembled at 4:15 a.m., the next morning to load the cameras and make last minute checks.

Echo 2 rose in the north, on schedule, while Echo 1, as predicted, approached from the northwest, still eclipsed by the shadow of the earth. Echo 1 rose out of shadow into sunlight west of the North Star, as was expected.

Grover Hughes acted as timer and visual observer. The camera team began the 6-minute, 20-second exposure at his signal about 4:35 a.m. Echo 1 was in the camera field approaching the intersection and reached the intersection point 35 seconds after Echo 2 crossed it.

At 04:35:42, the exposure was "chopped" by placing a black card over the lens for two seconds. The result, a break in the white streaks of the photograph, can be seen in the accompanying photograph. The break is useful for calculating angular velocities of the two satellites.

In the photo, the thin white trails forming the "X" are the paths of the satellites. In the original photo, the Echo 2 Agena carrier rocket is also visible at one point, but is lost here in this **Lab News** reproduction. The brighter of the two trails is Echo 2 which is assumed to be the result of the fully-inflated balloon satellite. Echo 1 leaves a less bright, less uniform trace.

The short, curving white streaks in the photo are stars. They appear as streaks due to the time exposure method of photography.

"While it is by no means unusual for as many as three satellites to be in an observer's sky at one time," Grover Hughes says, "it is quite unusual for more than one of these to be a visual object, that is, bright enough to be seen without optical aid. It is extremely unusual to have three objects of this type appearing within a region as small as 17° of sky."

Historian Reports on Problems of Authorship

In 1960, F. C. Alexander, supervisor of Special Projects Division 4133, began work on a project to reduce the size of the negative files at Sandia Laboratory. The project led the way to a History of Sandia Corporation, which begins serialization in the next issue of the **Lab News.**

"The negative files contained many pictures of buildings and people, taken in the Company's very early days," Ted explained. "When I started work on the history, the negatives were about the only thing I had to work with."

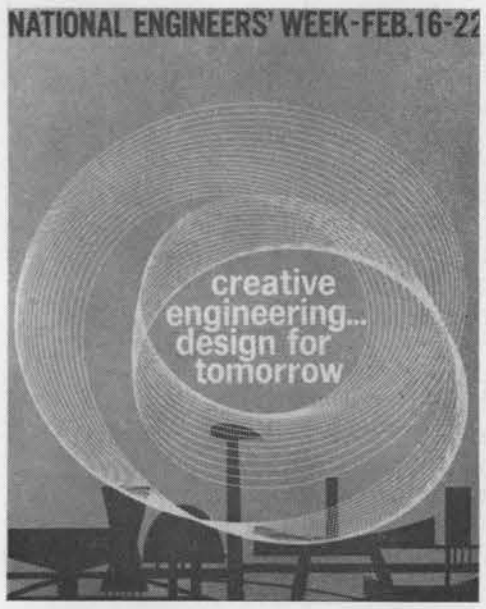
He began contacting individuals connected with Sandia's Los Alamos days, when the Laboratory was an extension of LASL. "I found that conversations led to new leads for material, and to new individuals from whom I could seek information," he continued. "In this way, the project gained momentum rapidly; I shortly found myself concerned with the history of Sandia Base, before the LASL branch was established."

Ted feels that the history is finished at an opportune time. "Time has put a perspective on the early days of atomic energy," he continued, "and the historian must be especially aware of the old adage about time and tide waiting for no man. Many of the people who played vital roles in the early days have passed away — George Landry, Donald Quarles, James McRae, and many others. The precious sources of information are disappearing. And time dims the brilliance of memory."

Even with the many sources of information that were available, Ted nevertheless found that there were gaps in time when little, if any, information was available. "The entire year of 1946 offered a gap that was hard to bridge," he said. "There's almost no written evidence of what went on. There are several possible reasons for the lack of information. Operation Crossroads in the Pacific occupied all of the available time of the manpower who might have written of the events of the year. The whole atomic energy project was in a suspended state; it stood a chance of being abandoned. Bernard Baruch was advocating that the atom should be turned over to international control, and all of these reasons probably had their effects on the information activities."

SANDIA HISTORIAN F. C. Alexander, supervisor of Special Projects Division 4133 and author of History of Sandia Laboratory to be serialized in forthcoming issues of **Lab News,** reflects on the growth of Sandia Base since the days when it was known as Oxnard Field. Building behind him is original administration building for Oxnard Field.

U. S. Rep. Thomas G. Morris to Address Professional Engineers



All engineers in the Albuquerque area are invited to attend a luncheon at the New Mexico Union, University of New Mexico, Friday, Feb. 21, at 12 noon. Highlighting National Engineers' Week activities, the luncheon will feature as speaker Rep. Thomas G. Morris, member of the Joint Committee on Atomic Energy and House Committee for Science and Astronautics.

National Engineers' Week is being observed Feb. 16-22. Local activities will include an open house at UNM's engineering departments for selected high school students from throughout the state, displays at Winrock Center and the Public Service Company downtown, and presentation of an award to an outstanding foreign engineering student attending UNM.

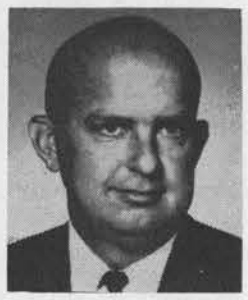
The Winrock displays are being provided by Community Relations Division 3143. One display will depict Project Gnome, the nuclear detonation in an underground salt dome near Carlsbad, and the other will be a presentation on the twin satellites now orbiting, designed to detect nuclear bursts.

Theme for the 1964 National Engineers' Week is "Creative Engineering — Design for Tomorrow."

Activities are being coordinated by a committee of representatives of five technical organizations — American Institute of Industrial Engineers, American Society for Civil Engineers, American Society of Mechanical Engineers, Institute of Electrical and Electronics Engineers, and the National Society of Professional Engineers.

Sandians serving on the committee include Robert G. Scharrer (7252), Glenn E. Andersen (7511), and Robert L. Dineen (1542). Mr. Dineen is also serving as ticket chairman for the National Engineers' Week luncheon and has tickets available at $2.50 each.

W. H. Chandler Elected Director of Albuquerque United Community Fund



W. H. Chandler, supervisor of Position Evaluation and Classification Division 3112, has been elected to serve as a director of the Albuquerque United Community Fund. His term is for two years.

At the annual business meeting on Jan. 20, 15 new directors were elected by members of the board. The meeting also marked the 30th anniversary of the fund in Albuquerque (originally called the Commuity Chest). UCF now includes 29 member agencies.

Mr. Chandler has been active in UCF for six or seven years. He was a "loaned executive" for two years and has served on the budget committee for two years, including one year as chairman. As a loaned executive, he worked for the United Fund campaign committee, talking with heads of Albuquerque's larger business firms and industries to encourage employee participation in UCF through payroll deduction plans.

Credit Union Elects—

For the third year, J. S. Miller (4122) was elected president of the Sandia Laboratory Federal Credit Union, the Board of Directors announce. Also reelected were R. L. Kollman (4136), vice president; E. R. Frye (1112), secretary; and Dale Bellamy, treasurer.

Mr. Frye and Mr. Bellamy along with D. W. Ballard (2564) were reelected by the Credit Union membership to serve three year terms on the Board of Directors.

Serving unexpired terms on the Board are R. A. Quelle (3122), M. E. Grothe (4150), D. S. Tarbox (3200), and J. J. Michnovicz (3465).

(Editorial Comment)

'Let Those Who Care Come Forward'

> "Rancor and bigotry, racial animosities and intolerance are . . . the deadly enemies of true democracy, more dangerous than any external force, because they undermine the very foundations of democratic effort."—Chief Justice Charles E. Hughes, co-founder of the National Conference of Christians and Jews.

* * *

Taking great significance this year is the observance of Brotherhood Week, an event sponsored by the National Conference of Christians and Jews.

Brotherhood — "Democracy at Work" — is not a new undertaking. Abraham Lincoln expressed it more than a hundred years ago, saying, "It is your business to rise up and preserve the Union and liberty for yourselves, and not for me. I appeal to you again to constantly bear in mind that not with politicians, not with Presidents, not with office seekers, but with you, is the question: Shall the Union and shall the liberties of this country be preserved to the latest generations."

More than a century later, President Lyndon B. Johnson said, "In this hour it is not our respective races that are at stake—it is our nation. Let those who care for their country come forward, North and South, white and Negro, to lead the way through this moment of challenge and decision."

The Civil War pitted brother against brother in a bitter physical struggle to preserve the Union. We still bear the scars of this conflict.

Today's struggle, too, is bitter. It is, however, an internal struggle. Its battlefield has no geographical location other than in the minds and hearts of the American people. It is a conflict between habit and custom and religious conviction, between the past and the future, between the luxury of false prejudice and the reality of human brotherhood.

Through brotherhood can be won freedom for all. There need be no scars of physical combat. This is the message the National Conference of Christians and Jews brings with Brotherhood Week.

Congratulations

Mr. and Mrs. W. R. Atkins (2541) a son, Matthew, Jan. 24.

Mr. and Mrs. C. L. McCoach (2544) a son on Feb. 4.

Mr. and Mrs. William B. Benedick (5133) a daughter, Mary Katherine, Jan. 31.

Mr. and Mrs. Loren Heavirland (5136) a daughter, Jill Elizabeth, Feb. 4.

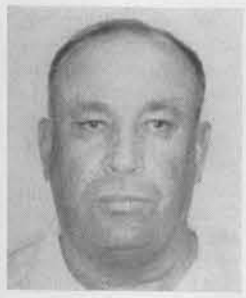
Mr. and Mrs. George Clark (1331-1) a daughter, Adrienne, Feb. 2.

Sympathy

To K. A. Peters (4611-4) for the death of his father, Jan. 16.

To C. J. McGarr (4600) for the death of his mother in Grove City, Pa., Feb. 7.

Death



Rafael Armijo (4574-1), a Sandia employee since June 1957, died Jan. 31 after a brief illness. He was 57.

Funeral services were held Feb. 4.

Survivors include his widow, his father, two daughters, four sons, four brothers, a sister, and 20 grandchildren. All reside in Albuquerque except one son serving with the U.S. Marines in Viet Nam, and one daughter and three sons living in Los Angeles. One of his brothers is Benjamin L. Armijo (4575-2).

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Take a Memo, Please

Accidents do not happen — they are caused by such things as carelessness, indifference, forgetfulness, recklessness, failure to recognize hazards.

CHECKING OVER equipment, owned by the Albuquerque Mountain Rescue Council, are members (l to r) Duane Arlowe (7334), George Steck (5425), and Hank Tendall (1513). Stretcher separates into two parts for easier "back-packing" up mountains.

Rescue Council Members Await Call to Serve

The west side of the Sandia Mountains is rugged. Frequently hunters, hikers, even picnickers, become lost or injured on its jagged slopes. That's when the Albuquerque Mountain Rescue Council goes into operation.

The council was formed in 1959 with Hank Tendall (1513) one of the five incorporators. At the present time there are 56 members, including several physicians and 14 Sandians. Current chairman of the council is George Steck (5425) and the other elected directors are Duane Arlowe (7334), Don Lundergan (1124), Sam Tanner (husband of Betty Tanner, 3421, who is also a member), and George Hankins, who is considered probably the best authority on the Sandias.

