

HAPPY th SANDIANS!



FORTY-YEAR SANDIA VETERANS in Organization 7000 include (front row, from left) Herb Anderson (7223), Ted Church (7290), Calvin Cox (7137), Bob Statler (7137), Bill Walker (7252), and Jo Davis (7531); and (back row, from left) Stan Reynolds (7535), Jim Winter (7813), Dick Andres (7135), and Chuck Wells (7818). Organization 7000 has 15 employees on roll who joined the Labs before Nov. 1, 1949. Others, not pictured, include Ken Wiley (7135), John Dickinson (7137), Hal Rarrick (7540), and Billy McConnell (7812). Frank Speakman (7411) is shown with another group of 40-year veterans on page four.

Special Issue Focuses on Our 40th Anniversary

Forty years ago today — Nov. 1, 1949 — Sandians officially became employees of the Sandia Corporation, then a subsidiary of Western Electric (now AT&T Technologies, Inc.).

We have a variety of related articles — some serious and some not-so-serious. Among them: several 40-year veterans review their careers; Labs VPs and directors discuss future directions and how they think Sandia's role will evolve; how the thunderbird became our logo; and the pre-1949 days as the Labs "split off" from the Los Alamos Scientific Laboratory and became a separate institution. (And more, as well.)

We didn't want the issue to get too "heavy," so we also included some old "unclassified ads" from the '50s, '60s, and '70s and some old column items from former LAB NEWS editors John Shunny (ret.) and Bruce Hawkinson (3153).

We hope you enjoy the issue.

**Old Photos:
Some Historical &
Some Hysterical
See Pages 10-13**



Forty-Year Sandia Veterans Look Back

Editor's Note: Anticipating this issue that's published on the 40th anniversary of the Labs' management by the Sandia Corporation, we thought it would be interesting to give the 29 Sandians who have been on roll for all 40 years a chance to reflect on their careers. So we sent them all a list of questions and asked them to respond.

Thirteen responded (we assume the others were simply too modest). Some answered only one or two questions, briefly. For others, the memory river flowed long and deep, and several — particularly Ted Church (7290) and Merrill Jones (9215) — sent several pages of answers. We didn't have space to use nearly all of their (very interesting) material, so we excerpted what we thought you'd find most interesting. The fact that we used more material from a few folks simply reflects their more-comprehensive answers.

We did very little editing — just removed a few extra words to save space — because we believe folks who have been around for 40 years or more deserve to answer in their own words. Thanks to all who answered, and congratulations to all 29 for their many years of service.

What is your fondest memory/impression of your Sandia career?

Marcie Samuelson (3428): My fondest memory of my Sandia career is having a personal computer delivered to my office and learning to use it.

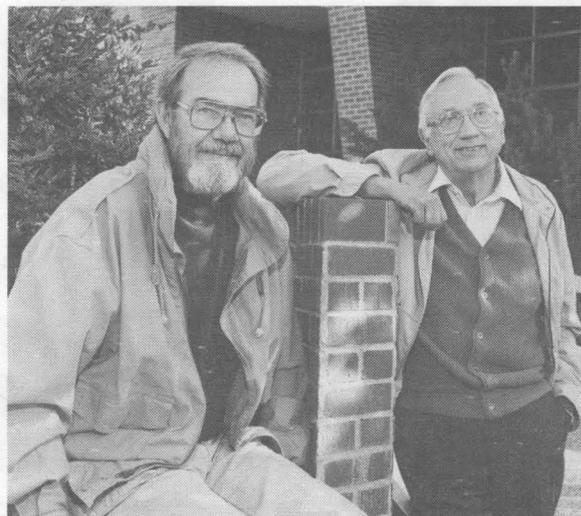
Joe Apodaca (3428-2): When I was promoted to section supervisor. I'm also grateful and privi-

leged to have met and made friends with so many fellow workers.

Roy Crumley (3714): Being accepted for employment in '47 (I came from a very poor family) and being promoted in '66.

Hal Rarrick (7540): The excitement and camaraderie of weapon testing.

Jim Winter (7813): My career began in a service group back in the days of the University of California. This group is now called the Facilities Directorate. My entire career has been in this group and has been a truly challenging and



ORG. 9000's 40-YEAR Sandians include Jack Suttman (9122, left) and Merrill Jones (9215). Jess Rehberg (9214) is pictured on page four.

rewarding experience.

Jess Rehberg (9214): The many friends who have passed on, but who in their years at Sandia shared their wisdom and various philosophies with us: Don Shuster, who was quick at grasping a concept and projecting a solution; W. T. Smith, whose uncanny predictions of forthcoming reorganizations were fabulous; Pop MacCallum, who could and would show one how to fix or make almost anything mechanical; Truitt Blackmon, who brought the mysteries of physics down to a practical level; Ruth Whan, who would listen and then suggest just the right thing to help solve the problem at hand; Fred Edwards, whose Mancos stories are legendary; and many, many more too numerous to name.

Ernie Alford (8161): Sandia's educational aid program helped me complete my college degree at night. I graduated from college on the same day my oldest daughter graduated from high school. It took a while, but I did it.

What is the strangest, funniest, or most memorable work-related event that you can recall during your career?

Ted Church (7290): A strange period in time — During the year or so immediately before the fall of 1949, Sandia became Sandia Laboratory, after being known as Z Division of the Los Alamos Scientific Laboratory. As the future of the enterprise was forecast to be as short as three years

(Continued on Page Four)

This & That

Today's the Day — the 40th anniversary of the Sandia Corporation, managed by AT&T Technologies, Inc. (formerly Western Electric) since November 1, 1949. On that date, Sandia's first President, George Landry, sent a letter to all Sandians informing them that they had become employees of the Sandia Corporation (see complete letter on page five).

We're publishing the LAB NEWS two days earlier than normal to coincide with the anniversary and featuring special material relating to the past and the future. Old photos, a look back by some Sandians who've been on roll for all 40 years, and a look ahead by some Sandia directors and vice-presidents highlight the issue.

An issue like this is interesting and challenging, but lots of hard work. Thanks to all who contributed — literally too many to name.

* * *

Acronyms — Got several responses to my challenge in the October 6 issue to top the worst acronym I've seen recently — WIMPs, for weakly interacting massive particles — but no "toppers." However, several related comments caught my eye.

Ned Godshall (2144) decries the widespread use of the acronym "CD" because it has so many different meanings around the Labs: compatibility document, conceptual design, characteristics and development (report), critical dimension, and compact disk, not to mention certificate of deposit. And John Brabson (5173) says he hopes I live up to my personal acronym "LP" (my initials). One thing I associate these letters with is liquefied petroleum (gas). I'm not sure that's what John meant, but I do admit to being a little volatile, and (on rare occasions) explosive.

* * *

Another Helpful Sandian — A recent call from an anxious high school student was answered by Rod Geer in Community Relations Div. 3163. The student said he needed to conduct an interview with an expert on management of radioactive waste. When asked when his assignment was due, the student answered, "Tomorrow!" Rod contacted Gloria Chavez of Environmental Protection Div. 3202, who not only agreed to talk to the student, but told Rod to give him her cellular phone number so she could talk with him while walking across the tech area. I think that extends the definition of helpfulness.

* * *

A Little Ad-versity — We sometimes get asked why we edit and shorten "unclassified" ads. For several reasons: First, to save space; we limit the ads to one LAB NEWS page, and we're near the limit in many issues. Second is a long-standing policy to eliminate superlatives (which also saves space) because we realize that Sandians sell only "like-new," "fantastically beautiful" and "real-bargain" items. However — believe it or not — we're human, and we may occasionally delete something pertinent or even (Oh, no!) misprint a phone number. If that ever happens in your ad, a friendly call will get you justice.

But — in our defense — it appears that a few of you who send in handwritten ads graduated from the Physicians' Permanship School.

* * *

Retiree Gem — Hap Kindschi, a driver who delivered many a Sandia passenger and visitor before retiring in '71, brought an ad by the office several weeks ago. Hap passed along a little gem that caught my ear: "There aren't enough crutches in the world to handle all of the lame excuses." ●LP

Livermore: Shook Up, But No Damage

Sandia, Livermore, reporter Barry Schrader (8522) says there is no known damage to Sandia facilities there from the Oct. 17 earthquake. The epicenter, south of San Francisco, was approximately 75 miles southwest of Livermore. Many safety features and procedures are in place at Sandia, Livermore, to prevent and minimize injuries and damage from quakes.

Livermore employees definitely felt the quake, though, which several described as a rolling sensation. Several rolls of microfilm toppled from a shelf in a library storage vault, but that was the only noticeable effect.

An earthquake measuring 5.5 on the Richter scale injured 13 Livermore Sandians in 1980 and shut down operations for a short time.

At least one Albuquerque Sandian was in San Francisco when the Oct. 17 quake took place. Joe Tillerson (6346) and his wife, Ruth, were there on a personal trip and were getting ready to leave the Marriott Hotel (south of the San Francisco airport) for dinner when it happened.

Joe says the sliding glass doors between his room and patio were shaken from their tracks and fell into the room, and lamps and other loose items crashed to the floor, but neither he nor his wife was injured.

"The hotel suffered some — but no severe — damage and was turned into a civil defense shelter for several hundred people who were stranded or left homeless," says Joe. "I was amazed," he adds, "that there was almost no panic. People were very courteous and helpful to one another." ●

Congratulations

To Stephanie (7841) and Ken (7842) Kuzio, a son, Elliot Daub, June 23.

To Donna Delaney and Steve Berlage (2858), married in Dubuque, Iowa, Sept. 9.

To Debbie and Ed (7841) Coghlan, twins, Katie and Patrick, Sept. 15.

To Georgia (21-1) and Jim (7815) Matsu, a daughter, Sept. 25.

To Tina and Don (7842) Hardenbrook, a son, Joshua Robert, Sept. 27.

To Rosalie and Scott (5238) Nichols, a son, Anthony Wayne, Oct. 2.

To Cheryl Laird-Wilde and Steve (9216) Wilde, a daughter, Cierra Leslie, Oct. 2.

To Brenda and Jim (7483) Pankey, a daughter, Marisa Jean, Oct. 3.

To Maureen and Dave (7844) Hendrick, a son, Michael David, Oct. 4.

LAB NEWS

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SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO 87185
LIVERMORE, CALIFORNIA 94550
TONOPAH, NEVADA
AMARILLO, TEXAS

Sandia National Laboratories is operated by Sandia Corporation, a subsidiary of AT&T Technologies, Inc., and a prime contractor to the US Department of Energy.

LARRY PERRINE, Editor (505/844-1053)
PHYLLIS WILSON, Assistant Editor (4-7842)
DONNA RIX, Writer (6-6888)
CHARLES SHIRLEY, Writer (6-5542)
RANDY MONTOYA, Photographer (4-5605)
JANET WALEROW, Editorial Assistant (4-7841)
DENISE ARCHULETA, Production Assistant
RUTH GABALDON, Assistant
BARRY SCHRADER, Livermore Reporter
(415/294-2447; FTS 234-2447)

Sandia National Laboratories

Exceptional Service in the National Interest

Presented to American Telephone and Telegraph Company by the employees of Sandia National Laboratories on the occasion of 40 years of continuing, dedicated and enlightened direction of the Laboratories. During that span, and solely as an act of public service, AT&T has answered in full measure President Truman's urgent call to duty in defense of the nation. By its example, AT&T has endowed Sandia and its employees with a commitment to the public interest and to a high standard of excellence in every endeavor. These legacies have served for four decades as the fundamental values of the Laboratories and remain the foundation upon which is built its commitment to the security and welfare of the country and all its citizens. Through the direction of Sandia, AT&T has served its country, and served it well.

On behalf of the employees of Sandia National Laboratories

October 11, 1989

THE WHITE HOUSE
WASHINGTON

May 13, 1949

Dear Mr. Wilson:

I am informed that the Atomic Energy Commission intends to ask that the Bell Telephone Laboratories accept under contract the direction of the Sandia Laboratory at Albuquerque, New Mexico. This operation, which is a vital segment of the atomic weapons program, is of extreme importance and urgency in the national defense, and should have the best possible technical direction.

I hope that after you have heard more in detail from the Atomic Energy Commission, your organization will find it possible to undertake this task. In my opinion you have here an opportunity to render an exceptional service in the national interest.

I am writing a similar note direct to Dr. O. E. Buckley.

Very sincerely yours,

Harry Truman

Mr. Leroy A. Wilson,
President,
American Telephone and Telegraph Company,
135 Broadway,
New York 7, N. Y.

PLAQUE PRESENTED TO AT&T on behalf of Sandia employees includes words of appreciation, entitled "Exceptional Service in the National Interest," on left, and a copy of President Truman's letter (May 13, 1949) to AT&T President Leroy Wilson, requesting that AT&T take over the operation of Sandia, on right.

Eleven of Livermore's 'Forty-Niners'**Sandia Pioneers Recall Early Days at the Labs**

One of the first persons at Sandia's original base in Albuquerque, Les Rowe (ret.), and 10 others who were there by 1949, were at Castlewood Country Club recently for the annual Livermore retirees' dinner. Nine of those pioneers posed for a photo before dinner and paused to talk about the early days of 40 (or more) years ago.

An Army captain in 1945, Les was sent to activate the Albuquerque base with 62 men from a special ordnance detachment from Wendover, Utah, where they had been working on the atomic bombs used at the end of World War II. Their first job was to erect an assembly building brought in from Wendover and a new shop complex attached to it. The assembly building was the one Les had used to build the early bombs.

"Since the war had ended, all the bomb hardware and related materials left over were shipped to us at the base," says Les. "We were still a part of the Manhattan Engineer District. Included in the shipment were five locked file cabinets of classified documents from Los Alamos. However, they didn't send a key or a lock combination. I had the cabinets opened and then made a list of all the classified material." Les thus probably established the first Document Accountability Station at what was then called Sandia Base.

In October 1946, Les ended his military service and returned the next day as a civilian to work as group leader of Z-7, a part of Z Division (see "How Z Division Grew Into Sandia Labs," page fourteen) that worked on bomb design and testing. He transferred to Livermore in 1957 and retired from Sandia in 1970.

Samples From Radioactive Clouds

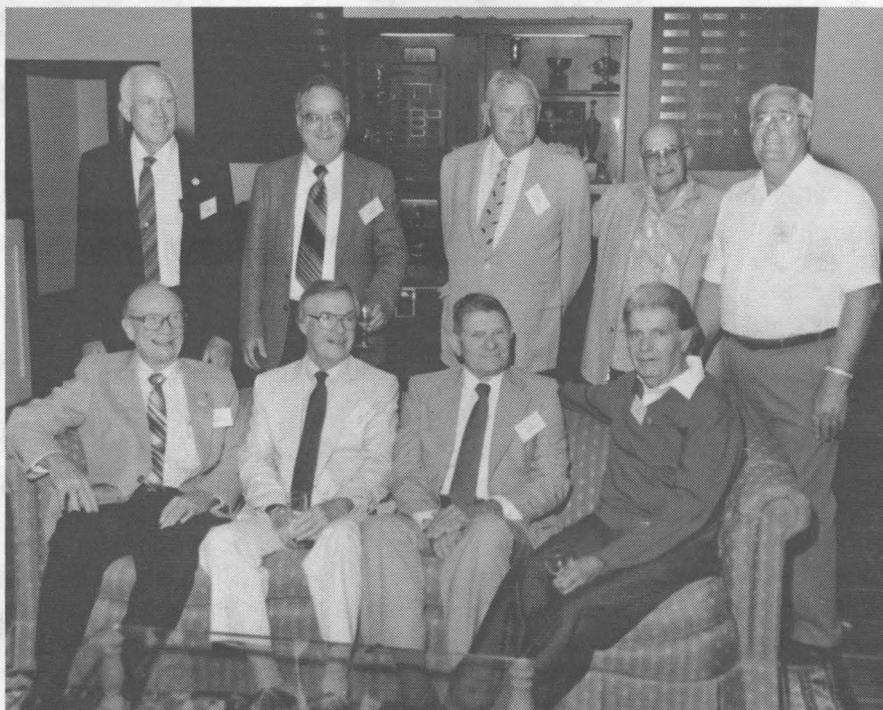
Another pioneer was Bill Jamieson, who started work at Los Alamos in February 1946. Because Bill had experience with radio-controlled targets in the military, he was hired to work on Operation Crossroads, a project in which remote-controlled planes were sent into radioactive clouds to take atmospheric samples. But once on the job, he was assigned to assemble devices used in the sampling work. Soon thereafter, Bill moved to Albuquerque to join Z Division under Glenn Fowler (ret.) and was asked to set up the personnel office there.

Bill and recent Livermore retiree Bob Ware began issuing a mimeographed newsletter in 1949, the forerunner of today's LAB NEWS. In 1957, Bill transferred to Livermore to head the personnel division, then the library and public information. He retired in 1974.

Bombing Range at Los Lunas

Hilton DeSelm joined the fledgling outfit in Albuquerque shortly after Bill, in March 1946. Since April 1945, Hilt had been stationed by the Navy at Los Alamos, working at Salton Sea and Wendover. "They decided to open the base at Albuquerque, so Glenn Fowler, Dale Corson, and I were among the first to go down there in the fall of 1945 to start a small field-test base and reactivate a bombing range at Los Lunas," Hilt says. "I became a civilian in March 1946 and then worked on Operation Crossroads. The Z-1A group was created, with Corson and Fowler as group leaders. Glenn went on to become a vice-president for Sandia, and Dale left in 1947 to teach at Cornell, later becoming president and chancellor of that university." Hilt moved to Livermore in 1961 to become Director of Staff Services; he retired in 1978.

Leo Gutierrez had been discharged from the Navy and was finishing his master's degree at UNM, earning the first advanced degree in electrical engineering from that school, when he applied for a job at Los Alamos. After waiting three or four months for a clearance, he was told to report to work in October 1947. But when he appeared at Los Alamos, he was told he would be



THESE "FORTY-NINERS" who joined the labs 40 or more years ago gathered at Sandia, Livermore's, annual retirees' dinner recently. In front (from left) are Hilton DeSelm, Bill Jamieson, Lee Davies, and Bill Ryan. In back (from left) are Val Black, Bob Ware, Charles Anderson, Les Rowe, and Leo Gutierrez.

sent to the new branch at Albuquerque. The next day, he reported to Bill Jamieson in the Personnel Office. He first worked in environmental testing and later in the design of new weapon components. Leo and his family moved to Livermore in 1956. He became Director of Systems Development in 1963, retiring from that position in June 1984.

Lee Davies started work at Sandia in May 1949 for Hilt DeSelm, in heavy equipment and aircraft liaison. His early assignments involved the handling equipment for the Mark VI, Mark XI, and Mark XII, followed by the Mark XXI. Lee transferred to Livermore in 1958 to manage the Polaris Missile project. He also worked on the Minuteman, Poseidon, Titan and SUBROC missile programs at Livermore. Lee retired in 1982.

Bill Ryan joined Sandia in October 1949, just two weeks before the Western Electric contract took effect, he recalls. He had left the Air Force with a medical retirement, and a friend suggested he apply at Sandia. He began work in procurement. In 1957 he transferred to Livermore into personnel, then back to procurement, eventually retiring in 1979.

High-Speed Photos at Salton Sea

Tom Takahashi joined the company in January 1949. He went to work for Glenn Fowler in high-speed cinematography, photographing aircraft and bomb drops at Salton Sea. In 1954, he joined the telemetry group and moved to Sandia's Point Magoo operation in California for two years, spending a lot of time aboard a submarine on the

Regulus missile program. When he returned to Albuquerque, he worked in arming and firing, with some time spent at the Nevada Test Site. In 1966, Tom volunteered for an assignment as a resident engineer in Hawaii; there he worked for Department Manager Cliff Selvage for two years (Cliff retired from Livermore in 1989). In 1968,

Sandia Base got five locked cabinets of classified documents, but no key or combination.

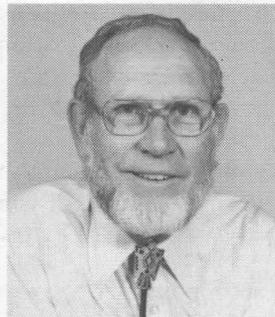
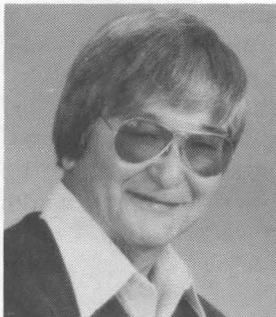
Tom came to Livermore and worked at LLNL in arming and firing. He moved across the street to Sandia's Area 8, where he worked in the firing chambers and then on a project in Gayle Cain's division. Tom retired in 1982.

Walt Maupin also joined Sandia in January 1949, coming from St. Louis, where he had been with AT&T Long Lines. While in the service, he had worked on the Manhattan Project at Oak Ridge. Walt was an electrical engineer, initially in the surveillance division and then in a project engineering division. In April 1957, Walt moved to Livermore to work in Frank Murar's section on thermal batteries. Other assignments included the Hardtack series at Eniwetok and Bikini atolls, as well as work at the Nevada Test Site. He retired in December 1985.

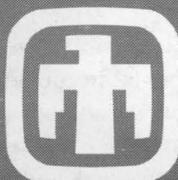
Two Already Chronicled

Two other retirees, whose stories appeared previously in the LAB NEWS, were also at the retiree dinner. Val Black went to Los Alamos in January 1947 and moved to Albuquerque in early 1949 (LAB NEWS, April 24, 1987). He transferred to Livermore in 1962 and retired in 1987. Bob Ware joined Sandia in June 1948, transferred to Livermore in 1959 and retired in January 1988 (LAB NEWS, Jan. 15, 1988).

Charles Anderson joined this very special group for a photograph as well. He started in October 1947 with Sandia. He transferred in July 1958 to Livermore and retired in 1980. After spending some time back in New Mexico, he recently returned to California. ●BLS



TOM TAKAHASHI (left) and Walt Maupin are "forty-niners" who attended the retirees' dinner, but couldn't make the group photo.



**SANDIA
LIVERMORE NEWS**

(Continued from Page One)

Vets Look Back

and maybe as long as eight years, the Applied Physics group settled into the old girls' school (current KAFB-West Officers Club). . . . At one point, we expected to see Sandia Laboratory set up in or near Colorado Springs, perhaps Salida, or even Phoenix. Looking back on that period now suggests a very fluid and unsettling situation, certainly not something on which to base a career as we now understand the word. Then, rather suddenly, 40 years ago, Sandia Laboratory became Sandia Corporation. The "manufacturing attitude" brought by Western Electric personnel turned out to be . . . "unsettling" for those of us who came from the old LASL Z Division era, as short as it actually was.

Stan Reynolds (7535): Memorable — Watching the atmospheric after-effects of the high-altitude nuclear tests at Johnston Island. Beautiful, awesome, and food for thought!

Hal Rarrick (7540): Two things. (1) The first day I came to work, I was shown some metal pieces and was told they were worth \$5 million. They were uranium and plutonium components. (2) Being the test program manager of the truck and train wrecks [full-scale crash tests of spent nuclear fuel casks mounted on tractor-trailer rigs and on railcars, conducted in the mid-'70s].

Jim Winter (7813): My most memorable event is one of a personal note. I met a young lady working in the Purchasing Section. She became my wife and a mother of five.

