



SANDIA CORPORATION

PRIME CONTRACTOR TO THE ATOMIC ENERGY COMMISSION

ALBUQUERQUE, NEW MEXICO • LIVERMORE, CALIFORNIA

LAB NEWS

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Sandia Develops Rocket For High Altitude Studies

Sandia has developed an inexpensive, reliable, data-gathering rocket system that can carry relatively large instruments to extremely high altitudes; a mission formerly restricted to larger, more complex, and expensive rocket systems.

Called the Nitehawk 9, it carries gross payloads of 150 pounds to altitudes above 950,000 feet with the greatest possible operational flexibility.

Designed as a general workhorse in the field of sounding rockets, it has proven so versatile that its uses now reach into every facet of the sounding rocket field. It is especially useful in obtaining data in the largely unexplored region between the 100,000-foot altitude reached by balloons and the area 200 miles or more from earth covered by satellites.

Nitehawk 9 is a two-stage, fin-stabilized vehicle that uses a surplus M-5 Nike motor for its booster and a Thiokol Tomahawk motor for its second stage. It is 29½ feet long and weighs 1,960 pounds at launch. It can be fired from a simple 16-foot launcher.

The 9-inch diameter payload carries up

to 60 pounds of instruments without a recovery system or 40 pounds of instruments with a recovery system.

Sandia has used the Nitehawk 9 on 48 flights since the first one in June 1963. All of the flights have been successful except two early launches which experienced a faulty ignition of the second-stage motor and a spin-yaw coupling failure.

Flights have been conducted to obtain a variety of information on the aurora borealis, winds, radiation, and solar activity at heights up to 200 miles. Launch sites for the studies have included Wallops Island, Va.; Ft. Churchill, Canada; Rarotonga in the Cook Islands; Tonopah Test Range; and Kauai in the Hawaiian Islands.

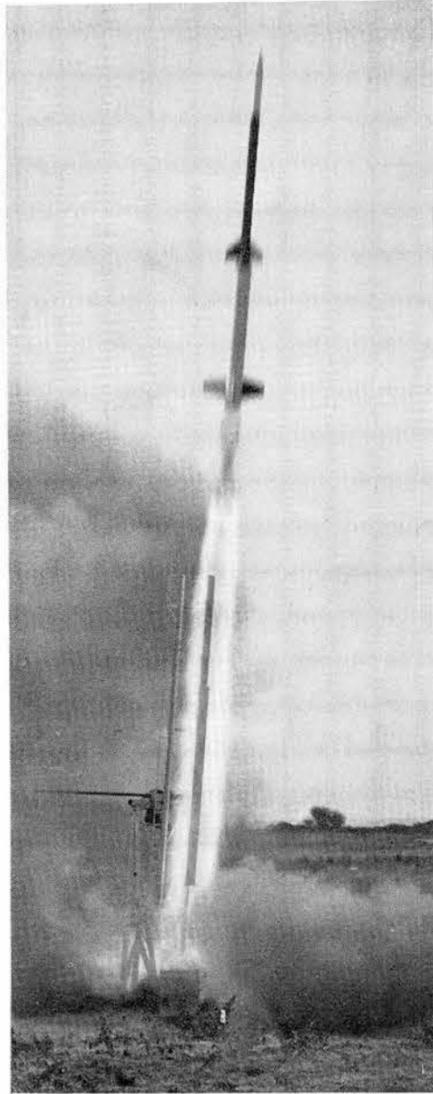
In a typical Nitehawk 9 flight, the booster is fired and the umbilical cables are pulled as the vehicle moves along the launch rail. An acceleration switch starts the timer that provides the time sequence for all explosive functions, including second stage ignition. The first stage Nike burns for about 3.5 seconds before it separates from the second stage Tomahawk because of drag differential between stages. The Tomahawk coasts for 8.5 seconds and then ignites 12 seconds after launch and burns for 9 seconds.

Sixty-five seconds after launch, the nose cone is blown off for instruments requiring direct exposure. The unit reaches an apogee of 189 miles five minutes after launch. For recovery units the payload is separated from the second stage at 450 seconds and allowed to re-enter the earth's atmosphere.

Nitehawk telemetry transmits acceleration, and temperature data, in addition to spin and yaw information from an attitude-reference system.

A 12-inch diameter payload version to carry 200 to 250-pound gross payloads to somewhat lower altitudes is currently under development in the Carrier Development Division 9224.

W. C. Womack (9224) is the project engineer for Nitehawk 9. Other members of the project group include G. W. Stone (9324), aerodynamics; C. H. Senter (1424), antenna; N. F. Sinnott (7211), attitude reference system; V. T. Strascina (9224), mechanical assemblies; D. W. Johnson (9324), recovery; J. M. Berry and C. M. Long (both 9221), telemetering; and C. G. Sproul (9224), timers.



BLASTOFF—The slender Nitehawk 9 is fired on one of the 48 successful flights conducted to date. The Sandia-designed rocket system has carried a variety of instruments to altitudes of 175 to 200 miles.



TYPICAL PAYLOAD — Nitehawk 9 model payload section is examined by W. C. Womack, project engineer for the sounding rocket system. Instead of the conventional metal casing, this demonstration section is covered with plastic to show the location of typical payload components which are labeled for briefing purposes.

Bldg. 807 Is 90 Percent Complete; Occupancy to Start in June

Appearance of Tech Area I has undergone a steady change in recent months. Construction started on Bldg. 807 in Nov. 1964 and, through the months of construction, work has progressed until now the structure is 90 percent complete. The building completes the side of a giant "U-shaped" complex created by Bldgs. 805, 806 and now 807—all three-story, modern, laboratory buildings.

In outside appearance, the new building resembles the other two and is connected to 806 on the upper floors and through the basement. Entrance to the new building will be from the north side in the center.

Inside, workmen are installing tiles, completing the utility chases, air conditioning, and the other finishing details.

Bids for the occupancy are expected to be invited in April. Target dates for moving personnel into the building are June 15 for the third floor, July 1 for the second floor, July 15 for the first floor, and August 15 for the basement rooms.

The new building's third floor will provide new laboratories and office space for organizations 5140, 5141, and 5154 moving from Bldgs. 824 and 806. Also on the third floor will be organizations 1313 and 1315 moving from Bldg. 802, and a new chemistry laboratory for organizations 1311 and 1312, also moving from 802.

Occupying the second floor will be the 5200 Directorate office, moving from Bldg. 806, and laboratories and offices of organizations 5230, 5232, 5234, 5241, and 5242. These organizations are moving from Bldg. 806 where other 5000 research organizations will expand laboratory facilities into the vacated space.

Also on the second floor of 807 will be organizations 1314, 1333, and 1324 moving from Bldg. 802.

The first floor of Bldg. 807 will be occupied by Department offices of 1310, and 1330, laboratories and offices for 1411 and 1414 moving from Bldgs. 802, 828, and 856. The first floor will also house organizations 1332 and 1334 moving from Bldg. 802 plus a branch machine shop of organization 4250, a drafting group from organization 2210, and an instrument facility maintained by organization 4610.

In two basement rooms, Bldg. 807 will house two special laboratories of organizations 1411 and 1414.

The space vacated from other buildings will be used generally to consolidate administrative organizations into Bldg. 802, a move that will open space in Bldg. 880 for expansion of Field Test, Special Projects, and computing operations.

Plans now call for transferring the Ac-

counting organizations 4130 and 4150 into the first floor of Bldg. 802. Organization 3110 will move into the second floor of 802 along with organizations 3210 and 6010.

The moves into 802 and 807 will vacate completely four temporary buildings that have been in use for a number of years at Sandia—Bldgs. 820, 821, 856, and 810. These buildings will be demolished and removed from the tech area.

Follow-up moves will be implemented during the remainder of the year, according to the schedule prepared by Plant Engineering Department 4540. The moves will be made in an orderly manner for maximum convenience to the organizations involved. As areas are vacated, Plant Engineering personnel will modify or renovate areas to the new occupant's specifications.

Completion of Bldg. 807 is an event long anticipated by Sandians. About 250 Sandians will call the new building "home" for their work efforts.



INSPECTING BLDG. 807—Sandia Plant Engineers (l to r) Jim Brooks (mechanical), Cecil Morrisett (project engineer), and Bob French (electrical) discuss construction progress with George Abbinett, right, architectural inspector with Kruger, Lake, and Henderson. The building is now about 90 percent complete. Photo shows half of the second floor. The building contains six large areas (a total of 76,000 square feet) such as this one which will be partitioned into offices and laboratories.

Sandians Return from Cosmic Ray Study Based in Puerto Rico

After gathering cosmic ray data, Sandia participants in the scientific expedition to the Atlantic equatorial region returned to Albuquerque Feb. 22 with early indications of a successful mission.

Cosmic rays, which are sub-atomic bits of matter that continually bombard the earth's atmosphere from outer space, are deflected in the earth's atmosphere and are more numerous at the earth's poles than at the equator.

Some 2,000 separate four and five digit numbers must now be processed and correlated to analyze the cosmic ray data gathered during flights of the Sandia-manned flying laboratory, according to J. E. Keith (5234), experimenter and scientific advisor for the Sandia expedition. He estimates that this may take several months.

Two NC-135A jet aircraft, one with Sandia cosmic ray data gathering equipment and the other equipped with Los Alamos Scientific Laboratory instrumentation, worked as a team to measure the distribution of intensities of cosmic rays simultaneously over wide ranges of latitude with special emphasis on simultaneous measurements at conjugate geomagnetic latitudes in the Northern and Southern Hemispheres.

As the LASL plane gathered data on cosmic ray levels in the region of the South Atlantic magnetic anomaly, the Sandia plane made identical measurements in the corresponding area over the North Atlantic from the equator to the Hudson Bay area.

Originally the flights were scheduled to be conducted from Piarco Airport in Trinidad, but the base of operations was changed

(Continued on Page 8)

Editorial Comment

The Sandia man lived 25,000 years ago. He might be classified as prehistoric, but he is not the searched-for "missing link." Some of our present day Sandia men (and women) are a different kind of missing link.