The membership list is remarkable because this is not a club; there is only one meeting a year; the qualifications for membership require known ability in first aid, mountaineering, technical climbing techniques, and search and rescue methods; and there is no remuneration for expenses, work, or danger.

Back in 1955 when a commercial passenger plane crashed in the Sandias, a number of local mountain climbers (mainly members of the New Mexico Mountain Club) were called on to bring the bodies down from the heights. The airline later donated a sum of money for this rescue operation, which became the financial basis for the Albuquerque Mountain Rescue Council. From time to time, money or equipment has been donated by other persons who have been the object of a search or rescue. Any money goes to purchase additional or better rescue equipment.

State Police Call

"Usually the initial call for help comes from the State Police," said George Steck. "The member called begins telephoning others and a meeting place is arranged—this is often the State Police headquarters since our equipment and supplies are kept there. If the initial call is from a different source, we must first determine if a 'real emergency' exists."

"Sometimes we receive calls from someone who has 'seen a fire' on the hillside," Duane Arlowe continued. "It's embarrassing to mount a full-scale rescue for someone who is just camping out and doesn't want to be rescued."

Hank Tendall picked up the subject: "I remember being called out one winter night to check on a flickering firelight. Our signals were returned by the unknown persons. College boys, camping out, thought the signals were from their buddies down on the mesa."

The initial search group will include six to 12 persons. The rescue group will be larger since the success of this operation often depends upon sheer muscle power.

"A base camp will be established, frequently near the lost party's abandoned car. Immediately we try to identify footprints. If there are no tracks, then we must send for more people to set up a search pattern over a large area," George said.

Lost children are particularly hard to find — probably because they're afraid they'll be spanked. "They often try to hide," Duane explained, "and they're suspicious of strangers. Sometimes you almost have to step on them before you discover them."

George suggested that parents taking their children on mountain outings give them whistles. "If they think they're lost," he said, "tell them to sit down and blow their whistle."

Fatal Exposure

The question arose, "Why is overnight exposure fatal to some uninjured persons while others are unharmed?" The experienced mountaineers believed that determining factors were temperament, whether the person was distressed about being alone outdoors, or whether the person simply "gave up"; general physical condition; and amount of body energy burned up by physical exertion in trying to find help or a familiar site.

When an injured person is located, part of the search party remains there to administer first aid, while other members will obtain a stretcher.

If the injured person is on a ledge, it may require rock work on the part of the rescuers to reach him. After the patient is strapped in the stretcher, ropes are attached to each side and each end, and the whole thing is belayed down. Two rescuers would be lowered at the same time to keep the stretcher level.

On a trail, carrying a stretcher is awkward, but not difficult.

"Because of the rugged terrain on this side of the Sandias, the council has more or less specialized in rock techniques required for evacuating injured persons," Hank added.

"Rescue work from helicopters isn't usually possible in the Sandias," Duane said, "because of the high altitude, steepness of the slopes, air turbulence, and lack of a level place to land."

Council members occasionally conduct a full-scale search and "rescue"; however, as a rule, searchers are called out five times more often than the number of rescues effected. The searcher operates in a self-sufficient manner: he goes out fully equipped to stay overnight, if necessary, and will often carry a sleeping bag in addition to extra food and clothing. Associate members of the council will remain at base camp to coordinate activities and help in other ways.

At the present time, the council's biggest problem is lack of portable equipment to aid in communications. "We really need four 'walkie-talkies' and one base station for best operation," George said.

"Another problem," he continued, "is that frequently prominent features in the Sandias are known by more than one name." Aerial photographs of the area have been taken and the members hope to make a mosaic from these for easier identification.

Whitewater Club Meets

Slides of trips and future plans will be featured at the Albuquerque Whitewater Club meeting Tuesday, Feb. 18, at 7:30 p.m. at the Albuquerque Federal Savings and Loan Bldg., Wyoming and Menaul NE.

Secretary Hugh Church (5414) said that plans for kayak instruction and safety instruction to be given at a local swimming pool will also be discussed. All persons interested in whitewater trips are invited to attend.

Sandia Assures Safety of Aerospace Nuclear Systems

Nuclear power sources ideally satisfy the requirements of satellites for continuous energy, light weight, stable operation, and long life. In addition to technical problems in developing and orbiting nuclear power supplies, there is still another important area to be considered — safety. This is where Sandia Corporation comes in.

The Atomic Energy Commission has assigned Sandia the responsibility of making an independent safety evaluation of proposed aerospace nuclear devices. The company's work in the nuclear aerospace program has been termed "an invaluable central role."

Two nuclear power generators — SNAP 9A devices—are currently powering orbiting satellites. The SNAP 9A (Systems for Nuclear Auxiliary Power) is an isotopic generator which uses the spontaneous decay of plutonium 238 to generate heat. An assembly of solid state thermoelectric elements converts the heat directly into electrical energy which powers instrumentation aboard the satellites. The generator weighs 27 lbs. and provides 25 watts of direct electrical energy. It is designed for an operating life of five years. However, both satellites carrying 9A generators are in orbits of at least 900 years. During this time, the radioactive fuel in the generators will undergo almost complete decay.

Prior to the launch of the 9A generators, Sandia Corporation's Aerospace Nuclear Safety Department 7410, under V. E. Blake, Jr., performed extensive tests and evaluation of the safety features of the device.

* * *

Frank K. Pittman, Director of the AEC's Division of Reactor Development, wrote the following letter to G. A. Fowler, Vice President, Development 7000:

"I wish to acknowledge the coordinating assistance and technical contributions of the Sandia Corporation toward the Commission's safety analysis and evaluation of the scheduled SNAP 9A aerospace launches. A massive amount of technical information has been accumulated in the last year through our coordinated interagency nuclear safety activities on SNAP 9A and other aerospace programs, and many lessons in safety analysis techniques, technical data available and required, and critical safety features of nuclear aerospace systems and missions have been learned.

"The Sandia Corporation has performed an invaluable central role in the safety research, test, and evaluation activities which led to the Commission's approval of these SNAP 9A launches."

* * *

The company has also made significant contributions to the evaluation of another type of nuclear space power supply—the SNAP 10A, a small nuclear reactor. This type of power supply is not presently incorporated into any orbiting satellite. Designed to provide 500 watts of electrical energy for a year, it is being developed by the AEC for use in space.

To more fully explore the safety aspects of the SNAP 10A, Sandia designed a reentry vehicle (called the RFD-1) and flew an inert mockup of the reactor on an 800-mile trajectory from NASA's Wallops Island station in Virginia to impact about 250 miles below Bermuda. The flight occurred last May.

The test provided experimental data to support theoretical analysis and laboratory studies of atmospheric reentry phenomena and demonstrated certain disassembly features designed into the reactor.

In addition, other important data was obtained from the test. A new type of meteorological rocket system for measuring atmospheric density above 200,000 ft. and winds above 300,000 ft. was used effectively in conjunction with the RFD-1.

* * *

Department 7410 is now preparing another flight test of a SNAP system.

The RFD-2 reentry system has undergone drop testing at Tonopah Test Range and in the Gulf of Mexico. The RFD-2 flight, scheduled later this year, will duplicate the flight pattern of the original RFD-1 but will test a different kind of nuclear power source, an isotopic generator similar to the SNAP 9A.

The reentry system is scheduled for extensive environmental testing in Sandia's Area III facilities.

Sandia's activities in the aerospace nuclear space program encompass four general areas, as defined by the original assignment from the AEC.

Division 7411

Aerospace Nuclear Safety Division I, 7411, under H. E. Hansen, is responsible for development and conduct of long-range aerospace safety research and development to establish techniques for assuring safe performance of nuclear systems. The Division is performing basic research and engineering to develop data for prediction of reentry conditions for a variety of aerospace systems.

Currently under investigation are the basic mechanisms involved in reentry burn up or destruction of materials. The emphasis is on nuclear fuels and closely associated encapsulation materials. The Division is performing studies of the convective heating of these materials, dynamic pressure forces in the high-velocity flow of air over the materials in environments simulating reentry conditions, and the chemical reactions encountered when materials enter the atmosphere at and above orbital speeds.

The objective of the studies is to understand the basic phenomena of the reentry process and reactions of materials in order to predict confidently the effects on any specific device.

Division 7411 is analyzing reentry conditions to obtain a better understanding of the processes involved in order to make recommendations for the safest combinations of materials to use. The work includes studies and experiments to verify burn up theory and material responses. Tests have been performed under contract using a hyper-thermal arc-powered wind tunnel in California to study radio-isotope materials, reactor materials, and encapsulation materials.

* * *

The Division is also interested in high altitude studies to determine the fate of particulate debris, resulting from reentry burn up. In this area, Aerospace Physics Division 5414 has contributed significant theoretical assistance. Contracts have been awarded for specific studies to describe dispersion of particles from several hundred thousand feet altitude to the surface.

Oak Ridge National Laboratories is contributing a compilation and evaluation of data on high temperature, thermal, physical, and chemical properties of materials directly associated with reentry burn up.

Other contractors are contributing studies of the high temperature properties of such materials as uranium-zirconium-hydride reactor fuel.

In the basic research area, Division 7411 is assisted by Materials and Process Departments I and II, 1110 and 1120. The Departments are contributing materials properties investigations such as the vacuum self-welding phenomena. This occurs in the vacuum of space. Different materials tend to "weld" or fuse together with resulting changes in electrical conduction and physical properties.

Division 5414 is performing high altitude studies of atmospheric dispersion and fallout hazards analysis, investigations of molten droplets of materials in a reentry simulated environment, oxidation kinetics studies, and investigations of hydrogen diffusion and effusion within and from solid hydride materials.

John Banister (5153) is assisting as a consultant on atmospheric dispersion and fallout studies.

Division 7412

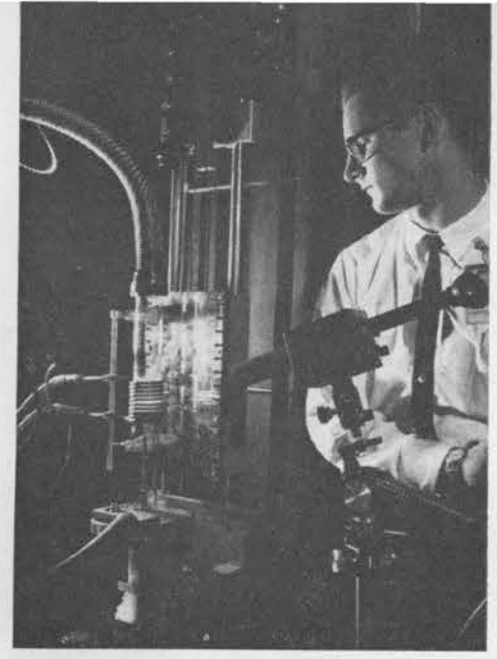
Division 7411 also works closely with Aerospace Nuclear Safety Division II, 7412, under A. J. Clark, Jr., in planning actual reentry flight tests to provide data in unknown areas of reentry phenomena and materials reactions. Also, the Division helps plan actual debris sampling at high altitude.

Both Divisions contribute to the complete systems analysis of proposed uses of SNAP devices. This activity uses mathematical techniques to provide quantitative data on the performance of the total system. Data produced provides a basis for evaluation and decision-making.