Ernie Alford (8161): Observing the first "shot" I worked on at the Nevada Test Site — hard to describe — you have to experience it. You see the burst of light and feel the heat at the same instant, and then watch the shock wave rolling a dust cloud toward you.

Merrill Jones (9215): The Physical and Electrical Standards organization (now Dept. 7240) was formed under John R. Townsend in early 1953. I believe that the first person in that organization was Joe Moody, and I was the second. When Mr. Townsend called me to his office and announced my new assignment as a section supervisor, I — young and brash — declared that I was surprised to be told rather than asked. He, somewhat startled I think, then asked me whether I would like the job, and I readily accepted. The years that followed, as we built the Standards Laboratory into one of the finest in the country, were challenging and exciting ones for me.

Comparing Sandia today to Sandia 40 years ago, what is the biggest difference/change, other than the size?

Marcie Samuelson (3428): Ordering our supplies from Just-in-Time. No more "Free Stores." Writing purchase orders and obtaining our P. O. numbers over the phone. Getting Sandia computerized.

Joe Apodaca (3428-2): Self-improvement and educational opportunities that are given to employees in general today.

Calvin Cox (7137): Type of work. Although Sandia is still weapon-oriented, it has contributed greatly to many other fields.



TWO 40-YEAR VETS work at Livermore: Ernie Alford (8161, left) and Frank Duggin (8534).



MORE 40-YEAR SANDIANS (from left): Howard Devaney (2542), Joe Apodaca (3428), G. C. Hollowwa (3411), Marcie Samuelson (3428), Jess Rehberg (9214), Frank Speakman (7411), and Fred Deiber (2852). Other 40-year employees who are not pictured include Roy Crumley (3714), Billy Duggin (1221), Zachary Ortiz (5213), and Joe Sanchez (3424).

George Walker (7252): One of the main functions of Sandia 40 years ago was the production of weapon assemblies.

Ted Church (7290): The biggest change that I see is in the administrative side. As new technology has brought the benefits . . . the administrative burden has expanded to take up the slack and then some. Now, with the current improvement in environmental conscience and the impact of past transgressions, the bureaucracy seems about to explode in the rush to make all things pure.

Stan Reynolds (7535): Higher proportion of women, MSs, and PhDs in technical staff positions and more emphasis on energy systems and non-nuclear weapon programs.

Merrill Jones (9215): The biggest change that I see in Sandia is in the degree of openness with our knowledge and skills, in both our internal and external relationships. Paradoxically, we seem to be much more open in communicating with industry and the world at large, and at the same time to have a more guarded approach between our own organizations. The latter is more of a feeling than something I can substantiate with hard data or examples. But early on, there was more of an atmosphere of all of us together being involved in a program of crucial importance to the nation; if we didn't solve the problems, no one would, so we all shared freely and pulled together. Now there seems to be more of an attitude of competition, and sharing in the same way is made difficult by our size and the diversity of our interests.

If you could make only one suggestion to improve Sandia (in whatever way), what would it be?

Calvin Cox (7137): Recognize technical experience more.

Ted Church (7290): Obtain more . . . control of Sandia's future and activities by making the rules which it follows. In "making the rules," I mean participate in the rule-making of the orders and regulations in Washington before they are enshrined in the concrete of the Federal Register. We have mastered this art in the technical arena. Systems and components are developed to functional concepts and specifications that we have had a large part in defining. We need to have a similar approach on the business and indirect side of our activity. ES&H regulations . . . are not the only ones to address. Procurement, accounting, and

other business procedures are slowly strangling our creativity. Stepping into this arena involves politics, but must be done. Sandia's experience in lack of self-aggrandizement and interest in simplicity, truth, and directness in its dealings can contribute immensely to the way DOE does business and perhaps have an impact on other parts of the government and Congress.

Frank Speakman (7411): Improve our ethics, especially our drivers.

Stan Reynolds (7535): Provide a more systematic, better-defined and publicized route and procedure for advancing TA, STA, and TSA personnel to MTS status. Frequently these positions as perceived as dead-end paths, and many promising and experienced people leave Sandia instead of "fighting the system." [Editor's Note: Effective today, Sandia TSAs (Technical Staff Associates) become MTSs (Members of Technical Staff) under the new classification system that was explained in our October 20, 1989, article. A main reason for establishing the new system, according to Executive VP Orval Jones (20), is to give technical employees a unified and visible career path.]

Hal Rarrick (7540): Use other criteria in addition to grade point average in selecting staff members and technicians. Students from small schools or who work, etc., may have high GPAs after their first or second year, but not overall.

Merrill Jones (9215): My one suggestion to improve Sandia now would be: Keep working diligently at communication, at and across all levels of management and staff.

Anything else about your career or Sandia experiences that you think would be of interest or helpful to Sandians?

Roy Crumley (3714): Don't stay in one place too long. Sandia offers a lot of opportunities.

Frank Speakman (7411): Keep taking courses and expand on your education.

Hal Rarrick (7540): I have had a very interesting and varied career in weapons, radiation safety, field test operations, test program management, uranium mill tailings cleanup, safeguards, and development testing. Adaptability is the key to career satisfaction.

Jim Winter (7813): It is interesting to reflect back on the fantastic growth of the Laboratories and (Continued on Next Page)

Forty Years Ago Today

The Day We Became Sandians

Here is a reproduction of the November 1, 1949, letter informing employees that they had become employees of the Sandia Corporation. The letter is from George Landry (dec.), Sandia

President from 1949 to 1952. He had been operating manager at Western Electric before coming to Sandia. After leaving the Labs in '52, he returned to Western Electric as Vice-President.

SANDIA CORPORATION
SANDIA BASE, ALBUQUERQUE, N. M.

November 1, 1949

George A. Landry
President

TO ALL EMPLOYEES:

Welcome and greetings to all of you who today become employees of the Sandia Corporation.

I think you already know that the University of California asked to be relieved of the responsibility of management of the Sandia Laboratory and that at the request of the Atomic Energy Commission, the Western Electric Company and the Bell Telephone Laboratories agreed to assume this responsibility. The Sandia Corporation - a subsidiary of the Western Electric Company - was organized for this purpose and the new Corporation takes over its duties as of today.

Every possible effort will be made with your full cooperation to accomplish the changeover in the management smoothly. I know I speak for all supervisors, in expressing the utmost confidence in the personnel of the Laboratory, and that all of us will continue to expend our best efforts to carry on the fine performance of the past.

I know that you are very much interested in what the changeover from the University of California to the Sandia Corporation will mean in the way of changes in management and personnel policies and practices. It is and will continue to be our desire to treat everyone with complete fairness and consideration. All of the newer members of your management staff have had many years of experience in Western Electric and Bell Laboratories where the aim is to have personnel policies which are among the more progressive in industry. It will be our purpose to maintain this progressive leadership in the Sandia Corporation. Except for the State of California pension plan which of course must be replaced, no changes will be made until there is time to study each item carefully. A replacing pension plan will be announced as soon as possible.

You have done an outstanding job in the relatively short time that the Sandia Laboratory has been in operation. My associates from Western and Bell Laboratories and I are very proud to join you in this important task, and I hope in time to meet all of you and to become acquainted with you and your work.

Sincerely,

George Landry

(Continued from Preceding Page)

Forty-Year Vets Look Back

the City of Albuquerque. Most Sandians may not be aware that housing in the Albuquerque area in the late '40s and early '50s could not provide adequate quarters for our expanding staff, so the company became landlord. We managed the housing area, which consisted of 401 family units and 97 dormitory rooms with full maid service. As housing became available in the city, the Laboratories turned the housing area back to the military — this was accomplished in August of 1960.

Merrill Jones (9215): When I came to work here in 1948, my intentions were strictly short-term. I needed to further my education. I would, I said, work here long enough to do that, then go somewhere else and get a good job. The place was run then by the University of California. Surely they would encourage me in my educational objectives. To meet the requirements for attendance at

UNM as a resident, I had to live in New Mexico for a year before starting school. By the time that first year had passed, the University of California was gone, and I was working for Sandia Corporation under the policies of the Western Electric Company. At that time, the education of employees was not one of its priorities. Fortunately, my superintendent (there were no directors then) was a kindly man, Harvey Pagenkoff, who arranged a part-time work schedule for me so that I could also attend the University. The struggle seemed long and hard, but I did get the degree I sought, and I did not have to go anywhere else to get that good job. Later, as the Bell Laboratories influence grew at Sandia and educational policies changed, I was able to earn an advanced degree at UNM under the Technical Development Program, (partly) on company time. ●LP

Vote Was Close

Sandians Chose Thunderbird Logo In 1955

It can be risky to pick an important symbol by popular vote, but that's how Sandia chose the thunderbird. In the summer of 1955, when more than 1000 Sandians had become eligible for a five-year service award, the Public Relations Division invited employees to submit sketches for a pin — finalists to be chosen by secret committee and a single design then selected by Sandians' votes.

The LAB NEWS article announcing the contest cautioned entrants that "variations of the atomic nucleus design, such as the one used in the AEC seal," would not be suitable because Sandia did the non-nuclear part of weapon development. But that didn't deter one of the 200-plus entrants from submitting a design based on a mushroom cloud.

The four final designs were drawn in finished versions and published with a clip-out ballot in the LAB NEWS. Although the mushroom cloud was not among the finalists, one of them did feature a bomb. The winner — by a margin of 18 votes out of more than 1000 — was

Clyde Walker's (5212) pentagonal design, which included a turquoise-enamel thunderbird on a copper background.

"The thunderbird is a typical Southwestern symbol," says Clyde, "and it has a connotation of tribal protection — it was a very symbolic image to the Indians. The direction of the bird's head is significant. I had read enough about Indian folklore to know that the head was turned the way that means protection — though I don't remember now what the other meanings could be."

Too Complex to Print Well

The pin became a logo, but the logo's complexity — requiring finely drawn lines — made it a problem to print, says Jack Suttman (9122), who supervised the Graphic Design Section in the early '70s (and who also designed the LAB NEWS "flag" that first appeared in 1970 and is still used on the first page of each issue). So the next step was to create a second-generation logo, keeping the thunderbird and pentagon, but placing them inside a square. Jack recalls that the five sides were generally believed to stand for something, but people usually couldn't remember what. (Clyde says he used a pentagon for the pin merely to symbolize five years of service.)

The latest change came when, about the same time AT&T was simplifying its logo, Sandia followed suit. No voting this time — Jack's section got the redesign job. The new logo, a less-complicated thunderbird in a basically square frame, took its place during a general overhaul of letterhead and similar material, says Jack. It began appearing on company publications about 1970 and is still familiar to Sandians as an instantly recognizable emblem of the Labs. ●



Early thunderbird logo, closely resembling Clyde Walker's (5212) design for an award pin.



Second-generation logo, used until 1970, streamlined Clyde's design.

Large Staff Looks at Sandia's Future

Energy, Environment, Economic Competitiveness, And Education Seen as Key Issues

"What major changes do you foresee for Sandia in the 1990s — and how will these affect your operations?"

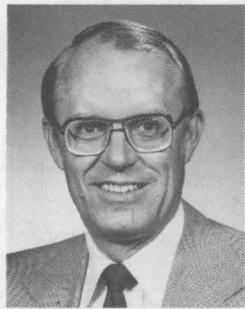
That's the question LAB NEWS recently posed to Large Staff.

In their responses to the question, members of Large Staff agreed that in the 1990s Sandia will face exciting new challenges in an ever-growing number of nationally important areas, such as energy, the environment, economic competitiveness, and education.

They also agreed that, at least for the next decade, the development of safe, secure, and reliable nuclear weapons will continue to be Sandia's primary mission. But how we handle that responsibility may be significantly affected by changes in the international political climate, particularly by new arms-control agreements and nuclear testing limitations.

Perestroika and the Stockpile

"Assumptions about the future of US nuclear weapon policy are difficult to make with any great certainty," says Executive VP **Orval Jones** (20). "Nevertheless, I believe we can expect the future to be significantly different as the nation continues to explore 'glasnost' and 'perestroika' with the Soviets."

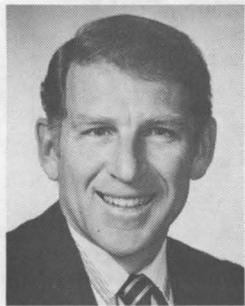


ORVAL JONES

It's highly probable that one effect of the new international political climate will be a reduction in the size of nuclear stockpiles.

"But," says Orval, "our weapon-development work load is more likely to be increased than decreased by such a reduction. Substantial reductions in stockpile size will place new requirements on maintaining a strong deterrent with those weapons remaining. Reliability and safety will become increasingly important, and stockpile survivability will become critical. In a world of reduced superpower tension, there will be less tolerance of risks for reasons of operational necessity or readiness."

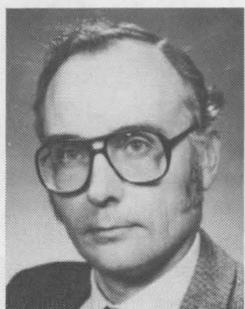
John Crawford, VP of Livermore Programs 8000, agrees with Orval: "Sandia has traditionally been the national laboratory that pays the most attention to the stockpile — through surveillance, SIPs [Stockpile Improvement Programs], retrofits — and this role will be even more important in the next decade when aging warheads will need to be replaced with safer, modernized designs that can meet more demanding accountability, survivability, and quality assurance standards."



JOHN CRAWFORD

A danger that must be guarded against, he notes, is that "nuclear weapons could come to be seen as a 'mature technology' and that our sponsors will have little interest in supporting a viable stockpile. But as long as there is a nuclear stockpile, it should be maintained in absolute first-class condition with the highest standards of safety, survivability, and reliability."

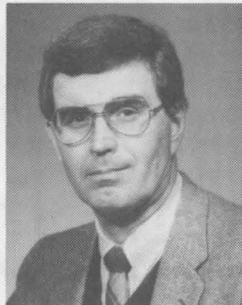
Unfortunately, in the public's view, the importance of maintaining a safe, secure stockpile waxes and wanes with changes in the political climate, says **Jack Wirth**, Director of Electronic Subsystems 2300. "I



JACK WIRTH

suspect it's on a downturn for at least the next decade, and I expect to see continuing downward pressure on nuclear-weapon funding."

Roger Hagengruber, VP of Exploratory Systems 9000, also sees public perceptions of the international political climate affecting the Labs' work: "The public senses new opportunities to assure global peace at the same time that it feels uncomfortable about the strength of the economy. The public expects the government to be effective in capitalizing on these opportunities and in increasing its cost-effectiveness — all government institutions, including Sandia, will be expected to be part of the solution, not part of the problem."



ROGER HAGENGRUBER

"Our work in technologies to facilitate new arms-control agreements and the rapid introduction of innovative technologies in conventional, as well as nuclear, weapon systems will be important in satisfying those public expectations," says Roger.

Helping to verify arms-control treaties is the primary activity of Monitoring Systems 9200. Director **Bill Myre** explains that "Sandia has a long history in this field and currently has the largest treaty verification R&D program in the country."

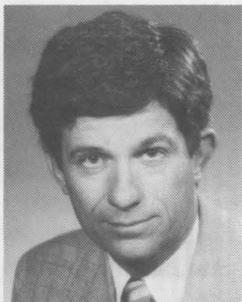


BILL MYRE

"I recall Jack Howard [former EVP] telling me in 1966 that we should work with the (then) new agency, ACDA [Arms Control and Disarmament Agency], 'to be prepared in case peace should break out,'" says Bill. "In view of the current political climate, it seems he was very wise — I foresee a period of continuing activity and excitement as we try to keep ahead of, or at least not too far behind, the negotiations and, at the same time, try to transfer our experience to other organizations entering the field."

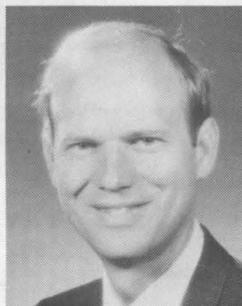
Tighter Defense Budgets Likely

Tighter budgets also concern **Everet Beckner**, VP of Defense Programs 5000. "In addition to managing tighter budgets, we're going to need to stand ready to respond to frequent changes in program plans, especially in nuclear weapon programs where there will almost certainly be changes dictated by the international political climate."



EVERET BECKNER

Shortfalls in defense funding in the 1990s will force more cost-effective solutions to defense problems, says **Pace VanDevender**, Director of Pulsed Power Sciences 1200: "During the '70s and '80s, Sandia invested in pulsed power — the lowest-cost form of directed energy. We can now apply that technology to aboveground testing on Saturn and Hermes III to satisfy our present commitments. It can also be applied to PBFA II [Particle Beam Fusion Accelerator] and the Laboratory Microfusion Facility to prepare for



PACE VANDEVENDER

future requirements through inertial fusion.

"The cost-effectiveness of this technology," Pace says, "will be attractive to new sponsors in directed-energy weapons and electromagnetic launch to space. Commercial spin-offs that would enhance America's economy might also become possible — if regulations can be changed to permit the technology transfer."

Rick Wayne, Director of Component and Systems Research 8400, also considers the effects of tighter budgets on his operations: "The direction for our tritium responsibility is very clear. We are going to be working very hard to tie our materials science and modeling capabilities much more directly into applications. At the same time, we intend to reduce the cost of this program substantially by concentrating on determining what the real requirements are and making sure we meet those needs."

"I believe this mode of operation will be essential in the '90s, as resources for our primary mission become smaller."

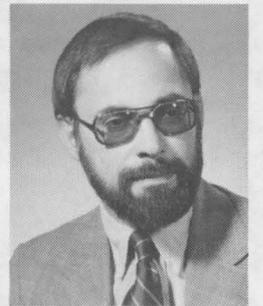
Quality Initiatives Stretch Resources

"One way of stretching our resources," says Orval, "is to work more efficiently and effectively — not only internally, but in partnership with the production complex."

"The new quality initiatives we are undertaking will help us prevent — rather than fix — problems, and help us understand how each of us adds value as work passes through us to our immediate customers."

John Crawford also sees help for budget squeezes through quality initiatives: "We must meet increased demands on staff and resources by concentrating on the truly important issues and doing our jobs 'right the first time' without resorting to retrofits, rework, and multiple design iterations."

"Quality initiatives are absolutely necessary to our success," says **Gerry Yonas**, who heads the Technology Transfer and Special Projects Directorate (6100). "But they should not be applied in a way that drives out innovation and creativity. We'll have to take risks, if we are to make advances in science and technology — but we will have to manage that risk appropriately."



GERRY YONAS

'May You Live in Interesting Times'

Glen Cheney, VP of Component Development 2000, sees some new threats related to nuclear weapons that Sandia may be called upon to address. "Despite the steady trend toward decreasing superpower tensions, nuclear weapons are not going to disappear." He believes, though, that fewer weapons are likely to be needed in the future.

"Sandia will continue to be called upon to preserve nuclear weapon engineering technology and to protect the nation from technological surprise," he says. "But a more credible threat is likely to come not from confrontations between the superpowers, but from emerging nuclear



GLEN CHENEY

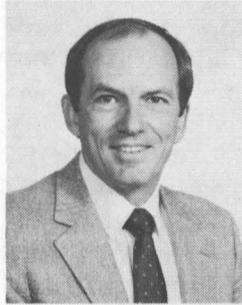
powers with — by our standards — primitive delivery systems. Coping with a few missiles from a third-world madman or a nuclear terrorist are real threats just now looming on the horizon.”

Glen predicts that the need for R&D in matters involving national security will continue, but “with greater emphasis on intelligence gathering and defense against terrorists and emerging nuclear powers.

“There’s an old Chinese saying, ‘May you live in interesting times,’ ” he notes. “Well, the times are surely interesting — and likely to become more so.”

‘Foray with the Four E’s’

Other challenges Sandia faces in the next decade are identified by **Dan Hartley**, VP of Energy Programs 6000, in what he calls “Foray With the Four E’s,” a phrase he used in an editorial forecast for *Environment Week* about six months ago.



DAN HARTLEY

“In the ‘60s,” explains Dan, “we worried about Environment; in the ‘70s, Energy was twice a crisis; in the ‘80s, Economic competitiveness forced a global view.

“Now, we come to the ‘90s and are faced with interrelated problems in Everything above. The only way we’ll be able to adequately address the problems of the ‘90s is by understanding the intimate couplings among energy, environment, and economic competitiveness — I am convinced that what drives our nation will drive Sandia in the coming decades.

“Today, I would modify that forecast by noting that environment is no longer an issue waiting for the ‘90s; it has leapt into our Labs’ culture with a vengeance — and it is *not* going away.

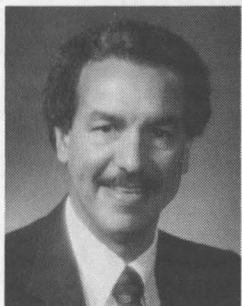
“We must learn how to use our resources at Sandia to solve the nation’s environmental problems — which are also intricately related both to the weapon programs and the energy programs.

“During the six months since I wrote that editorial forecast, we have also totally restructured our technology transfer function to make a quantum leap forward in aggressiveness, openness, and willingness to work more closely with industry. This will require Sandia facilities outside the classified area, staff to support visitors, and research programs developed with users in mind. It’s already happening.

“My final modification to the forecast,” adds Dan, “would be to add another ‘E’ — Education. I see education hitting us twofold: first, we’ll be getting much more involved in helping support the nation’s educational infrastructure; second, I hope to see a renewed emphasis on continuing education among our staff as we strive for continuous improvement in everything we do.”

Environment Won’t Wait

Nestor Ortiz, Director of Environment, Safety, and Health 3200, is especially aware that environment is no longer an issue waiting for the ‘90s: “I



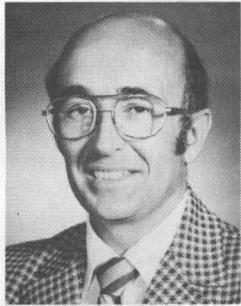
NESTOR ORTIZ

foresee an increased DOE emphasis on full compliance with all ES&H laws and regulations,” he says. “Special emphasis is going to be placed on protecting the environment and human health.

“I am confident Sandia will become a leader in conducting its operations in a manner that minimizes adverse ES&H impacts and maximizes ease of regulatory compliance.

“New initiatives in environmental and waste management research,” says Nestor, “are going to help us reach these goals — at Sandia and at other DOE sites.”

Ron Detry, Director of Engineering Design 8200, comments that “Sandia’s mission has broadened from almost exclusively weapons work to include many other challenges dealing with problems affecting national security — environmental cleanup is one of those challenges.

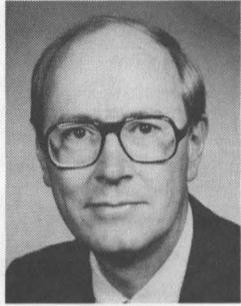


RON DETRY

“In the next decade, we’ll see increased attention to problems of the environment. For my organization, that means developing processes in the Model Shops that involve fewer toxic or hazardous materials or effluents, and a very proactive program of continual improvement of the ES&H systems in the Tritium Research Laboratory.

“Our improvements must keep pace with the changing expectations of our neighbors and the taxpayers who fund us.”