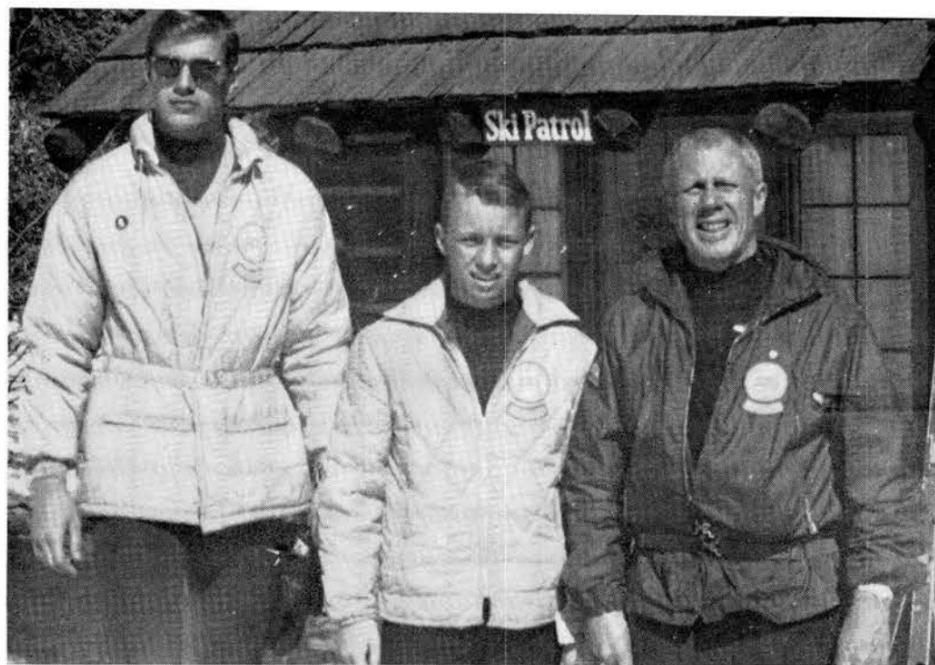
They are the missing links in the chain of security at Sandia.

Sandia's Security personnel take every possible step to prevent a security violation. They try to take into account basic human nature as well as the pressures of time, interruptions, and work demands, when establishing and helping individual organizations establish security procedures. They continually develop new and varied ways to remind us to be security conscious. They conduct training sessions and persistently seek to improve the near-perfect security procedures.

And yet their efforts can be foiled by the monitor who fails to follow each step of an end-of-day security check, by the secretary who incorrectly disposes of carbon paper used to prepare a classified report, by the man who leaves a classified document in his desk, or by the person who leaves a safe unlocked.

These infractions occur within our secured technical area, and our security inspectors, during their evening patrols, are quick to spot an infraction and to secure the area.

However, poor security habits can be carried off the job, out of the tech area. Let's do our part to prevent the lapses which make us the missing links in the security chain. Security is not a sometime thing.



JUNIOR SKI PATROLMEN assigned to Sandia Peak include Max E. Linn (left) and Steve Stewart (center). Hup Wallis (7531) helped to train and organize the teenage group.

Sandia Skier Volunteers Time to Help Develop Jr. Ski Patrolmen

National Ski Patrol volunteers have long been the good samaritans of the ski slopes, but an addition to the Sandia Peak area this year is the presence of junior patrolmen.

These are youngsters, 15, 16, and 17 years old, who have undergone the same rigorous training as adult ski patrolmen. Hup Wallis (7531), who has patrolled at Santa Fe Ski Basin and Sandia Peak for about 10 years, organized the local group which now consists of nine boys and one girl—some of whom have skied almost since the time they started to walk.

"We felt a junior patrol would be a good training ground for future patrolmen," he said.

The teenagers are required to take both standard and advanced American Red Cross first aid courses (a total of 26 hours instruction), and they must pass the same tests on the ski slopes as candidates for senior patrolman: ability to load an injured skier on a toboggan and control the sled on the trip down the mountain, and ability to ski under control in varied snow conditions. Endurance and an interest in this volunteer work are extra requirements.

"The junior patrolman can carry out all the rescue functions of senior patrolmen except they should not administer first aid or attempt to move a loaded toboggan without an adult patrolman on hand unless a true emergency exists," Hup added. Normally, the juniors serve as "apprentices" to regular patrolmen.

In the ski patrol room, the teenagers help to move and cover injured skiers, splint possible fractures, and make out accident reports. From late November through Jan. 31 at Sandia Peak there were 120 accidents ranging from minor cuts and bruises to 14 fractures—this averaged about 6.5 fractures per 10,000 skier-days (number of skiers and days).

The juniors mark danger spots on the slopes with bamboo poles, and may be asked to assist area personnel in rescuing skiers from the chair lift when it's stalled. At the end of the ski day, junior and senior patrolmen, alike, "sweep" all the slopes and trails to make sure all skiers are safely off the mountain.

The Santa Fe and Los Alamos ski areas have used junior patrolmen for some time, as have many areas in Colorado. In early March, junior patrolmen from throughout the Southern Rocky Mountain area met at Geneva Basin, near Georgetown, Colo., for a clinic. There were demonstrations of ski techniques, toboggan handling, and avalanche instruction. "But the most valuable thing," Hup said, "was the exchange of information."

Among Hup's junior patrolmen are Max Linn, son of M. K. Linn (3400), Steve Stewart, son of R. E. Stewart (2522), and Jeff Pewe, son of P. D. Pewe (3113).

Hup added, "There's strong interest in the program. I've had several 14-year-olds ask me, 'Am I old enough yet to join the junior patrol?'"

Events Calendar

- March 11-13 and 16-20—Moliere's comedy "Doctor in Spite of Himself," Old Town Studio, 1208 Rio Grande Blvd. NW. For reservations call 242-4602.
- March 12-13—Weekend campout in the San Mateo Mountains, southwest of Socorro. N. M. Mountain Club, leader, Bob Kyrilach, tel. 344-3083.
- March 15—Stan Getz jazz concert, Johnson Gym, UNM campus.
- March 18—Flamenco guitarist Sabicas, UNM Cultural Series, Student Union.
- March 20—Juan Tabo Loop hike. N. M. Mountain Club, leader George Steck, tel. 299-2313.
- March 21—Janos Starker, cellist, Community Concert series, Civic Auditorium.
- March 21—Col. "Shorty" Powers, "America's Space Effort—Where Is It Going?" UNM Cultural Series, Student Union.
- March 24—YWCA bus tour to Quarai, Gran Quivera and Abo Monuments. Non-members invited. For information, tel. 247-8841.

Deaths . . .



Naomi Vickers, service clerk in Employee Services Division 3121, died suddenly Feb. 25. She had been employed at Sandia since October 1958. She was 61.

Mrs. Vickers is survived by a son, Robert C., who is stationed at Dyess Air Force Base, Texas, and five sisters.

Memorial services were held in Albuquerque Feb. 28 and interment was in Tulsa, Okla.

* * *



Clarence U. Puthoff, a painter in Specialty Crafts Section 4514-3, died Feb. 25 in a Calina, Ohio, hospital. He had made the trip there to attend the funeral of his brother. Mr. Puthoff was 55. He had been at Sandia since August 1948.

He is survived by his widow, two daughters, and seven grandchildren. Funeral services were held in Albuquerque Feb. 28.

* * *



Louis R. Chavez, an assembler in Branch Shop and Assembly Section A 4221-1, died March 6 after a long illness. He was 63.

Mr. Chavez had been employed at Sandia since September 1949.

Survivors include three daughters and one son.

Services were held Tuesday, March 8, in Albuquerque.

* * *

Albert Cordall, a retired Sandia employee, died March 3 after a lengthy illness. He was 79.

Mr. Cordall retired in May 1957 after three years at Sandia as a mechanical inspector.

Survivors include his widow, two daughters, three grandchildren and one great grandchild. Funeral services were held March 5 in Albuquerque.



John L. Reimholz of Test Equipment Reliability and Engineering Design Practices Division 2442, died March 6 after a short illness. He was 39.

Mr. Reimholz had been employed at Sandia since June 1951.

Survivors include his widow, one daughter and two sons, his father, and a sister.

Services were held March 9 in Albuquerque and committal was the same day at the National Cemetery at Santa Fe with military honors.

* * *



Jack M. Miller, a retired Sandia employee, died March 2 in Albuquerque. He was 74. Mr. Miller retired in November 1957 after five years employment as a machinist in the Development Shops organization.

Survivors include his widow, three sons, three daughters, and 12 grandchildren.



X-RAY and infrared techniques, used at Sandia to detect flaws in components, were of interest to Bryant E. Justice (center), national president of the Society for Nondestructive Testing, during a visit here last week. He was accompanied by Charles W. Musser (left), vice chairman of SNT's New Orleans Section, and R. W. Mottern (7322), president of the Albuquerque Section. Mr. Justice is examining a print taken by the pulsed X-ray source machine.

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1956



1966

Ten Years of Growth:

Livermore Laboratory Marks First Decade

It was on March 8, 1956, that the Atomic Energy Commission announced that Sandia Corporation would operate a permanent research and development facility in Livermore.

Although this date is considered the official founding date of Livermore Laboratory, a handful of employees remember earlier days. An "advanced cadre" of Sandia employees came to the Livermore Valley in the fall of 1955 to set up shop in an old wooden barracks on the grounds of the University of California Radiation Laboratory (now the Ernest O. Lawrence Radiation Laboratory).

This week as the Laboratory marked its first decade, ten employees, members of the original group who transferred to Livermore Laboratory from Sandia Laboratory, recalled these early "pioneer" days.

Organized as Engineering Department 1250, the small group led by W. J. Howard was formed to work with LRL in the advanced phases of weapon development. Within the next few months the organization expanded rapidly. Additional employees were recruited and hired locally, and other personnel transferred from Albuquerque and other Sandia sites.

Today, the modern research installation is valued at \$21 million and occupies almost 75 acres. It employs about 980 scientists, engineers, technicians, and support personnel, and has a payroll of about \$9.1 million.

Of the original 13 transferees 10 remain at SCLL. They are: C. R. Barncord (8150); S. C. Cain (8113); C. O. Erickson (8252-1); V. M. Field (8148); B. F. Fisher, Jr. (8123); W. A. Little (8250); J. McMinn (8241); R. L. Siglock (8251); O. W. Wallen (8244-3); and M. A. Van Brocklin (8241-1).



SANDIA RECEIVED the Navy's highest merit award for the design, development, and engineering of the non-nuclear portion of the Polaris missile warhead in December 1960. Livermore Laboratory in partnership with Lawrence Radiation Laboratory has had prime responsibility for the Polaris Program, as well as other weapon programs.