Division 7412 is responsible for development of a flight test program in conjunction with Division 7413 to demonstrate that safety aspects of SNAP devices will function as designed. The work includes design of flight tests, definition of nuclear power supply payload configuration, coordination with nuclear power supply designer, recommendations on types of vehicles and trajectories to be used, and methods of recovery.

Specifically, Division 7412 is responsible for the design and development of the reentry system. This includes the thermal, structural and aerodynamic design of the reentry vehicle, and the design of the recovery system. Development test schedules are prepared with the assistance of PERT charts.

Aero- & Thermodynamics Department 7420 provides assistance in the areas of aerodynamic analysis, wind tunnel testing, and parachute design. Auxiliaries Engineering Department 1540 provides support for structural analysis, dynamic analysis, and thermal analysis. The test and evaluation program is conducted by Environmental Testing 7300 and reliability studies are prepared by Reliability Department 1440.



RESEARCH ACTIVITIES of Aerospace Nuclear Safety Department 7410 include special studies of reactor materials at high temperature. Frank Wessling (7411) uses an induction heater and vacuum system to investigate material interactions with graphite. Temperatures reach 5400 degrees F.

The ultimate goal of this design and development program is to provide a complete reentry system capable of surviving the missile launch environment and the reentry environment. Ablation protection of the reentry vehicle is employed to withstand the extreme heating and burning during reentry.

The Division is also responsible for developing and conducting ground tests to determine the performance of aerospace nuclear systems during handling, launching, while operating in space, and during reentry and impact. This includes mechanical tests to simulate impact on land or during ground shipment, thermal and chemical tests to simulate conditions of intense fire or explosion during launch failure, and nuclear tests to determine the extent of danger of radiation resulting from the melting of a nuclear device or parts of such a device.

* * *

The Division is currently concentrating on the development of the RFD-2 reentry system and planning for the flight test next summer.

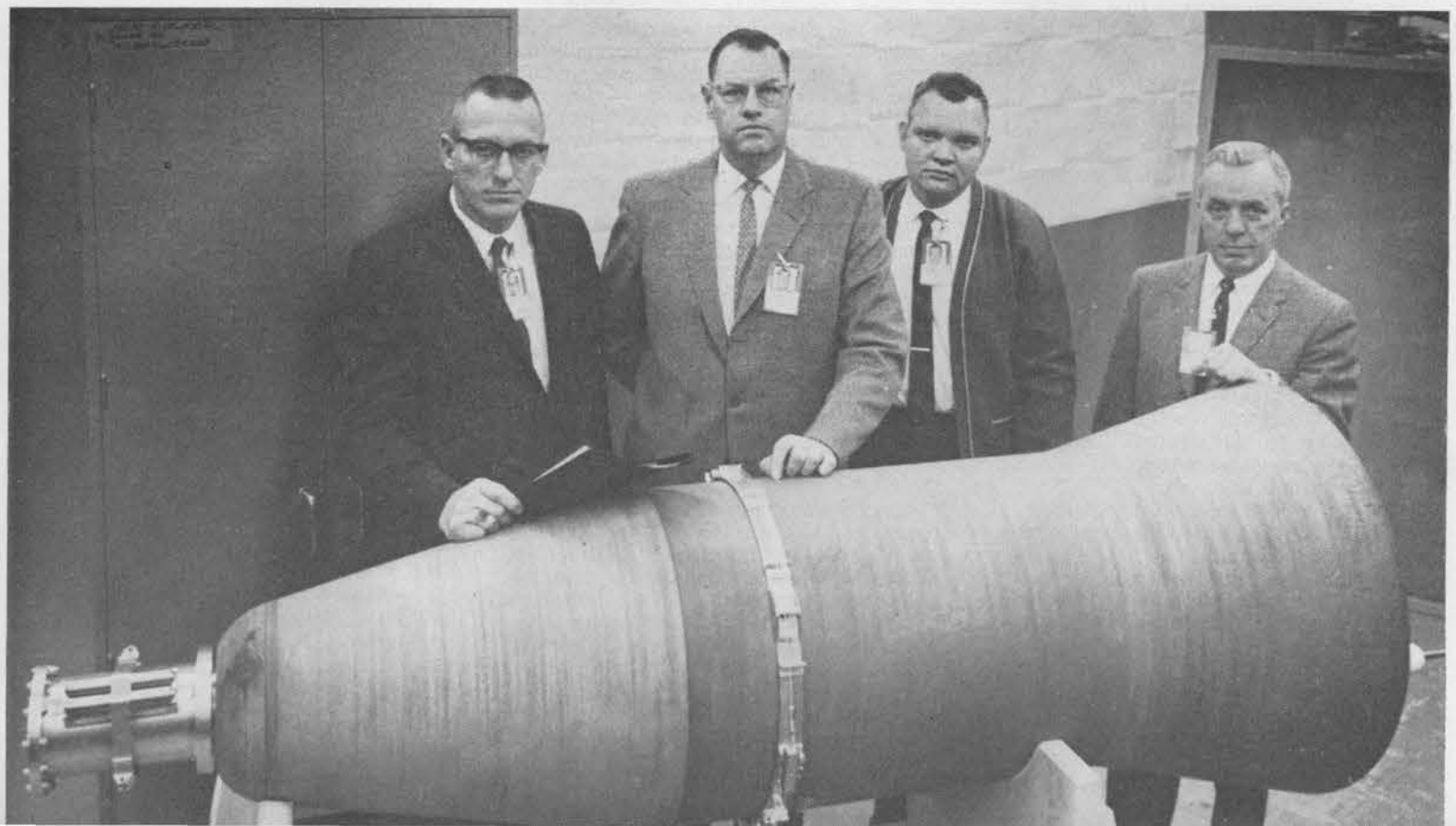
In addition, a major effort is going into analysis and simulation of "abort environment." This is a study of all phases of the events which might occur if a rocket carrying a nuclear power source should fail on the launch pad or during early trajectory.

The design problem in SNAP devices is to provide a configuration which will withstand abort and failure conditions during launch but break apart and burn up during reentry. Sandia must assure that these design features will work and make recommendations in areas of possible weakness.

Here again, the search is to establish a safety criteria. Enough ground tests must be performed to confirm analytic data to a confidence level which will permit prediction of results in specific areas.

A major portion of the ground tests are being performed in Area III using such Sandia facilities as the radiant heat facility, rocket sled track, centrifuge, and air guns. The plasma jet facilities operated by Aero- & Thermodynamics Department 7420 are also being used as well as other

(Continued on Page Four)



RFD-2 REENTRY VEHICLE, designed by Department 7410 to test safety aspects of a nuclear generator reentering the atmosphere, will fly next summer. First qualification unit, shown here, is now undergoing a series of design qualification tests. From left are A. E. Bentz (7413), A. J. Clark (7412), James Jacobs (7412-2), and W. H. Everhart (7413-1). Dummy generator, which should be consumed by heat of reentry, rides at front of vehicle. The unit is covered with shingle-wrap Fiberglas phenolic ablation material which provides thermal protection for telemetry and recovery system.

How Safe Is a Nuclear Reactor?

Nuclear power reactors are becoming a familiar sight on the American landscape. As they appear in more communities, public interest in their operation increases. Following is the first of three articles reporting on these reactors and the safety of their operation.

* * *

Fourteen civilian nuclear power reactors now have been built and placed in operation throughout the United States.

Operated in most cases by private or public utilities, the plants have an installed electrical generating capacity of more than one million kilowatts, or enough to meet the daily household power requirements of over one million American families.

Additional nuclear power plants now under construction and due for completion in 1964 and in 1965 will add nearly one million more kilowatts to the Nation's nuclear power capacity.

By 1970, the installed capacity of nuclear power plants in the U. S. is expected to rise to nearly five million electrical kilowatts for use by American homes, schools, churches, business and industries.

The total will rise to approximately 40 million kilowatts of capacity by 1980, and in the year 2000 half of all electrical power produced in the United States is expected to come from the atom.

Already civilian nuclear power is on the threshold of being economically competitive with that derived from the fossil fuels —coal, oil and gas — in high-cost fuel areas, declares Dr. Glenn T. Seaborg, Chairman of the Atomic Energy Commission.

"In fact," says Dr. Seaborg, "in these high-cost fuel areas of the United States, such as California and New England, utilities have already decided to proceed with the immediate construction of new, large nuclear power plants because they consider them to be economical."

There is no difference, of course, between electricity produced by nuclear power and that made by more conventional means, but as more and ever larger reactors are built or proposed for new sites across the country, anxious questions arise.

How Safe?

Are nuclear power reactors safe?

How safe?

How can we be sure?

Where public apprehension over such reactors exists, it is linked for the most part to memory of the destructive power of the atom in World War II.

"It is unfortunate that the potentialities of nuclear fission were first introduced to mankind in the form of a bomb," says Dr. Theos J. Thompson, director of the Massachusetts Institute of Technology nuclear reactor and a member of the AEC Advisory Committee on Reactor Safeguards.

"If gasoline had first been introduced in the form of jellied gasoline bombs spreading havoc and destruction in war, I am sure that the development of the automobile would have been delayed for many years.

"The talk would have been of exploding gasoline tanks at every corner, of children being burned to death, and of other disastrous fires as a result of using gasoline-powered cars.

"So it is natural, perhaps, that there are such fears regarding the peaceful applications of nuclear power."

Reactors vs. Bombs

One of the first things many people ask when they think about civilian power reactors is whether they can explode as does an atomic bomb when set off as a weapon.

The truth is that they cannot.

There are two reasons for this.

The first concerns the kind of nuclear material used in an atomic bomb versus that used in civilian power reactors.

The second concerns the interior design and mechanism of a bomb as compared to the interior of a power reactor.

In an atomic bomb, the nuclear material is almost pure, highly-fissionable material.

In a civilian power reactor, the nuclear fuel is always in the form of a chemical compound or alloy that is totally unsuitable for use in a bomb.

In a bomb, the interior mechanism is designed so that the highly-fissionable material can be brought instantly together and compressed into a very dense mass when the bomb is triggered. These two factors produce a fantastically rapid nuclear chain reaction by which the bomb's tremendous explosive force is generated.

In a nuclear power reactor, exactly opposite conditions are required.

The fuel used and the design needed for power production are such that it is impossible to concentrate and hold in place the highly-fissionable material in the reactor core so that a bomb-like explosion can take place.

One comparison which may be made to illustrate the latter point is that between loose and tightly-packed gunpowder. Every hunter knows that if he takes the powder from a gun shell and sprinkles it loosely over the ground, the powder will simply burn when ignited. On the other hand, when tightly compressed in a shell and restrained in a gun barrel, the concentrated powder develops a highly-explosive force upon being ignited.

Actually, the creation of a bomb is a difficult task carried out in a completely different way and by different methods than those used in nuclear reactors.

Reactor Physics

To find what hazards are associated with power reactors a brief explanation of some reactor physics is necessary. Fortunately, the basic principles involved are not difficult for a layman to understand.

An atomic reactor is an atomic furnace in which the heat generated by the splitting, or fissioning, of the nuclei, or centers, of the atoms of uranium or other nuclear fuel is controlled and harnessed so it can be made to do useful work.