Dick Lynch, Director of Nuclear Waste Management and Transportation 6300, is also mindful of the inter-relatedness of energy, environmental issues, and economic competitiveness. “In the next decade, the US must resolve the tension between manufacturing goods at competitive prices and the imperative to protect the environ-



DICK LYNCH

ment. The difficulties within the Nuclear Production Complex are but one example of this tension.

“Today, Sandia is heavily involved in the WIPP [Waste Isolation Pilot Plant] and Yucca Mountain Repository Projects. We’re seeking similar technically significant roles in the issues of chemically hazardous materials and waste.

“Our aim,” Dick continues, “is to complete technically valid evaluations and bring on line new technologies in the 1990s that will help government and the concerned public find mutually acceptable solutions.”

Sandia is exceptionally well positioned to promote the development, growth, and acceptability of nuclear energy to meet national needs, says **Bill Snyder**, Director of Exploratory Nuclear Energy Systems 6500. “We have an extensive nuclear technology experience base going back to the early 1960s and have developed international leadership in many areas. In addition to our ongoing safety research programs, we’re emphasizing projects to improve the reliability and useful life of present- and second-generation plants through alliances with government agencies, other federal laboratories, and private industry.



BILL SNYDER

“We’ll use our unique capabilities in research, experimentation, and engineering testing to improve technology for plant design and for safe, reliable performance.”

Nuclear facilities in Tech Area V will continue to be the focus of Sandia’s nuclear technology development programs in the interests of national security and energy availability, says **Dave McCloskey**, Director of Nuclear Energy Technology 6400. “The facilities will also continue as a unique national resource for simulating neutron and gamma environments essential to the research, development, and certification testing of hardened weapon systems.



DAVE MCCLOSKEY

“A major change over the next ten years,” says

Dave, “will be modernization of existing facilities and development of new facilities to maintain and expand aboveground test capabilities.

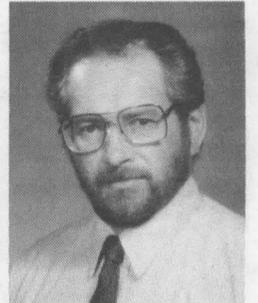
Fred Vook, Director of Solid State Sciences 1100, sums up Sandia’s expected “foray into the four E’s”: “In the future, Sandia will increase its scientific and technological contributions to the nation’s security through expanded programs in economic competitiveness, environmental restoration, and educational cooperation — in addition to our core programs in defense and energy.



FRED VOOK

“We will have increased interactions with industrial and university consortia in the co-development of science and technology that has high potential for commercialization. These interactions will increase our needs for unclassified laboratory and office space.”

In short, which is the way **Ed Barsis**, Director of Computer Sciences and Mathematics 1400, puts it — “Sandia will face many new challenges. To prosper, we must continue to live by our wits and plan farther ahead.”

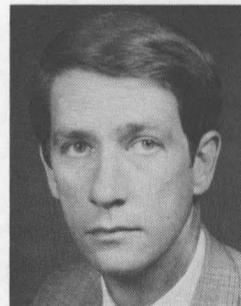


ED BARSIS

Bullish on Sandia

“I’m bullish about Sandia’s role in all of this,” says Dan Hartley. “The challenges of all the E’s meet our culture — Engineering — and we have the foundation of our technical programs already established in remarkably relevant areas. All we need to add is the creative energy of our people.”

Virgil Dugan, Director of Advanced Energy Technology 6200, is equally bullish on Sandia’s future. “I see Sandia being increasingly recognized as a resource of exceptional national value and being asked to contribute technological solutions to an expanded list of issues critically important to the nation. These may include responsibilities such as providing adequate supplies of fresh water and finding means for dealing effectively with the toxic-waste products of our civilization.



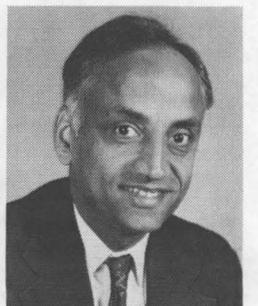
VIRGIL DUGAN

“In addition, Sandia should have the opportunity to take a technological ‘Giant Step’ in dealing with the issues of adequate supplies of energy. A visionary example of this may be the development of a new catalyst that will allow the direct conversion of carbon dioxide to a hydrogenated liquid fuel within low temperature and pressure boundaries and with process energy provided by sunlight.

“In all these activities,” notes Virgil, “we will probably become more international in our perspective and more interactive with the industrial community.”

New Directions for Research

Venky Narayanamurti, Vice President of Research 1000, is also optimistic about Sandia’s future and expects to see some new directions for the Labs’ research: “As the political and economic climates change, I expect research to play a major role in defining new directions important to Sandia’s future,” he says.



VENKY NARAYANAMURTI

“Economic competi- (Continued on Next Page)

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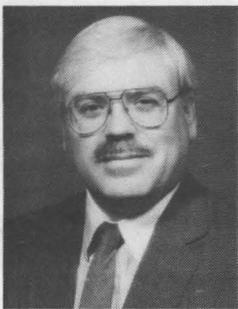
Large Staff Looks at Future

tiveness will be an important arena on the national scene, for example, as will alliances with US industry involving national labs and universities.

"Our work with SEMATECH on the SETEC [Semiconductor Equipment Technology Center] contract is an excellent example of this. Waste minimization, materials processes, robotics, computer modeling involving massively parallel computers, and optoelectronics will all be important. Inertial fusion with light ions is likely to make substantive progress towards ignition in the next few years.

"I would like us to be nimble and open to change," says Venky, "and able to pursue new technological directions important to our future."

Some of those new technical directions may already be taking shape in Materials and Process Science 1800. "Changes in materials and processes required to meet environmental regulations will provide exciting scientific and technological problems in our area," says Director **Bob Eagan**.



BOB EAGAN

"Our capabilities to predict the reliability of components — based on understanding the behavior of materials — must improve as new manufacturing processes are developed and applied.

"We expect to meet these challenges in the '90s by attracting exceptional personnel to the materials organizations," notes Bob.

New technological directions may also be taking shape in Semiconductor Components 2100. Says Director **Harry Saxton**, "During the '90s, we will see an ever-increasing and pervasive impact of electronics upon the systems we design and on our workplace. Much of this growth in importance will be fueled by exciting new microelectronics capabilities — not only in evolutionary advancements in silicon integrated circuits, but also in revolutionary developments of compound semiconductors, optoelectronics, radar, and high-speed logic devices.



HARRY SAXTON

"We'll also witness the use of microelectronic technologies and processes to design and fabricate smart sensors and highly miniaturized electromechanical devices to serve a myriad of applications ranging from checking the health of weapons to monitoring the environment," notes Harry.

The Labs' new emphasis on tech transfer may also affect the direction of some research. Says Gerry Yonas, "The need to improve US

competitiveness in world markets will encourage more government sponsorship of R&D in areas likely to develop science and technology with high potential for commercialization."

New Directions in Communications, Too

Larry Bertholf, Director of Computing 2600, sees some exciting new directions for communications in Sandia's future: "I believe we will become much better communicators. This will occur in all aspects of our work — peer to peer, upward and downward, between our major locations, within the nuclear weapon complex, and beyond. It will be realized by significant attention to interpersonal relations, perhaps a flatter organization structure, and by major improvements in the technology we use for computing and communications.

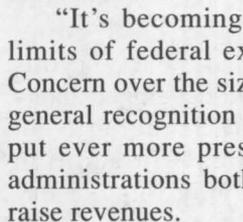
LARRY BERTHOLF

"We'll capitalize on industry standards and modern equipment for voice communications, video, high-speed data communications, and computer operating systems. We'll have newer, more efficient, and more standard computer systems for office automation, work stations, and centralized facilities.

"Finally," notes Larry, "we will also be able to communicate effectively between voice and data systems, administrative and scientific systems, open and secure partitions. Our Livermore/Albuquerque interconnections will set the standard for efficient, transparent, high-speed voice and data communications."

Managing Change

To help Sandia anticipate change, Org. 100 is moving on several fronts, says Controller **Paul Stanford**: "A strategic planning support group has been formed, and is actively engaged in facilitating planning efforts throughout the Labs — from Small Staff, to activity committees, to organizations. Our aim is to institutionalize strategic planning as a management ethic at Sandia.



PAUL STANFORD

"It's becoming increasingly clear that the limits of federal expenditure are being tested. Concern over the size of the federal deficit, and a general recognition of the need to reduce it, will put ever more pressure on Congress and new administrations both to reduce spending and to raise revenues.

"Reductions in federal spending will almost inevitably mean reductions in defense spending and increasing requirements for accountability in the defense spending that is done," continues Paul. "Sandia will capitalize on its differentiating strengths to serve other, more broadly defined national security needs, and the funding that comes from those sources

will also have to be closely accounted for.

"We're supporting and participating in groups like the Ad Hoc Committee on Project Management (the so-called "Mauney Committee") that are examining the ways in which Sandia has done business and recommending ways to improve Sandia's flexibility and effectiveness in the future.

"We are in the midst of totally revamping the financial reporting and management information system," Paul adds. "Our aim here is to create a system that will support management at the Labs with timely, flexible, and accurate financial reports and will allow us to meet the stringent accounting requirements placed on us by the DOE and our reimbursable-project sponsors."

Administrative management of the Labs will continue to address the challenges of intense domestic legal and regulatory changes, says **Dennis Roth**, VP of Administration 3000.

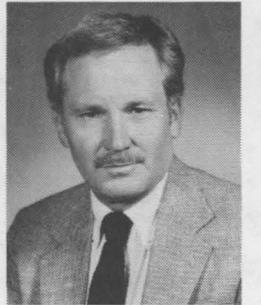


DENNIS ROTH

"Pressures can be expected to continue to modify the basics of the DOE-AT&T contract; to implement both the letter and spirit of all safety, health, and environmental legislation; to strictly adhere to federal government procurement regulations; to proactively address personnel security assurance and a drug-free workplace; and to recognize the importance of a culturally diverse work force and the demographic imperative.

"The next ten years," adds Dennis, "will result in changes much greater than the last forty."

Diversity of programs will complicate the process of management in service organizations, says **Herb Pitts**, Director of Information and Communication Services 3100. "Collaboration between the programs-side and the service-side will increase in importance, and service organizations will find new ways to deliver the products to customers," says Herb.

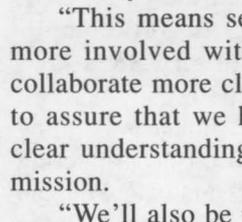


HERB PITTS

"New technology will make an increased commitment to the training of all of our people necessary. Breadth of capability will be as important as depth."

Challenges for Safeguards and Security

"Through the 1990s, our Safeguards and Security program will be faced with the challenge of dealing with increased threats to sensitive information and materials from adversary nations while, at the same time, supporting other efforts to transfer technology to increase our national competitiveness," says **J.D. Martin**, Director of Security and Facility Support Services.



J.D. MARTIN

"This means security people must become more involved with the technical mission and collaborate more closely with the technical staff to assure that we have a balanced view and a clear understanding of all aspects of the Labs' mission.

"We'll also be making more use of technology — not as a substitute for people, but to make people more effective. Computer-based automated access control systems that will enhance security while minimizing interference with technical staff activities are in the planning stages. Such a system may, to be interactive with similar systems at other labs, incorporate use of a universal badge." ●DR

Fun & Games

Ski Swap — The Sandia Peak Ski Patrol's 22nd annual Ski Swap will be held this weekend, Nov. 3-5, at the NM State Fairgrounds main exhibit hall. The Swap offers skis, boots, poles, and clothing for both downhill and cross-country skiers. If you have equipment to sell, register it on Friday, Nov. 3, between noon and 8 p.m. The sale runs Saturday, Nov. 4, from 9 a.m. to 4 p.m., and Sunday, Nov. 5, from 2 to 4 p.m. Profits are used by the Ski Patrol to buy medical supplies and rescue equipment to help injured skiers at Sandia Peak. For information, contact John Shunny (ret.) on 265-1620.

Fun Run — The 9th annual Charlie Black Fun Run (four miles) to benefit the Animal Humane Association will be held Sunday, Nov. 5, starting at Ventura and Paseo Del Norte. Registration is at 8 a.m.; the run starts at 9. Run with or without your dog. The event is in honor of Charlie Black, a mistreated dog adopted by the Association. Prizes will be awarded in each age group; separate awards will go to top finishers in the "run-with-your-dog" category. There will also be a two-mile non-competitive walk. Entry fee is \$8 before race day and \$10 on race day. T-shirts will be presented to early registrants. Entry blanks are available at Gil's Runners Shoe World and at the AHA (615 Virginia SE).

Fortieth Anniversary Greetings from Sandia's Board of Directors

AT&T takes very seriously its responsibility in managing Sandia National Laboratories. We are pleased to have played this role for 40 years, and can continue to make this contribution if the government desires. It is especially gratifying to note that, in its quest for excellence, Sandia has replicated many of the systems and procedures of AT&T Bell Laboratories.

*Ian Ross
President
AT&T Bell Laboratories*

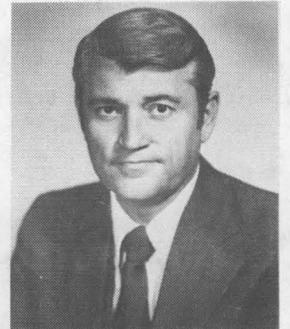


IAN ROSS

I've been associated with Sandia for almost seven years. During that time, I have been pleased in both the way and the substance that Sandia has distinguished itself in fulfillment of its mission and obligations. Since the management approaches and principles used in Sandia are those we use at AT&T, your success . . . is a positive reflection on AT&T. To my Sandia colleagues, I want to say: Keep up the good work! And let's continue to be a credit to those who established such a fine 40-year legacy. (Excerpted from remarks made at the 40th anniversary commemoration, Oct. 11, 1989.)

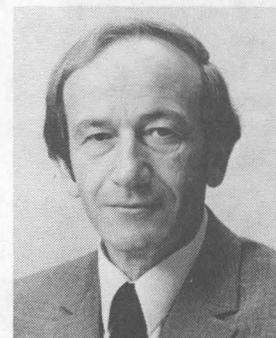
*Tom Thomsen
President
AT&T Technology Systems*

TOM THOMSEN



Since its formation four decades ago, Sandia has become perhaps the premier government engineering laboratory in the nation. Talented people, dedicated to work that is of crucial importance to national security and well-being, are Sandia's hallmark. I'd like to think that AT&T's stewardship of Sandia has contributed to Sandia's success and excellence, but the lion's share of the credit goes to the people of Sandia. And so I salute you, the people of Sandia, on this noteworthy occasion.

*Sol Buchsbaum
Executive Vice-President, Customer Systems
AT&T Bell Laboratories*

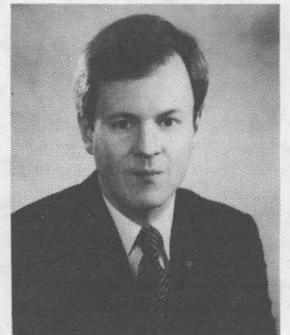


SOL BUCHSBAUM

For 40 years, AT&T has, through its association with Sandia National Laboratories, pursued the single purpose of providing exceptional service in the national interest. My five years' service as a Sandia board member has brought an extra dimension to my work at AT&T. There is an undeniable satisfaction — indeed an exhilaration — in being some small part of this great institution and its contributions to the most pressing global issues of our times. Perhaps even more satisfying has been my personal contact with many individual Sandians. Each of my experiences has renewed my pride in your accomplishments and the privilege which I feel to be associated with you. Congratulations on 40 years of dedication.

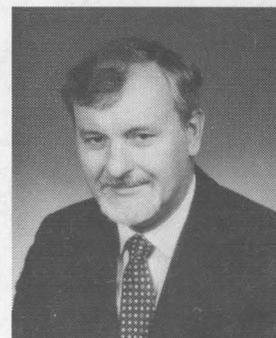
*John D. Zeglis
Senior Vice-President & General Counsel
AT&T*

JOHN ZEGLIS



Reflecting on Sandia's first 40 years, we should feel proud of what has been accomplished during that span of time. The Laboratories' record of achievement stands as a tribute to the concerted efforts of the many employees, past and present, who believed in the importance of their work, invested a large part of themselves in the endeavor — and in the process created an outstanding institution. We owe much to those efforts. Without yesterday's achievements, we would not be able to deal successfully with the growing challenges confronting us today. As we approach the last decade of this century, I can think of no better way to pay respect to the past than to direct all our energies toward realizing our vision of the future.

*Al Narath
President
Sandia National Laboratories*

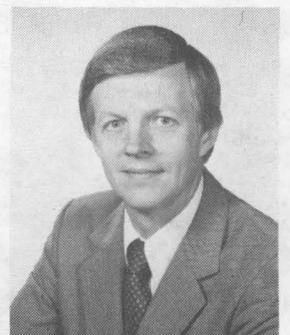


AL NARATH

Over the course of the last 40 years, Sandia has made many substantial contributions to our nation's security and well-being . . . ones in which all Sandians can rightfully take pride. I believe that we can attribute much of our success to the leadership and management guidance provided by AT&T. That being the case, we are indeed fortunate to enjoy a relationship that is mutually beneficial; that is, AT&T's leadership and management guidance are invaluable in enabling Sandia to achieve a high level of success, which, in turn, reflects favorably on AT&T as well as Sandia. Our challenge for the future is to keep that cycle going. Congratulations to all, and best wishes for continued success.

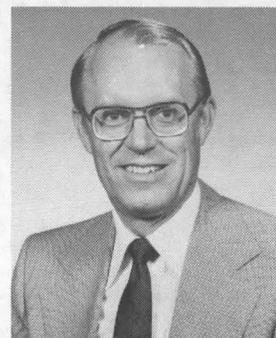
*Lee Bray
Executive Vice-President
Sandia National Laboratories*

LEE BRAY



I hope all Sandians feel the same sense of pride that I do in our 40 years of accomplishments under the management of AT&T. We have a lot to be proud of during these 40 years. Our contributions to the nation's defense are recognized and appreciated by freedom-loving people around the world. The Labs has made its mark through the dedicated efforts of many Sandians — former and current. As we observe our 40th anniversary, I want to thank and congratulate all of you who have made Sandia such a fine institution and to thank AT&T for its guidance throughout the years.

*Orval Jones
Executive Vice President
Sandia National Laboratories*



ORVAL JONES

Many Thousand Words . . .

A good photo, it's said, is worth a thousand words. On this and several following pages is a sampling of photos from Sandia's past. The photos aren't intended to depict our entire history. Some show major events, such as the 1962 visit of President John F. Kennedy. But most are included simply because they're interesting or entertaining. Enjoy!

In a few cases, we've credited the photographer, but, in most cases, we don't know who took the photos. Our thanks go to all of them and to several other Sandians and Labs groups — former and current — who provided photos, including retired LAB NEWS photographer Bill Laskar, corporate historian Necah Furman (3141-2), Still Photography Sec. 3154-3, and Public Information Div. 3161.



FORMER SANDIAN BILL BIRD operates the master-slave manipulators at the Sandia Engineering Reactor Facility (SERF) — Sandia's first reactor facility — in 1962. (Laskar photo)



THIS 1974 PUBLICITY SHOT for the Coronado Club 4th of July picnic spoofed a Camels cigarette ad circulating at that time. Under the question, "Can You Spot Who'll Miss the C-Club's Glorious 4th?", each person in line was assigned a name: (from left) Aunt Tagonist (C-Club employee, no ID); Aunt Teek (Norma Taylor, ret.); Tab Runreader (Jim Mitchell, 3160); Mark and S. Terwill Yums (John Shunny, ret., and LAB NEWS summer hire, no ID); Bug E. Whip (Joe Laval, 3163); Evil Kin Eval (Andy Landis, ret.); Meet E. Orologist (Gerse Martinez, ret.); and Rabid Service (C-Club employee, no ID). Yes, you're right; Tab Runreader was the one not going to the picnic — too many much more important things to do . . .



THE McDONALD RANCH at White Sands Missile Range is the setting for this '40s photo of Louis Jacot and Jerry Jercinovic (both ret.). Both were involved in Trinity shot preparations.



SANDIANS AT LIVERMORE file out the gate in the late '50s.



BIG SNOW HIT Feb. 1, 1956. Many employees were marooned at Sandia into the nighttime hours — almost certainly, the owner of this car was.

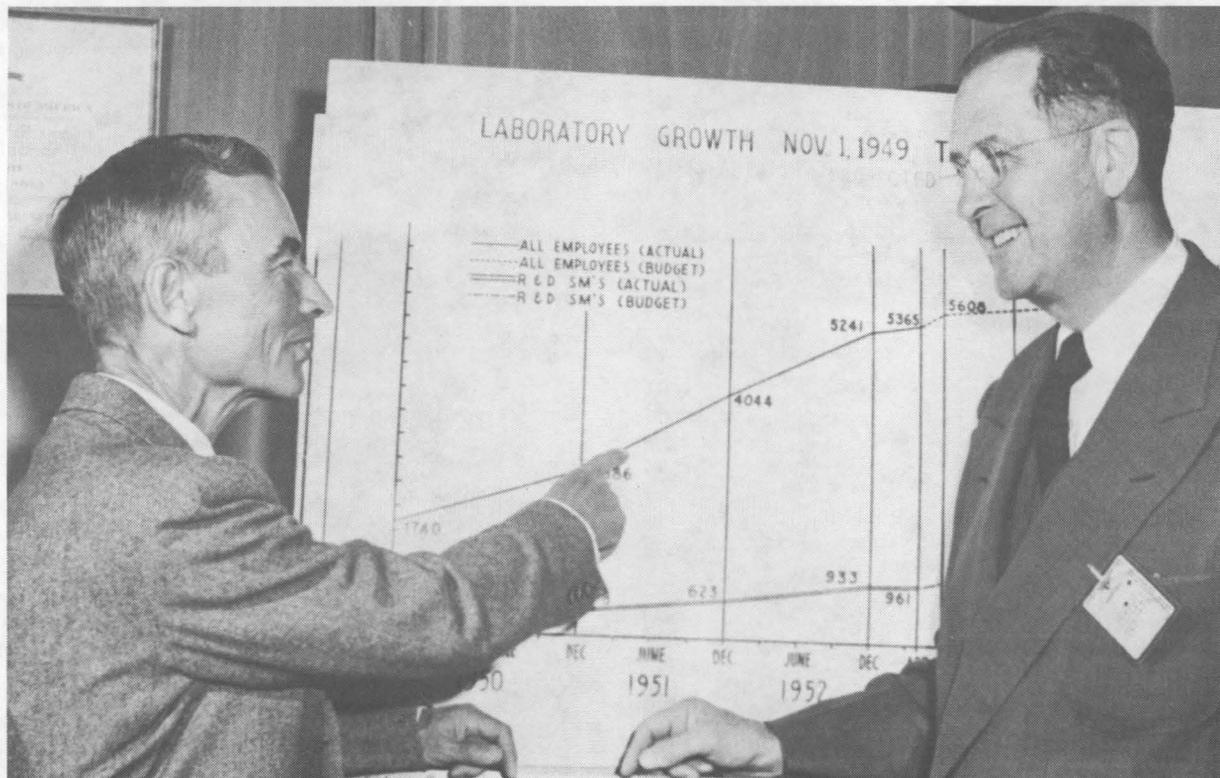




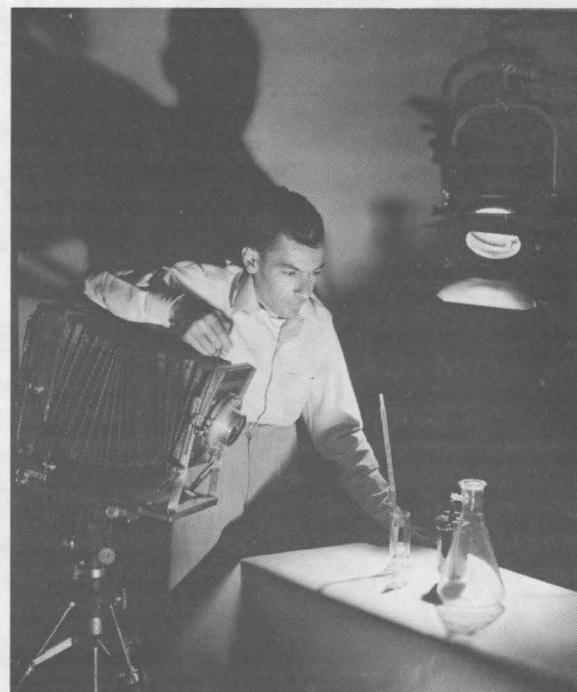
FORMER VP GLENN FOWLER (ret., second from left) and Sandia President James McCrae (dec., second from right) learned how to build outriggers from Ujelang natives while they were in the South Pacific for field tests during the mid-'50s.