REMINISCING, Pat Hinrichsen (8232) and Jim McMinn (8241) recall the early days at Livermore Laboratory. Pat, one of the first new hires at the Laboratory, remembers how "the girls in the office worried about the structural soundness of the old wooden barracks building we occupied. Everytime someone moved a safe-file across the floor, it shook the whole building. I can recall one particular morning after they had moved two new safe-files into the second floor offices, we experienced a slight earthquake and thought the entire building was collapsing from the additional weight." Jim, one of the original transferees, said, "conditions weren't the best in the old barracks, but the esprit de corps was great."



It has been my privilege to be associated with Sandia during most of the ten year existence of Livermore Laboratory, and I can recall the discussions with General Starbird which led up to the AEC approval for constructing the new facility.

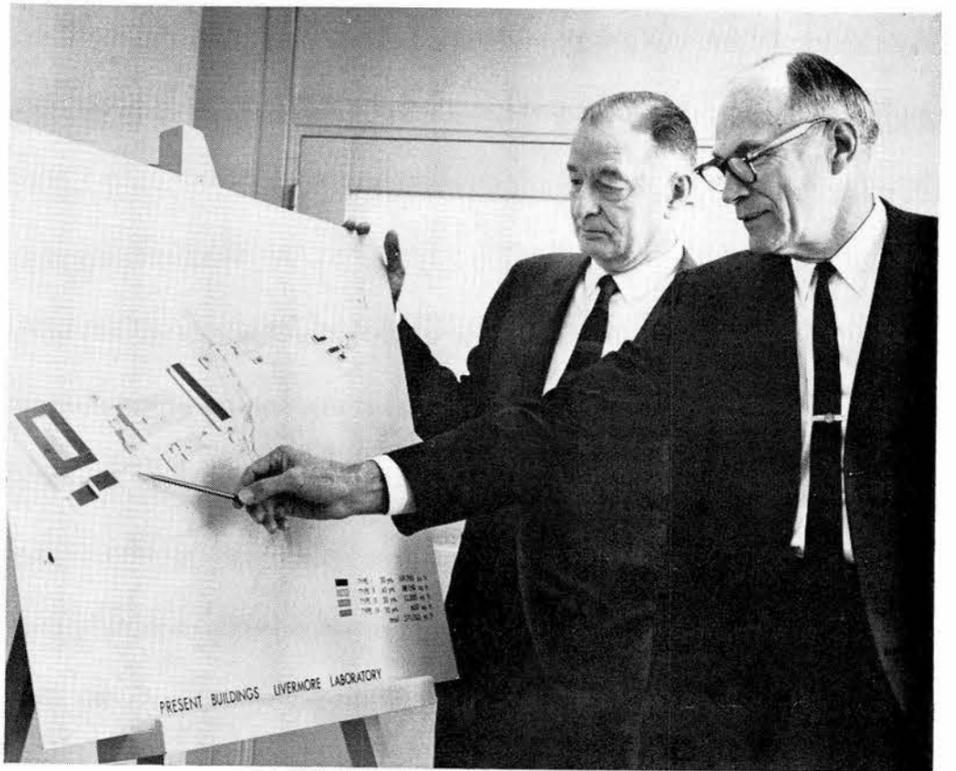
I am happy to say that all of our plans and expectations have been more than realized and the performance of both of our laboratories during this period has developed a reputation for excellence which, in my opinion, assures a bright future for Sandia.

S. P. Schwartz,
President

Livermore Laboratory is operating today at its planned level of just under 1000 people, a level which it reached in 1961 after five years of rapid growth. It continues to meet every challenge presented to it and each employee can take pride in the record. We have been partners in the design of some of the most important weapons in the nation's stockpile and each one has gone into production on schedule.

The Laboratory is currently participating fully in the changing trend toward advanced development work and thus is heavily involved with new technology that will have an important effect on future weapon systems. This, together with current design projects and their all-important support, means that every employee on the Livermore staff, regardless of his particular skill, has a full and challenging job ahead of him.

B. S. Biggs,
Vice President 8000



ABOVE—S. P. Schwartz, Sandia Corporation President, and B. S. Biggs, Vice President 8000, discuss the growth and technical achievements of Livermore Laboratory during the past 10 years.

BELOW—The late R. E. Poole, first Sandia Vice President at Livermore, and the late J. W. McRae, President of Sandia Corporation when Livermore Laboratory was founded in March 1956.

NEWEST MEMBER of the clerical staff, June Takahashi (8235), joined Sandia following graduation from Chabot College in January. "After completing one year in a pre-nursing program at college, I decided to change my major to secretarial services," she said. "I came to Sandia because my dad (T. H. Takahashi, 8121) has been employed here for many years and I know it is a good place to work."





Now 'At Home' in Amarillo

SANDIANS at the Pantex facility near Amarillo, Tex., pose for a group portrait. In the foreground are D. E. Murphy, Division 2126 supervisor, and section leaders P. R. Taylor, L. G. Parsons, and G. E. Power. Professionals in the weapons business, the group averages nine years of service with Sandia.

Pantex Provides Data Service for Weapons Program

In a new, 20,000 square-foot building, 39 Sandians of Stockpile Sampling Operational Division 2126 are now "at home" at the sprawling Atomic Energy Commission's Pantex facility some 17 miles east of Amarillo, Texas.

In 1964, the Atomic Energy Commission announced plans to close its weapons facilities at San Antonio, Texas, and Clarksville, Tenn., and transfer their operations to the Pantex Plant at Amarillo, Texas, and the Burlington (Iowa) AEC plant. Since then Sandia has gradually transferred its quality evaluation testing facilities from their former locations to Pantex. The Clarksville facility is now closed, the Medina facility at San Antonio will be phased out soon, and operations are well underway at Pantex.

Although the work is substantially the same as before, the consolidation involved more than a relocation of personnel and equipment. Inspection and evaluation programs in progress at Clarksville and Medina had to be completed according to schedule while men and equipment were moving. New organizational structures and working relationships with Mason and Hanger-Silas Mason Company, which is the AEC's contractor operating Pantex, were established. Much effort went into the design of work flow and equipment installation of the new Sandia facility.

Heading Division 2126 at Pantex is D. E. Murphy, a veteran of more than 16 years in the weapons business, who with others made the move from Medina. He had pre-

viously been assigned to Clarksville. P. R. Taylor and G. E. Power, two of the section leaders, came from Clarksville, while L. G. Parsons, head of QEST Section II, came from Medina. The people at Pantex are experienced professionals. Average length of service for employees in the Division is in excess of nine years.

In performing its total assignment, the Division works closely with Mason and Hanger and the AEC/ALO at Pantex and coordinates activities with Sandia at Albuquerque and Livermore, Los Alamos Scientific Laboratory, Lawrence Radiation Laboratory, and the military services. The work can best be described as providing a complete, detailed data collection service for Sandia's portion of the nuclear weapons program.

The Division is responsible for completing the operational phases of Stockpile Sampling (SSP) and New Material System Test (NMST) programs, providing joint AEC/DOD test assemblies, and conducting special Quality Assurance testing services.

The work is always demanding, and requires constant training and use of precise operational procedures to fulfill the technical tasks.

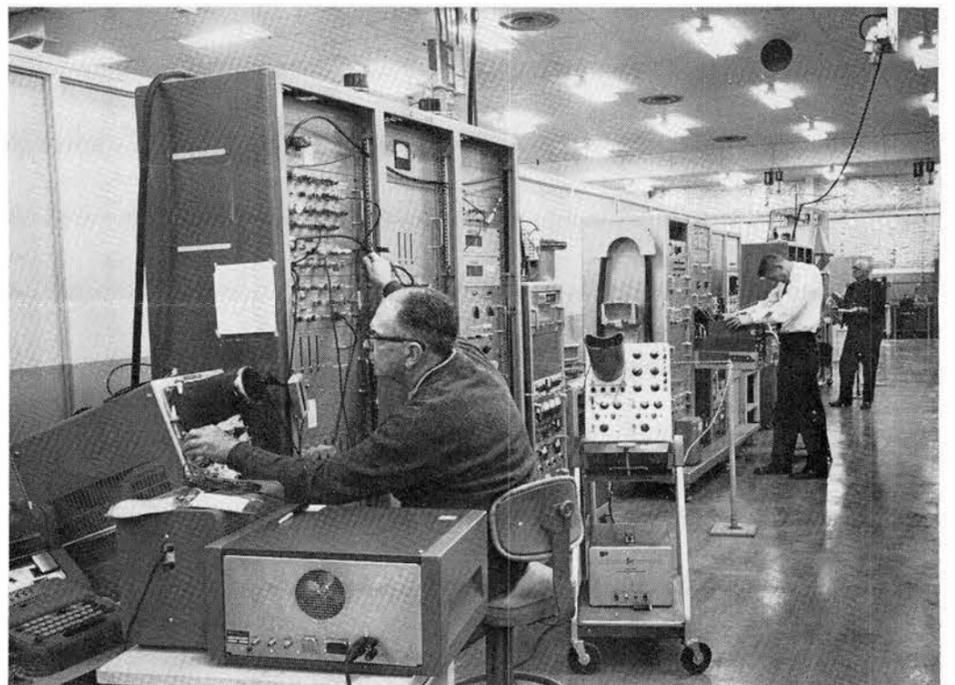
In the first tasks mentioned above—stockpile sampling and material system testing—the computer-like QEST (Quality Evaluation Systems Tester) is used. These machines automatically provide appropriate signals to actuate specific components during the systems test. Weapon system parameters are designed into the QEST and each of these parameters has to be met for a satisfactory systems test. In addition to system requirements, the QEST records all essential data from the weapon's performance as well as performance data of the QEST itself.

Following each test, all data are evaluated for abnormalities before the connections between weapon and tester are removed. Any abnormal condition results in an immediate analysis of the overall test set-up by all concerned organizations in order to isolate the point of failure.

After the system test, the sample weapon is further tested for alternate capabilities and disassembled into basic components for additional functional testing.

After this phase of testing, the weapon is returned to Mason and Hanger for re-assembly in normal production channels. All test data are forwarded to Sandia where the Quality Assurance organization maintains complete files of each weapon in stockpile.