In the reaction process, sub-atomic particles called neutrons split the fuel nuclei, producing large amounts of heat and more neutrons with which to split other nuclei, etc., in the now-classic nuclear chain reaction pattern.

But the reaction process also produces something else.

These are the fragments which result from the splitting of the nuclei of the atomic fuel.

Most of these fragments are radioactive. They are known as fission products and may be thought of as the "ashes" of the nuclear fission process.

The radioactive fission products include a variety of substances which continue, for varying lengths of time, to emit beta and gamma rays.

Uncontrolled, these rays can be harmful to people.

Thus, the first and most important aspect of reactor safety is to see to it that these radioactive fission products do not escape into the environment under conditions that could be hazardous to the health and safety of the public.

Designing Reactor Safety

Reactor safety begins with careful attention to the design of the reactor itself, its control system and all other component parts to make as sure as possible that no accident which could result in the release of fission products is likely to occur.

Take the case of control rods as an example. Civilian reactors are normally operated by control rods, which contain substances that absorb neutrons — the subatomic particles used to split the nuclei of fuel atoms so as to produce energy.

When control rods are inserted into the reactor, the reactor is shut down, or "scrammed." Conversely, when the rods are withdrawn, the neutrons are allowed to become active again and the chain reaction is started up. The rods also are used to raise or lower the power level of the reactor.

Reactor Shut-Down

One major approach followed in accident-prevention design is to insure — through the control rod drive mechanism's response to reactor scram signals — that the reactor can be shut down without fail when need arises.

The drive mechanism is designed so that the control rods are inserted automatically when signals indicate something might go wrong. One set of signals, for instance, would scram the reactor at any indication that a predetermined power level was being exceeded. Other signals would set off scrams if the power level should rise too rapidly or if excess reactor temperature or pressure were indicated.

Power reactors, incidentally, often are provided with auxiliary methods of shutdown. Back-up systems also are provided for other important reactor components.

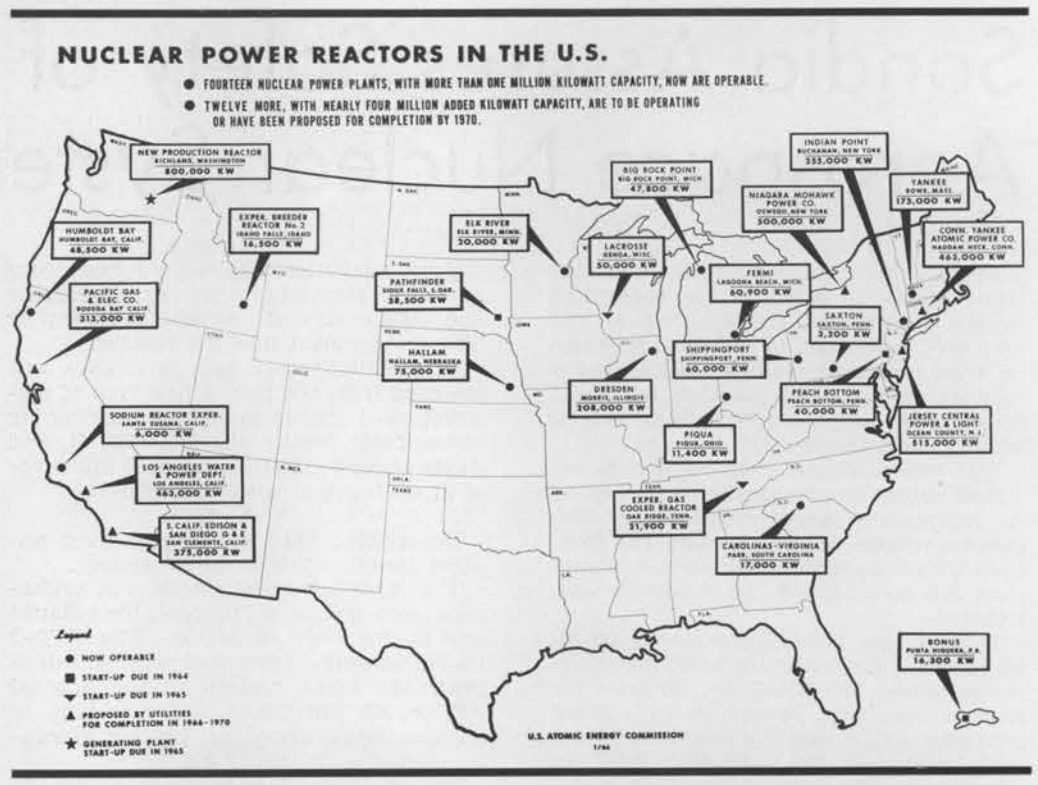
One instrument alone, for example, is never depended upon to monitor the reactor power level. Generally, three or more independent instruments are employed for this purpose. Any one of them could shut the reactor down if pre-set power levels were exceeded. Other systems, such as the cooling system or instrument air supply system and valves in the containment closure system, similarly are backed up by auxiliary, automatically-activated systems which can take over if the primary system should fail to work.

Another practice of conservative and careful reactor design is to employ safety margins well above bare minimum safety margins so as to further reduce the possibility of accidents. Designs of the reactor pressure vessel, certain control rod components and important electric circuitry are examples where this practice is followed.

Finally, great care is taken in the choice of reactor materials. These must be selected to withstand high temperatures and pressures, high radiation effects and severe corrosive actions. They must also be free of constituents which would interfere with the nuclear reaction.

* * *

The next article on nuclear power reactor safety discusses the normal operation of these reactors and the radioactive fission products whose release must be guarded against. The article reports on the controlling of these fission products and checking on reactor safety.



Patent Granted to G. J. Simmons for Teaching Machine

A patent on an electronic, self-grading, cheatproof, teaching machine was recently granted G. J. Simmons (9101) and Henry Schutzberger (former 7242 division supervisor).

The machine was invented when Mr. Simmons was chief engineer and Mr. Schutzberger was director of research for Fairbanks-Morse Research Division, formerly located in Albuquerque.

Utilizing an 8mm spool of film, the machine grades and advances the film only after the student has selected the correct "answer" from one of four responses offered. The student knows immediately if his answer is "right" or "wrong" and progresses through the course at his own speed. The machine seems to have the fascination of a pin ball machine; the youngsters are reluctant to quit.

"We worked with Ben Wyckoff, an educational psychologist at the University of Pennsylvania who specializes in programmed instruction," Mr. Simmons said. "He insisted on punitive circuits — the cheatproof feature. Experiments have shown that in the beginning the students are busy learning how to operate the machine. However, once they have become familiar with the mechanism, they'll try to cheat by holding down more than one key or quickly tapping a key. When this happens, the projection light is switched off and a loud buzzer sounds. Everyone in the room knows the student is trying to cheat."

This is one of the few patents issued to date on complete teaching machines.

(Continued from Page Three)

Aerospace Nuclear Safety

plasma jet facilities contracted from other agencies. Weapon Systems Development Department III, 1550, is contributing thermal and dynamic studies, and structural analysis.

Photometrics Division 7226 is providing support in the area of data film in support of Area III activities and missile ground abort studies, while Motion Picture Division 3465 is providing documentary film. Technical Information Department 3420 is providing support in report preparation and publication.

Division 7413

Conducting aerospace nuclear flight tests and providing associated telemetry and electrical systems are the responsibilities of Aerospace Nuclear Safety Division III, 7413, under A. E. Bentz. Division 7413 also shares in ground test responsibilities. Personnel of the Division recently conducted drop tests of the RFD-2 vehicle at Tonopah Test Range and helicopter drops of the vehicle into the ocean near Eglin AFB in Florida.

Mr. Bentz serves as Mission Director during flight tests and coordinates range activities. The Division provides close liaison with the designers and manufacturers of aerospace nuclear systems and all involved government agencies.

The work includes procurement of payload components, specification of instrumentation and data requirements and analysis of test data. Range Optics Division 7224, under cognizance of 7413, is providing optical instrumentation for forthcoming flight tests for installation on the Crown Colony of Bermuda. Optical instrumentation for the RFD-1 flight contributed important data to the experiment and helped establish burn up rate of the dummy fuel rods carried on the reentry vehicle. Optical instrumentation will contribute significantly to the results of fuel element ablation and disassembly of the generator on RFD-2.

Division 1424 designs all telemetry and radar antennae used on the reentry vehicle and supporting aircraft.

"All of this effort," Mr. Blake says, "demonstrates the AEC's primary concern with the safety of people. Our job is to determine the hazards involved, evaluate precautions provided, and provide an assessment for the AEC of the safety of the particular nuclear power source."

Sandia Concludes Tests At Barking Sands Range In Hawaiian Islands

A number of Sandia rocket-borne experiments to study upper atmosphere winds were successfully completed last week at Barking Sands Launch Site in the Hawaiian Islands. A new method of injecting a glowing cloud into the night sky proved successful. Produced by trimethylaluminum, the cloud, a pale white glow, was visible from all the Islands for a period up to one hour and 10 minutes.

A total of eight rockets was fired to altitudes between 300,000 and 500,000 ft. Three of the rockets carried canisters of the trimethylaluminum while one injected a sodium cloud into the upper atmosphere. Four of the rockets ejected aluminum chaff for radar tracking.

The experiments were part of the upper atmosphere research program of Aerospace Physics Division 5414. Lawrence B. Smith is the scientific director.

Photographic data of the experiments were gathered by cameras at three locations in the Islands.

Rocket Projects Division 7431 under J. J. Miller, operates the Barking Sands Range. Alfred A. Young and Lester F. Luehring were project engineers for the launches. E. Randall Parsons was in charge of rocket assembly and Dale Fastle (7244) was responsible for operation of the camera stations.

AEC Seeks Bids for Construction of Buildings At Tonopah Test Range

The Atomic Energy Commission has called for construction of several metal buildings at Tonopah Test Range. Two buildings, 40'x60', will house an electronics and camera repair facility and a warehouse. An HE disassembly area, 20'x40', and two guardhouses, 10'x14' and 20'x 28', will also be constructed.

The project calls for concrete slabs, installing partitions, installing 16-ton and 5-ton hoists and monorails, and heating, cooling, electrical, and plumbing facilities.

The project, set aside for small business firms, will be completed within 180 days after the successful bidder is notified to proceed by the AEC.

Invitations to bid will be issued about Feb. 20. Bids will be opened about Mar. 18.

Plant Engineering Department project engineer is R. G. Piper (4543-3).

ICY FINGERS reminded Sandia employees of better things ahead, for if Winter comes can Spring be trailing very far behind?

ASM to Give Course 'Elements of Metallurgy' At U. of New Mexico

J. R. Holland (5135) will instruct a course, "Elements of Metallurgy," developed by the Metals Engineering Institute of the American Society for Metals. The course, sponsored by the Albuquerque Chapter of ASM, will begin Thursday, Feb. 27, at 7 p.m. in Rm. 107 of Mitchell Hall, University of New Mexico.

The course will provide the engineer and metal worker with a broad understanding of the principles of metallurgy. The student will start with atoms and molecules, simple chemistry, and physics, then progress into heat treating of metals and alloys, forming processes, mechanical testing and the behavior of materials.

A 15-week course, Elements of Metallurgy, will use a text developed by the Metals Engineering Institute. An MEI certificate will be awarded for successful completion.

Fee for the course will be $50 for ASM members, $55 for non-members.