TELEPHONE OPERATORS made sure the calls went through in Sandia's early days.



SANDIA PRESIDENT DONALD QUARLES (1952-53, dec.) charts Labs employee growth for N.M. Senator Clinton P. Anderson (right) in early 1953. According to the drawing behind them, 5365 people worked at Sandia as of the end of April 1953.



FORMER LAB NEWS PHOTOGRAPHER Bill Laskar (ret.) worked in the Still Photo Lab in the early '50s. Here, he recalls, he was setting up the props for a brochure photo. Bill took many of the photos shown on these pages.



SANDIAN ABIE JOJOLA (ret.) also had another job in 1964; he was governor of Isleta Pueblo.



PHOTOGRAPHERS Bill Geck (left, ret.) and Tiny Harris (dec.) set up cameras before the visit of President Kennedy in December 1962.



CLEAN-OUT-THE-FILE DAY — Sometime in the '50s, former Sandian Jane Holman (now Bickelman) came across a very interesting collectible.



PRESIDENT KENNEDY greeted the crowd as his limousine drove through Area I in December 1962. With him is N.M. Senator Clinton P. Anderson. Part of the Secret Service detail rides in front.



BACK IN THE '60s, the folks in Tech Art really took their carpooling seriously. This photo ran Dec. 31, 1965, with a LAB NEWS editorial comment on the virtues of carpooling — eight years ahead of the '73 oil shortage. (Laskar photo)



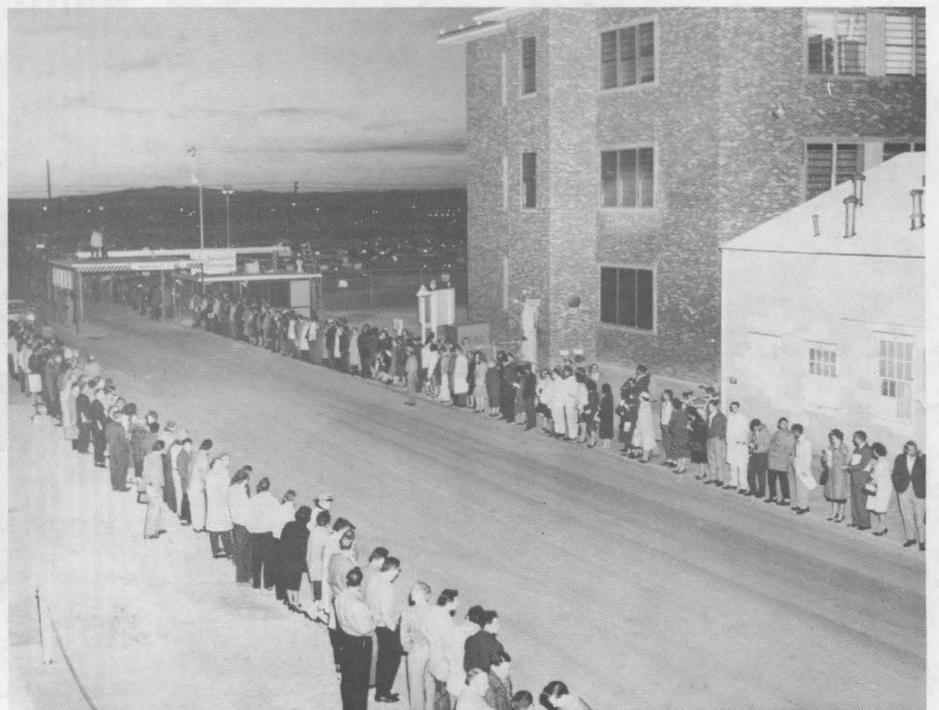
ON-ROLL CERTIFIED PROFESSIONAL SECRETARIES numbered 13 in August 1976. They were (from left) Bobbi Voelker (3151), D'Ann Streater (now Anderson, 5200), Jean Langston (Gaeddert, ret.), Helen Walsh, June Rugh, Marla Kist, Rachel Jackson (Botner, 122), Etta Moore (3562), Esther Coffman, Virginia Podvin (contractor), Betty Pickel, Wanda Whitham (6400), and Jo Hanna.



AT THE PEAK OF THE '70s OIL CRUNCH, "Sheik" Bert Quelle (dec.) posed with his oil can for LAB NEWS photographer Bill Laskar (ret.).



SANDIANS IN BLDG. 840 were surprised to find a batch of new kittens in the assembly storage yard outside the building one morning in August 1966. From left: Jim Tichenor (2565), Thomas Spindle (7476), and Marion Apodaca (7556).



SANDIANS LINED TECH AREA STREETS from Gate 1 to Bldg. 892 when President John F. Kennedy visited the Labs in December 1962.



TONOPAH COURTHOUSE PHOTO was shot in 1964 by LAB NEWS photographer Bill Laskar (ret.). Bill recalls he was standing in the entrance of an old mine when he took the picture.



WOMAN WITH THE HOE (actually, with the rake) — LAB NEWS assistant editor Phyllis Wilson (3162), featured in a LAB NEWS story on Sandia gardeners in 1979, showed off some summer produce at her North Valley home.



FORMER SANDIAN MARGIE SUTTON and the turkeys she raised on her North Valley farm were featured in the 1954 Thanksgiving issue of LAB NEWS.



IN 1968, SANDIA PHOTOGRAPHERS volunteered to help *Albuquerque Tribune* editor Ralph Looney (right) film families of N.M. Air National Guard members stationed in Viet Nam. The films were subsequently sent to the Guardsmen at Christmas time. Labs photographers included (from left) Bob Matthews (ret.), Bill Mahaffey, and Tiny Harris (both dec.).



PUBLIC RELATIONS MANAGER Ted Sherwin (ret.) met Minnie Pearl at the 1970 national meeting of the American Cancer Society in Chicago.



GENE IVES (now 8100) played the title role in the Albuquerque Civic Light Opera production of "Music Man" in 1968.





Z-DIVISION TECHNICAL AREA, now Sandia Tech Area I, photographed from the southeast. Bldgs.

838 and 839 are left, Bldg. 828 and the chapel at top center. At right are crates of material stored out-

doors. This is a view from the 1946-47 era; the chapel was later moved north of the parade ground.

A Four-Year Metamorphosis

How Z Division Grew Into Sandia Labs

At the end of World War II, the US had a monopoly on the immense military power of the atomic bomb. What it didn't have was a stockpile of bombs or a well-organized way to build a stockpile. Nor was it clear that a stockpile would be created, beyond what could be assembled from components produced during the war. Once the nation committed itself to nuclear armaments, however, it needed a laboratory that could do the engineering needed to turn nuclear explosives into field-usable bombs.

In late July 1945, a Los Alamos group was formed to do the engineering and assembly required to develop and produce future nuclear weapons. This was Z Division, named for its head, Jerrold Zacharias, who had come to Los Alamos from MIT's Radiation Laboratory.

A few weeks later, after the Japanese surrender, Los Alamos and the embryonic Z Division entered the postwar era. Z Division was assigned to assemble and stockpile weapons from already-ordered components and, in cooperation with X (explosives) and G (gadget) divisions, to design new weapons.

Zacharias had already proposed — on the same day the Hiroshima bomb was dropped — that Z-2 Assembly Group move to Albuquerque's Oxnard Field. It was clear to Robert Oppenheimer, Director of Los Alamos Laboratory, and Gen. Leslie Groves, head of the Manhattan Engineer District, that some site other than Los Alamos had to be found. Too inaccessible and, by the end of

the war, too crowded with researchers, Los Alamos could not accommodate a weapon-development effort of any size.

Oxnard Field was a prewar civilian airport. The Army Air Corps purchased it in 1942, used it for training aircraft mechanics and later as a convalescent center, and turned it over to the Manhattan Engineer District in July 1945. It was near Kirtland Field, the closest place to Los Alamos where anything more than a lightly loaded DC-3 could land and take off. Moving there along with the largely military Z-2 people were O (ordnance) Division procurement specialists, needed to redirect deliveries of weapon components.

From "Oxnard" to "Sandia"

In September 1945, Groves directed that renovation and some new construction be done, for an initially authorized sum of \$95,000, at "Sandia

The feeling increased that the weapon-development work could be separated from Los Alamos.

Base." This seems to be the first time Oxnard Field was officially called "Sandia Base." General adoption of the new name may have been speeded by the misdelivery of some material to a different Oxnard Field — in California.

Although Zacharias returned to MIT in October

1945 (about the same time Oppenheimer left Los Alamos), the division retained its name. Portions of it gradually moved to Sandia Base through the next year, until the relocation of Z-4 Engineering in early 1947 reunited the whole division.

The feeling increased that the weapon-development work could be separated from Los Alamos organizationally, just as it was being separated

In June 1947, the US was producing less than one atomic bomb every two months.

geographically. Still unclear was whether Sandia Base would be military or civilian. In May 1946, a Los Alamos conference of military and civilian representatives decided that Sandia would be an ordnance activity administered by the military.

At the same time, however, debate on the makeup of a commission to control US use of atomic energy was nearing an end. The Atomic Energy Act, signed by President Truman on Aug. 1, 1946, established a civilian Atomic Energy Commission. Although this bill provided for military representation to the AEC, including appointment of a military director for AEC's Division of Military Application, the AEC's absorption of much of the Manhattan Engineer District ensured that Sandia Base would be primarily civilian.

Where Are the Bombs?

During 1946 and 1947, several groups of Washington officials — including the newly appointed AEC commissioners — visited Sandia to inspect operations. They found activity among the fewer than 400 people at the base — for instance, technicians were sorting existing weapon components and testing new ones — but not much of a stockpile, and no production-scale facility for creating one.

In fact, in June 1947, the US was producing less than one atomic bomb every two months, a rate reported to be constrained in part by Los Alamos's capacity for metal fabrication and initiator production. Using components as they became available, the assemblymen of Z Division worked in the Kirtland ordnance area. Completed bombs were stored in igloos in Tijeras Arroyo, south of the runways.

Because of growing Cold War tensions, a greater production rate was felt to be necessary. But Z Division's staff had been stretched by

(Continued on Next Page)



BUILDING 828, with the chapel still standing just north, was one of Z Division's earliest bomb-assembly buildings. This photo was taken in 1946.

(Continued from Preceding Page)

Z Division

Operation Crossroads in 1946, which tested the effect of atomic bombs on ships. In 1947, the division had to prepare for Operation Sandstone, conducted in April 1948 to test new Los Alamos designs. There were also administrative problems — such as those in procurement, which was hampered by separation from Los Alamos headquarters and by the security-motivated need to funnel purchased material through several transfer points. Nor was it easy to build up the staff rapidly — many people were still in a postwar mood of reaction against armament work, housing remained short, salaries of Z Division were low, and clearances could require months.

Z Division's leadership was also in flux. Roger Warner had replaced Zacharias in 1945; in early 1947, he became the AEC's Director of Engineering in Washington, and Bob Henderson (later a Sandia vice-president) became temporary

The AEC's absorption of Manhattan Engineer District ensured that Sandia Base would be primarily civilian.

leader of the Division. Paul Larsen, who had worked with several US companies as well as with Johns Hopkins University's Applied Physics Laboratory, became Z Division head in December 1947.

During 1947-48, the production rate at Sandia Base increased, but it was becoming clear that in the long term two things were needed: a larger, more stable staff at all levels, and industrial expertise for weapon production.

The personnel problems were gradually overcome. From 370 people in December 1947, Sandia Base grew to 470 in April 1948, more than 1000 by the fall of 1948 (though overtime remained frequent), and 1420 in March 1949.

Z Division Becomes Sandia Branch

The other problem, developing an industrial approach to weapon production, involved further separation from Los Alamos. Z Division became a separate Sandia Branch of Los Alamos on April 1, 1948. This reorganization was an initial step in moving toward industrial-style management. By establishing a Department of Applied Physics, it also set the stage for a future research emphasis along with engineering.

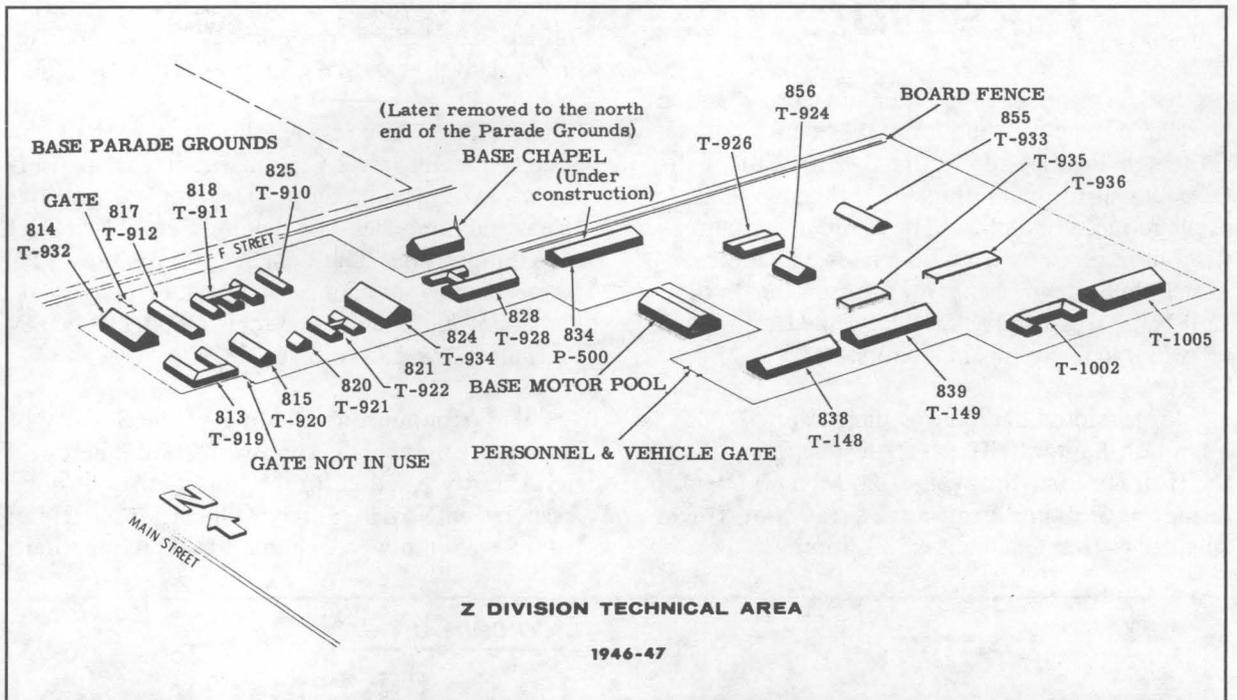
While research was being added to Sandia's mission, production was being subtracted from it. In late 1948, a former aircraft-engine plant in

Needed were a larger, more stable staff at all levels, and industrial expertise for weapon production.

Kansas City was selected as a new weapon-production site, with Bendix Aviation Corporation managing it. When this plant began operation the next year, Sandia's former production facilities became available for fabricating prototypes. Sandia's unique mix of research, engineering, and prototyping was thus created, along with an understanding that the weapon developers would keep close technical ties with the producers.

Contractor Needed

This change relieved the University of California, which was still managing Sandia along with Los Alamos, of responsibility for weapon production. But considering the engineering expertise and industrial management needed for effective weapon development to be beyond the University's capabilities, the UC regents went further and announced at the end of 1948 that the University did not wish to manage Sandia after



DRAWING OF Z-DIVISION Tech Area, made about 25 years ago, can (with some mental gymnastics) serve as a key to the aerial photo on preceding page. Drawing is view from southwest; note relative position of chapel and Bldgs. 838-39 here and in photo.

July 1, 1949.

Even before this formal statement, AEC officials had discussed with several companies — including Bell Labs — the possibility of taking over Sandia. None wanted the job. After the regents' announcement, the AEC retained Bell Labs Executive Vice-President Mervin Kelly to evaluate both the Los Alamos and Sandia operations. Kelly recommended that Sandia be placed under industrial-style management. He did not recommend a particular company for the job, specifying only that it should be an organization with experience in systems work and strength in scientific fundamentals.

AEC Wants Bell System

The AEC considered several companies and decided that the Bell System was the best candidate. Military representatives agreed. AEC Chairman David Lilienthal met with President Truman on May 13, 1949, to tell him of the choice. The same day, Truman sent a letter to AT&T President Leroy Wilson, urging him to accept the AEC's request as an opportunity for "an exceptional service in the national interest."

Wilson notified the AEC on July 1 that Western Electric would manage Sandia — provided that a pending antitrust suit against the Bell System would not be affected — on a no-fee, no-profit basis; the last stipulation was also on account of the suit.

Sandia Corporation was formed after an inactive Albuquerque real-estate holding company agreed to release its claim to the name. The new company's capitalization of \$1000, the legal minimum, was paid by Western Electric for 100 shares of stock (the \$1000 was then invested in US Savings Bonds). On Oct. 4, 1949, Western Electric and the AEC signed a contract for operation of Sandia Laboratory until Dec. 31, 1953. Two days later, at its first meeting, Sandia's board of directors endorsed the contract. Sandia Corporation took over operation of the Laboratory on Nov. 1, 1949.

(Sources for this drastically condensed version of Sandia's history from 1945 to 1949 include Frederic C. Alexander, Jr.'s *History of Sandia Corporation Through Fiscal Year 1963* and Necah Furman's (3141-2) *Sandia National Laboratories: A Product of Postwar Readiness* (SAND88-0984), both available in the Technical Library.) ●CS



"RECOLLECTIONS FOR TOMORROW," a collection of first-person accounts describing some of the most notable programs and accomplishments of the Labs' first 40 years, is being distributed to all employees and retirees. Key members of the production team (from left): Mike Lanigan (3155), graphic artist; Lillian Pritchard (3152), lead compositor; Rod Geer (3163), a writer and project coordinator; and Jacqueline McWilliams (3151), copy editor. Other Div. 3152 contributors include Cecilia Gutierrez, Emma Johnson, Adron Pritchard, and Maxine Norton. Other writers: Jim Mitchell (3160), who conceived the idea for the booklet, selected the topics, and edited all of the copy; Nigel Hey, Ace Etheridge, and Ken Frazier (all 3161); and Charles Shirley (3162).

Take Note

Sandia retirees Floyd Elder and Curley Saxton were able to help Albuquerque residents contact relatives and friends in the Bay area after the Oct. 17 California earthquake. Floyd and Curley are ham radio operators. They contacted hams in the San Francisco area with names and addresses of people there to check on. Information on their well-being was sent back to Floyd and Curley, who relayed it to the original inquirers.

Professional Secretaries International, Albuquerque Chapter, will meet Tuesday, Nov. 14, at the Holiday Inn Midtown (2020 Menaul NE) for dinner at 6:30 and program at 7:30 p.m. Guest speaker is Tom Gautsch, whose topic is "So You

Think You've Got Your Life In Control." For information and dinner reservations (due by noon on Friday, Nov. 3) call Mary Scott (9200) on 4-8034.

The New Mexico Kachina chapter of the Society for Technical Communication is sponsoring a daylong workshop, "Desktop Publishing: Issues and Strategies," on Saturday, Nov. 4, at T-VI in Albuquerque. The cost is \$41 for non-STC members (\$16 for members), which includes a box lunch. For information and registration, call Nancy Benson on 271-2324 or 296-4282.

The Albuquerque Chapter of the Society of Logistics Engineers is sponsoring Albuquerque's first Charity Auction for the Muscular Dystrophy Association Nov. 12 at the Ramada Classic Hotel from 2 to 5 p.m. More than \$10,000 in merchan-

dise and gift certificates — including vacation trips, computer equipment, housewares, sports equipment, home-entertainment items, and toys — will be available in live and silent auctions. There will also be drawings for door prizes. Tickets are \$4 advance purchase or \$5 at the door. For information and tickets, call 889-2776.

Sandians are invited to join a new Albuquerque Civitan group that meets Wednesdays at noon at the Airport Restaurant. Civitan is a community service organization of business and professional people, who, through local clubs, seek out community human-service needs and work to fulfill them. For information about Civitan and membership in the new group, call Judy Whittinghill on 765-4260.

Retiring



JIM KING (7400)

Medical Corner

Be on the Lookout — It's the Great American Smokeout

By Arlene Price (3300)

Many of us know from firsthand experience that quitting smoking isn't easy. The November 16 Great American Smokeout, sponsored by the American Cancer Society, can help.

If you've been wanting to give up smoking but have just kept on procrastinating, here's your chance! You don't even have to quit — all you have to do is take the pledge to stop smoking for 24 hours. In effect, you get a practice run.

Research shows that successful quitters have stopped smoking lots of times. Mark Twain said, "It's easy to quit smoking! I know! I've done it a thousand times!" Well, the fact of the matter is that successful quitters have done it thousands of times, too.