One of the newer proof-of-product programs involving Sandia is the joint AEC/DOD firing and drop test program. Division 2126 participates in this program when stockpiled weapons are returned to Pantex for removal of the explosive and nuclear systems. This removal is a carefully controlled process to assure that the functional status of the material is not compromised. The removal is performed by Mason and Hanger production specialists



MAINTENANCE, CALIBRATION of QEST and PT testers at the Pantex facility is a precise, demanding job. In this test area, one of many in Sandia's new 20,000 square foot building at Pantex, C. D. Thompson, Mike Zapach, and Del Poer prepare test equipment for forthcoming programs.

under the direct control of Division 2126 personnel. After the removal operation, and addition of test instrumentation, the weapon is subjected to complete stockpile-to-target operations by DOD agencies.

Under the category of special QA testing are grouped various support testing of prototype weapons under development.

"We support the system development groups by running QEST tests of models which contain new components to be incorporated in forthcoming modifications," Mr. Murphy says. "A dual benefit is realized in these tests. Development people prove their new configuration and, at the same time, requirements for modification of the QEST to test the new weapon are determined."

This pre-production testing continues through the Tool Made Sample (TMS) phase of production assuring that the new units will meet required standards.

Also under the special QA testing category are the evaluations of units undergoing retrofit in the field.

(Retrofit, a "modernizing" operation, describes a program under which approved changes are incorporated into previously produced weapon material.)

Mason and Hanger performs retrofit on some units and these are tested to detect or correct any design or modification problems before the retrofit operation starts in stockpile material.

"The overall proof-of-product activity at

Pantex is indeed an integrated program," Mr. Murphy says. "We have become sensitive to the many data needs of the various organizations and agencies involved in the weapons program. A concentrated effort is made to maintain a strong data collection capability in all areas, tailored to specific needs."

Mr. Murphy indicates that the "adjustment" period is over for most of the personnel assigned to Pantex.

"We've become acclimated to the weather and the landscape," he says. "We've purchased homes and are becoming part of the community."

The Pantex Plant is part of the AEC's Albuquerque Operations. Mason and Hanger fabricates chemical explosives and has responsibilities in component and nuclear weapon assembly functions. The contractor employs about 1300 persons at Pantex with an annual payroll of more than \$8 million.

Mason and Hanger and Sandia activities are performed in close cooperation. "Our work," Mr. Murphy says, "is never routine."



DATA SHEETS from QEST (Quality Evaluation Systems Tester) are checked by Harry Morris, left, and John Thomas. The computer-like QEST programs a sample weapon through complete parameters of performance. It must meet rigid standards. After systems check, weapon components are also checked for performance.

Sandian, Youngsters Build Large Adobe House to Last 200 Years

About 25 miles south of Albuquerque, in the El Cerro Road loop area, stands a two-story adobe house containing some 2200 square feet of space. The roof is about half-covered with red Mexican tiles, the roof beams still need paint, some landscaping effort has been started, and in back, a corral, barn, and haystack stand among stacks of lumber, concrete blocks, pipe, and adobe bricks.

"What a tremendous amount of work remains to be done," says Walt Haskell (9323), owner, builder, parent.

"The four of us built it," he says, giving credit to his three teen-age youngsters, "and we've reached the point where it's comfortable to live in."

Stepping through the portal, you enter a large, high-ceilinged living room. A massive fireplace covers the north wall, and the room is decorated with Indian rugs and artifacts, western paintings, and trophies from game hunts. Mexican light fixtures hang from the big-beamed ceiling. Red brick provides the floor throughout the lower level.

"We're about 85 percent complete," Walt says. "That includes the five lower level bedrooms, two baths, living room, and kitchen." Upstairs Walt's "apartment" is still under construction. This will be a study, bedroom, and bath when complete.

The house was started in March 1963 and grew "crisis by crisis" to meet the needs of the family. First section started was a two-bedroom, bath, and hall unit. Walt lived in a small trailer while construction was underway.

From the beginning, Walt wanted a house that was "solid." He was impressed by the 200-year-old adobes still standing and inhabited in the Valley. To insure this goal for his own house, the foundation is 16-inch reinforced concrete with the first course of the walls of concrete-filled blocks. All outside walls are 16-inch adobes and so are many of the inside walls. Upstairs, the adobes are nine inches thick but two-inch plastic foam insulation was used between the adobes and the inside wall board.

"This house is cool in the summer and warm in the winter," Walt says. "The old-timers knew what they were doing when they built with adobe. We used the best materials available for the roof, beams, frames, and windows with the idea of saving fuel, maintenance, and repair costs in the future."

Second section completed included the living room, dining room, kitchen, bath, and another bedroom. Whereas Walt and his 15-year-old son, Donald, did most of the work on the first section, the second part was basically built by a contractor.

"We were in a hurry," Walt says, "and we needed some refinement for the two girls. We all pitch-in on the house cleaning, laundry, and cooking. We've progressed from camping-out to occasional candles on the dining room table."

The third section was started about a year ago and included two more bedrooms and the upstairs apartment. Walt figures this part will be finished by the end of the summer.

"We have to finish the roof tiles, paint throughout, finish the closets, shelves, cabinets, polish the brick floors, complete the duct work for the central heating, and about a thousand other details plus landscaping," Walt says, "but we've come a long way."

Walt also gives credit to "an army" of Sandia friends who have volunteered time and effort and contributed furniture and various materials.

"It's not all work around the place," Walt says. "We've got a real menagerie—five horses, three dogs, two cats, three geese, a flock of pigeons, and miscellaneous ducks. It's noisy and fun."

"The kids are organized and take care

Take Note

C. J. McGarr (4600) spoke Feb. 23 at a joint meeting of the Raton Chamber of Commerce and the New Mexico Business and Manufacturers Association. His subject was "The Businessman in Politics."

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LAB NEWS

MARCH 11, 1966



WALT, Barbara, and Colleen feed two of the five Haskell horses. The adobe house is located on a six-acre site in the El Cerro Road loop area.

of their own responsibilities. We have sort of a family council every evening at dinner and then they square away the place and take care of their homework. Weekends usually include a family community activity such as an FFA meeting."

Looking back over the past years, Walt admits that he didn't know what he was getting into. "Building a house is a tremendous project. I don't know if I would do it again, but on the other hand, there is no question that it was worth it. We have something that has given the family strength and a purpose, and that's worth more than anything I can think of."



COMFORTABLE WESTERN DECOR greets visitors to the Haskell adobe home. This living room plus dining area measures 16 by 28 feet. Walt plans to add finishing touches to the ceiling and to build new furniture.



STACK of red roof tiles await installation on the roof of Walt Haskell's two story adobe home, but house is about 85 per cent complete. It represents three years' work by Walt and his three teen-age youngsters. House contains about 2200 square feet of space.

Gail Barton Serves as Firefighter

Fire fighting is one area where you don't encounter many women. The exception is the recently organized Bernalillo County Fire District 10, which has as volunteers several women, including Miss Gail Barton (5256).

These women volunteers receive the same type of training as their male counterparts. Gail is qualified to drive the pumper truck, handle the fire hose, operate a respirator, and fight a fire as the situation and available equipment dictates. So far, she has answered two fire alarms: one was a brush fire, the other was a summer cottage which had been burning for an hour.

The boundaries of District 10 are roughly from the Albuquerque city limits east to the Bernalillo county line, and about two miles north to 10 miles south of U.S. 66—an area of some 80 square miles. Since a long stretch of U.S. 66 is included, the volunteers have already fought more automobile fires than residential blazes.

Gail and other volunteers have taken a 20-hour firefighting course at Sandia Base, and during February an additional 16-hour course was given at the A. Montoya School in Tijeras. "The latter course," Gail said, "stressed techniques more suitable for our area. Special attention was given to ways of fighting forest fires and blazes in small buildings."

The area is generally mountainous, fairly heavily forested, virtually devoid of natural springs or large bodies of water, and contains both year-round homes (many owned by Sandians) and summer cottages. In Tijeras and the other villages, there are a number of adobe houses, but log or frame structures are more prevalent.

Until establishment of the fire district, the area was served by the fire district to the north, but due to distances involved, the fire truck (kept at Cedar Crest) often arrived too late to be of assistance.

An ad hoc committee was formed about a year ago to investigate the possibility of forming the new district. Among the committee's members were C. B. McCampbell (1310), A. P. Gruer (2130), and R. B. Foster, Jr. (2411), who are now directors on the district's board of governors. District 10 was recognized by Bernalillo County in June 1965, and a few months later a used 500-gallon pumper truck was purchased from Las Vegas, N. M.

The truck is kept in a heated garage in

Tijeras. Fires are reported to the U.S. Forest Ranger. He relays the message to the fire chief and one of the volunteers, who in turn calls the other volunteers and tells them where to go. The volunteers drive directly from their homes to the fire. "We sometimes beat the fire truck there," Gail said, "so we just pitch-in whatever way we can."

The truck's storage tank is filled with water after each run, and there is equipment to pump water from any nearby pond, but such a source of water is seldom available.

Bob Foster has made available citizen's radio equipment and the use of a 250 gal-

lon home-made pumper he keeps at his home on South Highway 10. A volunteer fire district has to have a certain amount of existing fire fighting equipment in order to qualify for state and county funds.

"Anyone living in the area is welcome to become a volunteer firefighter—and that certainly includes women," Gail noted. "Women who live in the mountains are very versatile." When Gail isn't at work, she's at home studying—she was the first woman to take graduate study at the University of New Mexico under Sandia's Technical Development Program.



WHERE'S THE FIRE? Gail Barton (5256) is one of the volunteer firefighters in Bernalillo County Fire District 10, which covers Tijeras and mountainous areas around both north and south Highway 10.

'Fine Workmanship'

Foundry Casts F-4 Model For Wind Tunnel Tests

One phase of Sandia's job is to assure compatibility of hardware with delivery systems. Recently, Advanced Systems Development Department I, 5610, asked Aero and Thermodynamics Department 9320 for support in a feasibility study to determine separation characteristics of a general test vehicle shape if it were released from the centerline rack of a McDonnell F-4 airplane. Air flow fields vary with the velocity and shape of delivery airplanes and may alter the trajectory or separation characteristics of the falling shape.

Wind tunnels are suitable for this type of experimentation since pre-determined altitude, velocity, and flow direction can be simulated; and a multitude of data can be collected in a brief period of time. In addition, Sandia has had experience in conducting tests of this nature and employs the latest testing techniques.