For additional information or to register, contact F. R. Sweet (1551), ext. 264-1959.

Women's Bowling Tourney Restricted to Coronado Club Members Sanctioned by WIBC

Annual Coronado Club Women's Bowling Tournament is scheduled Mar. 7-8 and possibly will continue on Mar. 14-15 depending on the number of entries. Deadline for entering the tourney is Feb. 29. Entry forms are available at the Coronado Club Bowling desk. Fee is $2.75 for singles or doubles.

Contestants in the handicap tournament must be Coronado Club members and sanctioned members of the W.I.B.C.

Additional information is available from Louise Di Santi (2625-2), tel. 264-3851, or Barbara Vandenberg (7334-3), tel. 264-8168.

Welcome Newcomers

Jan. 27-Feb. 7

Albuquerque	
Ava I. Bowden	3126
*Thurlow W. H. Caffey	7212
Kenneth F. Dykeman	4574
Loren B. Furrow	4574
Jon N. Glanzer	3413
Eugene R. Gutchman	2341
*Paul R. Hasley	4411
*Betty J. Langell	4211
Tony I. Lucero	4574
Gladys E. Lydic	3126
Linda McDonnell	4613
Fernando A. Nizzi	4574
*Stanley B. Roeske	5151
Mabel D. Sanchez	3126
*Lois J. Swearingen	3126
Jose E. Vigil	4574
Arizona	
Oscar L. George, Jr., Phoenix	7422
Colorado	
Darrell A. McNabb, Englewood	2631
Illinois	
R. Eugene Gardner, Urbana	7424
Iowa	
Dick G. Bleyenberg, Sioux Center	2121
New Mexico	
*Ronald L. Flury, Las Cruces	1542
T. Franklin Ezell, Las Cruces	5133
Oklahoma	
Larry N. Garrison, Moore	4121
Texas	
Duane E. Lee, Bryan	7224
Returned from Leave (Dec. 16-Feb. 7)	
Betty J. Brumfield	7612
W. Winn Erdman, Jr.	4413
Mary M. Griego	3153
Emilia Perea	3126
Kenneth W. Arasim	1314
Arminta L. Robinson	3126
Joseph E. Brown	4233
Frederick O. Carleton	3133
A. Darlene Kraft	2130
Deyoe T. Stark	3126

* Denotes rehired

Retiring

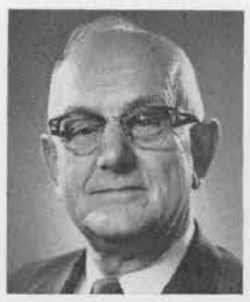
Ralph B. Larsen, a machine shop layout operator in Project Section 4253-3, will retire the end of February after 15 years at Sandia.

Mr. Larsen came to Sandia from Los Alamos where he worked from 1943-45.

Mr. and Mrs. Larsen make their home at 4009 Smith SE along with their oldest daughter and their son. Both of the children are doing graduate study at the University of New Mexico. Another daughter is married and lives in Milwaukee.

With retirement, Mr. Larsen plans to spend more time on his hobby of pistol shooting. He has competed in pistol matches since 1935, and, at different times, has been state champion in Colorado, Illinois, Arizona, and New Mexico. Mr. Larsen also enjoys clay-pigeon shooting and fishing.

* * *



Stan M. Krell, supervisor of Employee Processing and Reports Section 3153-2, will retire the end of February after 12 years with Sandia in personnel statistics work.

His immediate plans are to "fix the yard and the house." Mr. Krell has a workshop and he enjoys building things. He did most of the work when a den was added to the back of his house. Mr. and Mrs. Krell live at 812 Jefferson NE.

Travel will continue to be a part of their normal life. "We have always traveled to visit our children, now we'll take more time to see the things we have driven by," he said.

Their daughter and her husband, both former Sandia employees, live in Seattle. Their son lives in Sunnyvale, Calif. "He retired last year from the Navy," Mr. Krell pointed out. "He beat me to it!"

VISIT SANDIA LABORATORY — Members of the Strategic Studies Branch, Special Studies Group, Office of the Chairman, Joint Chiefs of Staff visited Sandia last week for technical briefings. From left are P. W. Ager, Assistant Manager, AEC Albuquerque Operations Office; and Lt. Col. D. B. Freed, Field Command, Defense Atomic Support Agency; and the visitors — Capt. Harold S. Bottomley, Col. Raymond J. Hart, Col. Augustine C. Trapold, III, Capt. Samuel C. Walls, Lt. Col. Howard D. Elliott, and Col. Roy N. Casbeer — and S. P. Schwartz, Sandia Corporation President.

Harry Blechinger Heads Volleyball Association

Harry J. Blechinger (7323) heads the 1964 Sandia Laboratory Employees' Volleyball Association. He was elected last week with John L. Robertson (3111), vice president.

Nineteen teams have been formed by the Association within Sandia general organizations. League play will begin Feb. 25.

Games will be played on Tuesday and Thursday evenings beginning at 5:30 at the Sandia Base gymnasium.

SANDIA EXHIBIT at a recent Bell System program sponsored by the Pacific Telephone and Telegraph Company for retired telephone employees is explained by Bob Harks (8234) to Mr. and Mrs. A. H. Leigh of San Rafael. Sandia was among many Bell System organizations invited to present displays. The two-day program was held at the Masonic Auditorium in San Francisco, and at Goodman Hall, Oakland, Calif.

Sandia Corporation's Two Laboratories Win Fire Prevention Prizes

FIRE PREVENTION HONORS — Sandia Laboratory's year-around fire prevention program was judged eleventh out of a field of 183 industrial entries in the annual contest sponsored by the National Fire Protection Association. Judging was on the basis of a scrapbook and entry form prepared by Inspection Section 4542-1, assisted by Technical Arts Division 3463 and Industrial Photographics Division 3465. T. A. Rosenwald (4542-1), right, scrapbook coordinator, checks the entry with J. B. Walston of Technical Art Division, scrapbook designer.

FIRE PREVENTION SCRAPBOOK at Livermore Laboratory is reviewed by technical illustrator Wally Arevalo (8233-2), who designed the layout, and Vern McNabney (8242-1), coordinator of the publication. The book helped Livermore Laboratory take 12th place in the Industrial Division in the 1963 National Fire Prevention Contest. A total of 183 North American organizations competed in the industrial category. Text for the publication was prepared by technical editor Coralyn McGregor (8233-1).

Women's Golf Tourney Play Starts April 21

League play for the Sandia Laboratory Women's Golf Association will begin Apr. 21. Teams will play the Los Altos Short Nine Course on Tuesday evenings. Play on the Long Nine course will start Apr. 18 and continue every other Saturday for the season.

Membership applications are now being accepted. Forms are available from Benefits and Services Division 3122, Bldg. 610. A membership fee of $1 is charged.

Women employees of Sandia Laboratory and SAO/AEC are eligible to join the Association.

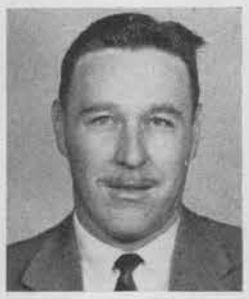
One Dollar Hot Lunch Popular at Coronado Club

Started last fall to augment the regular Coronado Club cafeteria and sandwich service, the "One Dollar Hot Lunch" line is proving one of the more popular features of noon hours at the Club.

With entrees ranging from Swedish meatballs to veal cutlets, the line regularly features a selection of main dishes, a variety of vegetables, rolls, coffee, tea, and desserts.

As the sign says, "All You Can Eat For $1," is the policy. It's the best buy around, Club patrons agree.

Supervisory Appointments

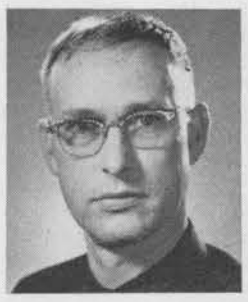


JACK J. MARRON to supervisor of Component Development Division 1314, Special Devices Department.

Jack has been at Sandia since September 1952 and has been a section supervisor for eight and a half years. His first three years at Sandia were in electrical system design work, then followed a year in electrical system and component development. Since 1956 Jack has worked in the field of advanced component development, in particular, special ferroelectric and ferromagnetic transducers.

He has a BS degree in electrical engineering from the University of California at Berkeley, and is a member of Sigma Xi and other honorary societies.

During four years in the Navy, Jack worked on electronic and radar systems.



GEORGE P. STECK to supervisor of Statistical Research Division 5425, Mathematical Research Department.

George has been at Sandia since May 1955 and has done statistical research work the entire time except for 18 months when he was assigned to the Quality Assurance organization.

Prior to coming here, he was a graduate student at the University of California in Berkeley, where he received his PhD in statistics. He also has an MS in physics from California Institute of Technology, and a BA in general curriculum from the University of California.

George taught math and physics for a year and a half at the University of California campus at Davis, Calif.

He served four years in the Navy (ROTC).

George is a member of Phi Beta Kappa and Sigma Xi, honorary societies, and the Institute of Mathematical Statistics, American Mathematical Society, American Statistical Association, and Society for Industrial and Applied Mathematics. He was a visiting lecturer at the University of New Mexico during 1958-59, and participates in the New Mexico Academy of Science's visiting scientist program.

Sandia Speakers

Following is a list of speakers, titles, and places of presentation for recent talks by members of Sandia Corporation.

D. H. Killpatrick (5132), "High Pressure Synthesis of a New Superconducting beta-wolfram Compound, Nb_3Bi," American Institute of Mechanical Engineers Symposium on Physical Metallurgy of Superconductors, Feb. 18, New York City.

C. J. McGarr (4600), "Management Science in an Inventories Control System," National Industrial Property Management Association, Feb. 6, Los Angeles, Calif.

J. W. Easley (5300), "The Effects of Radiation on Electronic Circuits and Components," San Diego Chapter of the American Nuclear Society, Jan. 15, San Diego, Calif.

E. H. Beckner (5153), "Interaction of a Plasma Stream with an Inhomogeneous Magnetic Field," Southwestern Meeting of the American Physical Society, Feb. 27-29, Tucson, Ariz.

K. H. Jones (5323), "Inter- and Intra-Molecular Energy Transfer in Gamma-Ray-Irradiated Alkylbenzens and Related Mixtures," Chemistry Seminar, University of New Mexico, Feb. 7, Albuquerque. Co-authors of the paper are L. P. Theard and William Van Dusen (5323).

L. S. Nelson (5414), "Flash Heating—New Freedoms in High Temperature Chemistry," Department of Chemistry Seminar, University of California, Feb. 17, San Diego, Calif.

Max McWhirter (7325), "Mechanical Shock Testing," Colorado Chapter of the Institute of Environmental Sciences, Jan. 23, Denver, Colo.

G. L. Eggert (1124), "The Influence of Neutron Irradiation on the Dimensional Stability of Steel," 1964 ASM Golden Gate Metals Conference, Feb. 13-15, San Francisco, Calif.

D. E. Fossum (2412-2), "Standardization of Precision Coaxial Connectors," PTGMTT/PTGAP of the IEEE, Feb. 17, Albuquerque.

J. R. Garcia (3133), "Understanding Individual Needs," Albuquerque Council of Hospital Administrators, Jan. 21.

W. F. Carstens, (3410), "Preparing Technical Papers for the Junior Academy of Science," Valley High School Science and Engineering Club, Jan. 28.