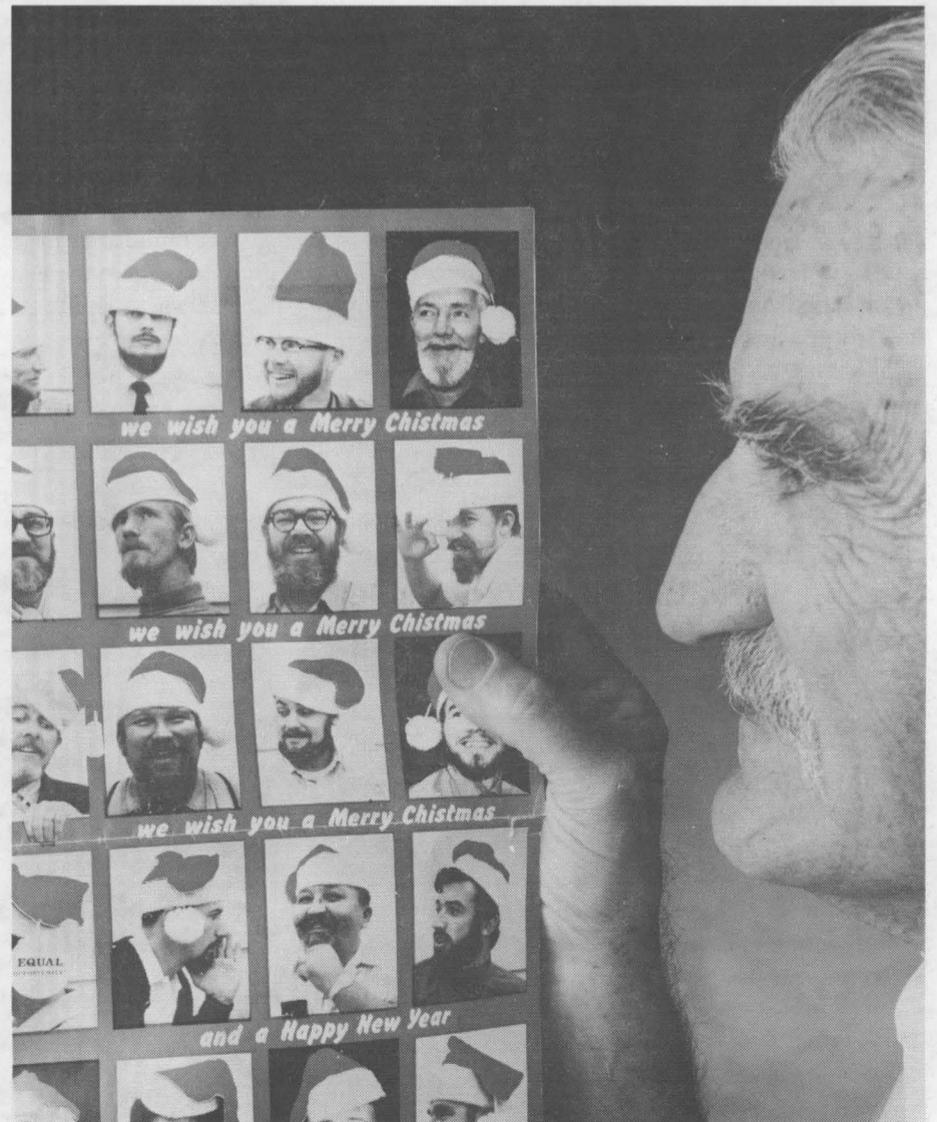
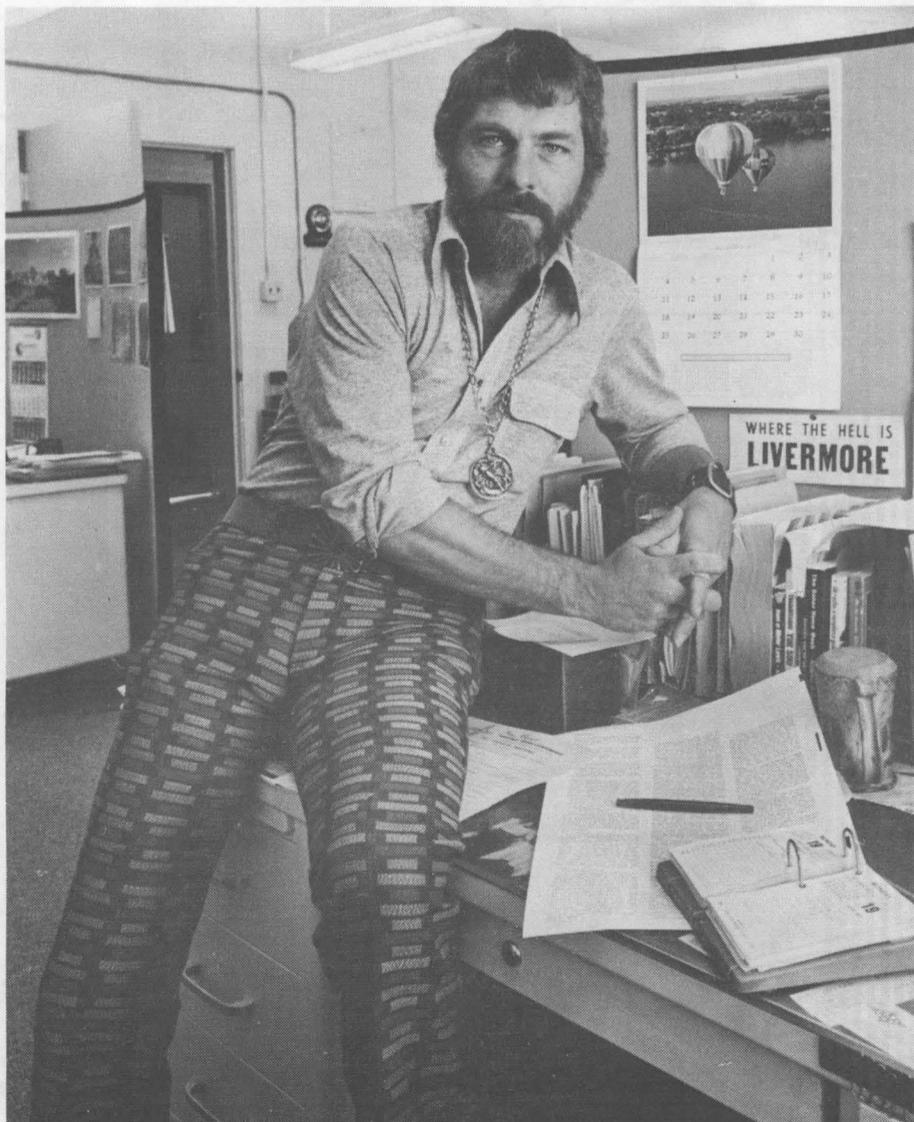
The point is, don't give up on yourself if you've tried it before. You never know exactly when you're ready to make a change.

Research also shows that successful quitters pick a date to quit. I know — quitting smoking can be very scary. But that's where the Great American Smokeout can help. There will be lots of people just like you striving to get through those 24 hours. And your loved ones will encourage you, too, because they care.

Be on the lookout for Sandia's Great American Smokeout volunteers! Each year we're around with all kinds of goodies — stickers and buttons and survival kits filled with munchies.

Even if you've tried it before and are still smoking, don't be embarrassed to come back again. Who ever said that other people achieve their goals — any kind of goal — on the first try?

The Great American Smokeout is the Thursday before Thanksgiving. So be on the lookout for further information on where and when to find us! ●



IN SEPTEMBER 1977, LAB NEWS writer Bruce "Snake Legs" Hawkinson (now 3153) was getting ready to head for Livermore to handle PR chores and write copy for the LAB NEWS Livermore page. Looks like he bought some new clothes — and an astrological medallion — to prepare for what he probably called the "California experience." Bruce later returned to Albuquerque as a writer/director in the Motion Picture Division and subsequently was named LAB NEWS editor in 1982. When you wear pants like these, you gotta keep movin' on.

THE LAB NEWS HOLIDAY COVER in December 1970 is one that then-editor John Shunny will never forget — but most of the time, he'd just as soon not be reminded about it. On one of his recent visits to the LAB NEWS office, John good-naturedly posed with the ill-fated cover. "Not only did we misspell Christmas," says John, "we misspelled it three times." The cover featured 35 bearded and mustached Sandia-Clauses and one lone Sandia-Clausette sporting an equal-opportunity sign (barely visible, lower left).

From the Editors' Notebooks: "Afterthoughts" and "Antojitos"

Former LAB NEWS editor John Shunny (ret.) introduced an editor's column — "Afterthoughts" — when he took over the paper in 1968. When John retired in 1982, his replacement, Bruce Hawkinson (now 3153), continued the tradition with "Antojitos" (loosely translated: "little morsels" or "hors d'oeuvres"). When current editor Larry Perrine became editor last

March, he said goodbye to "Antojitos" and hello to "This & That."

The names are different, but the idea is the same: Reflect on what's happening at Sandia in a variety of short — and often pithy — items, philosophize a bit, air some pet peeves, and throw in some irreverent zingers occasionally. (All three of the editors are reputedly irreverent fellows from

time to time, so the latter probably involved doing what comes naturally.)

Below are excerpts from John's "Afterthoughts" column and Bruce's "Antojitos" column, with dates indicated. Larry declines to be included; rather, he wills his pearly prose to those who put together the 80th anniversary issue.

Thanks for the memories, John and Bruce. ●

Afterthoughts

News Story of the Week — Most of you are thinking this is going to be one more item to add to the saturation coverage of the Democratic Convention. But interesting, I guess, as the convention was, it wasn't for me the *real* story of the week. In its story of the naming of Miss Carlsbad as Miss New Mexico for 1972, the *Journal* says "Her talent routine was a vaudeville tap dance routine to the tune, 'It's A Grand Old Flag,' which ended with her performing 1-1/2 minutes of tap dancing upside-down on an especially built platform, to thunderous applause." Just contemplate that for a while and see if you aren't as much moved by this account as I was and am. (July 21, 1972)

Whatever Happened to the Sensible Brogan? — Men, if you want to feel stodgy, take a look in a shoe store window. Heels are high, wide, and wooden, looking like Carmen Miranda discards. . . . Colors, well you can have most anything except brown or black. (You can have brown *and* black.) Even the humble sole becomes a fashion item — the climber's lugged sole, great for scrambling up mountains but of dubious qualification for strolling around the office, is suddenly chic. And buttons, bows, festoons, chains, and rainbow-colored laces, batteries not included. Thomas Jefferson said, "In matters of principle, stand like a rock; in matters of taste, swim with the current." Well OK Tom, if you say so, I do incline to those fuchsia wedgies with the tassels. (Jan. 12, 1973)

Where Are the Reformers of Yesteryear? — In the late '60s and early '70s, the youth of the country became a national preoccupation, necessarily so because of the sheer stridency with which they advocated their causes. . . . There was shrill insistence that the young view of necessary changes in our social fabric and educational system prevail, and many of us were swept along and solemnly tried to see the merit of these views (a courtesy seldom returned). Well, a few years have passed, the firebrands appear to have burned out, mainstream America really hasn't changed much, and from today's perspective, the whole movement shapes up as a gigantic spoof. One feels sort of like the sheepish victim of the shell game in the carnival. . . . (July 19, 1974)

Hair — I recall a local tennis tournament in the late '60s in which a finalist in the men's singles scandalized onlookers because he sported a kind of Prince Valiant hairdo. Do you remember the furor about long hair? "Long" was touching the collar, and school PTAs anxiously adopted resolutions urging authorities to banish hirsute boys. Bearing in mind the intensity of the passion the subject aroused then, take a close look now at your Sandia male. Assuming your subject has hair, chances are his collar is not only touched but engulfed, his ears are concealed by hair, he may have bangs and, not content with this manly show, he may even have a mustache and/or beard. And this appearance provokes scarcely a blink. Moral: Today's indignation is tomorrow's indifference, especially in matters of taste and style. (Dec. 24, 1976)

Antojitos

Look Mom, No Hands — One of the wonders of the Information Age has arrived at the LAB NEWS! It's a word processor — in fact, four of them — and we're collectively spending most of our time getting acquainted with the habits of our new beasts of (word)burden. I approached the arrival of the much-touted marvels with feelings akin to those of an adolescent lad facing a heavy date with, say, Loni Anderson — awe, delight, and fear. . . . But I'm on my way to the glories of Machine Mastery — not bad for a guy who has to read the instructions every time he uses a can opener. And if I just press this key . . . look, Mom, it's typing! (Dec. 2, 1983)

Boring? Sandians? — Several Tuesdays ago, the *Journal's* IMPACT magazine included an article, "The Great Beyawned," that described the patently boring activities of the Albuquerque Dull Men's Club, Clod Chapter. One of its principals, Dr. Don Seelinger, was quoted as concerned over the minuscule [yes, it's spelled right] Sandia representation in the club. "Once we tap Sandia," he predicted, "we'll be overrun with members." (May 11, 1984)

If Sandians Were in the Olympics — "Yes, Jim, I'm really thrilled with my gold medal. It was really tough out there today. But I was able to see a stability problem coming up and that's when I made my breakthrough. What I knew I had to do was to choose the right material to make a thin layer of corrosion-resistant wide bandgap semiconductor and then, when we came off the backstretch, use it to make a protective window for the smaller bandgap unstable semiconductors; then I'd be home free. I did have some real competition in choosing the right material, of course, but once I realized how chemically robust boron phosphide is, I was able to cruise on in to a first-place finish. . . . I want to take this opportunity to thank my running mate — without his fantastic skills in the crystal-growing lab, I never could have won this medal today." (Aug. 17, 1984)

Overheard in the Cafeteria — "I've got 30 years here. I'll retire at 62 — or three bad days in a row, whichever comes first." (Oct. 12, 1984)

True Story — Employee with "Sandia Lab" cap in shopping center in Midwest. Sweet little lady comes up to him and says, "I have a lab. I even belong to the lab club. But I never heard of a Sandia Lab. What color are they?" (March 14, 1986)

LAB NEWS Good Deed of the Day — To save you some embarrassment, you should know that one of the ways that President Welber is getting to meet and know more Sandians is to eat in the Sandia cafeteria.

Said Irwin to one fellow diner, "What organization are you in?" "(9231 [or whatever it was]," replied the fellow; "and how about you?" "One," said Irwin. "Which one?" asked the fellow.

Another diner introduced himself by name. "And I'm Irwin Welber," came the response. "Sure you are," said the Sandian. "And I'm the Pope." (Aug. 1, 1986)

Classified Ads Reflect the Times

Classified ads tell a lot about the time they're published. More specifically, they mirror the economic situation — interest rates, inflation level, relative value of "things."

LAB NEWS surveys in recent years show that the ad page is read by a large number of readers.

For whatever reason (maybe things sell fast), the ads section has grown from four or five column inches in the early '50s to — often — a full page in the '80s: some 70 column inches.

Perhaps it's fitting, on the occasion of Sandia's 40th anniversary, to look back at some of

the LAB NEWS ads that ran in a less inflationary era. Below is a sampling of what Sandians were buying and selling in 1951, 1961, and 1971 (minus phone numbers and addresses). The ads may make you long for the "good old days," but remember: Salaries were much less then!

1951

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| <p>WRINGER-TYPE WASHING MACHINE, full-size capacity, good condition, \$30. Goodman.</p> <p>'37 CHEV. TOWN SEDAN, dependable transportation, radio and heater, \$175. Dierks.</p> <p>'49 PACKARD DELUXE, 135 hp, 2-dr., radio, heater, overdrive, extra good condition, \$1550. Schmidt.</p> <p>'50 FORD CONVERTIBLE (chartrouse), radio, heater, overdrive, 9K miles, \$1950. Hayes.</p> <p>PHONOGRAPH, single-speed, leather-cased, 1500 new needles, \$9. Weber.</p> | <p>'47 HUDSON COMMODORE SIX, 4-dr. sedan, perfect condition throughout, below ceiling, \$875. Dixon.</p> <p>BUICK RIVIERA, late 1950, 2-dr. sedan, Dynaflo, radio, heater, side mirrors, all custom equipment including undercoating and white side-wall tires, two-tone green, 4K miles, cost \$3100, sacrifice \$2450. Smitha.</p> <p>'48 HARLEY-DAVIDSON 125 motorcycle, good running condition, \$125. Kelsey.</p> <p>'48 CROSLY STATION WAGON, Egyptian sand color, heater, '51</p> | <p>license, economical and dependable transportation, \$395. Peirce.</p> <p>2-BDR. HOME, almost new, NE, near school and bus, our equity, payments \$53/month. Nickell.</p> <p>BRICK HOME, Hoffmantown, 3-bdr., 1-3/4 baths, garage, six rooms, \$450 in extras, all for \$10,535, \$2500 down, FHA payments \$68. Marshall.</p> <p>APARTMENT FOR RENT, 2-rm., private entrance, near University, \$10/week, all utilities paid. Harris.</p> <p>2-BDR. HOUSE, relatively dust-free area, landscaping and sprinklers</p> | <p>fore and aft, wall aft, FHA loan of \$8400, selling price \$12,000. Dondanville.</p> <p>CESSNA 120, 850 hrs. total time, 10 hrs. since engine overhaul, fuselage green, wings silver, excellent condition, \$1150. Dasso.</p> <p>ORIENTAL RUG, 5 x 7 ft., rose color, new condition, \$35; Navajo rug, 4 x 6 ft., new condition, \$17. Smitha.</p> <p>'40 STUDEBAKER CHAMPION, overdrive, cheap transportation, \$100. Ayers.</p> <p>BABY GRAND PIANO, small-size</p> | <p>Brambach in perfect condition, \$200 down and terms or \$877 cash. Cheeseman.</p> <p>EVERBEARING STRAWBERRY PLANTS, transplant now and they'll bear next summer, 10¢/doz.; raspberry plants, 50¢/doz. Sherwin.</p> <p>ALBUQUERQUE RANCH ESTATE LOTS, 4 choice locations, \$300 to \$450. McCoy.</p> <p>COLLIER ENCYCLOPEDIA, complete set, \$50. Starr.</p> <p>FUR COAT, lady's, Persian lamb, \$25. Smitha.</p> |
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Obviously, Mr. Smitha used the ads section frequently in 1951 — and "cream-puff" descriptions weren't against the rules. Real estate and

automobiles were mixed right in with miscellaneous items, and "for rent" ads were OK. And, too, there weren't any word limitations that year;

the longest ad of all time — 188 words (too long to print here) — appeared Sept. 14, 1951. Now, on to 1961:

1961

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| <p>STERLING SILVER FLATWARE, Westmoreland's "John and Priscilla," five 6-piece place settings, \$125. Janney.</p> <p>4-BDR. HOME, 1-3/4 baths, attached garage, carpeting, air conditioning, good school area, selling for \$12,500 FHA appraisal, \$400 down. Brinkley.</p> <p>'51 NASH STATESMAN, nearly new tires, battery, and voltage regulator, seats make into bed, \$245. Thompson.</p> <p>DINING ROOM SET, 9-piece: buffet, china cabinet, table, 6 chairs, \$100. Pope.</p> <p>'40 CHEV. COUPE, 2-dr., heater, good tires, \$100. Peurifoy.</p> <p>'51 FORD, 4-dr. sedan, automatic shift, R&H, snow tires on rear, \$75. Guiseppi.</p> <p>'55 DESOTO, 4-dr., power brakes, power steering, auto. transmission, AC, R&H, \$600. Bahr.</p> <p>NO. 85 IRONRITE MANGLE, \$125. Costello.</p> <p>GOOD OLD '47 DESOTO FORDOR, runs fine, \$65. Stam.</p> <p>ADMIRAL TV, 12", w/table, \$25; rural mail box, \$1. Summers.</p> <p>3-BDR. HOME, almost new, on half acre SW Valley, h/w floors, extra large storage room, screened back porch, priced at FHA appraisal of \$13,600. Smith.</p> <p>DINING TABLE, cherry wood, 6 chairs, upholstered seats, extra leaf to seat 8, \$75. Shepherd.</p> | <p>'58 EDSEL, Ranger Series H.T., power brakes, power steering, low mileage. Norton.</p> <p>OWNER GONE, must sell or rent quickly, 3 bedrooms, 1-1/2 baths, attractive neighborhood, \$10,500 or \$85 rent. Robnett.</p> <p>NEW APARTMENT FOR RENT, 4 furnished rooms, \$58, water and garbage paid. Glory.</p> <p>HOUSE TRAILER FOR RENT, in canyon, 10 minutes from Sandia Base, \$10/month. Chavez.</p> <p>LIMED OAK FURNITURE: desk, \$20; dining table and 6 chairs, \$75; coffee table and 2 end tables, \$15; Simmons studio couch, \$20 OBO. Goen.</p> <p>3-BDR. HOME, 1-1/2 baths, pitched roof, corner lot, \$11,900, down payment \$500 plus closing, monthly payments \$100. Kaczar.</p> <p>1-1/2 TO 5 ACRES, South 217, \$495/acre; 5 to 40 acres, Torreon, \$200/acre, your terms. Kurowski.</p> <p>10 ACRES, Manzano Mountains, pine trees, joins National Forest, electricity on property, title insurance, \$90/acre cash. McKinley.</p> <p>'56 FORD, 4-dr., V-8, \$145 cash and take over 7 Credit Union payments of \$50.70. Archuleta.</p> <p>'58 CHEV., original owner, 4-dr., stick shift, full lakers, louvered hood, R&H, ww tires, \$995. Smith.</p> <p>FIVE-ROOM HOUSE FOR RENT, 1 bdr., University area, furnished or unfurnished, \$65. Flores.</p> | <p>MOSSMAN 3-BDR., den, double garage, drapes, carpeted, SW landscape professionally installed, all built-in appliances, 5-1/4% FHA, \$23,500. Pearl.</p> <p>'52 STUDEBAKER CHAMPION, R&H, \$175 OBO. Adair.</p> <p>BEAGLE PUPPY, 11 months old, female, AKC-registered, \$30. Carlmark.</p> <p>'57 BUICK SPECIAL, 4-dr., hardtop, \$695, terms if desired. Pasko.</p> <p>EQUITY in 1 or 2 acres, under irrigation in Corrales, \$3000/acre, all offers considered. Trujillo.</p> <p>'58 OLDS 88, 4-dr. sedan, \$125. Merrell.</p> <p>'51 IMPERIAL, a clean limousine, \$350 OBO. Mozley.</p> <p>TWO LIONEL TRAIN SETS, complete, w/track mounted on 5' x 10' collapsible table, \$400 value, \$75 OBO. Harrison.</p> <p>'59 MUSTANG, bought new Dec. '59, low mileage, extras, \$325, see to appreciate. Schenck.</p> <p>MAPLE ROCKING CHAIR, antique, contour seat, sturdy and man-size, rock your troubles away for \$59. Galbreath.</p> <p>CHINA CABINET, Colonial solid cherry, upper doors glass, lower doors wood, \$35. Lohse.</p> <p>'56 CHEV. STATION WAGON, V-8, Powerglide, PB, R&H, tinted glass, low mileage, \$850 or make offer. Taylor.</p> <p>GREEN WOOL WILTON RUG, 12' x</p> | <p>15', w/pad, \$30. Sherwin.</p> <p>KITTENS CHEAP, LIKE FREE, cute, box broke. Levy.</p> <p>UPRIGHT PIANO, black and tatami exterior, \$85; rattan chaise lounge, w/pad, \$15. Schatz.</p> <p>'59 GERMAN WARTBURG (Auto-Union), 4-dr., 5-passenger, limousine, extras, \$550, will finance part, less for cash. Wilcox.</p> <p>3-BDR. ROBERSON, 4-1/2% GI, some extras, \$16,500 with \$1000 down, willing to bargain. Heinz.</p> <p>COCKTAIL DRESS, full-skirted, pink crystalline, w/matching duster, fits sizes 12-14, \$10. Cox.</p> <p>LADY'S Watch, 17-jewel Benrus, diamond each side, new band, \$25. Smith.</p> <p>DRAPES, full-length gray cotton, gold lurex thread, 10-ft. and 6-ft. widths, both for \$5. Miller.</p> <p>'61 CHEV. BISCAYNE, white, blue interior, R&H, V-8, AT, just what I owe, \$2300, cost \$3199.99. Cummings.</p> <p>4-BDR. HOME, 2 patios, BBQ, den w/FP, refrigerated AC, 2000 sq. ft., landscaped, \$9 a square foot. Remholz.</p> <p>HOUSE, \$7000 total price, \$500 down with easy terms. Aguilar.</p> <p>'47 STUDEBAKER COMMANDER, \$75. Fitch.</p> <p>TWO NEW MOUNTAIN HOMES, Cedar Crest, each w/2 scenic acres, save \$\$\$, you finish inside, \$6000 and \$7000. Aaron.</p> | <p>SURREY WITH FRINGE ON TOP, factory-motorized, owned by little ole girl who never drove over 5 mph. Abbott.</p> <p>SPORTSLINER CAMPER for 1/2-ton pickup, cost \$235 new, will take \$40. Weimer.</p> <p>COLEMAN FLOOR FURNACE, 35,000 Btu's, \$15. Deeter.</p> <p>STEP TABLE, limed oak, feels out of place among walnut furniture, wants to make a change. Mick.</p> <p>'49 FORD PICKUP, 4-spd. 1/2 ton, \$140; '51 Buick Super, straight 8, R&H, \$225. Elskes.</p> <p>'42 CHEV., 4-dr., heater, defroster, running condition, \$79. Nohl.</p> <p>1-BDR. HOUSE FOR RENT, NE, garage, 1/2 acre, w/w rug, draw drapes, tile bath, range, refrigerator, \$55, completely furnished, \$70. Brown.</p> <p>HICKORY SKIS, 6'8" Groswood with cable bindings, metal edges, metal poles, \$20. Burns.</p> <p>IT'S \$70, it runs, it's transportation, it's a '47 Packard, it's for sale. Weber.</p> <p>ELECTRIC TRAIN, American Flyer, 2 engines, 6 cars, all mounted on 4' x 8' plywood board w/village, \$20 OBO. Richter.</p> <p>FUR NECKPIECE, 4 squirrel skins w/mink tails, \$20. Dyckes.</p> <p>'52 PACKARD, 4-dr. sedan, \$165. Chandler.</p> <p>CARPET AND PAD, 9 x 14 ft., beige wool, \$20. Woodall.</p> |
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Recapping 1961: It looks like limed-oak furniture was out, walnut in. Mortgage rates were in the

four- to five-percent range, land was a bargain (especially *Corrales* land at \$3000 an acre), and dresses

came with matching dusters. Ad-placers became more creative with their copy. Here's a look at 1971:

1971

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| <p>LADY'S WIG, Dutch Boy style, medium brown, Penney's color six, worn once. Randall.</p> <p>'59 HILLMAN STATION WAGON, 4-spd., R&H, new starter, \$75. Bell.</p> <p>BLOND COCKTAIL & END TABLES, \$30; Slenderette machine, \$50. Grimes.</p> <p>BLACK DRESS SAFETY SHOES, size 10-D, \$3. Mills.</p> <p>'62 FORD GALAXIE, new brakes & paint (black over peach), \$295; '61 VW, new paint, \$495. Brinkley.</p> <p>2 ACRES, Belen, irrigated, alfalfa & fruit trees, electricity, phone & gas to property, \$2000 total. Gonzales.</p> <p>GE WASHER, matching dryer, both for \$80. McClelland.</p> <p>'62 RAMBLER, 18-20 mpg, good mechanically, needs paint, \$295 OBO. Bickle.</p> <p>'66 THUNDERBIRD CONVERTIBLE, 390 engine, AC, \$1150 or trade</p> | <p>on '70 3/4-ton pickup. Vigil.</p> <p>500 SHARES Computer Consultants stock, \$1.75/share. Gholson.</p> <p>'60 BUICK LeSABRE, 2-dr., all power, AC, \$350; '61 Rambler Classic, 4-dr., \$250. Lannon.</p> <p>ROBERSON 3-BDR. HOME, 1-3/4 baths, den, DR, utility room, assume 5-1/4 FHA, \$129/mo., low equity. Luna.</p> <p>TRIPLEX, NE Heights, 2-bdr. units, \$300 monthly income, \$27,000. Eaves.</p> <p>INSTANT HAIRSETTER, Kindness 20 by Clairol. Oberst.</p> <p>'62 CORVAIR MONZA, 4-dr. sedan, \$325 or make offer. Hughes.</p> <p>ROYAL DOULTON CHINA, English Renaissance pattern, 4 place settings, retail value over \$150, sell for \$100. Worrell.</p> <p>COCKER SPANIEL PUPPIES, AKC-registered, \$50. Downey.</p> <p>4-BDR. HOME, Holiday Park, den, tri-</p> | <p>level, landscaped, carpeted, cash to 5-3/4% loan, \$178/mo. Lee.</p> <p>'59 CHEV., 2-dr., blue, PS, PB, \$105. Guist.</p> <p>BLEACHED BULL SKULL, complete with horns, \$7.50. Summers.</p> <p>'62 FORD FALCON, worth \$75. Rakoczy.</p> <p>WIG, blond frosted human hair, \$7. Erlandson.</p> <p>'64 VW CAMPER, luggage rack, heater, 2 new tires, Elfner-maintained, \$950. MacDonald.</p> <p>'53 CHEV. PICKUP, 4-spd., \$150 as is. Moery.</p> <p>ALL-STEEL POGO STICK, will bounce 200-lb. man, \$4; 3-spd. record player, \$6. Guttman.</p> <p>FOOTBALL SHOES, YAFL-approved, sizes 3-1/2 & 5, McGregor & Puma, \$5/pr. Martin.</p> <p>SUNFISH SAILBOAT, w/car-top carrier, \$100; 23" Airline B&W TV, \$25. Thompson.</p> | <p>'69 MUSTANG, AT, PS, \$1800 OBO, will consider trade-in. Silva.</p> <p>2-BDR. HOME, carpet, AC, new hot water heater & roof, 4 blocks from Wyoming gate, \$1500 & assume 7% loan, \$103/mo. Ortega.</p> <p>MOUNTAIN HOME, Sandia Park, 2 acres, 2-bdr., 1-1/2 baths, sun room, heated 2-car garage, \$23,500, 7-1/2% contract. Paige.</p> <p>'66 MUSTANG, 2-dr. fastback, R&H, AC, 4 on floor, 56K miles, \$1050. Houghton.</p> <p>BOMB: 442 '68 Olds, low mileage, AC, PS, radio, new radials. Pilkington.</p> <p>700 STOCK SHARES, Magma Power (geothermal energy), will sell for average of bid and asked, about \$1800. Holland.</p> <p>DUNCAN PHYFE DROP-LEAF TABLE, w/2 leaves, arm chair, 5 side chairs, tapestry seats, \$75. Stevens.</p> | <p>3-BDR. HOME, Four Hills, view, privacy, 1-3/4 baths plus 1/2, den, dual fireplace, \$43,500. Butler.</p> <p>'50 CHEV., 4-dr., 2 new tires, 2 spares, \$85. Benjamin.</p> <p>'56 CHEV., 4-dr. sedan, needs shocks & short block, \$125. Baldwin.</p> <p>4-BDR. HOME, den, FP, 1-3/4 baths, carpet, drapes, SW landscaping, corner lot, garage, circle drive, \$35,990. Bozone.</p> <p>TWO MOUTON FUR COATS: size 14, \$15; size 10, \$25. Williams.</p> <p>THREE HALF-ACRE LOTS, Rio Grande Estates (Belen), \$900/ea. lot. Chavira.</p> <p>'66 CORVAIR, 4-dr., AT, new spare, \$450. Smith.</p> <p>'61 T-BIRD, red convertible, needs top, AT, AC, \$250. Johnson.</p> <p>'49 PLYMOUTH, \$75. McIlroy.</p> |
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So there you have it — a look at the past, courtesy of the classifieds. Maybe you even placed one (or more) of them. And you're prob-

ably kicking yourself for not buying that Four Hills home for 43 grand — or that red T-Bird convertible for \$250, even if it *didn't* have a top.

Forty years from now, ads from the '80s may bring a similar reaction. ●PW

Sandia Activities — Seventies and Eighties

This is the last in a series of articles (see LAB NEWS, Aug. 11 and Sept. 8, 1989) that highlights some of Sandia's programs and projects over the past 40 years. These historical tidbits are not intended to be a comprehensive listing of events and accomplishments, but to give some "flavor" of the times. We'll leave the comprehensive history to the historians.

The Seventies

In the '70s, Sandia added new departments to meet the energy-crunch challenge that shook up the nation. Solar and geothermal energy programs sprang into existence, and Sandia engineers and scientists visited volcanoes, sank probes into the ocean's depths, and tracked the sun with mirrors to trap energy in solar receivers. Weapon programs were still the prime mission, but Sandians had a variety of assignments and puzzles to solve.

1970 — Sandians developed a carbon and graphite process for producing carbon/carbon (short for carbon filament reinforced carbon) hardware, particularly for use in rocket heat shields. Also that year, the Labs produced PLZT, an electro-optic ceramic (the first transparent ceramic) that could be used to generate black-and-white and color images.

1971 — In an effort to learn whether energetic particles from the earth's aurora originate in the sun or on the earth, Sandians collaborated with university scientists to fire a pair of research rockets into the Arctic aurora. A new shock tunnel capable of generating supersonic flow mach numbers at its muzzle end was completed in Coyote Test Field to subject full-size test units to shocks and overpressures created by detonating explosive charges.

1972 — Sandia's Planetary Quarantine Applied Science Division scientists isolated elusive heat-resistant spores found in soil samples at Cape Kennedy, using a new technique that involved washing a soil sample in Freon. Part of the Mars lander of the Viking spacecraft visited Sandia for a series of balance tests. Sandians went to Alaska to fire a rocket into the eclipse shadow in a combined LANL/SNL test to measure polarization of zodiacal light in an effort to learn more about interplanetary dust.

1973 — In a Sandia study, rockets were fired through storms off the Virginia coast to gather data on the effects of rain, snow, and ice-particle erosion on missile nose cones and heatshield material. Cavitation (formation of gas and vapor-filled voids around an object as it impacts and travels through water) of high-speed projectiles was studied at Sandia's water jet, water tunnel, and water impact facilities. Results enabled engineers to design projectiles that maintain speed and trajectory in water. Sandia began solar research, employing the "solar community concept" to study using the sun's energy as an electrical and heating source for residential and small-business communities. Computer codes were developed to study cratering effects of underground nuclear explosions. Sandians also developed the first fully workable spin-fin roll-control system that stabilizes the roll rate, and thus the flight trajectory, for reentry vehicles.

1974 — The Labs created a new department responsible for managing and coordinating Sandia activities in developing *in situ* fossil-fuel processing technology, with initial focus on oil shale deposits. Sandia also began developing the vertical axis wind turbine. The Labs also participated in NASA's space shuttle rocket-booster-recovery program by evaluating the preliminary system design, proposing alternatives, analyzing system deployment dynamics and parachute structure, and helping design the system test program.

1975 — An experiment in Area III for Sandia's Magma Energy Research Project showed that a stainless-steel heat transfer pipe could survive and function in a corrosive 1400° C magma

environment. Seismic sensors were developed and tested on volcanic Augustine Island off the coast of Alaska to explore using the sensors to characterize a molten body — the magma — underlying the earth's crust. Area III was selected in August as the site for a five-megawatt thermal solar test facility. Sandians studied the idea of using radioactive waste to treat sewage.

1976 — At Tonopah Test Range, Sandians conducted tests to determine if reactor power plant containment walls could withstand the forces of a tornado. B-1 Bomber segments were tested in the Shock Tube Facility in Coyote Test Field. Three full-scale destructive tests of locomotives and trucks were conducted on the rocket sled track to determine the safety of nuclear fuel shipping casks under extreme accident conditions.

1977 — Sandia began testing Proto II, the nation's most powerful electron beam fusion accelerator. Solar receivers were being tested in Area III. Sandians produced the country's first fusion neutrons with electron beams. The Labs also performed core meltdown studies in light-water reactors.

1978 — Sandians helped find the Russian spacecraft Cosmos 954 after it reentered the atmosphere in northern Canada, scattering debris over a wide area. An electronic seal that readily reveals tampering was designed and built at Sandia and was sent to the International Atomic Energy Agency for field testing. Sandia participated in the Diablo Hawk nuclear test at Nevada Test Site to determine if hardware could survive and function in an extreme radiation environment.

1979 — A new plutonium safeguards system was developed and tested at Sandia for DOE. Mirrors in the solar facility focused radiation from celestial and atmospheric events onto detectors as part of a study of "black holes." A transparent ceramic armor was developed for use on vehicles that transport nuclear materials. A portable viscometer was developed to measure flow characteristics of drilling mud under borehole conditions as deep as 20,000 feet.

The Eighties

1980 — A 5.5 Richter-scale earthquake struck Sandia, Livermore, on Jan. 24, 1980, followed by a 5.6 quake a few days later. Sandia engineers strewed sand and gravel from a shaker system into the path of a rocket sled at the 5000-ft. track to simulate an explosive debris cloud to test missile skin materials. The track site was also the scene of nuclear power plant containment structure materials testing in which a segment of a steam turbine was slammed into a concrete slab. The SWERVE II flight test was successfully completed in September. The first microprocessor-based subsystem entered the nuclear stockpile. Development was completed and production started on thermal flashblindness protective goggles for use by the Strategic Air Command.

1981 — Sandia scientists developed and tested gallium phosphide diodes and transistors to operate for long periods at high temperatures for use in geothermal well logging tools and other applications. Lithium/sulfur dioxide cells were modified to develop a battery capable of providing electrical power continuously for up to five years. The Center for Radiation-Hardened Microelectronics was established at Sandia to develop technologies and design capabilities needed in producing large-scale integrated circuits that operate in high-radiation environments. Sandia's Semiconductor Development Lab successfully processed the first integrated circuits designed at Sandia with three-micrometer-minimum feature size.

1982 — Sandia provided technical direction and management support for construction and checkout of the world's largest solar total energy plant at Shenandoah, Ga. Solar One, the 10MWe central receiver pilot plant near Barstow, Calif.,

delivered power to the Southern California Edison grid for the first time on April 12. Sandia provided technical management for the project.

1983 — Development of the W85 warhead for the Pershing II Missile System was completed and released for production. Sandia design and development activities culminated in the first production of the B83 Modern Strategic Bomb. The bomb was certified for the FB-111 and B-52 aircraft, and compatibility testing with the B-1B bomber was begun. Sandians helped Albuquerque study the city's winter haze of wood smoke and vehicle exhaust components, using surface and aerial sampling techniques.

1984 — The Norwegian Regional Seismic Array, a cooperative effort of the Norwegian and US governments, was deployed during the summer near Hamar, Norway, to improve the ability to detect nuclear explosions. A computer code was developed to model buoyancy-driven fluid flows that can be used to predict the formation of plumes from large explosions, the effects of fires inside buildings, or the solution mining of salt caverns. A 30-foot-tall steel vessel 1/8th-scale model of a containment building typical of those surrounding light-water reactor nuclear power plants was filled with pressurized nitrogen gas to the point of gross leakage to validate the analytical computer codes used to predict behavior of containment buildings during severe accidents.

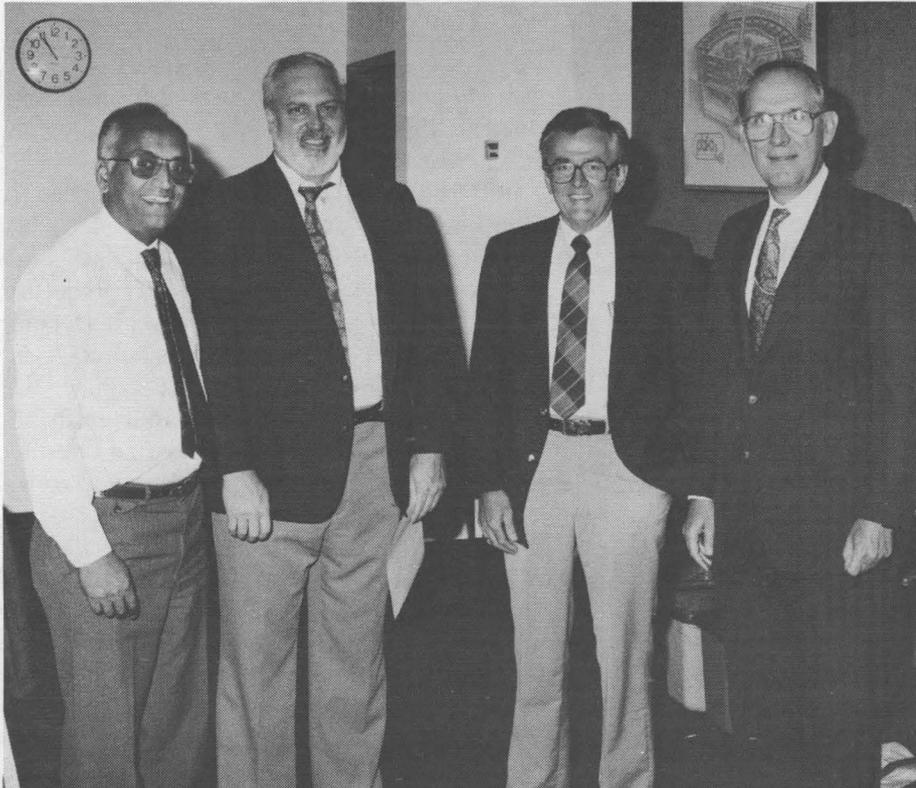
1985 — A new rocket sled speed record was set on the dual-rail track. A 500-pound reverse ballistic target reached 6050 feet per second. The Particle Beam Fusion Accelerator II was completed within budget in late 1985. A robot was successfully introduced for spraying and inspecting light-initiated high explosives applied to and detonated on weapon-related structures. A new radar concept — the Directional Altimeter — for navigation based on terrain topography at very high altitudes for maneuvering reentry vehicles was demonstrated.

1986 — RAPRENOx (RAPid REDuction of Nitrogen Oxides), a chemical means to remove noxious pollutants from exhaust gases was developed at Sandia, Livermore. Experiments at Sandia to study the microscopic chemical and physical processes that occur in explosive reactions produced some of the first real-time spectroscopic measurements in the severe environment of a detonation. The three-wheeled SIR (Sandia Interior Robot) was developed to patrol interior areas, back up intrusion devices, and assist in alarm assessment by broadcasting a TV image to a remote station.

1987 — Development of the Automated PAL (Permissive Action Link) Code Handling System was completed. The system provides the US European Command an automated method of replacing nuclear release combinations in its weapons and maintains accurate records of theater readiness. The Saturn x-ray simulator became operational on Sept. 18, with its first radiation-producing shot. Sandia's EPOCH (Electron Propagation on CHannels) Facility was used to propagate an electron beam 56 metres on a plasma channel, the longest e-beam propagation ever achieved. The Labs developed an unmanned aerial reconnaissance vehicle, AROD (Airborne Remotely Operated Device) for the Marine Corps, and Fire Ant, an experimental robotic system designed to spot and destroy moving vehicles up to 550 yards away.

1988 — A full-scale test to show that a strategic earth penetrator could successfully penetrate medium-strength rock and survive was conducted at Tonopah Test Range. An airborne imaging radar for precise navigation and guidance applications was developed. Sandia and AT&T Bell Labs completed the joint design of a radiation-hard 256K SRAM (Static Random-Access Memory) chip, the

(Continued on Page Twenty)



"PIVOTAL ROLE in the conception and development of the SETEC [Semiconductor Equipment Technology Center] program" — that's what Venky Narayanamurti (VP for Research 1000, left) cited Wayne Johnson (1126, second from left) and Jim Gerardo (1120, third from left) for in giving them the Sandia Award for Excellence. Sandia is developing a national center for increasing the reliability of integrated-circuit processing equipment and helping US companies develop advanced equipment and processing techniques that will improve their ability to compete worldwide. Commenting on SETEC's significance, Glen Cheney (VP for Component Development 2000, right) says, "Economic revitalization is a critical issue facing our country. SETEC will enable Sandia to make a vital contribution in this area." The SETEC program involves efforts in most of Sandia's vice-presidencies. The award given to Wayne and Jim is the first of its kind within 1000; beginning this fiscal year, a portion of Sandia's funds for recognizing individual performance has been set aside for cash awards that are a part of the Sandia Awards for Excellence.

"CQ WESTERN ELECTRIC" was the call 17 Sandians and retirees used to help Sandia win the 1988 CQ-Western Electric amateur-radio contest — among them, Bruce Draper (left, 2131), who used both voice and Morse-code contacts to take first place, and Gene Carter (ret.), who came in third (the two are in Gene's radio room). "CQ" is radio amateurs' — hams' — call for contacting each other. The CQ-WE contest (it keeps that name despite the disappearance of the Western Electric name from AT&T) started as a way to get all Western Electric hams on the air to meet operators from each AT&T location. The event has grown over the decades — last year, during the 29th annual contest, more than 300 hams at 50 AT&T locations entered. The rest of the Sandia 17: Rich Anderson (2142), Ray Arvidson (ret.), Jim Baremore (400), Bryan Burns (2345), Chuck Collier (7264), Jan Collins (8134), Tom Jones, Emile Komarek, Francis Martin (all ret.) Kenneth Mazze (3428), A. V. McFarland, Vaughn Nogle, James Sheley, Merle Snyder (all ret.), and Richard Stump (3212). Sandians and retirees interested in participating this year can call Bruce on 4-7865 — the 1989 CQ-WE will be Nov. 10-11.

Support All Facets of Company

AT&T Graphics Managers Discuss Corporate Design Issues at Sandia-Hosted Forum

Every day, in Sandia and other parts of AT&T, researchers and managers say, "I need a color slide for my presentation," or "I need a brochure for my program," or "I need a 12-minute videotape about my project." As item after item appears in front of professional colleagues or the public, the cumulative effect is a corporate image that can either help or hurt.

To ensure that AT&T's image is moving in the right direction, nearly 50 managers of graphic-design groups throughout the company met here recently and became acquainted with the Labs while discussing quality-related issues.

"The conference gave Sandia graphics supervisors and staff some new ideas in how graphic services can benefit a large corporation like Sandia," says John Cantwell, manager of Technical Communications Dept. 3150, which hosted the forum. "We also strengthened colleague-to-colleague ties with our AT&T counterparts," John continues. "We learned about major

AT&T initiatives and AT&T's organization of graphic support services. Hosting this meeting is just one initiative to strengthen our contacts and collaboration with our counterparts in AT&T. Another is an AT&T communications architecture project, which is being developed to help maintain or improve quality while reducing cost."

Diverse Group

"The graphics organizations in AT&T are diverse," points out Charley Dimmick, Graphics and Reprographics Staff Manager in AT&T Contract Services Organization. "They're all over the country, and they support people in product development, manufacturing, and documentation, for instance. There's also training documentation, sales material, and — as in Bell Labs and Sandia — research and development. All these internal clients need excellent graphic design."

Charley also notes that designers have to be prepared to do high-quality work with emerging

media, such as computer-based training that incorporates videodisk images or CD-ROM (compact disk — read-only memory). The conference, however, focused on how graphic design fits into the corporation, not on specific techniques or technologies.

AT&T has about 70 graphics organizations, says Charley, ranging in size from one person to more than 30.