Test engineer Roger N. Everett (9322) selected the wind tunnel facility and later conducted the test; design engineer R. T. McVeety (9323) did the structural design; and project aerodynamicist A. D. Foster (9325) decided what conditions should be simulated and what type of data would be most significant.

It was decided that the models should be 1/20th of actual size since any smaller size would prohibit the shape from housing a strain gage balance made to measure aerodynamic loads. The scaled size of the F-4 airplane (1.9 ft. from wingtip to wingtip and 2.9 ft. long) ruled out Sandia's wind tunnels; therefore, arrangements were made to use a high speed wind tunnel operated by Ling-Temco-Vought, Inc., near Dallas, Texas. The transonic section of this facility is 4 ft. x 4 ft. which is large enough to prevent blockage effects.

The next problem was to locate a scaled-down airplane model. McDonnell Aircraft, which produces the F-4 Phantom jet, had two such models, but both were being used in test programs. Normally, wind tunnel models are machined from blocks of metal—a very time-consuming job—but Sandia Laboratory's foundry had previous experience casting an F-100 model from "almag" (an aluminum magnesium alloy) and it seemed worth a try. The drawings were borrowed from McDonnell Aircraft and Sandia started on two models: one complete model for actual use in the wind tunnel; the second of only the wing section for structural tests of static loads on the wings. Mrs. G. R. Hines and others in Section 2213-3 helped with blueprints and design definition.

Thomas Mickey of Pattern and Foundry Section 4221-4 had the assignment of making the wooden pattern of the F-4 for the foundry. This involved outside patterns and inside core boxes to create a wall thickness of about 1/4 inch, and foundry flasks to contain the sand molds. He had

to allow for a 3 percent shrinkage. Mahogany templates were carved to denote each change in body cross section and blocks of pine were glued between these templates and carved down to size (a child's plastic F-4 model aided in visual conception). Contoured ducts inside the model simulated the internal mass flow of air encountered by the full-scale plane under actual flight conditions.

The sand impression of the model was baked; then the metal was poured into the form. The trickiest job was pouring the wing and part of the fuselage in one continuous piece. Three circular risers (which were later machined away) were the last part of the mold to fill with metal, and shrinkage occurred here rather than in the thin wing areas.

After indicating where the finished model mold line should be, the model was machined to the final dimensions in Heavy Machine Section 4252-1. However, because of the fine workmanship in the Pattern and Foundry Section, all contoured surfaces required only hand finishing. A final silver conductive finish was applied, and the sleek model was ready for its January test.

The Ling-Temco-Vought facility has a unique feature. There are separate sting holding devices for models of both the airplane and the test vehicle shape. The airplane model can be moved forward or backward and the shape model can be moved up, down, and sideways. The combined motions of the airplane and shape models in the wind tunnel allow simulation of the separation of a full scale shape from an airplane during flight.

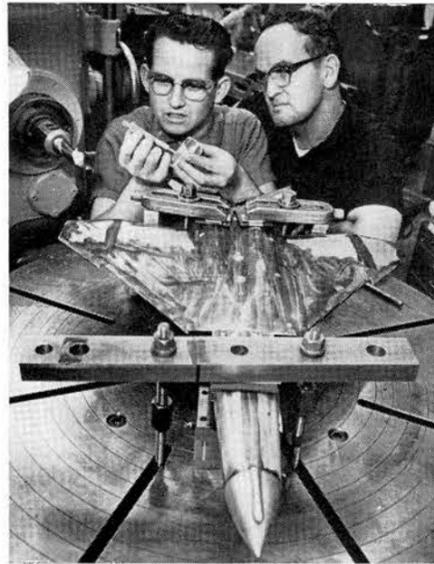
In a test, the air flow is established and the shape is positioned adjacent to the aircraft as if it were being carried. A closed loop circuit is made with the signals from a strain gage balance located inside the shape, an analog computer, and servo mechanisms which position the airplane and shape models. The computer determines what full scale shape motions would result from these measured loads scaled to full scale test conditions. The computer then sends signals to the servosystems which cause proportional motions of the shape and airplane models. This sequence of events proceeds continuously until the test is completed. Throughout the test, aerodynamics loads on the shape and the location of the shape relative to the airplane are continuously recorded.

In all, 32 runs were made in the transonic section. Both the attitude of the airplane and of the shape were changed in different combinations at varying air velocities to simulate a number of possible separation conditions.

"The test results substantiated our preliminary estimates," aerodynamicist Foster said. "The shape separated safely under all release conditions and valuable information was obtained."



SANDIA'S FOUNDRY made a sand casting from the wooden model—in this case, the wings and part of the fuselage. D. A. Quayle (left) and C. C. Riley (both 4221-2) are checking the almag casting against the pattern.



CLOSE CALIBRATION was necessary in milling and boring as apprentice machinist Jerry R. Brooks (left) and Bill Weinbecker (both 4252-1) carried out their phase of the job.



READY FOR SHIPMENT to the wind tunnel, R. T. McVeety (9323), who was design engineer for this project, holds the finished 1/20th scale model of the F-4 Phantom jet.



AERODYNAMICISTS Sam McAlees (9314) and A. D. Foster (9325), middle and right, examine foundry-cast wings for the F-4. Thomas Mickey (4221-4) carved the wooden patterns used for the foundry. The paint on both metal parts indicates areas to be trimmed in the machine shop.

Sandia Speakers

J. J. Deely (5263), "Non-Parametric Empirical Bayes Procedures for Selecting the Best of k-Populations," Central Regional Meeting of the Institute of Mathematical Statistics, March 23-25, Lafayette, Ind.

L. S. Nelson (5234), "The Role of Supercooling in the Combustion of Zirconium Droplets," American Chemical Society, March 22-31, Pittsburgh, Pa.

R. T. Meyer (5122), "Flash Photolysis and Time Resolved Mass Spectrometry: Detection of the Hydroxyl Radical in the Nitrogen Dioxide Sensitized Reaction of Hydrogen and Oxygen," American Chemical Society, March 22-31, Pittsburgh, Pa.

H. S. Levine (5234), "High Temperature Metallic Oxidation Reactions: I. Kinetics and Mechanisms; II. Isothermal Reaction in Oxygen," American Chemical Society, March 22-31, Pittsburgh, Pa.

A. W. Snyder (5220), "Atomic Origins of Transient Nuclear Radiation Effects in Electronics," International meeting of the Institute of Electrical and Electronics Engineers, March 21-25, New York City.

M. I. Weinreich (3421), "Prolegomena to Modern Bahuvrihi—Interlinguistic Translation Problems of Adjectival Semantics," 11th National Conference on Linguistics, March 12-13, New York City.

A. F. Cone (2510), "Evaluation of Contractor Quality Control Systems," Seventh Annual ASQC Quality Control Clinic, March 11, Knoxville, Tenn.

D. P. Brautigam (4517-1), "The Decision Matrix Approach in the Selection of Maintenance Personnel," 1966 National Plant Engineering and Maintenance Conference, March 21-23, Cleveland, Ohio. R. D. Flaxbart (4510) will be chairman of the Automation and Value Analysis Session.

J. W. McKiernan (7419), "The SNAP Program," ASME, Midland-Odessa (Texas) Section, March 8.

M. A. McCutchan (3132), "After High School—What Then?" Civics classes, Jackson Junior High, March 1-2, Albuquerque.

Willis Whitfield (2564), "The Laminar Flow Concept," Albuquerque Science Teachers Association, March 14, Albuquerque.

Moorestown Office Serves New England Field Reps

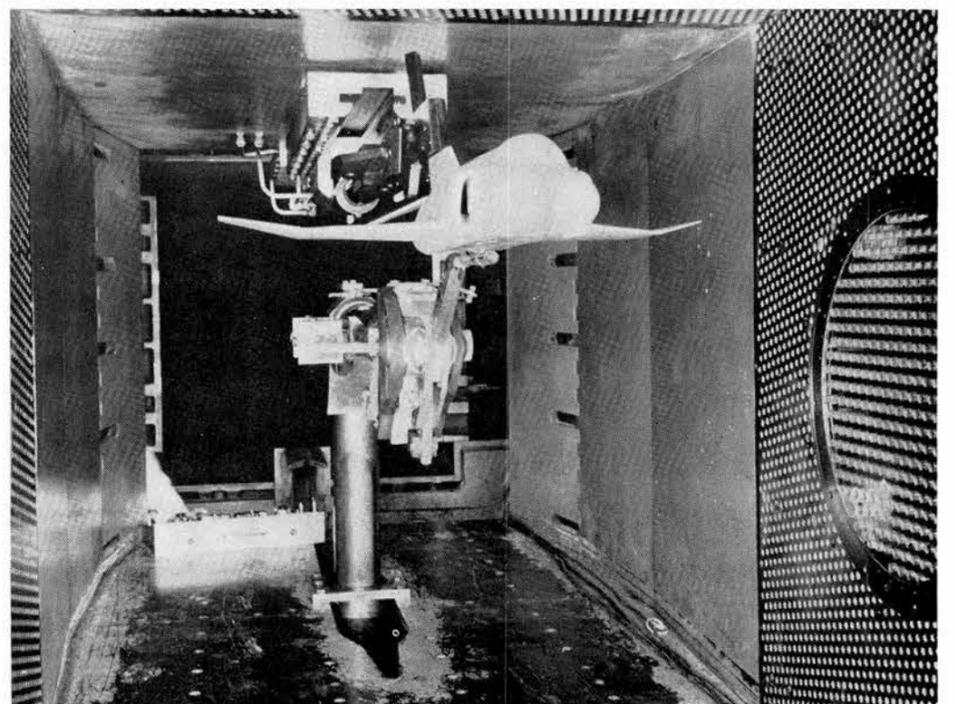
Sandia's New England area quality control field office and secondary standards laboratory in Hartford, Conn., is being consolidated with the East Coast Office, effective March 1. The area's seven field representatives will report to the East Coast area office in Moorestown, N.J., but will remain in their present locations close to contractors' plants.

The change will bring about only one transfer—that of M. K. Rhoads, who will report to Quality Control Engineering Division 2514 in Albuquerque on April 1.

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LAB NEWS

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AIRPLANE and test vehicle shape models are positioned inside the Ling-Temco-Vought 4 ft. x 4 ft. high speed wind tunnel.