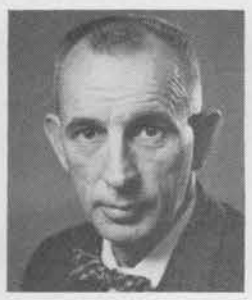
R. H. Schultz (7320), "Environmental Testing," New Mexico Business and Manufacturing Association, Feb. 11, Albuquerque. Also showed "Environmental Testing" film.

R. E. Tate (7424-2), "Careers in Aeronautical Engineering," Valley High School Feb. 13.

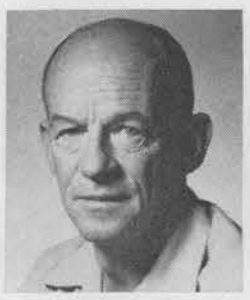
Service Awards

15 Year Pins

James A. Williams
2444
Feb. 4, 1949



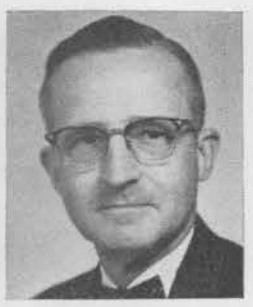
R. C. A. Sadler
1431
Feb. 16, 1949



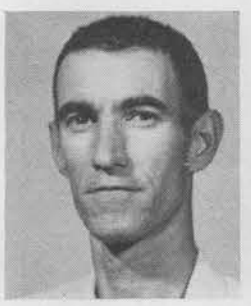
Earl V. Shannon
7434
Feb. 16, 1949

Leroy W. Paulson
7244
Feb. 18, 1949

Leslie L. Cole
4231
Feb. 21, 1949



J. C. Moody
2411
Feb. 23, 1949



Wayne C. McCrory
3211
Feb. 24, 1949

Alfred T. Aldrich
7418
Feb. 25, 1949

Reporters Hear Lab News Editor Describe Objectives of This Paper

Four major objectives of the **Sandia Lab News** were described by its editor, Robert S. Gillespie (3142), at the annual volunteer reporters' meeting held recently at Livermore Laboratory.

Editor Gillespie told the 26 reporters at the meeting that keeping **Lab News** articles "informative" helps fulfill the purpose of "stimulating employees' interest in their work."

In accomplishing this objective, he said, the **Lab News** publishes articles to inform readers of the work of individuals and organizations, and to give recognition for jobs well done.

The **Lab News** also strives to develop in each employee "a feeling that he is an important part of the company," said the editor. To accomplish this objective, an effort is made to publish articles showing how the work of an individual fits into the bigger picture, and to stress the importance of teamwork in carrying out assignments.

A third objective is to keep employees aware of company objectives, plans, policies, and practices. This is done, he pointed out, by explaining the future plans of the company, clarifying the meaning of certain operating procedures, and reminding employees of the responsibility given to Sandia by the AEC.

The fourth objective is to "maintain employee awareness of factors outside the company which affect their lives." Articles describing personal activities, local current events, and civic and business activities fall within this category, according to the editor.

ANS Distributes Proceedings of Nuclear Symposium

Distribution was made this month of 1300 copies of the Proceedings of the National Topical Meeting on Aerospace Nuclear Safety, SC-DR-3553, according to Dee Ellett (1541), chairman of the Trinity Section of the American Nuclear Society.

The 366-page Proceedings were distributed to interested persons throughout the Atomic Energy Commission and other government agencies and to the 450 delegates who attended the symposium here last October.

Editing and publication of the book were performed by Technical Information Division 3423. R. E. Dunlap of the Division was technical editor, and Julia M. Polito was compositor for the publication.

"Not only was there a significant contribution to the dissemination of knowledge on this important subject," Mr. Ellett reported, "but also the meeting, through attendance fees, was a financial success. The net profit of about $3000 will be used to establish a scholarship and awards fund. In addition, the Trinity Section will establish a $300 fund to be awarded at the discretion of the Section to participants in the New Mexico Science Fair next year."

DISTRIBUTION was made this month of the 366-page Proceedings of the National Topical Meeting on Aerospace Nuclear Safety. From left are Julia Polito (3423), compositor; Dee Ellett (1541), chairman of the Trinity Section of the American Nuclear Society; and Bob Dunlap (3423), technical editor of the publication. The meeting, held here last October, was co-sponsored by Sandia Corporation and other government agencies.

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6. **No commercial ads, please**
7. **Include name and organization**

FOR SALE

GOLF CLUBS, three woods (Wilson Stratabloc), eight irons (Wilson Middlecoff), putter, and golf bag, $125. Golf shoes, 7½C, $7.50. McKelvey, 256-9787.

'58 TAUNUS station wagon 17M deluxe, new brakes, battery, automatic clutch, Blaupunt radio, seat belts, seat covers, 6000 since major overhaul. Hamilton, 268-9787.

PAINT CANS, 5 gal. size, ideal for planting large srubs, 3 for $1. Hill, CH 3-3493.

LIONEL ELECTRIC train with figure eight track, transformer, engine, four cars including one novelty car, $13. Smith, 299-6873.

'50 DODGE ½-ton pickup; 8'x7' Berry all steel garage door w/hardware; male Boston terrier puppies; 4-speed transmission for '49-'54 Chev. Naumann, 298-6476.

3 BDR ROBERSON, 1¾ bath AC, built-in range and oven, landscaped, carpeted, draped. Sitts, 298-5246 after 5:30 p.m.

ALL STATE motorcycle, 10 hp, old but clean, $200. 1953 Studebaker, classic 2-dr. coupe, $325. Chandler, 298-5069.

TOBOGGAN, six ft., Lund. Car bed. Brooks, 299-1884.

2 BDR HOME, SE Heights, built-in range-oven, hardwood floors, carpeting, near schools, shopping, bases. Mann, 1300 Hermosa Dr. SE, AL 5-8049 evenings.

DINETTE SET, chrome, table and four chairs, $20. Howell, 298-4001.

EXERCYCLE, manually operated. Kostka, 268-8793.

SKI BOOTS, Garmisch, double construction, size 10½, $12. Taylor, 256-3774.

AUTOMATIC WASHER, Maytag, $25; 6'x 6'8" sliding glass door with screen, $20. Nunez, 256-3492.

17" TV, portable Zenith, new set guarantee, $69.50. Kutzley, 255-3572.

'63 VOLKSWAGEN Microbus, R&H, other extras. 7000 miles. Sisler, 299-0963.

STEREO TAPE recorder, Concord, 880, 1 year old, $260. Harris, AX 9-6664.

2 METER RIG, S-20R Rcvr w/LW-61 converter; panel mtd 522 w/3 xtls, in cabinet; P.S. good for 500v/200ma, $65. Cundy, 255-0381.

BOAT TRAILER for 14 ft. boat, home made. Cook, AX 9-7509.

UPRIGHT PIANO, $200 or will trade for equivalent value in tape recording equipment. Breitenbach, 268-7900.

BED-DIVAN and matching chair, Koehler, suitable for den, very sturdy, rose color, Heathkit receiver, 4-band, AR-1. Tilley, 299-0762.

AMPEX Model 960 stereo tape recorder with carrying case, manual, and patch cords. Milloy, 299-9112.

'52 STUDEBAKER V-8, OD, 47,000 miles, new front end, brakes (shoes and fittings), original paint, tinted glass, R&H, '64 license plates, $310. Gallo, 255-9129.

3 BDR MOSSMAN, 1¾ baths, all electric kitchen, sprinklers, screened patio, central heat, cooler, carpet, drapes, FHA appraised, $18,250. Meyer, 256-0042.

OR TRADE, body for hot rod; Hawaiian steel electric guitar. Make offer. Pritchard, 268-9618.

TARGET PISTOL, Ruger Mark I, with new black leather holster, $37. Smailer, 299-8413.

24" TV, Motorola, table model, $20; Kelvinator automatic washer, needs hoses, $30. Chavez, 298-0674.

'59 TRIUMPH TR-3, conv. roadster, Sebring white, ww/tires, OD, new rear windows/side curtain windows, $1000. Kobs, 255-6828.

'62 MONZA 4-speed sports coupe w/bucket seats, white w/red upholstery, $1680. Westman, AL 5-6048.

BEDROOM SET, 3 piece, $50; box springs and mattress not included; divan-bed, beige tones, $60. Kochmann, 299-5133.

'62 VOLKSWAGEN Calthorpe camper, 53hp engine, rear heater, sway bars, sleeps 2 adults and 6 children. Roller, 299-4661 after 5 p.m.

REFRIGERATOR, Philco two-door with separate freezer compartment, 10 cubic ft. refrigerator space. Kimball, 299-2015.

SEARS LARGE jig saw with motor and table, $47.50; Ward's $39.95 heavy duty saber saw, now $28.50. Morgan, 299-2850.

GIRL'S SKIRTS, blouses, knit shirts, pullover and button-down sweaters, size 8 and 10. Boy's two-piece suits, size 3. Caudell, AX 9-0646.

PUREBRED GERMAN shepherd pups, six weeks old, AKC registered. Boling, 282-3256.

KENMORE ELECTRIC range w/pushbutton controls, full width oven, rotisserie, $45; Silvertone 21" TV, blond oak cabinet, $25. Schiess, AL 5-3252.

KING SIZE Casco automatic electric thermal massager; registered female pitbull pup, 10 weeks old. Sanchez, 268-5321.

3 BDR, den, utility room, double garage, electric kitchen, w/w carpeting, drapes, AC, $2200 GI loan or refinance. Trybull, 298-3325.

DINING ROOM set, mahogany, Duncan Phyfe drop-leaf table w/2 leaves, 4 chairs, $35. Ellingson, 299-4056.

MANKIN 3 BDR house, w/w carpeting, drapes, landscaped, walled yard, near Princess Jeanne, refinance or cash to 4½% GI, $12,450. Hogue, 299-1807.

HAND CROCHETED bedspread, double bed size, lucky star design, reasonable. Hayes, 855-9425.

BOY'S BICYCLE, 24", Schwinn, coaster brakes, green, thorn-resistent tubes, $20. Pardee, AL 5-1998.

CIVIL WAR sword, $18; large handmade bear trap, $45; German Luger, $65; want flintlock pistol. Smitha, 299-1096.

MOBILE HOME, 8'x35', 1 bedroom with new Westinghouse refrigerator, davenport, tub/shower, reasonable. Newton, 265-1042.

'51 CHEVROLET, 4-dr., standard transmission, R&H, original owner. Miner, AX 9-2020.

COLUMBIA UNIVERSITY rapid reading and improved retention study program, portfolios and aids, complete, $35. Reimer, 256-2522 evenings.

21" TV, $35; kitchen range, 42", $35; one pair disc brakes, $40. Villella, 299-6261 before 7 a.m. or late.

NEXT

DEADLINE

FOR SHOPPING CENTER ADS

Thursday Noon, Feb. 20

'62 FORD Galaxie 500 convertible, PS, PB, new tires, 19,000 miles. Klein, 299-9037.

'59 MERCEDES-BENZ, model 190-D. Hassebroek, see on Sat. or Sun. mornings at 1117 Tijeras Ave. NE.