"Talking across AT&T units can have many benefits," says John Leechan, a staff member of Charley's who organized the conference agenda. "A couple of years ago, for example, a photography conference sponsored by us and Kodak — Sandia's photography supervisor at the time, Tom Zudick [ret.] was there — led us to set up a network. Say an AT&T location needs photographic work done somewhere else, maybe halfway across the country. If there's another AT&T photographic organization close to the job, even in a different business unit, their photographers can do it. So AT&T saves money on travel and hiring freelancers. Sandia is part of the network."

The conference, officially titled the 1989 Support Graphics Design Forum, was coordinated by Nettie Jones (3153) and Kay Rivers (3155-2), who arranged opportunities for the visitors to learn about Sandia and the Albuquerque area. ●

(Continued from Page Nineteen)

Seventies & Eighties

most complex radiation-hard memory currently available. Sandians demolished an F-4 Phantom jet aircraft in a full-scale impact test on the Labs 2000-ft.-long rocket sled track to help researchers predict the impact forces of an aircraft crashing directly into a nuclear power-plant structure. Barriers to parallel computing were overcome when Sandians developed new methods and algo-

gorithms for parallel computing that produced record-setting speedups.

1989 — Sandia's Vibrafuge was completed. It can simulate the combined acceleration and vibration of reentry from space, a missile launch, or a hard turn in an aircraft to test critical electrical and mechanical components of warheads. Sandians continued investigating volcanoes, and introduced new theories about the inconsistent behavior of high-silica volcanoes. A remotely operated miniaturized intrusion detection system (MIDS) was developed that's used to detect passage of people or vehicles along a path or road. ●JW



We Also Provided Pre-Mission Testing and Advice

Sandia Rad-Hard Chips Will Let Galileo Systems Operate in Hostile Jovian Environment

As the Galileo spacecraft makes its way toward Jupiter, Sandians in several divisions can look to the stars and know they had a hand in its odyssey.

Galileo began its six-year journey October 18 aboard the Space Shuttle Atlantis. On board are more than 2000 radiation-resistant silicon chips designed in Semiconductor Components Directorate 2100 and fabricated in conjunction with Allied-Signal's Albuquerque Microelectronics Operations (AMO).

The chips — microprocessors, memories, and custom integrated circuits — are the heart of Galileo systems that will measure, correlate, analyze, and transmit data about the surface and atmosphere of Jupiter and its moons.

Frank Hewlett, supervisor of Microprocessors and Memories Design Div. 2115; Al Giddings (DMTS, 2345); and Keith Treece (DMTS, 2118) spearheaded the Sandia design efforts. At the time all were members of 2115. Jim Jorgensen, who was division supervisor, is now supervisor of Microcontrollers and Analog Div. 2116.

Jupiter Unfriendly to Chips

Ray Bair, manager of Microelectronics Products Dept. 2110, explains that Jupiter's atmosphere contains a large density of high-energy ions that can disrupt normal circuitry. When these charged particles, believed to be generated by volcanic emissions from one of Jupiter's moons, pass directly through a transistor located on one of these chips, the transistor absorbs some of the ion's energy and suffers a voltage surge that scrambles binary digital information. This causes a temporary memory loss, called single event upset (SEU).

The chips were "radiation hardened" through a process developed by the Labs during the past 15 years. They were fabricated in extremely clean surroundings and their electronic structures were chemically and physically altered to slow the degrading effects of radiation.

John Casani, assistant laboratory director for flight projects at the Jet Propulsion Laboratory (JPL), has called Sandia's work in this area abso-

"Sandia's quick solution to the problem avoided the necessity to develop a new computer for the spacecraft."

lutely crucial for the success of the mission. In a 1985 Sandia Science News interview, Casani, who was then Galileo project manager, said, "Sandia's quick solution to the problem avoided the necessity to develop a new computer for the spacecraft."

Older-generation microelectronics, which did not have as many transistors in a given space, were not as affected by direct hits from energized particles. But as components became smaller and more compactly packaged, virtually all of the commercially available integrated circuits were found to be susceptible to SEU.

After detailed analysis of data from the Voyager and Pioneer space missions, Galileo project leaders determined that the more advanced chips planned primarily for the spacecraft's attitude-control system would be unacceptably prone to SEU, even with additional physical shielding.

The attitude-control system ensures that the spacecraft antennae face the earth so that it can send and receive messages.

Rad-Hard Circuits Designed, Tested

In mid-'83, Sandia scientists and engineers began to develop a set of new SEU-immune devices that would be functional, physical, and electrical replicas of the original parts. Sandia began supplying electronic components for Project Galileo two years earlier.



KEITH TREECE (DMTS, 2118) is interviewed by Bob Martin of Albuquerque's KGGM-TV-13 at the Kennedy Space Center Visitor Center near Cape Canaveral before the Oct. 18 Atlantis launch. Keith was one of the Sandians who designed radiation-hard integrated circuits that will allow Galileo to operate in the hostile environment around Jupiter.

"It was really an effort involving a lot of people. The layout designers, the test program development staff, the product engineers, and fabrication technologists all had a hand in the project," says Frank.

Samples of the radiation-hardened components were tested for SEU susceptibility with charged particles generated by a cyclotron at Lawrence Berkeley Laboratory. Samples also were tested at Sandia's Gamma Irradiation Facility, and the actual components in the Galileo spacecraft underwent 168 hours of heat and voltage tests.

Sandia also conducted tests for other elements of the spacecraft — the fuel capsules and the instrument-laden probe that will sample the Jovian atmosphere.

Checking Safety of Plutonium Power

The fuel capsules, processed at Los Alamos National Laboratory, will power the spacecraft's two radioisotope thermoelectric generators (RTGs). The spacecraft must use RTGs because it travels too far from the sun to use solar panels and the mission lasts too long to use batteries. The same power system has been used in 21 other space missions over the past 25 years.

RTGs are powered by non-weapon-grade plutonium-238 dioxide in the form of ceramic pellets encased in an iridium-alloy metal. JPL wanted to determine whether the capsules could be damaged if an explosion of the shuttle's solid rocket boosters propelled shrapnel into the RTGs.

Los Alamos engineers responsible for the safety of the fuel elements asked Sandia to test the capsules on one of Sandia's rocket sleds. To test the Galileo fuel capsules, Sandia's Track and Cables Div. 7535 mounted a booster fragment on the rocket

Sandia also conducted tests for the fuel capsules and the probe that will sample the Jovian atmosphere.

sled and slammed it into a mock-up RTG that contained fuel capsules filled with simulated fuel.

The probe, powered by a lithium sulfur dioxide battery, will separate from the orbiter, sample Jupiter's atmosphere, and transmit its findings to the orbiter for relay to Earth. JPL asked Sandia to perform chemical analyses and other tests to ensure the reliability of the probe's battery.

Route Demands Long-Lived Battery

Jim Searcy, supervisor of Exploratory Batteries Div. 2523, says JPL asked Sandia to perform chemical analyses and other tests to ensure

that the battery would operate after years of dormancy (as Galileo moves toward Jupiter). Sam Levy (2523) was the lead researcher. He was assisted by Darryl Bouchard (2523) and Calvin Jaeger (5245).

After the space shuttle Challenger exploded in January 1986, NASA ruled out using a liquid-fueled upper-stage rocket that would have hurled Galileo on a direct flight to Jupiter. Denied this booster, JPL came up with a route that would allow the spacecraft to use the gravity of Venus and Earth to increase its kinetic energy enough to reach Jupiter.

"When the route became longer, the lifetime of the probe's battery became more critical. It would really be a disaster to get there and the battery not work," Jim Searcy says.

"We did chemical analysis on the cell, non-destructive testing, and discharge tests and reported to JPL that the battery should last 10 years," he says.

Jim says the probe's battery also incorporates some Sandia designs, which Sandia shared with JPL during the years the battery was being developed.

Another Sandian contributed to the mission by serving on one of the independent review panels

The chips were "radiation hardened" through a process developed by the Labs during the past 15 years.

that assessed mission risks. The panels report their findings to the White House Office of Science and Technology Policy, which in turn makes recommendations to the President before he approves or disapproves space launches.

Bill McCulloch (DMTS) of Space Power Systems Div. 6522 serves on a panel that studied the possibility of plutonium being released into the atmosphere as a result of an accident during the launch sequence. Because the panel was meeting in Florida during the week of the Atlantis launch, Bill got to see the space shuttle lift off.

Keith Treece also journeyed to Florida to watch the launch. Two other Sandians who witnessed the launch spent almost two weeks at Kennedy Space Center as members of DOE teams assigned to the launch. Nigel Hey, supervisor of Public Information Div. 3161, was one of the DOE information specialists dealing with media queries at the Kennedy Space Center. Betsy Forbes of Health and Safety Dept. 3210 was a member of a team of industrial hygienists and health physicists that the DOE had on duty at the launch.

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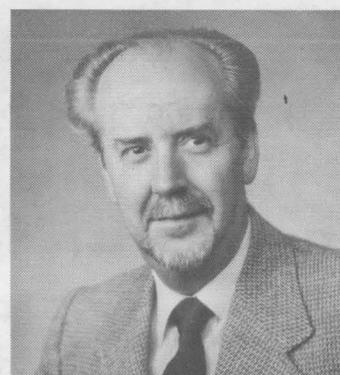
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LAB NEWS

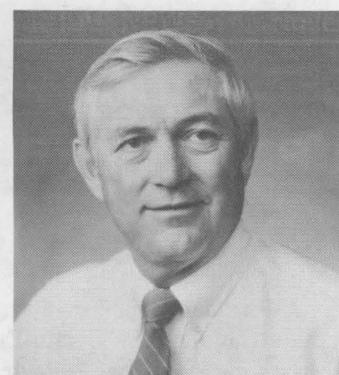
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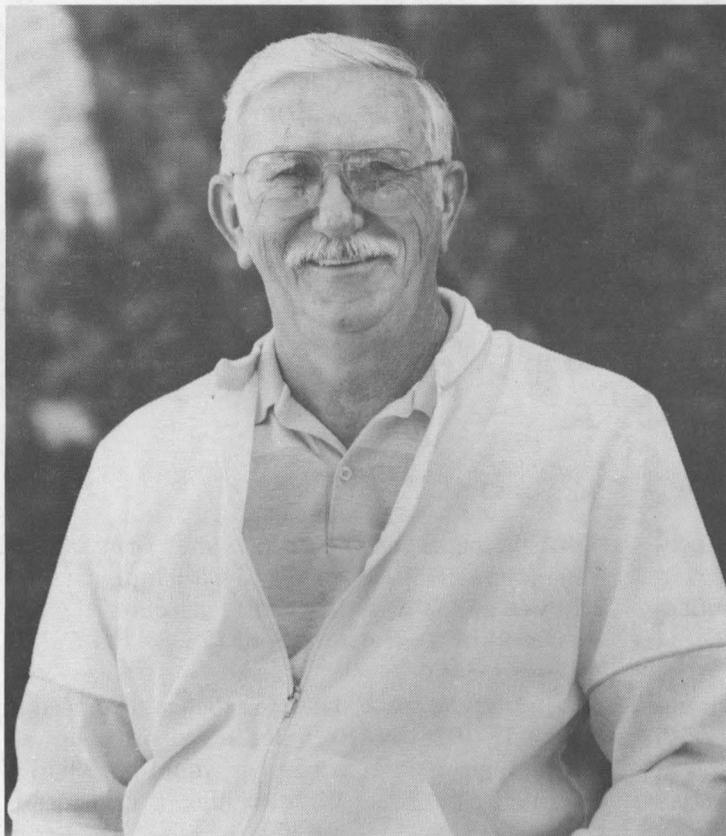
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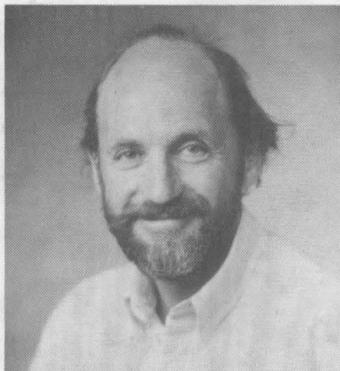
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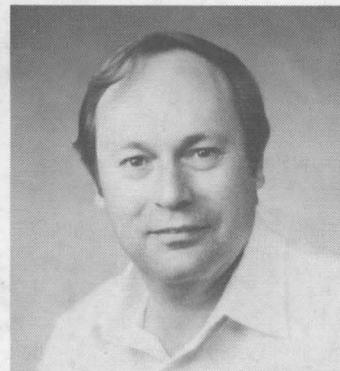
Gary Beeler (5130) 25



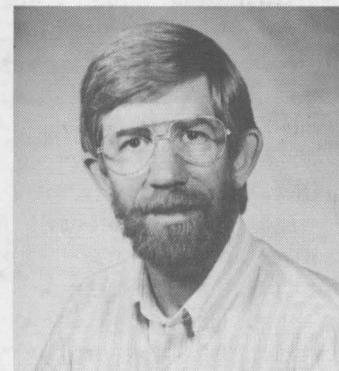
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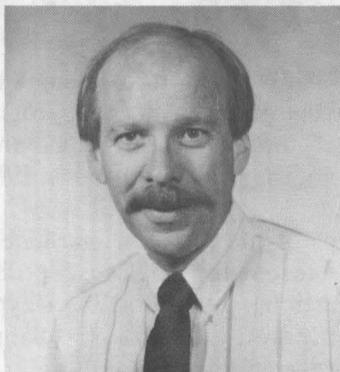
Peter Feibelman (DMTS, 1151) 15



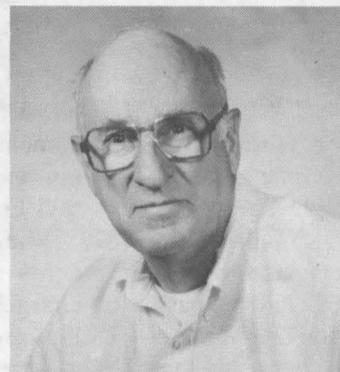
Jerry Myers (5219) 15



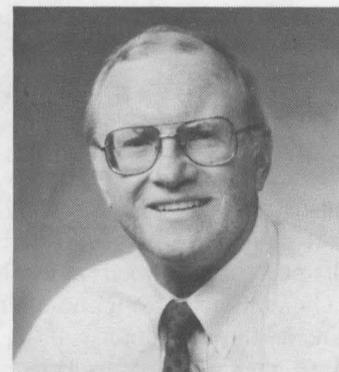
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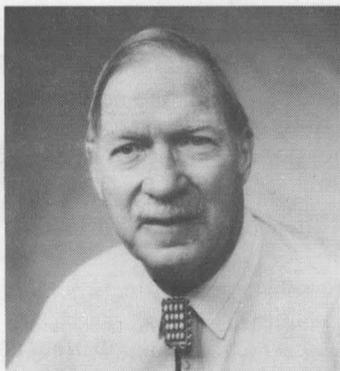
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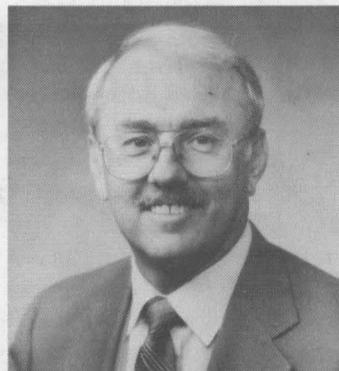
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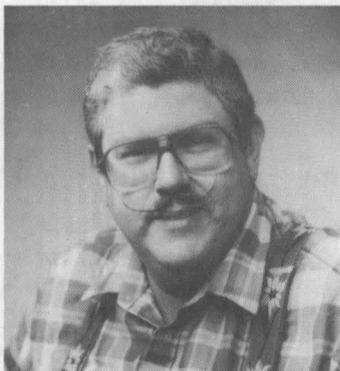
John Shane (5161) 25



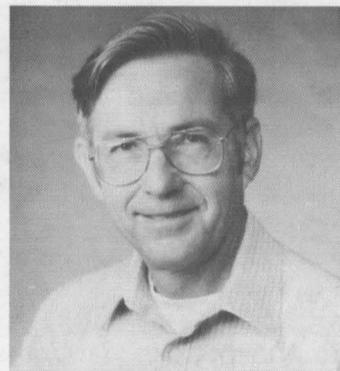
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Jay Tidmore (3724) 25



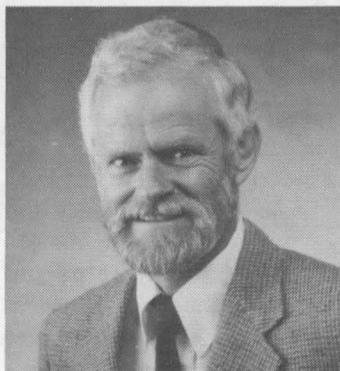
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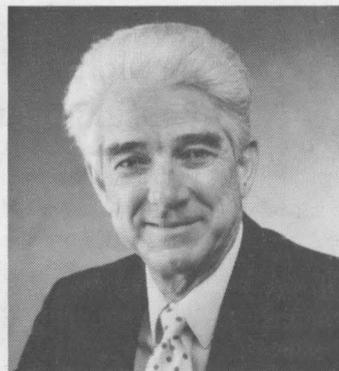
John VanDyke (DMTS, 1424) 20



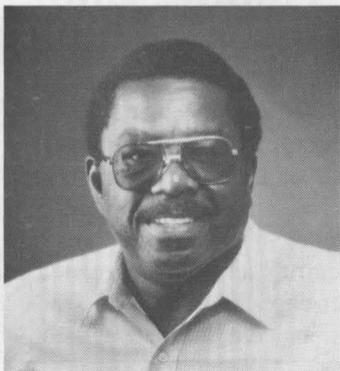
Jimmie Searcy (2523) 15



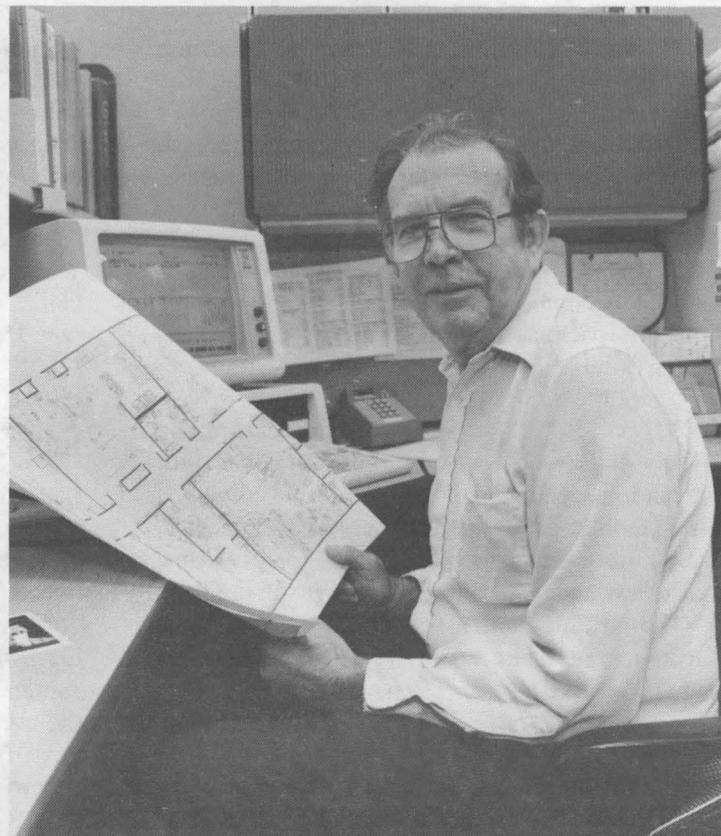
Dave Northrop (6253) 25



Jim Collier (DMTS, 7266) 35



O. B. Crump (2514) 20



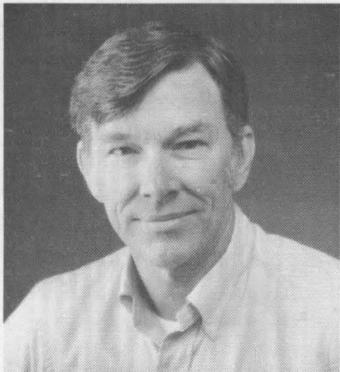
Cecil Morrisett (7842) 30



Celso Sanchez (3424) 35



Chuck Wells (7818) 40



Dick Shead (9115) 30

Take Note

The Provisional class of the Junior League of Albuquerque, in conjunction with the Rocky Mountain Adoption Exchange, is presenting a parent education seminar Wednesday, Nov. 15, from 7 to 10 p.m. at the Holiday Inn Pyramid for people seeking information about adopting special-needs children: those who are seven years old or older, mentally or physically handicapped, a minority

child, or a sibling group including one child seven years old or older. For seminar reservations or information, contact the Rocky Mountain Adoption Exchange on 296-4017 by Nov. 13.

The goblins, witches, ghosts, Batman, princesses, and other Halloween ghouls and heroes from last night's door-to-door festivities

are enjoying their treats. Now that Halloween's over, consider donating your children's costumes to All Faiths Receiving Home for its Halloween costume swap/sale planned for September 1990. Costumes may be dropped off at any Pistol Pete's Pizza parlor or in the drop-boxes at various Labs locations. Call Jann Levin (3543) on 4-6402 or Louise Loudon (141) on 4-3882 for information.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same "for sale" or "wanted" item.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

WINDSURFER, racer, F2 Lightning World Cup, composite construction board (never been used), cost \$1700, sell for \$1000 OBO. Gwinn, 281-9897.

TRAILER with car-top carrier, can be pulled by small car or motorcycle, \$250. Brewer, 831-5031.

SIDE-BY-SIDE REFRIGERATOR, '75 Admiral, frost-free, water through door, harvest gold, \$400 OBO. Craven, 298-0978.

BABY FORMULA, 14 cans of Pro-Sobee liquid concentrate, 85¢/ea. or trade for Similac with iron. Krause, 299-0931.

CARPET KIT for LWB pickup, \$200. Benton, 877-2473.

RAYOVAC WORKHORSE FLASH-LIGHTS, sizes 2AA, 2D, 3D, and 6-volt lantern battery, in original package. Weir, 881-8645.

COMPUTER MEMORY SIMMS, 256K x 9, 100NS, fast-paged mode, \$240/four. Risse, 869-2037.

NORDICTRACK CROSS-COUNTRY SKI TRAINER, \$250. Dale, 291-9020.

CAMPER SHELL, fiberglass, for small pickup, \$300; 4 tires and rims, 14", 5-hole, \$40. Baca, 881-4184.

TRAVEL TRAILER, '84 Terry, 28', self-contained, microwave, stereo, dual propane tanks. Holt, 1-356-5554.

EXERCISE BIKE, Sears Lifestyler, w/digital readout including speed, distance, RPM, time, \$35. Convisor, 828-2137.

AKC-REGISTERED SHELTYE FEMALE, 12 months old, all shots, \$150; 3/4 Sheltie male, 6 months old, all shots, \$35. Dillon, 891-2776.

WINDOW AIR CONDITIONER, 2500 CFM, needs motor, \$25; 2 aluminum screen doors, 30" x 32", \$10/ea. Denish, 256-1559.

NFL SEASON TICKETS, Phoenix vs. Buccaneers, on 40 yard line, Thanksgiving weekend, at cost, \$100. Schofield, 292-7220.

TRAVEL TRAILER, 17' Aristocrat, gas refrigerator, heater, stove, oven, sleeps 6, \$1275. Andraka, 294-2618.