Service Awards

20 Years



B. E. Hickerson
3462



J. W. Jones
2540



P. R. Owens
2222



P. R. Taylor
2126

15 Years



S. L. Apodaca
4221



T. A. Baca
4575



Elias Benavidez
4514



Naomi Bennett
4213



P. H. Bircher
2113



R. S. Claassen
5100



W. D. Clark
2553



J. J. Colwell, Jr.
1523



A. C. Dale
2225



D. C. Davis
4518



C. M. Gabriel
2544



J. H. Gibson
3342



J. R. Gonzales
8115



E. R. Gourley
3242



R. W. Gustin
2225



D. L. Harrison
2234



Ben Jajola, Jr.
2554



R. D. Jones
9232

10 Years

March 11-24

C. H. Dalin, Jr. 3465, C. F. Drummond 8252, Vivian M. Goodwin 2552, B. Doreen Buck 2234, E. R. Matlock 3312, D. J. Adkins 7322, S. A. Ravenbyrne 7322, A. C. Skirwood 8142, Maxine M. Hemen 4332, H. E. Morris, Jr. 5622, and P. B. Vanderberg 7255.



Retha Kay
4131



J. R. Mahboub
3242



T. L. Mead
3242



E. P. Monahan
4614



M. N. Pliner
9214



L. W. Ramsey
2132



G. H. Romero
3242



Mary Schwartz
6021



B. L. Stewart
2522



A. J. Williams
4512



D. J. Yarbrough
4614

Sandia Authors

B. T. Kenna (1121) and B. H. Van Dorn (5530), "Neutron Activation: Relationship of Sample Mass to Self-Shielding Factor," Vol. 17, No. 1, page 47, INTERNATIONAL JOURNAL OF APPLIED RADIATION AND ISOTOPES (published in England).

E. M. Bauer (7334), "Control and Certification of Humidity Test Chambers," January issue, TEST ENGINEER AND MANAGEMENT MAGAZINE.

Promotions

Ruth C. Easton (8100) to Secretary
Lloyd C. Young (7231) to Staff Associate Technical
C. E. Shipley (2225) to Staff Associate Administrative
Emma Hollingsworth (3126) to Staff Assistant Technical
Charles Byrne (4631) to Technician
Carlton Pennington (3415) to Messenger
Dixie L. Lamoria (3126) to Secretarial Steno
Mary F. Malone (3126) to Secretarial Steno
Betty Lou Womack (3126) to Secretarial Typist
Benjamin Garcia (2232) to Reproduction Service Clerk
Nena A. Brannan (7521) to Editorial Assistant
Patricia Warmboe (8223) to Assembler
Richard Campiotti (8232) to Messenger
John S. Benapfl (8232) to Mail Clerk
Emma Jane Moon (8253) to Service Clerk
Martha Leverenz (8253) to Service Clerk
Einar Morterud (4615) to Staff Assistant Technical
Jack E. Cannon (7325) to Staff Assistant Technical
John R. Goff (7332) to Staff Assistant Technical
Phyllis Swartz (3431) to Staff Member Administrative
Harry B. Conrad (4517) to Staff Assistant Technical
Edith F. Malatzo (8000) to Secretary Executive
Edward J. Hodyke (4622) to Receiving Clerk
F. Edward Martinez (4221) to Helper
Cecil Fitzgerald (4632) to Tester
L. Noriene Felter (3421) to Library Assistant
Michael Chavez (2112) to Record Clerk
M. Alberta Grady (3462) to Reproduction Service Clerk
Doris H. Kokkes (2112) to Record Clerk
Mildred S. Hill (7331) to Data Reduction Clerk
E. Mary Gallegos (3428) to Service Clerk
Janet J. Johnson (3421) to Librarian
K. E. Scranton (7331) to Senior Clerk
James C. Reitz (8223) to Assembler
Glenda A. Plake (8166) to Secretarial Steno
Dolores E. Allen (8244) to Record Clerk
Mary D. Monser (8253) to Production Release Clerk
Le Ora Matlow (8160) to Secretary
Barbara G. Piper (8233) to Camera Operator
G. Dean Miller (4120) to Secretary
Carl R. King (3241) to Staff Assistant Administrative
Byron A. Hock (7212) to Staff Associate Technical
Robert G. Eastburn (8112) to Staff Assistant Technical
Rand R. Rozelle (2213) to Staff Assistant Drafting
Jose Gutierrez (4613) to Stockkeeper
Donald J. Loehle (4615) to Instrument Technician
Judith A. Gaunce (3126) to Typist Clerk
Gloria Mae Smith (3126) to Typist Clerk
Dennis M. Gullierrez (3415) to Messenger
Barbara M. Elliott (4135) to Invoice Clerk
Martha Craig (3126) to Secretarial Steno
Mary E. Remillard (3126) to Secretarial Steno
Eva R. Sylvia (3126) to Secretarial Steno
Helen G. Riedy (3126) to Secretarial Typist
Leona B. Cooper (4131) to Payroll Clerk
Marvin E. Barnett (7212) to Staff Associate Technical
Harry Corcoran (3462) to Reproduction Equipment Operator
Paul Aaron Silva (4573) to Heavy Equipment Operator
Delbert R. McBride (3416) to Messenger
Eddie L. Rodriguez (2232) to Reproduction Service Clerk
Elsie J. Curkendall (7521) to Typist
Evangeline H. Duran (7521) to Typist
M. A. Petrillo (3462) to Report Clerk
Judith M. Shirer (8243) to Stenographer Clerk
Albert J. Bastion (8223) to Shop Clerk
Helen E. Verstynen (2210) to Secretary

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LAB NEWS

MARCH 11, 1966

Congratulations

Mr. and Mrs. Richard C. Wayne (5132) a son, Christopher, Feb. 15.

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

- WASHER and dryer combination, gas RCA Whirlpool, \$100. Sweley, 298-6694.
- DINETTE SET, includes five black and white chairs, table is black with wrought iron legs, \$40. Purchase, 268-8179.
- AIR CONDITIONER: 25'x13' carpet and pad; 2 electric motors. Tyson, 2519 General Marshall NE, 298-2561.
- BICYCLE, 26" men's, lightweight, \$12.50. Hansen, 299-0357.
- '62 CHEV. II Nova, 2-dr. hardtop, stick shift, w/w tires, bucket seats, \$1050. Mancuso, 299-4279.
- '61 VW, \$825 or consider trade for small travel trailer. Roseberry, 877-4826.
- '64 1/2-TON Chev. pick-up truck, 4-speed, many extras. Maes, 256-7345.
- 1/2-TON A-100 International pick-up, 6-cyl., 3-speed, limited slip differential, \$375. Roh, 299-3749.
- TIRE, black wall 7.50x14, used 2000 miles (Wards 6424), \$5. Ristine, 298-8383.
- DREXEL "Profile" walnut furniture: dining room table, chairs; bed, dresser, mirror, vanity; tables, carpet, drapes, 1/3 original price. Dossey, 256-0857.
- CRIB, complete, \$15; baby buggy, \$12. Elbert, 298-2204.
- '55 CADILLAC, 4-dr., \$500. Puccini, 933 Madison NE, 255-0568.
- 6-BDR, 3-bath, den, greenhouse, orchard, convenient to schools, Winrock-Coronado area. Swap for comparable property in Las Vegas, Nev., or vicinity. Mayfield, Box 468, Mercury, Nev.
- 3-BDR, 1 1/2 bath, wall-to-wall carpet, drapes, close to schools and golf course. Talbutt, 424 Mankin NE, 299-5104.
- '54 OLDS, R&H, AT, 4-dr. sedan, engine overhaul, 2 extra snow tires, \$245. Glass, 298-0842.
- WOODEN SKIS w/safety bindings, \$6; 20" bike, needs handlebars, \$8; paint spray gun, \$6. Hart, 299-8832.
- '64 VW engine, 1500 cc, 37,000 miles, complete less flywheel, \$200. Arnold, 313 Charleston SE, #C.
- SKI BOOTS size 7B, \$5; rug, dark brown cotton loop, 9x12", \$15; auto chains, 6.70x15, \$5. Reynolds, 299-5157.
- CABIN for your lot, 672 sq. ft., will move anywhere in state, make offer. Villella, 268-1363.
- SEARS Coldspot chest-type deep freeze, 28" x 54" x 38" deep, \$100. Alexander, 298-4448.

- 2-BDR home, Holiday Park, 2 baths, AC, carpeted, drapes, fireplace, dbl. garage, FHA appraisal \$18,000. Husa, 3100 Riviera Pl. NE, 298-3335.
- '61 FORD Thunderbird, tan exterior, white interior, new tires and battery. Cotter, 256-7629.
- PIANO, spinet, walnut finish, \$450; Emerson stereo console, \$30. Cash, 242-3721.
- 10 LOTS, Estancia Valley, Block 9, title insurance, \$200 less than original price, Golden Valley Estate. Eaves, 299-7728.
- WATER SKIS: trick skis (banana peels), jumpers, shoe skis, and water saucer. Rowley, 299-8419.
- LATE MODEL J. C. Higgins bicycle, \$20. Kraft, 299-2157.
- BABY CRIB, \$10; limed oak drop-leaf table, four chairs, buffet, \$115. Segrist, 298-5608.
- 3-BDR and den, 1 1/2 bath, double garage, carpet, drapes, AC, sprinklers, \$17,800 or assume. Cnare, 3225 Britt NE, 299-3604.
- BRICK 3-bdr., den, walk to schools, shopping center, \$17,900, assume \$10,000 4 1/2% loan, \$1700 down new FHA. Halpin, 299-7710.
- 3-BDR, 1 1/2 bath, 10x40' patio, w/w wool carpet, custom features, AC, walled yard, 5 mins. from Sanja Base, \$13,750. Martin, 298-6644.
- HEATHKIT AS-12 Multiplex FM tuner and AS-10 speaker. Halsey, 299-6418.
- OR TRADE—Universal electric range, 3-burner with deep-well, (trade for a freezer); Beautyrest mattress and spring. Marsh, 243-2767.
- GIRL'S 20-inch bicycle, \$5 or trade for 26-inch boy's bicycle. Laursen, 299-1656.
- 3-BDR, and dining room, den with wb fireplace, 1 1/2 bath, close to all schools, shopping, 5 mins. from base. Ryanczak, 299-3527.
- LA SALLE Grande, 5-bdr. brick, 1/2 acre lot, den, utility room, double garage, 3 baths, two furnaces. Weir, 299-1160.
- 3-BDR Roberson, flat roof, corner lot, 1 1/2 bath, den w/fp, double garage, hw/floors, sprinklers, AC, \$17,950 to 5 1/4% loan, balance \$14,250. Duvall, 299-8744.
- ELECTRIC dryer, Westinghouse, operates on 220 or 110 volt power, \$50. McGuckin, 298-8091.
- GUITAR, Stella, \$10. Dalphin, 500 Princeton SE, Apt. 1.
- BOLEX C-8 8mm movie camera, Paillard f2.5 lens, variable framing speed 12 to 64 fps, daylight filter, wrist strap, \$40. Bader, 299-9459.
- MAPLE bedroom suite, single bed, wardrobe and desk with dresser, needs refinishing, \$45. Precit, 299-3438.
- JUMPING HORSE, Mattel, list price \$49, sell for \$15. Webb, 298-8139.
- 10 FT. WIDE mobile home, \$2100; temporary meter pole, \$8; 1949 Ford 1/2-ton, 4-speed, \$150; sewing machine, \$30. Patterson, 877-3158.
- '61 CHEV. Belair, 4-dr., standard transmission, 6 cyl., R&H, several extras, 1966 plates. Stoever, 256-2439.
- 3-BDR, BRICK, 1 1/2 baths, study, screened porch, garage, landscaped, near schools, shopping, \$17,200. McCutcheon, 299-6655.
- SKI BINDINGS, Ski-Free, \$6; K-22 S&W revolver, \$55; American Rifleman yearly collections, \$1 each; other gun books. Shunmy, 265-1620.
- OUTBOARD motor, Sea King 15 hp, see to appreciate, reasonable, used very little. Jajola, 877-3977.
- '64 MODEL teardrop pickup camper, half cab over, \$650. Goodwin, 256-2216.