CARCOAT, girl's 14, navy blue, $4; new chrome blender, $20; hair clippers, case cracked, $2; blond oak step table, $6. Mitcham, 299-8425.

10 kw GENERATOR 120/240 volt, single phase powered by jeep engine, $250. Ault, 282-3280.

RING, ½ carat, $150, 21" TV, $35. Sullivan, 298-0148.

3 BDR, den, 1¾ baths, lots of closets and storage, fireplace, carpet, carport, sprinklers, near Winrock, schools, buses. Welsh, 299-3555 evenings.

WATER SOFTENER, 120,000 grain unit, cost over $600, sell for $100. Boy's wool suit, size 14 or 16, $15. Bowen, 255-8195.

GAS HEATERS, various types; new electric chain saw, 1¾ hp, $59. Meagher, CH 2-7048.

STEREO AMPLIFIER, Realistic Mod. 40A, 40 watt, $45; record changer, Garrard RC88MKII w/Shure cartridge and extra plug-in head, $60. Rutledge, 344-2071.

'58 CHEVROLET station wagon, $595; 1959 Ford 4-dr., $695. Beall, 298-4969.

'61 WESTINGHOUSE refrigerator, 18 cu. ft., 2-dr., 500 lb. top freezer, $125; 1961 Westinghouse 30" electric range, auto. oven. Jarvis, AX 8-1113 after 6 p.m. and weekends.

HI-FI AM/FM tuner by Approved Electronics, cost $65, sell for $30. Vivian, 299-1785.

AQUARIUM, 5 gal. w/aerator, light, table stand, some underwater decorations, a few fish, $15. Reed, AX 9-7425.

TRAILER HITCH for compact cars (Falcon, Tempest, etc.), $10; Super Monroe level loader shock absorbers, $25. Gise, 264-3585.

'53 CHEVROLET, 6-cyl., stick shift, $225. Davis, AX 8-6944.

'63 B.S.A. 650 c.c. motorcycle, must sell, low mileage, less than half original sale price. Wilhelmi, 298-5610.

'51 CHEV., needs work, $50. Hendrix, 299-8872.

SOFA BED, Early American, wing back, brown tweed, $60. Lambert, 344-9012.

REGISTERED APPALOOSA brood mare in foal to foundation stud, $375; Appaloosa horse colt, $400, 2-horse trailer, $250. Harker, 282-3435.

'58 FORD WAGON, white, 4-dr., automatic transmission, Thunderbird engine, $450. Gravning, 2044 Moon NE, AX 9-0117.

'59 METROPOLITAN. Jackson, 255-8142.

TWO 2-bdr. houses, NE Heights. Norvill, 255-2787.

DINING TABLE, 6 chairs, hutch, mahogany, $60; blond dresser w/mirror, $25. Schultheis, 247-2812.

21" RCA Victor TV, console, mahogany, $45. Young, 255-8193.

CHRYSLER HI-WAY Hi-Fi, 16 RPM, 6-12 volt; single phase motor; Alexander Hamilton business course; make offer on any item. Anderson, 264-5057.

NORGE automatic washer, $40. Hawk, 1821 Florida NE, 256-6264.

'51 HENRY J, '64 plates, $60; youth bed, complete, $10. Oliver, 299-8853.

RIFLE, 300 Savage M99 w/Lyman 2½ power scope, $80; will trade, want .410 shotgun, Polaroid camera, or what have you. Zaluga, 344-1564.

STEREO SET, extension speakers, new cost $300, sell for $100; Chippendale couch, new upholstery. Butler, 299-5626.

DISHWASHER; jig saw; mobile radio gear; 5 HP gasoline engine; 8 HP outboard engine w/tank; V.H.F. antenna w/22' mast. Pliner, 256-1907.

'59 PONTIAC CATALINA station wagon, hydramatic, one owner, $745, no trade. Price, 2829 Virginia NE, 299-6265.

'57 OLDS 98, 2-dr. HT, full power, priced below blue book, sell or trade. Capaldi, 2036 La Veta NE.

'61 COMET STATION WAGON, 4-dr., stick shift, 20,000 miles, $1100 or best offer. Benson, 268-5597.

ROLLER SKATES, semi-precision bearings, toe stops, size 7½B, black. James, AX 8-0709.

VM-722 STEREOMATIC tape recorder, $145; Webcor automatic record changer, 4-speed, chrome plated, including base, cost $110, sell for $28. McIntire, 298-6145.

'57 ENGLISH FORD Squire station wagon, $280. Baxter, 298-1567.

21" TV, push-pull, audio, four speakers, plus cathode follower output, almost new picture tube, $50. Souther, 299-2964.

NEW WARD'S Butler building, original price, $90, sell for $50. Johnson, 243-9625.

25 CU. FT. Amana food freezer, must transfer $225. Gonzales, 6908 Central SE, 265-0737, or 265-0774.

TWO RUGS, all wool, 12x15, 9x12, neutral shades; girl's bike, 28" w/side baskets, needs tires, $10. Buss, 298-1589 after 5:30 p.m.

SHELL LOADING SET: 30-30 C&H dies, primers, powder, Redding hydrylic scale, C&H press, Lyman powder measure, custom loading bench, 3½'x4½', $70. Freshman, AX 9-9263.

KENMORE washing machine. Hook, 255-1897.

'50 FORD tudor sedan, V-8, new battery, jack, heater, permanent anti-freeze, $100 cash. Stark, 299-5953.

RECLINING CHAIR, naugahyde, $50. Sirwinski, AL 6-9531.

DUMONT CONSOLE with 19" TV, AM/FM radio, phonograph. Bliss, 255-7980.

'59 CHEVROLET Bel-Air, standard, 6 cylinder, R&H, $750. Seay, 299-5270.

'59 FORD 4-dr. hardtop Galaxie, PB, PS, factory air. Lewis 255-2488.

GIRL'S 24" bicycle, $16. Cook, 1816 Dorothy NE, 299-6649.

RESIDENTIAL LOTS, two adjoining, Northeast, between Juan Tabo and Panorama, terms. One 60'x120' near Manzano High. Avallone, AL 6-0403.

TWO LOTS, Tres Pistoles canyon, near city, view, title insurance, $2,000 each for cash, some terms available. Weir, AX 9-1160.

POLAROID CAMERA, Model 80A, case, flash attachment, bounce flash bracket, $35. Grace, AL 5-4009.

TOY POODLES, champagne color, AKC registered. Condit, 344-9887.

MUSICAL BABY bed and mattress, $20; baby carrier, $2; walker, $2. Watt, 298-0595.

SOFA, never used, Kroehler, 80" long, gold color, bought on sale for $189, sell for $125. Rouckus, AL 5-2649.

'57 ELCAR mobile home, 8x38', 2-bdr. Stewart, 298-6246.

KEYSTONE K-38 movie camera w/meter and (3) f1.9 lenses on turret. Goddard, 299-6844 after 5:30 p.m. or weekends.

2-BDR. HOFFMAN BRICK, corner lot, landscaped, pitched roof, walled yard, carpet, drapes, a/c, $10,500. Ridsdale, 299-6186.

'55 PONTIAC HT coupe, R&H, $295. Wilson, 298-0049.

AIRPLANE Taylorcraft BC12D, new license, 1450 TT, 350 SMOH, recovered 1961, always hangared, A80 engine, $1350. Risse, AX 9-5002.

'61 VOLVO TUDOR, original owner, see at 3116 Valencia NE. Stanfill, 256-2809.

'49 STUDEBAKER stock car, V-8 motor, swap for guns or reloading equipment, Gonset Super-12 converter, bumper mount and antenna. Ernst, 268-9414.

42" GAS RANGE; electric refrigerator; furnace thermostat; lawnmower; garden tools; 45" cotton mattress; set of Great Books. Letbetter, 256-1242.

WANTED

RIDE from 2613 Indiana NE, vicinity of Louisiana and Menaul, to Bldg. 880. Calkins, 256-0041.

TO TRADE car for lot, pay difference. Chavez, AL 5-5461 or AX 8-5091.

TO CARE for child, age 3 to 5, my home, 1135 Marron Cir. NE, walled yard, 2½-year-old for playmate. Beeson, 299-6132.

RESPONSIBLE PARTY to drive late model car from the vicinity of Atlanta, Ga., to Albuquerque. Everett, 298-3994.

RIDE from Paradise Hills Standard Service Station to Bldg. 802. Williams, 242-5175.

BOY'S 26" bicycle in good running condition, appearance not important. Floyd, AX 9-2419.

PEOPLE interested in forming group to buy World's Fair tickets at discount, limit 15 families. Hoge, 255-9011 after 6 p.m.

16-FT. LADDER; mortar boat; 8-in. concrete blocks, 4-in. sewer pipe; 8-in. form lumber. Collins, 268-3612.

OLD TAPE RECORDER to cannibalize for parts. James, AX 8-0709.

TRADE 30 HP outboard for 45-45 HP outboard, standard shaft. Aldrich, 255-6637.

3 TO 5 HP outboard motor, new or old, in good condition. May, 299-5548.

WILL BABY SIT weekdays. Perea, 720 Amherst NE, AM 5-0861.

FOR RENT

2 BDR house to rent to couple, carpet, drapes, new elec. range, garbage disposal, AC. Deveney, 268-6806 or 242-0134.

MAN 25-35 years, share apartment near Base, $25 deposit, furniture, all utilities, local phone, $65 month. Villella, 299-6261 before 7 a.m. or late.