MAHOGANY FRENCH PROVINCIAL COLOR TV, 25" record player, AM/FM radio, console, \$275. Allen, 298-8933.

MAGNIFIER FLUORESCENT LAMP, in box, \$69; home shop vacuum, 16-gal. wet/dry, \$69; attachments, \$15; file/storage cabinet, \$89; 24' ladder, \$89. Brooks, 298-8448.

PELLA WINDOW, aluminum-clad w/wooden frame, fits 33" x 41" opening in 4" wall construction, \$115 OBO. Nelson, 265-7482.

HEDGE TRIMMER, 16", \$30; oil-filled electric radiator, 3 settings, used once, \$35. Kureczko, 281-8206.

METAL DESK, 4-drawer type, w/chair, \$40. Bailey, 821-2471.

DOUBLE KITCHEN SINK, white cast iron, \$10. Spires, 275-3655.

THREE CEILING FANS, \$10/ea.; sheepskin bench seat covers, 2 sets, \$10/ea. Patrick, 265-4569.

UPRIGHT GRAND PIANO, reconditioned and refinished, tuned regularly, will pay for in-town moving, \$900. Foty, 268-0412.

AKC-REGISTERED CHIHUAHUA PUPPIES: champion-sired, female, white w/chocolate head, \$275; male, chocolate sable, \$225; first shots, ready Nov. 29. Sargent, 865-3227.

YOUTH BEDROOM SET: twin bed, bookcase headboard, nightstand, 4-drawer dresser, \$550. Bartberger, 823-2843.

OSCILLOSCOPE, LaVoie Laboratories, LA265A with 53/54K plug-in unit, dual trace, \$50; Smith-Corona portable typewriter, Courier, \$70. Everts, 822-1767.

MINOLTA WEATHERMATIC CAMERA, 110 film. Torrez, 265-1469.

SIG SAUER P-220 .45-CAL., 20 rounds through it, \$550. Chavez, 898-6147.

CLAYTON MARCUS SOFA & CHAIR, \$300; wooden dining set, w/6 chairs, \$225. Prins, 821-0490.

SHOP MANUAL for '85 Ford Bronco II, \$20. Volk, 299-1702.

KING-SIZE WATER BED, complete, \$100 OBO; above-ground pool, 4' high, complete, \$100 OBO. DeTevis, 897-4981.

SOFA/SLEEPER, green plaid, \$150; Capehart 8-track AM/FM stereo, w/speakers, \$30. Graham, 293-7302.

POKER/GAME TABLE, felt-covered, folding legs, \$25. Cronin, 265-5229.

THREE-PIECE BEDROOM SET, plus 2 double beds, \$500 OBO. Lewin, 898-2303.

TWO SENIOR-CITIZEN AIRLINE TICKETS, American Airlines, one-way, Albuquerque to Dallas to Montreal, Nov. 9, \$250 OBO. Balint, 298-2652.

ATOMIC AL7-170s SKIS, Tyrolia bindings, size 7 Trappeur boots, metric poles, \$140 OBO. Marchi, 291-9681.

'81 MASSEY-FERGUSON FARM TRACTOR, 21-hp diesel, 12 forward and 3 reverse speeds, \$3795. Graham, 865-9427.

HERCULON SOFA/SLEEPER, queen-size, 8-cushion, brown/gold/white plaid, \$175 OBO. Bear, 881-7128.

ELECTRIC TYPEWRITER, Sears, w/case cover, \$100. Leatherman, 265-0243.

BETHANY FOLD-OUT CAMPER, refrigerator, stove, heater, sink, 2 butane bottles, storage, awning. Padilla, 831-2114.

TIRES, on white steel rims, 5-hole pattern, 3 with 50% tread, 1 new, P235-75R15, \$100 OBO. Striker, 883-3806.

BLACK & DECKER RADIAL ARM SAW, w/table, \$150; gun cabinet, locking glass doors and ammo drawer, \$30. Curzi, 296-5386.

BABY STROLLER, \$25; playpen, \$25; booster seat, \$5; boat anchor, weed-free swivel type, \$20; ice

chest, \$10. Falacy, 293-2517.

MOVING SALE: furniture, major appliances, miscellaneous, 1900 Father Sky NE. Myers, 294-7316.

NATIVITY SET, 13 pieces, 8" tall, camels, shepherds, et. al., white w/blue cast, never used, \$100. Devor, 293-6710.

GARAGE SALE: furniture, books, dishes, TVs, tools, miscellaneous, Nov. 4-5, 9 a.m.-3 p.m., 3441 Tahoe St. NE. Purcell, 296-4986.

BUNK BEDS, built with 2 x 6's, w/small dresser; 50' three-rail horse corral, \$50. Jackson, 836-1013.

CASE 100 WALK-BEHIND TRENCHER, w/trailer, \$2000 OBO; Saki tamper, \$500; submersible pump, 12-volt, 1-1/2" discharge, \$300. Walerow, 823-2406.

OLHAUSEN POOL TABLE, w/accessories, 4' x 8', 3/4" slate, oak w/leather pockets, 2 yrs. old, \$850 OBO. Disch, 822-9690.

KITCHEN RANGE, all elements operate, \$100; two candy-vending machines, \$100/ea. Shaut, 299-8569.

TWO BRASS/WOODEN TABLE LAMPS, \$25; full-length lined curtains, w/rod, for 6' patio door, \$30. Shrouf, 821-0765.

ELECTRIC PIANO, Wurlitzer, w/acoustic amp, \$475; double bed w/Firm-O-Pedic mattress, box spring, frame, headboard, \$150. Guthrie, 299-7182.

DESKS: pecan rolltop, \$125; pine student, \$65; oak, \$100. Herther, 298-4823.

COMMODORE 64 COMPUTER, tape, disk drive, printer, software, \$290; Cannon Advanced golf clubs & bag, \$250. Davis, 293-7457.

REFRIGERATOR/FREEZER, 18.2 cu. ft., Sears, frostless, ice maker, cold-water tap, harvest gold, \$150. Oberkampf, 292-4366.

PENTAX ME SUPER 35mm CAMERA, 35-70 macro zoom, Vivitar 3500 bounce head flash, 2x and 1.5x multipliers, \$175. Crenshaw, 296-8948.

SONY TAPE DECK, 3-spd., 3-head, w/dust cover, \$15. Guilford, 255-6294.

SEARS BONNET BEDROOM FURNITURE, white w/gold, triple dresser, mirror, desk, bookcase, chair, nightstand, \$450. Wickesberg, 294-8334.

ELECTRIC GUITAR, Peavy T-60, w/hard case, \$195; Gorilla amp, \$30. Johnson, 255-8834.

STARCRAFT TENT CAMPER, interior lights, stove, heater, icebox; chest freezer, \$150; Studio knitting machine, w/templates, patterns, attachments, \$125. Ledbetter, 296-2138 evenings.

BLACK VINYL ARMCHAIR, w/footstool, \$45; antique Morris chair, \$65; 2 small-animal carriers (cat-size), \$15/ea. Goetsch, 892-8366.

CANARIES, bred for song and color, \$60; free guide for care and feeding. Jeppesen, 294-4512.

MAHOGANY TABLE, 3 leaves, \$250; 6 Mexican chairs, leather seats, \$250; antique tongs, \$20; hand-raised doves, \$10. Levan, 344-9794.

FOUR ALLOY WHEELS, wide, high-performance, w/low-profile high-speed tires for BMW, \$750 OBO. Carson, 281-5115.

'76 OLDS. STARFIRE, 3.8L V-6, rebuilt AT, new water pump, shocks, and AC/VS, \$1000 OBO. Craven, 298-0978.

'87 DODGE DAKOTA, 4-WD, SE, 8' bed, V-6 engine, below book. Pryor, 294-6980.

TRANSPORTATION

'69 AMC REBEL, 40K miles, \$1100 OBO. Servais, 292-7016.

'86 YAMAHA VENTURE ROYALE, 1300cc, loaded, extras, garaged, \$6100. Roady, 299-6084.

'72 VW BUG, 89K miles, recent tune-up, \$1200 OBO. Lemen, 293-3487 or 266-6408.

'67 COUGAR XR-7 CLASSIC, PS, PB, AC, AT, 12K miles on rebuilt engine, totally restored, \$6500. Gallegos, 293-8885.

'81 TOYOTA FJ40 LAND CRUISER, white, \$5500. Wronosky, 296-7265.

'73 WINNEBAGO MOTORHOME, 21', generator, AC, refrigerator, furnace, PS, PB, \$5000. Himes, 869-2856.

'77 VW RABBIT, 2-dr., AT, sunroof, new battery and alternator, \$700 OBO. Fleddermann, 262-0008.

'85 CUTLASS CRUISER WAGON, 3.0 litre V-6, AT, AC, AM/FM cassette, tilt, luggage rack, cloth seats, tachometer, \$5100 OBO. Valenzuela, 344-2024.

'76 TOYOTA LAND CRUISER, new paint, rebuilt engine and transmission, 72K miles, \$5500. Cronin, 265-5229.

'85 OLDS. CUTLASS SUPREME, 2-dr., V-6, 40K miles, \$800 below NADA book. Cook, 296-3064.

'82 FORD GRANADA L, AT, AC, PS, 4-dr. Johnson, 296-1917.

'86 FORD BRONCO II, V-6, fuel injection, 4x4, AC, AM/FM, white, 5-spd. OD. Howe, 881-6834.

BICYCLES: 5-spd. woman's, 10-spd. w/new tires plus thick tubes, \$30/ea. Curzi, 296-5386.

'87 PLYMOUTH RELIANT, 4-dr., 50K miles, \$5500 NADA retail. Bailey, 265-0975.

WOMAN'S 10-SPD. SCHWINN BICYCLE, w/luggage racks, \$50. Stang, 256-7793.

'65 FORD MUSTANG FASTBACK, 289, 4-spd., \$4500. Weatherbee, 869-2849.

'89 CLASS A MOTORHOME, 25', basement model, 460 Ford engine, most options, 8 months and 7900 miles left on warranty, \$29,500. Jackson, 821-2012.

'30 FORD "AA" TRUCK, flatbed, overhauled engine, new and spare parts, \$2500 OBO. Schaub, 821-7242.

'49 JEEP CJ-3, tow bar, canvas top, \$1200 OBO. Schuster, 299-1072.

'79 AUDI 5000, 4-dr., AT, PS, \$900 OBO. Shaut, 299-8569.

'81 TOYOTA SR5 PICKUP, one owner, 5-spd., AC, tilt, PS, 75K miles, \$2800; '68 Corvette convertible, both tops, 327, 4-spd., AC, \$10,500. Meeks, 292-5915.

ALLEZ SE BICYCLE, red, 54cm, Sun-tour and Dia-Compe components, cost \$600, sell for \$200. Crenshaw, 296-8948.

'87 HONEY RV, 34', twin beds, Chev. 454, extras. Spatz, 299-0410.

5.5 SOUTH VALLEY ACRES, 1/2-mile east of Coors, \$70,000, terms negotiable. Harrison, 242-2785.

3-BDR. BELLHAVEN CUSTOM HOME, 1850 sq. ft., formal LR, DR, FR, 1-3/4 baths, 2-car garage, landscaped, sprinklers, assume 5-1/4%, \$98,000. Pilat, 292-4727.

2-BDR. ANGEL FIRE CONDO, 2 baths, fully furnished, 1000 sq. ft. Krahling, 268-8126.

TWO-ACRE DEVELOPED LOT in Tomé, fertile valley land, near UNM extension, zoning restrictions, horses allowed, terms. Aronson, 898-8893.

FOR RENT: 3-bdr. home, study, 2

REAL ESTATE

baths, equipped kitchen, more, 2600 sq. ft., \$925/mo. Light, 293-2295.

3-BDR. MOBILE HOME on permanent foundation, w/2-bdr. addition, on fenced half-acre, flexible financing, \$48,000. Stevens, 869-3622.

NE HEIGHTS TOWNHOUSE, twin master bedrooms, 3 baths, views, wet bar, FP, skylights, ceramic tile, 1715 sq. ft., 2-car garage, \$104,900. Roberts, 299-5671.

3-BDR. HOME, study, 1-3/4 baths, city views, landscaped, auto sprinklers, alarm, 1000 Turner Dr. NE (foothills), \$91,500. Molley, 296-8653.

MOUNTAIN HOME on 2 wooded acres, detached 2-car garage, guest accommodations, Highway N14 access, \$110,000. Carson, 281-5115.

WANTED

TRAILER SUITABLE FOR HAULING a full-size car. Prevender, 296-8586.

WORLD BOOK ENCYCLOPEDIA, recent set. Macha, 298-6583.

SERVICE MANUAL for '77 or '78 Dodge M-500 motor home chassis, to buy or borrow. Davis, 865-9265.

SPOTTING SCOPE, can be fixed or zoom power magnification, could be rubber-armored or not, 20x or greater. Schaub, 865-9581.

COMPUTER AND ACCESSORIES, for donation to church, prefer MS-DOS. Andraka, 294-2618.

KING-SIZE BED FRAME. Spires, 275-3655.

TAYLOR RANCH AND PARADISE HILLS PEOPLE interested in starting a vanpool to work. Vigil, 899-0046.

CHEV. SUBURBAN. Jewett, 898-4440.

VOICE LESSONS, looking for teacher to give private singing lessons to an adult with natural abilities but no classical training. Watson, 281-2691.

CHILDREN'S BOOKS, clothes, and toys for toddler girl. Crooks, 293-7008.

CAST-IRON KITCHEN SINK, garbage disposal. Lucero, 296-2473 or 831-5871.

SOCCER BALLS, size 3 or 4, field marker cones, portable goal, etc. Shrouf, 821-0765.

METRANOME, electronic or mechanical. Borgman, 299-6010.

CAMERA, 35mm Olympus 35RC or OM-1, in working condition only. Boyd, 298-4712.

STEP LADDER, 8' minimum. Moss, 298-2643.

BOOKS by Jessie Penn-Lewis, Watchman Nee, Jeanne Guyon, F.J. Huegel, E.E. Fromke, Gene Edwards, T. Austin Sparks, to borrow or purchase. Levan, 344-9794.

LOST AND FOUND

SILVER NECKLACE FOUND between Bldgs. 891 and 892, please provide description to claim. Vigil-Lopez, 6-6669.

SHARE-A-RIDE

VANPOOL SEATS AVAILABLE, along N-14 and Frost Rd., \$34/mo., ride every day. Rentzsch (281-5017) or Burns (281-3922).

NOTE: Since this issue is published two days earlier than normal, advertisers may not expect calls before Friday, Nov. 3.

Coronado Club Activities**Dinner Theatre This Friday Features "Godspell"**

THE OFF-BROADWAY HIT "GODSPELL" is the featured attraction this Friday night (Nov. 3) at the C-Club dinner theatre. The musical, presented by the Kirtland Community Theatre Group, begins at 8 p.m. Beforehand, enjoy a very special dinner — served from 6 to 8 p.m. — featuring chicken breast teriyaki, baron of beef, baked potatoes, sautéed vegetables, a full salad bar, and cheesecake for dessert. Cost is just \$9.95/person, which includes dinner and the show. Reservations requested (265-6791).

THE BEST BRUNCH BARGAIN in town happens again Sunday, Nov. 12, from 10 a.m. to 1 p.m. Menu selections include Virginia baked ham, baron of beef, Denver omelets, scrambled eggs, salsa, bacon, hash browns, green chile stew, green beans almondine, tossed salad, fresh fruit, peach and cherry cobbler, and beverages — the

latter, of course, including a complimentary glass of champagne. Now here's the bargain part: The cost of this mouth-watering meal is just \$6.95/adults, \$3.50/children ages 3 through 11, and free/ankle-biters under 3.

BINGO MANIA happens only three more times this year: Nov. 2, 9, and 16. Cards go on sale at 5:30 p.m., and the early-bird special — with some super gift prizes — begins at 6:45. Reasonably priced food is available throughout the evening, so plan to make a night of it. (Sorry, gang; no bingo nights in December. You've been displaced by special holiday catered functions.)

BACK BY POPULAR DEMAND, Lobster Night's scheduled for Friday, Nov. 10. Besides a whole Maine lobster (\$12.95), other entree selections are filet mignon (\$8.95), stuffed cod (\$6.95),

and broiled salmon (\$6.95). Afterward, enjoy some very danceable music (8 p.m. to midnight) from the Bourguet Brothers Orchestra.

WHAT ARE YOU DOING NEW YEAR'S — New Year's Eve, that is? Tickets for the celebration welcoming 1990 will be on sale from Nov. 13 through Dec. 15. Each couple gets dinner, dessert, a bottle of champagne, and continental breakfast. Dance your way from 1989 to 1990 (9 p.m. to 1 a.m.) with music from Southside. Ticket prices are \$20/person for members, \$23/person for guests.

NO UNDER-THE-TABLE DEALS — That's a guarantee when the T-Bird card sharks get together. And this gregarious group will do just that on Nov. 16, starting at 10 a.m. Come on out for convivial conversation, cut-throat (not really) cards, and gratis goodies.

Events Calendar

Events Calendar items are gathered from various sources. Readers should confirm times and dates of interest whenever possible.

Nov. 1-5 — Dia De Visitaciones (Day of Visitations), multimedia presentation combining theatre, dance, music, art, and film, based on work by New Mexico poet Luis Lopez, with music by Daniel Davis; 2 p.m. Wed., Thurs., & Sun., 8 p.m. Fri. & Sat.; KiMo Theatre, 848-1370.

Nov. 1-18 — "The Comedy of Errors," burlesque by Shakespeare, presented by Theatre-in-the-Making; 8 p.m. Fri. & Sat.; CenterStage (3211 Central NE), 260-0331.

Nov. 2 — Pops Concert Two: "Dizzy and Mr. B Salute the Count," Dizzy Gillespie and Billy Eckstine join the Count Basie Orchestra conducted by Frank Foster, presented by the New Mexico Symphony Orchestra; 8:15 p.m., Kiva Auditorium, 842-8565.

Nov. 3 — Dia De Los Muertos Dance, music by Bayou Seco, come dressed as your favorite deceased person; 7-10 p.m., South Broadway Cultural Center, 848-1320.

Nov. 3 — Holiday Craft and Food Sale, handmade gifts, foods, and craft items; 10 a.m.-3 p.m., 4-H Club Center (1500 Menaul NW), free, 299-2934.

Nov. 3-5 — Dark Weekend Series: "Who Ya Callin' A Lady?" montage of songs, narratives, and other works by women, about women, for everyone; 8 p.m. Fri. & Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

Nov. 3-5 — "A Christmas Carol," New Mexico Ballet presentation; 8:15 p.m. Fri. & Sat., 2:15 p.m. Sun.; Popejoy Hall, 277-3121.

Nov. 3-5, 9-12, & 17-18 — "Picnic," slice of 1950s Midwestern life; 8 p.m. Thurs. & Fri., 6 & 9 p.m. Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

Nov. 4-5 — 40th Annual Hollyberry Fair, Christmas bazaar; 9 a.m.-3 p.m. Sat., 9 a.m.-1 p.m. Sun.; St. Mark's on the Mesa Episcopal Church (431 Richmond Pl. NE), 262-2484.

Nov. 5 — UNM Centennial Series for the Arts: "Memories from Spain," vocal extravaganza of solos and duets from well-known Spanish operettas (zarzuelas), as well as classical and pop Spanish music, presented by the UNM Division of Continuing Education; 5 p.m., UNM Conference Center (1634 University Blvd. NE), 277-1176.

Nov. 5 — Duo Pianists: David Gross and Arlette Felberg, in support of the 50th anniversary of the June Music Festival in 1991; 3:15 p.m., Keller Hall, 277-4402.

Nov. 5 — "Artery"/Lifeline to Contemporary New Mexican Art: Albuquerque United Artists

auction event, live music, preview reception, door prizes, and art by New Mexico artists; 4-6:15 p.m. preview-reception, silent auction; 6:30 p.m. regular auction bidding; La Posada de Albuquerque ballroom and mezzanine, free, 243-0531.

Nov. 5 — Concert, Albuquerque Philharmonic Orchestra; 2 p.m., Central United Methodist Church (1615 Copper NE), free, 292-4886.

Nov. 6 — Keller Hall Series: baroque and 20th century music; 8:15 p.m., Keller Hall, 277-4402.

Nov. 7 — Subscription Concert II: "Opera Without Words," Chamber Orchestra of Albuquerque conducted by David Oberg, music by Rossini, Beethoven, and Weill; 8:15 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

Nov. 7 — "Beehive," singers and combos of the '60s; 8:15 p.m., Popejoy Hall, 277-3121.

Nov. 8 — "Storm Reading," Access Theatre, based on writings of disabled writer/poet/actor Neil Marcus, a celebration of life and human experience, translated in American Sign Language; 8 p.m., KiMo Theatre, 768-5188.

Nov. 9 — "Tziganka," east European music and dance, authentic Russian Gypsy songs; 8 p.m., KiMo Theatre, 848-1370.

Nov. 9-11 & 16-18 — "Death's Nose" (La Nariz de la Muerte), by Jim Linnel, award-winning play with puppets, masks, music, and dance; 8 p.m., Rodey Theatre, 277-4402.

Nov. 9-12 — Southwest Arts and Crafts Festival: more than 200 entrants from across the US, invitational juried show; 10 a.m.-9 p.m. Fri. & Sat., 10 a.m.-5 p.m. Sun.; Exhibit Hall, NM State Fairgrounds, 262-2448.

Nov. 11 — Chicago Repertory Dance Ensemble, mini-performance featuring highlights from the Southern gothic murder mystery, "What Are We Going To Do With Mary?"; KiMo Theatre, 848-1370.

Nov. 11 — Pops Concert III: New Mexico Symphony Orchestra presents the Kingston Trio; 8:15 p.m., Popejoy Hall, 842-8565.

Nov. 11-12 — Prime Time Expo IV: quilt show, fashion show, 200 exhibitors, topical seminars, door prizes, free health screening, travel opportunities, senior arts & crafts fair, continuous entertainment, photo and art show, and special guest Phil Donahue, proceeds benefit Bernalillo County's frail elderly through the Senior Foundation, Inc.; 9 a.m.-5 p.m. Sat., 11 a.m.-5 p.m. Sun.; free transportation from all Albuquerque senior centers, Albuquerque Convention Center, 764-6469.

Nov. 12 — San Diego Feast Day: Buffalo, Comanche, Corn, Deer, and Flag dances; call for times; Jemez and Tesuque pueblos, free, 843-7270.

Nov. 12 — Debra Donleavy, children's rock music; 2 p.m., KiMo Theatre, 848-1370.

Nov. 12 — Taj Majal, folk ballads; 7 p.m., KiMo Theatre, 848-1370.

Nov. 15 — "The Skin Drum," by Julian Grant, 1988 National Opera Association winner, presented by the UNM Opera Studio; 8:30 p.m., Popejoy Hall, 277-4402.

Nov. 16-18 — ASUNM Christmas Arts & Crafts Fair, fine arts and crafts by more than 80 New Mexican artists; 9 a.m.-6 p.m.; UNM's NM Union ballroom, 277-5644.



SANDIA'S BUDGET REVIEW COMMITTEE met last night to review the outlook for employee salary increases next fiscal year. From left are Perry Pessimistic, Olivia Optimistic, and Ned Noncommittal. Needless to say, a consensus was not reached.