- AQUARIUM 15 gal. w/fluorescent light, reflector, complete cleanup, 2 pumps, undergravel filter, fish, 1 gal. quarantine tank w/filter, complete \$25. Weber, 299-1389.
- PISTOL, .22 Hi Standard, \$32.50; three size 10 formals, worn once, \$10 each. Bascom, 299-1662.
- '52 JEEP 4-wd station wagon, 6-cyl., \$350 or best offer. Netz, 282-3607.
- 3-BDR BRICK, 1 1/2 baths, custom drapes, w/w carpet, large patio, walled yard, water softener, new tile, NE location. Wilson, 298-0049.
- ORIGINAL OWNER, Inez brick 3-bdr., 1 1/2 baths, carpeted, drapes, AC, near schools, shopping; large patio, circle driveway; access to backyard. Crawford, 299-0260 after 5:30.
- 3-DOOR mahogany wardrobe closet, 73"x65"x24"; maple rocker, \$9; misc. items priced to sell. Sal, and Sun. Gelman, 415 Buena Ventura Pl. NE, 298-5335.
- 8mm ZOOM lens movie camera with carrying case and lightbar, \$80. Lindquist, 298-2464 after 5:30.
- PISTOL, .22 cal. six-shooter, German made, 2 inch barrel. Zamora, 243-7107.
- CHEST OF drawers, light colored, 15" x 30" (high) x 36" (long), \$20. Pope, 816 Val Verde Rd. SE, 255-6702.
- AMERICAN Homecrest, 50 x 10' two-bedroom, carpet, storm windows, AC, underseated, storage, move free. Archbold, 898-1880 or 345-0450.
- DAVENPORT w/chair to match, corner table, and one-wheel trailer. Moore, 6500 Cochiti SW, Spot 60, 255-6625.
- '54 GMC 1/2-ton pickup, new motor, 4-speed, R&H, insulated camper, new tires, paint, seats. Casares, 255-9961 after 6.
- BASSET HOUND, female, tri-color, 7 months old, AKC, all shots, excellent pedigree, champion stock for breeding, make offer. Moss, 298-2643.
- '61 CHEV. Impala 4-dr. sedan, AT, PS, R&H, see to appreciate, \$850. Williams, 299-9150.
- KROHLER living room suite, matching couch and chair, grey tweed, \$40. Clark, 298-3703.
- AUTO air conditioner, used one season, \$100. Dauphinee, 255-6367.
- AKC REGISTERED golden retriever, show stock. Lewis, 299-0588.
- PORTABLE Television, 17" screen, General Electric, picture okay, needs minor tune-up \$40. Colp, 268-8035.
- 35HP Johnson motor, 1957 model, \$100 or make an offer, will consider trade. Flinchum, 344-1072.
- COLDSPOT refrigerator, \$15. Riley, 299-3163.
- OR TRADE one acre Holiday Hills, city electricity, free water. Elder, 268-7479.
- '55 JEEP Universal, 4-wheel drive, Warn hubs, heater, canvas half cab, snow tires. Varnado, 298-7334.
- ORGAN, Thomas electronic, 13 pedals, 10 voices, 2 keyboards, \$450. Pierce, 255-7923.
- '57 OPEL Record with radio and heater. Cafferty, 898-3102.
- 17" Hoffman TV w/stand, \$20; detachable car top luggage rack, used once, \$5. Murphy, 256-1130.
- 4 1/2" CRAFTSMAN jointer, 8" tilt arbor table saw, mounted on portable table, 6 saw blades, 6" dado set, 2 table extensions, \$135. Carmichael, 255-2531.

- '63 HONDA motorcycle, 150cc, 140 mpg, 4900 miles, \$375; '61 Ford wagon or rebuilt '57 Olds, \$45; stereo-TV combination, furniture. Chandler, 298-1114.
- '57 CHEV. Belair convertible, R&H, AT, new paint, good tires, \$525. Jarvis, 298-1113 after 5:30.
- '54 FORD Country sedan, V-8, R&H, overdrive, \$100. Sieglitz, 268-8756.
- '65 LARSON car-top boat, 5 4/10hp, Evinrude motor. Burright, 299-7386 after 5.
- OLYMPIA standrt typewriter, \$85. Carlyon, 344-5347.
- GLOBE 100 watt sideband transmitter, covers 5 ham bands, complete with VFO, voice operated transmit switch, and changeover relay, \$80. Bauer, 255-7774.
- '57 MERCURY convertible, one owner, w/w tires, PS, PB, 38,000 miles, 1966 license, \$400. Anderson, 268-0934.
- 2 BLOCKS from base, brick, 3-bdr., 1 1/2 baths, attached garage, FHA appraisal, \$16,500 or best offer. Schatz, 299-4585.
- FURNITURE: 4-piece sectional; bedroom suite w/bookcase, bed, night stand, dresser, mattress; 17" TV. Prices negotiable. Chavez, 298-0674.
- MOTORCYCLE, 1964 Honda Dream, 305cc, 2500 miles, black and chrome, \$445. Kefauver, 255-8270.
- '63 CORVAIR, 26,000 miles, 4-dr., R&H, priced at \$875 for quick sale. Coughenour, 296-4146.
- ROBERSON 3-bdr., LR fp, 1 1/2 bath, double garage, carpet, drapes, AC, electric kitchen, dishwasher, Eastdale area, \$18,000 VA or assume. Taylor, 298-0426.
- '58 FORD country sedan, factory air, other extras; '55 Chev. V-8 Belair, stick; Bug Go-Cart, McCulloch engine. Carpenter, 299-3519 evenings.
- '60 PORSCHE roadster conv., blue with black top, roll-up windows, top converts in seconds. Hitchcock, 247-1711, ext. 3405 weekdays.
- CUSTOM built bar for den, formica tops, naugahyde padded, brown and white, \$160. Baca, 299-5743.
- BY OWNER, 3-bdr. Roberson, Sandia bus #2, pitched roof, covered patio, double garage, AC, FAH, walled, carpeting, FHA appraisal \$16,500. Hirni, 299-7061.
- MOSSMAN Sacramento, enlarged, 4-bdr and den, 1800 sq. ft. living area, below FHA, \$22,000, 3506 Florida NE. Mattox, 268-5554.
- RCA WASHER-dryer combination, five years old, \$25; Underwood standard typewriter, pica, \$20. Cox, 299-0480.
- WALNUT 24 x 18 x 81" stereo cabinet, incl. speakers, 4-track stereo recorder, 2 ea. stereo turntables, speakers and amplifiers. Browning, 299-6384.
- '59 DODGE wagon, AT, PS, AC, new tires, \$500. 1955 Ford wagon, AT, \$100. Shock, 877-3728.
- BUNK BEDS, light oak, innerspring mattresses, \$45; large work bench, 3' x 8', \$10. Strawderman, 299-7548.
- '55 LINCOLN Capri 2-dr. HT, new battery, \$250. Hastings, 344-6818.
- HOLLYWOOD BED, complete. Fisher, 299-9235.
- SELL OR LEASE: 3-bdr., den, pitched roof, hw/floors, AC, FHA app., landscaped, near schools, shopping. Coonce, 296-1089.

- BLOND bookcase headboard and 7-drawer dresser with large mirror; baby crib and mattress, 6 year size. Kelley, 255-2262.
- 2 CARLSON enclosures with 15" Wolverine LS-15 speakers. Roybal, 299-9647.
- 21" MOTOROLA low boy TV console, \$60. Clark, 298-3703.
- IRONRITE, desk type w/health chair, \$95. Bleakney, 255-8222.
- '48 GMC Caravan, new battery, 6-ply tires, 4-speed trans., \$125; Craftsman power lawn edger, \$15. Otero, 256-6597.
- TYPEWRITER, Smith-Corona portable with case, \$20. Tidwell, 298-5086.