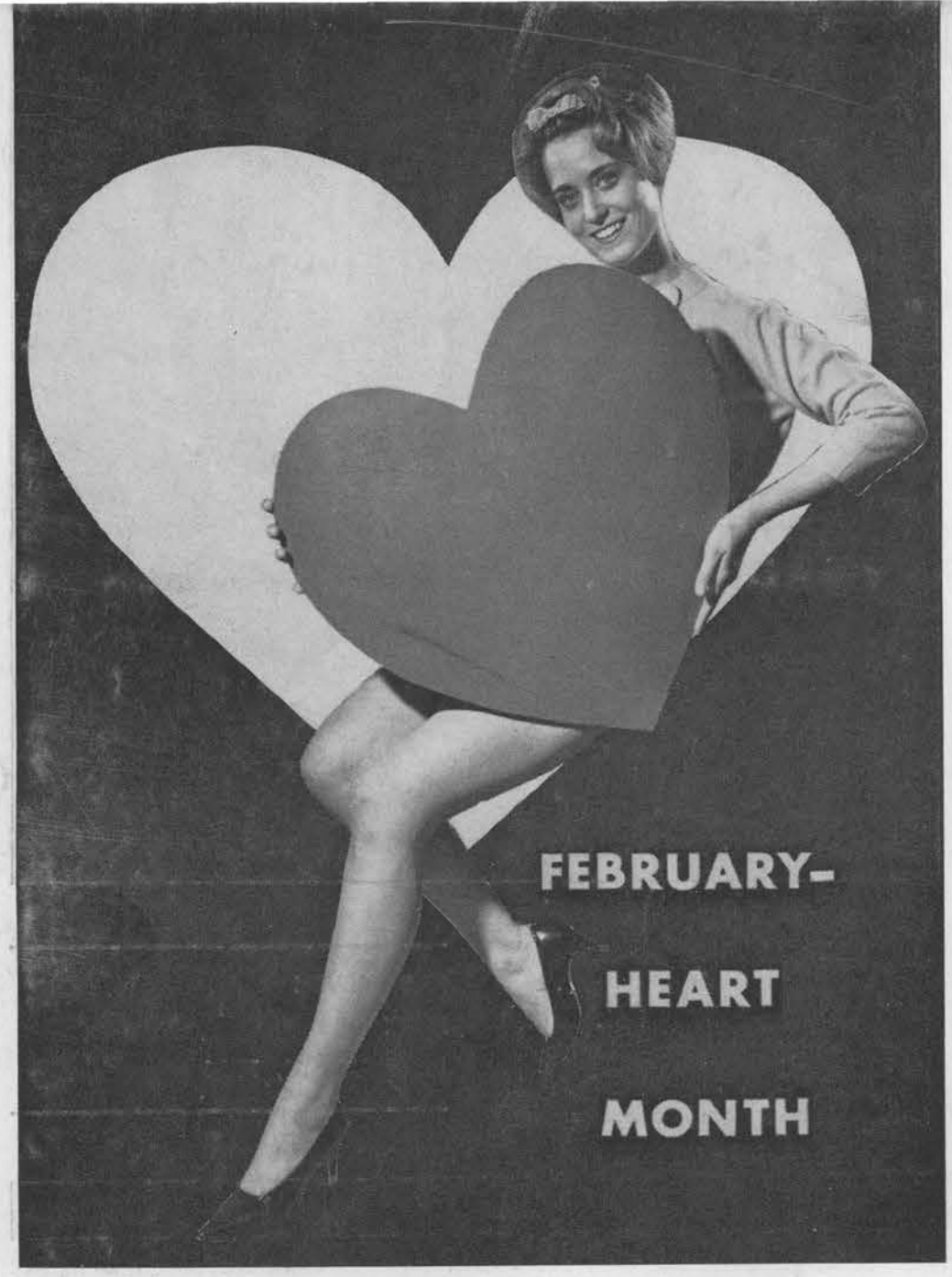
PENTHOUSE apartment, unfurnished, one bedroom (knotty pine), large sunroom, carpeting, drapes, stove, refrigerator, all utilities paid, $100. Coburn, 1934 San Pedro NE, 268-6844.

3-BDR., 1¾ bath, built-in range, oven, garbage disposal, carpeted LR w/fireplace, 1012 Espejo NE, $135/mo. Peterson, 299-4714.

LOST AND FOUND

LOST—Sheaffer White Dot gold pencil, notebook w/brown pressboard cover — containing notes, gold wedding and engagement ring welded together, brown leather wallet w/ID card, man's grey suede glove, gold Tau Beta Tau key. LOST AND FOUND, ext. 264-2757.

FOUND—Brown clip-on tie, hand made Indian jewelry, pearl and gold link necklace w/pearl cross, St. Christopher medal, ladies ring w/gold mounting and purple stone, man's eyeglasses w/black frames. LOST AND FOUND, ext. 264-2757.



LINDA BUREAU (3126) makes an attractive valentine as she honors National Heart Month. The event is sponsored locally by the Bernalillo County Heart Association, a member agency of the Employees' Contribution Plan. Sandians contributed $6952 during 1963.

Safety Delegates Learn New Mexico Highway Safety Record Rates Poorly

Three Sandians recently participated in the Governor's Second Annual Safety Congress. With the theme, "The Time is Crucial," the Congress explored means to combat New Mexico's highway death rate.

W. W. Allison, Elio Cultreri (both 3211), and Paul D. Darrah (4252) were delegates to the Congress.

They learned that New Mexico has a death rate of 7.9 per 100 million miles of travel and that 48 states have a better record. New Mexico has a death rate of 42.8 per 100,000 population, and again, 48 states have a better record.

In addition to calling for more public awareness of the seriousness of the problem, the Congress urged community expansion of programs which have been tested and found effective such as the School Safety Patrol, driver education, pedestrian protection, and selective law enforcement. The Congress called for more traffic signs, signals and marking, and more uniform traffic laws. Adoption by cities and states of uniform standards would go a long way toward reducing the accident toll, delegates believe.

Wider use of seat belts would reduce the death rate. Studies show that 5000 lives a year would be saved if all cars were outfitted with seat belts and occupants used them consistently.

Gov. Jack Campbell outlined the State's vehicle safety program and summarized results of the first year of operation. Some $20,000 has been saved in insurance fees as a result of the state vehicle safety record.

"We do know what needs to be done in New Mexico;" the Governor said, "let's all go to work and get this job done."

Sandia's Safety Record

Sandia Laboratory

HAS WORKED 210,000 MAN HOURS OR 6 DAYS WITHOUT A DISABLING INJURY

Livermore Laboratory

HAS WORKED 113,000 MAN HOURS OR 21 DAYS WITHOUT A DISABLING INJURY

Safety Record Set Back By Several Employees' Exposure to Fumes

Four Sandians suffered over-exposure to ammonia fumes last week as a result of contamination in the air conditioning system in Bldg. 892. Employees in the building equipment room were connecting a full tank of ammonia to a manifold when a coupling blew off after the tank valve was open. The air conditioning system picked up the ammonia and spread it through the building, which was evacuated of personnel.

Clinical Medical Department 3320 treated a number of employees for over-exposure to the ammonia. Three were hospitalized and one was sent home to recover. None were seriously harmed.

All have recovered and returned to work.

Sandia Laboratory employees have suffered seven disabling injuries since Jan. 1, 1964.

Sandia Demonstrates Policy of Promotion From Within

Advancement from within is the policy of Sandia Corporation and statistics for the year 1963 point up this fact.

Figures from Personnel Development Division 3152 show that 377 employees advanced within the graded area last year.

In addition, during the year 59 employees were advanced to the position of staff assistant, 25 to staff associate, and 18 to staff member.

There were 64 supervisory appointments last year. Forty-one persons were appointed to technical supervisory positions, 20 were administrative appointments, and three were general supervisory appointments. Of these 64 appointments, 34 were to the section supervisor level, 18 were division supervisor appointments, 10 were to the position of department manager, and three persons were appointed directors.

Statistics for previous years indicate that there has been a similar advancement experience.

Take Note

In May 1962, Paul V. Delker left Sandia's Staff & Management Development Section 3131-1 for duty with the Peace Corps in Washington, D. C. His job involves establishing Corps training procedures in the Washington area.

Paul is continuing his work in Washington, and has taken several trips in conjunction with his work, including visits to Puerto Rico and Africa.

* * *

Colonel Conrad R. Peterson (USAF) has been assigned to direct the newly-established Nevada Operations Division of Field Command, Defense Atomic Support Agency. Col. Peterson's Nevada Operations Division will have offices in the Atomic Energy Commission's Nevada Operations Office building in Las Vegas, Nev., and at the Nevada Test Site.

As director of the Division, Col. Peterson will have command control over all Department of Defense personnel and activities connected with nuclear weapons tests conducted by NVOO. He will also maintain liaison with the AEC, and other government agencies and civilian contractors engaged in nuclear weapons tests.

* * *

George A. Lux, chief industrial engineer of the Potash Company of America, Carlsbad, will speak before a meeting of the New Mexico Area Chapter of the American Institute of Industrial Engineers, Tuesday, Feb. 18. His topic: "Introduction of the Industrial Engineering Function Into An Established Company." The meeting will begin at 6:45 p.m. at Eby's Restaurant. Technical meeting will start at 8 p.m.

Persons interested in attending the meeting are invited to contact Lee Stinnett (2563-3), ext. 264-3847, for reservations.

* * *

Wives of employees participating in Sandia's Technical Development Program are forming a group aimed at helping new TDP wives to become acquainted with Albuquerque and other Sandians. For more information contact the publicity chairman, Mrs. R. E. Fairley (wife of R. E. Fairley 7333), tel. 299-0161.

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Sixth Annual Founder's Day Dinner of the University of Nebraska Alumni Club of New Mexico will be held Saturday, Feb. 29, at the Albuquerque City Club. A social hour beginning at 6 p.m. will be followed by dinner and dancing.

Featured speaker at the event will be E. R. Harrington, Director of Secondary Education, Albuquerque Public Schools, who will discuss "History of New Mexico."

Reservations may be made by calling C. M. Littleton (7513) at 299-7467. Deadline is Feb. 24.

Livermore Toastmasters Start Annual 'Speak-Off'

Two Sandians were among those trying to out-talk each other this week in the first part of a three-part speech contest held by the Livermore Toastmasters Club.

Taking part in the annual "Speak-Off" program were Chet Tarne (8143-1) and Carl Lundbom (8116-2). Malcolm Maddy (8116-2), club president, will vie for honors at the club's meeting Feb. 24, and two other Sandians, George Ruzicka (8161-3), and Dick Sundahl (8151-2), will compete Mar. 9.

Winners of the three sessions will battle it out in the run-off Mar. 23. The winner will receive a trophy for his efforts.

The club meets at 6:45 p.m. the second and fourth Monday of each month at the Lucky Lanes Bowling Alley. Visitors are welcome to attend the meetings.

Sandians Take Part In UNM Lecture Series in Solids

A second series of lectures in solids is announced by the University of New Mexico. Sponsored by the Civil and Mechanical Engineering Departments, the series will feature several instructors and authorities, among them three Sandians, presenting a general program in solid mechanics.

The series will carry one credit hour as ME 292 if taken with regular enrollment procedures. Sandia Laboratory employees may monitor all or any of the lectures without enrollment or payment of fees.

To be presented on Thursdays at 4 p.m. in Rm. 2, Mechanical Engineering Bldg., the series will begin Feb. 13 with "Analog Computer Simulation of a Booster Vehicle," presented by K. F. Nelson. H. F. Guffey will present "Theory and Instrumentation of Inertial Guidance Systems," Feb. 27, and M. Bodwell will present "Data Reduction and Analysis of Inertial Guidance System," Mar. 12. R. C. Dove will present "Postelastic Strain Measurement," on Mar. 26.

Final three lectures will be presented by Sandians of Aerodynamic Research Division 7421 and will deal with the general subject of "Trajectories."

A. C. Bustamante will present "Aerodynamic Stability," Apr. 9; M. D. Bennett will discuss "Trajectories,' Apr. 23; and Samuel McAlees, Jr., will present "Reentry," May 7.

Sandia Auditors Are The 'Flyingest' People

The 20 auditors in Department 4120 travel about 360,000 miles a year, which is a great deal of mileage for what is usually considered a "desk job."

The six-trips-a-year average takes the men from one end of the country to the other, examining the books of an increasing number of suppliers. At the present time, they visit some 200 suppliers with Sandia orders representing $141,000,000 in cost type contracts.

Usually, two or more of the auditors travel together and they almost always fly. The job may take one man one day, or several men several weeks with return visits sometimes necessary. The required time varies with size of the orders or may be due to that factor known to every person who has tried to balance a checkbook: supplier figures that don't balance.

"We usually audit each major supplier once a year," explained W. E. Prekker, supervisor of one of the Supplier Audits Divisions. "Our men go over each company's accounting system quite extensively. Some knowledge of manufacturing processes is helpful in verifying the costs claimed by a supplier."

In addition to audits of New Mexico and out-of-state suppliers, these men are also responsible for Sandia Corporation's internal audits.