WANTED

- TO BORROW maintenance manuals for following power supplies: Polytechnic Type 807; Kepco 1220B; Beta 209 R and D. Plumlee, 282-3224.
- CHILD'S 12 in. tricycle in good condition. Sluyter, 298-5844.
- POKER TABLE, eight sides, and pool table, 4 x 8' in air condition. Garcia, 298-8630.
- GAS FLOOR heater for travel trailer. Rowley, 299-8419.
- USED drafting table. Roymann, 298-1370.
- GOOD HOME for seven healthy, energetic puppies. Free. Arthur, 728 Monroe NE, 256-7359.
- HARD TOP for TR-3. Dowd, 299-8473.
- GENTLE graded kid's horse to trade for hay. Roth, 877-4997.
- CANOE, aluminum or fiberglass. Also, paddles, life jackets, sail and mast, and sideboards, if available. Baxter, 344-7601.
- USED Encyclopedia Britanica and set of Great Books with Syntopicon. Steele, 255-5807.
- SHOTGUN, prefer double. Stephenson, 299-3914.
- TO TRADE '64 OLDS F-85 super deluxe, AT, 21,000 miles, white w/red interior, bucket seats, for late model pickup. Downs, 268-5896 after 5:30.
- SET of World Book encyclopedia. Dauphinee, 255-6367.
- YOUNG LADY to share apartment. Maureen Goodwin, 268-9045.

FOR RENT

- 2-BDR house with stove, refrigerator and garage, NE, \$85. Hawk, 256-6264.
- 2-BDR furnished apt., AC, automatic washer, near Sandia, no pets, special lease price or regular \$87.50 monthly. Villella, 268-1363.
- LARGE HOUSE on 110 acres, Placitas area, available April 1, country living with all utilities, garage, coral, modern conveniences. Iling, 299-7378.
- TAKE UP lease until Sept., 1-bdr, fireplace, electric garbage disposal, rough-in for washer, unfurnished, \$100 per month. Baker, 7701 Phoenix NE, Apt. 1.

LOST AND FOUND

- LOST: man's gold butane lighter; small clip earring, pearl w/gold stem; coral drop earring. LOST AND FOUND, tel. 264-2757. Bldg. 610.
- FOUND: man's prescription sunglasses w/brown frames; Volkswagen key; silver butane gas lighter; Kwikset key marked "Heights"; gold bracelet; green earring; gold drop earring. LOST AND FOUND, tel. 264-2757. Bldg. 610.

St. Patrick's Ball, Adult Go-Go, Texas Stomp Scheduled at Club

Three major social events are scheduled in the next couple of weeks at the Coronado Club, along with regular activities such as Social Hour, bridge meetings, bowling, and Ski Club.

Tomorrow night, Club members will be wearing the green for the St. Patrick's ball. Festivities start at 7 p.m. with a corned beef and cabbage dinner. Sol O'Chavez plays for dancing from 9 until 1:30 a.m. Admission for members is \$3, guests \$3.50.

Next Friday, March 18, following Social Hour and the popular Mexican buffet, an Adult Go-Go is scheduled at 8:30 p.m. This event was a blast last month and the veterans are eager for the battle again. All Club members are invited to twist, frug, monkey, and all that jazz with "The Rip-ples," a rock 'n roll group. Admission is free.

In the same vein, a Texas Stomp is set Saturday, March 26, with the Elton Travis swingers providing the cactus music. The Mexican buffet will be served from 7 to 8:30 p.m. and the sagebrush shuffle starts at 9 p.m. and continues until 1 a.m. Admission is \$2.50 for this one, guests \$3.

Other Club Activities

Social Hours

Tommy Kelly's trio provides the happy music tonight for Social Hour dancing. The Chuckwagon Roast Beef and Shrimp buffet will be served. Cost is \$1.75 for adults, \$1.50 for kids.

Next week, March 18, preceding the Adult Go-Go, Max Apodaca will play for Social Hour. The Mexican buffet will be served, \$1 for children, \$1.50 for adults.

Bridge

The Coronado Club bridge groups will be active during the next two weeks with regularly scheduled activities and a "New Membership" party for the Duplicate Bridge Group. The party starts at 6:30 p.m. Monday, March 14. On the following Monday, March 21, the group meets for regular duplicate play at 7 p.m.

Recently, George (1422) and Mary Lou Arnot won the local Duplicate Contract Bridge tournament. Their scores will compete in the regional contest. If their scores are tops, they will participate in the national playoffs in Chicago next May. Last year's local champs, Walter (7215) and Barbara Howerton, came in second this time.

Ladies Bridge will be played at 1:15 p.m. Thursday, March 17. Call Mrs. Hickerson, 268-7605, or Mrs. Rarrick, 299-9371, for reservations.

The ACF bridge group, which is open to all Club members, will meet at 7 p.m. Wednesday, March 16.

Bowling

The Coronado Bowling Club is sponsoring a Men and Women's Singles Tournament April 2 at Lomas Bowl. Open to all Club members, the handicap tournament will allow 80 percent for women, 70 percent for men. Current averages (21 games) will be used in computing handicap. If interested in the tourney, please contact C. J. Kaspar (4145), C. B. O'Keefe (3126), or O. B. Tjel-tweed (5632) for entry blanks and additional information.

Ski Club

Election of officers will be the business conducted by the Coronado Ski Club at 7 p.m. Monday, March 21. Plans will be made for forthcoming trips, hopefully to be as successful as the recent Red River expedition by the Club. The family affair attracted sizable participation.

Dance Instruction

Registration for the third session of adult dance instruction will be March 21. Instruction will start that evening and classes will meet for 10 weeks. Both beginning and advanced classes will be taught. Gail and Jennifer Ward will instruct ballroom dancing, Holly and Charles Balistrere will teach the Latin sessions. Cost is \$15 per couple for the 10-week courses.

Safety Record Downed With Mishap Feb. 16

Sandia Laboratory's safety record fell Feb. 16 when an employee injured his back while helping load a truck.

A telemetering console, weighing about 1,200 pounds, had been rolled on casters across a loading dock and onto the power gate of a truck and then raised to the level of the truck bed. While being rolled onto the truck, one of the console's casters became stuck in an open space between the power gate and the truck bed. The employee placed his hands in the safety bar installed across the back of the truck and his back against the console and, with a co-worker pulling from the front, applied sufficient force to the unit to move it forward onto the truck bed.

When the employee straightened up he felt a sharp pain in his lower back. After reporting to his supervisor, he was taken to Clinical Medicine Department 3330, examined, x-rayed, and referred to a local clinic for additional treatment. He has recovered and returned to work.

At the time of the accident, Sandia employees had worked 61 days or 2,135,000 man hours without a disabling injury.



PLAN CONFERENCE—W. C. Kraft (2440), center, president of the Albuquerque Section of the American Society for Quality Control, with co-chairmen T. D. Harrison (2514), left, and J. O. Muench (2151) work on plans for the forthcoming conference, "Breakthrough—To Higher Quality at Lower Cost." The conference will be held April 14 at UNM.

Local ASQC Section Planning Quality Control 'Breakthrough' Meet

A number of Sandians, members of the Albuquerque Section of the American Society for Quality Control, are currently planning a one-day conference to be held at the University of New Mexico, Thursday, April 14.

Co-Chairmen of the event are T. D. Harrison (2514) and J. O. Muench (2151). Theme of the conference is "Breakthrough—To Higher Quality at Lower Cost."

Featured speaker will be Dr. J. M. Juran, international authority and consultant on quality control and management practices. Subject of his talk will be "Managerial

Breakthrough." Other speakers include F. A. Lally, Hughes Aircraft Co., "Feedback—Breakthrough to Cost Reduction"; and W. Z. Kehayias, IBM Corp., "Breakthrough to Computer-Aided Quality Control." For this talk, Mr. Kehayias will have a connection to a computer in San Jose, Calif., so that problems from the conference floor may be fed into the computer and solutions received back immediately.

Luncheon speaker will be Dr. M. M. Henning, University of New Mexico, speaking on "Concepts of Excellence and Equality and Implications for American Education."

W. C. Kraft (2440), president of the Albuquerque ASQC, will open the conference and E. H. Draper, Vice President 2000, will present the conference introductory remarks.

Sandians serving on various conference committees include L. E. Snodgrass (2514), R. W. Devore (2110), E. E. Ard (2114), P. H. Bircher (2113), and B. W. Bell (2113). K. J. Crump (AEC) is serving on the finance committee.

Welcome Newcomers

Feb. 21 - Mar. 4

Albuquerque	
Philip N. Banhagel	1322
Veronica G. Dostart	3421
Pilar A. Garcia	3415
Grace C. Murray	3126
Betty L. Straba	2554
Frances M. Thatcher	4574
Richard E. Wallis	1421
Kansas	
Warren Wessel, Lawrence	5633
Oklahoma	
Frederick W. Dippold, Norman	4115

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Sandians Return From Puerto Rico

to Roosevelt Roads Naval Air Station in Puerto Rico because of runway repairs at Piarco. At Roosevelt Roads, an engine in one of the planes had to be replaced, delaying the program a few days. Then the change in schedules made it necessary to obtain new flight clearances from six South American countries. The combination of delays set the program back several days.

By Feb. 17 all clearances had been obtained, and the two aircraft took off on the first of several daily flights to study cosmic rays over the Atlantic in the equator area. Four days later the Sandia plane flew north along the magnetic meridian and landed at Westover AFB in Mass. The next day the Sandia group left Westover for a flight to 53 degrees North latitude, over the Hudson Bay region, and returned to Kirtland AFB.

Equipment aboard the Sandia aircraft included a neutron detector, moderated neutron counter, and two meson detectors.

W. B. Pafford, supervisor of Diagnostic Aircraft Section 7255-1, was the Sandia aircraft mission coordinator. Other personnel aboard the aircraft included J. E. Keith, D. R. Lewis, P. B. Vandenberg, H. F. Sisson, W. L. Bierly, H. F. Ward, M. C. Frettem, D. A. Mayhew, and L. B. Neeley.

A. F. Hutters, supervisor of Diagnostic Aircraft Operations Division 7255, was the Sandia representative aboard the LASL aircraft.

E. G. Connelly, supervisor of Logistics and Support Section 2554-1, arranged for housing and transportation for the 60 participants in Trinidad and then in Puerto Rico.



LASSO ONE and head for the Texas Stomp. The Coronado Club goes Western Saturday, March 26, with the Mexican Buffet and the sagebrush shuffle with the Elton Travis music makers. Jim Pennington (3465) and Bertie Grady (3462) urge you to be on hand about 7 p.m. for the buffet, 9 p.m. for dancing. Cost to members is \$2.50, guests \$3.

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LAB NEWS

MARCH 11, 1966

Sandia's Safety Scoreboard

Sandia Laboratory:

20 DAYS

700,000 MAN HOURS

WITHOUT A

DISABLING INJURY

Livermore Laboratory:

69 DAYS

343,700 MAN HOURS

WITHOUT A

DISABLING INJURY